

## ÚČTOVNÁ ZÁVIERKA

neziskovej účtovnej jednotky účtujúcej  
v sústave podvojného účtovníctva

zostavená k 3 1 . 1 2 . 2 0 2 3

|   |  |   |
|---|--|---|
| Daňové identifikačné číslo<br>2 0 2 0 7 9 5 8 2 1 | Účtovná závierka                           | Mesiac Rok  |
| IČO<br>0 0 5 9 8 4 2 9                            | <input checked="" type="checkbox"/> riadna | Za obdobie od 0 1 2 0 2 3                           |
| SK NACE<br>7 2 . 1 9 . 0                          | mimoriadna                                 | do 1 2 2 0 2 3                                      |
|   | priebežná                                  | Bezprostredne predchádzajúce obdobie od 0 1 2 0 2 2 |
|   | (vyznačí sa x)                             | do 1 2 2 0 2 2                                      |

Priložené súčasti účtovnej závierky

☒ Súvaha (Úč NUJ 1-01)  
(v eurocentoch)☒ Výkaz ziskov a strát (Úč NUJ 2-01)  
(v eurocentoch)☒ Poznámky (Úč NUJ 3-01)  
(v celých eurách alebo eurocentoch)

Názov účtovnej jednotky

E l e k t r o t e c h n i c k ý   ú s t a v   S A V ,  
v .   v .   i .

Sídlo účtovnej jednotky

Ulica

D ú b r a v s k á   c e s t a

Číslo

9

PSČ

Obec

8 4 1 0 4   B r a t i s l a v a

Telefónne číslo

5 9 2 2 2 6 5 8

E-mailová adresa

j o z e f . f a b i a n @ s a v b a . s k

Zostavená dňa:

2 8 . 0 2 . 2 0 2 4

Schválená dňa:

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Podpisový záznam  
štatutárneho orgánu alebo  
člena štatutárneho orgánu  
účtovnej jednotky:



| Strana aktív  |   | č.r.       | Bežné účtovné obdobie |             |            | Bezprostredne predchádzajúce účtovné obdobie |
|---|---|------------|-----------------------|-------------|------------|--|
|   |   |            | Brutto                | Korekcia    | Netto      | Netto  |
| a   |   | b          | 1                     | 2           | 3          | 4  |
| <b>A. NEOBEŽNÝ MAJETOK SPOLU r. 002 + r. 009 + r. 021</b> |   | <b>001</b> | 15285256.27           | 13682392.99 | 1602863.28 | 1652076.93                                   |
| <b>A.I. Dlhodobý nehmotný majetok r. 003 až r. 008</b>    |   | <b>002</b> | 100802.09             | 87377.13    | 13424.96   | 11963.8                                      |
| <b>A.I.1.</b>   | Nehmotné výsledky z vývojovej a obdobnej činnosti 012 - (072+091AÚ)                               | 003        |                       |             |            |  |
| <b>2.</b>   | Softvér 013 - (073+091AÚ)   | 004        | 96602.09              | 87027.09    | 9575       | 11963.8                                      |
| <b>3.</b>   | Oceniteľné práva 014 - (074 + 091AÚ)  | 005        | 4200                  | 350.04      | 3849.96    |  |
| <b>4.</b>   | Ostatný dlhodobý nehmotný majetok (018+ 019)-(078 + 079 + 091 AÚ)                                 | 006        |                       |             |            |  |
| <b>5.</b>   | Obstaranie dlhodobého nehmotného majetku (041-093)  | 007        |                       |             |            |  |
| <b>6.</b>   | Poskytnuté preddavky na dlhodobý nehmotný majetok (051-095AÚ)                                     | 008        |                       |             |            |  |
| <b>A.II. Dlhodobý hmotný majetok r. 010 až r. 020</b>     |   | <b>009</b> | 15184454.18           | 13595015.86 | 1589438.32 | 1640113.13                                   |
| <b>A.II.1.</b>  | Pozemky (031)   | 010        | 154400.16             |             | 154400.16  | 154400.16                                    |
| <b>2.</b>   | Umelecké diela a zbierky (032)  | 011        |                       |             |            |  |
| <b>3.</b>   | Stavby 021 - (081 - 092AÚ)  | 012        | 1528859.68            | 526655.43   | 1002204.25 | 984110.42                                    |
| <b>4.</b>   | Samostatné hnuťelné veci a súbory hnuťelných vecí 022 - (082 + 092AÚ)                             | 013        | 13486782.67           | 13053948.76 | 432833.91  | 501602.55                                    |
| <b>5.</b>   | Dopravné prostriedky 023 - (083 + 092AÚ)  | 014        | 14411.67              | 14411.67    |            |  |
| <b>6.</b>   | Pestovateľské celky trvalých porastov 025 - (085 + 092AÚ)   | 015        |                       |             |            |  |
| <b>7.</b>   | Základné stádo a ťažné zvieratá 026 - (086 + 092AÚ)   | 016        |                       |             |            |  |
| <b>8.</b>   | Drobný dlhodobý hmotný majetok 028 - (088 + 092AÚ)  | 017        |                       |             |            |  |
| <b>9.</b>   | Ostatný dlhodobý hmotný majetok 029 - (089 +092AÚ)  | 018        |                       |             |            |  |
| <b>10.</b>  | Obstaranie dlhodobého hmotného majetku (042 - 094)  | 019        |                       |             |            |  |
| <b>11.</b>  | Poskytnuté preddavky na dlhodobý hmotný majetok (052 - 095AÚ)                                     | 020        |                       |             |            |  |
| <b>A.III. Dlhodobý finančný majetok r. 022 až r. 028</b>  |   | <b>021</b> |                       |             |            |  |
| <b>A.III.1.</b>   | Podielové cenné papiere a podiely v obchodných spoločnostiach v ovládanej osobe (061- 096 AÚ)     | 022        |                       |             |            |  |
| <b>2.</b>   | Podielové cenné papiere a podiely v obchodných spoločnostiach s podstatným vplyvom (062 - 096 AÚ) | 023        |                       |             |            |  |
| <b>3.</b>   | Dlhové cenné papiere držané do splatnosti (065 - 096 AÚ)  | 024        |                       |             |            |  |
| <b>4.</b>   | Pôžičky podnikom v skupine a ostatné pôžičky (066 + 067) - 096 AÚ                                 | 025        |                       |             |            |  |
| <b>5.</b>   | Ostatný dlhodobý finančný majetok (069 - 096 AÚ)  | 026        |                       |             |            |  |
| <b>6.</b>   | Obstaranie dlhodobého finančného majetku (043 - 096 AÚ)   | 027        |                       |             |            |  |
| <b>7.</b>   | Poskytnuté preddavky na dlhodobý finančný majetok (053 - 096 AÚ)                                  | 028        |                       |             |            |  |



| Strana aktív   |  | č.r.       | Bežné účtovné obdobie |            |            | Bezprostredne predchádzajúce účtovné obdobie |
|--|--|------------|-----------------------|------------|------------|--|
|  |  |            | Brutto                | Korekcia   | Netto      | Netto  |
| a  |  | b          | 1                     | 2          | 3          | 4  |
| <b>B. OBEŽNÝ MAJETOK SPOLU</b>   | <b>r. 030+ r. 037+ r. 042 + r. 051</b>   | <b>029</b> | 2306241.59            | 35708.71   | 2270532.88 | 2542971.86                                   |
| <b>B.I. Zásoby</b>   | <b>r. 031 až r. 036</b>  | <b>030</b> | 58340.62              | 35708.71   | 22631.91   | 23069.63                                     |
| <b>B.I.1. Materiál</b>   | (112 + 119) - 191  | 031        | 58340.62              | 35708.71   | 22631.91   | 23069.63                                     |
| 2.   | Nedokončená výroba a polotovary vlastnej výroby (121+122) - (192 +193)                               | 032        |                       |            |            |  |
| 3.   | Výrobky (123 - 194)  | 033        |                       |            |            |  |
| 4.   | Zvieratá (124 - 195)   | 034        |                       |            |            |  |
| 5.   | Tovar (132 + 139) - 196  | 035        |                       |            |            |  |
| 6.   | Poskytnuté prevádzkové preddavky na zásoby (314 AÚ - 391 AÚ)   | 036        |                       |            |            |  |
| <b>B.II. Dlhodobé pohľadávky</b>   | <b>r. 038 až r. 041</b>  | <b>037</b> |                       |            |            |  |
| <b>B.II.1. Pohľadávky z obchodného styku (311 AÚ až 314 AÚ) - 391 AÚ</b> |  | 038        |                       |            |            |  |
| 2.   | Ostatné pohľadávky (315 AÚ - 391AÚ)  | 039        |                       |            |            |  |
| 3.   | Pohľadávky voči účastníkom združení (358AÚ - 391AÚ)  | 040        |                       |            |            |  |
| 4.   | Iné pohľadávky ( 335 AÚ + 373 AÚ + 375 AÚ + 378AÚ) - 391AÚ   | 041        |                       |            |            |  |
| <b>B.III. Krátkodobé pohľadávky</b>                                      | <b>r. 043 až r. 050</b>  | <b>042</b> | 1095191.6             |            | 1095191.6  | 1970679.71                                   |
| <b>B.III.1. Pohľadávky z obchodného styku (311AÚ až 314 AÚ) - 391AÚ</b>  |  | 043        | 43513                 |            | 43513      | 2691   |
| 2.   | Ostatné pohľadávky (315 AÚ - 391 AÚ)   | 044        |                       |            |            | 436233.61                                    |
| 3.   | Zúčtovanie so Sociálnou poisťovňou a zdravotnými poisťovňami (336 )                                  | 045        |                       |            |            | 0.01   |
| 4.   | Daňové pohľadávky (341 až 345)   | 046        |                       |            |            |  |
| 5.   | Pohľadávky z dôvodu finančných vzťahov k štátnemu rozpočtu a rozpočtom územnej samosprávy (346+ 348) | 047        | 1051678.6             |            | 1051678.6  | 1531742.84                                   |
| 6.   | Pohľadávky voči účastníkom združení (358 AÚ - 391AÚ)   | 048        |                       |            |            |  |
| 7.   | Spojovací účet pri združení (396 - 391AÚ)  | 049        |                       |            |            |  |
| 8.   | Iné pohľadávky (335AÚ + 373AÚ + 375AÚ + 378AÚ) - 391AÚ   | 050        |                       |            |            | 12.25  |
| <b>B.IV. Finančné účty</b>   | <b>r. 052 až r. 056</b>  | <b>051</b> | 1152709.37            |            | 1152709.37 | 549222.52                                    |
| <b>B.IV.1. Pokladnica</b>  | (211 + 213)  | 052        |                       |            |            |  |
| 2.   | Bankové účty (221 AÚ + 261)  | 053        | 1152709.37            |            | 1152709.37 | 549222.52                                    |
| 3.   | Bankové účty s dobou viazanosti dlhšou ako jeden rok (221 AÚ)  | 054        |                       |            |            |  |
| 4.   | Krátkodobý finančný majetok(251+ 253 + 255AÚ+ 256 + 257) - 291AÚ                                     | 055        |                       |            |            |  |
| 5.   | Obstaranie krátkodobého finančného majetku (259 - 291AÚ)   | 056        |                       |            |            |  |
| <b>C. ČASOVÉ ROZLIŠENIE SPOLU</b>  | <b>r. 058 a r. 059</b>   | <b>057</b> | 9330.23               |            | 9330.23    | 1311.02                                      |
| <b>C.1. Náklady budúcich období</b>                                      | (381)  | 058        | 5419.13               |            | 5419.13    |  |
| 2.   | Príjmy budúcich období (385)   | 059        | 3911.1                |            | 3911.1     | 1311.02                                      |
| <b>MAJETOK SPOLU</b>   | <b>r. 001 + r. 029 + r. 057</b>  | <b>060</b> | 17600828.09           | 13718101.7 | 3882726.39 | 4196359.81                                   |



| Strana pasív  |  | č.r.       | Bežné účtovné obdobie | Bezprostredne predchádzajúce účtovné obdobie |
|---|--|------------|-----------------------|--|
| a   |  | b          | 5                     | 6  |
| <b>A. VLASTNÉ IMANIE</b> r. 062+ r. 067 + r. 071 + r. 072   |  | <b>061</b> | 514024.49             | 481822.38                                    |
| <b>A.I. Imanie a fondy</b> r. 063 až r. 066   |  | <b>062</b> | 154400.16             | 154400.16                                    |
| <b>A.I.1.</b> Základné imanie (411)   |  | 063        | 154400.16             | 154400.16                                    |
| <b>2.</b> Fondy tvorené podľa osobitných predpisov (412)  |  | 064        |                       |  |
| <b>3.</b> Fond reprodukcie (413)  |  | 065        |                       |  |
| <b>4.</b> Oceňovacie rozdiely z precenenia kapitálových účastín (415)                                       |  | 066        |                       |  |
| <b>A.II. Fondy tvorené zo zisku</b> r. 068 až r. 070  |  | <b>067</b> | 6000                  | 8300   |
| <b>A.II.1.</b> Rezervný fond (421)  |  | 068        | 6000                  | 8300   |
| <b>2.</b> Fondy tvorené zo zisku (423)  |  | 069        |                       |  |
| <b>3.</b> Ostatné fondy (427)   |  | 070        |                       |  |
| <b>A.III. Nevysporiadaný výsledok hospodárenia minulých rokov (+; - 428)</b>                                |  | <b>071</b> | 317013.98             | 329189.96                                    |
| <b>A.IV. Výsledok hospodárenia za účtovné obdobie r. 060 - (r. 062 + r. 067 + r. 071 + r. 073 + r. 100)</b> |  | <b>072</b> | 36610.35              | -10067.74                                    |
| <b>B. ZÁVÄZKY</b> r. 074 + r. 078 + r. 086 + r. 096   |  | <b>073</b> | 239326.47             | 250705.31                                    |
| <b>B.I.1. Rezervy</b> r. 075 až r. 077  |  | <b>074</b> |                       |  |
| <b>2.</b> Rezervy zákonné (451AÚ)   |  | 075        |                       |  |
| <b>3.</b> Ostatné rezervy (459AÚ)   |  | 076        |                       |  |
| <b>4.</b> Krátkodobé rezervy (323 + 451AÚ + 459AÚ)  |  | 077        |                       |  |
| <b>B.II. Dlhodobé záväzky</b> r. 079 až r. 085  |  | <b>078</b> | 115522.51             | 143813.65                                    |
| <b>B.II.1.</b> Záväzky zo sociálneho fondu (472)  |  | 079        | 13637.51              | 13616.65                                     |
| <b>2.</b> Vydané dlhopisy (473 - 255 AÚ)  |  | 080        |                       |  |
| <b>3.</b> Záväzky z nájmu (474 AÚ)  |  | 081        |                       |  |
| <b>4.</b> Dlhodobé prijaté preddavky (475)  |  | 082        |                       |  |
| <b>5.</b> Dlhodobé nevyfakturované dodávky (476 AÚ)   |  | 083        |                       |  |
| <b>6.</b> Dlhodobé zmenky na úhradu (478)   |  | 084        |                       |  |
| <b>7.</b> Ostatné dlhodobé záväzky (373 AÚ + 479 AÚ)  |  | 085        | 101885                | 130197                                       |
| <b>B.III. Krátkodobé záväzky</b> r. 087 až r. 095   |  | <b>086</b> | 123803.96             | 106891.66                                    |
| <b>B.III.1.</b> Záväzky z obchodného styku (321 až 326) okrem 323   |  | 087        | 4613.75               | 3182.66                                      |
| <b>2.</b> Záväzky voči zamestnancom (331+ 333)  |  | 088        | 675.03                |  |
| <b>3.</b> Zúčtovanie so Sociálnou poisťovňou a zdravotnými poisťovňami (336)                                |  | 089        |                       |  |
| <b>4.</b> Daňové záväzky (341 až 345)   |  | 090        | 5912.18               |  |
| <b>5.</b> Záväzky z dôvodu finančných vzťahov k štátnemu rozpočtu a rozpočtom územnej samosprávy (346+348)  |  | 091        |                       |  |
| <b>6.</b> Záväzky z upísaných nesplatených cenných papierov a vkladov (367)                                 |  | 092        |                       |  |
| <b>7.</b> Záväzky voči účastníkom združení (368)  |  | 093        |                       |  |
| <b>8.</b> Spojovací účet pri združení (396)   |  | 094        |                       |  |
| <b>9.</b> Ostatné záväzky (379 + 373 AÚ + 474 AÚ +476AÚ + 479 AÚ)   |  | 095        | 112603                | 103709                                       |
| <b>B.IV. Bankové úvery a iné výpomoci a pôžičky</b> r. 097 až r. 099  |  | <b>096</b> |                       |  |
| <b>B.IV.1.</b> Dlhodobé bankové úvery (461AÚ)   |  | 097        |                       |  |
| <b>2.</b> Bežné bankové úvery ( 231+ 232 + 461AÚ)   |  | 098        |                       |  |
| <b>3.</b> Prijaté krátkodobé finančné výpomoci (241+ 249)   |  | 099        |                       |  |
| <b>C. ČASOVÉ ROZLIŠENIE SPOLU</b> r. 101 až r. 103  |  | <b>100</b> | 3129375.43            | 3463832.12                                   |
| <b>C.I.1.</b> Výdavky budúcich období (383)   |  | 101        |                       |  |
| <b>2.</b> Výnosy budúcich období krátkodobé (384 AÚ)  |  | 102        | 1555491.81            | 1537986.88                                   |
| <b>3.</b> Výnosy budúcich období dlhodobé (384 AÚ)  |  | 103        | 1573883.62            | 1925845.24                                   |
| <b>SPOLU VLASTNÉ IMANIE, ZÁVÄZKY A ÚČTY ČASOVÉHO ROZLIŠENIA</b> r.061+ r.073 + r.100                        |  | <b>104</b> | 3882726.39            | 4196359.81                                   |



| Číslo účtu                                  | Náklady   | Číslo riadku | Činnosť            |                 |                   | Bezprostredne predchádzajúce účtovné obdobie |
|---|---|--------------|--------------------|-----------------|-------------------|--|
|   |   |              | Hlavná nezdaňovaná | Zdaňovaná       | Spolu             |  |
| a   | b   | c            | 1                  | 2               | 3                 | 4  |
| 501   | Spotreba materiálu  | 01           | 344861.17          | 10663.31        | 355524.48         | 269944.81                                    |
| 502   | Spotreba energie  | 02           | 73260.51           |                 | 73260.51          | 64028.57                                     |
| 504   | Predaný tovar   | 03           |                    |                 |                   |  |
| 511   | Opravy a udržiavanie  | 04           | 38952.47           |                 | 38952.47          | 38359.58                                     |
| 512   | Cestovné  | 05           | 122325.36          |                 | 122325.36         | 90915.28                                     |
| 513   | Náklady na reprezentáciu  | 06           | 5240               |                 | 5240              | 1097.07                                      |
| 518   | Ostatné služby  | 07           | 220403.62          |                 | 220403.62         | 176038.24                                    |
| 521   | Mzdové náklady  | 08           | 2342606.76         | 2091.88         | 2344698.64        | 1976742.12                                   |
| 524   | Zákonné sociálne poistenie a zdravotné poistenie                                      | 09           | 792685.11          | 736.34          | 793421.45         | 668986.2                                     |
| 525   | Ostatné sociálne poistenie  | 10           | 13765.26           |                 | 13765.26          | 3499.1                                       |
| 527   | Zákonné sociálne náklady  | 11           | 115697.61          |                 | 115697.61         | 97267.69                                     |
| 528   | Ostatné sociálne náklady  | 12           | 6382               |                 | 6382              |  |
| 531   | Daň z motorových vozidiel   | 13           |                    |                 |                   |  |
| 532   | Daň z nehnuteľností   | 14           | 142.43             |                 | 142.43            | 135.83                                       |
| 538   | Ostatné dane a poplatky   | 15           | 2599.3             |                 | 2599.3            | 3195.03                                      |
| 541   | Zmluvné pokuty a penále   | 16           | 1872.02            |                 | 1872.02           | 3050.39                                      |
| 542   | Ostatné pokuty a penále   | 17           |                    |                 |                   |  |
| 543   | Odpísanie pohľadávky  | 18           |                    |                 |                   |  |
| 544   | Úroky   | 19           |                    |                 |                   |  |
| 545   | Kurzové straty  | 20           | 997.38             |                 | 997.38            | 1012.06                                      |
| 546   | Dary  | 21           |                    |                 |                   |  |
| 547   | Osobitné náklady  | 22           |                    |                 |                   |  |
| 548   | Manká a škody   | 23           |                    |                 |                   |  |
| 549   | Iné ostatné náklady   | 24           | 151670.54          | 0.3             | 151670.84         | 129941.51                                    |
| 551   | Odpisy dlhodobého nehmotného majetku a dlhodobého hmotného majetku                    | 25           | 169089.9           |                 | 169089.9          | 198522.04                                    |
| 552   | Zostatková cena predaného dlhodobého nehmotného majetku a dlhodobého hmotného majetku | 26           |                    |                 |                   |  |
| 553   | Predané cenné papiere   | 27           |                    |                 |                   |  |
| 554   | Predaný materiál  | 28           |                    |                 |                   |  |
| 555   | Náklady na krátkodobý finančný majetok  | 29           |                    |                 |                   |  |
| 556   | Tvorba fondov   | 30           |                    |                 |                   |  |
| 557   | Náklady na precenenie cenných papierov  | 31           |                    |                 |                   |  |
| 558   | Tvorba a zúčtovanie opravných položiek  | 32           |                    |                 |                   |  |
| 561   | Poskytnuté príspevky organizačným zložkám   | 33           |                    |                 |                   |  |
| 562   | Poskytnuté príspevky iným účtovným jednotkám  | 34           |                    |                 |                   |  |
| 563   | Poskytnuté príspevky fyzickým osobám  | 35           |                    |                 |                   |  |
| 565   | Poskytnuté príspevky z podielu zaplatenej dane  | 36           |                    |                 |                   |  |
| 567   | Poskytnuté príspevky z verejnej zbierky   | 37           |                    |                 |                   |  |
| <b>Účtová trieda 5 spolu r. 01 až r. 37</b> |   | <b>38</b>    | <b>4402551.44</b>  | <b>13491.83</b> | <b>4416043.27</b> | <b>3722735.52</b>                            |



| Číslo účtu  | Výnosy  | Číslo riadku | Činnosť            |           |            | Bezprostredne predchádzajúce účtovné obdobie |
|---|---|--------------|--------------------|-----------|------------|--|
|   |   |              | Hlavná nezdaňovaná | Zdaňovaná | Spolu      |  |
| a   | b   | c            | 1                  | 2         | 3          | 4  |
| 601   | Tržby za vlastné výrobky  | 39           | 10000              |           | 10000      |  |
| 602   | Tržby z predaja služieb   | 40           | 144265.05          | 48162.3   | 192427.35  | 37273.87                                     |
| 604   | Tržby za predaný tovar  | 41           |                    |           |            |  |
| 611   | Zmena stavu zásob nedokončenej výroby                                       | 42           |                    |           |            |  |
| 612   | Zmena stavu zásob polotovarov   | 43           |                    |           |            |  |
| 613   | Zmena stavu zásob výrobkov  | 44           |                    |           |            |  |
| 614   | Zmena stavu zásob zvierat   | 45           |                    |           |            |  |
| 621   | Aktivácia materiálu a tovaru  | 46           |                    |           |            |  |
| 622   | Aktivácia vnútroorganizačných služieb                                       | 47           |                    |           |            |  |
| 623   | Aktivácia dlhodobého nehmotného majetku                                     | 48           |                    |           |            |  |
| 624   | Aktivácia dlhodobého hmotného majetku                                       | 49           |                    |           |            |  |
| 641   | Zmluvné pokuty a penále   | 50           |                    |           |            |  |
| 642   | Ostatné pokuty a penále   | 51           |                    |           |            |  |
| 643   | Platby za odpísané pohľadávky   | 52           |                    |           |            |  |
| 644   | Úroky   | 53           |                    |           |            |  |
| 645   | Kurzové zisky   | 54           | 27.03              |           | 27.03      | 3.04   |
| 646   | Prijaté dary  | 55           |                    |           |            |  |
| 647   | Osobitné výnosy   | 56           | 44344.44           |           | 44344.44   |  |
| 648   | Zákonné poplatky  | 57           |                    |           |            |  |
| 649   | Iné ostatné výnosy  | 58           | 7.36               |           | 7.36       | 1769.22                                      |
| 651   | Tržby z predaja dlhodobého nehmotného majetku a dlhodobého hmotného majetku | 59           |                    |           |            |  |
| 652   | Výnosy z dlhodobého finančného majetku                                      | 60           |                    |           |            |  |
| 653   | Tržby z predaja cenných papierov a podielov                                 | 61           |                    |           |            |  |
| 654   | Tržby z predaja materiálu   | 62           |                    |           |            |  |
| 655   | Výnosy z krátkodobého finančného majetku                                    | 63           |                    |           |            |  |
| 656   | Výnosy z použitia fondu   | 64           |                    |           |            |  |
| 657   | Výnosy z precenenia cenných papierov  | 65           |                    |           |            |  |
| 658   | Výnosy z nájmu majetku  | 66           |                    |           |            |  |
| 661   | Prijaté príspevky od organizačných zložiek                                  | 67           |                    |           |            |  |
| 662   | Prijaté príspevky od právnických osôb                                       | 68           | 410753.15          |           | 410753.15  | 194941.65                                    |
| 663   | Prijaté príspevky od fyzických osôb   | 69           |                    |           |            |  |
| 664   | Prijaté členské príspevky   | 70           |                    |           |            |  |
| 665   | Príspevky z podielu zaplatenej dane   | 71           |                    |           |            |  |
| 667   | Prijaté príspevky z verejných zbierok                                       | 72           |                    |           |            |  |
| 691   | Dotácie   | 73           | 3800294.86         |           | 3800294.86 | 3478680                                      |
| Účtová trieda 6 spolu r. 39 až r. 73                              |   | 74           | 4409691.89         | 48162.3   | 4457854.19 | 3712667.78                                   |
| Výsledok hospodárenia pred zdanením r. 74 - r. 38                 |   | 75           | 7140.45            | 34670.47  | 41810.92   | -10067.74                                    |
| 591   | Daň z príjmov   | 76           |                    | 5200.57   | 5200.57    |  |
| 595   | Dodatočné odvody dane z príjmov   | 77           |                    |           |            |  |
| Výsledok hospodárenia po zdanení (r. 75 - (r. 76 + r. 77) ) (+/-) |   | 78           | 7140.45            | 29469.9   | 36610.35   | -10067.74                                    |



## Čl. I

## Všeobecné informácie

(1) Meno a priezvisko fyzickej osoby alebo názov právnickej osoby, ktorá je zakladateľom alebo zriaďovateľom účtovnej jednotky, dátum založenia alebo zriadenia účtovnej jednotky.

Zakladateľ: Slovenská akadémia vied.

Dodatkom č.1, k Zakladacej listine, sa s účinnosťou od 1.1.2022 zmenila organizácia na Elektrotechnický ústav Slovenskej akadémie vied, verejná výskumná inštitúcia.

(2) Informácie o členoch štatutárnych orgánov, dozorných orgánov a iných orgánov účtovnej jednotky:

**Vedenie ústavu**

Riaditeľ ústavu: RNDr. Vladimír Cambel, DrSc.

Zástupca riaditeľa: Ing. Milan Ťapajna, PhD.

Zástupca riaditeľa pre technickú infraštruktúru: Ing. Ján Fedor, PhD.

Vedecká tajomníčka: RNDr. Marianna Španková, PhD.

**Správna rada:**

RNDr. Vladimír Cambel, DrSc.

Ing. Jozef Fabian, CSc.

Ing. Ján Fedor, PhD.

RNDr. Marianna Španková, PhD.

Ing. Milan Ťapajna, PhD.

**Dozorná rada:**

prof. RNDr. Peter Samuely, DrSc.

prof. Ing. Viera Stopjaková, PhD.

Ing. Romana Jurkiewiczová

**Vedecká rada**

Predseda: RNDr. Dagmar Gregušová, DrSc.

Interní členovia:

Ing. Filip Gučmann, PhD. – podpredseda

Ing. Boris Hudec, PhD. – tajomník

doc. Ing. Fedor Gömöry, DrSc

Dr. rer. nat. Martin Hulman

Mgr. Enric Pardo, PhD.

Mgr. Michaela Sojková, PhD.

Externí členovia:

doc. Ing. Peter Bokes, PhD.

Ing. Roman Lupták, PhD.

doc. Ing. Miroslav Mikolášek, PhD.

doc. RNDr. Tomáš Pleceník, PhD.

(3) Opis činnosti, na účel ktorej bola účtovná jednotka zriadená

Prevažujúcou hlavnou činnosťou organizácie je uskutočňovanie výskumu v odboroch vedy a techniky (ďalej tiež „odbory): Fyzika kondenzovaných látok a akustika (010304), Teoretická elektrotechnika (020201), Elektrické stroje a prístroje (020204), Elektrotechnológie a materiály (020205), Elektroenergetika (020210), Mikroelektronika (020211), Optoelektronika (020212), Senzorika (020216), Fyzikálne inžinierstvo (020404), Nanomateriály (021 1 0 I ) a Nanoelektronika (02 1 1 03).

Ďalšími hlavnými činnosťami organizácie sú:

a) zabezpečovanie a správa infraštruktúry výskumu a vývoja



- b) získavanie, spracúvanie a šírenie informácií z oblasti vedy a techniky a poznatkov z vlastného výskumu a vývoja organizácie; spoluvydávanie časopisu Journal of Electrical Engineering (ISSN 1339-309X),
- c) podieľanie sa v spolupráci s vysokou školou na uskutočňovaní študijných programov tretieho stupňa vysokoškolského štúdia a
- d) spolupráca v oblasti vedy a techniky s vysokými školami, ostatnými právnickými osobami uskutočňujúcimi výskum a vývoj.

(4) Priemerný prepočítaný počet zamestnancov a z toho počet vedúcich zamestnancov účtovnej jednotky za účtovné obdobie, za ktoré sa zostavuje účtovná závierka (ďalej len „bežné účtovné obdobie“).

|  | Bežné účtovné obdobie | Počet hodín vykonávania dobrovoľníckej činnosti |
|--|-----------------------|---|
| Priemerný prepočítaný počet zamestnancov | 86,4                  | x   |
| z toho počet vedúcich zamestnancov       | 7                     | x   |

(5) Organizačná štruktúra účtovnej jednotky.

#### Vedenie ústavu

Medzinárodný poradný zbor

**Správna rada**

**Vedecká rada**

**Dozorná rada**

Zástupca v Sneme SAV

#### Vedecké oddelenia

Oddelenie fyziky a technológie nanoštruktúr

Oddelenie III-V polovodičov

Oddelenie supravodičov

Oddelenie mikroelektroniky a senzoriky

#### Podporné útvary

Hospodársko správny útvar

Knižnica

Technický útvar

## Čl. II

### Informácie o účtovných zásadách a účtovných metódach

(1) Informácia, či je účtovná závierka zostavená za splnenia predpokladu, že účtovná jednotka bude nepretržite pokračovať vo svojej činnosti.

Účtovná jednotka bude nepretržite pokračovať vo svojej činnosti.

(2) Zmeny účtovných zásad a zmeny účtovných metód s uvedením dôvodu týchto zmien a vyčíslením ich vplyvu na finančnú hodnotu majetku, záväzkov, základného imania a výsledku hospodárenia účtovnej jednotky.

Transformáciou účtovnej jednotky na verejnú výskumnú inštitúciu sa od 1.1.2022 zmenil spôsob vedenia účtovníctva z príspevkových organizácií na neziskové organizácie. V roku 2022 boli zaúčtované sumy neuhradených finančných čiastok zo zmlúv so zahraničnými partnermi ako ostatné pohľadávky na účte 315 v hodnote 436 233,61 €. V roku 2023 boli odúčtované sumy neuhradené k 31.12.2023, čím sa znížila hodnota pohľadávok v súvahe o 293 769,52 €.

(3) Spôsoby ocenenia jednotlivých položiek majetku a záväzkov.

a) dlhodobý nehmotný majetok - ocenený obstarávacou cenou,



- b) dlhodobý hmotný majetok - ocenený obstarávacou cenou,
- c) zásoby - ocenené obstarávacou cenou. Opravné položky k zásobám sa tvoria na základe zásady opatrnosti, vyjadrujú prechodné zníženie ich hodnoty.
- d) pohľadávky - ocenené menovitou hodnotou,
- e) krátkodobý finančný majetok - ocenený menovitou hodnotou,
- f) záväzky, vrátane rezerv, dlhopisov, pôžičiek a úverov - ocenené menovitou hodnotou,
- g) majetok obstaraný z transferov - ocenený obstarávacou cenou,
- h) majetok zistený ako inventarizačný prebytok - ocenený reálnou cenou - hodnota zistená oceňovacím modelom

- Účtovná jednotka nie je platiteľom dane z pridanej hodnoty ale je registrovaná podľa § 7. V prípadoch, keď dodávatelia sú platiteľmi DPH, fakturovaná DPH je súčasťou ocenenia dlhodobého majetku, zásob a nákladov.

(4) Spôsob zostavenia odpisového plánu pre jednotlivé druhy dlhodobého hmotného majetku a dlhodobého nehmotného majetku, pričom sa uvádza doba odpisovania, použité sadzby odpisov a odpisové metódy pri určení odpisov.

| Druh dlhodobého majetku                | Doba odpisovania | Sadzba odpisov | Odpisová metóda |
|--|------------------|----------------|-----------------|
| Softvér, stroje, prístroje, zariadenia | 6                | 16,66%         | Rovnomerná      |
| Stroje, prístroje, zariadenia          | 8                | 12,50%         | Rovnomerná      |
| Stroje, prístroje, zariadenia          | 10               | 10 %           | Rovnomerná      |
| Stroje, prístroje, zariadenia          | 12               | 8,33%          | Rovnomerná      |
| Budovy                                 | 50               | 2%             | Rovnomerná      |

(5) Zásady pre zohľadnenie zníženia hodnoty majetku. Uvádza sa, či účtovná jednotka uplatňuje opravné položky a rezervy.

Opravné položky boli vytvorené v predchádzajúcich účtovných obdobiach k zásobám v sume 35 708,71 €. Rezervy v roku 2023 boli tvorené na nevyfakturované dodávky colného dlhu v sume 4,73 € na účte 326.

(6) Informácie o účtovaní opráv významných chýb minulých účtovných období v bežnom účtovnom období s uvedením vplyvu na výsledok hospodárenia minulých rokov; súčasne sa môže uviesť aj informácia o účtovaní opráv nevýznamných chýb minulých účtovných období v bežnom účtovnom období s uvedením vplyvu na výsledok hospodárenia bežného účtovného obdobia.

Vplyv na výsledok hospodárenia minulých rokov malo doúčtovanie dane z príjmu právnickej osoby za rok 2022. Daňové priznanie bolo podané oneskorene a splatná daň v sume 4 408,24 € bola účtovaná ako oprava významných chýb minulých účtovných období na účte 428.

### Čl. III

#### Informácie, ktoré dopĺňajú a vysvetľujú údaje v súvahe

(1) Významné sumy prírastkov a úbytkov dlhodobého nehmotného majetku a dlhodobého hmotného majetku.

Obstaraním majetku vznikli prírastky dlhodobého hmotného majetku v sume 119 876,250 €. Najvýznamnejšie položky : digitálny mnohokanálový analyzátor v hodnote 11 475,60 €, optický mikroskop OLYMPUS BX53M v hodnote 14 578,33 € ozon generátor v hodnote 17 026,80 €, reflexná/transmisná jednotka pre kryostat v hodnote 15 045,60 € a technické zhodnotenie budovy – zateplenie strechy v hodnote 42 309,84 €. Úbytok vyradeného majetku bol v hodnote 318 998,80 €.

(2) Prehľad dlhodobého majetku, na ktorý je zriadené záložné právo a prehľad dlhodobého majetku, pri ktorom má účtovná jednotka obmedzené právo s ním nakladať.

Účtovná jednotka neeviduje.

(3) Údaje o štruktúre dlhodobého finančného majetku za bežné účtovné obdobie a jeho umiestnenie v členení podľa položiek súvahy v riadkoch 022 a 023.

Účtovná jednotka neeviduje.



(4) Údaje o štruktúre dlhodobého finančného majetku a krátkodobého finančného majetku v členení podľa položiek súvahy v riadkoch 024, 026 a 055.

Účtovná jednotka neeviduje.

(5) Údaje o štruktúre dlhodobých pôžičiek.

Účtovná jednotka neeviduje.

(6) Prehľad o vývoji významných súm opravných položiek podľa jednotlivých druhov majetku.

| Druh majetku, ku ktorému sa tvorí opravná položka | Stav opravnej položky na konci bezprostredne predchádzajúceho účtovného obdobia | Tvorba opravnej položky (zvýšenie) | Zúčtovanie opravnej položky (použitie, zrušenie) | Stav opravnej položky na konci bežného účtovného obdobia |
|---|---|------------------------------------|--|--|
| zásoby  | 35708,71  |                                    |  | 35 708,71  |

(7) Opis významných súm pohľadávok v nadväznosti na položky súvahy, v členení na pohľadávky za hlavnú nezdaňovanú činnosť a zdaňovanú činnosť za bežné účtovné obdobie.

| Druh a opis významných položiek pohľadávok | Hlavná nezdaňovaná činnosť | Zdaňovaná činnosť |
|--|----------------------------|-------------------|
| Pohl. z dôvodu fin. vzťahov k SR (346)     | 1 051 678,60               |                   |
| Pohl. z projektov zo zahraničia (315)      |                            |                   |
| Pohľadávky z obch. styku (311,314)         | 43 083,-                   | 430,-             |

(8) Prehľad pohľadávok do uplynutia lehoty splatnosti a po uplynutí lehoty splatnosti.

| Pohľadávky                       | Stav na konci bezprostredne predchádzajúceho účtovného obdobia | Stav na konci bežného účtovného obdobia |
|----------------------------------|--|---|
| - do uplynutia lehoty splatnosti | 1 970 661,71   | 1 094 761,60                            |
| - po uplynutí lehoty splatnosti  | 18,-   | 430,-                                   |
| <b>Spolu</b>                     | <b>1 970 679,71</b>  | <b>1 095 191,60</b>                     |

(9) Prehľad o významných položkách časového rozlíšenia nákladov budúcich období a príjmov budúcich období.

Náklady budúcich období – vložné na konferencie ktoré sa budú konať v roku 2024 v celkovej sume 5419,13 €. Príjmy budúcich období – výdavky nezahrnuté v žiadostiach o platbu z Plánu obnovy v celkovej sume 3 911,10 €.

(10) Opis a výška zmien vlastného imania v priebehu bežného účtovného obdobia podľa položiek súvahy.

|                               | Stav na začiatku bežného účtovného obdobia | Prírastky (+) | Úbytky (-) | Presuny (+, -) | Stav na konci bežného účtovného obdobia |
|-------------------------------|--|---------------|------------|----------------|---|
| <b>Vlastné imanie</b>         |  |               |            |                |   |
| Základné imanie               | 154 400,16                                 |               |            |                | 154 400,16                              |
| z toho:                       |  |               |            |                |   |
| - prioritný majetok           | 154 400,16                                 |               |            |                | 154 400,16                              |
| <b>Fondy tvorené zo zisku</b> |  |               |            |                |   |
| Rezervný fond                 | 8 300,-                                    |               | 2 300,-    |                | 6 000,00                                |
| <b>Výsledok hospodárenia</b>  |  |               |            |                |   |
| Nevysporiadaný výsledok       | 329 189,96                                 | 2 300,-       | 4408,24    | -10 067,74     | 317 013,98                              |



|   |                   |                  |                 |           |                   |
|---|-------------------|------------------|-----------------|-----------|-------------------|
| hospodárenia minulých rokov             |                   |                  |                 |           |                   |
| Výsledok hospodárenia účtovného obdobia | -10 067,74        | 36 610,35        |                 | 10 067,74 | 36 610,35         |
| <b>Spolu</b>                            | <b>481 822,38</b> | <b>38 910,35</b> | <b>6 708,24</b> | <b>0</b>  | <b>514 024,49</b> |

(11) Opis a vyčíslenie jednotlivých druhov fondov tvorených podľa osobitných predpisov.

Rezervný fond bol vytvorený zo zisku z roku 2021. V roku 2023 bolo použitých 2300 € na čiastočné krytie straty z roku 2022.

| Opis fondov tvorených podľa osobitných predpisov | Stav na konci bezprostredne predchádzajúceho účtovného obdobia | Prírastky | Úbytky   | Stav na konci bežného účtovného obdobia |
|--|--|-----------|----------|---|
| Rezervný fond                                    | 8 300,-  |           | 2 300,00 | 6 000,00                                |

(12) Informácia o rozdelení účtovného zisku alebo o vysporiadaní účtovnej straty za bezprostredne predchádzajúce účtovné obdobie.

| Názov položky   | Bezprostredne predchádzajúce účtovné obdobie |
|---|--|
| <b>Účtovná strata</b>   | -10 067,74                                   |
| <b>Vysporiadanie účtovnej straty</b>                            |  |
| Z rezervného fondu  | 2 300,00                                     |
| Prevod do nevysporiadaného výsledku hospodárenia minulých rokov | -7 767,74                                    |

(13) Údaje o jednotlivých druhoch rezerv v členení na stav rezerv na konci bezprostredne predchádzajúceho účtovného obdobia a stav rezerv na konci bežného účtovného obdobia, ich tvorbu, použitie alebo zrušenie v priebehu bežného účtovného obdobia.

| Druh rezervy                 | Stav na konci bezprostredne predchádzajúceho účtovného obdobia | Tvorba rezerv | Použitie rezerv | Zrušenie rezerv | Stav na konci bežného účtovného obdobia |
|------------------------------|--|---------------|-----------------|-----------------|---|
| <b>Zákonné rezervy spolu</b> |  |               |                 |                 |   |
| Nevyfakturované dodávky      |  | 4,73          |                 |                 | 4,73                                    |
| <b>Ostatné rezervy spolu</b> |  | <b>4,73</b>   |                 |                 | <b>4,73</b>                             |
| <b>Rezervy spolu</b>         |  | <b>4,73</b>   |                 |                 | <b>4,73</b>                             |

(14) Údaje o významných sumách záväzkov v nadväznosti na položky súvahy, v členení na záväzky za hlavnú nezdaňovanú činnosť a zdaňovanú činnosť.

| Druh a opis významných položiek záväzkov  | Hlavná nezdaňovaná činnosť | Zdaňovaná činnosť |
|---|----------------------------|-------------------|
| Záväzky daň z príjmov PO                  |                            | 5 200,57          |
| Záväzky z projektov APVV dlhodobé (479)   | 112 603,00                 |                   |
| Záväzky z projektov APVV krátkodobé (479) | 101 885,00                 |                   |
| Záväzky zo sociálneho fondu (472)         | 13 637,51                  |                   |



(15) Prehľad záväzkov do uplynutia lehoty splatnosti a po uplynutí lehoty splatnosti.

| <b>Závazky</b>                   | <b>Stav na konci bezprostredne predchádzajúceho účtovného obdobia</b> | <b>Stav na konci bežného účtovného obdobia</b> |
|----------------------------------|---|--|
| - do uplynutia lehoty splatnosti | 250 705,31  | 239 326,47                                     |
| - po uplynutí lehoty splatnosti  |   |  |
| <b>Spolu</b>                     | 250 705,31  | 239 326,47                                     |

(16) Prehľad o začiatocnom stave, tvorbe, čerpaní a konečnom zostatku sociálneho fondu v priebehu bežného účtovného obdobia.

| <b>Sociálny fond</b>                                   | <b>Suma</b>      |
|--|------------------|
| <b>Stav k prvému dňu bežného účtovného obdobia</b>     | <b>13 616,65</b> |
| Tvorba na ťarchu nákladov                              | 24 657,55        |
| Čerpanie   | 24 636,69        |
| <b>Stav k poslednému dňu bežného účtovného obdobia</b> | <b>13 637,51</b> |

(17) Prehľad o bankových úveroch, pôžičkách a návratných finančných výpomociach s uvedením meny.

Účtovná jednotka neeviduje.

(18) Prehľad o významných položkách časového rozlíšenia výdavkov budúcich období.

Účtovná jednotka neeviduje.

(19) Prehľad výnosov budúcich období v členení podľa jednotlivých druhov a v členení na dlhodobé výnosy budúcich období a krátkodobé výnosy budúcich období.

| <b>Položky výnosov budúcich období - dlhodobé z dôvodu</b> | <b>Stav na konci bezprostredne predchádzajúceho účtovného obdobia</b> | <b>Stav na konci bežného účtovného obdobia</b> |
|--|---|--|
| dlhodobého majetku obstaraného z verejných zdrojov         | 1 316 741,30  | 1 271 484,89                                   |
| prijatý, nepoužitý kapitálový transfer zo ŠR               | 10 637,49   | 11 711,-                                       |
| dlhodobého majetku obstaraného zo súkromných zdrojov       | 10 776,45   | 17 418,73                                      |
| transferov od subjektov verejnej správy na roky 2025 -2027 | 587 690,00  | 273 269,-                                      |
| <b>Spolu</b>   | 1 925 845,24  | 1 573 883,62                                   |

| <b>Položky výnosov budúcich období - krátkodobé z dôvodu</b> | <b>Stav na konci bezprostredne predchádzajúceho účtovného obdobia</b> | <b>Stav na konci bežného účtovného obdobia</b> |
|--|---|--|
| dotácie zo štátneho rozpočtu a z prostriedkov Európskej únie | 127 590,06  | 188 110,90                                     |



|  |                     |                     |
|--|---------------------|---------------------|
| transferov od subjektov verejnej správy na roky 2024 | 645 189,41          | 527 255,94,-        |
| grantov zo zahraničia                                | 765 207,41          | 840 124,97          |
| <b>Spolu</b>   | <b>1 537 986,88</b> | <b>1 555 491,81</b> |

(20) Údaje o druhoch majetku a záväzkoch z lízingových zmlúv.

Účtovná jednotka neeviduje.

#### Čl. IV

##### Informácie, ktoré dopĺňajú a vysvetľujú údaje vo výkaze ziskov a strát

(1) Prehľad tržieb za vlastné výkony a tovar s uvedením ich opisu a vyčíslením hodnoty tržieb podľa jednotlivých hlavných druhov výrobkov, služieb hlavnej nezdaňovanej činnosti a zdaňovanej činnosti účtovnej jednotky za bežné účtovné obdobie.

| Druh a opis tržieb                  | Hlavná nezdaňovaná činnosť | Zdaňovaná činnosť |
|-------------------------------------|----------------------------|-------------------|
| Kvapalné plyny                      |                            | 48 162,30         |
| CORT Cable                          | 10 000,-                   |                   |
| Merania a analýzy, príprava vzoriek | 70 314,-                   |                   |
| Príjem vložného na konferenciu IEEE | 73 951,05                  |                   |

(2) Opis a vyčíslenie hodnoty významných súm v nadväznosti na položky výkazu ziskov a strát v členení na nepenážné dary, osobitné výnosy, zákonné poplatky a iné ostatné výnosy za bezprostredne predchádzajúce účtovné obdobie a za bežné účtovné obdobie.

| Druh a opis významných súm výnosov                                 | Stav na konci bezprostredne predchádzajúceho účtovného obdobia | Stav na konci bežného účtovného obdobia |
|--|--|---|
| Výnosy z bežných transferov od subjektov mimo verejnej správy      | 193 810,07   | 340 584,35                              |
| Výnosy z kapitálových transferov od subjektov mimo verejnej správy | 1 131,58   | 63 168,80                               |
| Sponzorské na konferenciu IEEE                                     |  | 7 000,-                                 |
| Podiel z predaja patentu   |  | 44 344,44                               |

(3) Prehľad významných súm dotácií zo štátneho rozpočtu, štátnych fondov, z prostriedkov Európskej únie, dotácií z rozpočtu obce a z rozpočtu vyššieho územného celku, ktoré účtovná jednotka prijala v bezprostredne predchádzajúcom účtovnom období a v bežnom účtovnom období.

| Druh a opis významných súm dotácií a grantov | Stav na konci bezprostredne predchádzajúceho účtovného obdobia | Stav na konci bežného účtovného obdobia |
|--|--|---|
| Inštitucionálna forma podpory zo ŠR          | 2 438 538,30   | 2 909 425,19                            |
| Dotácie – bežný transfer od agentúry APVV    | 390 548,55   | 297 684,45                              |
| Dotácie – bežný transfer projekty z EÚ       | 183 376,35   | 149 610,62                              |



|  |            |            |
|--|------------|------------|
| Dotácie – bežný transfer od ostatných subjektov VS | 302 423,87 | 371 963,70 |
| Dotácie – kapitálový transfer zo ŠR                | 39 113,95  | 40 344,66  |
| Dotácie – kapitálový transfer projekty z EÚ        | 124 678,98 | 31 266,24  |

(4) Opis a vyčíslenie hodnoty významných položiek príjmov z reklám, ktoré sú určené na charitatívne účely, a charitatívnej lotérie prijatých v bezprostredne predchádzajúcom účtovnom období a v bežnom účtovnom období.

Účtovná jednotka neeviduje.

(5) Opis a vyčíslenie hodnoty významných súm v nadväznosti na položky výkazu ziskov a strát v členení na nepeňažné dary, náklady na ostatné služby, osobitné náklady a iné ostatné náklady poskytnuté v bežnom účtovnom období.

| <b>Druh a opis významných položiek nákladov</b>                    | <b>Stav na konci bezprostredne predchádzajúceho účtovného obdobia</b> | <b>Stav na konci bežného účtovného obdobia</b> |
|--|---|--|
| Materiál (elektro, chemikálie, drobný majetok)                     | 269 944,81  | 355 524,48                                     |
| Energie (el. energia, voda)  | 64 028,57   | 73 260,51                                      |
| Opravy a udržiavanie (výťahy, zariadenia)                          | 38 359,58   | 38 952,47                                      |
| Cestovné (tuzemské, zahraničné)                                    | 90 915,28   | 122 325,36                                     |
| Ostatné služby( SW, Školenia, konferencie, merania, patenty)       | 176 038,24  | 220 403,62                                     |
| Mzdové náklady   | 1 976 742,12  | 2 344 698,64                                   |
| Zákonné sociálne poistenie a zdravotné poistenie                   | 668 986,20  | 793 421,45                                     |
| Ostatné sociálne poistenie – zahraničie, DDS                       | 3 499,10  | 13 765,26                                      |
| Zákonné sociálne náklady (PN, SF, stravné)                         | 97 267,69   | 115 697,61                                     |
| Iné ostatné náklady (štipendiá)                                    | 129 941,51  | 151 670,84                                     |
| Odpisy dlhodobého nehmotného majetku a dlhodobého hmotného majetku | 198 522,04  | 169 089,90                                     |

(6) Prehľad o účele a výške použitia zostatku prijatého podielu zaplatenej dane v minulých účtovných obdobiach a prijatého podielu zaplatenej dane v bežnom účtovnom období.

Účtovná jednotka neeviduje.

## Čl. V

### Opis údajov na podsúvahových účtoch

Významné položky zásob prijatých na komisionálny predaj, prenajatého majetku, majetku prijatého do úschovy, odpísané pohľadávky a prípadné ďalšie položky.

Účtovná jednotka neeviduje.

## Čl. VI

### Ďalšie informácie

(1) Opis a hodnota iných aktív, ktorými sa rozumie majetok, ktorý vznikol v dôsledku minulých udalostí a ktorého existencia alebo vlastníctvo závisí od toho, či nastane alebo nenastane jedna alebo viac neistých udalostí v budúcnosti, ktorých vznik nezávisí od účtovnej jednotky; týmito inými aktívami sú napríklad práva zo servisných zmlúv, poisťných zmlúv, koncesionárskych zmlúv, licenčných zmlúv, práva z investovania prostriedkov získaných oslobodením od dane z príjmov.



Účtovná jednotka neeviduje.

(2) Opis a hodnota iných pasív vyplývajúcich zo súdnych rozhodnutí, z poskytnutých záruk, zo všeobecne záväzných právnych predpisov, z ručenia podľa jednotlivých druhov ručenia; takýmito inými pasívami sú:

a) povinnosť, ktorá vznikla ako dôsledok minulej udalosti a ktorej existencia závisí od toho, či nastane alebo nenastane jedna alebo viac neistých udalostí v budúcnosti, ktorých vznik nezávisí od účtovnej jednotky, alebo

b) povinnosť, ktorá vznikla ako dôsledok minulej udalosti, ale ktorá sa nevykazuje v súvahe, pretože nie je pravdepodobné, že na splnenie tejto povinnosti bude potrebný úbytok ekonomických úžitkov, alebo výška tejto povinnosti sa nedá spoľahlivo oceniť.

Účtovná jednotka neeviduje.

(3) Opis významných položiek ostatných finančných povinností, ktoré sa nesledujú v účtovníctve a neuvádzajú sa v súvahe; pri každej položke sa uvádza jej opis, výška a údaj, či sa týka spriaznených osôb, a to

a) povinnosť z devízových termínovaných obchodov a iných finančných derivátov,

b) povinnosť z opčných obchodov,

c) zákonná povinnosť alebo zmluvná povinnosť odobrať určité produkty alebo služby, napríklad z dodávateľských zmlúv alebo odberateľských zmlúv,

d) povinnosť z lízingových zmlúv, nájomných zmlúv, servisných zmlúv, poisťných zmlúv, koncesionárskych zmlúv, licenčných zmlúv a podobných zmlúv,

e) iné povinnosti.

Účtovná jednotka neeviduje.

(4) Prehľad nehnuteľných kultúrnych pamiatok, ktoré sú v správe alebo vo vlastníctve účtovnej jednotky, a to názov, adresa a číslo kultúrnej pamiatky v Ústrednom zozname pamiatkového fondu.

Účtovná jednotka neeviduje.

(5) Informácie o významných skutočnostiach, ktoré nastali medzi dňom, ku ktorému sa zostavuje účtovná závierka a dňom jej zostavenia.

Účtovná jednotka neeviduje.



**Elektrotechnický ústav SAV, v. v. i.**



**Výročná správa o činnosti a hospodárení  
za rok 2023**

Bratislava  
február 2024



## Obsah

### **ČASŤ A**

#### **Výročná správa o činnosti organizácie za rok 2023**

1. Základné údaje o organizácii
2. Vedecko-výskumná činnosť – projekty, výsledky
3. Medzinárodná vedecká spolupráca
4. Aplikácia výsledkov výskumu v praxi
5. Doktorandské štúdium a pedagogická činnosť
6. Zmluvná spolupráca s univerzitami/vysokými školami a inými subjektmi vedy a výskumu
7. Vedecko-organizačné a popularizačné aktivity
8. Aktivity pre Národnú radu SR, vládu SR, ústredné orgány štátnej správy SR a iné inštitúcie
9. Aktivity v orgánoch SAV
10. Starostlivosť o ľudské zdroje, rodovú rovnosť, pracovné a sociálne podmienky zamestnancov a uplatňovanie ich práv
11. Organizačné a právne zmeny v organizácii
12. Činnosť knižnično-informačného pracoviska organizácie
13. Nadácie a fondy pri organizácii
14. Realizácia Koncepcie dlhodobého rozvoja a Akčného plánu organizácie
15. Iné významné činnosti organizácie SAV
16. Poskytovanie informácií v súlade so zákonom o slobodnom prístupe k informáciám
17. Problémy organizácie a podnety pre Predsedníctvo SAV k činnosti SAV
18. Vyjadrenia vedeckej rady organizácie k výsledkom výskumnej činnosti za uplynulý rok



## **PRÍLOHY K ČASTI A**

*A-1 Zoznam zamestnancov a doktorandov organizácie k 31.12.2023*

*A-2 Projekty riešené v organizácii*

*A-3 Publikačná činnosť organizácie*

*A-4 Údaje o pedagogickej činnosti organizácie*

*A-5 Medzinárodná mobilita organizácie*

*A-6 Vedecko-popularizačná činnosť pracovníkov organizácie*

*A-7 Vyznamenania, ceny a iné ocenenia udelené organizácii a jej pracovníkom*

## **ČASŤ B**

### **Výročná správa o hospodárení organizácie za rok 2023**

19. Rámcové informácie o hospodárení organizácie
20. Ročná účtovná závierka
21. Výrok štatutárneho audítora k ročnej účtovnej závierke
22. Prehľad príjmov a výdavkov
23. Pohyb a konečný stav majetku
24. Opatrenia na odstránenie nedostatkov v hospodárení a správa o plnení opatrení prijatých na odstránenie nedostatkov z predchádzajúceho roku
25. Ďalšie údaje o hospodárení organizácie

## **PRÍLOHY K ČASTI B**

*B-1 Správa štatutárneho audítora k ročnej účtovnej závierke*



## ČASŤ A



**Elektrotechnický ústav SAV, v. v. i.**

**Výročná správa o činnosti organizácie  
za rok 2023**



## 1. Základné údaje o organizácii

### 1.1. Kontaktné údaje

**Názov:** Elektrotechnický ústav SAV, v. v. i.

**Riaditeľ:** RNDr. Vladimír Cambel, DrSc.

**1. zástupca riaditeľa:** Ing. Milan Ťapajna, PhD.

**2. zástupca riaditeľa:** Ing. Ján Fedor, PhD.

**Vedecký tajomník:** RNDr. Marianna Španková, PhD

**Predseda vedeckej rady:** RNDr. Dagmar Gregušová, DrSc.

**Člen Snemu SAV:** Ing. Milan Ťapajna, PhD.

**Adresa:** Dúbravská cesta 9, 841 04 Bratislava

<http://www.elu.sav.sk>

**Tel.:** 02/ 5922 2555

**E-mail:** [elusav@savba.sk](mailto:elusav@savba.sk)

#### Názvy a adresy organizačných zložiek a detašovaných pracovísk:

Organizačné zložky: nie sú

Detašované pracoviská:

- **Oddelenie mikroelektroniky a senzoriky**  
Vrbovská cesta 110, 921 01 Piešťany

#### Vedúci organizačných zložiek a detašovaných pracovísk:

Organizačné zložky: nie sú

Detašované pracoviská:

- **Oddelenie mikroelektroniky a senzoriky**  
Mgr. Bohumír Zaťko, PhD

#### Členovia Snemu SAV za organizačné zložky:

nie sú

**Typ organizácie:** Verejná výskumná inštitúcia od roku 2022



## 1.2. Údaje o zamestnancoch

Tabuľka 1a Počet a štruktúra zamestnancov

| Štruktúra zamestnancov  | K   | K  |    | K do 35 rokov |   | F   | P     | T     | O    |
|---|-----|----|----|---------------|---|-----|-------|-------|------|
|   |     | M  | Ž  | M             | Ž |     |       |       |      |
| <b>Celkový počet zamestnancov</b>   | 116 | 82 | 34 | 20            | 8 | 111 | 86.16 | 67.79 | 10.3 |
| <b>Vedeckí pracovníci</b>   | 64  | 53 | 11 | 11            | 3 | 61  | 50.48 | 49.48 | 0    |
| <b>Odborní pracovníci VŠ</b><br>(výskumní a vývojoví zamestnanci <sup>1</sup> ) | 24  | 16 | 8  | 8             | 5 | 23  | 12.01 | 12.01 | 2.4  |
| <b>Odborní pracovníci VŠ</b><br>(ostatní zamestnanci <sup>2</sup> )             | 6   | 2  | 4  | 0             | 0 | 6   | 5.3   | 0.5   | 1    |
| <b>Odborní pracovníci ÚS</b>  | 18  | 10 | 8  | 1             | 0 | 17  | 14.05 | 5.8   | 6.9  |
| <b>Ostatní pracovníci</b>   | 4   | 1  | 3  | 0             | 0 | 4   | 4.32  | 0     | 0    |

<sup>1</sup> odmeňovaní podľa 553/2003 Z.z., príloha č. 5<sup>2</sup> odmeňovaní podľa 553/2003 Z.z., príloha č. 3 a č. 4

K – kmeňový stav zamestnancov v pracovnom pomere k 31.12.2023 (uvádzať zamestnancov v pracovnom pomere, vrátane riadnej materskej dovolenky, zamestnancov pôsobiacich v zahraničí, v štátnych funkciách, členov Predsedníctva SAV, zamestnancov pôsobiacich v zastupiteľských zboroch)

F – fyzický stav zamestnancov k 31.12.2023 (bez riadnej materskej dovolenky, zamestnancov pôsobiacich v zahraničí v štátnych funkciách, členov Predsedníctva SAV, zamestnancov pôsobiacich v zastupiteľských zboroch)

P – celoročný priemerný prepočítaný počet zamestnancov

T – celoročný priemerný prepočítaný počet riešiteľov projektov

O – celoročný priemerný prepočítaný počet obslužného personálu podieľajúceho sa na riešení projektov (technikov, laborantov, projektových manažérov a pod.) mimo zamestnancov v administratíve, správe a údržbe budov, upratovačiek, vodičov a pod.

M, Ž – muži, ženy

Tabuľka 1b Štruktúra vedeckých pracovníkov (kmeňový stav k 31.12.2023)

| Rodová skladba | Pracovníci s hodnosťou |           |       |      | Vedeckí pracovníci v stupňoch |       |       |
|----------------|------------------------|-----------|-------|------|-------------------------------|-------|-------|
|                | DrSc.                  | CSc./PhD. | prof. | doc. | I.                            | II.a. | II.b. |
| <b>Muži</b>    | 8                      | 42        | 0     | 4    | 8                             | 31    | 14    |
| <b>Ženy</b>    | 2                      | 9         | 0     | 1    | 2                             | 6     | 3     |

Tabuľka 1c Štruktúra pracovníkov podľa veku a rodu, ktorí sú riešiteľmi projektov

| Veková štruktúra (roky) | < 31 |     | 31-35 |     | 36-40 |     | 41-45 |     | 46-50 |     | 51-55 |     | 56-60 |     | 61-65 |     | > 65 |      |
|-------------------------|------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|-------|-----|------|------|
|                         | A    | B   | A     | B   | A     | B   | A     | B   | A     | B   | A     | B   | A     | B   | A     | B   | A    | B    |
| <b>Muži</b>             | 8    | 5.3 | 11    | 7.7 | 10    | 8.4 | 7     | 7.0 | 8     | 7.7 | 1     | 1.0 | 4     | 4.0 | 4     | 3.4 | 19   | 11.6 |
| <b>Ženy</b>             | 3    | 1.2 | 4     | 2.4 | 1     | 1.0 | 2     | 2.0 | 0     | 0.0 | 1     | 1.0 | 1     | 1.0 | 4     | 3.6 | 3    | 1.8  |



*A - Prepočet bez zohľadnenia úväzkov zamestnancov*

*B - Prepočet so zohľadnením úväzkov zamestnancov*

Tabuľka 1d Priemerný vek zamestnancov organizácie k 31.12.2023

|              | <b>Kmeňoví zamestnanci</b> | <b>Vedeckí pracovníci</b> | <b>Riešitelia projektov</b> |
|--------------|----------------------------|---------------------------|-----------------------------|
| <b>Muži</b>  | 49.2                       | 49.4                      | 48.6                        |
| <b>Ženy</b>  | 52.1                       | 48.7                      | 47.6                        |
| <b>Spolu</b> | 50.0                       | 49.3                      | 48.4                        |

### 1.3. Iné dôležité informácie k základným údajom o organizácii a zmeny za posledné obdobie (v zameraní, v personálnej štruktúre a pod.)

V roku 2023 prebehla na ústave voľba vedúcich oddelení na obdobie 5 rokov (v apríli 2023). V troch oddeleniach zostali staronoví vedúci, v jednom máme nového vedúceho

- Oddelenie Supravodičov – E. Pardo
- Oddelenie Fyziky a technológie nanoštruktúr – M. Hulman
- Oddelenie Mikroelektroniky a senzoriky – B. Zaťko
- v Oddelení III-V polovodičov bol zvolený nový vedúci - F. Gucmann



## 2. Vedecko-výskumná činnosť – projekty, výsledky

### 2.1. Domáce projekty

Tabuľka 2a Domáce projekty riešené v roku 2023

| ŠTRUKTÚRA PROJEKTOV   | Počet |   | Čerpané financie (€) |                 |                 |                 |                |                 |
|---|-------|---|----------------------|-----------------|-----------------|-----------------|----------------|-----------------|
|   | A     | B | A                    |                 |                 |                 | B              |                 |
|   |       |   | Zo zdrojov SAV       |                 | Z iných zdrojov |                 | Zo zdrojov SAV | Z iných zdrojov |
|   |       |   | Spolu                | Pre organizáciu | Spolu           | Pre organizáciu |                |                 |
| 1. Projekty VEGA  | 13    | 1 | -                    | -               | 145390          | 153554          | -              | 3845            |
| 2. Projekty APVV  | 10    | 8 | -                    | -               | 386095          | 302732          | -              | 183451          |
| 3. Projekty EŠIF/OP ŠF, Plán obnovy EÚ  | 1     | 1 | -                    | -               | 187393          | 187393          | -              | 7263            |
| 4. Projekty SASPRO, MoRePro, IMPULZ   | 1     | 0 | 42448                | 42448           | -               | -               | -              | -               |
| 5. Iné projekty (FM EHP, Vedecko-technické projekty, na objednávku rezortov a pod.) | 5     | 0 | 36598                | 36598           | -               | -               | -              | -               |

A - organizácia je nositeľom projektu

B - organizácia sa zmluvne podieľa na riešení projektu

Tabuľka 2b Domáce projekty podané v roku 2023

| Štruktúra projektov                     | Miesto podania | Organizácia je nositeľom projektu | Organizácia sa zmluvne podieľa na riešení projektu |
|---|----------------|-----------------------------------|--|
| 1. Účasť na nových výzvach APVV r. 2023 | -              | 5                                 |  |
| 2. Projekty výziev EŠIF podané r. 2023  | Bratislava     | 1                                 | 1  |
|   | Regióny        |                                   |  |



## 2.2. Medzinárodné projekty

### 2.2.1. Medzinárodné projekty riešené v roku 2023

Tabuľka 2c Medzinárodné projekty riešené v roku 2023

| ŠTRUKTÚRA PROJEKTOV  | Počet |   | Čerpané financie (€) |                 |                 |                 |                |                 |
|--|-------|---|----------------------|-----------------|-----------------|-----------------|----------------|-----------------|
|  | A     | B | A                    |                 |                 |                 | B              |                 |
|  |       |   | Zo zdrojov SAV       |                 | Z iných zdrojov |                 | Zo zdrojov SAV | Z iných zdrojov |
|  |       |   | Spolu                | Pre organizáciu | Spolu           | Pre organizáciu |                |                 |
| <b>1. Projekty Horizont 2020 a Horizont Európa</b>                   | 0     | 4 | -                    | -               | -               | -               | 16427          | 221485          |
| <b>2. Projekty ERA.NET, ESA, JRP</b>                                 | 1     | 1 | 11597                | 11597           | -               | -               | 6250           | 3708            |
| <b>3. Projekty COST</b>  | 0     | 2 | -                    | -               | -               | -               | 5000           | -               |
| <b>4. Projekty EUREKA, NATO, UNESCO, CERN, IAEA, IVF, ERDF a iné</b> | 0     | 4 | -                    | -               | -               | -               | 102934         | 155360          |
| <b>5. Projekty v rámci medzivládnych dohôd</b>                       | 0     | 0 | -                    | -               | -               | -               | -              | -               |
| <b>6. Bilaterálne projekty MAD, Mobility, Open Mobility</b>          | 0     | 0 | -                    | -               | -               | -               | -              | -               |
| <b>7. Bilaterálne projekty ostatné</b>                               | 3     | 0 | 33751                | 33751           | -               | -               | -              | -               |
| <b>8. Podpora MVTs z národných zdrojov (SAV, APVV a iné)</b>         | 0     | 0 | -                    | -               | -               | -               | -              | -               |
| <b>9. SAS-UPJŠ ERC Visiting Fellowship Grants</b>                    | 0     | 0 | -                    | -               | -               | -               | -              | -               |
| <b>10. Iné projekty</b>  | 0     | 0 | -                    | -               | -               | -               | -              | -               |

A - organizácia je nositeľom projektu

B - organizácia sa zmluvne podieľa na riešení projektu



## 2.2.2. Medzinárodné projekty Horizont Európa podané v roku 2023

Tabuľka 2d Počet projektov Horizont Európa v roku 2023

|   | A | B |
|---|---|---|
| <b>Počet podaných projektov Horizont Európa</b> |   |   |

A - organizácia je nositeľom projektu

B - organizácia sa zmluvne podieľa na riešení projektu

Údaje k domácim a medzinárodným projektom sú uvedené v Prílohe A-2.

## 2.2.3. Zámery na čerpanie Európskych štrukturálnych a investičných fondov v ďalších výzvach

## 2.3. Výber najvýznamnejších výsledkov vedeckej práce organizácie v roku 2023

Služi aj na výber výsledkov do výročnej správy SAV. Každý výsledok má byť charakterizovaný stručným, všeobecne zrozumiteľným popisom – maximálne 1000 znakov + 1 obrázok; bibliografický údaj uvádzajte rovnako ako v zozname publikačnej činnosti, vrátane IF. Nadpis by mal vystihnúť prínos a význam výsledku – podľa možnosti by nemal byť zredukovaný na názov/nadpis publikačného výstupu.

### 2.3.1. Výsledky na báze základného výskumu

**Názov:** Vplyv lítia na rast ultratenkých vrstiev MoS<sub>2</sub>

**Riešitelia:** M. Sojková, J. Hrdá, T. Vojteková, L. Pribusová Slušná, M. Hulman

**Projekt:** APVV-19-0365, VEGA 2/0059/21

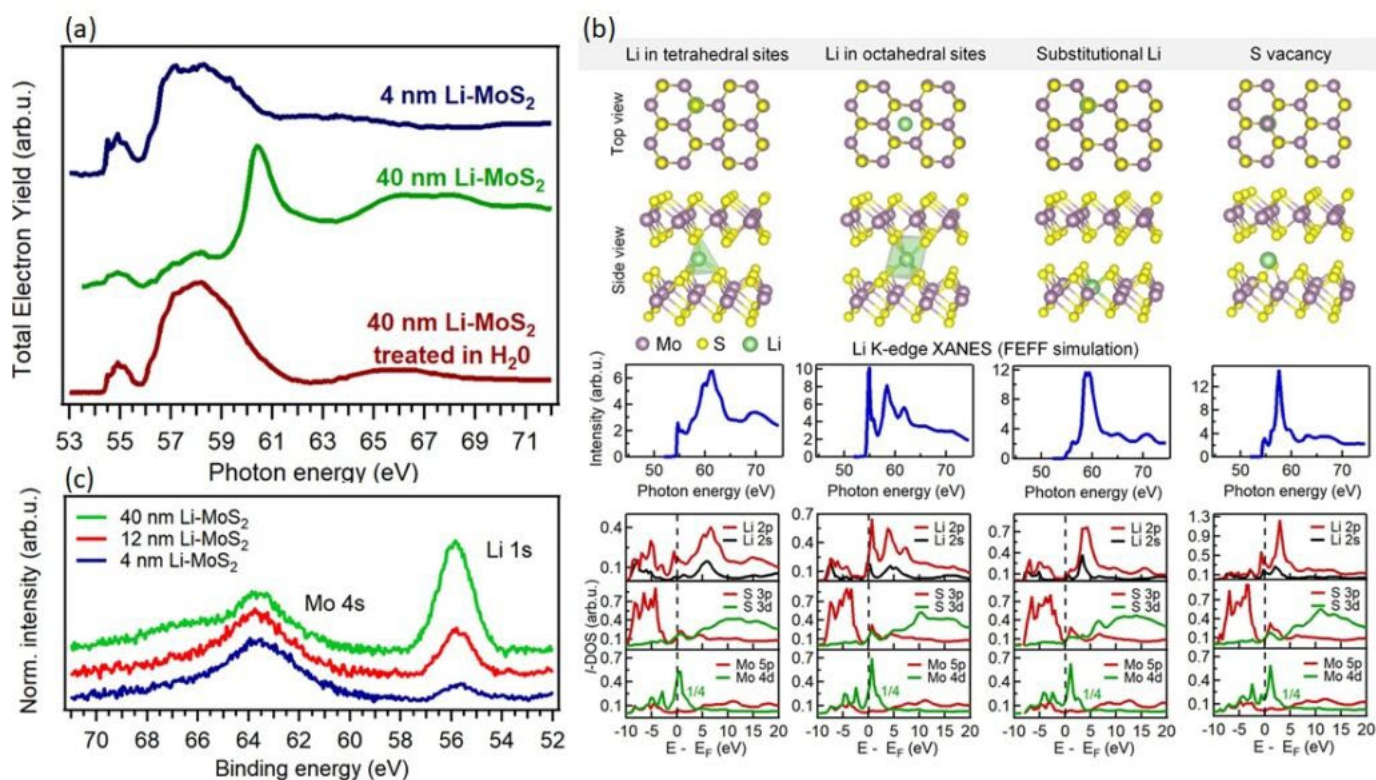
Pri našom výskume sme sa sústredili na sledovanie vplyvu lítia na rast ultratenkých vrstiev disulfidu molybdénu (MoS<sub>2</sub>). Pozitívny vplyv lítia sa už ukázal pri zvýšenom katalytickom výkone MoS<sub>2</sub> vrstiev dopovaných lítiom pri produkcii vodíka a redukcii CO<sub>2</sub>. Dopovanie lítiom má tiež potenciál zlepšiť technológiu lítiových batérií.

MoS<sub>2</sub> je vrstvený materiál, ktorý možno pripraviť vo forme jednej alebo len niekoľkých vrstiev. Vďaka svojim zaujímavým vlastnostiam a širokej škále možných aplikácií je tento materiál predmetom rozsiahleho štúdia. Interkalácia je jedným zo spôsobov, ako ovplyvňovať fyzikálne, chemické a elektronické vlastnosti materiálov. Vplyv lítia na rast MoS<sub>2</sub> vrstiev však doteraz nebol úplne preskúmaný.

V našej práci sme použili nový prístup na zabudovanie lítia do MoS<sub>2</sub> vrstiev. Na výrobu MoS<sub>2</sub> používame jednozónovú sulfurizáciu vopred nanosených molybdénových vrstiev. Ako zdroj lítia sme použili sulfid lítny. Štrukturálne analýzy ukazujú pozoruhodný účinok lítia, a to podporu epitaxného a horizontálneho rastu vrstiev. Po žíhaní v prítomnosti Li majú MoS<sub>2</sub> vrstvy tendenciu rásť horizontálne aj pre hrubšie počiatočné vrstvy molybdénu. Najprekvapivejším pozorovaním je konverzia vertikálnych MoS<sub>2</sub> vrstiev na horizontálne po žíhaní v prítomnosti Li. Predpokladáme, že lítium pôsobí ako katalyzátor uľahčujúci túto konverziu.

V našej práci demonštrujeme, že pomocou dopovania lítiom je možné meniť orientáciu bazálnej roviny MoS<sub>2</sub> vo veľmi tenkých vrstvách. Ako už bolo ukázané, vertikálne a horizontálne orientované vrstvy vykazujú odlišné elektronické, chemické a optické vlastnosti. Kontrola nad kryštalografickou orientáciou MoS<sub>2</sub> bude teda rozhodujúca pri navrhovaní zariadení novej generácie obsahujúcich vrstvy MoS<sub>2</sub>.





(a) Li K-edge XANES experimentálne spektrá pre Li dopovaný 2H-MoS<sub>2</sub>.

(b) Li K-edge XANES spektrá získané výpočtami FEFF. Hore: fragmenty štruktúrnych modelov pre hexagonálny 2H-MoS<sub>2</sub> s atómami v tetraedrických a oktaedrických intersticiálnych miestach, substitučne dopovaným MoS<sub>2</sub> a s lítiom v blízkosti atómu síry. Stred: simulované Li K-edge XANES spektrá. Dole: vypočítaná orbitálna projektovaná hustota stavov pre Li, S a Mo atómy.

(c) Mo 4s a Li 1s XPS spektrá zo vzoriek MoS<sub>2</sub> dopovaných Li.

#### Publikácia:

SOJKOVÁ, Michaela\*\* – PÍŠ, I. – HRDÁ, Jana – VOJTEKOVÁ, Tatiana – PRIBUSOVÁ SLUŠNÁ, Lenka – VĚGSO, Karol – ŠIFFALOVÍČ, Peter – NÁDAŽDY, Peter – DOBROČKA, Edmund – KRBAL, M. – FONS, P.J. – MUNNIK, F. – MAGNANO, E. – HULMAN, Martin – BONDINO, F.\*\*. Lithium-induced reorientation of few-layer MoS<sub>2</sub> films. In Chemistry of Materials, 2023, vol. 35, p. 6246-6257. (2022: 8.6 – IF, Q1 – JCR, 2.869 – SJR, Q1 – SJR). ISSN 0897-4756. Dostupné na: <https://doi.org/10.1021/acs.chemmater.3c00669> Typ: ADCA

### 2.3.2. Výsledky aplikačného typu

**Názov:** Striedavé straty v supravodivých motoroch pre vodíkovo-elektrické lietadlá

**Riešitelia:** E. Pardo, J. Kováč

**Zadávateľ výskumného kontraktu:** AIRBUS UpNext (France)

Komerčná letecká doprava je rastúcim zdrojom emisií skleníkových plynov (CO<sub>2</sub>, NO<sub>x</sub> a vodná para vo vysokých výškach). Vodíkovo-elektrické lietadlá sa vyznačujú nulovými emisiami CO<sub>2</sub> a v prípade ak elektrickú energiu na palube vyrábajú palivové články, neprodukujú ani oxidy dusíku a vypúšťajú malé množstvá vodnej pary. Z tohto dôvodu dokument Európskej komisie ACARE fly-the-green-deal stanovuje niekoľko cieľov súvisiacich s vodíkovými lietadlami, vrátane certifikovaného lietadla na vodíkový pohon do roku 2035 a výstavby najmenej 100 vodíkových uzlov na európskych letiskách. Z tohto dôvodu má spoločnosť Airbus za cieľ vyvinúť prvé lietadlo na vodíkový pohon do roku 2035, pričom využitie supravodičov v elektrických rozvodoch a pohonných jednotkách predstavuje intenzívne študovanú alternatívu.



Supravodivé motory sú skutočne veľmi sľubné pre budúce vodíkovo-elektrické lietadlá vďaka ich očakávanému vysokému špecifickému výkonu, ktorý by mohol dosiahnuť leteckým priemyslom stanovený cieľ 25 kW/kg. Náš ústav získal kontrakt od spoločnosti Airbus na modelovanie striedavých strát v supravodivom elektromotore a na meranie striedavých strát v páskach z vysokoteplotných supravodičov. Projekt bol úspešne ukončený a priniesol zaujímavé výsledky.

### 2.3.3. Výsledky na báze medzinárodnej spolupráce

**Názov:** Supravodiče pre budúce urýchľovače

**Projekty:** I.FAST, Filaments4Fusion

**Riešitelia:** F. Gömöry, E. Seiler, R. Ries, M. Soloviov, J. Šouc, T. Kujovič

Tradične sa pásky z vysokoteplotných supravodičov v okrúhlych kábloch navíjajú so striedavou helicitou. Potom sa okraje pásky zdvihnú v dôsledku Poissonovho efektu, čo spôsobí lokálnu nepravidelnosť povrchu a vtlačenie do nasledujúcich vrstiev. Nedávno sme overili, že tento efekt je slabší v prípade zhodných uhlov uloženia, pretože potom okraje pásky vytvárajú odtlačky, ktoré sú rovnobežné s dĺžkou pásky. Nebolo však jasné, ako takéto usporiadanie ovplyvní striedavé straty. Výskumy experimentálnych testov malých laboratórnych modelov a numerického modelovania odhalili, že vplyv geometrie je významný iba v nízkych magnetických poliach. Tam mal najnižšie straty kábel pozostávajúci z párov na sebe naskladaných pások. Na druhej strane, pri podmienkach očakávaných vo vinutí cievky generujúcej magnetické pole sa striedavé straty pre káble s rôznym usporiadaním priblížili k rovnakým hodnotám.

V prípravných prácach na experimentálne overenia bolo potrebné podrobne preštudovať limity mechanického zaťaženia, ktorým pásky pri kabeláži nevyhnutne podliehajú, a význam nehomogenít materiálu ako zdroja nadmernej degradácie kritického prúdu.

Publikácie:

RIES, Rastislav\*\* - HLAVÁČ, Dominik - SOLOVYOV, Mykola - GÖMÖRY, Fedor. Induced delamination in REBCO coated-conductor tape by a scratch line and bending. In Physica C. Superconductivity and its applications, 2023, vol. 613, no. 1354358. (2022: 1.7 - IF, Q3 - JCR, 0.423 - SJR, Q2 - SJR). ISSN 0921-4534. Dostupné na: <https://doi.org/10.1016/j.physc.2023.1354358>

MOŠAŤ, Marek\*\* - ŠOUC, Ján - RIES, Rastislav - GÖMÖRY, Fedor. Longitudinal critical current profiles in coated conductors examined by transport and magnetization measurements. In IEEE Transactions on Applied Superconductivity, 2023, vol. 33, no. 6602205. (2022: 1.8 - IF, Q3 - JCR, 0.536 - SJR, Q2 - SJR). ISSN 1051-8223. Dostupné na: <https://doi.org/10.1109/TASC.2023.3264956>

GÖMÖRY, Fedor\*\* - ŠOUC, Ján - GODÁR, Michal - HINTZE, Carl, Dr. - GROSSE, V. Analysis of critical current fluctuations as a means of checking the quality of high-temperature superconductor tape slitting. In Superconductor Science and Technology, 2023, vol. 36, art. no. 054001. (2022: 3.6 - IF, Q2 - JCR, 1.191 - SJR, Q1 - SJR). ISSN 0953-2048. Dostupné na: <https://doi.org/10.1088/1361-6668/acb73f>

KUJOVIČ, Tomáš\*\* - RIES, Rastislav - MOŠAŤ, Marek - GÖMÖRY, Fedor. The critical current of REBCO coated conductors subjected to a mechanical loading at varying angles. In IEEE Transactions on Applied Superconductivity, 2023, vol. 33, no. 5, art. no. 6601004. (2022: 1.8 - IF, Q3 - JCR, 0.536 - SJR, Q2 - SJR). ISSN 1051-8223. Dostupné na: <https://doi.org/10.1109/TASC.2023.3242924>

SOLOVYOV, Mykola\*\* - ŠOUC, Ján - KUJOVIČ, Tomáš - FROLEK, Lubomír - GÖMÖRY,



Fedor. Magnetization AC losses in multilayer superconducting round cables with coinciding and opposite lay angles. In Superconductor Science and Technology, 2023, vol. 36, no. 034001. (2022: 3.6 - IF, Q2 - JCR, 1.191 - SJR, Q1 - SJR). ISSN 0953-2048. Dostupné na: <https://doi.org/10.1088/1361-6668/acb08e>

RIES, Rastislav\*\* - GÖMÖRY, Fedor - MOŠAŤ, Marek - KUJOVIČ, Tomáš - HINTZE, Carl, Dr. - GIL, P. Effect of off-axis bending on microstructural and transport properties of coated conductor tape. In Superconductor Science and Technology, 2023, vol. 36, no. 014006. (2022: 3.6 - IF, Q2 - JCR, 1.191 - SJR, Q1 - SJR). ISSN 0953-2048. Dostupné na: <https://doi.org/10.1088/1361-6668/aca6ad>

GÖMÖRY, F.\*\* - SOLOVYOV, M. - ŠOUC, J. - FROLEK, L. - KUJOVIČ, T. - SEILER, E. - RIES, R. - MOŠAŤ, M. - WINKLER, T. - SUGITA, K. - DHALLÉ, M. - KROOSHOOPE, H.J.G. - HINTZE, C. - TROSHYN, A. - PRUSSEIT, W. - NEDERGAARD, L. - TRABERG, L. - CHRISTENSEN, J.J. - JORGENSEN, N.O. - BAHL, C.R.H. - WULFF, A.C.: AC loss reduction in round HTS cables achieved by low-cost filamentization of tape conductors. In IEEE Transactions on Applied Superconductivity, 2024, in press (2022: 1.8 - IF, Q3 - JCR, 0.536 - SJR, Q2 - SJR). ISSN 1051-8223. Dostupné na: <https://doi.org/10.1109/TASC.2024.3364133>



**2.4. Publikačná činnosť** (zoznam je uvedený v prílohe A-3)

Tabuľka 2e Štatistika vybraných kategórií publikácií

| <b>PUBLIKAČNÁ A EDIČNÁ ČINNOSŤ</b>   | <b>Počet v r. 2023/<br/>doplňky z r. 2022</b> |
|--|---|
| <b>1. Vedecké monografie a monografické štúdie vydané v domácich vydavateľstvách (AAB, ABB)</b>  | <b>0 / 0</b>                                  |
| <b>2. Vedecké monografie a monografické štúdie vydané v zahraničných vydavateľstvách (AAA, ABA)</b>  | <b>0 / 0</b>                                  |
| <b>3. Odborné monografie, vysokoškolské učebnice a učebné texty vydané v domácich vydavateľstvách (BAB, ACB, CAB)</b>                          | <b>0 / 0</b>                                  |
| <b>4. Odborné monografie a vysokoškolské učebnice a učebné texty vydané v zahraničných vydavateľstvách (BAA, ACA, CAA)</b>                     | <b>0 / 0</b>                                  |
| <b>5. Kapitoly vo vedeckých monografiách vydaných v domácich vydavateľstvách (ABD)</b>   | <b>0 / 0</b>                                  |
| <b>6. Kapitoly vo vedeckých monografiách vydaných v zahraničných vydavateľstvách (ABC)</b>   | <b>1 / 0</b>                                  |
| <b>7. Kapitoly v odborných monografiách, vysokoškolských učebniciach a učebných textoch vydaných v domácich vydavateľstvách (BBB, ACD)</b>     | <b>0 / 0</b>                                  |
| <b>8. Kapitoly v odborných monografiách, vysokoškolských učebniciach a učebných textoch vydaných v zahraničných vydavateľstvách (BBA, ACC)</b> | <b>0 / 0</b>                                  |
| <b>9. Vedecké práce registrované v Current Contents Connect (ADCA, ADCB, ADDA, ADDB)</b>   | <b>64 / 1</b>                                 |
| <b>10. Vedecké práce registrované vo Web of Science Core Collection alebo Scopus (ADMA, ADMB, ADNA, ADNB)</b>                                  | <b>7 / 3</b>                                  |
| <b>11. Vedecké práce v ostatných domácich časopisoch (ADFA, ADFB)</b>  | <b>0 / 0</b>                                  |
| <b>12. Vedecké práce v ostatných zahraničných časopisoch (ADEA, ADEB)</b>  | <b>3 / 0</b>                                  |
| <b>13. Vedecké práce v domácich recenzovaných zborníkoch (AEDA)</b>  | <b>0 / 0</b>                                  |
| <b>14. Vedecké práce v zahraničných recenzovaných zborníkoch (AECA)</b>  | <b>0 / 0</b>                                  |
| <b>15. Publikované príspevky na domácich vedeckých konferenciách (AFB, AFD)</b>  | <b>12 / 0</b>                                 |
| <b>16. Publikované príspevky na zahraničných vedeckých konferenciách (AFA, AFC)</b>  | <b>1 / 0</b>                                  |
| <b>17. Vydané periodiká evidované v CCC, WoS Core Collection, SCOPUS</b>   | <b>0</b>                                      |
| <b>18. Ostatné vydané periodiká</b>  | <b>0</b>                                      |
| <b>19. Zostavovateľské práce knižného charakteru (FAI)</b>   | <b>0 / 0</b>                                  |
| <b>20. Preklady vedeckých a odborných textov (EAJ)</b>   | <b>0 / 0</b>                                  |
| <b>21. Heslá v odborných terminologických slovníkoch a encyklopédiách (BDA, BDB)</b>   | <b>0 / 0</b>                                  |
| <b>22. Recenzie v časopisoch a zborníkoch (EDI)</b>  | <b>0 / 0</b>                                  |

*Evidujú sa len tie práce zamestnancov a doktorandov, v ktorých je uvedená afiliácia k organizácii*



Tabuľka 2f Štatistika vedeckých prác podľa kvartilu vedeckého časopisu

| Kvartil vedeckého časopisu   | Q1     | Q2     | Q3     | Q4    | Spolu  |
|--|--------|--------|--------|-------|--------|
| <b>Podľa IF z r. 2022 (zdroj JCR)</b><br><i>Počet článkov / doplnky</i>      | 17 / 0 | 31 / 0 | 14 / 0 | 2 / 2 | 64 / 2 |
| <b>Podľa SJR z r. 2022 (zdroj Scimago)</b><br><i>Počet článkov / doplnky</i> | 38 / 0 | 25 / 1 | 1 / 1  | 7 / 2 | 71 / 4 |

Tabuľka 2g Ohlasy

| OHLASY   | Počet v r. 2022/<br>doplnky z r. 2021 |
|--|---------------------------------------|
| <b>Citácie vo WOS (1.1, 2.1)</b>   | 1560 / 13                             |
| <b>Citácie v SCOPUS (1.2, 2.2)</b>   | 183 / 26                              |
| <b>Citácie v iných citačných indexoch a databázach (9, 10, 3.2, 4.2)</b>             | 0 / 0                                 |
| <b>Citácie v publikáciách neregistrovaných v citačných indexoch (3, 4, 3.1, 4.1)</b> | 4 / 1                                 |
| <b>Recenzie na práce autorov z organizácie (5, 6, 7, 8)</b>                          | 0 / 0                                 |

## 2.5. Aktívna účasť na vedeckých podujatiach

Tabuľka 2h Vedecké podujatia

|  |    |
|--|----|
| <b>Prednášky a vývesky na medzinárodných vedeckých podujatiach</b>         | 84 |
| <b>Prednášky a vývesky na národných vedeckých podujatiach<sup>15</sup></b> | 15 |

## 2.6. Vyžiadané prednášky

*Ak boli príspevky publikované, sú súčasťou prílohy C, kategória (AFC, AFD, AFE, AFF, AFG, AFH)*

### 2.6.1. Vyžiadané prednášky na medzinárodných vedeckých podujatiach

1. Cuninková, E., Frolek, L., Ferenčík, F., Bónová, L., Skarba, M., Hulačová, S., and Pekarčíková, M.: Characterization of a novel TORT cable wound of stabilised striated REBCO tapes with reduced magnetization AC losses. In 36<sup>th</sup> Inter. Symp. Supercond. (ISS2023). Takina, Wellington, New Zealand 2023.
2. Gömöry, F., Mošat', M., Godár, M., and Šouc, J.: Current and heat transfer in location with reduced critical current in CC tape. In: EUCAS 2023. Bologna 2023.
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7. Hulman, M., Sojková, M., Precner, M., Pribusová Slušná, L., Vojteková, T., Hrdá, J., Kačmarčík, J., Moško, M., and Dobročka, E.: Optical and transport properties of polycrystalline thin layers of 2D-TMDC semimetals. In: 13<sup>th</sup> Inter. Conf. Nanomater.: Appl. & Properties - IEEE NAP-2023. Bratislava 2023.
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9. Mustonen, K., Hofer, C., Kotrusz, P., Markevich, A., Hulman, M., Mangler, C., Susi, T., Pennycook, T.J., Meyer, J.C., Kotakoski, J., and Skákalová, V.: New approaches for new materials: exotic 2D crystals from table-top chemistry. In: 13<sup>th</sup> Inter. Conf. Nanomater.: Appl. & Properties - IEEE NAP-2023. Bratislava 2023.
10. Mruczkiewicz, M., Zelent, M., Zhang, Z., Christensen, J., Ščepka, T., and Feilhauer, J.: Unidirectional spin-wave edge modes in magnonic crystal. In: 13<sup>th</sup> Inter. Conf. Nanomater.: Appl. & Properties - IEEE NAP-2023. Bratislava 2023.
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15. Skákalová, V., Varga, M., Åhlgren, E.H., Propst, D., Kotakoski, J., Richter, C., and Hricovini, K.: High resolution STEM imaging of individual quantum centers in diamond. In 6<sup>th</sup> Workshop on Electron and Spin Dynamics. Neuville (France) 2023.
16. Skákalová, V., Mustonen, K., Kotrusz, P., Hofer, C., Hricovini, K., and Richter, C.: Simple chemical approach to two-dimensional metal iodides/graphene heterostructures. In: 35<sup>rd</sup> Inter. Winterschool on Electronic Properties of Novel Mater. - IWEPM 2023. Kirchberg 2023.
17. Ľapajna, M., Egyenes, F., Hrubíák, F., Hušeková, K., Dobročka, E., Nádaždy, P., Rosová, A., Chouhan, H., Keshtkar, J., and Gucmann, F.: Liquid-injection MOCVD-grown Ga<sub>2</sub>O<sub>3</sub> on sapphire and 4H-SiC substrates: Material, transport, and MOSFET properties. In: Inter. Meeting for Future of Electron Dev. IMFEDK 2023. Kyoto 2023.
18. Vanko, G.: Gallium nitride based heterostructures for sensor applications. In 6<sup>th</sup> Erwin Schrödinger Symp. 2023. Dornbirn (Austria) 2023.

## 2.6.2. Vyžiadané prednášky na národných vedeckých podujatiach



### 2.6.3. Vyžiadané prednášky na významných vedeckých inštitúciách

1. Guemann, F.: Growth and properties of LI-MOCVD-grown Ga<sub>2</sub>O<sub>3</sub> films. In Inst. Technol. Sci, Wuhan Univ. 2023.

### 2.7. Patentová a licenčná činnosť na Slovensku a v zahraničí v roku 2023

#### 2.7.1. Vynálezy, na ktoré bol v roku 2023 udelený patent

##### a) na Slovensku

##### b) v zahraničí

#### 2.7.2. Vynálezy prihlásené v roku 2023

##### a) na Slovensku

Názov vynálezu: Záporná elektróda pre nabíjateľnú Li-iónovú batériu, spôsob jej výroby a nabíjateľná Li-iónová batéria

Číslo prihlášky: PP 50005-2023

Dátum priority: 25.1.2023

Majiteľ / spolumajiteľ: Elektrotechnický ústav SAV, v.v.i.

Pôvodcovia vynálezu: Fröhlich Karol, Sahoo Prangya Paramita, Hudec Boris, Güneren Alper, Nada Ahmed Ali Ahmed Haggag

##### b) v iných krajinách ako prioritná prihláška

##### c) PCT

Názov vynálezu: A negative electrode for a rechargeable Li-ion battery, its production method, and a rechargeable Li-ion battery

Krajina: Slovensko

Číslo prihlášky: PCT/SK2023/050003

Dátum priority: 22.2.2023

Majiteľ / spolumajiteľ: Elektrotechnický ústav SAV, v.v.i.

Pôvodcovia vynálezu: Fröhlich Karol, Sahoo Prangya Parimita, Hudec Boris, Güneren Alper, Nada Ahmed Ali Ahmed Haggag

##### d) EP

Názov vynálezu: Veľkoplošný detector jadrových častíc a žiarenia s podložkou, spôsob jeho výroby a zapojenie obsahujúce veľkoplošný detektor

Krajina: Slovensko

Číslo prihlášky: EP 22755321.1

Dátum priority: 28.9.2023

Majiteľ / spolumajiteľ: Elektrotechnický ústav SAV, v.v.i.

Pôvodcovia vynálezu: Zat'ko Bohumír, Dubecký František

##### e) v iných krajinách v rámci tzv. národnej fázy po PCT, resp. po validácii EP



### 2.7.3. Úžitkové vzory na Slovensku

#### a) prihlásené v roku 2023

Názov UV: Expozičný modul s programovateľným cloniacim poľom pre vákuové komory

Číslo UV: 50039-2023

Dátum prihlášky: 7.6.2023

Majiteľ / spolumajiteľ UV: Elektrotechnický ústav SAV, v.v.i.

Pôvodcovia UV: Gucmann Filip, Zelenay M., Kurbel M., Hudec Boris, Ťapajna Milan

Názov UV: Stereolitografický modul pre vákuové komory

Číslo UV: 50038-2023

Dátum prihlášky: 7.6.2023

Majiteľ / spolumajiteľ UV: Elektrotechnický ústav SAV, v.v.i.

Pôvodcovia UV: Hudec Boris, Zelenay M., Kurbel M., Gucmann Filip, Ťapajna Milan

#### b) udelené v roku 2023

### 2.7.4. Realizované vynálezy

#### a) predané patenty resp. prihlášky vynálezov (v prípade úplnej zmeny majiteľa patentu)

#### b) predané licencie (v prípade že majiteľom ostáva organizácia SAV)

*Finančný prínos pre organizáciu SAV v roku 2023 a súčet za predošlé roky sa neuvádzajú, ak je zverejnenie v rozpore so zmluvou súvisiacou s realizáciou patentu.*

### 2.8. Účasť expertov na hodnotení národných projektov (APVV, VEGA a iných)

Tabuľka 2i Experti hodnotiaci národné projekty

| Meno pracovníka  | Typ programu/projektu/výzvy | Počet hodnotených projektov |
|------------------|-----------------------------|-----------------------------|
| Gregušová Dagmar | VV APVV                     | 1                           |
| Haščík Štefan    | VEGA                        | 1                           |
| Chromik Štefan   | VEGA                        | 1                           |
| Osvald Jozef     | VEGA                        | 1                           |
| Rosová Alica     | APVV                        | 1                           |
| Ťapajna Milan    | KEGA                        | 1                           |
| Tóbbik Jaroslav  | VEGA                        | 2                           |

### 2.9. Účasť na spracovaní hesiel do encyklopédie Beliana

Počet autorov hesiel: 0



**2.10. Recenzovanie knižných publikácií a príspevkov vo vedeckých časopisoch**

Tabuľka 2j Počet vypracovaných recenzií na vedecké monografie, vedecké štúdie a zborníky

| Meno pracovníka   | Ved. monografie |             | Príspevky v časopisoch |              |          | Zborníky  |             |
|-------------------|-----------------|-------------|------------------------|--------------|----------|-----------|-------------|
|                   | Domáce          | Zahra-ničné | WoS, SCOPUS            | Iné databázy | Ostatné  | Domáce    | Zahra-ničné |
| Gömöry Fedor      | 0               | 0           | 12                     | 0            | 0        | 0         | 0           |
| Gregušová Dagmar  | 0               | 0           | 7                      | 0            | 0        | 0         | 0           |
| Gucmann Filip     | 0               | 0           | 17                     | 0            | 0        | 0         | 0           |
| Hudec Boris       | 0               | 0           | 4                      | 0            | 0        | 0         | 0           |
| Hulman Martin     | 0               | 0           | 2                      | 0            | 0        | 0         | 0           |
| Chromik Štefan    | 0               | 0           | 2                      | 0            | 0        | 3         | 0           |
| Izsák Tibor       | 0               | 0           | 3                      | 0            | 0        | 2         | 0           |
| Kováč Pavol       | 0               | 0           | 26                     | 0            | 0        | 0         | 0           |
| Kuzmík Ján        | 0               | 0           | 5                      | 0            | 0        | 0         | 0           |
| Rosová Alica      | 0               | 0           | 10                     | 0            | 0        | 0         | 0           |
| Skákalová Viera   | 0               | 0           | 2                      | 0            | 0        | 0         | 0           |
| Sojková Michaela  | 0               | 0           | 10                     | 0            | 0        | 0         | 0           |
| Soloviov Mykola   | 0               | 0           | 8                      | 0            | 0        | 0         | 0           |
| Španková Marianna | 0               | 0           | 3                      | 0            | 0        | 0         | 0           |
| Ťapajna Milan     | 0               | 0           | 30                     | 0            | 0        | 3         | 0           |
| Tóvik Jaroslav    | 0               | 0           | 1                      | 0            | 0        | 0         | 0           |
| Vanko Gabriel     | 0               | 0           | 3                      | 0            | 0        | 3         | 0           |
| Varga Marian      | 0               | 0           | 2                      | 0            | 0        | 2         | 1           |
| Zápražný Zdenko   | 0               | 0           | 1                      | 0            | 0        | 0         | 0           |
| Zaťko Bohumír     | 0               | 0           | 3                      | 0            | 0        | 1         | 0           |
| <b>Spolu</b>      | <b>0</b>        | <b>0</b>    | <b>151</b>             | <b>0</b>     | <b>0</b> | <b>14</b> | <b>1</b>    |

**2.11. Iné informácie k vedecko-výskumnej činnosti.**



### 3. Medzinárodná vedecká spolupráca

#### 3.1. Medzinárodné vedecké podujatia

##### 3.1.1. Medzinárodné vedecké podujatia, ktoré organizácia SAV organizovala v roku 2023 alebo sa na ich organizácii podieľala, s vyhodnotením vedeckého a spoločenského prínosu podujatia

IEEE 2023 Nanomateriály: Aplikácie a vlastnosti, Bratislava, 400 účastníkov, 03.11.-03.11.2023

Konferencia bola zameraná predovšetkým na oblasť materiálov v nanorozmeroch s dôrazom na interdisciplinárny výskum a využitie ich jedinečných fyzikálnych a chemických vlastností pre praktické aplikácie.

Medzi účastníkmi konferencie boli poprední súčasní chemici, fyzici a materiáloví vedci (prof. Y. Gogotsi, prof. J. Fabian, prof V. Tsukruk a ďalší), poprední medzinárodní odborníci z priemyslu a podnikatelia.

Konferenciu finančne podporili firmy ESET, Bizzcom a Atlant 3D (Dánsko), Sumy state university a IEEE NT. Podujatie IEEE NAP v Bratislave tak priťahlo množstvo domácich a medzinárodných doktorandov, študentov a odborníkov na začiatku kariéry. Účastníci boli zo 48 krajín. Účastníci z Ukrajiny boli podporení grantom.

Počas konferencie sme zorganizovali množstvo sprievodných podujatí: Uvítaciu recepciu, konferenčnú večeru, okrúhly stôl "Nanotech Startup" a večer mladých profesionálov.

Z konferencie vyšiel aj zborník so 110 príspevkami.

##### 3.1.2. Medzinárodné vedecké podujatia, ktoré usporiada organizácia SAV v roku 2024 (anglický a slovenský názov podujatia, miesto a termín konania, meno, telefónne číslo a e-mail zodpovedného pracovníka)

##### 3.1.3. Počet pracovníkov v programových a organizačných výboroch medzinárodných konferencií

Tabuľka 3a Programové a organizačné výbory medzinárodných konferencií

| Meno pracovníka | Programový | Organizačný | Programový i organizačný |
|-----------------|------------|-------------|--------------------------|
| Gömöry Fedor    | 0          | 0           | 3                        |
| Gucmann Filip   | 0          | 0           | 1                        |
| Skákalová Viera | 0          | 0           | 1                        |
| <b>Spolu</b>    | 0          | 0           | 5                        |

#### 3.2. Členstvo a funkcie v medzinárodných orgánoch

##### 3.2.1. Členstvo a funkcie v medzinárodných vedeckých spoločnostiach, úniách a národných komitétach SR

doc. Ing. Fedor Gömöry, DrSc.

Applied Superconductivity Educational Foundation (ASEF) (funkcia: člen výboru)



Ing. Pavol Kováč, DrSc.

Academic Committee for International Congress on Advanced Materials (funkcia: člen)

### 3.3. Účasť expertov na hodnotení medzinárodných projektov (EÚ RP, ESF a iných)

Tabuľka 3b Experti hodnotiaci medzinárodné projekty

| Meno pracovníka | Typ programu/projektu/výzvy             | Počet hodnotených projektov |
|-----------------|---|-----------------------------|
| Kuzmík Ján      | HORIZON KDT JU 2023 Calls 1-3           | 37                          |
| Ľapajna Milan   | DFG (Nemecko) Research Grants Programme | 1                           |

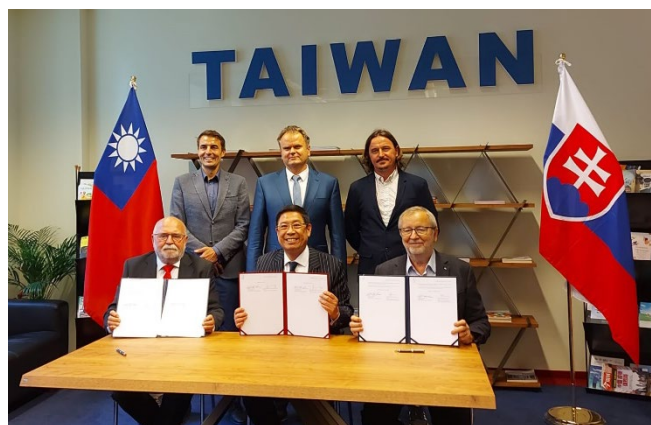
### 3.4. Najvýznamnejšie prínosy MVTS ústavu vyplývajúce z mobility a riešenia medzinárodných projektov a iné informácie k medzinárodnej vedeckej spolupráci

V r. 2023 sme potvrdili našu spoluprácu so svetovým lídrom v oblasti polovodičov, s firmou **Industrial Technology Research Institute, ITRI** (Taiwan), podpisom dvoch dokumentov.

Prvý z nich, základný, bol podpísaný na Taiwane a hovorí o transfere know-how, o spolupráci na najbližšie 4 roky v oblasti výskumu a vývoja GaN a GaO technológií ako aj o testovaní výkonových modulov a vzdelávaní v tejto oblasti (obr vľavo).

Druhý dokument, podpísaný v Bratislave, hovorí o konkrétnej finančnej podpore počas obdobia riešenia projektu (obr. vpravo). Celková výška podpory pre EIÚ SAV, v.v.i., je asi 2,7 mil. €.

Na uvedenej spolupráci sa podieľa a zmluvu s ITRI podpísala aj STU v Bratislave. Toto je významný impulz na zlepšenie našej ďalšej spolupráce s STU do budúcnosti.



Prehľad údajov o medzinárodnej mobilite pracovníkov organizácie je uvedený v Prílohe A-5.

Prehľad a údaje o medzinárodných projektoch sú uvedené v kapitole 2 a Prílohe A-2.



## 4. Aplikácia výsledkov výskumu v praxi

### 4.1. Výsledky výskumu organizácie aplikované v technologickej a všeobecnej spoločenskej praxi

#### 4.2. Kontraktový – zmluvný výskum (vrátane zahraničných kontraktov)

Názov/účel kontraktového výskumu: Participation of IEE to ASCEND

Zadávateľ výskumného kontraktu: AIRBUS UpNext (France)

Začiatok spolupráce: 2022

Ukončenie spolupráce: 2023

Finančný prínos pre organizáciu (€): 32145

Názov/účel kontraktového výskumu: Superconducting (HTS) version of HEBT magnet

Zadávateľ výskumného kontraktu: GSI Darmstadt (Germany)

Začiatok spolupráce: 2023

Ukončenie spolupráce: 2023

Finančný prínos pre organizáciu (€): 43000

#### 4.3. Iné formy aplikácie výsledkov výskumu a využitia odbornosti

## 5. Doktorandské štúdium a pedagogická činnosť

### 5.1. Údaje o doktorandskom štúdiu

Tabuľka 5a Počet doktorandov v roku 2023

| Forma                 | Počet k 31.12.2023 |   |                    |   | Počet doktorandov po doktorandskej skúške |   | Počet ukončených doktorantúr v r. 2023 |   |                     |   |                     |   |
|-----------------------|--------------------|---|--------------------|---|---|---|--|---|---------------------|---|---------------------|---|
|                       |                    |   |                    |   |   |   | Ukončenie z dôvodov                    |   |                     |   |                     |   |
|                       | celkový počet      |   | z toho novoprijatí |   |   |   | ukončenie úspešnou obhajobou           |   | predčasné ukončenie |   | neúspešné ukončenie |   |
|                       | M                  | Ž | M                  | Ž | M   | Ž | M                                      | Ž | M                   | Ž | M                   | Ž |
| Denná zo zdrojov SAV  | 9                  | 3 | 2                  | 1 | 5   | 0 | 1                                      | 0 | 0                   | 0 | 0                   | 0 |
| Denná z iných zdrojov | 2                  | 1 | 0                  | 0 | 4   | 2 | 2                                      | 1 | 0                   | 0 | 0                   | 0 |
| Externá               | 1                  | 0 | 0                  | 0 | 2   | 0 | 0                                      | 0 | 1                   | 0 | 0                   | 0 |
| Spolu                 | 12                 | 4 | 2                  | 1 | 11  | 2 | 3                                      | 1 | 1                   | 0 | 0                   | 0 |
| Z toho zahraničných   | 6                  | 2 | 2                  | 1 | 4   | 1 | 1                                      | 1 | 0                   | 0 | 0                   | 0 |
| Súhrn                 | 16                 |   | 3                  |   | 13  |   | 4                                      |   | 1                   |   | 0                   |   |

Uvádzajte len doktorandov organizácie ako externej vzdelávacej inštitúcie.

Riadok „Spolu“ je súčtom troch riadkov nad ním. Každá bunka v riadku „Súhrn“ vyjadruje celkový počet doktorandov (mužov a žien spolu), čiže je súčtom príslušných dvoch buniek z riadku „Spolu“. V stĺpci „Počet doktorandov po doktorandskej skúške“ sa uvádza počet doktorandov, ktorí počas roku 2023 boli aspoň 1 deň doktorandami po doktorandskej skúške. Sú číselne zahrnutí aj v predchádzajúcich stĺpcoch.

Pod predčasným ukončením rozumieme ukončenie bez obhajoby dizertačnej práce pričom doktorand neabsolvoval celú štandardnú dĺžku štúdia. Pod neúspešným ukončením rozumieme ukončenie bez úspešnej obhajoby dizertačnej práce, pričom študent absolvoval celú štandardnú dĺžku štúdia.



**5.2. Zmena formy doktorandského štúdia**

Tabuľka 5b Počty preradení z dennej formy na externú a z externej na dennú

| Pôvodná forma | Denná z prostriedkov SAV | Denná z prostriedkov SAV | Denná z iných zdrojov    | Denná z iných zdrojov | Externá                  | Externá               |
|---------------|--------------------------|--------------------------|--------------------------|-----------------------|--------------------------|-----------------------|
| Nová forma    | Denná z iných zdrojov    | Externá                  | Denná z prostriedkov SAV | Externá               | Denná z prostriedkov SAV | Denná z iných zdrojov |
| Počet         | 2                        | 0                        | 0                        | 1                     | 0                        | 0                     |

**5.3. Zoznam doktorandov, ktorí ukončili doktorandské štúdium úspešnou obhajobou**

Tabuľka 5c Menný zoznam ukončených doktorandov v roku 2023 úspešnou obhajobou

| Meno doktoranda          | Forma DŠ                                   | Mesiac, rok nástupu na DŠ | Mesiac, rok obhajoby | Číslo a názov študijného odboru              | Meno a organizácia školiteľa                                   | Fakulta udeľujúca vedeckú hodnotu           |
|--------------------------|--|---------------------------|----------------------|--|--|---|
| Mgr. Konstantin Bublikov | interné štúdium hrazené z prostriedkov SAV | 9 / 2017                  | 1 / 2023             | 4.1.3 fyzika kondenzovaných látok a akustika | Ing. Jaroslav Tóvik PhD., Elektrotechnický ústav SAV, v. v. i. | Fakulta matematiky, fyziky a informatiky UK |
| Mgr. Fridrich Egyenes    | interné štúdium hrazené z iných zdrojov    | 9 / 2018                  | 8 / 2023             | 4.1.3 fyzika kondenzovaných látok a akustika | Ing. Milan Ťapajna PhD., Elektrotechnický ústav SAV, v. v. i.  | Fakulta matematiky, fyziky a informatiky UK |
| Mgr. Iuliia Vetrova      | interné štúdium hrazené z iných zdrojov    | 9 / 2018                  | 8 / 2023             | 4.1.3 fyzika kondenzovaných látok a akustika | Ing. Ján Šoltýs PhD., Elektrotechnický ústav SAV, v. v. i.     | Fakulta matematiky, fyziky a informatiky UK |

**5.4. Zoznam doktorandov, ktorí ukončili doktorandské štúdium úspešnou obhajobou v nadštandardnej dĺžke štúdia**

Tabuľka 5d Menný zoznam ukončených doktorandov v roku 2023 úspešnou obhajobou v nadštandardnej dĺžke štúdia

| Meno doktoranda       | Forma DŠ                                | Mesiac, rok nástupu na DŠ | Mesiac, rok obhajoby | Číslo a názov študijného odboru | Meno a organizácia školiteľa                                       | Fakulta udeľujúca vedeckú hodnotu         |
|-----------------------|---|---------------------------|----------------------|---------------------------------|--|---|
| Ing. Ondrej Pohorelec | interné štúdium hrazené z iných zdrojov | 9 / 2018                  | 8 / 2023             | 5.2.13 elektronika              | RNDr. Dagmar Gregušová DrSc., Elektrotechnický ústav SAV, v. v. i. | Fakulta elektrotechniky a informatiky STU |



### 5.5. Uplatnenie absolventov doktorandského štúdia

Tabuľka 5e Prehľad uplatnenia absolventov doktorandského štúdia

| Počet absolventov PhD. štúdia v roku 2023 (obhajoba leto 2023) | z toho koľkí sa zamestnali vo výskume (SAV, univerzity, rezortné výskumné ústavy) | z toho koľkí sa zamestnali v praxi mimo výskum, kde využívajú svoju kvalifikáciu | z toho koľkí sa zamestnali v praxi, kde nevyužívajú svoju kvalifikáciu | z toho koľkí boli nejaký čas nezamestnaní |
|--|---|--|--|---|
| 4  | 3   | 1  | 0  | 0   |

Zoznam interných a externých doktorandov je uvedený v prílohe A-1.

### 5.6. Medzinárodné doktorandské štúdium

Tabuľka 5f Počet študentov v medzinárodných programoch doktorandského štúdia

| Cotutelle | Co-direction | Iné | Zahraniční doktorandi štátne občianstvo/počet |
|-----------|--------------|-----|---|
| 0         | 0            | 0   | IRN/4, RUS/3, PAK/2, IND/1                    |

Zahraniční doktorandi sú doktorandi v dennej alebo externej forme štúdia, ktorí sú občanmi iných krajín. Doktorandi školení v rámci Cotutelle alebo Co-direction sa do posledného stĺpca nezapočítavajú.

### 5.7. Zoznam študijných odborov, na ktoré má ústav uzatvorenú rámcovú dohodu, s uvedením VŠ

Tabuľka 5g Zoznam študijných odborov, na ktoré má ústav uzatvorenú rámcovú dohodu, s uvedením univerzity/vysokej školy a fakulty, kde sa doktorandský študijný program uskutočňuje

| Názov študijného odboru (ŠO)           | Číslo ŠO | Názov doktorandského študijného programu | Doktorandské štúdium uskutočňované na (univerzita/vysoká škola a fakulta) |
|--|----------|--|---|
| fyzika                                 | 4.1.1    | Fyzika kondenzovaných látok a akustika   | Fakulta matematiky, fyziky a informatiky UK                               |
| fyzika kondenzovaných látok a akustika | 4.1.3    | Fyzika kondenzovaných látok a akustika   | Fakulta matematiky, fyziky a informatiky UK                               |
| fyzikálne inžinierstvo                 | 5.2.48   | Fyzikálne inžinierstvo                   | Fakulta elektrotechniky a informatiky STU                                 |
| elektrotechnika                        | 5.2.9    | Fyzikálne inžinierstvo                   | Fakulta elektrotechniky a informatiky STU                                 |

Názov a číslo študijného odboru vyplňte/vyberte podľa aktuálne platného zoznamu študijných odborov <https://www.portalvs.sk/sk/studijne-odbory?from=menu1>. Názov doktorandského študijného programu v stĺpci 3 je potrebné vložiť ako voľný text.

Do 31. 8. 2023 študujú študenti doktorandského štúdia zaradení do študijných programov podľa zoznamu MŠVVaŠ, platného do 1. 9. 2019. Pre týchto študentov je potrebné napísať názov programu ako voľný text do stĺpca 3 a nevyplňovať stĺpce 1 a 2.



Tabuľka 5h Účasť na pedagogickom procese

| <b>Menný prehľad pracovníkov, ktorí boli menovaní do odborových komisií pre doktorandské štúdium</b> | <b>Menný prehľad pracovníkov, ktorí pôsobili ako členovia vedeckých rád univerzít, správnych rád univerzít a fakúlt</b> | <b>Menný prehľad pracovníkov, ktorí získali vyššiu vedeckú, pedagogickú hodnotu alebo vyšší kvalifikačný stupeň</b> |
|--|---|---|
| RNDr. Vladimír Cambel, DrSc. (elektronika)   | doc. Ing. Fedor Gömöry, DrSc. (Elektrotechnická fakulta ŽU)   | Mgr. Konstantin Bublikov, PhD. (IIb)  |
| doc. RNDr. Edmund Dobročka, CSc. (fyzikálne inžinierstvo)  | doc. Ing. Fedor Gömöry, DrSc. (Fakulta matematiky, fyziky a informatiky UK)   | Mgr. Fridrich Egyenes, PhD. (IIb)   |
| doc. Ing. Fedor Gömöry, DrSc. (fyzikálne inžinierstvo)   | doc. Ing. Jozef Novák, DrSc. (Fakulta elektrotechniky a informatiky STU)  | Ing. Ondrej Pohorelec, PhD. (IIb)   |
| RNDr. Dagmar Gregušová, DrSc. (elektrotechnika)  | Ing. Milan Ľapajna, PhD. (Fakulta elektrotechniky a informatiky STU)  | RNDr. Lenka Pribusová Slušná, PhD. (IIa)  |
| RNDr. Dagmar Gregušová, DrSc. (elektronika)  |   | Mgr. Iuliia Vetrova, PhD. (IIb)   |
| Dr. rer. nat. Martin Hulman (fyzika)   |   | Mgr. Konstantin Bublikov, PhD. (PhD., Fakulta matematiky, fyziky a informatiky UK)                                  |
| Ing. Ján Kuzmík, DrSc. (teoretická elektrotechnika)  |   | Mgr. Fridrich Egyenes, PhD. (PhD., Fakulta matematiky, fyziky a informatiky UK)                                     |
| Ing. Ján Kuzmík, DrSc. (elektronika)   |   | Ing. Ondrej Pohorelec, PhD. (PhD., Fakulta elektrotechniky a informatiky STU)                                       |
| doc. RNDr. Martin Moško, DrSc. (fyzika kondenzovaných látok a akustika)                              |   | Mgr. Iuliia Vetrova, PhD. (PhD., Fakulta matematiky, fyziky a informatiky UK)                                       |
| doc. RNDr. Martin Moško, DrSc. (chemická fyzika)   |   |   |
| doc. RNDr. Martin Moško, DrSc. (teoretická elektrotechnika)  |   |   |
| doc. RNDr. Martin Moško, DrSc. (fyzikálne inžinierstvo)  |   |   |
| doc. Ing. Jozef Novák, DrSc. (elektronika)   |   |   |
| RNDr. Marianna Španková, PhD (elektrotechnika)   |   |   |
| Ing. Milan Ľapajna, PhD. (elektronika)   |   |   |
| Ing. Gabriel Vanko, PhD. (elektronika)   |   |   |



## 5.8. Údaje o pedagogickej činnosti

Tabuľka 5i Prednášky a cvičenia vedené v roku 2023

| PEDAGOGICKÁ ČINNOSŤ                        | Prednášky |             | Cvičenia a semináre |             |
|--|-----------|-------------|---------------------|-------------|
|  | doma      | v zahraničí | doma                | v zahraničí |
| Počet prednášateľov alebo vedúcich cvičení | 5         | 0           | 7                   | 0           |
| Celkový počet hodín v r. 2023              | 48        | 0           | 47                  | 0           |

Prehľad prednášateľov predmetov a vedúcich cvičení, s uvedením názvu predmetu, úväzku, katedry, fakulty, univerzity/vysokej školy je uvedený v prílohe A-4.

Tabuľka 5j Aktivity pracovníkov na VŠ

|    |   |    |
|----|---|----|
| 1. | Počet pracovníkov, ktorí pôsobili ako vedúci alebo konzultanti diplomových a bakalárskych prác                                      | 8  |
| 2. | Počet vedených alebo konzultovaných diplomových a bakalárskych prác   | 8  |
| 3. | Počet pracovníkov, ktorí pôsobili ako školitelia doktorandov (PhD.)   | 16 |
| 4. | Počet školených doktorandov (aj pre iné inštitúcie)   | 22 |
| 5. | Počet oponovaných dizertačných a habilitačných prác   | 6  |
| 6. | Počet pracovníkov, ktorí oponovali dizertačné a habilitačné práce   | 5  |
| 7. | Počet pracovníkov, ktorí pôsobili ako členovia komisií pre obhajoby DrSc. prác  | 1  |
| 8. | Počet pracovníkov, ktorí pôsobili ako členovia komisií pre obhajoby PhD. prác   | 10 |
| 9. | Počet pracovníkov, ktorí pôsobili ako členovia komisií, resp. oponenti v inauguračnom alebo habilitačnom konaní na vysokých školách | 0  |

## 5.9. Iné dôležité informácie k pedagogickej činnosti

- Ústav pozýva zahraničných odborníkov, aby predstavili výsledky v rôznych oblastiach výskumu. V tomto roku odzneli prednášky:

Dr. Chao Yuan (The Institute of Technological Sciences, Wuhan University, China): Pump-probe thermoreflectance techniques for non-contact and non-invasively characterizing the thermal properties of wide bandgap semiconductors

Dr. D. Zákutná (Univ. Karlova, Praha): Polarized small-angle neutron scattering as a powerful tool for magnetic nanoparticle characterization

MSc. M. Gerina (Univ. Karlova, Praha): Size dependence of surface spin disorder in ferrite nanoparticles

- Ústav spolupracuje na výučbe predmetov Elektromagnetické prvky a systémy a Nanotechnológie na FEI STU a Praktikum Fyziky tuhých látok na FMFI UK
- Ústav tradične zamestnáva VŠ študentov formou VPS. Ich práca často vyústi do prípravy semestrálnych, bakalárskych a diplomových prác. V r. 2023 ich bolo 14
- dvojmesačný študijný pobyt na Ústave strávila Lucia Sajes z Universidad Católica Boliviana na medzinárodné štipendium IAESTE

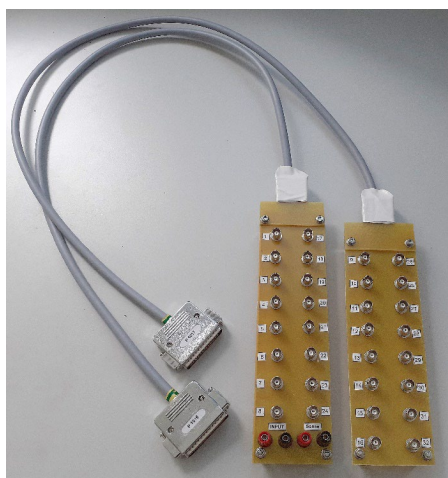


- dvojmesačnú odbornú prax na ústave absolvovala Audrey Romain z Université Polytech Paris-Saclay. D. Gregušová supervizor, zodpovedná pracovníčka

V lete 2023 absolvovali niekoľkí študenti stredných škôl zo SPŠE K. Adlera, SPŠE Zochova a Gymnázia Bilíkova na EIÚ SAV, v.v.i. pod vedením našich kolegov Ing. Ľ. Froleka, Ing. T. Meliška a Ing. B. Hudeca, PhD. odbornú prax stredoškôľakov, resp. letnú brigádu.

Počas praxe navrhli a realizovali konektorové rozhranie pre multiplexer KEITHLEY 7703. Naučili sa, aký je rozdiel medzi paralelným a sériovým radením odporov/kondenzátorov/zdrojov prúdu, resp. napätia. Študent zhotovil podľa vlastného návrhu dosku plošného spoja, zapojil do nej súčiastky a dokončil jej mechanickú montáž (obr. vľavo). Iný študent sčasti navrhol, naobjednával a pozapájal 4-kanálový teplotný PID kontroler z bežne dostupných komponentov (obr. vpravo).

Študentov sme sa opýtali, či prax na našom ústave splnila ich očakávania. Odpoveď jedného zo žiakov bola: „Myslel som si, že sa tam budem iba pozerieť, ale naopak som tam robil rôzne veci, pri ktorých som sa veľa naučil.“



## 6. Zmluvná spolupráca s univerzitami/vysokými školami a inými subjektmi vedy a výskumu

*Pozn.: Uvádzajte formy spolupráce a aktivity, ktoré nie sú uvedené v kapitolách 2, 3, 4, 5.*

### 6.1. Spoločné pracoviská organizácie

#### 6.1.1. Spolupráca s univerzitami/VŠ (fakultami)

**Názov univerzity/vysokej školy a fakulty:** Fakulta elektrotechniky a informatiky STU

**Oblasť spolupráce:** Výchova študentov, spoločná príprava a riešenie projektov a aplikačných riešení

**Sídlo spoločného pracoviska (ak je vytvorené):**

**Začiatok spolupráce:** 1969

**Zhodnotenie:** Výsledkom spolupráce sú spoločné projekty, publikácie a PhD študenti.

**Názov univerzity/vysokej školy a fakulty:** Fakulta matematiky, fyziky a informatiky UK

**Oblasť spolupráce:** Výchova študentov, spoločná príprava a riešenie projektov a aplikačných riešení

**Sídlo spoločného pracoviska (ak je vytvorené):**



**Začiatok spolupráce: 1992**

**Zhodnotenie:** Výsledkom spolupráce sú spoločné projekty, publikácie a PhD študenti.

*Pozn.: uvádzajte len tie spolupráce, na ktoré má organizácia zmluvu resp. memorandum o zriadení spoločného pracoviska, resp. o vzájomnej spolupráci v konkrétnej oblasti výskumu*

**6.1.2. Spoločné pracoviská s inými organizáciami SAV**

*Pozn.: uvádzajte len tie spolupráce, na ktoré má organizácia zmluvu resp. memorandum o zriadení spoločného pracoviska, resp. o vzájomnej spolupráci v konkrétnej oblasti výskumu*

**6.2. Spoločné pracoviská organizácie s inými inštitúciami mimo SAV a VŠ**

*Pozn.: uvádzajte len tie spolupráce, na ktoré má organizácia zmluvu resp. memorandum o zriadení spoločného pracoviska, resp. o vzájomnej spolupráci v konkrétnej oblasti výskumu*

**6.3. Spoločné projekty s univerzitami a ostatnými inštitúciami mimo SAV**

**Názov projektu:** Dlhodosahový jav blízkosti v supravodič/feromagnet heteroštruktúrach

**Agentúra:** APVV

**číslo projektu:** 19-0303

**Spolupracujúce inštitúcie:** FMFI UK

**Koordinátor projektu:** FMFI UK

**Začiatok spolupráce:** 2020

**Koniec spolupráce:** 2023

**Názov projektu:** Metalické 2D dichalkogenidy prechodných kovov: príprava, štúdium vlastností a korelované stavy

**Agentúra:** APVV

**číslo projektu:** 19-0365

**Spolupracujúce inštitúcie:** FMFI UK

**Koordinátor projektu:** EIÚ SAV

**Začiatok spolupráce:** 2020

**Koniec spolupráce:** 2023

**Názov projektu:** Robustné spinové vlny pre budúce magnonické aplikácie

**Agentúra:** APVV

**číslo projektu:** 19-0311

**Spolupracujúce inštitúcie:** FMFI UK

**Koordinátor projektu:** EIÚ SAV

**Začiatok spolupráce:** 2020

**Koniec spolupráce:** 2023

**Názov projektu:** Optimalizácia okrúhleho kábla z vysokoteplotného supravodiča pre pulzné magnetické polia

**Agentúra:** APVV

**číslo projektu:** 20-0056

**Spolupracujúce inštitúcie:** Materiálovotechnologická fakulta STU

**Koordinátor projektu:** Materiálovotechnologická fakulta STU

**Začiatok spolupráce:** 2021

**Koniec spolupráce:** 2025



**Názov projektu:** Topologicky netriviálne magnetické a supravodivé nanoštruktúry

**Agentúra:** APVV

**číslo projektu:** 20-0425

**Spolupracujúce inštitúcie:** Prírodovedecká fakulta, UPJŠ

**Koordinátor projektu:** Prírodovedecká fakulta, UPJŠ

**Začiatok spolupráce:** 2021

**Koniec spolupráce:** 2024

**Názov projektu:** Nanoelsen – Nanoštrukturované tenkovrstvové materiály vyznačujúce sa slabými väzbovými interakciami pre elektronické a senzorické aplikácie

**Agentúra:** APVV

**číslo projektu:** 21-0278

**Spolupracujúce inštitúcie:** Ústav elektroniky a fotoniky FEI STU

**Koordinátor projektu:** Ústav elektroniky a fotoniky FEI STU

**Začiatok spolupráce:** 2022

**Koniec spolupráce:** 2026

**Názov projektu:** NanoMemb-RF – Moderné nanomembránové heteroštruktúry na báze GaAs pre vysoko produktívne vysokofrekvenčné prvky

**Agentúra:** APVV

**číslo projektu:** 21-0365

**Spolupracujúce inštitúcie:** Ústav elektroniky a fotoniky FEI STU

**Koordinátor projektu:** Ústav elektroniky a fotoniky FEI STU

**Začiatok spolupráce:** 2022

**Koniec spolupráce:** 2025

**Názov projektu:** PEGANEL – p-GaN elektronika pre úsporu energie a post-CMOS obvody

**Agentúra:** APVV

**číslo projektu:** 21-0008

**Spolupracujúce inštitúcie:** Ústav elektroniky a fotoniky FEI STU

**Koordinátor projektu:** EIÚ SAV

**Začiatok spolupráce:** 2022

**Koniec spolupráce:** 2025

**Názov projektu:** Fotonické laboratórium na čipe: výskum a vývoj platformy plazmonického senzora pre okamžitú detekciu zložiek v roztokoch

**Agentúra:** APVV

**číslo projektu:** 20-0437

**Spolupracujúce inštitúcie:** Ústav elektroniky a fotoniky FEI STU

**Koordinátor projektu:** Ústav elektroniky a fotoniky FEI STU

**Začiatok spolupráce:** 2021

**Koniec spolupráce:** 2024

**Názov projektu:** Transit2D – Tranzistory na báze 2D kovových chalkogenidov pripravených teplom podporovanou konverziou

**Agentúra:** APVV

**číslo projektu:** 21-0231

**Spolupracujúce inštitúcie:** Ústav elektroniky a fotoniky FEI STU

**Koordinátor projektu:** EIÚ SAV

**Začiatok spolupráce:** 2022

**Koniec spolupráce:** 2026



**Názov projektu:** Moderné elektronické súčiastky na báze ultraširokopásmového polovodiča Ga<sub>2</sub>O<sub>3</sub> pre budúce vysokonapäťové aplikácie

**Agentúra:** APVV

**číslo projektu:** 20-0220

**Spolupracujúce inštitúcie:** Ústav elektroniky a fotoniky FEI STU, Materiálovotechnologická fakulta STU

**Koordinátor projektu:** EIÚ SAV

**Začiatok spolupráce:** 2021

**Koniec spolupráce:** 2025

**Názov projektu:** Perspektívne detektory ionizujúceho žiarenia pre nepokryté energetické okno neutrónov

**Agentúra:** APVV

**číslo projektu:** 22-0382

**Spolupracujúce inštitúcie:** Ústav jadrového a fyzikálneho inžinierstva FEI STU

**Koordinátor projektu:** EIÚ SAV

**Začiatok spolupráce:** 2023

**Koniec spolupráce:** 2027

**Názov projektu:** Radiačne odolnejší senzor pre RTG zobrazovanie vyššej kvality

**Agentúra:** APVV

**číslo projektu:** 18-0273

**Spolupracujúce inštitúcie:** Ústav jadrového a fyzikálneho inžinierstva FEI STU

**Koordinátor projektu:** Ústav jadrového a fyzikálneho inžinierstva FEI STU

**Začiatok spolupráce:** 2019

**Koniec spolupráce:** 2023

**Názov projektu:** Vysokoodolné polovodičové senzory ionizujúceho žiarenia pre využitie v radiačnom prostredí

**Agentúra:** VEGA

**číslo projektu:** 2/0084/20

**Spolupracujúce inštitúcie:** Ústav jadrového a fyzikálneho inžinierstva FEI STU

**Koordinátor projektu:** EIÚ SAV

**Začiatok spolupráce:** 2020

**Koniec spolupráce:** 2023

**Názov projektu:** Nanooptické sondy a senzory integrované na optickom vlákne

**Agentúra:** APVV

**číslo projektu:** 20-0264

**Spolupracujúce inštitúcie:** Žilinská univerzita v Žiline

**Koordinátor projektu:** Žilinská univerzita v Žiline

**Začiatok spolupráce:** 2021

**Koniec spolupráce:** 2024

*Pozn.: uviesť konkrétne spoločné aj bilaterálne projekty na základe platnej zmluvy o spolupráci*

#### **6.4. Iné typy spoločných aktivít s inštitúciami mimo SAV**

Ako bolo spomínané v časti 3.4, EIÚ SAV úzko spolupracuje s FEI STU v Bratislave a výskumnou inštitúciou ITRI (Taiwan) v oblasti montáže, testovania a spoľahlivosti výkonových modulov na báze širokopásmových polovodičov. Podpísané trilaterálne zmluvy predstavujú významný faktor na zlepšenie našej spolupráce s STU v budúcnosti.



## 7. Vedecko-organizačné a popularizačné aktivity

### 7.1. Vedecko-popularizačná činnosť

Tabuľka 7a Súhrnné počty vedecko-popularizačných činností organizácie SAV

| Typ              | Počet | Typ                  | Počet | Typ                | Počet |
|------------------|-------|----------------------|-------|--------------------|-------|
| prednášky/besedy | 1     | tlač                 | 3     | TV                 | 1     |
| rozhlas          | 0     | internet             | 1     | exkurzie           | 1     |
| publikácie       | 0     | multimediálne nosiče | 0     | dokumentárne filmy | 0     |
| iné              | 7     |                      |       |                    |       |

### 7.2. Vedecko-organizačná činnosť

Tabuľka 7b Vedecko-organizačná činnosť

| Názov podujatia                                    | Domáca/<br>medzinárodná | Miesto     | Dátum konania   | Počet<br>účastníkov |
|--|-------------------------|------------|-----------------|---------------------|
| IEEE 2023 Nanomateriály:<br>Aplikácie a vlastnosti | medzinárodná            | Bratislava | 3.11.-3.11.2023 | 400                 |

### 7.3. Účasť na výstavách

### 7.4. Účasť v programových a organizačných výboroch národných konferencií

Tabuľka 7c Programové a organizačné výbory národných konferencií

| Meno pracovníka | Programový | Organizačný | Programový i organizačný |
|-----------------|------------|-------------|--------------------------|
| Chromik Štefan  | 1          | 0           | 0                        |
| Novák Jozef     | 0          | 0           | 1                        |
| Vanko Gabriel   | 0          | 0           | 1                        |
| <b>Spolu</b>    | 1          | 0           | 2                        |

### 7.5. Členstvo v redakčných radách časopisov

doc. Ing. Fedor Gömöry, DrSc.

Cryogenics (funkcia: člen)

IEEE Transactions on Applied Superconductivity (funkcia: člen)

Superconductivity (funkcia: člen)

RNDr. Dagmar Gregušová, DrSc.

Electronic Materials - mdpi (funkcia: člen)

Ing. Filip Gucmann, PhD.

MDPI Materials, special issue Wide and Ultra-Wide Bandgap Semiconductor Materials for Power Devices (funkcia: guest editor)

Ing. Štefan Chromik, DrSc.

ICRN Condensed Matter Physics (funkcia: člen)



Ing. Pavol Kováč, DrSc.

Superconductor Science and Technology (funkcia: člen)

doc. Ing. Jozef Novák, DrSc.

Journal of Electrical Engineering (funkcia: člen)

Material Science in Semiconductor Processing (funkcia: člen)

Ing. Jozef Osvald, DrSc.

Materials Science in Semiconductor Processing (funkcia: člen)

Mgr. Enric Pardo, PhD.

Scientific Reports (funkcia: člen)

Superconductor Science and Technology (funkcia: člen)

Ing. Milan Ľapajna, PhD.

MDPI Materials, special issue Wide and Ultra-Wide Bandgap Semiconductor Materials for Power Devices (funkcia: guest editor)

Semiconductor Science and Technology (funkcia: člen)

Ing. Jaroslav Tóvik, PhD.

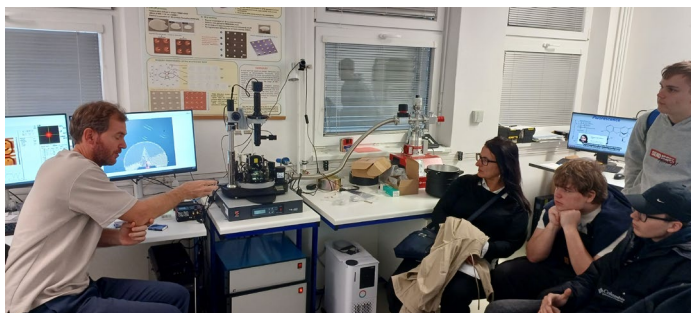
Scientific Reports (funkcia: člen)

## **7.6. Činnosť v domácich vedeckých spoločnostiach**

## **7.7. Iné dôležité informácie o vedecko-organizačných a popularizačných aktivitách**

Dňa 9. 11. 2023 sa konalo v rámci Týždňa vedy a techniky podujatie Deň otvorených dverí na Elektrotechnickom ústave.

Ústav navštívili žiaci z vybraných bratislavských škôl (Gymnázium J. Papánka, ZŠ Rajčianska, ZŠ Vetvárska) ako aj žiaci zo SPŠT Trnava. Pre žiakov základných škôl boli pripravené zaujímavé experimenty z fyziky, stredoškólači si vypočuli prednášky o polovodičoch a supravodičoch. Nakoniec všetci navštívili vybrané laboratóriá s ukázkami magnetickej levitácie, elektrických meraní polovodičových a supravodivých štruktúr. Takisto sa oboznámili so zobrazovacími technikami na štúdium povrchu a kryštalickej štruktúry rôznych materiálov. Najväčší záujem bol už tradične o levitujúce predmety, na čom demonštrujeme správanie sa supravodičov v magnetickom poli pri nízkej teplote.





29. septembra sme na [NOC VÝSKUMNÍKOV](#) predstavili experimenty, ktoré okrajovo súvisia aj s našou vedeckou prácou. Účastníci si mohli vyskúšať jeden krok v príprave polovodičových súčiastok s rozmermi len niekoľko mikrometrov, poskladať si 3-D model tranzistora, pripraviť si najtenší materiál na svete – grafén, zažiť magnetickú levitáciu supravodiča v supravodivom stave, či vidieť demonštráciu Teslovho sna – bezdrôtového prenosu elektrickej energie. Okrem experimentov sme zvedavým návštevníkom priblížili aj naše výskumné aktivity a pracovisko.



Ústav sa pripojil k oslavám 70. výročia založenia SAV na podujatí Víkend so SAV, kde počas dvoch dní pripravil stánok s vedecko-popularizačnými aktivitami najmä pre deti a mládež. Taktiež sme pripravili mnoho vývesiek, ktoré prezentovali naše aktuálne riešené vedecké témy širokej laickej aj odbornej verejnosti.

## 8. Aktivity pre Národnú radu SR, vládu SR, ústredné orgány štátnej správy SR a iné inštitúcie

### 8.1. Členstvo v poradných zboroch vlády SR, Národnej rady SR, ministerstiev SR, orgánoch EÚ, EP, NATO a pod.

Tabuľka 8a Členstvo v poradných zboroch Národnej rady SR, vlády SR, ministerstiev SR, orgánoch EÚ, EP, NATO a pod.

| Meno pracovníka               | Názov orgánu                        | Funkcia                     |
|-------------------------------|-------------------------------------|-----------------------------|
| doc. Ing. Fedor Gömöry, DrSc. | SKVH                                | člen                        |
| RNDr. Dagmar Gregušová, DrSc. | SKVH                                | predsedníčka ad hoc komisií |
| Ing. Ján Kuzmík, DrSc.        | SKVH                                | člen                        |
| Mgr. Bohumír Zaťko, PhD       | Komisia pre SUJV Dubna pri vláde SR | člen                        |

### 8.2. Expertízna činnosť a iné služby pre štátnu správu a samosprávy



### 8.3. Členstvo v radách štátnych programov a podprogramov ŠPVV a ŠO

Tabuľka 8b Členstvo v radách štátnych programov a podprogramov ŠPVV a ŠO

| Meno pracovníka          | Názov orgánu                | Funkcia                      |
|--------------------------|-----------------------------|------------------------------|
| Ing. Milan Ťapajna, PhD. | Grantová agentúra MŠ - APVV | Člen Rady pre technické vedy |

### 8.4. Prehľad aktuálnych spoločenských problémov, ktoré riešilo pracovisko v spolupráci s Kanceláriou prezidenta SR, s vládnyimi a parlamentnými orgánmi alebo pre ich potrebu

## 9. Aktivity v orgánoch SAV

### 9.1. Členstvo vo Výbore Snemu SAV

### 9.2. Členstvo v Predsedníctve SAV a vo Vedeckej rade SAV

### 9.3. Členstvo v komisiách SAV

RNDr. Vladimír Cambel, DrSc.

- Etická komisia SAV (člen)

Ing. Ján Fedor, PhD

- Kontrolná rada areálu SAV (člen)

doc. Ing. Fedor Gömöry, DrSc.

- Akreditačná komisia SAV (člen )
- Komisia pre stratégiu rozvoja SAV (člen)
- Porota pre udeľovanie Medzinárodnej ceny SAV (člen)
- Rada SAV pre vzdelávanie a doktorandské štúdium (člen)

RNDr. Dagmar Gregušová, DrSc.

- Komisia pre posudzovanie vedeckej kvalifikácie (predsedníčka)

### 9.4. Členstvo v orgánoch VEGA

RNDr. Dagmar Gregušová, DrSc.

- Komisia 5 pre elektrotechniku, automatizáciu a riadiace systémy a príbuzné odbory informačných a komunikačných technológií (podpredsedníčka)
- Rozšírené Predsedníctvo VEGA (člen)

Dr. rer. nat. Martin Hulman

- Komisia VEGA č.1 pre matematické vedy, počítačové a informatické vedy a fyzikálne vedy (člen )



Ing. Ján Kuzmík, DrSc.

- Komisia 5 pre elektrotechniku, automatizáciu a riadiace systémy a príbuzné odbory informačných a komunikačných technológií (člen)

Ing. Alica Rosová, CSc.

- Komisia pre strojárstvo a príbuzné odbory informačných a komunikačných technológií a materiálové inžinierstvo (člen)

Ing. Milan Ľapajna, PhD.

- Komisia pre elektrotechniku, automatizáciu a riadiace systémy a príbuzné odbory informačných a komunikačných technológií (člen)

Mgr. Bohumír Zat'ko, PhD

- Komisia č. 5 pre elektrotechniku, automatizáciu a riadiace systémy a príbuzné odbory informačných a komunikačných technológií (člen)

## **10. Starostlivosť o ľudské zdroje, rodovú rovnosť, pracovné a sociálne podmienky zamestnancov a uplatňovanie ich práv**

### **10.1. Uplatňovanie princípov stratégie ľudských zdrojov HRS4R**

*Uveďte stručnú charakteristiku a hodnotenie aktivít v oblasti HRS4R.*

### **10.2. Informácie o aktivitách súvisiacich s uplatňovaním princípov rodovej rovnosti**

Na Elektrotechnickom ústave SAV, v.v.i. je od 1. 12. 2021 zriadená Komisia pre rodové a etické otázky. Jej úlohou je zvyšovať povedomie o diverzite a rodovej rovnosti na pracovisku a zároveň riešiť konkrétne podnety pracovníkov a pracovníčok. V roku 2023 sa Komisia zaoberala jedným podnetom.

Komisia pre rodové a etické otázky na EIÚ SAV, v. v. i. a vedenie EIÚ SAV v. v. i. v spolupráci s Ústavom výskumu sociálnej komunikácie SAV, v. v. i. organizovali pre mladých vedeckých pracovníkov do 35 rokov, doktorandov a postdoktorandov workshop na tému „Základy diverzity a rodovej rovnosti na EIÚ SAV, v. v. i.“

Workshop sa konal 23. 5. 2023 pod vedením Mgr. Zuzany Očenášová, PhD. z Ústavu výskumu sociálnej komunikácie SAV, v. v. i. a zúčastnilo sa ho 20 mladých vedeckých pracovníkov. V takýchto aktivitách Komisia pre rodové a etické otázky na EIÚ SAV, v.v.i. plánuje pokračovať v roku 2024.

*Stručné hodnotenie stavu uplatňovania princípov rodovej rovnosti v organizácii, súvisiace aktivity a opatrenia, návrhy na aktualizáciu Plánu rodovej rovnosti SAV.*



**10.2.1. Rodová skladba hlavných riešiteľov (vedúcich) projektov***Prípadný stručný komentár ako úvod (nepovinný).*

Tabuľka 10a Rodová skladba hlavných riešiteľov domácich projektov

| ŠTRUKTÚRA PROJEKTOV  | Organizácia SAV je nositeľom projektu |                 |      | Organizácia SAV je zmluvným partnerom |                                |      |
|--|---------------------------------------|-----------------|------|---------------------------------------|--------------------------------|------|
|  | Počet                                 | Hlavný riešiteľ |      | Počet                                 | Hlavný riešiteľ za organizáciu |      |
|  |                                       | Muž             | Žena |                                       | Muž                            | Žena |
| <b>1. Projekty VEGA</b>  | 13                                    | 9               | 4    | 1                                     | 1                              | 0    |
| <b>2. Projekty APVV</b>  | 10                                    | 10              | 0    | 8                                     | 6                              | 2    |
| <b>3. Projekty EŠIF/OP ŠF, Plán obnovy EÚ</b>  | 1                                     | 1               | 0    | 1                                     | 1                              | 0    |
| <b>4. Projekty SASPRO, MoRePro, IMPULZ</b>   | 1                                     | 1               | 0    | 0                                     | 0                              | 0    |
| <b>5. Iné projekty (FM EHP, Vedecko-technické projekty, na objednávku rezortov a pod.)</b> | 5                                     | 4               | 1    | 0                                     | 0                              | 0    |

Tabuľka 10b Rodová skladba hlavných riešiteľov medzinárodných projektov

| ŠTRUKTÚRA PROJEKTOV  | Organizácia SAV je nositeľom projektu |                 |      | Organizácia SAV je zmluvným partnerom |                                |      |
|--|---------------------------------------|-----------------|------|---------------------------------------|--------------------------------|------|
|  | Počet                                 | Hlavný riešiteľ |      | Počet                                 | Hlavný riešiteľ za organizáciu |      |
|  |                                       | Muž             | Žena |                                       | Muž                            | Žena |
| <b>1. Projekty Horizont 2020 a Horizont Európa</b>                   | 0                                     | 0               | 0    | 4                                     | 4                              | 0    |
| <b>2. Projekty ERA.NET, ESA, JRP</b>                                 | 1                                     | 1               | 0    | 1                                     | 1                              | 0    |
| <b>3. Projekty COST</b>  | 0                                     | 0               | 0    | 2                                     | 2                              | 0    |
| <b>4. Projekty EUREKA, NATO, UNESCO, CERN, IAEA, IVF, ERDF a iné</b> | 0                                     | 0               | 0    | 4                                     | 3                              | 1    |



|  |   |   |   |   |   |   |
|--|---|---|---|---|---|---|
| <b>5. Projekty v rámci medzivládnych dohôd</b>               | 0 | 0 | 0 | 0 | 0 | 0 |
| <b>6. Bilaterálne projekty MAD, Mobility, Open Mobility</b>  | 0 | 0 | 0 | 0 | 0 | 0 |
| <b>7. Bilaterálne projekty ostatné</b>                       | 3 | 3 | 0 | 0 | 0 | 0 |
| <b>8. Podpora MVTS z národných zdrojov (SAV, APVV a iné)</b> | 0 | 0 | 0 | 0 | 0 | 0 |
| <b>9. SAS-UPJŠ ERC Visiting Fellowship Grants</b>            | 0 | 0 | 0 | 0 | 0 | 0 |
| <b>10. Iné projekty</b>                                      | 0 | 0 | 0 | 0 | 0 | 0 |

#### 10.2.2. Výskum zameraný na rodovú problematiku

*Uved'te stručné, základné informácie o projektoch orientovaných na rodovú problematiku, ak organizácia takýto výskum realizuje. Informácie o financovaní a výsledkoch takýchto projektov sa nachádzajú v kapitole 2 a v prílohe A-3.*

#### 10.3. Informácie o pracovných a sociálnych podmienkach zamestnancov a uplatňovaní ich práv

*Uved'te stručné, základné informácie k problematike.*

### 11. Organizačné a právne zmeny v organizácii

#### 11.1. Informácie o vnútorných organizačných zmenách

*Uved'te stručné, základné informácie k problematike.*

#### 11.2. Zmeny zakladacej listiny, vnútorných predpisov organizácie alebo zakladateľa

*Uved'te stručné, základné informácie k problematike.*



## 12. Činnosť knižnično-informačného pracoviska organizácie

### 12.1. Knižničný fond

Tabuľka 12a Knižničný fond

|  |   |      |
|--|---|------|
| <b>Knižničné jednotky spolu</b>              |   | 2187 |
| z toho                                       | knihy a zviazané periodiká                            | 1218 |
|  | audiovizuálne dokumenty                               | 0    |
|  | elektronické dokumenty (vrátane digitálnych)          | 146  |
|  | mikroformy  | 0    |
|  | iné špeciálne dokumenty - dizertácie, výskumné správy | 823  |
|  | Rukopisy, vzácne tlače                                | 0    |
| Počet titulov dochádzajúcich periodík        |   | 1    |
| z toho zahraničné periodiká                  |   | 1    |
| Ročný prírastok knižničných jednotiek        |   | 6    |
| v tom  | kúpou   | 1    |
|  | darom   | 5    |
|  | výmenou   | 0    |
|  | bezodplatným prevodom                                 | 0    |
|  | náhradou  | 0    |
| Úbytky knižničných jednotiek                 |   | 0    |
| Knižničné jednotky spracované automatizovane |   | 2187 |

Výraz „**v tom**“ označuje úplné (vyčerpávajúce) údaje, ktorých súčet sa musí rovnať údaju v riadku „spolu“, čiže nadradenému riadku.

Výraz „**z toho**“ označuje neúplné (výberové) údaje, ktorých súčet sa nemusí rovnať údaju v riadku „spolu“.

### 12.2. Výpožičky a služby

Tabuľka 12b Výpožičky a služby

|                                   |                                  |   |
|-----------------------------------|----------------------------------|---|
| <b>Výpožičky spolu (riadok 1)</b> |                                  | 0 |
| v tom z r. 1                      | prezenčné výpožičky              |   |
|                                   | absenčné výpožičky               |   |
| v tom z r. 1                      | odborná literatúra pre dospelých |   |
|                                   | výpožičky periodík               |   |
| MVS iným knižniciam               |                                  | 0 |
| MVS z iných knižníc               |                                  | 0 |
| MMVS iným knižniciam              |                                  | 0 |
| MMVS z iných knižníc              |                                  | 0 |
| Počet vypracovaných bibliografií  |                                  | 0 |



|                             |     |
|-----------------------------|-----|
| Počet vypracovaných rešerší | 298 |
|-----------------------------|-----|

### 12.3. Používatelia

Tabuľka 12c Používatelia

|  |     |
|--|-----|
| Registrovaní používatelia                              | 124 |
| Návštevníci knižnice spolu (bez návštevníkov podujatí) | 0   |

### 12.4. Iné údaje

Tabuľka 12d Iné údaje

|   |     |
|---|-----|
| On-line katalóg knižnice na internete ( 1=áno, 0=nie) | 1   |
| Náklady na nákup knižničného fondu v €                | 122 |

### 12.5. Iné informácie o knižničnej činnosti

## 13. Nadácie a fondy pri organizácii

## 14. Realizácia Koncepcie dlhodobého rozvoja a Akčného plánu organizácie

### 14.1. Odporúčania z posledného pravidelného (akreditačného) hodnotenia organizácií SAV

Medzinárodný panel EIÚ SAV, v.v.i. skonštatoval progress dosiahnutý ústavom v poslednom období. Veľkú úlohu v tomto zohral náš Medzinárodný poradný zbor (Advisory Board – AB) a realizácia jeho odporúčaní v praxi.

### 14.2. Hlavné body Akčného plánu organizácie a stav ich plnenia

EIÚ SAV v.v.i. postupuje v zmysle svojho akčného plánu, čo bolo vyzdvihnuté aj členmi P SAV.

### 14.3. Aktualizácia Akčného plánu organizácie v roku 2023

Akčný plán EIÚ SAV bude aktualizovaný na základe pripomienok nášho AB na začiatku r. 2024.

## 15. Iné významné činnosti organizácie SAV

## 16. Poskytovanie informácií v súlade so zákonom o slobodnom prístupe k informáciám

*Uved'te informácie v súlade so zákonom č. 211/2000 Z.z. o slobodnom prístupe k informáciám.*

## 17. Problémy organizácie a podnety pre Predsedníctvo SAV k činnosti SAV

*Uved'te informácie a podnety v súlade s názvom kapitoly.*



## **18. Vyjadrenia vedeckej rady organizácie k výsledkom výskumnej činnosti za uplynulý rok**

Vedecká rada EIÚ SAV, v.v.i. na zasadnutí dňa 6. februára 2024 prerokovala výročnú správu Elektrotechnického ústavu v.v.i. a konštatuje, že ústav dosiahol významné výsledky vo výskumnej činnosti, o čom svedčí veľký počet pôvodných vedeckých prác a ohlasov na ne. Dosiahol významné výsledky aj v rámci pedagogickej aktivity, medzinárodnej spolupráce a aj v spolupráci s podnikateľskými subjektami.

*Uvádzajte tu stručné rámcové hodnotenie výsledkov výskumnej činnosti schválené vedeckou radou organizácie a jej vyjadrenie k spôsobilosti organizácie vykonávať výskumnú činnosť.*

Schválila vedecká rada organizácie SAV dňa 6. 2. 2024

RNDr. Dagmar Gregušová, DrSc.  
*predseda vedeckej rady*

**Výročnú správu o činnosti organizácie za rok 2023 vypracoval(i):**

RNDr. Vladimír Cambel, DrSc., 02/ 5922 2552, 2555  
PhDr. Anna Gömöryová, 0903 919 384

Bratislava, 8.2.2024

RNDr. Vladimír Cambel, DrSc.  
*riaditeľ organizácie*



## **PRÍLOHY k časti A**



**Príloha A-1****Zoznam zamestnancov a doktorandov organizácie k 31.12.2023****Zoznam zamestnancov podľa štruktúry**

|  | <b>Meno s titulmi</b>            | <b>Úväzok<br/>(v %)</b> | <b>Ročný prepočítaný<br/>úväzok</b> |
|--|----------------------------------|-------------------------|-------------------------------------|
| <b>Vedúci vedeckí pracovníci DrSc.</b> |                                  |                         |                                     |
| 1.                                     | RNDr. Vladimír Cambel, DrSc.     | 100                     | 1.00                                |
| 2.                                     | doc. Ing. Fedor Gömöry, DrSc.    | 100                     | 1.00                                |
| 3.                                     | RNDr. Dagmar Gregušová, DrSc.    | 100                     | 1.00                                |
| 4.                                     | Ing. Štefan Chromík, DrSc.       | 60                      | 0.60                                |
| 5.                                     | Ing. Pavol Kováč, DrSc.          | 100                     | 1.00                                |
| 6.                                     | Ing. Ján Kuzmík, DrSc.           | 100                     | 1.00                                |
| 7.                                     | doc. RNDr. Martin Moško, DrSc.   | 40                      | 0.40                                |
| 8.                                     | doc. Ing. Jozef Novák, DrSc.     | 60                      | 0.60                                |
| 9.                                     | Ing. Jozef Osvald, DrSc.         | 20                      | 0.30                                |
| 10.                                    | doc. Ing. Viera Skákalová, DrSc. | 60                      | 0.60                                |
| <b>Samostatní vedeckí pracovníci</b>   |                                  |                         |                                     |
| 1.                                     | Ing. Michal Blaho, PhD.          | 100                     | 1.00                                |
| 2.                                     | RNDr. Pavol Boháček, CSc.        | 40                      | 0.40                                |
| 3.                                     | doc. RNDr. Edmund Dobročka, CSc. | 80                      | 0.80                                |
| 4.                                     | Ing. Ján Fedor, PhD              | 100                     | 1.00                                |
| 5.                                     | Mgr. Juraj Feilhauer, PhD.       | 100                     | 1.00                                |
| 6.                                     | Ing. Filip Gucmann, PhD.         | 100                     | 1.00                                |
| 7.                                     | RNDr. Štefan Haščík, PhD.        | 60                      | 0.60                                |
| 8.                                     | Ing. Boris Hudec, PhD.           | 100                     | 1.00                                |
| 9.                                     | Dr. rer. nat. Martin Hulman      | 100                     | 1.00                                |
| 10.                                    | Ing. Tibor Izsák, PhD.           | 100                     | 1.00                                |
| 11.                                    | RNDr. Dušan Korytár, CSc.        | 20                      | 0.20                                |
| 12.                                    | Mgr. Peter Kotrusz, PhD.         | 100                     | 1.00                                |
| 13.                                    | Mgr. Ján Kováč, PhD.             | 100                     | 1.00                                |
| 14.                                    | Mgr. Andrii Kozak, PhD.          | 100                     | 0.50                                |
| 15.                                    | RNDr. Michal Kučera, PhD         | 50                      | 0.50                                |
| 16.                                    | Ing. Róbert Kúdela, CSc.         | 20                      | 0.20                                |
| 17.                                    | Mgr. Agáta Laurenčíková, PhD.    | 100                     | 0.00                                |
| 18.                                    | Ing. Peter Lobotka, CSc.         | 20                      | 0.18                                |



|                          |                                    |     |      |
|--------------------------|------------------------------------|-----|------|
| 19.                      | RNDr. Antónia Mošková, CSc.        | 60  | 0.73 |
| 20.                      | Dr. Michal Mruczkiewicz            | 30  | 0.31 |
| 21.                      | Mgr. Enric Pardo, PhD.             | 100 | 1.00 |
| 22.                      | Ing. Marián Precner, PhD.          | 100 | 1.00 |
| 23.                      | RNDr. Lenka Pribusová Slušná, PhD. | 100 | 1.00 |
| 24.                      | Ing. Alica Rosová, CSc.            | 100 | 1.00 |
| 25.                      | Mgr. Eugen Seiler, PhD             | 100 | 1.00 |
| 26.                      | Mgr. Michaela Sojková, PhD.        | 100 | 1.00 |
| 27.                      | Mgr. Mykola Soloviov, PhD.         | 100 | 1.00 |
| 28.                      | Ing. Roman Stoklas, PhD.           | 100 | 1.00 |
| 29.                      | Ing. Ján Šoltýs, PhD               | 100 | 1.00 |
| 30.                      | Ing. Ján Šouc, CSc.                | 80  | 0.80 |
| 31.                      | RNDr. Marianna Španková, PhD       | 100 | 1.00 |
| 32.                      | Ing. Milan Ťapajna, PhD.           | 70  | 0.70 |
| 33.                      | Ing. Jaroslav Tóvik, PhD.          | 100 | 0.88 |
| 34.                      | Ing. Gabriel Vanko, PhD.           | 100 | 1.00 |
| 35.                      | Ing. Marian Varga, PhD.            | 100 | 1.00 |
| 36.                      | Ing. Zdenko Zápražný, PhD.         | 100 | 1.00 |
| 37.                      | Mgr. Bohumír Zaťko, PhD            | 100 | 1.00 |
| <b>Vedecí pracovníci</b> |                                    |     |      |
| 1.                       | MSc. Anang Dadhich, PhD.           | 100 | 1.00 |
| 2.                       | Mgr. Fridrich Egyenes, PhD.        | 100 | 0.78 |
| 3.                       | Ing. Jozef Fabian, CSc             | 100 | 1.00 |
| 4.                       | Ing. Norbert Gál, PhD.             | 100 | 0.00 |
| 5.                       | Ing. Ladislav Hrubčín, CSc.        | 20  | 0.20 |
| 6.                       | Mgr. Peter Hutár, PhD.             | 50  | 0.48 |
| 7.                       | RNDr. Tetiana Kalmykova, PhD.      | 100 | 1.00 |
| 8.                       | Ing. Tomáš Kujovič, PhD.           | 100 | 1.00 |
| 9.                       | Ing. Marek Mošat', PhD.            | 100 | 1.00 |
| 10.                      | Mgr. Peter Nádaždy, PhD.           | 50  | 0.50 |
| 11.                      | RNDr. Katarína Neilinger, PhD.     | 80  | 0.40 |
| 12.                      | Ing. Ondrej Pohorelec, PhD.        | 100 | 1.00 |
| 13.                      | Ing. Rastislav Ries, PhD.          | 100 | 1.00 |
| 14.                      | Dr. Arpit Kumar Srivastava         | 100 | 1.00 |
| 15.                      | Ing. Tomáš Ščepka, PhD.            | 100 | 1.00 |



|  |                                |     |      |
|--|--------------------------------|-----|------|
| 16.  | Ing. Marcel Talacko, PhD.      | 50  | 0.45 |
| 17.  | Mgr. Iuliia Vetrova, PhD.      | 100 | 0.70 |
| <b>Odborní pracovníci s VŠ vzdelaním (výskumní a vývojoví zamestnanci)</b> |                                |     |      |
| 1.   | Mgr.Phil. Faizan Ahmad         | 10  | 0.02 |
| 2.   | Ing. Michal Bennár             | 10  | 0.10 |
| 3.   | Ing. Dušan Berek               | 100 | 1.00 |
| 4.   | Ing. Marek Búran               | 100 | 1.00 |
| 5.   | Ing. Peter Eliáš               | 100 | 1.00 |
| 6.   | MSc. Ghazaleh Esmaeili Dehaghi | 10  | 0.10 |
| 7.   | Ing. Lubomír Frolek            | 100 | 1.00 |
| 8.   | Ing. Stanislav Hasenöhrl       | 100 | 1.00 |
| 9.   | Mgr. Jana Hrdá                 | 100 | 0.40 |
| 10.  | Ing. Fedor Hrubíšák            | 10  | 0.10 |
| 11.  | MSc. Arif Hussain              | 10  | 0.10 |
| 12.  | Ing. Imrich Hušek              | 100 | 1.00 |
| 13.  | RNDr. Kristína Hušeková        | 80  | 0.93 |
| 14.  | MTech. Hemendra Chouhan        | 10  | 0.08 |
| 15.  | MSc. Javad Keshtar             | 10  | 0.10 |
| 16.  | Ing. Eva Kováčová              | 100 | 1.00 |
| 17.  | Sergei Krylov                  | 100 | 0.70 |
| 18.  | Ing. Martin Kucharovič         | 100 | 0.40 |
| 19.  | Ing. Tibor Melišek             | 60  | 0.60 |
| 20.  | Mgr. Martina Pakanová          | 30  | 0.11 |
| 21.  | MSc. Saviz Parsa Saeb          | 10  | 0.00 |
| 22.  | Mgr. Michal Pecz               | 10  | 0.10 |
| 23.  | Mgr. Mária Sekáčová            | 40  | 0.40 |
| 24.  | Mgr. Tatiana Vojteková         | 10  | 0.10 |
| <b>Odborní pracovníci s VŠ vzdelaním (ostatní zamestnanci)</b>             |                                |     |      |
| 1.   | Mgr. Miroslava Blázyová        | 100 | 1.00 |
| 2.   | PhDr. Anna Gömöryová           | 60  | 0.90 |
| 3.   | Ing. Pavol Mozola              | 100 | 1.00 |
| 4.   | Mgr. Vojtech Ogrodnik          | 40  | 0.40 |
| 5.   | Ing. Marta Zofcsáková          | 100 | 1.00 |
| 6.   | Mgr. Eva Žiačiková             | 100 | 1.00 |
| <b>Odborní pracovníci ÚSV</b>  |                                |     |      |



|                           |                       |     |      |
|---------------------------|-----------------------|-----|------|
| 1.                        | Juraj Arbet           | 100 | 1.00 |
| 2.                        | Ján Dérer             | 60  | 0.50 |
| 3.                        | Michal Gerboc         | 100 | 1.00 |
| 4.                        | Iveta Grófova         | 100 | 1.00 |
| 5.                        | Martin Grujbár        | 100 | 1.00 |
| 6.                        | Ľubomír Kopera        | 80  | 0.80 |
| 7.                        | Peter Martiš          | 100 | 1.00 |
| 8.                        | Darina Ružičková      | 100 | 1.00 |
| 9.                        | Jana Ryzá             | 100 | 1.00 |
| 10.                       | Alena Seifertová      | 100 | 1.00 |
| 11.                       | Karol Schwarz         | 50  | 0.17 |
| 12.                       | Edita Sýkorová        | 50  | 0.50 |
| 13.                       | Edita Šimeková        | 100 | 1.00 |
| 14.                       | Stanislav Štefánik    | 100 | 1.00 |
| 15.                       | Juraj Tančár          | 50  | 0.50 |
| 16.                       | Iveta Tóthová         | 100 | 1.00 |
| 17.                       | Michal Vrbovský       | 100 | 0.00 |
| 18.                       | Mária Zajíčková       | 50  | 0.50 |
| <b>Ostatní pracovníci</b> |                       |     |      |
| 1.                        | Jolana Častková       | 100 | 1.00 |
| 2.                        | Kvetoslava Hamburgová | 100 | 1.00 |
| 3.                        | Iveta Putiková        | 100 | 1.00 |
| 4.                        | Róbert Vanek          | 100 | 1.00 |

**Zoznam zamestnancov, ktorí odišli v priebehu roka**

|  | Meno s titulmi                 | Dátum odchodu | Ročný prepočítaný úväzok |
|--|--------------------------------|---------------|--------------------------|
| <b>Vedeckí pracovníci</b>  |                                |               |                          |
| 1.   | Mgr. Konstantin Bublikov, PhD. | 31.8.2023     | 0.67                     |
| <b>Odborní pracovníci s VŠ vzdelaním (výskumní a vývojoví zamestnanci)</b> |                                |               |                          |
| 1.   | Mgr. Peter Šichman             | 31.8.2023     | 0.67                     |
| <b>Odborní pracovníci ÚSV</b>  |                                |               |                          |
| 1.   | Magdaléna Krajčírová           | 31.1.2023     | 0.08                     |
| <b>Ostatní pracovníci</b>  |                                |               |                          |
| 1.   | Ivo Šimek                      | 24.8.2023     | 0.32                     |



**Zoznam doktorandov**

|  | Meno s titulmi                 | Škola/fakulta                               | Študijný odbor                               |
|--|--------------------------------|---|--|
| <b>Interní doktorandi hradení z prostriedkov SAV</b> |                                |   |  |
| 1.   | Mgr. Faizan Ahmad              | Fakulta elektrotechniky a informatiky STU   | 5.2.9 elektrotechnika                        |
| 2.   | Ing. Michal Bennár             | Fakulta elektrotechniky a informatiky STU   | 5.2.48 fyzikálne inžinierstvo                |
| 3.   | Mohammad Dehghan               | Fakulta elektrotechniky a informatiky STU   | 5.2.9 elektrotechnika                        |
| 4.   | MSc. Ghazaleh Esmaeili Dehaghi | Fakulta elektrotechniky a informatiky STU   | 5.2.48 fyzikálne inžinierstvo                |
| 5.   | Ing. Fedor Hrubíšák            | Fakulta elektrotechniky a informatiky STU   | 5.2.9 elektrotechnika                        |
| 6.   | MSc. Arif Hussain              | Fakulta elektrotechniky a informatiky STU   | 5.2.48 fyzikálne inžinierstvo                |
| 7.   | Hemendra Chouhan               | Fakulta elektrotechniky a informatiky STU   | 5.2.9 elektrotechnika                        |
| 8.   | MSc. Javad Keshtar             | Fakulta elektrotechniky a informatiky STU   | 5.2.9 elektrotechnika                        |
| 9.   | Sergei Krylov                  | Fakulta matematiky, fyziky a informatiky UK | 4.1.3 fyzika kondenzovaných látok a akustika |
| 10.  | MSc. Saviz Parsa Saeb          | Fakulta elektrotechniky a informatiky STU   | 5.2.9 elektrotechnika                        |
| 11.  | Mgr. Michal Pecz               | Fakulta matematiky, fyziky a informatiky UK | 4.1.3 fyzika kondenzovaných látok a akustika |
| 12.  | Mgr. Tatiana Vojteková         | Fakulta matematiky, fyziky a informatiky UK | 4.1.1 fyzika                                 |
| <b>Interní doktorandi hradení z iných zdrojov</b>    |                                |   |  |
| 1.   | Ing. Marek Búran               | Fakulta elektrotechniky a informatiky STU   | 5.2.48 fyzikálne inžinierstvo                |
| 2.   | Mgr. Jana Hrdá                 | Fakulta elektrotechniky a informatiky STU   | 5.2.9 elektrotechnika                        |
| 3.   | Ing. Martin Kucharovič         | Fakulta elektrotechniky a informatiky STU   | 5.2.9 elektrotechnika                        |
| <b>Externí doktorandi</b>                            |                                |   |  |
| 1.   | Mgr. Peter Šichman             | Fakulta matematiky, fyziky a informatiky UK | 4.1.3 fyzika kondenzovaných látok a akustika |

**Zoznam zamestnancov prijatých do jedného roka od získania PhD.**

|  | Meno s titulmi | Dátum obhajoby | Dátum prijatia | Úväzok (v %) |
|--|----------------|----------------|----------------|--------------|
|--|----------------|----------------|----------------|--------------|

**Zoznam emeritných vedeckých zamestnancov**

|  | Meno s titulmi |
|--|----------------|
|--|----------------|



## Príloha A-2

### Projekty riešené v organizácii

#### Medzinárodné projekty

#### Programy: COST

##### 1.) Európska sieť pre inovatívnu a pokročilú epitaxiu (*European Network for Innovative and Advanced Epitaxy*)

|   |   |
|---|---|
| <b>Zodpovedný riešiteľ:</b>                   | Ján Kuzmík  |
| <b>Trvanie projektu:</b>                      | 1.11.2021 / 30.10.2025  |
| <b>Evidenčné číslo projektu:</b>              | CA20116   |
| <b>Organizácia je koordinátorom projektu:</b> | nie   |
| <b>Koordinátor:</b>                           | Centre des Nanosciences et des Nanotechnologies, C2N-CNRS-UMR9001, Université Paris-Saclay, France  |
| <b>Počet spoluriešiteľských inštitúcií:</b>   | 31 - Rakúsko: 1, Belgicko: 1, Bulharsko: 1, Bosna a Hercegovina: 1, Cyprus: 1, Česko: 1, Nemecko: 1, Dánsko: 1, Španielsko: 1, Estónsko: 1, Fínsko: 1, Veľká Británia: 1, Grécko: 1, Chorvátsko: 1, Maďarsko: 1, Švajčiarsko: 1, Írsko: 1, Izrael: 1, Taliansko: 1, Litva: 1, Luxembursko: 1, Lotyšsko: 1, Moldavsko: 1, Holandsko: 1, Nórsko: 1, Poľsko: 1, Portugalsko: 1, Rumunsko: 1, Srbsko: 1, Švédsko: 1, Turecko: 1 |
| <b>Čerpané financie:</b>                      | SAV: 2500 €   |

##### 2.) Vysokoteplotná supravodivosť pre zrýchlenie prechodu k čistejšej energii (*High-TeHigh-Temperature SuperConductivity for AcceLerating the Energy Transitionmperature SuperConductivity for AcceLerating the Energy Transition*)

|   |  |
|---|--|
| <b>Zodpovedný riešiteľ:</b>                   | Enric Pardo  |
| <b>Trvanie projektu:</b>                      | 8.10.2020 / 7.10.2024  |
| <b>Evidenčné číslo projektu:</b>              | CA19108  |
| <b>Organizácia je koordinátorom projektu:</b> | nie  |
| <b>Koordinátor:</b>                           | NOVA.ID.FCT , Caparica   |
| <b>Počet spoluriešiteľských inštitúcií:</b>   | 27 - Rakúsko: 1, Belgicko: 1, Bulharsko: 1, Bosna a Hercegovina: 1, Brazília: 1, Nemecko: 1, Dánsko: 1, Španielsko: 3, Fínsko: 1, Francúzsko: 1, Veľká Británia: 1, Grécko: 1, Izrael: 1, Taliansko: 1, Luxembursko: 1, Poľsko: 1, Portugalsko: 2, Rumunsko: 1, Srbsko: 2, Slovinsko: 1, Turecko: 2, Ukrajina: 1 |
| <b>Čerpané financie:</b>                      | SAV: 2500 €  |

#### Dosiahnuté výsledky:

Yazdani-Asrami, M., Song, W.J., Morandi, A., De Carne, G., Murta-Pina, J., Pronto, A., Oliveira, R., Grilli, F., Pardo, E., Parizh, M., Shen, B., Coombs, T., Salmi, T., Wu, D., Coatanea, E., Moseley, D.A., Badcock, R.A., Zhang, M.J., Marinozzi, V., Tran, N., Wielgosz, M., Skoczen, A., Tzelepis, D., Meliopoulos, S., Vilhena, N., Sotelo, G., Jiang, Z., Grosse, V., Bagni, T., Mauro, D., Senatore, C., Mankevich, A., Amelichev, V., Samoilenkov, S., Yoon, T.L., Wang, Y., Camata, R.P., Chen, C.C., Madureira, A.M., and Abraham, A.: Roadmap on artificial intelligence and big data techniques for superconductivity, *Supercond. Sci Technol.* 36 (2023) 043501.



## Programy: EUREKA

### 3.) Filamentované pásy z vysokoteplotného supravodiča pre použitie vo fúzii (*Filamentized high temperature superconductor tapes for fusion*)

**Zodpovedný riešiteľ:** Fedor Gömöry  
**Trvanie projektu:** 1.10.2021 / 31.5.2024  
**Evidenčné číslo projektu:** Eurostars 2 - E115264  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** SUBRA A/S  
**Počet spoluriešiteľských inštitúcií:** 2 - Nemecko: 1, Dánsko: 1  
**Čerpané financie:** MŠVVŠ SR: 81257 €

#### Dosiahnuté výsledky:

Gömöry, F., Šouc, J., and Godár, M.: Limitation of current transport in coated conductors: statistical fluctuations or weak spots?, IEEE Trans. Applied Supercond. 33 (2023) 8000105.

Kujovič, T., Ries, R., Mošať, M., and Gömöry, F.: The critical current of REBCO coated conductors subjected to a mechanical loading at varying angles, IEEE Trans. Applied Supercond. 33 (2023) 6601004.

Mošať, M., Šouc, J., Ries, R., and Gömöry, F.: Longitudinal critical current profiles in coated conductors examined by transport and magnetization measurements, IEEE Trans. Applied Supercond. 33 (2023) 6602205.

Solovyov, M., Šouc, J., Kujovič, T., Frolek, L., and Gömöry, F.: Magnetization AC losses in multilayer superconducting round cables with coinciding and opposite lay angles, Supercond. Sci Technol. 36 (2023) 034001.

Gömöry, F., Šouc, J., Godár, M., Hintze, C., and Grosse, V.: Analysis of critical current fluctuations as a means of checking the quality of high-temperature superconductor tape slitting, Supercond. Sci Technol. 36 (2023) 054001.

## Programy: International Visegrad Fund (IVF)

### 4.) Projektovanie šírky zakázaného pásu v nekonvenčných polovodičoch (*Band-gap engineering in unconventional semiconductors*)

**Zodpovedný riešiteľ:** Viera Skákalová  
**Trvanie projektu:** 1.1.2022 / 31.12.2024  
**Evidenčné číslo projektu:** nie  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** Dr. Ryo Kitaura  
**Počet spoluriešiteľských inštitúcií:** 4 - Česko: 1, Maďarsko: 1, Japonsko: 1, Poľsko: 1  
**Čerpané financie:** SAV: 28418 €



Dosiahnuté výsledky:

Hofer, Ch., Mustonen, K., Skákalová, V., and Pennycook, T.J.: Picometer-precision few-tilt ptychotomography of 2D materials, 2D Mater. 10 (2023) 035029.

**Programy: Bilaterálne - iné**

**5.) Topologicky netriviálne fázy vrstvených dichalkogenidov prechodných kovov**

*(Topologically nontrivial phases of layered transition-metal dichalcogenides)*

**Zodpovedný riešiteľ:** Martin Hulman  
**Trvanie projektu:** 1.1.2023 / 31.12.2024  
**Evidenčné číslo projektu:** SASA-SAS-2022-01  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 1 - Srbsko: 1  
**Čerpané financie:** SAV: 2776 €

**6.) Vývoj vertikálnych kompozitov z dichalkogenidov prechodových kovov pre použitie v mikrosuperkondenzátoroch** *(Vertically aligned two-dimensional transition metal dichalcogenide composites for micro-supercapacitors)*

**Zodpovedný riešiteľ:** Martin Hulman  
**Trvanie projektu:** 1.1.2023 / 31.12.2025  
**Evidenčné číslo projektu:** MSC\_SAS\_MOST 2022  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** SAV: 30975 €

Dosiahnuté výsledky:

Vojteková, T., Pribusová Slušná, L., Dobročka, E., Precner, M., Sojtková, M., Hrdá, J., Gregor, M., and Hulman, M.: Fourier-transform infrared spectroscopy of MoTe<sub>2</sub> thin films, Phys. Status Solidi B 260 (2023) 2300250.

**7.) Vybudovanie laboratória pre výskum spoľahlivosti výkonových modulov a spoločný výskum v oblasti GaN a Ga<sub>2</sub>O<sub>3</sub> polovodičových výkonových súčiastok** *(Establishment of reliability laboratory for power modules and joint reserch of GaN and Ga<sub>2</sub>O<sub>3</sub> power devices)*

**Zodpovedný riešiteľ:** Milan Ľapajna  
**Trvanie projektu:** 1.7.2023 / 30.6.2027  
**Evidenčné číslo projektu:** SK-TW  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 1 - Taiwan: 1  
**Čerpané financie:** -



## Programy: ERANET

### 8.) 3D tlač atomárnych vrstiev ako nová paradigma pre múdru senzoriku (*Atomic-layer 3D printing as a new paradigm for smart sensorics*)

**Zodpovedný riešiteľ:** Boris Hudec  
**Trvanie projektu:** 1.6.2023 / 31.5.2026  
**Evidenčné číslo projektu:** M-ERA.net 10418  
**Organizácia je** áno  
**koordinátorom projektu:**  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 3 - Dánsko: 1, Slovensko: 1, Taiwan: 1  
**Čerpané financie:** SAV: 11597 €

#### Dosiahnuté výsledky:

Hudec, B., Ščepka, T., Horský, M., Nádaždy, P., Vetrova, I., Predanocy, M., Nemec, P., Andok, R., Patrnčiak, M., and Plecenik, T.: Hydrogen sensing characteristics of TiO<sub>2</sub> thin films grown by atomic layer depositon using TTIP precursor with H<sub>2</sub>O vs. O<sub>3</sub> reactants. In: 13<sup>th</sup> Inter. Conf. Nanomater.: Appl. & Properties - IEEE NAP-2023. Bratislava 2023. Výveska.

### 9.) Epitaxné vrstvy tranzitných kovov dichalkogenidov pripravených na polovodičoch so širokým zakázaným pásmom pre modernú elektroniku (*Epitaxial transition metal dichalcogenides onto wide bandgap hexagonal superconductors for advanced electronics*)

**Zodpovedný riešiteľ:** Štefan Chromik  
**Trvanie projektu:** 1.4.2020 / 31.3.2023  
**Evidenčné číslo projektu:** FLAG-ERA III/2019/884/ETMOS  
**Organizácia je** nie  
**koordinátorom projektu:**  
**Koordinátor:** Consiglio Nazionale delle Ricerche – Istituto per la Microelettronica e Microsistemi  
**Počet spoluriešiteľských inštitúcií:** 4 - Francúzsko: 1, Maďarsko: 1, Taliansko: 2  
**Čerpané financie:** EU: 3708 €  
Podpora medzinárodnej spolupráce z národných zdrojov: 6250 €

#### Dosiahnuté výsledky:

Hrdá, J., Moško, M., Vojteková, T., Pribusová Slušná, L., Precner, M., Hulman, M., Španková, M., Chromik, Š., and Sojková, M.: Electron transport in lithium-doped few-layer MoS<sub>2</sub> films. In Proc. 11<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. – ADEPT. Eds. D. Jandura et al. Žilina: EDIS 2023. ISBN 978-80-554-1977-0. P. 83-86.

Španková, M., Chromik, Š., Dobročka, E., Pribusová Slušná, L., Talacko, M., Gregor, M., Pécz, B., Koos, A., Greco, G., Panasci, S.E., Fiorenza, P., Roccaforte, F., Cordier, Y., Frayssinet, E., and Giannazzo, F.: Large-area MoS<sub>2</sub> films grown on sapphire and GaN substrates by pulsed laser deposition, Nanomater. 13 (2023) 2837.

Giannazzo, F., Panasci, S.E., Schilir, E., Fiorenza, P., Greco, G., Roccaforte, F., Cannas, M., Agnello, S., Koos, A., Pécz, B., Španková, M., and Chromik, Š.: Highly homogeneous 2D/3D heterojunction diodes by pulsed laser deposition of MoS<sub>2</sub> on ion implantation doped 4H-SiC, Adv.



Mater. Interfaces 10 (2023) 2201502.

## Programy: Horizont 2020

### 10.) Supravodivé magnety pre European Magnet Field Laboratory (*Superconducting magnets for the European Magnet Field Laboratory*)

**Zodpovedný riešiteľ:** Enric Pardo  
**Trvanie projektu:** 1.1.2021 / 31.12.2024  
**Evidenčné číslo projektu:** H2020-951714  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** Centre National De La Recherche Scientifique CNRS  
**Počet spoluriešiteľských inštitúcií:** 9 - Belgicko: 1, Nemecko: 3, Francúzsko: 1, Veľká Británia: 1, Švajčiarsko: 1, Holandsko: 2  
**Čerpané financie:** EU: 48279 €  
Podpora medzinárodnej spolupráce z národných zdrojov: 4928 €

#### Dosiahnuté výsledky:

Pardo, E. and Dadhich, A.: Electro-thermal modelling by novel variational methods: racetrack coil in short-circuit, IEEE Trans. Applied Supercond. 33 (2023) 5201606.

### 11.) Podpora inovácií v urýchľovačovom výskume a technológií (*Innovation Fostering in Accelerator Science and Technology*)

**Zodpovedný riešiteľ:** Eugen Seiler  
**Trvanie projektu:** 1.5.2021 / 30.4.2025  
**Evidenčné číslo projektu:** H2020-101004730  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** European Organization For Nuclear Research - CERN  
**Počet spoluriešiteľských inštitúcií:** 20 - Rakúsko: 1, Nemecko: 2, Španielsko: 2, Estónsko: 1, Francúzsko: 4, Veľká Británia: 1, Maďarsko: 1, Švajčiarsko: 2, Taliansko: 1, Lotyšsko: 1, Holandsko: 1, Poľsko: 1, Slovensko: 1, Švédsko: 1  
**Čerpané financie:** EU: 11473 €  
Podpora medzinárodnej spolupráce z národných zdrojov: 4928 €

## Programy: Horizont Európa

### 12.) Supravodivé káble podporujúce prechod na udržateľnú energetiku (*Superconducting cables for sustainable energy transition*)

**Zodpovedný riešiteľ:** Fedor Gömöry  
**Trvanie projektu:** 1.9.2022 / 28.2.2027  
**Evidenčné číslo projektu:** Horizont Európa-101075602  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** SINTEF ENERGI AS, Trondheim  
**Počet spoluriešiteľských inštitúcií:** 13 - Nemecko: 3, Francúzsko: 4, Írsko: 1, Taliansko: 4, Portugalsko: 1



**Čerpané financie:** EU: 92515 €  
Podpora medzinárodnej spolupráce z národných zdrojov: 6571 €

**13.) Heterogenná materiálová a technologická platforma pre novú doménu výkonovej nanoelektroniky** (*Heterogeneous Material and Technological Platform for a New Domain of Power Nanoelectronics*)

**Zodpovedný riešiteľ:** Ján Kuzmík  
**Trvanie projektu:** 1.12.2022 / 30.11.2025  
**Evidenčné číslo projektu:** Horizont Európa-101091433  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** THALES  
**Počet spoluriešiteľských inštitúcií:** 10 - Nemecko: 2, Španielsko: 1, Veľká Británia: 1, Grécko: 3, Taliansko: 1, Rumunsko: 1, Švédsko: 1  
**Čerpané financie:** EU: 69218 €

**Programy: EDF**

**14.) Európska inovatívna pokročilá GaN mikrovlnná integrácia** (*European Innovative GaN Advanced Microwave Integration*)

**Zodpovedný riešiteľ:** Ján Kuzmík  
**Trvanie projektu:** 15.12.2022 / 14.12.2026  
**Evidenčné číslo projektu:** 101102983  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** United Monolithic Semiconductors GmbH  
**Počet spoluriešiteľských inštitúcií:** 15 - Belgicko: 1, Nemecko: 2, Španielsko: 3, Fínsko: 1, Francúzsko: 1, Grécko: 1, Chorvátsko: 1, Taliansko: 2, Litva: 1, Holandsko: 1, Švédsko: 1  
**Čerpané financie:** EU: 74103 €

Dosiahnuté výsledky:

Blaho, M., Gucmann, F., Eliáš, P., Gregušová, D., Hasenöhr, S., and Kuzmík, J.: MOCVD growth of highly Si doped GaN from triethylgallium. In: 14<sup>th</sup> Inter. Conf. Nitride Semicond. ICNS. Fukuoka 2023. Výveska.

**Programy: Digital Europe Programme**

**15.) Slovenská kvantová komunikačná infraštruktúra** (*Slovak Quantum Communication*)

**Zodpovedný riešiteľ:** Mário Ziman  
**Zodpovedný riešiteľ v organizácii SAV:** Vladimír Cambel  
**Trvanie projektu:** 1.1.2023 / 30.6.2025  
**Evidenčné číslo projektu:** 101091548  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** Fyzikálny ústav SAV, v. v. i.



**Počet spoluriešiteľských inštitúcií:** 13 - Slovensko: 13  
**Čerpané financie:** SAV: 74516 €

## Domáce projekty

### Programy: VEGA

**1.) Transport magnetických skyrmiónov v antidot mriežkach: Efekt teploty a kombinácie rôznych transportných mechanizmov** (*Transport of magnetic skyrmions in antidot lattices: Effect of temperature and combination of transport mechanisms*)

**Zodpovedný riešiteľ:** Juraj Feilhauer  
**Trvanie projektu:** 1.1.2021 / 31.12.2023  
**Evidenčné číslo projektu:** 2/0177/21  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** VEGA: 3079 €

#### Dosiahnuté výsledky:

Feilhauer, J., Tóbiš, J., Šoltýs, J., and Cambel, V.: Numerical characterization of magnetic vortex probe imaging for magnetic force microscopy, IEEE Trans. Magnet. 59 (2023) 6500210.

Feilhauer, J., Zelent, M., Zhang, Z., Christensen, J., and Mruczkiewicz, M.: Unidirectional spin-wave edge modes in magnonic crystal, APL Mater. 11 (2023) 021104.

Tóbiš, J.: Dynamical symmetry breaking in magnetic systems, Phys. Status Solidi RRL 17 (2013) 2200459.

Ščepka, T., Feilhauer, J., Tóbiš, J., Krylov, S., Kalmykova, T., Cambel, V., and Mruczkiewicz, M.: Control of closure domain state circulation in coupled triangular permalloy elements using MFM tip, J. Applied Phys. 134 (2023) 213902.

**2.) Tepelná stabilizácia vysokoteplotných supravodivých pások pre použitie v obmedzovačoch skratových prúdov** (*Thermal stabilization of high-temperature superconducting tapes for fault current limiters*)

**Zodpovedný riešiteľ:** Fedor Gömöry  
**Trvanie projektu:** 1.1.2021 / 31.12.2024  
**Evidenčné číslo projektu:** 1/0205/21  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** Materiálovotechnologická fakulta STU  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** VEGA: 3845 €



Dosiahnuté výsledky:

Gömöry, F., Šouc, J., and Godár, M.: Limitation of current transport in coated conductors: statistical fluctuations or weak spots?, IEEE Trans. Applied Supercond. 33 (2023) 8000105.

Ries, R., Hlaváč, D., Solovyov, M., and Gömöry, F.: Induced delamination in REBCO coated-conductor tape by a scratch line and bending, Physica C 613 (2023) 1354358.

Ries, R., Gömöry, F., Mošat', M., Kujovič, T., Hintze, C., and Gil, P.: Effect of off-axis bending on microstructural and transport properties of coated conductor tape, Supercond. Sci Technol. 36 (2023) 014006.

Gömöry, F., Šouc, J., Godár, M., Hintze, C., and Grosse, V.: Analysis of critical current fluctuations as a means of checking the quality of high-temperature superconductor tape slitting, Supercond. Sci Technol. 36 (2023) 054001.

**3.) Výskum a vývoj kontaktov pre nové materiály a súčiastky** (*Contact engineering for advanced materials and devices*)

|   |                                      |
|---|--------------------------------------|
| <b>Zodpovedný riešiteľ:</b>                   | Dagmar Gregušová                     |
| <b>Trvanie projektu:</b>                      | 1.1.2021 / 31.12.2024                |
| <b>Evidenčné číslo projektu:</b>              | 2/0068/21                            |
| <b>Organizácia je koordinátorom projektu:</b> | áno                                  |
| <b>Koordinátor:</b>                           | Elektrotechnický ústav SAV, v. v. i. |
| <b>Počet spoluriešiteľských inštitúcií:</b>   | 0                                    |
| <b>Čerpané financie:</b>                      | VEGA: 13153 €                        |

Dosiahnuté výsledky:

Gregušová, D., Pohorelec, O., Eliáš, P., Stoklas, R., Dobročka, E., Kučera, M., Blaho, M., and Kúdela, R.: III-V semiconductor nanomembranes in device technology. In Proc. 11<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. – ADEPT. Eds. D. Jandura et al. Žilina: EDIS 2023. ISBN 978-80-554-1977-0. P. 138-141.

Kuzmík, J., Pohorelec, O., Hasenöhrl, S., Blaho, M., Stoklas, R., Dobročka, E., Rosová, A., Kučera, M., Guemann, F., Gregušová, D., Precner, M., and Vincze, A.: Mg doping of N-polar, in-rich InAlN, Materials, 16 (2023) 2250.

Chvála, A., Kováč, J., Gregušová, D., Ťapajna, M., Guemann, F., Marek, J., and Florovič, M.: 3D thermal simulation of GaAs-based HEMT on foreign substrates. In: 5<sup>th</sup> Inter. Conf. Microelectr. Devices Technol. MicDAT 2023. IFSA Publ. 2023. ISBN 978-84-09-53748-8, pp. 20-23.

**4.) Ultratenké homogénne povrchové vrstvy na štruktúrach komplexnej morfológie pre vylepšenie výkonu batérii využitím depozície po atómových vrstvách** (*Ultra-thin conformal surface coatings of complex-morphology structures for improving battery performance using atomic layer deposition*)

|   |                       |
|---|-----------------------|
| <b>Zodpovedný riešiteľ:</b>                   | Boris Hudec           |
| <b>Trvanie projektu:</b>                      | 1.1.2022 / 31.12.2025 |
| <b>Evidenčné číslo projektu:</b>              | 2/0162/22             |
| <b>Organizácia je koordinátorom projektu:</b> | áno                   |



**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** VEGA: 10635 €

**5.) Supravodivé spoje pre MgB<sub>2</sub> vinutia v perzistentnom móde** (*Superconducting joints of MgB<sub>2</sub> wires for windings in persistent mode*)

**Zodpovedný riešiteľ:** Pavol Kováč  
**Trvanie projektu:** 1.1.2022 / 31.12.2025  
**Evidenčné číslo projektu:** 2/0017/22  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** VEGA: 15453 €

Dosiahnuté výsledky:

Hušek, I., Kováč, P., Melišek, T., and Hain, M.: Transport currents and micro-structure of superconducting joint between MgB<sub>2</sub>/Ni and MgB<sub>2</sub>/Nb wires made by IMD process, Ceramics Inter. 49 (2023) 11178-11183.

Búran, M., Kopera, L., Melišek, T., and Kováč, P.: E-I characteristics and critical currents of small Bi-2223/Ag coil thermally stabilized by solid and liquid nitrogen compared to water ice, Supercond. Sci Technol. 36 (2023) 105013.

Srivastava, N., Mehrotra, S., Sharma, D., Shalini, Búran, M., Hušek, I., Goswami, Kováč, P., and Santra, S.: Effect of wire diameter on structure and electrical properties of (Al + Al<sub>2</sub>O<sub>3</sub>)-sheathed MgB<sub>2</sub> with Nb barrier, Ceram. Inter. 49 (2023) A34627-34637.

Srivastava, N., Mehrotra, S., Búran, M., Hušek, I., Sharma, D., Kováč, P., and Santra, S.: Interfacial reactions and critical current density of Cu-sheathed Cu-doped MgB<sub>2</sub> wire with Ti diffusion barrier, J. Alloys Comp. 966 (2023) 171657.

**6.) Kritické aspekty rastu polovodičových štruktúr pre novú generáciu III-N súčiastok** (*Critical aspects of the growth for a new generation of III-N devices*)

**Zodpovedný riešiteľ:** Ján Kuzmík  
**Trvanie projektu:** 1.1.2022 / 31.12.2025  
**Evidenčné číslo projektu:** 2/0005/22  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** VEGA: 18449 €

Dosiahnuté výsledky:

Hasenöhrl, S., Blaho, M., Dobročka, E., Guemann, F., Kučera, M., Nádaždy, P., Stoklas, R., Rosová, A., and Kuzmík, J.: Growth of N-polar In-rich InAlN by metal organic chemical vapor



deposition on on- and off-axis sapphire, Mater. Sci Semicond. Process. 156 (2023) 107290.

Kuzmík, J., Pohorelec, O., Hasenöhrl, S., Blaho, M., Stoklas, R., Dobročka, E., Rosová, A., Kučera, M., Guemann, F., Gregušová, D., Precner, M., and Vincze, A.: Mg doping of N-polar, in-rich InAlN, Materials, 16 (2023) 2250.

Stoklas, R., Hasenöhrl, S., Dobročka, E., Guemann, , and Kuzmík, J.: Electron transport properties in thin InN layers grown on InAlN, Mater. Sci Semicond. Process. 155 (2023) 107250.

Šichman, P., Stoklas, R., Hasenöhrl, S., Gregušová, D., Ťapajna, M., Hudec, B., Haščík, Š., Hashizume, T., Chvála, A., Šatka, A., and Kuzmík, J.: Vertical GaN transistor with semi-insulating channel, Physica Status Solidi (a) 220 (2023) SI2200776.

Stoklas, R., Hasenöhrl, S., Dobročka, E., Guemann, F., Rosová, M. Blaho, M. Kučera, M., Ruterana, P., Chauvat, M.P., Kret, S., Kaleta, A., and Kuzmík, J.: Transport properties of thin InN layers grown on Mg-doped InAlN buffers. In: 14<sup>th</sup> Inter. Conf. Nitride Semicond. ICNS. Fukuoka 2023. Prednáška

Blaho, M., Guemann, F., Eliáš, P., Gregušová, D., Hasenöhrl, S., and Kuzmík, J.: MOCVD growth of highly Si doped GaN from triethylgallium. In: 14<sup>th</sup> Inter. Conf. Nitride Semicond. ICNS. Fukuoka 2023. Výveska.

#### **7.) Rast a optická charakterizácia 2D materiálov: MoTe<sub>2</sub>, WTe<sub>2</sub>, PtTe<sub>2</sub> (Growth and optical characterization of 2D materials: MoTe<sub>2</sub>, WTe<sub>2</sub>, PtTe<sub>2</sub>)**

|   |                                      |
|---|--------------------------------------|
| <b>Zodpovedný riešiteľ:</b>                 | Lenka Pribusová Slušná               |
| <b>Trvanie projektu:</b>                    | 1.1.2023 / 31.12.2025                |
| <b>Evidenčné číslo projektu:</b>            | 2/0046/23                            |
| <b>Organizácia je</b>                       | áno                                  |
| <b>koordinátorom projektu:</b>              |                                      |
| <b>Koordinátor:</b>                         | Elektrotechnický ústav SAV, v. v. i. |
| <b>Počet spoluriešiteľských inštitúcií:</b> | 0                                    |
| <b>Čerpané financie:</b>                    | VEGA: 4337 €                         |

#### Dosiahnuté výsledky:

Pribusová Slušná, L., Vegso, K., Dobročka, E., Vojteková, T., Nádaždy, P., Halahovets, Y., Sojková, M., Hrdá, J., Precner, M., Šiffalovič, P., Chen, Z., Huang, Y., Ražnjević, S., Zhang, Z., and Hulman, M.: Ordered growth of hexagonal and monoclinic phases of MoTe<sub>2</sub> on a sapphire substrate, CrystEngComm 25 (2023) 5706-5713. 3.1 - IF, Q1 - JCR

Vojteková, T., Pribusová Slušná, L., Dobročka, E., Precner, M., Sojková, M., Hrdá, J., Gregor, M., and Hulman, M.: Fourier-transform infrared spectroscopy of MoTe<sub>2</sub> thin films, Phys. Status Solidi B 260 (2023) 2300250.

#### **8.) Nízkostratový supravodivý kábel typu CORC z REBCO vodičov (Low-loss superconducting CORC-like cable from REBCO conductors)**

|                                  |                       |
|----------------------------------|-----------------------|
| <b>Zodpovedný riešiteľ:</b>      | Eugen Seiler          |
| <b>Trvanie projektu:</b>         | 1.1.2021 / 31.12.2023 |
| <b>Evidenčné číslo projektu:</b> | 2/0036/21             |



**Organizácia je** áno  
**koordinátorom projektu:**  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských** 0  
**inštitúcií:**  
**Čerpané financie:** VEGA: 25526 €

Dosiahnuté výsledky:

Fracasso, M., Gömöry, F., Solovyov, M., Gerbaldo, R., Ghigo, G., Laviano, F., Sparacio, S., Torsello, D., and Gozzelino, L.: Numerical study on flux-jump occurrence in a cup-shaped MgB<sub>2</sub> bulk for magnetic shielding applications, Supercond. Sci Technol. 36 (2023) 044001.

Li, S. and Pardo, E.: Numerical modelling of soldered superconducting REBCO stacks of tapes suggests strong reduction in cross-field demagnetization, Sci Rep. 13 (2023) 1087.

Mošat', M., Šouc, J., Ries, R., and Gömöry, F.: Longitudinal critical current profiles in coated conductors examined by transport and magnetization measurements, IEEE Trans. Applied Supercond. 33 (2023) 6602205.

Pardo, E. and Dadhich, A.: Electro-thermal modelling by novel variational methods: racetrack coil in short-circuit, IEEE Trans. Applied Supercond. 33 (2023) 5201606.

Ries, R., Seiler, E., Gömöry, F., Medvids, A., Onufrijevs, P., Pira, C., Chyhyrynets, E., Malyshev, O.B., Valizadeh, R., Leith, S., and Vogel, M.: Numerical calculation of magnetic field enhancement and impact of surface defects on premature entry of magnetic field in thin Nb films for SRF cavities, IEEE Trans. Applied Supercond. 33 (2023) 3500405.

Solovyov, M., Šouc, J., Kujovič, T., Frolek, L., and Gömöry, F.: Magnetization AC losses in multilayer superconducting round cables with coinciding and opposite lay angles, Supercond. Sci Technol. 36 (2023) 034001.

**9.) Príprava, charakterizácia a dopovanie ultratenkých vrstiev dichalkogenidov prechodných kovov** (*Fabrication, characterization, and doping of ultra-thin layers of transition metal dichalcogenides*)

**Zodpovedný riešiteľ:** Michaela Sojková  
**Trvanie projektu:** 1.1.2021 / 31.12.2024  
**Evidenčné číslo projektu:** 2/0059/21  
**Organizácia je** áno  
**koordinátorom projektu:**  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských** 0  
**inštitúcií:**  
**Čerpané financie:** VEGA: 13209 €

Dosiahnuté výsledky:

Hrdá, J., Moško, M., Vojteková, T., Pribusová Slušná, L., Precner, M., Hulman, M., Španková, M., Chromík, Š., and Sojková, M.: Electron transport in lithium-doped few-layer MoS<sub>2</sub> films. In Proc. 11<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. – ADEPT. Eds. D. Jandura et al. Žilina: EDIS 2023. ISBN 978-80-554-1977-0. P. 83-86.



Sojková, M., Piš, I., Hrdá, J., Vojteková, T., Pribusová Slušná, L., Vegso, K., Šiffalovič, P., Nádaždy, P., Dobročka, E., Krbal, M., Fons, P.J., Munnik, F., Magnano, E., Hulman, M., and Bondino, F.: Lithium-induced reorientation of few-layer MoS<sub>2</sub> films, Chem. Mater. 35 (2023) 6246-6257.

Ondrejka, P., Sojková, M., Kotok, V., Novák, P., Hotovy, I., Kemény, M., and Mikolášek, M.: Tuning the electrochemical properties of NiS<sub>2</sub> 2D-nanoflakes by one-zone sulfurization for supercapacitor applications, Mater. Res. Express 10 (2023) 10 065508.

Sojková, M., Hrdá, J., Vojteková, T., Pribusová Slušná, L., Végső, K., Dobročka, E., Šiffalovič, P., and Hulman, M.: Novel approach in fabrication of few-layer transition metal dichalcogenide films. In Proc. 11<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. – ADEPT. Eds. D. Jandura et al. Žilina: EDIS 2023. ISBN 978-80-554-1977-0. P. 32-35.

Varga, M., Sojková, M., Hrdá, J., Hutár, P., Parza Saeb, S., Vanko, G., Pribusová-Slušná, L., Ondic, L., Fait, J., Kromka, A., and Hulman, M.: Technological challenges in the fabrication of MoS<sub>2</sub>/diamond heterostructures. In NANOCON 2022. Proc. 14<sup>th</sup> Inter. Conf. Nanomater. – Res. & Appl. Ostrava. Tanger Ltd. 2023, pp 21-27. ISBN: 978-80-88365-09-9.

Vojteková, T., Pribusová Slušná, L., Dobročka, E., Precner, M., Sojková, M., Hrdá, J., Gregor, M., and Hulman, M.: Fourier-transform infrared spectroscopy of MoTe<sub>2</sub> thin films, Phys. Status Solidi B 260 (2023) 2300250. 1.6 - IF, Q4 - JCR

#### **10.) Štúdium dynamiky magnetického víru pre využitie v súčiastkach** (*Study of magnetic vortex dynamics for device applications*)

|   |                                      |
|---|--------------------------------------|
| <b>Zodpovedný riešiteľ:</b>                 | Ján Šoltýs                           |
| <b>Trvanie projektu:</b>                    | 1.1.2022 / 31.12.2024                |
| <b>Evidenčné číslo projektu:</b>            | 2/0168/22                            |
| <b>Organizácia je</b>                       | áno                                  |
| <b>koordinátorom projektu:</b>              |                                      |
| <b>Koordinátor:</b>                         | Elektrotechnický ústav SAV, v. v. i. |
| <b>Počet spoluriešiteľských inštitúcií:</b> | 0                                    |
| <b>Čerpané financie:</b>                    | VEGA: 16062 €                        |

##### Dosiahnuté výsledky:

Vetrova, I., Feilhauer, J., Cambel, V., and Šoltýs, J.: MFM tip with a ferromagnetic disk-shaped apex for large domain scanning, IEEE Trans. on Nanotechnol. 22 (2023) 634-640.

#### **11.) Modifikácia vlastností supravodivých, feromagnetických oxidových vrstiev a štruktúr pre modernú elektroniku** (*Modification of properties of superconducting, ferromagnetic, oxide films and structures for advanced electronics*)

|                                  |                                      |
|----------------------------------|--------------------------------------|
| <b>Zodpovedný riešiteľ:</b>      | Marianna Španková                    |
| <b>Trvanie projektu:</b>         | 1.1.2022 / 31.12.2025                |
| <b>Evidenčné číslo projektu:</b> | 2/0140/22                            |
| <b>Organizácia je</b>            | áno                                  |
| <b>koordinátorom projektu:</b>   |                                      |
| <b>Koordinátor:</b>              | Elektrotechnický ústav SAV, v. v. i. |
| <b>Počet spoluriešiteľských</b>  | 0                                    |



**inštitúcií:**

**Čerpané financie:** VEGA: 5209 €

Dosiahnuté výsledky:

Španková, M., Chromik, Š., Dobročka, E., Pribusová Slušná, L., Talacko, M., Gregor, M., Pécz, B., Koos, A., Greco, G., Panasci, S.E., Fiorenza, P., Roccaforte, F., Cordier, Y., Frayssinet, E., and Giannazzo, F.: Large-area MoS<sub>2</sub> films grown on sapphire and GaN substrates by pulsed laser deposition, *Nanomater.* 13 (2023) 2837.

**12.) Elektronické a optoelektronické súčiastky na báze ultra-širokopásmového Ga<sub>2</sub>O<sub>3</sub> polovodiča** (*Electronic and optoelectronic devices based on ultra-wide bandgap Ga<sub>2</sub>O<sub>3</sub> semiconductor*)

**Zodpovedný riešiteľ:** Milan Ťapajna  
**Trvanie projektu:** 1.1.2021 / 31.12.2024  
**Evidenčné číslo projektu:** 2/0100/21  
**Organizácia je** áno  
**koordinátorom projektu:**  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** VEGA: 14324 €

Dosiahnuté výsledky:

Dobročka, E., Gucmann, F., Hušeková, K., Nádaždy, P., Hrubíšák, F., Egyenes, F., Rosová, A., Mikolášek, M., and Ťapajna, M.: Structure and thermal stability of  $\epsilon/\kappa$ -Ga<sub>2</sub>O<sub>3</sub> films deposited by liquid-injection MOCVD, *Materials* 16 (2023) 20.

Egyenes, F., Gucmann, F., Rosová, A., Dobročka, E., Hušeková, K., Hrubíšák, F., Keshtkar, J., and Ťapajna, M.: Conductance anisotropy of MOCVD-grown  $\alpha$ -Ga<sub>2</sub>O<sub>3</sub> films caused by (010)  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> filament-shaped inclusions, *J. Phys. D: Appl Phys.* 56 (2023) 045102.

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Egyenes, F., Chikoidze, E., Guemann, F., Chi, Z., Precner, M., Moško, M., Hušeková, K., Dobročka, E., Rosová, A., Hrubíšák, F., Keshtkar, J., Chouhan, H., and Ťapajna, M.: Effect of hydrogen in Si-doped  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> grown by liquid injection MOCVD. In: E-MRS 2023 Fall Meeting. Varšava 2023. Prednáška.

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### **13.) Vysokovýkonná zakrivená röntgenová optika pripravená pokročilou technológiou nanoobrábania** (*High-performance curved X-ray optics prepared by advanced nanomachining technology*)

|   |                                      |
|---|--------------------------------------|
| <b>Zodpovedný riešiteľ:</b>                   | Zdenko Zápražný                      |
| <b>Trvanie projektu:</b>                      | 1.1.2021 / 31.12.2023                |
| <b>Evidenčné číslo projektu:</b>              | 2/0041/21                            |
| <b>Organizácia je koordinátorom projektu:</b> | áno                                  |
| <b>Koordinátor:</b>                           | Elektrotechnický ústav SAV, v. v. i. |
| <b>Počet spoluriešiteľských inštitúcií:</b>   | 0                                    |
| <b>Čerpané financie:</b>                      | VEGA: 8164 €                         |

### **14.) Vysokoodolné polovodičové senzory ionizujúceho žiarenia pre využitie v radiačnom prostredí** (*Radiation resistant semiconductor sensors for utilization in harsh environment*)

|   |                                      |
|---|--------------------------------------|
| <b>Zodpovedný riešiteľ:</b>                   | Bohumír Zaťko                        |
| <b>Trvanie projektu:</b>                      | 1.1.2020 / 31.12.2023                |
| <b>Evidenčné číslo projektu:</b>              | 2/0084/20                            |
| <b>Organizácia je koordinátorom projektu:</b> | áno                                  |
| <b>Koordinátor:</b>                           | Elektrotechnický ústav SAV, v. v. i. |
| <b>Počet spoluriešiteľských</b>               | 1 - Slovensko: 1                     |



**inštitúcií:**

**Čerpané financie:** VEGA: 5954 €

Dosiahnuté výsledky:

Gál, N., Hrubčín, L., Šagátová, A., Vanko, G., Kováčová, E., and Zaťko, B.: High-resolution alpha-particle detector based on Schottky barrier 4H-SiC detector operated at elevated temperatures up to 500 °C, Applied Surface Sci 635 (2023) 157708.

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Novák, A., Šagátová, A., and Zaťko, B.: Energy calibration of timepix detector with GaAs sensor, AIP Conf. Proc. 2778 (2023) 050004.

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**Programy: APVV**

**15.) Optimalizácia okrúhleho kábla z vysokoteplotného supravodiča pre pulzné magnetické polia** (*Optimization of round high-temperature superconducting cable for pulse magnetic field*)

**Zodpovedný riešiteľ:** Fedor Gömöry  
**Trvanie projektu:** 1.7.2021 / 30.6.2025  
**Evidenčné číslo projektu:** 20-0056  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** Materiálovotechnologická fakulta STU  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** APVV: 22383 €

Dosiahnuté výsledky:

Gömöry, F., Šouc, J., and Godár, M.: Limitation of current transport in coated conductors: statistical fluctuations or weak spots?, IEEE Trans. Applied Supercond. 33 (2023) 8000105.

Ries, R., Hlaváč, D., Solovyov, M., and Gömöry, F.: Induced delamination in REBCO coated-conductor tape by a scratch line and bending, Physica C 613 (2023) 1354358.

Ries, R., Gömöry, F., Mošat', M., Kujovič, T., Hintze, C., and Gil, P.: Effect of off-axis bending on



microstructural and transport properties of coated conductor tape, Supercond. Sci Technol. 36 (2023) 014006.

Solovyov, M., Šouc, J., Kujovič, T., Frolek, L., and Gömöry, F.: Magnetization AC losses in multilayer superconducting round cables with coinciding and opposite lay angles, Supercond. Sci Technol. 36 (2023) 034001.

Gömöry, F., Šouc, J., Godár, M., Hintze, C., and Grosse, V.: Analysis of critical current fluctuations as a means of checking the quality of high-temperature superconductor tape slitting, Supercond. Sci Technol. 36 (2023) 054001.

**16.) Moderné nanomembránové heteroštruktúry na báze GaAs pre vysoko produktívne vysokofrekvenčné prvky** (*Advanced GaAs-based nanomembrane heterostructures for highperformance RF devices*)

**Zodpovedný riešiteľ:** Dagmar Gregušová  
**Trvanie projektu:** 1.7.2022 / 30.6.2025  
**Evidenčné číslo projektu:** APVV-21-0365  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** STU Bratislava  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** APVV: 24870 €

Dosiahnuté výsledky:

Gregušová, D., Pohorelec, O., Eliáš, P., Stoklas, R., Dobročka, E., Kučera, M., Blaho, M., and Kúdela, R.: III-V semiconductor nanomembranes in device technology. In Proc. 11<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. – ADEPT. Eds. D. Jandura et al. Žilina: EDIS 2023. ISBN 978-80-554-1977-0. P. 138-141.

Chvála, A., Kováč, J., Gregušová, D., Ťapajna, M., Gucmann, F., Marek, J., and Florovič, M.: 3D thermal simulation of GaAs-based HEMT on foreign substrates. In: 5<sup>th</sup> Inter. Conf. Microelectr. Devices Technol. MicDAT 2023. IFSA Publ. 2023. ISBN 978-84-09-53748-8, pp. 20-23.

**17.) Nanoštrukturované tenkovrstvové materiály vyznačujúce sa slabými väzbovými interakciami pre elektronické a senzorické aplikácie** (*Nanostructured thin-film materials characterized by weak binding interactions for electronic and sensoric applications*)

**Zodpovedný riešiteľ:** Dagmar Gregušová  
**Trvanie projektu:** 1.7.2022 / 30.6.2026  
**Evidenčné číslo projektu:** APVV-21-0278  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** STU Bratislava  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** APVV: 35207 €

Dosiahnuté výsledky:

Hrdá, J., Moško, M., Vojteková, T., Pribusová Slušná, L., Precner, M., Hulman, M., Španková, M., Chromik, Š., and Sojková, M.: Electron transport in lithium-doped few-layer MoS<sub>2</sub> films. In Proc.



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Sojková, M., Hrdá, J., Vojteková, T., Pribusová Slušná, L., Végső, K., Dobročka, E., Šiffalovič, P., and Hulman, M.: Novel approach in fabrication of few-layer transition metal dichalcogenide films. In Proc. 11<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. – ADEPT. Eds. D. Jandura et al. Žilina: EDIS 2023. ISBN 978-80-554-1977-0. P. 32-35.

**18.) Moderné elektronické súčiastky na báze ultraširokopásmového polovodiča Ga<sub>2</sub>O<sub>3</sub> pre budúce vysokonapäťové aplikácie** (*Modern electronic devices based on ultrawide bandgap semiconducting Ga<sub>2</sub>O<sub>3</sub> for future high-voltage applications*)

**Zodpovedný riešiteľ:** Filip Gučmann  
**Trvanie projektu:** 1.7.2021 / 30.6.2025  
**Evidenčné číslo projektu:** 20-0220  
**Organizácia je** áno  
**koordinátorom projektu:**  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 2 - Slovensko: 2  
**Čerpané financie:** APVV: 33025 €

Dosiahnuté výsledky:

Dobročka, E., Gučmann, F., Hušeková, K., Nádaždy, P., Hrubíšák, F., Egyenes, F., Rosová, A., Mikolášek, M., and Ľapajna, M.: Structure and thermal stability of  $\epsilon/\kappa$ -Ga<sub>2</sub>O<sub>3</sub> films deposited by liquid-injection MOCVD, Materials 16 (2023) 20.

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Gučmann, F., Nádaždy, P., Hušeková, K., Dobročka, E., Priesol, J., Egyenes, F., Šatka, A., Rosová, A., and Ľapajna, M.: Thermal stability of rhombohedral  $\alpha$ - and monoclinic  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> grown on sapphire by liquid-injection MOCVD, Mater. Sci Semicond. Process. 156 (2023) 107289.

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Chouhan, H., Egyenes, F., Rosová, A., Hušeková, K., Dobročka, E., Nádaždy, P., Ťapajna, M., Xiao, X., Mao, Y., Meng, B., Ma, G., Yuan, C., and Guemann, F.: Heteroepitaxy of (010)  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> on sapphire substrates using liquid-injection MOCVD. In: E-MRS 2023 Fall Meeting, Varšava 2023. Prednáška.

Xiao, X., Guemann, F., Ťapajna, M., and Yuan, C.: Lattice thermal conductivity in  $\alpha/\beta/\kappa$ -phase Ga<sub>2</sub>O<sub>3</sub> from first principles. In 3<sup>rd</sup> Inter. Symp. Multiscale Simul. Thermophys. MSTP 2023. Shenzhen (China) 2023. Prednáška.

Mao, Y., Xiao, X., Ťapajna, M., Hušeková, K., Egyenes, F., Guemann, F., and Yuan, C.: Thermal conductivities and interface thermal resistance of different phases ( $\alpha$ ,  $\beta$ , and  $\kappa$ ) Ga<sub>2</sub>O<sub>3</sub> thin films. In 24<sup>th</sup> National Semicond. Phys. Conf. SPC 2023. Shanghai 2023. Prednáška.

Ťapajna, M., Egyenes, F., Hrubíšák, F., Hušeková, K., Dobročka, E., Nádaždy, P., Rosová, A., Chouhan, H., Keshtkar, J., and Guemann, F.: Liquid-injection MOCVD-grown Ga<sub>2</sub>O<sub>3</sub> on sapphire and 4H-SiC substrates: Material, transport, and MOSFET properties. In: Inter. Meeting for Future of Electron Dev. IMFEDK 2023. Kyoto 2023. Pozvaná prednáška.

### **19.) Vlastnosti tepelného transportu v budúcich perspektívnych polovodičových materiáloch a rozhraniach** (*Thermal transport properties of perspective future semiconductor materials and interfaces*)

|   |                                      |
|---|--------------------------------------|
| <b>Zodpovedný riešiteľ:</b>                   | Filip Guemann                        |
| <b>Trvanie projektu:</b>                      | 1.1.2022 / 31.12.2023                |
| <b>Evidenčné číslo projektu:</b>              | SK-CN-21-0013                        |
| <b>Organizácia je koordinátorom projektu:</b> | áno                                  |
| <b>Koordinátor:</b>                           | Elektrotechnický ústav SAV, v. v. i. |
| <b>Počet spoluriešiteľských inštitúcií:</b>   | 0                                    |
| <b>Čerpané financie:</b>                      | APVV: 6220 €                         |

#### Dosiahnuté výsledky:

Dobročka, E., Guemann, F., Hušeková, K., Nádaždy, P., Hrubíšák, F., Egyenes, F., Rosová, A., Mikolášek, M., and Ťapajna, M.: Structure and thermal stability of  $\varepsilon/\kappa$ -Ga<sub>2</sub>O<sub>3</sub> films deposited by liquid-injection MOCVD, Materials 16 (2023) 20.

Egyenes, F., Guemann, F., Rosová, A., Dobročka, E., Hušeková, K., Hrubíšák, F., Keshtkar, J., and Ťapajna, M.: Conductance anisotropy of MOCVD-grown  $\alpha$ -Ga<sub>2</sub>O<sub>3</sub> films caused by (010)  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> filament-shaped inclusions, J. Phys. D: Appl Phys. 56 (2023) 045102.

Guemann, F., Nádaždy, P., Hušeková, K., Dobročka, E., Priesol, J., Egyenes, F., Šatka, A., Rosová, A., and Ťapajna, M.: Thermal stability of rhombohedral  $\alpha$ - and monoclinic  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> grown on



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Ľapajna, M., Keshtkar, J., Szabó, O., Shagieva, E., Hušeková, K., Dobročka, E., Fedor, J., Dérier, J., Kromka, A., and Guemann, F.: Growth of nanocrystalline diamond on gallium oxide using various interlayers. In Proc. 11<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. – ADEPT. Eds. D. Jandura et al. Žilina: EDIS 2023. ISBN 978-80-554-1977-0. P. 28-31.

Chvála, A., Kováč, J., Gregušová, D., Ľapajna, M., Guemann, F., Marek, J., and Florovič, M.: 3D thermal simulation of GaAs-based HEMT on foreign substrates. In: 5<sup>th</sup> Inter. Conf. Microelectr. Devices Technol. MicDAT 2023. IFSA Publ. 2023. ISBN 978-84-09-53748-8, pp. 20-23.

Egyenes, F., Chikoidze, E., Guemann, F., Chi, Z., Precner, M., Moško, M., Hušeková, K., Dobročka, E., Rosová, A., Hrubíšák, F., Keshtkar, J., Chouhan, H., and Ľapajna, M.: Effect of hydrogen in Si-doped  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> grown by liquid injection MOCVD. In: E-MRS 2023 Fall Meeting. Varšava 2023. Prednáška.

Chouhan, H., Egyenes, F., Rosová, A., Hušeková, K., Dobročka, E., Nádaždy, P., Ľapajna, M., Xiao, X., Mao, Y., Meng, B., Ma, G., Yuan, C., and Guemann, F.: Heteroepitaxy of (010)  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> on sapphire substrates using liquid-injection MOCVD. In: E-MRS 2023 Fall Meeting, Varšava 2023. Prednáška.

Xiao, X., Guemann, F., Ľapajna, M., and Yuan, C.: Lattice thermal conductivity in  $\alpha/\beta/\kappa$ -phase Ga<sub>2</sub>O<sub>3</sub> from first principles. In 3<sup>rd</sup> Inter. Symp. Multiscale Simul. Thermophys. MSTP 2023. Shenzhen (China) 2023. Prednáška.

Mao, Y., Xiao, X., Ľapajna, M., Hušeková, K., Egyenes, F., Guemann, F., and Yuan, C.: Thermal conductivities and interface thermal resistance of different phases ( $\alpha$ ,  $\beta$ , and  $\kappa$ ) Ga<sub>2</sub>O<sub>3</sub> thin films. In 24<sup>th</sup> National Semicond. Phys. Conf. SPC 2023. Shanghai 2023. Prednáška.

Ľapajna, M., Egyenes, F., Hrubíšák, F., Hušeková, K., Dobročka, E., Nádaždy, P., Rosová, A., Chouhan, H., Keshtkar, J., and Guemann, F.: Liquid-injection MOCVD-grown Ga<sub>2</sub>O<sub>3</sub> on sapphire and 4H-SiC substrates: Material, transport, and MOSFET properties. In: Inter. Meeting for Future of Electron Dev. IMFEDK 2023. Kyoto 2023. Pozvaná prednáška.

**20.) Metalické 2D dichalkogenidy prechodných kovov: príprava, štúdium vlastností a korelované stavy** (*Fabrication, physics and correlated states in metallic 2D transition metal*



*dichalcogenides)*

**Zodpovedný riešiteľ:** Martin Hulman  
**Trvanie projektu:** 1.7.2020 / 30.6.2023  
**Evidenčné číslo projektu:** 19-0365  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 2 - Slovensko: 2  
**Čerpané financie:** APVV: 19975 €

Dosiahnuté výsledky:

Hrdá, J., Moško, M., Vojteková, T., Pribusová Slušná, L., Precner, M., Hulman, M., Španková, M., Chromík, Š., and Sojková, M.: Electron transport in lithium-doped few-layer MoS<sub>2</sub> films. In Proc. 11<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. – ADEPT. Eds. D. Jandura et al. Žilina: EDIS 2023. ISBN 978-80-554-1977-0. P. 83-86.

Sojková, M., Piš, I., Hrdá, J., Vojteková, T., Pribusová Slušná, L., Vegso, K., Šiffalovič, P., Nádaždy, P., Dobročka, E., Krbal, M., Fons, P.J., Munnik, F., Magnano, E., Hulman, M., and Bondino, F.: Lithium-induced reorientation of few-layer MoS<sub>2</sub> films, Chem. Mater. 35 (2023) 6246-6257.

Sojková, M., Hrdá, J., Vojteková, T., Pribusová Slušná, L., Végső, K., Dobročka, E., Šiffalovič, P., and Hulman, M.: Novel approach in fabrication of few-layer transition metal dichalcogenide films. In Proc. 11<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. – ADEPT. Eds. D. Jandura et al. Žilina: EDIS 2023. ISBN 978-80-554-1977-0. P. 32-35.

Pribusová Slušná, L., Vegso, K., Dobročka, E., Vojteková, T., Nádaždy, P., Halahovets, Y., Sojková, M., Hrdá, J., Precner, M., Šiffalovič, P., Chen, Z., Huang, Y., Ražnjević, S., Zhang, Z., and Hulman, M.: Ordered growth of hexagonal and monoclinic phases of MoTe<sub>2</sub> on a sapphire substrate, CrystEngComm 25 (2023) 5706.

Vojteková, T., Pribusová Slušná, L., Dobročka, E., Precner, M., Sojková, M., Hrdá, J., Gregor, M., and Hulman, M.: Fourier-transform infrared spectroscopy of MoTe<sub>2</sub> thin films, Phys. Status Solidi B 260 (2023) 2300250.

**21.) Dlhodosahový jav blízkosti v supravodič/feromagnet heteroštruktúrach** (*Long-range proximity effect in superconductor / ferromagnet heterostructures*)

**Zodpovedný riešiteľ:** Štefan Chromík  
**Trvanie projektu:** 1.7.2020 / 31.12.2023  
**Evidenčné číslo projektu:** 19-0303  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** FMFI UK  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** APVV: 20000 €

Dosiahnuté výsledky:



Španková, M., Chromik, Š., Dobročka, E., Pribusová Slušná, L., Talacko, M., Gregor, M., Pécz, B., Koos, A., Greco, G., Panasci, S.E., Fiorenza, P., Roccaforte, F., Cordier, Y., Frayssinet, E., and Giannazzo, F.: Large-area MoS<sub>2</sub> films grown on sapphire and GaN substrates by pulsed laser deposition, *Nanomater.* 13 (2023) 2837.

## **22.) p-GaN elektronika pre úsporu energie a post-CMOS obvody** (*p-GaN electronics for energy savings and beyond-CMOS circuits*)

**Zodpovedný riešiteľ:** Ján Kuzmík  
**Trvanie projektu:** 1.7.2022 / 30.6.2025  
**Evidenčné číslo projektu:** APVV-21-0008  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 1 - Slovensko: 1  
**Čerpané financie:** APVV: 66125 €

### Dosiahnuté výsledky:

Kuzmík, J., Pohorelec, O., Hasenöhrl, S., Blaho, M., Stoklas, R., Dobročka, E., Rosová, A., Kučera, M., Guemann, F., Gregušová, D., Precner, M., and Vincze, A.: Mg doping of N-polar, in-rich InAlN, *Materials*, 16 (2023) 2250.

Stoklas, R., Hasenöhrl, S., Dobročka, E., Guemann, F., Rosová, M., Blaho, M., Kučera, M., Ruterana, P., Chauvat, M.P., Kret, S., Kaleta, A., and Kuzmík, J.: Transport properties of thin InN layers grown on Mg-doped InAlN buffers. In: 14<sup>th</sup> Inter. Conf. Nitride Semicond. ICNS. Fukuoka 2023. Prednáška

## **23.) Robustné spinové vlny pre budúce magnonické aplikácie** (*Robust spin waves for future magnonic applications*)

**Zodpovedný riešiteľ:** Michal Mruczkiewicz  
**Trvanie projektu:** 1.7.2020 / 30.6.2023  
**Evidenčné číslo projektu:** 19-0311  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 1 - Slovensko: 1  
**Čerpané financie:** APVV: 35312 €

### Dosiahnuté výsledky:

Feilhauer, J., Tóbiš, J., Šoltýs, J., and Cambel, V.: Numerical characterization of magnetic vortex probe imaging for magnetic force microscopy, *IEEE Trans. Magnet.* 59 (2023) 6500210.

Feilhauer, J., Zelent, M., Zhang, Z., Christensen, J., and Mruczkiewicz, M.: Unidirectional spin-wave edge modes in magnonic crystal, *APL Mater.* 11 (2023) 021104.

Makartsou, U., Moalic, M., Zelent, M., Mruczkiewicz, M., and Krawczyk, M.: Control of vortex chirality in a symmetric ferromagnetic ring using a ferromagnetic nanoelement, *Nanoscale* 15 (2023) 13094-1310127.



Zelent, M., Moalic, M., Mruczkiewicz, M., Li, X., and Krawczyk, M.: Stabilization and racetrack application of asymmetric Néel skyrmions in hybrid nanostructures, *Sci Rep.* 13 (2023) 13572.

Tóbiš, J.: Dynamical symmetry breaking in magnetic systems, *Phys. Status Solidi RRL* 17 (2013) 2200459.

Ščepka, T., Feilhauer, J., Tóbiš, J., Krylov, S., Kalmykova, T., Cambel, V., and Mruczkiewicz, M.: Control of closure domain state circulation in coupled triangular permalloy elements using MFM tip, *J. Applied Phys.* 134 (2023) 213902.

**24.) Fotonické laboratórium na čipe: výskum a vývoj platformy plazmonického senzora pre okamžitú detekciu zložiek v roztokoch** (*Photonic Lab-on-a-Chip: investigation and development of plasmonic sensor platform for immediate detection of composites in solutions*)

**Zodpovedný riešiteľ:** Jozef Novák  
**Trvanie projektu:** 1.7.2021 / 31.12.2024  
**Evidenčné číslo projektu:** 20-0437  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** FEI STU Bratislava  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** APVV: 29461 €

Dosiahnuté výsledky:

Novák, J., Eliáš, P., Hasenöhrl, S., Sojková, M., Laurenčíková, A., Kováč, J.jr., and Kováč, J.: Influence of thin Ga<sub>2</sub>Se<sub>3</sub> interlayer on the properties of GaP/PtSe<sub>2</sub> heterojunction. In *Proc. 11<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. – ADEPT*. Eds. D. Jandura et al. Žilina: EDIS 2023. ISBN 978-80-554-1977-0. P. 24-27.

**25.) Nanooptické sondy a senzory integrované na optickom vlákne** (*Nano-optical probes and sensors integrated on optical fiber*)

**Zodpovedný riešiteľ:** Jozef Novák  
**Trvanie projektu:** 1.8.2021 / 31.12.2024  
**Evidenčné číslo projektu:** 20-0264  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** Žilinská univerzita v Žiline  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** APVV: 28455 €

Dosiahnuté výsledky:

Novák, J., Eliáš, P., Hasenöhrl, S., Sojková, M., Laurenčíková, A., Kováč, J.jr., and Kováč, J.: Influence of thin Ga<sub>2</sub>Se<sub>3</sub> interlayer on the properties of GaP/PtSe<sub>2</sub> heterojunction. In *Proc. 11<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. – ADEPT*. Eds. D. Jandura et al. Žilina: EDIS 2023. ISBN 978-80-554-1977-0. P. 24-27.

**26.) Vysokoteplotná supravodivá cievka pre motory elektrických a hybridných lietadiel** (*High temperature superconducting coils in motors for electric and hybrid aircrafts*)



**Zodpovedný riešiteľ:** Enric Pardo  
**Trvanie projektu:** 1.7.2020 / 30.6.2023  
**Evidenčné číslo projektu:** 19-0536  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** APVV: 36683 €

Dosiahnuté výsledky:

Li, S. and Pardo, E.: Numerical modelling of soldered superconducting REBCO stacks of tapes suggests strong reduction in cross-field demagnetization, Sci Rep. 13 (2023) 1087.

Pardo, E. and Grilli, F.: Electromagnetic modeling of superconductors. In Numerical modeling of superconducting applications: Simulation of electromagnetics, thermal stability, thermo-hydraulics and mechanical effects in large-scale superconducting devices. World Sci Publ. Co. Pte. Ltd., 2023, p. 1-104. ISBN 978-981-127-143-4.

Pardo, E. and Dadhich, A.: Electro-thermal modelling by novel variational methods: racetrack coil in short-circuit, IEEE Trans. Applied Supercond. 33 (2023) 5201606.

**27.) Topologicky netriviálne magnetické a supravodivé nanoštruktúry** (*Topologically nontrivial magnetic and superconducting nanostructures*)

**Zodpovedný riešiteľ:** Ján Šoltýs  
**Trvanie projektu:** 1.7.2021 / 31.12.2024  
**Evidenčné číslo projektu:** 20-0425  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** Prírodovedecká fakulta, UPJŠ Košice  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** APVV: 15640 €

Dosiahnuté výsledky:

Pribulová, Z., Marcin, M., Kačmarčík, J., Gabáni, S., Flachbart, K., Shitsevalova, N., Mori, T., Sluchanko, N., Anisimov, M., Cambel, V., Šoltýs, J., Marcenat, C., Klein, T., and and Samuely, P.: Defect-induced weak collective pinning in superconducting YB6 crystals, JPhys Mater. 6 (2023) 045002.

**28.) Tranzistory na báze 2D kovových chalkogenidov pripravených teplom podporovanou konverziou** (*Transistors based on 2D Metal Chalcogenides Grown via Thermally Assisted Conversion*)

**Zodpovedný riešiteľ:** Milan Ľapajna  
**Trvanie projektu:** 1.7.2022 / 30.6.2026  
**Evidenčné číslo projektu:** APVV-21-0231  
**Organizácia je koordinátorom projektu:** áno



**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 1 - Slovensko: 1  
**Čerpané financie:** APVV: 40250 €

Dosiahnuté výsledky:

Hrdá, J., Moško, M., Vojteková, T., Pribusová Slušná, L., Precner, M., Hulman, M., Španková, M., Chromík, Š., and Sojková, M.: Electron transport in lithium-doped few-layer MoS<sub>2</sub> films. In Proc. 11<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. – ADEPT. Eds. D. Jandura et al. Žilina: EDIS 2023. ISBN 978-80-554-1977-0. P. 83-86.

Sojková, M., Hrdá, J., Vojteková, T., Pribusová Slušná, L., Végső, K., Dobročka, E., Šiffalovič, P., and Hulman, M.: Novel approach in fabrication of few-layer transition metal dichalcogenide films. In Proc. 11<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. – ADEPT. Eds. D. Jandura et al. Žilina: EDIS 2023. ISBN 978-80-554-1977-0. P. 32-35.

Ťapajna, M., Egyenes, F., Hrubíšák, F., Hušeková, K., Dobročka, E., Nádaždy, P., Rosová, A., Chouhan, H., Keshtkar, J., and Guemann, F.: Liquid-injection MOCVD-grown Ga<sub>2</sub>O<sub>3</sub> on sapphire and 4H-SiC substrates: Material, transport, and MOSFET properties. In: Inter. Meeting for Future of Electron Dev. IMFEDK 2023. Kyoto 2023. Pozvaná prednáška.

**29.) Zberač energie na báze mikrostĺpikovitých štruktúr** (*Energy Harvesting Device Based on Micropillar Structures*)

**Zodpovedný riešiteľ:** Gabriel Vanko  
**Trvanie projektu:** 1.1.2022 / 31.12.2023  
**Evidenčné číslo projektu:** SK-TW-21-0006  
**Organizácia je** áno  
**koordinátorom projektu:**  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 1 - Taiwan: 1  
**Čerpané financie:** APVV: 3636 €

Dosiahnuté výsledky:

Izsák, T., Ščepka, T., Vanko, G., Fedor, J., Romanyuk, O., and Hudec, B.: Structuring of titanium nitride films by dry reactive ion etching. In Proc. 11<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. – ADEPT. Eds. D. Jandura et al. Žilina: EDIS 2023. ISBN 978-80-554-1977-0. P. 150-153.

Vanko, G., Dérier, J., Hsu, R.-Ch., Kromka, A., Izsák, T., Varga, M., and Tsai, H.-Y.: Electrical properties of thin piezoelectric AlN layers prepared by DC and RF sputtering. In Proc. 11<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. – ADEPT. Eds. D. Jandura et al. Žilina: EDIS 2023. ISBN 978-80-554-1977-0. P. 242-245.

**30.) Perspektívne detektory ionizujúceho žiarenia pre nepokryté energetické okno neutrónov** (*Perspective ionizing radiation detectors for the uncovered neutron energy window*)

**Zodpovedný riešiteľ:** Bohumír Zatl'ko  
**Trvanie projektu:** 1.7.2023 / 30.6.2027  
**Evidenčné číslo projektu:** APVV-22-0382



**Organizácia je** áno  
**koordinátorom projektu:**  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských** 1 - Slovensko: 1  
**inštitúcií:**  
**Čerpané financie:** APVV: 11948 €

Dosiahnuté výsledky:

Zaťko, B., Šagátová, A., Kováčová, E., Novák, A., Sýkova, R., Kohout, Z., Polansky, Š.: Detection of fast neutrons using 4H-SiC radiation detectors, EPJ Web of Conferences 288 (2023) 03004.

Šagátová, A., Kurucová, N., Kotorová, S., Kováčová, E., Zaťko, B.: Influence of base material thickness on spectrometry of semiconductor detectors based on semi-insulating GaAs, EPJ Web of Conferences 288 (2023) 10013.

**31.) Radiačne odolnejší senzor pre RTG zobrazovanie vyššej kvality** (*Radiation harder sensor for X-ray imaging of higher quality*)

**Zodpovedný riešiteľ:** Bohumír Zaťko  
**Trvanie projektu:** 1.7.2019 / 30.6.2023  
**Evidenčné číslo projektu:** 18-0273  
**Organizácia je** nie  
**koordinátorom projektu:**  
**Koordinátor:** Ústav jadrového a fyzikálneho inžinierstva FEI STU  
**Počet spoluriešiteľských** 0  
**inštitúcií:**  
**Čerpané financie:** APVV: 7435 €

Dosiahnuté výsledky:

Gál, N., Hrubčín, L., Šagátová, A., Vanko, G., Kováčová, E., and Zaťko, B.: High-resolution alpha-particle detector based on Schottky barrier 4H-SiC detector operated at elevated temperatures up to 500 °C, Applied Surface Sci 635 (2023) 157708.

Šagátová, A., Novák, A., Kováčová, E., Riabukhin, O., Kotorová, S., and Zaťko, B.: Radiation-degraded SI GaAs detectors and their metallization, AIP Conf. Proc. 2778 (2023) 060009.

Kotorová, S., Šagátová, A., Vanko, G., Boháček, P., and Zaťko, B.: Effect of thermal annealing on 4H-SiC radiation detector, AIP Conf. Proc. 2778 (2023) 060004.

Zaťko, B., Hrubčín, L., Boháček, P., Gurov, Y.B., Rozov, S.V., Evseev, S.A., Bulavin, M.V., Zamiatin, N.I., Kopylov, Y.A., Sekáčová, M., and Kováčová, E.: Spectrometric performance of 4H-SiC detectors after neutron irradiation, AIP Conf. Proc. 2778 (2023) 060012.

Novák, A., Šagátová, A., and Zaťko, B.: Energy calibration of timepix detector with GaAs sensor, AIP Conf. Proc. 2778 (2023) 050004.

Sedlačková, K., Zaťko, B., and Nečas V.: Spectrometry of electron irradiated CdTe Schottky-barrier semiconductor detectors before polarization onset, AIP Conf. Proc. 2778 (2023) 060010.



**32.) Rastové a radiačné mechanizmy v diamantových hybridných detektoroch** (*Growth and Radiation Mechanisms in Diamond Hybrid Detectors*)

**Zodpovedný riešiteľ:** Bohumír Zaťko  
**Trvanie projektu:** 1.7.2022 / 30.6.2025  
**Evidenčné číslo projektu:** SK-CZ-RD\_21/0016  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 1 - Česko: 1  
**Čerpané financie:** APVV: 49558 €

**Programy: Iné projekty**

**33.) Výskum a vývoj pokročilého QCM-FET duálneho senzora reaktivovaného na báze diamantových vrstiev pre detekciu plynov a biomolekúl** (*Research and development of advanced for defiction of gases and biomolecules*)

**Zodpovedný riešiteľ:** Tibor Izsák  
**Trvanie projektu:** 1.1.2023 / 31.12.2024  
**Evidenčné číslo projektu:** CAS-SAS-2022-9  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 1 - Česko: 1  
**Čerpané financie:** SAV: 1443 €

*Dosiahnuté výsledky:*

Kočí, M., Izsák, T., Wróbe, P., Godzierz, M., Szabó, O., Vanko, G., Sojková, M., Pusz, S., Potocký, Š., Husák, M., and Kromka, A.: Room temperature gas sensors based on the diamond-molybdenum disulfide and diamond-graphene oxide structure. In Proc. 11<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. - ADEPT. Eds. D. Jandura et al. Žilina: EDIS 2023. ISBN 978-80-554-1977-0. P. 91-94.

Kromka, A., Kočí, M., Szabó, O., Aubrechtová Dragounová, K., Vanko, G., Izsák, T., and Varga, M.: Chemical vapor deposition of diamond films on qcm substrates. In Proc. 11<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. - ADEPT. Eds. D. Jandura et al. Žilina: EDIS 2023. ISBN 978-80-554-1977-0. P. 157-160.

Kromka, A., Varga, M., Kočí, M., Szabó, O., Izsák, T., Aubrechtová Dragounová, K., Gál, M., Vojs, M., Korčeková, J., and Poturnayová, A.: Diamond-coated quartz crystal microbalance: fabrication, characterization and applications – detection of gas molecules and SARS-Cov-2 proteins. Book Abstracts 15<sup>th</sup> Inter. Conf. Nanomater. - Research & Application NANOCON 2023. Brno 2023. Výveska.



**34.) Štipendia pre excelentných výskumníkov ohrozených vojnovým konfliktom na Ukrajine**  
(*Scholarships for excellent researchers threatened by the war conflict in Ukraine*)

**Zodpovedný riešiteľ:** Tetiana Kalmykova  
**Trvanie projektu:** 1.4.2022 / 31.3.2025  
**Evidenčné číslo projektu:** 09I03-03-V01-00006  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** SAV: 30721 €

**Programy: Vedecko-technické projekty**

**35.) Príprava a vlastnosti supravodivých a magnetických oxidových vrstiev pre moderné elektronické aplikácie** (*Preparation and properties of superconducting and magnetic oxide films for modern electronic applications*)

**Zodpovedný riešiteľ:** Štefan Chromik  
**Trvanie projektu:** 1.1.2023 / 31.12.2024  
**Evidenčné číslo projektu:** SAV-PAV  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 1 - Poľsko: 1  
**Čerpané financie:** SAV: 1434 €

**Programy: Štrukturálne fondy EÚ Výskum a inovácie**

**36.) CEMEA - Vybudovanie centra pre využitie pokročilých materiálov SAV** (*Building a centre for advanced material application SAS*)

**Zodpovedný riešiteľ:** Eva Majková  
**Zodpovedný riešiteľ v organizácii SAV:** Milan Ťapajna  
**Trvanie projektu:** 1.7.2019 / 30.6.2023  
**Evidenčné číslo projektu:** 313021T081  
**Organizácia je koordinátorom projektu:** nie  
**Koordinátor:** Centrum pre využitie pokročilých materiálov SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 6 - Slovensko: 6  
**Čerpané financie:** Výskumná agentúra: 7263 €



## Programy: DoktoGranty

### 37.) Zlepšenie kryštalickej kvality $\beta$ -Ga<sub>2</sub>O<sub>3</sub> rasteného na SiC substrátoch pomocou LI-MOCVD metódy (*Improvement of crystal quality of $\beta$ -Ga<sub>2</sub>O<sub>3</sub> grown on SiC using LI-MOCVD method*)

**Zodpovedný riešiteľ:** Fedor Hrubíšák  
**Trvanie projektu:** 1.1.2023 / 31.12.2023  
**Evidenčné číslo projektu:** APP0424  
**Organizácia je** áno  
**koordinátorom projektu:**  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** SAV: 2000 €

#### Dosiahnuté výsledky:

Hrubíšák, F., Hušeková, K., Zheng, X., Rosová, A., Dobročka, E., Ťapajna, M., Mičušík, M., Nádaždy, P., Egyenes, F., Keshtkar, J., Kováčová, E., Pomeroy, J.W., Kuball, M., and Gucmann, F.: Heteroepitaxial growth of Ga<sub>2</sub>O<sub>3</sub> on 4H-SiC by liquid-injection MOCVD for improved thermal management of Ga<sub>2</sub>O<sub>3</sub> power devices, J. Vacuum Sci Technol. A 41 (2023) 042708.

Hrubíšák, F., Hušeková, K., Zheng, X., Rosová, A., Dobročka, E., Ťapajna, M., Mičušík, M., Nádaždy, P., Egyenes, F., Keshtkar, J., Kováčová, E., Pomeroy, J.W., Kuball, M., and Gucmann, F.: Material properties of MOCVD-grown  $\beta$ - and  $\kappa$ -Ga<sub>2</sub>O<sub>3</sub> thin films on 4H-SiC substrates. In Proc. 11<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. – ADEPT. Eds. D. Jandura et al. Žilina: EDIS 2023. ISBN 978-80-554-1977-0. P. 87-90.

### 38.) Vývoj medzivrstiev karbidu kremíka a nitridu hliníka pre pn heteroštruktúry oxidu gália a bórom dopovaných nanodiamantov (*Development of silicon carbide and aluminum nitride interlayers for pn heterostructure based on gallium oxide and boron-doped nanodiamonds*)

**Zodpovedný riešiteľ:** Javad Keshtar  
**Trvanie projektu:** 1.1.2023 / 31.12.2023  
**Evidenčné číslo projektu:** APP0373  
**Organizácia je** áno  
**koordinátorom projektu:**  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** SAV: 1000 €

## Programy: MoRePro

### 39.) Heteroštruktúry TMD/diamant: Príprava, charakterizácia a aplikácia (*TMD/diamond heterostructures: Fabrication, characterization and applications*)

**Zodpovedný riešiteľ:** Marian Varga  
**Trvanie projektu:** 1.8.2020 / 31.7.2024  
**Evidenčné číslo projektu:** 19MRP0010  
**Organizácia je** áno



**koordinátorom projektu:**

**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 0  
**Čerpané financie:** SAV: 42448 €

Dosiahnuté výsledky:

Kočí, M., Izsák, T., Vanko, G., Sojková, M., Hrdá, J., Szabó, O., Husák, M., Végső, K., Varga, M., and Kromka, A.: Improved gas sensing capabilities of MoS<sub>2</sub>/diamond heterostructures at room temperature, ACS Applied Mater. Interfaces 15 (2023) 34206-34214.

Vanko, G., Déder, J., Hsu, R.-Ch., Kromka, A., Izsák, T., Varga, M., and Tsai, H.-Y.: Electrical properties of thin piezoelectric AlN layers prepared by DC and RF sputtering. In Proc. 11<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. – ADEPT. Eds. D. Jandura et al. Žilina: EDIS 2023. ISBN 978-80-554-1977-0. P. 242-245.

Kromka, A., Kočí, M., Szabó, O., Aubrechtová Dragounová, K., Vanko, G., Izsák, T., and Varga, M.: Chemical vapor deposition of diamond films on qcm substrates. In Proc. 11<sup>th</sup> Inter. Conf. on Advances in Electron. Photon. Technol. – ADEPT. Eds. D. Jandura et al. Žilina: EDIS 2023. ISBN 978-80-554-1977-0. P. 157-160.

Ondič, L., Trojánec, F., Varga, M., and Fait, J.: Strain-relaxed nanocrystalline diamond thin films with silicon vacancy centers using femtosecond laser irradiation for photonic applications, ACS Applied Nano Mater. 6 (2023) 3268-3276.

Trojánec, F., Hamráček, K., Hanák, M., Varga, M., Kromka, A., Babčenko, O., Ondič, L., and Malý, P.: Light emission dynamics of silicon vacancy centers in a polycrystalline diamond thin film, Nanoscale 15 (2023) 2734–2738.

Varga, M., Sojková, M., Hrdá, J., Hutár, P., Parza Saeb, S., Vanko, G., Pribusová-Slušná, L., Ondic, L., Fait, J., Kromka, A., and Hulman, M.: Technological challenges in the fabrication of MoS<sub>2</sub>/diamond heterostructures. In NANOCON 2022. Proc. 14<sup>th</sup> Inter. Conf. Nanomater. – Res. & Appl. Ostrava. Tanger Ltd. 2023, pp 21-27. ISBN: 978-80-88365-09-9.

**Programy: Európsky fond regionálneho rozvoja (EFRR)**

**40.) Nová technológia prípravy senzorov, detektorov a memristorov pre inteligentnú mikroelektroniku v 21. storočí** (*New technology for the preparation of sensors, detectors and memristors for intelligent microelectronics in the 21st century*)

**Zodpovedný riešiteľ:** Vladimír Cambel  
**Trvanie projektu:** 1.3.2022 / 30.9.2023  
**Evidenčné číslo projektu:** ITMS2014+ 313011BVN5  
**Organizácia je koordinátorom projektu:** áno  
**Koordinátor:** Elektrotechnický ústav SAV, v. v. i.  
**Počet spoluriešiteľských inštitúcií:** 1 - Slovensko: 1  
**Čerpané financie:** Výskumná agentúra: 187393 €



## Príloha A-3

### Publikačná činnosť organizácie

*Príloha je generovaná z ARL.*

#### ABC Kapitoly vo vedeckých monografiách vydané v zahraničných vydavateľstvách

- ABC01      PARDO, Enric - GRILLI, F. Electromagnetic modeling of superconductors. In Numerical modeling of superconducting applications : Simulation of electromagnetics, thermal stability, thermo-hydraulics and mechanical effects in large-scale superconducting devices. - Singapur : World Scientific Publishing Co. Pte. Ltd., 2023, p. 1-104. ISBN 978-981-127-143-4. Dostupné na: <https://doi.org/10.1142/13282> (APVV 19-0536. VEGA 2/0097/18)

#### ADCA Vedecké práce v zahraničných karentovaných časopisoch – impaktovaných

- ADCA01      ANNUŠOVÁ, Adriana\*\* - LABUDOVÁ, Martina - TRUCHAN, Daniel - HEGEDŮŠOVÁ, Veronika - ŠVAJDLENKOVÁ, Helena - MIČUŠÍK, Matej - KOTLÁR, Mário - PRIBUSOVÁ SLUŠNÁ, Lenka - HULMAN, Martin - SALEHTASH, Farnoush - KÁLOSI, Anna - CSÁDEROVÁ, Lucia - ŠVASTOVÁ, Eliška - ŠIFFALOVICH, Peter - JERGEL, Matej - PASTOREKOVÁ, Silvia - MAJKOVÁ, Eva. Selective Tumor Hypoxia Targeting Using M75 Antibody Conjugated Photothermally Active MoOx Nanoparticles. In ACS Omega, 2023, vol. 8, no. 47, p. 44497-44513. (2022: 4.1 - IF, Q2 - JCR, 0.694 - SJR, Q1 - SJR). ISSN 2470-1343. Dostupné na: <https://doi.org/10.1021/acsomega.3c01934> (APVV-20-0485 : Využitie nanomedicíny v boji proti rakovine pankreasu prostredníctvom zacielenia nádorovo-asociovej karbonickej anhydrázy IX. VEGA 2/0046/23. VEGA 2/0041/21)
- ADCA02      BÚRAN, Marek\*\* - KOVÁČ, Pavol - KOPERA, Ľubomír - HUŠEK, Imrich. Thermal stability of 6-filament MgB2 wire with resistive CuNi sheath cooled by liquid He and water ice. In Cryogenics, 2023, vol. 133, no. 103694. (2022: 2.1 - IF, Q3 - JCR, 0.534 - SJR, Q2 - SJR). ISSN 0011-2275. Dostupné na: <https://doi.org/10.1016/j.cryogenics.2023.103694> (VEGA 2/0140/19)
- ADCA03      BÚRAN, Marek\*\* - KOPERA, Ľubomír - MELÍŠEK, Tibor - KOVÁČ, Pavol. E-I characteristics and critical currents of small Bi-2223/Ag coil thermally stabilized by solid and liquid nitrogen compared to water ice. In Superconductor Science and Technology, 2023, vol. 36, no. 105013. (2022: 3.6 - IF, Q2 - JCR, 1.191 - SJR, Q1 - SJR). ISSN 0953-2048. Dostupné na: <https://doi.org/10.1088/1361-6668/acef68> (APVV 18-0271. VEGA 2/0017/22)
- ADCA04      BYSTRICKÝ, Roman\*\* - ŠKRÁTEK, Martin - RUSNÁK, Jaroslav - PRECNER, Marián - ĎAPAJNA, Milan - ŠAJGALÍK, Pavol. Electrical and magnetic properties of silicon carbide composites with titanium and niobium carbide as sintering aids. In Ceramics International, 2023, vol. 49, p. 5319-5326. (2022: 5.2 - IF, Q1 - JCR, 0.918 - SJR, Q1 - SJR). ISSN 0272-8842. Dostupné na: <https://doi.org/10.1016/j.ceramint.2022.10.055>
- ADCA05      CUNINKOVÁ, E.\*\* - PEKARČÍKOVÁ, M. - FROLEK, Ľubomír - ŠIMON, Š. - SKARBA, M. - HULAČOVÁ, S. - KRAJČOVIČ, J. Numerical and experimental design of the former for TORT cables. In IEEE Transactions on Applied Superconductivity, 2023, vol. 33, no. 4800805. (2022: 1.8 - IF, Q3 - JCR, 0.536 - SJR, Q2 - SJR). ISSN 1051-8223. Dostupné na: <https://doi.org/10.1109/TASC.2023.3250383>



- ADCA06 DIN, Muhammad Faraz Ud\*\* - SOUSANI, Shima - KOTLÁR, Mário - ULLAH, Sami - GREGOR, Maroš - ŠČEPKA, Tomáš - SOYKA, Yaryna - STEPURA, Anastasiia - SHAJI, Ashin - IGBARI, Femi - VÉGSO, Karol - NÁDAŽDY, Vojtech - ŠIFFALOVÍČ, Peter - JERGEL, Matej - OMASTOVÁ, Mária - MAJKOVÁ, Eva. Tailoring the electronic properties of the SnO<sub>2</sub> nanoparticle layer for n-i-p perovskite solar cells by Ti<sub>3</sub>C<sub>2</sub>T<sub>x</sub> MXene. In Materials Today Communications, 2023, vol. 36, art.no. 106700, [10] p. (2022: 3.8 - IF, Q2 - JCR, 0.644 - SJR, Q2 - SJR). ISSN 2352-4928. Dostupné na: <https://doi.org/10.1016/j.mtcomm.2023.106700> (APVV-19-0465 : Hybridné nízkorozmerné vrstevnaté materiály s novými funkciami. APVV-17-0560 : Tribologické vlastnosti 2D materiálov a príbuzných nanokompozitov/. APVV-20-0111 : Pokročilé lítiové batérie s dlhou životnosťou. APVV-19-0365 : Metalické 2D dichalkogenidy prechodných kovov: príprava, štúdium vlastností a korelované stavy. APVV-18-0480 : Cieľový dizajn hydrogélových mikrokapsúl pre imunitnú ochranu pankreatických ostrovčiekov v liečbe cukrovky. VEGA 2/0041/21)
- ADCA07 DOBROČKA, Edmund - GUCMANN, Filip - HUŠEKOVÁ, Kristína - NÁDAŽDY, Peter - HRUBIŠÁK, Fedor - EGYENES, Fridrich - ROSOVÁ, Alica - MIKOLÁŠEK, M. - ŤAPAJNA, Milan\*\*. Structure and thermal stability of  $\epsilon/\kappa$ -Ga<sub>2</sub>O<sub>3</sub> films deposited by liquid-injection MOCVD. In Materials, 2023, vol. 16, no. 20. (2022: 3.4 - IF, Q2 - JCR, 0.563 - SJR, Q2 - SJR). ISSN 1996-1944. Dostupné na: <https://doi.org/10.3390/ma16010020>
- ADCA08 DWIVEDI, V. - CHAUHAN, Prerna - MAURYA, G.S. - ROLDÁN, A.M. - VEIS, Pavel\*\* - PATHAK, A.K.\*\*. Study of Pharmaceutical Samples using Optical Emission Spectroscopy and Microscopy. In Laser Physics, 2022, vol. 32, iss. 7, no. 075604. (2021: 1.380 - IF, Q4 - JCR, 0.342 - SJR, Q2 - SJR, karentované - CCC). (2022 - Current Contents). ISSN 1054-660X. Dostupné na: <https://doi.org/10.1088/1555-6611/ac641c>
- ADCA09 EGYENES, Fridrich\*\* - GUCMANN, Filip - ROSOVÁ, Alica - DOBROČKA, Edmund - HUŠEKOVÁ, Kristína - HRUBIŠÁK, Fedor - KESHTKAR, Javad - ŤAPAJNA, Milan. Conductance anisotropy of MOCVD-grown  $\alpha$ -Ga<sub>2</sub>O<sub>3</sub> films caused by (010)  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> filament-shaped inclusions. In Journal of Physics D: Applied Physics, 2023, vol. 56, no. 045102. (2022: 3.4 - IF, Q2 - JCR, 0.689 - SJR, Q1 - SJR). ISSN 0022-3727. Dostupné na: <https://doi.org/10.1088/1361-6463/aca775>
- ADCA10 ERNST, D. - KOLENČÍK, M.\*\* - ŠEBESTA, M. - ĎURIŠOVÁ, L. - ĎÚRANOVÁ, Hana - KŠIŇAN, S. - TOMOVIČOVÁ, L. - KOTLÁROVÁ, Nikola - KALÚZOVÁ, M. - ČERNÝ, I. - KRATOŠOVÁ, G. - ŽITNIAK ČURNÁ, V. - IVANIČ PORHAJAŠOVÁ, J. - BABOŠOVÁ, Mária - DOBROČKA, Edmund - QIAN, Y. - SWAMIAPPAN, S. - ILLA, R. - RADHAKRISHNAN, S.G. - SUNIL, B.R. - DUCSAY, L. Significance of phosphate nano-fertilizers foliar application: a brief real-field study of quantitative, physiological parameters, and agro-ecological diversity in sunflower. In Agronomy-Basel, 2023, vol. 13, no. 2606. (2022: 3.7 - IF, Q1 - JCR, 0.663 - SJR, Q1 - SJR). ISSN 2073-4395. Dostupné na: <https://doi.org/10.3390/agronomy13102606>
- ADCA11 ERNST, D.\*\* - KOLENČÍK, M. - ŠEBESTA, M. - ĎURIŠOVÁ, L. - ĎÚRANOVÁ, Hana - KŠIŇAN, S. - ILLA, R. - ŠAFÁRIK, Ivo - KRATOŠOVÁ, G. - ŽITNIAK ČURNÁ, V. - IVANIČ PORHAJAŠOVÁ, J. - BABOŠOVÁ, Mária - FENG, H. - DOBROČKA, Edmund - BUJDOŠ, M. - ZELENÁ POSPISKOVÁ, K. - AFZAL, S. - SINGH, N.K. - SWAMIAPPAN, S. - AYDIN, Elena. Agronomic investigation of spray dispersion of metal-based nanoparticles on sunflowers in real-world environments. In Plants, 2023, vol. 12, no. 1789. (2022: 4.5 - IF, Q1 - JCR, 0.79 - SJR, Q1 - SJR). ISSN 2223-7747. Dostupné na:



- <https://doi.org/10.3390/plants12091789>
- ADCA12 FEILHAUER, Juraj\*\* - TÓBIK, Jaroslav - ŠOLTÝS, Ján - CAMBEL, Vladimír. Numerical characterization of magnetic vortex probe imaging for magnetic force microscopy. In IEEE Transactions on Magnetism, 2023, vol. 59, no. 6, art. no. 6500210. (2022: 2.1 - IF, Q3 - JCR, 0.664 - SJR, Q2 - SJR). ISSN 0018-9464. Dostupné na: <https://doi.org/10.1109/TMAG.2023.3260975> (APVV 19-0311. VEGA 2/0177/21)
- ADCA13 FEILHAUER, Juraj - ZELENT, M. - ZHANG, Z. - CHRISTENSEN, J. - MRUCZKIEWICZ, Michal\*\*. Unidirectional spin-wave edge modes in magnonic crystal. In APL Materials, 2023, vol. 11, no. 021104. (2022: 6.1 - IF, Q1 - JCR, 1.662 - SJR, Q1 - SJR). ISSN 2166-532X. Dostupné na: <https://doi.org/10.1063/5.0134099> (APVV 19-0311. VEGA 2/0177/21)
- ADCA14 FRACASSO, M.\*\* - GÖMÖRY, Fedor - SOLOVYOV, Mykola - GERBALDO, R. - GHIGO, G. - LAVIANO, F. - SPARACIO, S. - TORSELLO, D. - GOZZELINO, L. Numerical study on flux-jump occurrence in a cup-shaped MgB2 bulk for magnetic shielding applications. In Superconductor Science and Technology, 2023, vol. 36, no. 044001. (2022: 3.6 - IF, Q2 - JCR, 1.191 - SJR, Q1 - SJR). ISSN 0953-2048. Dostupné na: <https://doi.org/10.1088/1361-6668/acbac5> (VEGA 2/0036/21)
- ADCA15 GÁL, Norbert - HRUBČÍN, Ladislav - ŠAGÁTOVÁ, A. - VANKO, Gabriel - KOVÁČOVÁ, Eva - ZÁTKO, Bohumír\*\*. High-resolution alpha-particle detector based on Schottky barrier 4H-SiC detector operated at elevated temperatures up to 500 °C. In Applied Surface Science, 2023, vol. 635, art. no. 157708. (2022: 6.7 - IF, Q1 - JCR, 1.187 - SJR, Q1 - SJR). ISSN 0169-4332. Dostupné na: <https://doi.org/10.1016/j.apsusc.2023.157708> (APVV 18-0243. APVV 18-0273)
- ADCA16 GIANNAZZO, F.\*\* - PANASCI, S.E. - SCHILIRÒ, E. - FIORENZA, P. - GRECO, G. - ROCCAFORTE, F. - CANNAS, M. - AGNELLO, S. - KOOS, A. - PÉCZ, B. - ŠPANKOVÁ, Marianna - CHROMIK, Štefan. Highly homogeneous 2D/3D heterojunction diodes by pulsed laser deposition of MoS2 on ion implantation doped 4H-SiC. In Advanced Materials Interfaces, 2023, vol. 10, no. 2201502. (2022: 5.4 - IF, Q2 - JCR, 1.315 - SJR, Q1 - SJR). ISSN 2196-7350. Dostupné na: <https://doi.org/10.1002/admi.202201502>
- ADCA17 GÖMÖRY, Fedor\*\* - ŠOUC, Ján - GODÁR, Michal - HINTZE, Carl, Dr. - GROSSE, V. Analysis of critical current fluctuations as a means of checking the quality of high-temperature superconductor tape slitting. In Superconductor Science and Technology, 2023, vol. 36, art. no. 054001. (2022: 3.6 - IF, Q2 - JCR, 1.191 - SJR, Q1 - SJR). ISSN 0953-2048. Dostupné na: <https://doi.org/10.1088/1361-6668/acb73f>
- ADCA18 GÖMÖRY, Fedor\*\* - ŠOUC, Ján - GODÁR, Michal. Limitation of current transport in coated conductors: statistical fluctuations or weak spots? In IEEE Transactions on Applied Superconductivity, 2023, vol. 33, no. 8000105. (2022: 1.8 - IF, Q3 - JCR, 0.536 - SJR, Q2 - SJR). ISSN 1051-8223. Dostupné na: <https://doi.org/10.1109/TASC.2022.3233805>
- ADCA19 GUCMANN, Filip\*\* - NÁDAŽDY, Peter - HUŠEKOVÁ, Kristína - DOBROČKA, Edmund - PRIESOL, J. - EGYENES, Fridrich - ŠATKA, A. - ROSOVÁ, Alica - ĽAPAJNA, Milan. Thermal stability of rhombohedral  $\alpha$ - and monoclinic  $\beta$ -Ga2O3 grown on sapphire by liquid-injection MOCVD. In Materials science in semiconductor processing, 2023, vol. 156, no. 107289. (2022: 4.1 - IF, Q2 - JCR, 0.688 - SJR, Q1 - SJR). ISSN 1369-8001. Dostupné na: <https://doi.org/10.1016/j.mssp.2022.107289>
- ADCA20 HASENÖHRL, Stanislav - BLAHO, Michal - DOBROČKA, Edmund - GUCMANN, Filip - KUČERA, Michal - NÁDAŽDY, Peter - STOKLAS, Roman - ROSOVÁ, Alica - KUZMÍK, Ján\*\*. Growth of N-polar In-rich InAlN by metal



- organic chemical vapor deposition on on- and off-axis sapphire. In Materials science in semiconductor processing, 2023, vol. 156, no. 107290. (2022: 4.1 - IF, Q2 - JCR, 0.688 - SJR, Q1 - SJR). ISSN 1369-8001. Dostupné na: <https://doi.org/10.1016/j.mssp.2022.107290>
- ADCA21 HOFER, C. - MUSTONEN, K. - SKÁKALOVÁ, Viera - PENNYCOOK, T.J.\*\*. Picometer-precision few-tilt ptychotomography of 2D materials. In 2D Materials, 2023, vol. 10, no. 035029. (2022: 5.5 - IF, Q2 - JCR, 1.631 - SJR, Q1 - SJR). ISSN 2053-1583. Dostupné na: <https://doi.org/10.1088/2053-1583/acdd80>
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#### GHG Práce zverejnené spôsobom umožňujúcim hromadný prístup

- GHG01 PARDO, Enric - GRILLI, F. - REIS, T. AC loss modeling of the stator of a 1 MW REBCO superconducting motor for aviation. In 7th International Workshop on Numerical Modelling of High Temperature Superconductors : 22nd to 23rd, 2021,



Virtual (Nancy, France). Dostupné na internete: <https://hal.archives-ouvertes.fr/hal-03295724>

**Citácie:**

1. [1.1] WROBEL, R. *A technology overview of thermal management of integrated motor drives-Electrical Machines. In THERMAL SCIENCE AND ENGINEERING PROGRESS. ISSN 2451-9049, MAR 1 2022, vol. 29. Dostupné na: <https://doi.org/10.1016/j.tsep.2022.101222>., Registrované v: WOS*



## **Príloha A-4**

### **Údaje o pedagogickej činnosti organizácie**

#### Semestrálne prednášky:

doc. RNDr. Edmund Dobročka, CSc.

Názov semestr. predmetu: Fyzika tuhých látok

Počet hodín za semester: 16

Názov katedry a vysokej školy: Fakulta elektrotechniky a informatiky STU, ÚJFI

doc. Ing. Fedor Gömöry, DrSc.

Názov semestr. predmetu: Elektromagnetické prvky a systémy

Počet hodín za semester: 4

Názov katedry a vysokej školy: Fakulta elektrotechniky a informatiky STU, ÚE

Ing. Ján Šoltýs, PhD

Názov semestr. predmetu: Nanotechnológie

Počet hodín za semester: 2

Názov katedry a vysokej školy: Fakulta elektrotechniky a informatiky STU, ÚJFI

Ing. Jaroslav Tóvik, PhD.

Názov semestr. predmetu: Fyzika 2

Počet hodín za semester: 24

Názov katedry a vysokej školy: Fakulta elektrotechniky a informatiky STU, ÚJFI

#### Semestrálne cvičenia:

Ing. Lubomír Frolek

Názov semestr. predmetu: Elektromagnetické prvky a systémy

Počet hodín za semester: 4

Názov katedry a vysokej školy: Fakulta elektrotechniky a informatiky STU, ÚE

RNDr. Dagmar Gregušová, DrSc.

Názov semestr. predmetu: Praktikum FTL

Počet hodín za semester: 14

Názov katedry a vysokej školy: Fakulta matematiky, fyziky a informatiky UK, Katedra experimentálnej fyziky

Ing. Tomáš Kujovič, PhD.

Názov semestr. predmetu: Elektromagnetické prvky a systémy

Počet hodín za semester: 4

Názov katedry a vysokej školy: Fakulta elektrotechniky a informatiky STU, ÚE

Ing. Marek Mošat', PhD.

Názov semestr. predmetu: Elektromagnetické prvky a systémy

Počet hodín za semester: 4

Názov katedry a vysokej školy: Fakulta elektrotechniky a informatiky STU, ÚE

Ing. Marek Mošat', PhD.

Názov semestr. predmetu: Supravodivosť



Počet hodín za semester: 2

Názov katedry a vysokej školy: Fakulta elektrotechniky a informatiky STU, ÚJFI

Ing. Ondrej Pohorelec, PhD.

Názov semestr. predmetu: Praktikum FTL

Počet hodín za semester: 13

Názov katedry a vysokej školy: Fakulta matematiky, fyziky a informatiky UK, Katedra experimentálnej fyziky

Mgr. Mykola Soloviov, PhD.

Názov semestr. predmetu: Elektromagnetické prvky a systémy

Počet hodín za semester: 4

Názov katedry a vysokej školy: Fakulta elektrotechniky a informatiky STU, ÚE

Ing. Ján Šoltýs, PhD

Názov semestr. predmetu: Nanotechnológie

Počet hodín za semester: 2

Názov katedry a vysokej školy: Fakulta elektrotechniky a informatiky STU, ÚJFI

#### Individuálne prednášky:

Ing. Gabriel Vanko, PhD.

Názov semestr. predmetu: MEMS – inteligentné senzory a aktuátory

Počet hodín za semester: 2

Názov katedry a vysokej školy: Fakulta elektrotechniky a informatiky STU, Ústav automobilovej mechatroniky



**Príloha A-5****Medzinárodná mobilita organizácie****(A) Vyslanie vedeckých pracovníkov do zahraničia na základe dohôd:**

| Krajina  | D r u h d o h o d y |           |                 |           |                        |           |
|----------|---------------------|-----------|-----------------|-----------|------------------------|-----------|
|          | MAD, KD, VTS        |           | Medziústavná    |           | Ostatné                |           |
|          | Meno pracovníka     | Počet dní | Meno pracovníka | Počet dní | Meno pracovníka        | Počet dní |
| Belgicko |                     |           |                 |           | Anang Dadhich          | 45        |
|          |                     |           |                 |           | Ján Kuzmík             | 6         |
| Česko    |                     |           |                 |           | Ján Fedor              | 1         |
|          |                     |           |                 |           | Lubomír Frolek         | 1         |
|          |                     |           |                 |           | Filip Gucmann          | 7         |
|          |                     |           |                 |           | Peter Hutár            | 1         |
|          |                     |           |                 |           | Peter Hutár            | 2         |
|          |                     |           |                 |           | Tibor Izsák            | 4         |
|          |                     |           |                 |           | Tibor Izsák            | 5         |
|          |                     |           |                 |           | Javad Keshtar          | 7         |
|          |                     |           |                 |           | Lenka Pribusová Slušná | 2         |
|          |                     |           |                 |           | Lenka Pribusová Slušná | 1         |
|          |                     |           |                 |           | Ján Šoltýs             | 1         |
|          |                     |           |                 |           | Ján Šoltýs             | 1         |
|          |                     |           |                 |           | Gabriel Vanko          | 5         |
|          |                     |           |                 |           | Gabriel Vanko          | 4         |
|          |                     |           |                 |           | Gabriel Vanko          | 1         |
| Čína     |                     |           |                 |           | Marian Varga           | 7         |
|          |                     |           |                 |           | Marian Varga           | 10        |
|          |                     |           |                 |           | Marian Varga           | 10        |
|          |                     |           |                 |           | Bohumír Zaťko          | 3         |
|          |                     |           |                 |           | Bohumír Zaťko          | 3         |
|          |                     |           |                 |           | Filip Gucmann          | 14        |
|          |                     |           |                 |           | Fedor Hrubíšák         | 14        |



|            |  |  |  |  |                           |    |
|------------|--|--|--|--|---------------------------|----|
| Dánsko     |  |  |  |  | Fedor Gömöry              | 4  |
|            |  |  |  |  | Tomáš Kujovič             | 4  |
|            |  |  |  |  | Mykola Soloviov           | 4  |
| Francúzsko |  |  |  |  | Ghazaleh Esmaeili Dehaghi | 6  |
|            |  |  |  |  | Zdenko Zápražný           | 6  |
| Grécko     |  |  |  |  | Michal Blaho              | 4  |
|            |  |  |  |  | Michal Blaho              | 4  |
|            |  |  |  |  | Ján Kuzmík                | 4  |
|            |  |  |  |  | Ján Kuzmík                | 9  |
| Holandsko  |  |  |  |  | Anang Dadhich             | 2  |
|            |  |  |  |  | Michal Mruczkiewicz       | 6  |
|            |  |  |  |  | Enric Pardo               | 2  |
|            |  |  |  |  | Enric Pardo               | 2  |
|            |  |  |  |  | Eugen Seiler              | 9  |
|            |  |  |  |  | Arpit Kumar Srivastava    | 2  |
| Japonsko   |  |  |  |  | Ján Kuzmík                | 12 |
| Nemecko    |  |  |  |  | Michal Blaho              | 2  |
|            |  |  |  |  | Dagmar Gregušová          | 3  |
|            |  |  |  |  | Dagmar Gregušová          | 2  |
|            |  |  |  |  | Arif Hussain              | 90 |
|            |  |  |  |  | Ján Kováč                 | 3  |
|            |  |  |  |  | Ján Kuzmík                | 3  |
|            |  |  |  |  | Ján Kuzmík                | 2  |
|            |  |  |  |  | Marek Mošat'              | 3  |
|            |  |  |  |  | Ondrej Pohorelec          | 2  |
|            |  |  |  |  | Tomáš Ščepka              | 5  |
| Nórsko     |  |  |  |  | Peter Hutár               | 17 |
| Poľsko     |  |  |  |  | Štefan Chromik            | 5  |
|            |  |  |  |  | Michal Mruczkiewicz       | 3  |
|            |  |  |  |  | Marianna                  | 5  |



|                                |  |  |  |  |                      |            |
|--------------------------------|--|--|--|--|----------------------|------------|
|                                |  |  |  |  | Španková             |            |
| Španielsko                     |  |  |  |  | Fedor<br>Hrubíšák    | 7          |
|                                |  |  |  |  | Hemendra<br>Chouhan  | 7          |
| Taiwan                         |  |  |  |  | Vladimír<br>Cambel   | 6          |
|                                |  |  |  |  | Jana Hrdá            | 13         |
|                                |  |  |  |  | Martin<br>Hulman     | 13         |
|                                |  |  |  |  | Michaela<br>Sojková  | 13         |
|                                |  |  |  |  | Milan<br>Ťapajna     | 6          |
|                                |  |  |  |  | Milan<br>Ťapajna     | 6          |
| Taliansko                      |  |  |  |  | Michal<br>Blaho      | 6          |
|                                |  |  |  |  | Michal<br>Blaho      | 4          |
|                                |  |  |  |  | Fedor<br>Gömöry      | 3          |
|                                |  |  |  |  | Dagmar<br>Gregušová  | 4          |
|                                |  |  |  |  | Martin<br>Hulman     | 10         |
|                                |  |  |  |  | Štefan<br>Chromik    | 5          |
|                                |  |  |  |  | Peter<br>Kotrusz     | 10         |
|                                |  |  |  |  | Ján Kuzmík           | 4          |
|                                |  |  |  |  | Eugen Seiler         | 5          |
|                                |  |  |  |  | Viera<br>Skákalová   | 10         |
|                                |  |  |  |  | Marianna<br>Španková | 5          |
| Turecko                        |  |  |  |  | Anang<br>Dadhich     | 11         |
| USA                            |  |  |  |  | Ján Fedor            | 31         |
|                                |  |  |  |  | Marián<br>Precner    | 31         |
| Veľká<br>Británia              |  |  |  |  | Enric Pardo          | 2          |
|                                |  |  |  |  | Viera<br>Skákalová   | 3          |
| <b>Počet<br/>vyslaní spolu</b> |  |  |  |  | <b>78</b>            | <b>595</b> |



**(B) Prijatie vedeckých pracovníkov zo zahraničia na základe dohôd:**

| Krajina                    | D r u h d o h o d y |           |                 |           |                 |            |
|----------------------------|---------------------|-----------|-----------------|-----------|-----------------|------------|
|                            | MAD, KD, VTS        |           | Medziústavná    |           | Ostatné         |            |
|                            | Meno pracovníka     | Počet dní | Meno pracovníka | Počet dní | Meno pracovníka | Počet dní  |
| Bolívia                    |                     |           |                 |           | Sajes L.        | 60         |
| Česko                      |                     |           |                 |           | Kromka A.       | 9          |
|                            |                     |           |                 |           | Potocký Š.      | 2          |
| Čína                       |                     |           |                 |           | Yuan C.         | 14         |
| Dánsko                     |                     |           |                 |           | Brock M.        | 35         |
| Francúzsko                 |                     |           |                 |           | Lyoussi A.      | 1          |
|                            |                     |           |                 |           | Romain A.       | 60         |
| Japonsko                   |                     |           |                 |           | Méhes G.        | 3          |
| Nemecko                    |                     |           |                 |           | Elschner S.     | 2          |
|                            |                     |           |                 |           | Fabian J.       | 2          |
|                            |                     |           |                 |           | Kudymov A.      | 2          |
|                            |                     |           |                 |           | Räch C.         | 2          |
| Poľsko                     |                     |           |                 |           | Gierlowski P.   | 8          |
|                            |                     |           |                 |           | Zajcewa I.      | 8          |
| Španielsko                 |                     |           |                 |           | Puig T.         | 2          |
| Taiwan                     |                     |           |                 |           | Lin J.-Y.       | 3          |
| USA                        |                     |           |                 |           | Novosad V.      | 2          |
| <b>Počet prijatí spolu</b> |                     |           |                 |           | <b>17</b>       | <b>215</b> |

**(C) Účasť pracovníkov pracoviska na konferenciách v zahraničí (nezahrnutých v "A"):**

| Krajina    | Názov konferencie | Meno pracovníka        | Počet dní |
|------------|-------------------|------------------------|-----------|
| Česko      | Flatlands 2023    | Dagmar Gregušová       | 5         |
|            |                   | Ondrej Pohorelec       | 5         |
|            |                   | Michaela Sojková       | 5         |
|            | NANOCON 2023      | Marian Varga           | 4         |
|            |                   | Bohumír Zaťko          | 4         |
|            | SPM               | Ján Šoltýs             | 2         |
| Francúzsko | MT-28             | Anang Dadhich          | 6         |
|            |                   | Fedor Gömöry           | 7         |
|            |                   | Arpit Kumar Srivastava | 6         |
|            | WESD 2023         | Viera Skákalová        | 4         |
| Japonsko   | ICNS-14           | Michal Blaho           | 10        |
|            |                   | Dagmar Gregušová       | 10        |
|            |                   | Ján Kuzmík             | 10        |
|            |                   | Roman Stoklas          | 10        |
|            | IMFEDK 2023       | Milan Ťapajna          | 7         |
| Nemecko    | SALVE 2D23        | Viera Skákalová        | 4         |
|            | SQHE              | Viera Skákalová        | 2         |
|            | SSESAPA           | Fedor Gömöry           | 3         |
| Nórsko     | iWORID 2023       | Bohumír Zaťko          | 5         |
| Poľsko     | E-MRS 2023        | Fridrich Egyenes       | 5         |
|            |                   | Filip Gucmann          | 5         |
|            |                   | Hemendra Chouhan       | 5         |
|            | NANOMAT 2023      | Viera Skákalová        | 5         |



|              |                            |                        |            |
|--------------|----------------------------|------------------------|------------|
| Portugalsko  | OPAL' 2023                 | Jozef Novák            | 5          |
| Rakúsko      | ESS 2023                   | Gabriel Vanko          | 4          |
|              | IWEPNM 2023                | Martin Hulman          | 7          |
|              |                            | Lenka Pribusová Slušná | 7          |
|              |                            | Tatiana Vojteková      | 7          |
| Španielsko   | AFM                        | Ján Šoltýs             | 3          |
| Švajčiarsko  | HiTAT                      | Fedor Gömöry           | 4          |
| Taliansko    | ANIMMA 2023                | Bohumír Zaťko          | 6          |
|              | EUCAS 2023                 | Marek Búran            | 5          |
|              |                            | Anang Dadhich          | 5          |
|              |                            | Fedor Gömöry           | 5          |
|              |                            | Arif Hussain           | 5          |
|              |                            | Ján Kováč              | 5          |
|              |                            | Pavol Kováč            | 5          |
|              |                            | Martin Kucharovič      | 5          |
|              |                            | Tomáš Kujovič          | 5          |
|              |                            | Marek Mošat'           | 5          |
|              |                            | Rastislav Ries         | 5          |
|              |                            | Mykola Soloviov        | 5          |
|              |                            | Arpit Kumar Srivastava | 5          |
|              | MEMRISYS 2023              | Boris Hudec            | 5          |
|              | WOCSDICE -<br>EXMATEC 2023 | Jozef Novák            | 5          |
| USA          | MRS SP 2023                | Martin Hulman          | 6          |
| <b>Spolu</b> | <b>23</b>                  | <b>46</b>              | <b>248</b> |

*Vysvetlivky: MAD - medziakademické dohody, KD - kultúrne dohody, VTS - vedecko-technická spolupráca v rámci vládnych dohôd*

#### Skratky použité v tabuľke C:

AFM - 9th Multifrequency AFM Conference  
ANIMMA 2023 - 8th International Conference on Advancements in Nuclear Instrumentation Measurement Methods and their Applications  
E-MRS 2023 - European Materials Research Society Fall Meeting 2023  
ESS 2023 - 6th Erwin Schrödinger Symposium 2023  
EUCAS 2023 - 16th European Conference on Applied Superconductivity  
Flatlands 2023 - Flatlands beyond Graphene 2023  
HiTAT - 1st High Temperature Superconductor Accelerator Technology workshop  
ICNS-14 - 14th International Conference on Nitride Semiconductors 2023  
IMFEDK 2023 - International Meeting for Future of Electron Devices 2023  
IWEPNM 2023 - International Winterschool on Electronic Properties of Novel Materials  
iWORID 2023 - International Workshops on Radiation Imaging Detectors  
MEMRISYS 2023 - 6th International Conference on Memristive Materials, Devices & Systems  
MRS SP 2023 - MRS Spring Meeting & Exhibit  
MT-28 - International Conference on Magnet Technology  
NANOCON 2023 - 16. ročník mezinárodní konference nanomateriálů - výzkum & aplikace  
NANOMAT 2023 - International Conference on Functional Nanomaterials and Nanodevices  
OPAL' 2023 - 6th International Conference on Optics, Photonics and Lasers  
SALVE 2D23 - SALVE 2D23 Symposium  
SPM - SPM workshop 2023  
SQHE - Symposium Quantum Hall Effects and Related Topics  
SSESAPA - Superconductivity for Sustainable Energy Systems and Particle Accelerators  
WESD 2023 - 6th Workshop on Electron and Spin Dynamics  
WOCSDICE - EXMATEC 2023 - 46th Workshop on Compound Semiconductor Devices and Integrated Circuits held in Europe 17th Expert Evaluation and Control of Compound Semiconductor Materials and Technologies



**Príloha A-6****Vedecko-popularizačná činnosť pracovníkov organizácie**

| <b>Meno</b>                   | <b>Spoluautori</b>   | <b>Typ<sup>1</sup></b> | <b>Názov</b>  | <b>Miesto zverejnenia</b> | <b>Dátum alebo počet za rok</b> |
|-------------------------------|--|------------------------|---|---------------------------|---------------------------------|
| Mgr. Fridrich Egyenes, PhD.   |  | TL                     | Elektróny v polovodičoch  | Quark                     | 23.11.2023                      |
| doc. Ing. Fedor Gömöry, DrSc. |  | TV                     | Experiment (Supravodivosť a supertekutosť)                              | RTVS                      | 23.10.2023                      |
| doc. Ing. Fedor Gömöry, DrSc. |  | TL                     | Vedci sa pri supravodičoch pomýlili už druhýkrát                        | Denník N                  | 31.8.2023                       |
| Ing. Filip Guemann, PhD.      |  | iné                    | Dni príležitostí  | Žilina                    | 22.3.2023                       |
| Ing. Filip Guemann, PhD.      | F. Egyenes   | iné                    | Dni príležitostí  | Bratislava                | 7.11.2023                       |
| Ing. Filip Guemann, PhD.      | M. Bennár, M. Blaho, F. Egyenes, L. Frolek, J. Hrdá, F. Hrubíšák, T. Kujovič, M. Mošat', M. Pécz, O. Pohorelec, M. Precner, M. Sojková, M. Ťapajna, G. Vanko, R. Ries, P. Šichman, J. Tóvik, B. Zát'ko | iné                    | Víkend so SAV   | Bratislava                | 23.6.2023                       |
| Ing. Filip Guemann, PhD.      | M. Bennár, M. Blaho, L. Frolek, J. Hrdá, F. Hrubíšák, P. Hutár, T. Kujovič, M. Mošat', M. Pécz, O. Pohorelec, M. Talacko, G. Vanko, J. Keshtar   | iné                    | Európska Noc výskumníkov  | Bratislava                | 13.11.2023                      |
| Ing. Fedor Hrubíšák           |  | PB                     | Prezentácia technológie prípravy polovodičových súčiastok pre študentov | ÚJFI FEI STU SAV          | 13.12.2023                      |
| Ing. Marek Mošat', PhD.       |  | iné                    | Dni príležitostí  | Košice                    | 21.4.2023                       |
| Ing. Ondrej Pohorelec, PhD.   | J. Hrdá  | iné                    | Dni príležitostí  | Bratislava                | 4.4.2023                        |
| Ing. Ondrej Pohorelec, PhD.   | M. Mošat'  | iné                    | Deň otvorených dverí na FEI STU   | Bratislava                | 27.1.2023                       |



|                                 |   |    |  |                            |           |
|---------------------------------|---|----|--|----------------------------|-----------|
| Ing. Rastislav Ries,<br>PhD.    |   | TL | (Ne)dosiahnuteľná<br>supravodivosť         | Quark                      | 1.12.2023 |
| RNDr. Marianna<br>Španková, PhD | Blaho M.,<br>Búran M.,<br>Bennár M.,<br>Dobročka E.,<br>Eliáš P., Frolek<br>L., Gömöry F.,<br>Gregušová D.,<br>Hutár P., Kováč<br>J., Kováčová E.,<br>Melíšek T.,<br>Mošat' M., Pecz<br>M., Pohorelec<br>O., Pribusová L.,<br>Precner M., Ries<br>R., Rosová A.,<br>Seiler E., Ščepka<br>T., Šoltýs J.,<br>Ťapajna, M.,<br>Vojteková T. | EX | Deň otvorených dverí                       | EIÚ SAV                    | 9.11.2023 |
| Ing. Milan Ťapajna,<br>PhD.     |   | IN | Zdravotné riziká 5G<br>sietí sú jasný hoax | SME-Vedecký<br>podcast SAV | 7.4.2023  |

<sup>1</sup> PB - prednáška/beseda, TL - tlač, TV - televízia, RO - rozhlas, IN - internet, EX - exkurzia, PU - publikácia, MM - multimédiá, DO - dokumentárny film



## **Príloha A-7**

### **Vyznamenania, ceny a iné ocenenia udelené organizácii a jej pracovníkom v roku 2023**

#### **Domáce ocenenia**

##### **Ocenenia SAV**

###### **Egyenes Fridrich**

Súťaž doktorandov a mladých vedeckých pracovníkov do 35 rokov

*Oceňovateľ: SAV*

*Opis: 1. miesto (1. odd.)*

###### **Hrdá Jana**

Súťaž doktorandov a mladých vedeckých pracovníkov do 35 rokov

*Oceňovateľ: SAV*

*Opis: 3. miesto (1. odd.)*

###### **Hulman Martin**

Špičková publikácia SAV, časopisy s vysokým IF

*Oceňovateľ: SAV*

###### **Kotrusz Peter**

Špičková publikácia SAV, časopisy s vysokým IF

*Oceňovateľ: SAV*

###### **Ries Rastislav**

Súťaž doktorandov a mladých vedeckých pracovníkov do 35 rokov

*Oceňovateľ: SAV*

*Opis: 3. miesto*

###### **Skákalová Viera**

Špičková publikácia SAV, časopisy s vysokým IF

*Oceňovateľ: SAV*

###### **Vetrova Iuliia**

Súťaž doktorandov a mladých vedeckých pracovníkov do 35 rokov

*Oceňovateľ: SAV*

*Opis: Čestné uznanie*

#### **Iné domáce ocenenia**

###### **Gömöry Fedor**

Štátna cena Jozefa Miloslava Hurbana

*Oceňovateľ: NR SR*

#### **Medzinárodné ocenenia**

*Uvádzajte v štruktúre: názov ocenenia, udeľujúca inštitúcia, meno a priezvisko ocenennej osoby.*



## **ČASŤ B**



**[ Elektrotechnický ústav SAV, v. v. i. ]**

**Výroční správa o hospodárení organizácie  
za rok 2023**



## 19. Rámcové informácie o hospodárení organizácie

Informácia o zmenách zakladacej listiny, vnútorných predpisov verejnej výskumnej inštitúcie alebo vnútorných predpisov zakladateľa podľa § 38 ods. 1,

### Zmeny zakladacej listiny

Elektrotechnický ústav Slovenskej akadémie vied vznikol v roku 1956 z elektrotechnického oddelenia laboratória pre výskum a konštrukciu meracích a fyzikálnych prístrojov. Uznesením Predsedníctva Slovenskej akadémie vied č. 510 zo dňa 25.2.1980 bol Elektrotechnický ústav Slovenskej akadémie vied s účinnosťou od 1.1.1981 združený do Centra elektro-fyzikálneho výskumu Slovenskej akadémie vied, z ktorého sa s účinnosťou od 1.1.1990 na základe uznesenia Predsedníctva Slovenskej akadémie vied č. 287 zo dňa 14.12.1989 osamostatnil. Uznesením Predsedníctva Slovenskej akadémie vied č. 172 zo dňa 17.12.1992 s účinnosťou od 1.1.1993 bola schválená zmena formy financovania Elektrotechnického ústavu Slovenskej akadémie vied z rozpočtovej na príspevkovú.

Na základe § 21a ods. 1 zákona o akadémii a zakladacej listiny verejnej výskumnej inštitúcie vydané Slovenskou akadémiou vied podľa § 21a ods. 2 písm. a) zákona o akadémii sa Elektrotechnický ústav Slovenskej akadémie vied dňom 1.7.2018 stal verejnou výskumnou inštitúciou. Dňa 10.9.2018 Ministerstvo školstva, vedy, výskumu a športu Slovenskej republiky vydalo rozhodnutie číslo 2018/11372:4-01CC, ktorým zastavilo konanie o zápis organizácií Slovenskej akadémie vied do registra verejných výskumných inštitúcií. Dňa 26.9.2018 nadobudol účinnosť zákon č. 270/2018 Z. z., ktorým sa menil a dopĺňal o. i. aj zákon o akadémii; podľa § 21b ods. 1 a 2 zákona o akadémii v znení zákona č. 270/2018 Z. z. sa organizácie Slovenskej akadémie vied odo dňa 26. 9.2018 opätovne stali rozpočtovými alebo príspevkovými organizáciami.

Dňa 5.10.2021 nadobudol účinnosť zákon č. 347/2021 Z. z., ktorým sa menil a dopĺňal zákon o akadémii a geologický zákon; podľa § 21aa ods. 1 zákona o akadémii v znení zákona č. 347/2021 Z. z. organizácie Slovenskej akadémie vied menia 1.1.2022 právnu formu na verejné výskumné inštitúcie. Na základe § 21aa ods. 1 zákona o akadémii a na základe zakladacej listiny číslo: 00384/2022 sa právna forma Elektrotechnického ústavu Slovenskej akadémie vied zmenila zo štátnej príspevkovej organizácie na verejnú výskumnú inštitúciu (ďalej len v.v.i.).

### Zmeny vnútorných predpisov:

V. v. i. vydala vnútorné predpisy pri vzniku, účinné od 1.1.2022. V priebehu roka 2023 sa nemenili. Všetky tieto dokumenty je možné nájsť na webovej stránke ústavu:

<http://www.elu.sav.sk/o-nas/zakladne-dokumenty/dokumenty-ustavu/>

Informácia o zložení orgánov, o zmenách v ich zložení a o ich činnosti

Zloženie jednotlivých orgánov a ich obsadenie je uvedené na webovej stránke ústavu

<http://www.elu.sav.sk/o-nas/organizacna-struktura/>. Taktiež informácie o členoch orgánov uvádzame aj v Poznámkach k účtovnej závierke.

Činnosť SR a VR EIÚ SAV v.v.i. je zdokumentovaná v jednotlivých zápisniciach z ich zasadnutí.

**Činnosť Správnej rady EIÚ SAV, v.v.i.**

Správna rada EIÚ SAV, v.v.i. v roku 2023 zasadala 6 krát.

**Činnosť Vedeckej rady EIÚ SAV, v.v.i.**

Vedecká rada EIÚ SAV, v.v.i. v roku 2023 zasadala 6 krát.

Opis činností, na účel ktorej bola inštitúcia zriadená:

Prevažujúcou hlavnou činnosťou inštitúcie je uskutočňovanie výskumu v odboroch vedy a techniky (ďalej tiež „odbornosti“): Fyzika kondenzovaných látok a akustika (010304), Teoretická elektrotechnika (020201), Elektrické stroje a prístroje (020204), Elektrotechnológie a materiály (020205), Elektroenergetika (020210), Mikroelektronika (020211), Optoelektronika (020212), Senzorika (020216), Fyzikálne inžinierstvo (020404), Nanomateriály (021 1 0 I) a Nanoelektronika (02 1 1 03).



Ďalšími hlavnými činnosťami inštitúcie sú:

- a) zabezpečovanie a správa infraštruktúry výskumu a vývoja,
- b) získavanie, spracúvanie a šírenie informácií z oblasti vedy a techniky a poznatkov z vlastného výskumu a vývoja organizácie,
- c) podieľanie sa v spolupráci s vysokou školou na uskutočňovaní študijných programov tretieho stupňa vysokoškolského štúdia,
- d) spolupráca v oblasti vedy a techniky s vysokými školami, ostatnými právnickými osobami uskutočňujúcimi výskum a vývoj.

### 19.1. Výdavky organizácie

Tabuľka 19a Výdavky organizácie (skutočnosť k 31. 12. 2023 v €)

| Typ organizácie (RO, PO)                |              | Zdroje, z ktorých sa kryli jednotlivé výdavky |                             |                |                         |
|---|--------------|---|-----------------------------|----------------|-------------------------|
| Výdavky                                 | Spolu        | kapitola SAV (111)                            | iné štátne a verejné zdroje | ostatné zdroje | % krytia z kapitoly SAV |
| <b>1. Bežné výdavky</b>                 | 4 651 818,87 | 2 909 425,19                                  | 1 210 500,15                | 531 893,53     | 62,54                   |
| z toho: mzdy (610)                      | 2 309 276,01 | 1 784 522,50                                  | 354 726,18                  | 170 027,33     | 77,28                   |
| vedecká výchova štipendiá (640)         | 141 034,70   | 127 922,40                                    | 179,00                      | 12 933,30      | 90,70                   |
| poistné a príspevok do poisťovní (620)  | 807 174,10   | 628 152,00                                    | 119 172,73                  | 59 849,37      | 77,82                   |
| tovary a služby (630)                   | 927 100,06   | 362 996,29                                    | 349 952,09                  | 214 151,68     | 39,15                   |
| transfery partnerom projektov (640)     | 466 402,00   | 5 000,00                                      | 386 470,15                  | 74 931,85      | 1,07                    |
| <b>2. Kapitálové výdavky</b>            | 119 876,25   | 88 156,49                                     |                             | 31 719,76      | 73,54                   |
| z toho: obstarávanie kapitálových aktív | 119 876,25   | 88 156,49                                     |                             | 31 719,76      | 73,54                   |
| kapitálové transfery                    |              |   |                             |                |                         |



## 19.2. Zdroje financovania organizácie

Tabuľka 19b Zdroje financovania organizácie (skutočnosť k 31. 12. 2023 v €)

| Typ organizácie (RO,PO)                       |              | Z toho kategórie  |                      |                                     |   |
|---|--------------|-------------------|----------------------|-------------------------------------|---|
| Zdroje  | Spolu        | Kapitálové zdroje | zdroje na mzdy (610) | zdroje na odvody do poisťovní (620) | zdroje na transfery partnerom projektov |
| <b>1. kapitola SAV (111)</b>                  | 3 009 292,68 | 99 867,49         |                      |                                     |   |
| z toho:<br>VEGA                               | 160 936,49   | 14 537,49         |                      |                                     |   |
| MVTS výskumné projekty                        | 115 393,56   | 44 330,00         |                      |                                     |   |
| MVTS podpora                                  | 5 876,26     |                   |                      |                                     |   |
| SASPRO/MOREPRO                                | 12 000,00    |                   |                      |                                     |   |
| Vydávanie časopisov                           |              |                   |                      |                                     |   |
| Mobility                                      | 3 814,64     |                   |                      |                                     |   |
| Vedecká výchova (štipendiá)                   | 132 762,40   |                   |                      |                                     |   |
| OTAS (630)                                    | 2 578 509,33 | 41 000,00         | 1 784 522,50         | 628 152,00                          |   |
| <b>2. ŠF EÚ vr. fin. zo ŠR</b>                | 533 389,75   |                   | 69 892,01            | 24 601,90                           | 269 103,13                              |
| <b>3. medzinárodné grantové projekty</b>      | 878 548,08   | 8 009,08          | 167 935,45           | 59 113,03                           |   |
| z toho H2020                                  | 781 692,76   | 8 009,08          | 143 709,80           | 50 585,61                           |   |
| <b>4. iné štátne a verejné zdroje (spolu)</b> | 892 511,62   |                   | 284 834,17           | 94 570,83                           | 109 854,00                              |
| z toho:<br>APVV                               | 604 654,45   |                   | 180 891,80           | 60 369,98                           | 109 854,00                              |
| podpora z kapitoly MŠVVaŠ SR (stimuly)        | 102 822,00   |                   | 54 954,72            | 16 957,83                           |   |
| <b>5. ostatné zdroje</b>                      | 597 024,85   | 23 710,68         | 2 091,88             | 736,34                              |   |
| z toho:<br>príjmy z prenájmu                  |              |                   |                      |                                     |   |
| príjmy z podnikateľskej činnosti              | 48 062,30    |                   | 2 091,88             | 736,34                              |   |
| príjmy z expertnej činnosti a služieb         | 230 707,65   | 23 710,68         |                      |                                     |   |

## 20. Ročná účtovná závierka

e) ročná účtovná závierka s uvedením informácie, či bola alebo nebola schválená dozornou radou,

Ročná účtovná závierka je uložená v Registri účtovných závierok.

Dozorná rada dňa 21.6.2024 v Bratislave schválila jednomyseľne ročnú účtovnú závierku za rok 2023 a nemá pripomienky k Výročnej správe. (Zápisnica DR EIÚ SAV č.3 z 21.6.2024)



## 21. Výrok štatutárneho audítora k ročnej účtovnej závierke

Štatutárny audit vykonal: Ing. Monika Király, 9. mája 44/7, 960 01 Zvolen, LICENCIA UDVA č.735

### „Názor

Uskutočnila som audit účtovnej závierky verejnej výskumnej inštitúcie Elektrotechnický ústav SAV, v. v. i., Dúbravská cesta 9,841 04 Bratislava, IČO: 00598429, ktorá obsahuje súvahu k 31. decembru 2023, výkaz ziskov a strát za rok končiaci sa k uvedenému dátumu a poznámky, ktoré obsahujú súhrn významných účtovných zásad a účtovných metód.

Podľa môjho názoru, priložená účtovná závierka poskytuje pravdivý a verný obraz finančnej situácie Elektrotechnického ústavu SAV, v. v. i. k 31. decembru 2023 a výsledku jeho hospodárenia za rok končiaci sa k uvedenému dátumu podľa zákona č.431/2002 Z. z. o účtovníctve v znení neskorších predpisov (ďalej len „zákon o účtovníctve“).

### Základ pre názor

Audit som vykonala podľa medzinárodných audítorských štandardov (International Standards on Auditing, ISA). Moja zodpovednosť podľa týchto štandardov je uvedená v odseku Zodpovednosť audítora za audit účtovnej závierky. Od Elektrotechnického ústavu SAV, v. v. i. som nezávislá podľa ustanovení zákona č. 423/2015 o štatutárnom audite a o zmene a doplnení zákona č. 431/2002 Z. z. o účtovníctve v znení neskorších predpisov (ďalej len „zákon o štatutárnom audite“) týkajúcich sa etiky, vrátane Etického kódexu audítora, relevantných pre môj audit účtovnej závierky a splnila som aj ostatné požiadavky týchto ustanovení týkajúcich sa etiky. Som presvedčená, že audítorské dôkazy, ktoré som získala, poskytujú dostatočný a vhodný základ pre môj názor.

### Iná skutočnosť

Účtovná závierka Elektrotechnického ústavu SAV, v. v. i. je auditovaná za rok 2023 v zmysle §26 ods.6 Zákona č.243/2017 o verejnej výskumnej inštitúcii ako prvý rok v štvorročnom cykle overenia účtovnej závierky štatutárnym audítorom.“

## 22. Prehľad príjmov a výdavkov

| Zdroj         |  | Program     | Príjmy              | Výdavky             |
|---------------|--|-------------|---------------------|---------------------|
| 111           | Rozpočtové prostriedky kapitoly                                  | NEALOKOVANÉ | 2 983 879,32        | 2 972 168,32        |
| 131M          | Rozpočtové prostriedky kapitoly z predchádzajúcich rokov         | NEALOKOVANÉ | 11 000,-            | 25 413,36           |
| 111           | Rozpočtové prostriedky kapitoly - APVV                           | 06K0G       | 599 681,-           | 591 970,58          |
| 131M          | Rozpočtové prostriedky kapitoly - APVV z predchádzajúcich rokov  | 06K0G       |                     | 4 973,45            |
| 111           | Rozpočtové prostriedky kapitoly - od iných subjektov Ver. Správy | 087010H     | 102 822,-           | 102 822,-           |
| 1AA1          | Európsky fond regionálneho rozvoja                               | NEALOKOVANÉ | 118 971,06          | 218 804,06          |
| 1AA2          | Spolufinancovanie EFRR   | NEALOKOVANÉ |                     | 11 745,07           |
| 3AA1          | EFRR z predchádzajúcich rokov                                    | NEALOKOVANÉ | 274 611,62          | 191 120,35          |
| 3AA2          | Spolufinancovanie EFRR z predchádzajúcich rokov                  | NEALOKOVANÉ | 20 966,33           | 14 134,42           |
| 3P01          | Plán obnovy z predchádzajúcich rokov                             | NEALOKOVANÉ | 179 645,78          | 74 169,38           |
| 3P02          | Plán obnovy DPH z predch. rokov                                  | NEALOKOVANÉ | 5 389,39            | 760,84              |
| 11GR          | Výskum, vývoj a inovácie – zahraničné granty                     | NEALOKOVANÉ | 428 798,78          | 176 297,28          |
| 13GR          | Výskum, vývoj a inovácie – zahraničné granty z predch. rokov     | NEALOKOVANÉ | 96 855,32           | 206 151,33          |
| 35            | Iné zdroje zo zahraničia   | NEALOKOVANÉ | 318 254,90          |                     |
| 46            | Iné zdroje vyššie neuvedené                                      | NEALOKOVANÉ | 234 285,61          | 181 164,68          |
| <b>SPOLU:</b> |  |             | <b>5 375 161,11</b> | <b>4 771 695,12</b> |



## 23. Pohyb a konečný stav majetku

| <b>Majetok:</b>           | <b>Prírastky</b>     | <b>Úbytky</b>        | <b>Konečný stav<br/>NETTO</b> |
|---------------------------|----------------------|----------------------|-------------------------------|
| <b>Neobežný majetok:</b>  | <b>119 876,25</b>    | <b>318 998,80</b>    | <b>1 602 863,28</b>           |
| dlhodobý nehmotný majetok | 4 200,-              |                      | 13 424,96                     |
| dlhodobý hmotný majetok   | 115 676,25           | 318 998,80           | 1 589 438,32                  |
| <b>Obežný majetok:</b>    | <b>10 036 650,30</b> | <b>10 309 097,88</b> | <b>2 270 532,88</b>           |
| Zásoby                    |                      | 437,72               | 22 631,91                     |
| krátkodobé pohľadávky     | 4 661 489,19         | 5 536 965,04         | 1 095 191,60                  |
| finančné účty             | 5 375 161,11         | 4 771 695,12         | 1 152 709,37                  |
| <b>Časové rozlíšenie:</b> | <b>9 330,23</b>      | <b>1 311,02</b>      | <b>9 330,23</b>               |
| příjmy budúcich období    | 3 911,10             | 1 311,02             | 3 911,10                      |
| <b>MAJETOK SPOLU:</b>     | <b>10 165 856,78</b> | <b>10 629 407,70</b> | <b>3 882 726,39</b>           |

## 24. Opatrenia na odstránenie nedostatkov v hospodárení a správa o plnení opatrení prijatých na odstránenie nedostatkov z predchádzajúceho roku

Opatrenia:

Príkaz riaditeľa EIÚ SAV č. 2/2023 preukázateľne oboznámiť zamestnancov zodpovedných za realizáciu projektov agentúry s výsledkami finančnej kontroly na mieste, s dôrazom na dodržiavanie príslušných zákonov, Závazných podmienok hospodárenia s finančnými prostriedkami a usmernení agentúry z dôvodu predchádzania vzniku rovnakých nedostatkov zistených finančnou kontrolou na mieste pri riešení projektov podporených agentúrou a predkladaní ročných/ záverečných správ.

Správa o plnení prijatých opatrení:

Oboznámenie zamestnancov s výsledkami finančnej kontroly na mieste a zároveň zaslanie podmienok hospodárenia s FP v jednotlivých výzvach bolo vykonané 12.12.2023 elektronicky.

## 25. Ďalšie údaje o hospodárení organizácie

Organizácia nevykonáva podnikateľskú činnosť, ale vykonáva činnosť podliehajúcu dani z príjmov, ktorá sa eviduje oddelene od hlavnej činnosti.

### Výročnú správu o hospodárení organizácie zostavil(i):

Ing. Jozef Fabian, CSc.  
Iveta Tothová

Bratislava, 10.5.2024

RNDr. Vladimír Cambel, DrSc.  
riaditeľ organizácie



## **PRÍLOHA K ČASTI B**

### **B-1 Správa štatutárneho audítora k ročnej účtovnej uzávierke**

*Prílohu B-1 vkladajte, ak sa v danom roku vyhotovuje.*

*Inak uveďte: V danom roku nebola vyhotovená.*



## **SPRÁVA NEZÁVISLÉHO AUDÍTORA**

**pre štatutárny orgán Elektrotechnického ústavu SAV, v. v. i.**

### **I. Správa z auditu účtovnej závierky**

#### **Názor**

Uskutočnila som audit účtovnej závierky verejnej výskumnej inštitúcie **Elektrotechnický ústav SAV, v. v. i.**, Dúbravská cesta 9,841 04 Bratislava, IČO: 00598429 , ktorá obsahuje súvahu k 31. decembru 2023, výkaz ziskov a strát za rok končiaci sa k uvedenému dátumu a poznámky, ktoré obsahujú súhrn významných účtovných zásad a účtovných metód.

Podľa môjho názoru, priložená účtovná závierka poskytuje pravdivý a verný obraz finančnej situácie **Elektrotechnického ústavu SAV, v. v. i.** k 31. decembru 2023 a výsledku jeho hospodárenia za rok končiaci sa k uvedenému dátumu podľa zákona č.431/2002 Z. z. o účtovníctve v znení neskorších predpisov ( ďalej len „zákon o účtovníctve“ ).

#### **Základ pre názor**

Audit som vykonala podľa medzinárodných audítorských štandardov (International Standards on Auditing, ISA). Moja zodpovednosť podľa týchto štandardov je uvedená v odseku Zodpovednosť audítora za audit účtovnej závierky. Od Elektrotechnického ústavu SAV, v. v. i. som nezávislá podľa ustanovení zákona č. 423/2015 o štatutárnom audite a o zmene a doplnení zákona č. 431/2002 Z. z. o účtovníctve v znení neskorších predpisov (ďalej len „zákon o štatutárnom audite“) týkajúcich sa etiky, vrátane Etického kódexu audítora, relevantných pre môj audit účtovnej závierky a splnila som aj ostatné požiadavky týchto ustanovení týkajúcich sa etiky. Som presvedčená, že audítorské dôkazy, ktoré som získala, poskytujú dostatočný a vhodný základ pre môj názor.

#### **Iná skutočnosť**

Účtovná závierka Elektrotechnického ústavu SAV, v. v. i. je auditovaná za rok 2023 v zmysle §26 ods.6 Zákona č.243/2017 o verejnej výskumnej inštitúcii ako prvý rok v štvorročnom cykle overenia účtovnej závierky štatutárnym audítorom.

#### **Zodpovednosť štatutárneho orgánu za účtovnú závierku**

Štatutárny orgán je zodpovedný za zostavenie tejto účtovnej závierky tak, aby poskytovala pravdivý a verný obraz podľa zákona o účtovníctve a za tie interné kontroly, ktoré považuje za potrebné na zostavenie účtovnej závierky, ktorá neobsahuje významné nesprávnosti, či už v dôsledku podvodu alebo chyby.

Pri zostavovaní účtovnej závierky je štatutárny orgán zodpovedný za zhodnotenie schopnosti Elektrotechnického ústavu SAV, v. v. i. nepretržite pokračovať vo svojej činnosti, za opísanie skutočností týkajúcich sa nepretržitého pokračovania v činnosti, ak je potrebné, a za použitie predpokladu nepretržitého pokračovania v činnosti v účtovníctve, ibaže by mal v úmysle v. v. i. zlikvidovať alebo ukončiť jeho činnosť, alebo by nemal inú realistickú možnosť než tak urobiť.

#### **Zodpovednosť audítora za audit účtovnej závierky**

Mojou zodpovednosťou je získať primerané uistenie, či účtovná závierka ako celok neobsahuje významné nesprávnosti, či už v dôsledku podvodu alebo chyby, a vydať správu audítora, vrátane názoru. Primerané uistenie je uistenie vysokého stupňa, ale nie je zárukou toho, že audit vykonaný podľa medzinárodných audítorských štandardov vždy odhalí významné nesprávnosti, ak také existujú.



Nesprávnosti môžu vzniknúť v dôsledku podvodu alebo chyby a za významné sa považujú vtedy, ak by sa dalo odôvodnene očakávať, že jednotlivito alebo v súhrne by mohli ovplyvniť ekonomické rozhodnutia používateľov, uskutočnené na základe tejto účtovnej závierky.

V rámci auditu uskutočneného podľa medzinárodných audítorských štandardov, počas celého auditu uplatňujem odborný úsudok a zachovávam profesionálny skepticizmus. Okrem toho:

- Identifikujem a posudzujem riziká významnej nesprávnej účtovnej závierky, či už v dôsledku podvodu alebo chyby, navrhujem a uskutočňujem audítorské postupy reagujúce na tieto riziká a získavam audítorské dôkazy, ktoré sú dostatočné a vhodné na poskytnutie základu pre môj názor. Riziko neodhalenia významnej nesprávnej účtovnej závierky v dôsledku podvodu je vyššie ako toto riziko v dôsledku chyby, pretože podvod môže zahŕňať tajnú dohodu, falšovanie, úmyselné vynechanie, nepravdivé vyhlásenie alebo obídenie internej kontroly.
- Oboznamujem sa s internými kontrolami relevantnými pre audit, aby som mohla navrhnúť audítorské postupy vhodné za daných okolností, ale nie za účelom vyjadrenia názoru na efektívnosť interných kontrol Elektrotechnického ústavu SAV, v. v. i.
- Hodnotím vhodnosť použitých účtovných zásad a účtovných metód a primeranosť účtovných odhadov a uvedenie s nimi súvisiacich informácií, uskutočnené štatutárnym orgánom.
- Robím záver o tom, či štatutárny orgán vhodne v účtovníctve používa predpoklad nepretržitého pokračovania v činnosti a na základe získaných audítorských dôkazov záver o tom, či existuje významná neistota v súvislosti s udalosťami alebo okolnosťami, ktoré by mohli významne spochybniť schopnosť Elektrotechnického ústavu SAV, v. v. i. nepretržite pokračovať v činnosti. Ak dospejem k záveru, že významná neistota existuje, som povinná upozorniť v mojej správe audítora na súvisiace informácie uvedené v účtovnej závierke alebo, ak sú tieto informácie nedostatočné, modifikovať môj názor. Moje závery vychádzajú z audítorských dôkazov získaných do dátumu vydania mojej správy audítora. Budúce udalosti alebo okolnosti však môžu spôsobiť, že Elektrotechnický ústav SAV, v. v. i. prestane pokračovať v nepretržitej činnosti.
- Hodnotím celkovú prezentáciu, štruktúru a obsah účtovnej závierky vrátane informácií v nej uvedených, ako aj to, či účtovná závierka zachytáva uskutočnené transakcie a udalosti spôsobom, ktorý vedie k ich vernému zobrazeniu.
- So štatutárnym orgánom komunikujem okrem iných záležitostí plánovaný rozsah a časový harmonogram auditu a významné zistenia z auditu, vrátane významných nedostatkov v interných kontrolách, ktoré identifikujem počas môjho auditu.

## **Správa k ďalším požiadavkám zákonov a iných právnych predpisov**

### ***II. Správa k informáciám, ktoré sa uvádzajú vo výročnej správe***

Štatutárny orgán je zodpovedný za informácie uvedené vo výročnej správe, zostavenej podľa požiadaviek zákona o účtovníctve a Zákona č.243/2017 o verejnej výskumnej inštitúcii a o zmene a doplnení niektorých zákonov. Môj vyššie uvedený názor na účtovnú závierku sa nevzťahuje na iné informácie vo výročnej správe.

V súvislosti s auditom účtovnej závierky je mojou zodpovednosťou oboznámenie sa s informáciami uvedenými vo výročnej správe a zváženie, či tieto informácie nie sú vo významnom nesúlade s auditovanou účtovnou závierkou alebo mojimi poznatkami, ktoré som získala počas auditu účtovnej závierky, alebo sa inak zdajú byť významne nesprávne.

Posúdila som, či výročná správa Elektrotechnického ústavu SAV, v. v. i. obsahuje informácie, ktorých uvedenie vyžaduje Zákon č.243/2017 o verejnej výskumnej inštitúcii.



Na základe prác vykonaných počas auditu účtovnej závierky, podľa môjho názoru:

- informácie uvedené vo výročnej správe zostavenej za rok 2023 sú v súlade s účtovnou závierkou za daný rok,
- výročná správa obsahuje informácie podľa zákona o verejnej výskumnej inštitúcii

Okrem toho, na základe mojich poznatkov o účtovnej jednotke a situácii v nej, ktoré som získala počas auditu účtovnej závierky, som povinná uviesť, či som zistila významné nesprávnosti vo výročnej správe, ktorú som obdržala pred dátumom vydania tejto správy audítora. V tejto súvislosti neexistujú zistenia, ktoré by som mala uviesť.

Zvolen, 21. mája 2024

Ing. Monika Király  
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Štatutárny audítor  
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