



# Martin Venhart

## Curriculum vitae

### Contact information

#### Slovak Academy of Sciences

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### Education

#### 2008, Doctor of Philosophy (PhD.)

Experimental nuclear physics  
Comenius University, Bratislava  
Thesis: *K isomerism in  $^{254}\text{No}$*   
Experimental part of the work done at  
cyclotron laboratory in Jyväskylä

#### 2004, Mgr. (MSc. equivalent)

Nuclear and subnuclear physics  
Comenius University, Bratislava  
Thesis: *Cross sections of isotopes present  
in nuclear fuel of thermal nuclear reactors  
VVER-440*  
In collaboration with nuclear industry in  
Slovakia and Nuclear Energy Agency  
(NEA), Paris

### Scientific publications

80 publications in referred journals  
>2000 citations registered in WoS  
h-index = 28 (WoS)

### Academic positions held

**2025 → President of Slovak Academy of Sciences**

**2017 - 2025, Presidium of Slovak Academy of Sciences**

Since 2021, Vice-president of Slovak Academy of Sciences

Since 2021, Deputy of President of Slovak Academy of Sciences

**2010 →, Institute of Physics, Slovak Academy of Sciences**

Senior Research scientist

**2013 – 2021, Institute of Physics, Slovak Academy of Sciences**

Head of Department of Nuclear Physics

**2008 – 2010, KU Leuven, Belgium**

Post-doctoral researcher, Instituut voor Kern-en Stralingsfysica

### Major achievements

**ERC Advanced Grant awarded with A (not funded)**

**Spokesperson of successful experiments IS521 (CERN), JR115, S17, M20 and R66 (all at University of Jyväskylä), and PR235 (iThemba Labs)**

In total 74 days of beam time awarded by PACs

Development of the HIGH-TATRA spectrometer for high resolution spectroscopy of  $\gamma$  rays and conversion electrons

**Full membership of Slovakia in CERN-ISOLDE collaboration**

Leader of negotiations, full membership established in 2016

**Full membership of Slovakia in Nuclear Physics European Collaboration Committee (NuPECC)**

Leader of negotiations, full membership established in 2019

### Membership in committees and boards

**2016 – 2022, ISOLDE collaboration committee (CERN)**

Representative of Slovak Republic

**2024 →, Natural Sciences and Engineering Research Council of Canada**

Member of Subatomic Physics Evaluation Section

**2019 →, Nuclear Physics European Collaboration Committee**

Representative of Slovak Republic

**2013 – 2022, Board for collaboration of Slovakia with CERN**

Vice-chair, representative for non-LHC experiments

**2017 →, Scientific council, Slovak Academy of Sciences**

## Professional interests

Nuclear structure  
Shape coexistence in nuclei  
Gamma-ray spectroscopy  
Conversion-electron spectroscopy  
Tape transportation systems  
Particle-core coupling in nuclei  
GEANT4 Monte Carlo simulations  
Accelerator-based experiments

## Scientific collaboration

University of Liverpool (UK)  
ISOLDE (CERN)  
Georgia Institute of Technology (USA)  
University of Jyväskylä (Finland)  
iThemba Labs (South Africa)

## Refereeing duties

Physics Letters B  
European Physics Journal A  
Nuclear Instruments and Methods in Physical Research A

European Research Council (ERC)  
Science and Technology Facilities Council (UK)  
National Research Foundation (South Africa)  
Natural Sciences and Engineering Research Council (Canada)

## PhD. opponent

University of Jyväskylä (Finland)  
University of Guelph (Canada)  
Comenius University (Slovakia)  
Slovak University of Technology

## Awards

**2012 Slovak Physical Society**  
Young physicist award

**2014 President of Slovakia**  
Congratulation for successful completion of the IS521 experiment (CERN)

**2022 Award of Slovak Academy of Sciences for development of research infrastructure**  
Development of the TATRA spectrometer

## Supervision of students

### PhD. students

Institute of Physics, Slovak Academy of Sciences  
2015 – 2019, Matúš Sedlák  
2014 – 2020, Robert Urban  
2016 – 2021, Matúš Balogh  
2018 – 2024, Gulnur Kantay  
2024 →, Magdaléna Šolcová  
2012 – 2015, Fuad A. Ali, (University of Liverpool, co-supervision)  
2013 – 2017, Faye Wearing, (University of Liverpool, co-supervision)

### Master students

2009 – 2010, Marijke Keupers (KU Leuven, Belgium)  
2015 – 2017, Jakub Krajňák  
2014 – 2016, Matúš Balogh  
2017 – 2019, Andrej Špaček  
2018 – 2020, Natália Džalaiová  
2020 – 2022, Erika Jajčišinová  
2022 – 2024, Magdaléna Šolcová  
2024 →, Tatiana Grečnárová

### Bachelor students

2012 – 2014, Matúš Balogh  
2013 – 2015, Jakub Krajňák  
2013 – 2016, Lukáš Holub  
2015 – 2017, Andrej Špaček  
2016 – 2017, Jakub Lietavec  
2015 – 2019, Monika Bírová  
2019 – 2020, Erika Jajčišinová  
2020 – 2024, Tatiana Grečnárová

## Supervision of post-docs

2015 – 2018, Pareshkumar Prajapati  
2018 – 2021, Andrej Herzán

## Conferences organized (as chairman)

### ISTROS 2013, 2015, 2017, 2019 and 2023

Častá-Papiernička, Slovakia  
Series of international conferences (approximately 50 participants each)  
The 2017 edition reported in Nuclear Physics News

### AWG 2011, and SWG 2015

Častá-Papiernička, Slovakia  
International school on GEANT4 simulations in nuclear physics  
With support of GEANT4 collaboration (CERN)  
Approximately 50 participants

### SWG 2013

Somerset West, Cape Town, South Africa  
International school on GEANT4 simulations in nuclear physics  
With support of GEANT4 collaboration (CERN)  
Approximately 50 participants, mostly from Africa

## Research grants

### Energy of symmetry in structure of nuclear matter

Slovak Research and Development Agency  
2012 – 2015, 203 750 €

### Structure of atomic nuclei

Slovak Research and Development Agency  
2016 – 2020, 250 000 €

### Experimental investigation of deformation and electromagnetic properties of atomic nuclei

Slovak Research and Development Agency  
2021 – 2025, 180 000 €

### Shape coexistence in heavy nuclei

Slovak grant agency VEGA  
2014 – 2016, 21 000 €

### Investigation of nuclear structure and reactions using Tandetron® accelerator

Slovak grant agency VEGA  
2017 – 2019, 51 000 €

Shape coexistence in odd-Au isotopes  
Ministry of Education, Science, Research and Sport of Slovak Republic  
2022 – 2026, 50 000 €

### Nuclear structure of odd-Au isotopes

Eset foundation (private resources)  
2022 → , 110 000 €

### Infrastructural projects funded through Structural funds of European Union:

#### Research centre Allegro

2014 – 2016, 600 000 €  
*purchasing of detectors and DAQ system for Tandetron Laboratory*

#### Tandetron Laboratory

2013 – 2015, 1 600 000 €  
*procurement of the Tandetron Accelerator with 2 MV terminal voltage*

## Selected publications

R.-D. Herzberg, P. T. Greenlees, P. A. Butler, G. D. Jones, M. Venhart *et al.*  
**Nuclear isomers in superheavy elements as stepping stones towards the island of stability**  
*Nature* **442**, 896 (2006).

M. Venhart *et al.*

**Population of a low-spin positive-parity band from high-spin intruder states in  $^{177}\text{Au}$ : The two-state mixing effect**  
*Physics Letters B* **806**, 135488 (2020).

M. Venhart *et al.*

**Shape coexistence in odd-mass Au isotopes: Determination of the excitation energy of the lowest intruder state in  $^{179}\text{Au}$**   
*Physics Letters B* **695**, 82 (2011).

M. Venhart *et al.*

**De-excitation of the strongly coupled band in  $^{177}\text{Au}$  and implications for core intruder configurations in the light Hg isotopes**  
*Physical Review C* **95**, 061302(R) (2017).

M. Venhart *et al.*

**New systematic features in the neutron-deficient Au isotopes**  
*Journal of Physics G: Nuclear and Particle Physics* **44**, 074003 (2017).

M. Sedlák, M. Venhart *et al.*

**Nuclear structure of  $^{181}\text{Au}$  studied via  $\beta^+/\text{EC}$  decay of  $^{181}\text{Hg}$  at ISOLDE**  
*European Physics Journal A* **56**, 161 (2020).

M. Balogh, E. Jajčišinová, M. Venhart *et al.*

**New collective structures in  $^{179}\text{Au}$  and their implications for the triaxial deformation of the  $^{178}\text{Pt}$  core**  
*Physical Review C* **106**, 064324 (2022).

M. Venhart *et al.*

**Application of the Broad Energy Germanium detector: A technique for elucidating  $\beta$ -decay schemes which involve daughter nuclei with very low energy excited states**  
*Nuclear Instruments and Methods in Physical Research, Section A* **849**, 112 (2017).

V. Matoušek, M. Sedlák, M. Venhart *et al.*

**TATRA: a versatile high-vacuum tape transportation system for decay studies at radioactive-ion beam facilities**  
*Nuclear Instruments and Methods in Physical Research, Section A* **812**, 118 (2016).

M. Venhart *et al.*

**Determination of  $\alpha$ -decay branching ratios for  $^{178,179}\text{Hg}$**   
*European Physics Journal A* **48**, 101 (2012).

S. Hofmann *et al.* incl. M. Venhart

**The reaction  $^{48}\text{Ca} + ^{238}\text{U} \rightarrow ^{286}112^*$  studied at the GSI-SHIP**  
*European Physics Journal A* **32**, 251 (2007).

M. Venhart *et al.*

**Decay study of  $^{246}\text{Fm}$  at SHIP**  
*European Physics Journal A* **47**, 20 (2011).

## Science-to-public

Member of PANS (Public Awareness of Nuclear Science) Committee in NuPECC

Annually approximately 10 public talks in Slovakia

Since 2022 many comments in various media on actual situation in Zaporizhzhya, Chernobyl and Kursk Nuclear Power Plants

## Memberships

Slovak Physical Society  
Slovak Chemical Society

## Language Skills

Slovak – mother tongue  
English – fluent speaker  
German – basic knowledge  
French – basic knowledge

## Talks at international conferences

### Shape coexistence, $E0$ transitions, and related topics

2023, Guelph, Canada

Shape isomerism in  $^{179}\text{Au}$ , **invited talk**

### Shapes and Symmetries in Nuclei: from Experiment to Theory

2022, Orsay, France

Possible monopole transitions in  $^{179}\text{Au}$ , **invited talk**

### X<sup>th</sup> Tastes of Nuclear Physics

2021, University of Western Cape, online

Building of research group in developing country, **invited talk**

### Shape coexistence and electric monopole transitions in atomic nuclei

2017, CEA-Saclay, France

Electric monopole transitions in  $^{183}\text{Au}$ , **invited talk**

### Zakopane Conference on Nuclear Physics 2022

2022, Zakopane, Poland

Nuclear structure of odd-mass Au isotopes

### ISTROS 2023

2023, Častá-Papiernička, Slovakia

Shape isomerism in  $^{179}\text{Au}$

### ISTROS 2019

2019, Častá-Papiernička, Slovakia

Nuclear structure of odd-Au isotopes

### Nuclear Fission and Structure of Exotic Nuclei

2019, Tokai, Japan

Nuclear structure of odd-Au isotopes

### ISTROS 2017

2017, Častá-Papiernička, Slovakia

Conversion-electron spectroscopy with TATRA spectrometer

### 6<sup>th</sup> Workshop on Nuclear Fission and Spectroscopy of Neutron-rich Nuclei

2017, Chamrousse, France

Application of BEGe detectors and LN<sub>2</sub> cooled Si(Li) detectors for studies of isotopes with large density of excited states at low energy

### ISOLDE Workshop and Users Meeting 2016

2016, CERN

Spectroscopy of conversion electrons with LN<sub>2</sub> cooled Si(Li) detector at the TATRA spectrometer

### ISOLDE Workshop and Users Meeting 2015

2015, CERN

Shape coexistence in odd-Au isotopes studied with BEGe detector