

# CURRICULUM VITAE



<b>Name</b>	<b>Oleksandr Romanenko</b>
<b>Date of birth</b>	1.1.1987
<b>Employer</b>	Nuclear Physics Institute of the Czech Academy of Sciences
<b>Position</b>	Researcher
<b>H-index according to Scopus</b>	7
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## Education

<b>From – to</b>	<b>Educational institution (name, location), area of study</b>
2004 – 2009	State Pedagogical University, Sumy, Ukraine – Master degree, physics, scientific field
2010 – 2013	Institute of Applied Physics, National Academy of Sciences of Ukraine, Sumy, Ukraine – PhD study. Defended in 2016 – thesis title: “ <i>Ion microbeam formation for study of radiation-induced migration of impurities in a solid</i> ”

## Professional experience

<b>From – to</b>	<b>Name of institution, position</b>	<b>Tasks and activities</b>
2009 – 2010	Institute of Applied Physics, National Academy of Sciences of Ukraine, engineer	<ul style="list-style-type: none"><li>- Scanning nuclear microbeam facility maintenance</li><li>- Vacuum system maintenance</li></ul>
2013 – 2017	Institute of Applied Physics, National Academy of Sciences of Ukraine, junior research fellow	<ul style="list-style-type: none"><li>- Ion beam optics calculation for constructing a new ion microbeam channels for external users</li><li>- Ion beam analysis of materials by micro-PIXE (Particles Induced X-ray Emission) and micro-RBS (Rutherford Backscattering) methods</li><li>- Study of impurity migration under ionizing radiation in constructional</li></ul>

		<p>materials</p> <ul style="list-style-type: none"> <li>- Ion beam lithography</li> </ul>
2017	Institute of Applied Physics, National Academy of Sciences of Ukraine, acting research fellow	<ul style="list-style-type: none"> <li>- Ion beam analysis</li> <li>- Ion beam lithography</li> <li>- Ion microbeam facility development</li> <li>- Teaching students to conduct experiments on nuclear microprobe</li> <li>- Teaching student to ion beam analysis</li> </ul>
2017 – 2023	Neutron Physics Department of Nuclear Physics Institute CAS v. v. i., PostDoc	<ul style="list-style-type: none"> <li>- Calculation of a new focusing system based on distributed triplet of magnetic quadrupole lenses to improve the spatial resolution of existing microbeam facility at the Nuclear Physics Institute</li> <li>- Creation of a polymeric nanocomposite material for Surface-enhanced Raman spectroscopy application</li> <li>- Creation of microoptic devices based on polymeric materials for miniaturization of optoelectronics</li> </ul>
2022	6 months scientific stay at Ruder Boskovic Institute, Zagreb, Croatia	<ul style="list-style-type: none"> <li>- Participation in ToF-ERDA experiments for internal and external users</li> <li>- ToF-ERD analysis for internal and external users</li> <li>- Ion beam optics calculation of a new microbeam channel with a short working distance dedicated to ion beam lithography and dual-beam irradiation</li> <li>- Presentation of scientific results at international conferences and laboratory meetings</li> </ul>
2023 – present	Neutron and Ion Methods Department of Nuclear Physics Institute CAS v.v.i., research scientist	<ul style="list-style-type: none"> <li>- Development of the ToF-ERDA facility at the Nuclear Physics Institute</li> <li>- Light elements analysis of nuclear reactor materials by ToF-ERDA method</li> <li>- Ion beam analysis</li> <li>- Ion beam lithography</li> <li>- Ion implantation</li> <li>- Development in-lab method for heavy ion implantation in a pattern</li> </ul>

## Publications:

### List of publications in peer-reviewed journals (last 5 years)

1. P.G. Bhat, P. Veis, A. Marín Roldán, J. Karhunen, P. Paris, I. Jõgi, A. Hakola, J. Likonen, S. Almviva, W. Gromelski, M. Ladygina, P. Gasior, J. Ristkok, I. Bogdanović Radović,

- Z. Siketić, O. Romanenko, C. Porosnicu, C. Lungu, *LIBS depth profiling of Be-containing samples with different gaseous impurity concentrations*, Nuclear Materials and Energy 37 (2023) 101549, IF 2.3, Cit. 3, <https://doi.org/10.1016/j.nme.2023.101549>
2. M. Jakšić, G. Provas, I. Božičević Mihalić, A. Crnjac, D. Cosic, T. Dunatov, O. Romanenko, Z. Siketic, *The dual ion beam microprobe*, Nuclear Instruments and Methods in Physics Research B 539 (2023) 120-126, IF1.4, Cit. 3, <https://doi.org/10.1016/j.nimb.2023.03.031>
  3. O. Romanenko, V. Lavrentiev, A. Borodkin, V. Havranek, A. Mackova, *Comparison of PMMA shrinkage in ion beam lithography: PMMA on glass substrate vs free-standing PMMA film*, Nuclear Instruments and Methods in Physics Research B 538 (2023) 123-130, IF 1.4, Cit. 1, <https://doi.org/10.1016/j.nimb.2023.02.001>
  4. R. Mateus, N. Catarino, M. Dias, L.C. Alves, O. Romanenko, Z. Siketic, I. Bogdanović Radović, A. Hakola, E. Grigore, E. Alves, *Deuterium and helium retention in W and W-Ta coatings irradiated with energetic ion beams*, Nuclear Instruments and Methods in Physics Research B 538 (2023) 41-46, IF 1.4, Cit. 3, <https://doi.org/10.1016/j.nimb.2023.02.028>
  5. P. Malinsky, O. Romanenko, V. Havránek, M. Cutroneo, J. Novák, E. Štěpanovská, R. Miksova, P. Marvan, V. Mazánek, Z. Sofer, A. Macková, *Graphene Oxide and Polymer Humidity Micro-Sensors Prepared by Carbon Beam Writing*, Polymers (2023) 15(5), 1066, IF 4.7, Cit. 5, <https://doi.org/10.3390/polym15051066>
  6. O. Romanenko, P. Slepicka, O. Kvítek, M. Šlouf, P. Němecek, V. Havránek, A. Macková, Václav Švorčík, *In-situ generation of Au nanoparticles in poly(methyl methacrylate) films via MeV proton irradiation*, Materials Chemistry and Physics (2022) 125205, IF 4.778, Cit. 2, <https://doi.org/10.1016/j.matchemphys.2021.125205>
  7. A. Jagerová, R. Mikšová, O. Romanenko, I. Plutnarova, Z. Sofer, P. Slepicka, J. Mistrík, A. Macková, *Surface modification by high-energy heavy-ion irradiation in various crystalline ZnO facets*, Physical Chemistry Chemical Physics 23 (2021) 22673 IF 3.945, Cit. 1, <https://doi.org/10.1039/D1CP02388H>
  8. A. Jagerova, P. Malinsky, R. Miksova, O. Lalik, M. Cutroneo, O. Romanenko, K. Szokolova, Z. Sofer, P. Slepicka, J. Cizek, A. Mackova, *Modification of structure and surface morphology in various ZnO facets via low fluence gold swift heavy ion irradiation*, Surface and interface analysis 53 (2020) 230-243, IF 1.702, Cit. 1, <https://doi.org/10.1002/sia.6904>
  9. P. Malinský, O. Romanenko, V. Havranek, V. Hnatowicz, J.H. Stammers, M. Cutroneo, J. Novak, P. Slepicka, V. Svorcik, K. Szokolova, D. Bousa, Z. Sofer, A. Macková, *Comparison of GO and polymer microcapacitors prepared by ion beam writing*, Surface and interface analysis 52 (2020) 1171-1177, IF 1.607, Cit. 0, <https://doi.org/10.1002/sia.6851>
  10. O. Romanenko, P. Slepicka, P. Malinsky, M. Cutroneo, V. Havranek, J. Stammers, V. Svorcik, A. Mackova, *The influence of Au-nanoparticles presence in PDMS on microstructures creation by ion beam lithography*, Surface and interface analysis 52 (2020) 1040-1044, IF 1.607, Cit. 3, <https://doi.org/10.1002/sia.6821>
  11. P. Malinský, O. Romanenko, V. Havranek, J.H. Stammers, V. Hnatowicz, M. Cutroneo, J. Novak, P. Slepicka, V. Svorcik, K. Szokolova, D. Bousa, Z. Sofer, A. Macková, *Microcapacitors on graphene oxide and synthetic polymers prepared by microbeam lithography*, Applied Surface Science 528 (2020) 146802, IF 6.707, Cit. 4, <https://doi.org/10.1016/j.apsusc.2020.146802>
  12. M. Marcisovska, D. Dudas, M. Havranek, A. Kabatova, V. Kafka, A. Kostina, A. Mackova, M. Marcisovsky, S.V. Mitrofanov, J. Popule, O. Romanenko, L. Tomasek, V. Vrba, *TID and SEU testing of the novel X-CHIP-03 monolithic pixel detector*, Journal of Instrumentation 15 (2020) C01043, IF 1.121, Cit. 1, <https://doi.org/10.1088/1748-0221/15/01/C01043>
  13. O. Romanenko, V. Havranek, P. Malinsky, P. Slepicka, J. Stammers, V. Svorcik, A. Mackova, D. Fajstavr, *Effect of irradiation conditions by swift heavy ions on the microstructure and composition of PMMA*, Nuclear Instruments and Methods in Physics Research B 461 (2019)

- 175-180, IF 1.27, Cit. 3, <https://doi.org/10.1016/j.nimb.2019.09.043>
14. O.V. Romanenko, A.G. Ponomarev, A. Macková, V. Havránek, A. Ponomarev, *Ion microprobe improvements in Tandatron Laboratory NPI CAS: Numerical calculation*, Nuclear Instruments and Methods in Physics Research B 458 (2019) 77-81, IF 1.27, Cit. 2, <https://doi.org/10.1016/j.nimb.2019.08.007>
15. O. Romanenko, V. Havranek, A. Mackova, M. Davidkova, M. Cutroneo, A.G. Ponomarev, G. Nagy, J. Stammers, I. Rajta, *Performance and application of heavy ion nuclear microbeam facility at the Nuclear Physics Institute in Řež, Czech Republic*, Review of Scientific Instruments 90 (2019) 013701 IF. 1.84, Cit. 12, <https://doi.org/10.1063/1.5070121>

## **Participation in the conferences (last 5 years)**

2024 – International Conference on Applied Nuclear Physics, 23-27 September 2024, Thessaloniki, Greece, oral presentation “Using a Nuclear Microprobe to Implant Heavy Ions in a Material in a Pattern”

2022 – International Conference on Ion Beam Modification of Materials, 10 - 15 July 2022, Lisbon, Portugal, poster presentation “Comparison of PMMA shrinkage in ion beam lithography: PMMA on glass substrate vs free standing PMMA film”

2021 – International Conference on Applied Nuclear Physics, 12-17 September 2022, Prague, Czech Republic, oral presentation “One-step 3D microstructuring of PMMA using MeV light ions”

2019 – European Conference on Applications of Surface and Interface Analysis, 15-20 September 2019, Dresden, Germany, poster presentation “The influence of Au-nanoparticles presence in PDMS on microstructures creation by ion beam lithography”

## **Scientific awards and academic memberships**

2017 – Award of the Parliament of Ukraine for the most talented young scientists in the field of fundamental and applied research and scientific and technical development.

2017 – Certificate of honour of the Department of Nuclear Physics and Power Engineering of the National Academy of Sciences of Ukraine

2013-2015 – Scholarship of Presidium (board) of National Academy of Sciences of Ukraine.

## **Research grants**

### **Team member of domestic grants**

Project name: Ion beam writing synthesis of novel microstructures in advanced polymer nanocomposites GACR 19-02482S

Source of funding: Grant Agency of the Czech Republic (GACR)

Total grant of the institution: 4 245 kCZC

Project Implementation period: 2019-2021

Project name: Centre of Accelerators and Nuclear Analytical Methods CANAM OP, CZ.02.1.01/0.0/0.0/16\_013/0001812

Source of funding: MEYS (Ministry of Education, Youth and Sport of the Czech Republic)

Total grant of the institution: 109 240 kCZC

Project Implementation period: 2022-2024

Project name: Advanced nano/microstructure creation using ion and electron beam surface modification with potential use in microfluid and lab-on-chip applications GACR 22-10536S  
Source of funding: Grant Agency of the Czech Republic (GACR)  
Total grant of the institution: 9 792 kCZC  
Project Implementation period: 2022-2024

Project name: Graphene oxide electronic structure modulation by intentional doping and defect introduction by ion beams for microelectronics, catalysts and sensors GACR 23-06702S  
Source of funding: Grant Agency of the Czech Republic (GACR)  
Total grant of the institution: 10 890 kCZC  
Project Implementation period: 2023-2025

Project name: Advanced MUltiscale materials for key Enabling Technologies, EH22\_008/0004558  
Source of funding: MEYS (Ministry of Education, Youth and Sport of the Czech Republic)  
Total grant of the institution: 480 072 kCZC  
Project Implementation period: 2024-2028

### **Team member of foreign grants**

Project name: Recyclable Materials Development At Analytical Research Infrastructures  
Source of funding: HORIZON-INFRA-2021-SERV-01 ReMade@ARI  
Total grant of the institution: 128.15 kEUR  
Project implementation period: 2022-2024

### **Applied results**

*TOSEDA* – design of novel polymeric materials for hi-tech applications and development of environmentally friendly procedures for production of green polymeric materials.  
*Advacam* – detectors development

### **Foreign collaborations and stays abroad**

6 months stay at Ruder Boskovic Institute, Croatia, 04/2022-09/2022.

Completed main goals: acquiring new knowledge about the ToF-ERD method, its specifics and limitations; ToF-ERD training; study of POTKU software for ToF-ERD analysis; simulation of experimental spectra by the Monte Carlo method.

Completed additional task: calculation of ion beam optics for a new microbeam channel at Ruder Boskovic Institute.

### **Common recent publications in foreign collaboration (last 5 years)**

O. Romanenko et.al., Rev. Sc. Instr. (2019)

O. Romanenko et.al., NIMB (2019)

R. Mateus et.al., NIMB (2023)

M. Jakšić et.al., NIMB (2023)

P.G. Bhat et.al., Nucl. Mat. and En. (2023)