



Mgr. Josef Novak

Education:

Doctoral studies: The University of J. E. Purkyne in Usti nad Labem, Faculty of Science, field of study: **Applied ion technologies**

2023–now

Master's degree: The University of J. E. Purkyne in Usti nad Labem, Faculty of Science, **Applied Nanotechnology**

2021–2023

Bachelor's degree: The University of J. E. Purkyne in Usti nad Labem, Faculty of Science, **Applied Physics/Applied Nanotechnology**

2017–2021

Gymnasium Lovosice, general education

2013–2017

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Personal data

Born 27.1.1997 in Kladno

Work experience:

- Neutron Physics Department of Nuclear Physics Institute CAS v. v. i., Řež,
- Employed as an undergraduate master and doctoral student since 2018

Focus:

- Utilization of energetic ion beams for characterization of solid substrates by ion analytical methods RBS, ERDA and use of ion implantation for modification of polymer and GO substrates

Conference contributions:

- The catalytic, sensory and electrical properties of GO, PI and PLLA implanted by lowenergy copper ions (pooster); **J. Novak**, E. Stepanovska, P. Malinsky, V. Mazanek, Z. Sofer, U. Kentsch, A. Mackova; 14th European Conference on Accelerators in Applied Research and Technology (ECAART14), 17-23.7. 2022, Sibiu, Romania
- The sensory and photo-catalytic properties of graphene oxide and polyimide thin films implanted by 1500 keV Cu ions (pooster); E. Stepanovska, **J. Novak**, P. Malinsky, P. Marvan, Z. Sofer, A. Mackova, 14th European Conference on Accelerators in Applied Research and Technology (ECAART14), 17-23.7. 2022, Sibiu, Romania
- The electrical, photo-catalytic and sensory properties of graphene oxide and polyimide implanted by low and medium energy silver ions (pooster); **J. Novák**, E. Stepanovska, P. Malinsky, V. Mazánek, J. Luxa, Z. Sofer, U. Kentsch, A. Mackova, The 26th International Conference on Ion Beam Analysis (IBA-2023) and the 18th International Conference on Particle Induced X-ray Emission (PIXE-2023); 7-13.10 2023; Toyama, Japan
- Modification of grapheme and polymere thin films by multi-energy implantation of Cu+ and Ag+ ions for their use on Li-ion batteries (pooster), E. Stepanovska, **J. Novak**, P. Malinsky, I. Luxa M. Kormunda, A. Mackova; The 26th International Conference on Ion Beam Analysis (IBA-2023) and the 18th International Conference on Particle Induced X-ray Emission (PIXE-2023); 7-13.10 2023; Toyama, Japan

Publications:

- **Novak, J.** & Stepanovska, E. & Malinský, Petr & Mazanek, Vlastimil & Sofer, Zdenek & Kentsch, U. & Macková, Anna. (2023). The catalytic, sensory and electrical properties of GO, PI and PLLA implanted by low-energy copper ions. Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms. 540. 199-209. 10.1016/j.nimb.2023.04.014.
- Stepanovska, E. & **Novak, J.** & Malinský, Petr & Marvan, Petr & Sofer, Zdenek & Macková, Anna. (2023). The sensory and photo-catalytic properties of graphene oxide and polyimide thin films implanted by 1500 keV Cu ions. Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms. 541. 180-189. 10.1016/j.nimb.2023.05.063.
- Malinský, Petr & Romanenko, Alexandr & Havránek, Vladimír & Hnatowicz, Vladimír & Stammers, James & Cutroneo, M. & **Novák, Josef** & Slepicka, Petr & Svorčík, Václav & Szökölová, Kateřina & Bouša, Daniel & Sofer, Zdeněk & Macková, Anna. (2020). Comparison of GO and polymer microcapacitors prepared by ion beam writing. Surface and Interface Analysis. 52. 10.1002/sia.6851.
- Malinský, Petr & **Novák, Josef** & Štěpanovská, Eva & Slepicka, Petr & Švorčík, Václav & Szökölová, Kateřina & Marvan, Petr & Sofer, Zdeněk & Mackova, Anna. (2022). The multi-energetic Au ion implantation of graphene oxide and polymers. EPJ Web of Conferences. 261. 02006. 10.1051/epjconf/202226102006.
- Malinský, Petr & Romanenko, Alexandr & Havránek, V. & Stammers, J.H. & Hnatowicz, Vladimír & Cutroneo, M. & **Novák, J.** & Slepicka, P. & Svorčík, V. & Szokolova, Katerina & Bouša, Daniel & Sofer, Zdenek & Macková, Anna. (2020). Microcapacitors at graphene oxide and synthetic polymers prepared by microbeam lithography. Applied Surface Science. 528. 146802. 10.1016/j.apsusc.2020.146802.
- Malinský, Petr & Romanenko, Oleksander & Havránek, Vladimír & Cutroneo, Mariapompea & **Novák, Josef** & Štěpanovská, Eva & Mikšová, Romana & Marvan, Petr & Mazanek, Vlastimil & Sofer, Zdeněk & Macková, Anna. (2023). Graphene Oxide and Polymer Humidity Micro-Sensors Prepared by Carbon Beam Writing. Polymers. 15. 1066. 10.3390/polym15051066.
- Middle-energy ion patterning of COC for selective cell adhesion in microfluidic devices; P. Aubrecht, P. Malinský, **J. Novák**, J. Smejkal, M. Štofík, J. Luxa, A. Macková, J.

Competitions:

1st place in the **13th Czech-Slovak Student Scientific Conference (CSSSVK2023)** in the section Particle and Nuclear Physics with the paper on Modification of polymer and graphene oxide properties by ion beams for sensing and photocatalytic applications, MFF UK Prague 14-15 September 2023

Student work:

Master thesis - Modification of polymer and graphene oxide properties by ion beams for sensing and photocatalytic applications

Bachelor thesis - Using ion beams to study and modify 2D derivatives of carbon and PMMA polymer

Project:

- **UJEP-SGS-2021-53-005-2** - Preparation of micro-sensors and micro-capacitors based on polymers and graphene oxide by ion lithography
- **UJEP-SGS-2023-53-007-2** - Modification of GO and polymer films with energetic ion beams for their use in lithium batteries
- **GACR-22-10536S** - Advanced nano/microstructure fabrication utilising ion and electron beams for potential applications in microfluidic and lab-on-chip devices
- **GACR-23-06702S** - Changes in the electronic structure of graphene oxide by targeted doping and defect modulation with ion beams for microelectronics, catalysis and sensing