

Curriculum Vitae

Personal data:

- Name: Peter Jeglič
- Date and place of birth: October 15th 1977, Ljubljana, Slovenia
- Marital status: Married, two children
- Nationality: Slovenian
- Home address: Podmilščakova ulica 15, SI-1000 Ljubljana, Slovenia, tel.: +386 41 395 493, e-mail: peter.jeglic@ijs.si, web: ultracool.ijs.si



Education:

- PhD in physics, “Physical properties of decagonal quasicrystals and quasicrystalline approximants”, University of Ljubljana, 2004.
- BSc in physics, “Temperature-dependent bitumen softening studied by NMR”, University of Ljubljana, 2000.

Current and past positions:

- 2018 – now **Senior Research Fellow at Jožef Stefan Institute.**
- 2013 – now **Head of Laboratory for cold atoms at Jožef Stefan Institute.**
- 2009 – 2013 Research Fellow at Centre of Excellence EN-FIST, Ljubljana.
- 2008 – 2018 Research Fellow at Jožef Stefan Institute.
- 2006 – 2007 Postdoctoral Researcher at Max-Planck Institute for Chemical Physics of Solids, Dresden.
- 2004 – 2008 Postdoctoral Researcher at Jožef Stefan Institute.
- 2000 – now Teaching assistant at University of Ljubljana.
- 2000 – 2004 Young Researcher at Jožef Stefan Institute.

Institutional responsibilities & Commissions of trust:

- 2023 – now **Member of the IJSplus Project Launch Working Group.**
- 2023 – now Project application evaluator for the Dutch Research Council NWO.
- 2021 – now Evaluator of applications for the postdoctoral fellowship program "EUTOPIA Science and Innovation".
- 2019 – now **Member of the IJS Infrastructure Program Implementation Committee.**
- 2014 – 2014 Evaluator for the Austrian Science Fund FWF.
- 2004 – now Reviewer for Physical Review Letters, Physical Review B, Physical Review A, Physical Review Applied, Nanomaterials, Photonics, Jalcom, Materials and Science Advances.

Research Projects:

- 2023 – 2025 **Head of the project team at IJS for the European project "SiQUID - Slovenian Quantum Communication Infrastructure Demonstration".**
- 2020 – 2024 **Head of the project team at IJS for the Slovenian-Croatian research project "Development of building blocks for new European quantum communication network", ARRS, J2-2514.**
- 2017 – 2021 Slovenian coordinator (MC) and member of the working group “Quantum Physics and Society” in the COST project “Quantum Technologies with Ultra-Cold Atoms”, EU COST, CA16221.
- 2017 – 2020 Head of a basic research project entitled “High-resolution optical magnetometry with cold cesium atoms”, ARRS, J2-8191.
- 2009 – 2012 Head of a basic research project entitled “Superconductivity and magnetism in new iron-based superconductors”, ARRS, J1-2284.
- 2007 – 2008 Head of a postdoctoral basic research project entitled "Complex metallic alloys - novel materials for the future", ARRS, Z1-9333, 2007-2008.

2006 – 2007 Head of the Humboldt research project entitled "Atomic ordering in complex intermetallic compounds", Max-Planck Institute for Chemical Physics of Solids, Dresden, Germany.

Research interests:

- **Quantum physics with cold atoms** – own field of research, with my group we study Bose-Einstein condensation, matter-wave solitons and Bose fireworks.
- **Quantum technologies with atoms** – in my group we are developing quantum devices (quantum simulator based on ensembles of Rydberg atoms, atom magnetometer for detection of magnetic fields and gradients, quantum random number generator based on spin noise, quantum memory for photon storage based on EIT).
- **Quantum communications** - setting up a testbed network for quantum key distribution between IJS and FMF.
- Metal-to-insulator transition in alkali-doped zeolites.
- Superconductivity and magnetism in Fe-based superconductors and fullerides.
- Industrial materials and novel materials including bitumen, nylon and clathrates.
- Physics of quasicrystals and complex metallic alloys.

Research methods:

- In the Laboratory for cold atoms I led the setting up of an experimental system that can now routinely cool, trap and manipulate cesium atoms with laser light and electromagnetic fields.
- Trapping and manipulating atoms with optical tweezers.
- Fluorescence, absorption and non-destructive imaging of cold atoms to determine their number, density and temperature.
- Optical magnetometry using Faraday rotation of polarized laser light.
- Slowing and stopping light using electromagnetically induced transparency (EIT).
- Nuclear magnetic resonance (NMR) and nuclear quadrupole resonance (NQR).
- High-pressure NMR experiments up to 2 GPa.

Awards:

- **Award for the best innovation with commercial potential from public research organisations**, 16th International Technology Transfer Conference, Ljubljana, ITTC 2023.
- **Plaque for mentorship to Katja Gosar, who received the Dr. Uroš Seljak Award for the best scientific papers by first and second cycle students**, University of Ljubljana, 2022.
- Humboldt Research Fellowship, 2007.
- Futurum Prize for the distinguished PhD thesis, 2007.
- International Pro Natura Research Prize, 2005.
- Prešeren Prize for the distinguished diploma work, 2001.
- Honourable Mention at XXVII International Physics Olympiad in Oslo, Norway, 1996.
- Various prizes on national competitions in physics and mathematics.

Organisation of scientific meetings and international schools:

- Major events are in the pipeline as part of the European SiQUID project and the annual World Quantum Days.
- “Ultracool Seminar” on cold atoms and quantum technologies, organised at F5 department, with active participation of researchers from F1, F5 and F7 departments and FMF, since 2016.
- Member of the Organizing Committee of European School "Complex Metallic Alloys" in the "Complex Metallic Alloys" Network of Excellence within the European 6th Framework Programme. The school took place in Slovenia in 2006, 2007, 2008, 2009 and 2010. The school had a high reputation in materials science community and attracted world class PhD students and scientists.
- Member of the Organizing Committee of the conference entitled “Magnetic Resonance in Highly Frustrated Magnetic Systems”, HFMR 2010, February 1-4, 2010, Kranjska Gora, Slovenia.
- Member of the Organizing Committee of the conference entitled “NMR and EPR of Broad-Line Solids”, Specialized Colloque AMPERE 2003, September 8-12, 2003, Portorož, Slovenia.

Ongoing Collaborations:

- I collaborate with a number of groups leading in the field of cold atoms and quantum technologies. I would like to highlight Prof. Cheng Chin's group (University of Chicago, USA: Bose fireworks), Prof. Rudi Grimm's group (University of Innsbruck, Austria: cold cesium atoms), Prof. Francesca Ferlaino group (University of Innsbruck, Austria: cold erbium atoms), Dr. Ticijana Ban's group (Institute of Physics, Zagreb, Croatia: cold rubidium atoms), Dr Wolf von Klitzing's group (FORTH, Crete, Greece: atomic interferometry) and Prof. Thorsten Schumm's group (Vienna University of Technology, Austria: quantum technologies and metrology on a chip).
- Since 2012, I have been investigating the metal-insulator transition in zeolites in collaboration with the research groups of Dr. Mutsuo Igarashi (Gunma College, Japan) and Prof. Takehito Nakano (University of Ibaraki, Japan).
- In the field of superconductivity and magnetism, Prof. Denis Arčon and I have worked closely for many years with the research groups of Prof. Kosmas Prassides (University of Tohoku, Sendai, Japan: fullerenes), Prof. Prof. Matthew Rosseinski (University of Liverpool, UK: fullerenes), Prof. Arnold Guloy (University of Houston, USA: iron superconductors) and Prof. Helge Rosner (Max Planck Institute, CPfS, Dresden, Germany: iron superconductors).
- In the field of molecular compounds, charge ordering in Cs₄O₆ and Rb₄O₆ has been studied for many years in collaboration with the research group of Prof. Claudia Felser from the Max Planck Institute, CPfS, Dresden, Germany.
- In the field of complex metal alloys, I have collaborated for many years with the research group of Prof. Frank Haarmann, University of Aachen, Germany.

Professional achievements:

- Head of the Laboratory for cold atoms, where we achieved Bose-Einstein condensation of cesium atoms in November 2016. **Since 2013, over 25 physics students have worked with us** (more info at ultracool.ijs.si).
- Project team leader at IJS on two major projects in the field of quantum communications (the European SIQUID project and the Slovenian-Croatian ARRS project J2-2514).
- **Supervisor of three PhD students: Katja Gosar, Jure Pirman and Tadej Mežnaršič (2022).**
- Co-mentor of five master and three diploma theses.
- Member of the IJSplus Project Launch Working Group and IJS Infrastructure Program Implementation Committee.
- Leader of 4 research projects.
- **74 publications in international journals with impact factor: 1 Science, 1 Nature, 2 Science Advances, 3 Phys. Rev. Lett, 32 Physical Review B, 5 Physical Review A.**
- 8 conference proceedings and 87 contributions at the international conferences.
- 1426 citations, h-index = 21 (source: Web of Science, 17. 12. 2023).
- 2012 citations, h-index = 25 (source: Google Scholar, 17. 12. 2023).
- 20 invited lectures at the international conferences and institutes.
- More than 100 contributions at the international conferences.
- **9 popular science articles (4 Delo, 3 Novice IJS, Proteus, Alternator), 2 interviews (Delo, Dnevnik).**
- **Appearance in radio shows "Frekvenca X" (3x), "Kibernetško varna ZOFFA" and "Podobe znanja".**
- Appearance in a TV show called "Sadovi znanja".
- Slovenian coordinator (MC) for the COST project CA16221, responsible for social media and the website (atomqt.eu).
- Member of Slovene Quantum Technologies community (www.qutes.si).
- Organizer of Ultracool seminar (ultracool.ijs.si).
- Reviewer for Physical Review Letters, Physical Review B, Physical Review A, Physical Review Applied, Nanomaterials, Photonics, Jalcom, Materials in Science Advances.
- Project reviewer for the Dutch research fund NWO (2023), the EUTOPIA Science and Innovation postdoctoral fellowship programme (2021, 2022, 2023) and the Austrian science fund FWF (2014).
- **Award for the best innovation with commercial potential from public research organisations (2023).**