
Personal details and date of CV

- Laukkanen
- Pekka Johannes
- March 25, 2026.

I started scientific activities as a research assistant in 1997 at Optoelectronics Research Centre (ORC) in Prof. Markus Pessa's group, Tampere University of Technology (Finland) where I learned to grow and measure III-V compound semiconductor devices. In 2001, I moved to University of Turku (Finland) where I have done surface-science research at Materials Physics Group, led first by Prof. Juhani Väyrynen and then by Prof. Kalevi Kokko. In December 2023, I started as a head of this group, and I was selected for the professor position in the beginning of 2026. I have a passion to connect two research areas: semiconductor technology and surface science, from which I have obtained experience. These two disciplines have been quite separate. I see a lot of synergy and potential in increasing collaboration between these two disciplines, I want to build upon this. I have obtained experience of guiding and supervising colleagues and students in their academic pursuits. This also extends to advising students on career opportunities outside of academia, for example, my PhD students have founded two start-up companies (Comptek Solutions in 2017, SisuSemi 2024). I endeavour to create an atmosphere of respectful and open communication with my students and colleagues.

Degrees

- *Docent in Materials Physics*, April 2007, University of Turku, Finland.
- *Doctor of Philosophy*, December 2005, University of Turku, Finland. PhD thesis: "Atomic and electronic properties of GaAs(100) and InAs(100) semiconductor surfaces". Doctoral dissertation was approved with honours.
- *Master of Science in Engineering*, December 2000, Tampere University of Technology, Finland. Technical physics subject: Growth of GaN films and LED by molecular beam epitaxy.

Current employment

- 2026 January – *Professor* of materials physics, University of Turku, Finland.
- 2023 December – *Head* of materials physics group, University of Turku, Finland.

Previous work experience

- 2015 – 2025 *University Researcher*, Dep. of Physics and Astronomy, University of Turku, Finland.
- 2012 – 2014 *Collegium researcher*, Turku Collegium for Science and Medicine, University of Turku, Finland.
- 2008 – 2011 *Researcher*, University of Turku, Department of Physics and Astronomy, Finland.
- 2007 *Researcher*, Optoelectronics Research Centre, (group of Prof. Markus Pessa) Tampere University, Finland.
- 2006 *Researcher*, Department of Physics, University of Turku, Finland.
- 2002 – 2005 *Position* of Graduate School of Materials Research, University of Turku, Finland.
- 1997 – 2001 *Assistant researcher*, Optoelectronics Research Centre, Tampere University, Finland.

Career breaks

Parental leaves with three children: 3 months in 2008; 3 months in 2010; 2 months in 2019.

Research funding and grants (total 2 709 105 EUR):

Business Finland, 480 000 EUR. Consortium research-to-business: “*Growing nanostructures on III-V semiconductors by a cost efficient and simple method*”. PI and co-writer with my PhD student Zahra Rad. 2022 – 2024 (18 months). Second PI: Prof. Mircea Guina, Tampere University.

Academy of Finland, 400 000 EUR. Consortium project: “*Elimination of contact losses in semiconductors through atomic-scale interface research and engineering*”. 2021 – 2025 (48 months). Responsible writer and PI. Second PI: Prof. Hele Savin, Aalto University.

Business Finland, 371 000 EUR. Consortium research-to-business: “*Silicon Surface Processing Commercialization*”. 2018–2019 (18 months). PI and responsible writer. Second PI: Prof. Hele Savin, Aalto University.

Academy of Finland, 374 515 EUR. Project title: “*Oxidation of semiconductor crystals and its effects*”. 2016 – 2020 (48 months). Responsible writer and PI.

Business Finland, 374 309 EUR. The research-to-business project: “*Commercialization of novel interfaces*”. 2016 – 2017 (18 months). Co-writer and co-management together with my PhD student Johnny Dahl.

Academy of Finland, 400 000 EUR. Consortium project: “*Epitaxy and fundamental studies of novel highly-mismatched III-V alloys incorporating Bi*”. 2012 – 2016 (48 months). Responsible writer and PI. Second PI: Prof. Mircea Guina, Tampere University, Finland.

Business Finland, 100 286 EUR. Consortium project: “*Advanced III-V semiconductors for multi-junction high efficiency solar cells*”. 2009-2011 (36 months). Other partners: Tampere University (coordinator) and Aalto University. I was responsible at UTU side.

Academy of Finland, 189 000 EUR. Postdoctoral grant for three years 2007 – 2009. Project title: “*Research and development of nanofilms and nanostructures*”.

Research output

- 160 refereed articles
- 4 book chapters
- 7 patent families, concerning semiconductor surfaces.

Research supervision and leadership experience

- 8 completed *PhD theses* as the main supervisor in University of Turku.
- 1 completed *PhD thesis* as a co-supervisor together with Prof. Markus Pessa, Tampere University.
- 4 ongoing *PhD theses* as main supervisor, University of Turku, Finland.
- 13 *MSc theses* as the main supervisor, University of Turku, Finland.
- Supervision of 3 post docs (M. Kuzmin, J. Dahl, and M. Yasir), University of Turku, Finland.
- Leading of 4 Academy of Finland projects and 3 Business Finland projects.
- Leading materials physics group at University of Turku since December 2023.

Teaching merits

2007–2024 Lecturer of the courses, for example: “Basics of phases and properties of matter”, “Semiconductors” and “Electrical properties of solids”.

Author of 3 handouts for course materials at University of Turku, Finland: “Electrical properties of solids”, “Aineen olomuodot ja ominaisuudet” and “Semiconductors”.

Co-author of 7 physics textbooks for high school school (lukio), Otava Vipu 1-8 series (2020-2023).

Awards and honours

Teacher of the Year 2020 selected by students at University of Turku.

Award of entrepreneurship (30 000 EUR) at University of Turku 2016-2017 for our research group.

Other academic merits

Referee of the following journals:

Advanced Energy Materials, Advanced Functional Materials, Advanced Materials Interfaces, Applied Physics Letters, Applied Surface Science, Journal of Applied Physics, Journal of Crystal Growth, Journal of Physics, Nature Light Science & Applications, Physical Review B, Physical Review Letters, Scientific Reports, Semiconductor Science and Technology, Surface Science.

Peer reviewer of 4 doctoral theses:

- (1) Sampsa Hämäläinen, Aalto University, Finland 2014.
- (2) Markku Hannula, Tampere University, Finland 2019.
- (3) Lauri Palmolahti, Tampere University, Finland 2025.
- (4) Teemu Loippo, University of Jyväskylä, Finland 2025.

Opponent in 3 doctoral thesis examinations:

- (1) Johannes Vuorinen, Tampere University of Technology, Finland 2010.
- (2) Dmytro Anin, University of Oulu, Finland 2014.
- (3) Ekaterina Soboleva, Lappeenranta University of Technology 2021 (remote).

Peer reviewer of 18 project applications:

- Two U.S. Department of Energy applications in 2009 and 2015.
- 13 applications of Czech Science Foundation in 2010 – 2023.
- Two applications of National Sci. Center Poland in 2022.
- One application of Deutsche Forschungsgemeinschaft (DFG) in 2023.

Other work for community:

- Program committee, 15th International Conference on Nitride Semiconductors 2025.
- Program committee, Compound Semiconductor Week 2024.
- Board member of Finnish Physical Society.

Invited speaker:

- 1st International Workshop on Bi-Containing Semiconductors, Michigan, USA, July 2010. Topic: "Unusual Bi-induced surfaces of III-V semiconductors".
- European Materials Research Society (EMRS) spring meeting 2012, Strasbourg, France, May 2012. Topic: "Surface studies of nitrides and Bi-containing III-V surface layers".
- EURO MBE, Levi, Finland, March 2013: Short course lecture (2 hours). Topic: Use of RHEED.
- Symposium on Optoelectronic Technology and Applications (OTA 2016), China, 2016. Topic: "Development of infrared semiconductor materials using surface-science methods".
- Seminar in Johannes Kepler Universität, Linz, May 2021 (remote). Topic: "Challenges in III-V passivation and some possible solutions".
- Fall Meeting of Electrochemical Society 2021 (remote) Topic "Challenges in III-V passivation and some possible solutions".
- Ultra Clean Processing of Semiconductor Surfaces, UCPS-2023, Belgium. Topic: "Atomic Level Chemical and Structural Properties of Silicon Surface and Initial Stages of Oxidation".
- Plus 10 invited presentations approximately in domestic seminars or workshops.

Societal impact

Founding 2 startup companies: Comptek Solutions (2027) and SisuSemi (2024) together with my PhD students, who are executive chiefs. I'm a co-founder of companies which develop surface passivation for semiconductor devices. In 2023, Comptek obtained 8 million EUR in series A round, and has 25 employees now. SisuSemi got 1 million EUR starting investment.