

CV PEKKA KOSKINEN

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1. PERSONAL DETAILS AND THE DATE OF THE CV

- **Name:** Koskinen, Pekka Johannes
- **WOS profile:** webofscience.com/wos/author/record/1432598
- **ORCID:** orcid.org/0000-0001-7711-3562
- **Date of writing CV:** 9 December 2024

2. DEGREES

- **Title of docent (Adjunct professor):** 1.6 2009, University of Jyväskylä
- **PhD:** thesis *Models for Quantum Dots and Rings* 31.12 2003, University of Jyväskylä
- **MSc:** thesis *Hubbard Model in Mean-Field Approximation* 3.7 2001, University of Jyväskylä

3. OTHER EDUCATION AND EXPERTISE

- **Vocational teacher education** (60 ECTS), 20.6 2011, JAMK University of applied sciences

4. LANGUAGE SKILLS

- **Native language:** Finnish
- **Other Languages:** English (fluent), Swedish (good), German (working knowledge)

5. CURRENT EMPLOYMENT

- **Full professor:** Nanoscience Center, Department of Physics, University of Jyväskylä, 1.10.2020-
- **Department vice-head**, pedagogical head, and communications head, 1.1.2018-

6. PREVIOUS WORK EXPERIENCE

- Senior lecturer, 1.9.2016-30.9.2020, University of Jyväskylä,
- Academy research fellow 1.9.2011-31.8.2016, University of Jyväskylä
- Post-doctoral research fellow 1.8.2007-30.8.2011, University of Jyväskylä
- Post-doctoral researcher 1.2.2005-31.7.2007, Fraunhofer Institute for Mechanics of Materials (IWM) and Faculty of Physics, University of Freiburg, Germany
- Post-doctoral researcher 1.1 2004-31.1 2005, University of Jyväskylä
- Guest researcher 1.1-30.6 2002, Institute of Theoretical physics, Karl-Franzens University, Graz, Austria
- Teaching assistant 2000-2004, University of Jyväskylä

7. RESEARCH FUNDING AND GRANTS

- **Acquired total of 2,31 M€ research funding:**
 - 200 k€ from the Finnish Cultural Foundation for project GreenCat (co-PI) 2023
 - 450 k€ from Jane & Aatos Erkko foundation for project EcoMet 2022
 - 61 k€ for Nanoscience Center profiling postdoc 2020 (co-PI)
 - 434 k€ from the Academy of Finland for research on two-dimensional metals 2016
 - 140 k€ for fellowship project 2014 (Academy of Finland)
 - 240 k€ for fellowship project 2011 (Academy of Finland)
 - 391 k€ from the Academy of Finland for Academy research fellowship 2011
 - 189 k€ from the Academy of Finland for independent post-doctoral project 2007
 - 19.5 k€ from the Academy of Finland for post-doctoral research 2005
 - 16 k€ from Vilho, Yrjö and Kalle Väisälä foundation for doctoral studies 2003
 - 16 k€ from Vilho, Yrjö and Kalle Väisälä foundation for doctoral studies 2002
 - 151 k€ acquired competitive funding for teaching development in total (PI and co-PI)

8. RESEARCH OUTPUT

- **Research summary:** Contributing to two research fields:
 - i. Low-dimensional nanomaterials, especially carbon nanomaterials, and their structural, mechanical, vibrational, electronic, and electromechanical properties. Research methods are computational and range from continuum and classical force field methods to *ab initio* electronic structure methods, such as density-functional theory (DFT) and density-functional tight-binding (DFTB).
 - ii. Physics education research (PER), especially the development of teaching and assessment methods.
- **Publication summary:** Published 78 original peer-reviewed articles in major international journals, including 6 *Physical Review Letters*, *Nano Letters*, 4 *Nanoscale*, 3 *Applied Physics Letters*, 3 *Scientific Reports*, 1 *Nature Communications* and 1 *Nature Materials* articles. Articles include 5 *APS Editor's suggestions*, *Nature Nanotechnology highlight*, and two *APS Physics synopses*.
- **Citation metrics summary:** Clarivate analytics: total number of citations 4811, H-index 27, citations per article 60.3, five highest-cited articles have 1254, 625, 324, 273, and 217. Google scholar: total number of citations 6830, H-index 34, five highest-cited articles 1830, 796, 524, 350, and 319 citations. A median number of authors per article is three.

9. RESEARCH SUPERVISION AND LEADERSHIP

- **Academic leadership:** Since 2019 Research group leader; Since 2018 Department vice head, pedagogical head, and communications head; Since 2020 head of teacher education
- **Student supervision:** Officially supervised and co-supervised **10 BSc, 15 MSc, and 6 PhD (+2 ongoing)** theses (*estimated graduation):
 - **Post-docs:** Claudia Gomes da Rocha (2011-2014), Topi Kähärä (2018-2020), Janne Nevalaita (2017-2022), Sukhbir Singh (2023-2024), Mohammad Bagheri (2024-)
 - **PhD:** Sami Malola (2009), Ville Mäkinen (2013), Topi Korhonen (2016), Oleg Kit (2019), Souvik Agasti (2020), Joni Lämsä (2020), Daria Anttila (2025*), Kameyab Raza Abidi (2025*)

10. TEACHING MERITS

- **Vocational teacher education:** 20.6 2011, JAMK University of applied sciences
- **Teaching of courses:**
 - **Teacher:** 46 courses during 2000-2021 in Finland (in Finnish and English)
 - **Assistant:** 17 courses during 2000-2009 in Finland and Germany
 - **Basic level:** Elementary mechanics, thermodynamics, and optics

- **Advanced level:** Researchers' toolbox (2008-), Computational nanoscience (2013-), Teaching assistant education (2012-)
- **Created courses:** Researchers' toolbox (2008), Computational nanoscience (2013), Working life project simulator (2020), Quantum mechanics and the theory of relativity for the layman (2020), Introduction to teacher education (2022), Everyday physics (2024), Problem-solving processes in physics (2024)
- **Teaching skills:** *excellent* 7.5 2007, evaluation board, University of Jyväskylä
- **Development of teaching methods:**
 - Pioneering and advocating peer instruction methods on mass lectures and collaborative learning in recitation classes, developer of the *Primetime Learning* instructional strategy and SCAN self-assessment technique
- **Acquired total of 161 k€ competitive funding** for teaching development (PI and co-PI)

11. AWARDS AND HONOURS

- **Teaching development diploma**, Ynnä ry, University of Jyväskylä 2022
- **Knight of the Order of the White Rose of Finland**, the President of the Republic 2019
- **University teaching developer -prize**, University of Jyväskylä 2019
- **Lecturer of the year**, Ynnä ry, University of Jyväskylä 2016
- **Lecturer of the year**, Ynnä ry, University of Jyväskylä 2014
- **University teaching developer -prize**, University of Jyväskylä 2012

12. OTHER ACADEMIC MERITS

- **PhD thesis opponent:** Arsalan Hashemi (Aalto University 2023)
- **Pre-examiner for PhD thesis:** Mari Ijäs (Aalto University 2013), Elina Harriet Åhlgren (University of Helsinki 2014), Jarno Linnera (Aalto University 2019), Natalia Berseneva (Aalto University 2020), Rina Ibragimova (Aalto university 2021)
- **Docent (Adjunct professor):** Computational nanoscience, 1.6 2009, University of Jyväskylä
- **Proposal evaluator:** Chilean science foundation (FONDECYT), Austrian science foundation (FWF), Agence Nationale de la Recherche (ANR), France, Degree program accreditation, USN, Norway
- **Journal and book refereeing** (webofscience.com/wos/author/record/1432598): John Wiley & Sons, Inc. and Nature Communications, Physical Review Letters, Applied Physics Letters, ACS Nano, Nanoscale, and **nearly 50 other peer-reviewed journals**.
- **Administrative responsibilities:** Department: vice head, pedagogical head, head of teacher education, communications head, chair of teaching development group, student advisor, chair of trial lecture evaluation group, evaluator of physics teacher aptitude tests, annual report editor; Faculty: member of faculty teaching development group; University: member of lifelong learning steering group, student life steering group
- **Advisory board member:** Symposium for Small Particles and Inorganic Clusters (*ISSPIC-18*)
- **Members in scientific societies:** American Physical Society, European Physical Society, Finnish Physical Society, Member of Finnish Mathematics and Science Education Research Association

13. SCIENTIFIC AND SOCIETAL IMPACT

- **Open-source code development:** Creator and coordinator of the density-functional tight-binding (DFTB) code *hotbit* (<https://github.com/pekkosk/hotbit>; GPL license)
- Several appearances as a physics expert in magazines and newspapers.
- Creator and manager of the YouTube channel *Opi fysiikkaa* ("Study physics"), national resource for elementary physics education at university level.
- The MOOC course *Quantum mechanics and the theory of relativity for the layman* (in Finnish) available for lifelong learning of the general public.