

Prof. **Kai Nordlund**
Department of Physics and Helsinki Institute of Physics
University of Helsinki



CURRICULUM VITAE

1. Full name and date

- **Full name:** Kai Henrik Nordlund
- **Gender:** Male
- **Date of writing the CV:** Jan 12, 2019

2. Date and place of birth, citizenship, contact information

- **Date and place of birth:** November 3, 1969, Helsinki, Finland
- **Citizenship:** Finnish
- **Contact information:**

Work address: Accelerator laboratory, P.O. Box 43, 00014 University of Helsinki, Finland
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3. Current positions

Professor in Computational Materials Physics, University of Helsinki, 2007 –
Dean, Faculty of Science, University of Helsinki, 2018-2021.

4. Education and degrees awarded

- **Education:**
 - PhD, University of Helsinki, 1995
 - MSc, University of Helsinki, 1993
 - Matriculation examination, Tölö Swedish Secondary School, 1988
- **Title of Docent:** Docent in Physics, University of Helsinki, 1998

5. Other education and training, qualifications and skills

6. Linguistic skills

Swedish (Native), Finnish (Native), English (Excellent, home language), German (Fair), Russian (Basic)

7. Leadership experience and training

- **Academic leadership:**
 - Head, Department of Physics, 1.1 - 15.10.2018
 - Vice dean of teaching, infrastructure and bilingual affairs of the Faculty of Science 2014-2017
 - Director of the University of Helsinki Doctoral School in Natural Sciences, 2016-2018
 - Director of the University of Helsinki Doctoral Programme in Materials Research and Nanosciences (MATRENA), 2013-2015
 - Vice leader of the Academy of Finland Center of Excellence 2006-2011 “Computational Molecular Science”

- Co-leader of the National Graduate School in Nanoscience 2006-2015.
- Leader of the national MGrid and FGCI cluster computing networks 2004-
- Leader of the research group in computational materials science at the University of Helsinki, 1998-. Current group size: 15 full-time working research scientists on PhD student to senior scientist level.

- **Other leadership and training:**

- Chairman of the student union of Swedish-speaking students at the Faculty of Science “Spektrum” 1992-1993
- Co-founder and vice chairman of the student union of the Faculty of Science “Matlu” 1994
- Chairman of “Fysikersamfundet i Finland rf” 2004-2015
- Reserve office training and practise (6 months), “Reserviupseerikoulu” and “Nylands Brigad” 1989-1990
- University of Helsinki intensive course for new leaders, Jan 2014
- University of Helsinki mentoring programme 2018 ▪ University of Helsinki Unilead leadership education 2019

8. Research positions held

Research assistant (part-time, in total 16 months), University of Helsinki, 1991 – 1993

Research scientist, University of Helsinki, 1994–1996 (28 months)

Postdoctoral Research Associate, University of Illinois, 1996 – 1997 (20 months)

Assistant, University of Helsinki, 1996 - 1999 (on leave)

Junior Fellow, Academy of Finland, 1996 – 1999 (41 months)

Visiting scholar, University of Illinois, 1998 – 2000 (in total 6 months)

Senior Lecturer, University of Helsinki, 2000 – 2002 (on leave)

Professor (*locum tenens*), University of Helsinki, 2000 (7 months)

Academy Fellow, Academy of Finland, 2000 – 2002

Professor in Computational Physics, University of Helsinki, 2003 – 2007

Professor in Computational Materials Physics, University of Helsinki, 2007 –

9. Research funding and supervision

- **Major research appropriations and network memberships:**

- Academy of Finland projects granted 2001-2010: *MAPROFA* (633 000 FIM), *ELENA* (106 000 EUR), *CONADEP* (274 000 EUR), *NANOTOMO* (126 000 EUR), *OPNA* (114 000 EUR), *SMARTWOOD* (140 000 EUR)
- *Nanocluster processing of materials (NAPROMA)*, University of Helsinki project 2001 – 2003; 600 000 FIM.
- **Coordinator** of the national “*Electronic properties of carbon nanotubes*” (*ELENA*) research consortium 2003-2006.
- *Materials GRID (MGrid)*: **Leader** of the national MGRID consortium 2004-2010; total acquisition value 800 000 EUR
- Principal investigator of several EURATOM-EFDA fusion research tasks, on average about 100 000 EUR/year (2005 -)
- Vice leader of the Academy of Finland Center of Excellence 2006-2011 “Computational Molecular Science”; Own group part of funding 105 000 EUR/year (2006-2008), 127 000 EUR/year (2009-2011)
- Co-leader of the National Graduate School in Nanoscience.
- Member of the Management Committee of COST Action P19 “Multiscale modeling of materials”

- *CONDAPA* Helsinki Institute of Physics Theory Programme project 2008-2010; 90 000 EUR/year.
- *GETMAT*, EU/Euratom FP7 Theme Fission Collaborative Project 2008 - 2013; 113 600 EUR.
- *EUCARD*, EU/Euratom FP7 CP-CSA-Infra Project 2008 - 2013; 100 000 EUR.
- Academy of Finland Computational sciences project SIMITER 2010 – 2013; 290 000 EUR.
- Academy of Finland Photonics bilateral Finnish-Russian project ENIGAZ 2010 – 2013; 157 000 EUR.
- EU-ERANET Matera+ Academy of Finland project DESTIMP 2010 – 2013; 250 000 EUR.
- **Coordinator** of the national Finnish GRID infrastructure (FGI) 2010-; total acquisition value 2 200 000 EUR.
- Academy of Finland project HISCON 2012 – 2016; 250 000 EUR.
- Academy of Finland Nuclear technology targeted call project SIRDAME 2012 – 2016; 264 000 EUR.
- Academy of Finland project MESIOS 2014 – 2018; 666 000 EUR.
- Academy of Finland project NANOIS 2017 – 2021; 305 000 EUR.
- EU HORIZON2020 project IONS4SET 2016 – 2020; 398 000 EUR; co-PI
- **Leader** of the national Finnish Grid and Cloud infrastructure (FGCI Stages 1 and 2) 2014-; total funding granted 2 240 000 EUR (1) and 2730 000 EUR (2).

- **Supervision:**

- **Supervision of postdoctoral scientists as main supervisor:**

Supervision of 15 postdocs since 2000.

- **Major academic career developments of supervised postdocs:**

J. Kotakoski is now associate professor at the University of Vienna. N. Juslin was research assistant professor at the University of Tennessee. A. V. Krasheninnikov is now permanent distinguished scientist at Helmholtz-Zentrum Dresden-Rossendorf, Germany. F. Djurabekova is now permanent university researcher and group leader at the Helsinki Institute of Physics.

- **Supervision of theses:**

Supervision of 36 completed PhD theses and 26 M. Sc. theses since 2000.

10. Merits in teaching and pedagogical competence

- **Teaching experience:**

- At the Physics Department of the University of Helsinki: Teaching of physics courses at the undergraduate and graduate levels: *Introduction to Atomistic Simulations* (in Finnish and English, 3 times), *Monte Carlo Simulations I & II** (in Finnish and English, 3 times), *Thermophysics* (in Swedish, 10 times), *Solid State Physics* (in Swedish, 4 times in classroom, 1 time as flipped classroom online course), *Electrodynamics* (in Swedish, 3 times), *Introduction to Electromagnetism I & II* (in Swedish, 1 time), *Introduction to Nanoscience** (in English, 1 time), and *Materials Physics I & II* (in Swedish, 3 times in classroom, 1 time as flipped classroom online course), *Radiation Damage in Materials** (in English, 1 time). Courses marked with an * were created by me from scratch. Teaching assistant on 6 courses 1992-2000.
- Coordinator and examiner of the specialization alternative in computational physics 2000-
- Coordinator of the courses Nanoscience I-IV, 2005-2011.

- **Development of education:**

- Creation and development of the specialization alternative in computational physics at the University of Helsinki (1999-).

- Creation and development of the interdisciplinary courses Nanoscience I-IV held by 30 different lecturers in the Helsinki region (2005-2010).
- Creation and development of the international Master's programme "MoMoNano" at the University of Helsinki (2008-2015)
- Preparation of complete (text, tables, figures and exercises) web lecture notes on Atomistic simulations (Finnish and English), Monte Carlo simulations (English), Introduction to nanoscience (English), Thermophysics (Swedish), Solid state physics (Swedish), Materials Physics (Swedish) and Radiation Damage in Materials (English). For latter three courses, material also included all lectures as videos to youtube.
- Leader, as Vice-dean, of the complete reorganization of the Faculty of Science teaching into 7 bachelor's and 13 master's programmes 2015–.

11. Awards, prizes and honours

• Prizes:

Recipient of the Magnus Ehrnrooth prize in Physics 2007

Recipient of the Theodor Homén prize in Physics 2014

• Honorary positions:

Elected *honorary member* of the Student union for Swedish-speaking students at the Faculty of Science "Spektrum rf" (2017)

Awarded the decoration "Knight, First Class, of the Order of the White Rose of Finland" 6.12.2016

Inspector of the Student union for Swedish-speaking students of East Finland (2011 on)

Member of the Finnish Society of Sciences and Letters, "Finska vetenskaps societeten" (2005 on)

Member of the Swedish Academy of Engineering Sciences in Finland, "Svenska tekniska vetenskapsakademien" (2006 on; board member 2011 on)

Member of the Finnish Academy of Science and Letters, "Suomalainen tiedeakatemia" (2017 on)

Second highest ranking Master (*magister ultimus*) at the XC conferment ceremony of the Faculty of Philosophy of the University of Helsinki, 1994.

12. Other academic merits

• Examiner and opponent of theses:

Examiner or opponent of 17 PhD theses and numerous M.Sc theses in Finland and abroad since 2000.

• Memberships and positions of trust in scientific societies:

Member of the Finnish Society of Sciences and Letters (2005 on).

Member of the Swedish Academy of Engineering Sciences in Finland (2006 on; board member 2011 on).

Member of the Physical Society in Finland (1993 on; secretary 1995, member of the board 1995 on, chairman 2004 on).

Finnish Physical Society (1993 on; chairman of the Computational Physics division, 1999 on.).

Materials Research Society (1996 on).

Member in several national and international research evaluation committees of various funding organizations, 2003 on.

- **International positions of trust:**

Member of several IAEA coordinated research programmes, 2007 -; Representative of Finland in EPS Computational Physics Division, 2011 -; Chairman of Nordic Data Grid Facility evaluation board, 2009; Member of NorduCLIC board, 2009-. OECD NEA Data bank, liaison officer for the University of Helsinki; Chairman, OECD NEA committee on Primary Radiation Damage, 2010-2013; Member, EUROfusion Scientific and Technological Advisory Board STAC, 2014-

- **Memberships in permanent committees for international conferences:**

Member of the international committees for the *Computer simulation of radiation effects in solids (COSIRES)* conference series (2000 on); *Radiation Effects in Insulators (REI)* conference series (2011-2015); *Ion Beam Modification of Materials (IBMM)* (2012 on).

- **Positions in editorial boards of scientific journals:**

Member of the editorial board of Nuclear Instruments & Methods in Physics Research B: Beam Interactions with Materials and Atoms, 2003-2008.

- **Referee for scientific and scholarly journals and research proposals:**

Referee for more than 30 journals, including Science, Nature, Nature Materials, and Physical Review Letters. Reviewer of research proposals for numerous organizations, including the U. S. Department of Energy, the American Chemical Society, the European Science Foundation and the Academy of Finland.

- **Invited talks at international conferences:**

- **Plenary or keynote speaker at the following conferences**

XXXVII Annual Conference of the Finnish Physical Society, 2003, Helsinki, Finland; *18th International Conference on Ion Beam Analysis*, 2007, Hyderabad, India; *18th International Workshop on Inelastic Ion-Surface Collisions (IISC-18)*, 2010, Gatlinburg, Tennessee, USA; *The 2014 Nuclear materials Conference*, Clearwater Beach, Florida, USA; *23rd International Conference on Ion Beam Analysis*, 2017, Shanghai, China; *The 15th European Vacuum Conference*, 2018, Geneva, Switzerland; *The 2018 Nuclear materials Conference*, Seattle, USA;

- **Invited speaker at 75 international conferences since 1998 (counting only accepted invitations).**

13. Scientific and societal impact of research

- **Total number of publications:**

- Jan 12, 2019: 515 refereed international scientific publications, 5 refereed invited review and overview articles, 4 book contributions and 23 non-refereed scientific overview and popularizing articles.

- Out of the these, 2 are in Nature group journals and 22 in the impact factor > 6 journals Physical Review Letters, ACS Nano, Small, Carbon, and Chemistry of materials.

- List available at http://beam.acclab.helsinki.fi/~knordlun/publications_txt.html

- **Impact of scientific work:**

Clarivate Analytics Web of Science, May 29, 2019: h-index 58, m-index 2.3, total number of citations 14319.

- **Merits in science communication:**

- 12 newspaper, 21 radio and 2 TV interviews since 2004.

- Columnist for “Forum för Ekonomi and Teknik”, 2017 on.

- Original author of 13 wikipedia articles.

- **Organization of scientific conferences:**

Main organizer (chairman) of 12 scientific conferences since 2003.

14. Positions of trust in society and other societal merits

- **Military service and rank:**

192'nd Finnish army Reserve Officers course, Hamina, 1989-1990

Rank in the reserve: Second Lieutenant

- **Outreach activities:**

- Member of the evaluation board of the "TekNatur" competition in science for high-school students, 2003 on; chairman, 2009 on.

- Initiator and organizer of biennial science outreach conference "Finnish-Swedish Physics and Chemistry days", reaching each time about 100 teachers and other non-academic attendees, since 2007.

- Speaker and session organizer at several events of the University of Helsinki outreach events "Tieteen päivät" and "Tiedekulma", 4 times since 2006.

15. Other merits

- **Posts in student unions:**

- Chairman of the student union of Swedish-speaking students at the Faculty of Science at the University of Helsinki "Spektrum" 1992-1993

- Co-founder and vice chairman of the student union of the Faculty of Science "Matlu" 1994

- Founding member of the student union of Finnish-speaking Physics students "Resonanssi" 1994