

CURRICULUM VITAE

16 January 2024

Emilia Katja Johanna Kilpua (née: Huttunen)

Born November 18, 1977, Oulu, Finland

<http://blogs.helsinki.fi/ekilpua/>



SUMMARY

- Full professor in space physics at the University of Helsinki (UH)
- Active in academic supervision: **13** post-doctoral researchers, **15** doctoral thesis (8 completed), **13** MSc thesis and **9** BSc thesis.
- Active in developing PhD training (Coordinator of Marie Skłodowska-Curie ITN project, Head of the doctoral program of Particle Physics and Universe Sciences at UH)
- Two textbooks published and developing MOOC courses
- Active publisher (**200+** papers in peer-reviewed journals, incl. Nature group)
- Active in the community (reviewer of journals, proposals, PhD thesis, positions, conference organizing, ESA delegate, EGU incoming division president, ...)
- 39 invited talks/seminars
- Successful in receiving research funding (total > **6 MEUR**)
- Active in outreach (e.g. recent popular science book about the Sun)

UNIVERSITY DEGREES

- *Docent in Space Physics*, June, 2013, University of Helsinki, Finland
- *Doctor of Philosophy*, April 24, 2005, University of Helsinki, Finland
Major subject: Theoretical physics
PhD Thesis: Interplanetary shocks, magnetic clouds and magnetospheric storms
- *Master of Science*, June 16, 2000, University of Helsinki, Finland,

PRESENT POSITION

- *Professor at Department of Physics, University of Helsinki*

PREVIOUS ASSIGNMENTS

- 2015 – 2020 *Associate professor at Department of Physics, University of Helsinki (tenure track)*
- 2015 *University Lecturer / Department of Physics, University of Helsinki, Finland*
- 2009 – 2015 *Academy Research Fellow, Academy of Finland*
- 2008 – 2009 *Post-doc/ Department of Physics, University of Helsinki, Finland*

- 2007 – 2008 Assistant Research Physicists, Space Sciences Laboratory, University of California, Berkeley, USA
- 2005 – 2007 Post-Doc/ Space Sciences Laboratory, University of California, Berkeley, USA
- 2001 – 2005 Scientist/ Department of Physics, University of Helsinki, Finland
- 2000 – 2001 Research assistant/ Department of Physics, University of Helsinki, Finland

CAREER BREAKS

- Maternity leave 1.11.2010-1.9.2011

PARTICIPATION IN ACADEMIC EDUCATION

- Supervisor of **13** post-doctoral researchers, **15** doctoral thesis (8 completed), **13** MSc thesis and **9** BSc thesis
- **Postdocs:** K. Snekvik (2015), A. Isavnin (2014 – 2016), J. Pomoell (September 2015 - 2019), E. Asvestari (2017 - 2019), Daniel Price (2018 →), Diana Morosan (2018 → 2023), Daniel Good (2018 →), Anshu Kumari (2020 → 2022), Farhad Daei (2020 →), Sanchita Pal (2020 →2022), Ranadeep Sarkar (2020 →), Matti Ala-Lahti (2021-2022), Sanni Hoilijoki (2020 →)
- **Doctoral theses:** M. Alalahti (2021), E. Palmerio, UH (2019) M. Myllys, UH (2017), A. Isavnin, UH (2014), L. Turc, Ecole Polytechnique (with D. Fontaine as main supervisor), France (2014), Immanuel JebaRaj (with Jasmina Magdalenic as main supervisor), Milla Kalliokoski (2022), Harriet George (2022), Chaitanya Shistla (expected 2024), Andreas Wagner (expected 2024), Arto Lehtolainen (expected 2024, supervisor), Juska Räsänen (expected 2025; co-supervisor), Julia Ruohotie (expected 2025, co-supervisor), Mayank Kumar (expected 2026, co-supervisor), Venla Koikkalainen (co-supervisor expected 2027)
- **MSc theses:** V. Lipsanen (expected, spring 2024), V. Koikkalainen (2023) J. Ruohotie (2022), J. Räsänen, (2020) M. Kalliokoski (June 2018), I. JebaRaj (October 2017), M. Ala-Lahti (May 2017), E. Lumme (September 2016), N. Wijzen, (KU Leuven, co-supervised, August 2016), A. Potemine, Paul Sabatier University, Toulouse, France (September 2015, co-supervised). E. Palmerio, UH (January 2015), S. Käki, UH (spring 2015), S. Nikbakhsh, UH (2014), M. Marsch, UH (2012)
- **BSc theses:** T. Bäck (expected 2023), V.-P. Linho (expected 2023), V. Koikkalainen (2021), J. Räsänen (2020), V. Tarvas (spring 2018), M. Kalliokoski (May 2017), M. Lotti (2015), E. Lumme, UH (2015), J. Havukainen, UH (spring 2015).
- 2018 – **Head of Doctoral Programme** in particle physics and universe sciences (PAPU)/Department of Physics, University of Helsinki, Finland
- 2021 – 2025: **Coordinator** of the Marie Skłodowska-Curie Innovative Training Network SWATNet (<https://swatnet.eu/>)
- Planning of training curriculum for doctoral students for the SWATNet project (both online and onsite activities)

SCIENTIFIC EXPERT POSITIONS

- 2024 – Member of the Finnish Society of Sciences and Letters
- 2023 – 2024 **President** of EGU Solar-Terrestrial Sciences Division
- 2023 – **Principal Investigator**, Bepicolombo SIXS
- 2023 – Co-I Sunstorm mission
- 2022 – Finnish **Delegate** in the Science Programme Committee, ESA
- 2022 – 2023 Deputy President of EGU Solar-Terrestrial Sciences Division
- 2022 – Associate Editor of Astrophysics and Space Science, Springer Nature
- 2021 – Review Editor in Frontiers in Space Physics
- 2020 – Member of Finnish Academy of Science and Letters
- 2020 – Member of Finnish Space Situational Awareness working team
- 2019 – 2021 President of Board of The Finnish Physical Society
- 2017 – Member of Scientific Committee on Solar-Terrestrial Physics (SCOSTEP)
- 2017 – 2021 Member of Board of Solar Physics Division - European Physical Society
- 2016 – 2019 Vice president of Board of The Finnish Physical Society
- 2015 – 2022 CO-I, Bepicolombo SIXS
- 2015 – 2019 Chair of Space Division of The Finnish Physical Society
- 2014 – Business Finland Senior Advisor Pauli Stigell's Horizon 2020 Space Support group
- *Reviewer of scientific journals* (e.g., Annales Geophysicae, Journal of Atmospheric and Solar-Terrestrial Physics, Astrophysics and Space Science, The Astrophysical Journal, Journal of Geophysical Research)
- *Reviewer of research proposals* (e.g., Swedish Research Council, Research Council of Norway (RCN), Suomen Kulttuurirahasto, NSF, USA 2011-2012, Czech Science Foundation, UK Research, and Innovation UKRI)
- Evaluator for academic positions/docentships/professorships (e.g., Faculty of Science, Stockholm University; University of Michigan; National Research Foundation, several positions for University of Helsinki)
- Member of *Academy Club for Young Scientists*, 2009-2010
- Member of International Space Science Institute (ISSI) teams 2018-2019 and 2019- 2020
- Member of Centre for Advanced Studies (CAS) at the Norwegian Academy of Science and Letters Young Fellow network

THESIS REVIEW COMMITTEES/PRE-EXAMINER

- Pauli Väisänen, University of Oulu, 2023 (Examiner)
- Stein Haaland, University of Oulu, 2023 (Examiner)
- Leonid Oliner, University of Alberta, Canada, September, 2022 (Examiner)
- Konrad Steinvall, Uppsala University, June 8, 2022, Sweden (Committee)

- Clement Moissard, Ecole Polytechnique, May 5, 2021, University of Paris, Saclay, France (Committee)
- Florian Regnault, Institut d'Astrophysique Spatiale, CNRS, Université Paris-Saclay, Orsay, France, 13 September 2021 (Committee)
- Filomena Catapano, Pierre and Marie Curie University, Paris, France, March 2019 (Examiner)
- Eduardo Sanchez Diaz, University of Toulouse, France 2017 (Committee)

INSTITUTIONAL RESPONSIBILITIES

- 2018 – Head of Doctoral Programme in particle physics and universe sciences (PAPU)/Department of Physics, University of Helsinki, Finland
- 2021 – Member of Ethical Board/Department of Physics, University of Helsinki, Finland
- 2017 – 2021 Member of Master's Programme in Particle Physics and Astrophysical Sciences (PARAS) Board, University of Helsinki, Finland
- 2016 – Member of Education Jury Board, UH
- 2016 - Committee of Master's Course Development Programme (Isopyörä), University of Helsinki, Finland
- 2014 – 2017 Steering group of Doctoral Programme in particle physics and universe sciences (PAPU)/ Department of Physics, University of Helsinki, Finland
- 2014 - Member of Teaching Committee, University of Helsinki, Finland

PRIZES AND RECOGNITIONS

- 2021 – Väisälä Prize 2021 of Finnish Academy of Science and Letters
- 2020 – Member of Finnish Academy of Science and Letters
- 2016 – 2022 ERC Consolidator Grant

PUBLICATIONS

- 190+ publications (38 as first-author) in peer-reviewed journals of the field (published/in revision/accepted)
- H-index 43, cited over 6000 times.
- Web of Science Researcher ID: G-8994-2012
- Orchid ID: <https://orcid.org/0000-0002-4489-8073>

TEACHING

- Fall 2023 - : *Lecturer of Vuorovaikutukset ja aine* at Department of Physics, University of Helsinki, Finland
- Fall 2018 - present: *Lecturer of Johdatus Avaruusplasmafysiikkaan* at Department of Physics, University of Helsinki, Finland
- Spring 2018: Coordinator of “My First Satellite” Summer School, 14-17.5.2018 (<https://www.helsinki.fi/en/news/science-news/my-first-satellite-summer-school>) Physics, University of Helsinki, Finland
- Spring 2017- present: *Lecturer of Electromagnetisms* at Department of Physics, University of Helsinki, Finland

- Spring 2016, 2018: *Lecturer of Advanced Space Plasma Physics* at Department of Physics, University of Helsinki, Finland
- Fall 2008, 2009, 2013-2016: *Lecturer of Plasma Physics*, Department of Physics, University of Helsinki, Finland
- Fall 2009, 2012, 2016: *Lecturer of Space Applications of Plasma Physics*, Department of Physics, University of Helsinki, Finland

TEACHING MATERIAL/BOOKS

- Own lecture notes for each course lectured
- Kilpua & Koskinen: *Introduction to Plasma Physics*, Limes Ry., 2017
- Koskinen & Kilpua: *Physics of Earth's Radiation Belts – Theory and Observations*, Springer (open access; <https://link.springer.com/book/10.1007/978-3-030-82167-8>)
- Working group member of “Tähdet ja Avaruus” (“Stars and Space”) MOOC course
- Leader of the working group of “Sustainable Space” MOOC course (planned release early 2024)

FORMAL PEDAGOGICAL EDUCATION

- University Pedagogy courses I and II (10 cr, fall 2012)
- Basic teaching courses: Basic Course for Math Teachers (12 cr, fall 2010), Introduction to General Didactics (2 cr, fall 2009), Observation Course in Teaching (1 cr, fall 2009), Physics and Mathematics didactic groups (2 cr, fall 2009), Basics concepts of school mathematics (6 cr, spring 2009), Major Physics Teachers' Laboratory Courses I&II (10 cr, fall 2008)
- Kovien tieteiden yliopistopedagogiikka (5 cr, fall 2013)
- Publication: <https://lehti.yliopistopedagogiikka.fi/2016/04/15/teoreettisen-fysiikan-opiskelijoiden-suhtautuminen-aktiivoiviin-opetusmenetelmiin/>

MOST IMPORTANT FOREIGN VISITS (> two weeks)

- 1.11.2019 – 15.11.2019, *Visiting professors*, Analysis of turbulence in CME-driven sheath regions, Laboratoire de Physique des Plasma, Ecole Polytechnique (EP), France with Prof. Dominique Fontaine. (2 weeks)
- 1.11.2018 – 30.11.2018, *Visiting professors*, Analysis of CME-driven sheath regions, Laboratoire de Physique des Plasma, Ecole Polytechnique (EP), France with Prof. Dominique Fontaine. (1 month)
- Fall 2003, *Visiting scientist*, Cluster data analysis with Dr. James Slavin NASA Goddard Space Flight Center, Greenbelt, U.S. (3 months)
- 1.9.2005 – 31.12.2007, *Post-doc*, STEREO data analysis with Dr. Janet Luhmann and Prof. Stuart Bale, Space Sciences Laboratory, University of California, Berkeley
- 1.1.2008 – 31.7.2008, *Visiting scientist*, STEREO data analysis with Dr. Janet Luhmann and Prof. Stuart Bale, Space Sciences Laboratory, University of California, Berkeley
- Fall 2002, *Visiting scientist*, LASCO and ACE data analysis, Max Planck Institute for Solar System Research, Katlenburg-Lindau, Germany (1.5 month)
- Spring 2001, *Visiting scientist*, LASCO&ACE data analysis, with Dr. Rainer

Schwenn Max Planck Institute for Solar System Research, Katlenburg-Lindau,
Germany (1.5 month)

INVITED TALKS

1. IAU Symposium 226: Coronal and stellar mass ejections, Beijing, 2004
2. SOHO 20 Transient Events on the Sun and in the Heliosphere, Ghent, Belgium, 2007
3. European Geosciences Union, General Assembly, Vienna, Austria, 19-24 Apr, 2009
4. European Geosciences Union, General Assembly, Vienna, Austria, 19-24 Apr, 2009 (two invited talks)
5. Three Eyes on the Sun STEREO-3/SOHO-22 Workshop, Bournemouth, UK, Apr, 2009
6. 11th IAGA Scientific Assembly, Sopron, Hungary, Aug, 2009
7. European Geosciences Union, General Assembly, Vienna, Austria, May, 2010
8. Stereo-4/SDO-2/SOHO-25 meeting, Kiel, Germany, Jul, 2011
9. 8th European Space Weather Week, Namur, Belgium, Dec 2011
10. 14th European Solar Physics Meeting, Trinity Colleague, Dublin, UK, Sep, 2014
11. Invited seminar, ESA Scientific Support Office Seminar Program, ESTEC, Noordwijk, Netherlands, March 4, 2016
12. ISSI Workshop on The scientific foundations of Space Weather, Bern, Switzerland, 27 June - 1 July 2016
13. European Week of Astronomy, 4-8 July 2016, Athens, Greece
14. Cospar Meeting, Istanbul, Turkey, 31 July – 7 August, 2016 (Meeting cancelled)
15. Space Weather Week, 14-18 November, 2016, Belgium, Session 9
16. Space Weather Week, 14-18 November, 2016, Belgium, Session 3
17. 7th Solar Orbiter Workshop, Granada, Spain, 3-6, April 2017
18. European Geosciences Union, General Assembly, Vienna, Austria, May, 2018
19. 7th Solar Orbiter Workshop, Granada, Spain, 3-6, April 2017
20. AOGS 15th Annual Meeting, Honolulu, Hawaii, June 3-8, 2018
21. XXXth General Assembly of the International Astronomical Union, Vienna, Austria, 20-31, 2018
22. AGU Fall Meeting, December 10-14, Washington DC, USA
23. Chapman on Scientific Challenges Pertaining to Space Weather Forecasting Including Extremes, 11-15 February, 2019, Pasadena, CA
24. EISCAT 3D User Meeting, 26 March, 2019, Oulu, Finland
25. Invited seminar, University of Stockholm, 29 March, 2019, Stockholm, Sweden
26. Preparing for When the Sun Wakes Up: Workshop on Deep-Space Sun-Earth L5/L1 Space-Weather Missions workshop, 27-28.6, London
27. AOGS 16th Annual Meeting, July 29 - August 2, 2019, Singapore,
28. European Geosciences Union, General Assembly, online, May 2020
29. Invited seminar, University of Stockholm, 29 March, 2019, Stockholm, Sweden
30. AGU fall meeting 1-7, 2020, online
31. Royal Astronomical Society Specialist Discussion Meeting, January 1, 2021

32. Solar Wind Magnetosphere Interaction Workshop Aug 30 - Sep 2 & September 13-16, 2021
33. Whole Heliosphere and Planetary Interactions (WHPI) Workshop, September 13-17, 2021
34. XVIIth Hvar Astrophysical Colloquium Programme, 20-24 September, 2021
35. IAU General Assembly XXXI, Beyond the Goldilocks Zone, Busan, South-Korea, August 2-3, 2022
36. CmPA 30 - prof. Poedts 60 Symposium, 6-9 September 2022, Leuven, Belgium
37. Invited lecturer (two lectures) at Radiation Belt Dynamics and Remote Sensing of the Earth's Plasmasphere school, L'Aquila, Italy, 25-29 September, 2022
38. Invited lecturer at the International Space Science School (ISSS), 24-26.11.2022, Brazil
39. SOLARNET Conference, 10 May 2023, Berlin, Germany

RESEARCH FUNDING

- Total research funding received ~**6.2 MEUR**
- 2024 – 2027: SOLER H2020 project, (WP leader) (~200k)
- 3.1.2021 – 28.2.2025: Marie Curie ITN SWATNET, (Coordinator) (~300 k)
- 1.1.2021 - 30.6.2024: H2020 Consortium SERPENTINE (WP Leader) (~300 k)
- 1.1.2020 – 1.1.2024: EUHFORIA 2.0, H2020 (WP leader) (~300k) 5.5
- 1.1.2021 – 1.7.2023: EU Use Of L5 Data In Cme Propagation Models (User Case leader) (~41k)
- 1.8.2018 -1.8.2021: Shocks and Magnetosheaths in the Heliosphere, Academy of Finland SMASH (co-PI) (398keur) 5
- 2018 - 2026: Finnish Center of Excellence for Sustainable Space, team leader, Academy of Finland (489 keur + 393 keur)
- 1.8.2018 -1.8.2021: Shocks and Magnetosheaths in the Heliosphere, Academy of Finland SMASH (co-PI) (398keur)
- 2017 -2021: Constraining CMEs and Shocks by Observations and Modelling (CCSOM), BRAIN-be (UH representative) (~200keur)
- 1.6.2017 -31.5.2022: ERC Consolidator Grant (PI) (1.93 Meur)
- 2015-2017: University of Helsinki 3-year research grant (PI) (150keur)
- 2015-2016: Coupling transient activity from the Sun to the Heliosphere, The Royal Society International Exchange Grant (co-PI) (7keur)
- 2014-2017: HELCATS, EU-FP7 (Task Leader) (220keur)
- 2013-2017: Missing Links in Space Weather Driving, Academy of Finland (Co-I) (256keur)
- 2009-2015: Academy of Research Fellow, Academy of Finland (PI) (606keur)
- 2012-2013: Turbulent properties of coronal mass ejection-driven sheath regions and related space weather effects, Academy of Finland (PI) (83keur)
- 2008-2010: University of Helsinki Post-Doc (PI)
- 2008: Microphysics of magnetic reconnection in the solar wind, Academy of Finland, (PI) (8keur)

- 2007: Observations of plasma wave activity in the solar wind magnetic reconnection regions, Academy of Finland, (PI) (8keur)
- > 20 travel and visitor grants (1– 4keur). Funding obtained from foundations from Finland, UK, Germany, USA, and France

CONFERENCE ORGANIZING

- 2024: SOC of Winter Satellite Workshop, Espoo, Otaniemi 17-19 January, 2024
- 2023: SCOSTEP-UN-ISWI Workshop on the Predictability of the Variable Solar-Terrestrial Coupling (PRESTO), Trieste May 30 - June 2, 2023
- 2022: 15th quadrennial solar-terrestrial physics symposium (STP-15), 21-25 February
- 2022: Cospar 2022 meeting in Athens, 16-24 July, 2022
- 2021: 16th European Solar Physics Meeting ESPM-16, September 6 – 10, 2021
- 2020: Cospar Meeting, Australia (SOC), ST27 - Origin, Propagation, and Heliospheric Impact of Magnetic Flux Ropes from the Sun
- 2020: AOGS 17th Annual Meeting, Hongcheon, South Korea, 28 June – 4 July, 2020 (SOC)
- 2019: XV meeting of Finnish space researchers FinCospar, 28-29.8.2019 (SOC&LOC)
- 2019: Solar Wind 15 meeting, Brussels, Belgium (SOC)
- 2019: 2019 IUGG General Assembly, Montreal (SOC)
- 2018: EGU meeting, Session ST1.7 (co-convener)
- 2017: EGU meeting, Session ST1.4 (co-convener)
- 2017: 4th SOLARNET Meeting, Canary Islands, Spain (SOC)
- 2016: Global Space Weather Modelling Workshop, Espoo, Finland (SOC, LOC)
- 2016: EGU meeting/Session ST1.2 (convener, chair) and ST2.4 (co-convener) Vienna
- 2015: EU/FP7 HELCATS project meeting /Helsinki, Finland (main organizer)
- 2015: The 49th Annual Meeting of Finnish Physical Society/ Helsinki, Finland (LOC)
- 2014: The 48th Annual Meeting of the Finnish Physical Society/ Tampere (chair)
- 2013: EPS conference of Plasma Physics/ Espoo, Finland (LOC)
- 2013: European Week of Astronomy and Space Science, Turku Finland (SOC)
- 2013: EGU meeting/Session ST1.4/ Vienna, Austria (co-convener)

MERITS RELATED TO DISSEMINATION OF RESEARCH RESULTS TO WIDER PUBLIC

- Aurinko - tuttu ja tuntematon tähtemme: Emilia Kilpua & Hannu Koskinen, ~300 pages, Gaudeamus, ISBN 9789523452329 (a popular science book about the Sun)
- Numerous outreach public lectures and key organizer of outreach events, e.g.
 - Coordinator of Researchers' Night event for school students and kindergarten kids (September 2023)
 - A Night with Space Nobelists (Finnish Physical Society's event main coordinator)
 - BepiColombo outreach event (May 2018) and launch party (October 2018)
 - Coordinator of the 70th Anniversary Year of the Finnish Physical Society (Tiede – Tutkimus – Tarina, powered by Pecha Kucha event, September 29.9, blog <https://blogs.helsinki.fi/sfs-70/>)

- Organizer of outreach events (e.g., Kosmoksen Valoja 2015, Uusi Avaruus, 2016, Elämää Avaruudessa? 2017 at Tiedekulma, Tutkijoiden Yö 2016)
- Public talks e.g., in URSA, and LUMA events, schools
- Media responsible of BepiColombo in Finland
- Active appearances in media, including TV and radio
- Actively using social media to promote science and research results for a wider public and for a scientific community (e.g., Twitter @EmiliaKilpua)