

Curriculum Vitae, Maarit J. Käpylä

3rd of June, 2016

1. Name and year of birth: Käpylä, Maarit Johanna (née Korpi, bef. Mantere), 1974

2. Degrees:

- December 1996, M.Sc. degree, major subject astronomy, University of Oulu
- September 1998, Phil. Lic., major subject astronomy, University of Oulu
- September 1999, Ph.D., major subject astronomy, University of Oulu, thesis topic 'Supernova driven interstellar turbulence - the role of supernova explosions'

3. Docentships: November 2008, title of Docent in astronomy, University of Helsinki, Finland.

4. Present employment: Independent Max Planck Research Group Leader, Max Planck Institute for Solar System Research, Göttingen, Germany (1.6.2016–31.8.2021), with adjunct professorship in Aalto University (astroinformatics; leading the ReSoLVE Centre of Excellence DYNAMO team).

5. Previous employment:

- May 1996 – December 1996, research assistant employed by the Academy of Finland project: 'Late-type stars: activity, magnetism, turbulence', PI Prof. Ilkka Tuominen, University of Oulu, Finland.
- January 1997 – October 1998, postgraduate researcher employed by the European Commission Human Resources and Mobility -network project: 'Late-type stars: activity, magnetism, turbulence', PI Prof. I. Tuominen, University of Oulu, Finland.
- September 2000 – July 2001, postdoctoral researcher at the University of Oulu, with funding from the Finnish Culture Foundation, Magnus Ehrnrooth Foundation and Väisälä Foundation.
- August 2001 – December 2002, November 2003 – May 2004, postdoctoral fellow of the Academy of Finland (University of Oulu and in the Laboratoire d'Astrophysique, Observatoire Midi-Pyrénées, Toulouse, France).
- April 2005 – August 2005, postdoctoral fellow, Nordic Institute for Theoretical Physics (NORDITA), Copenhagen, Denmark.
- Academy research fellow, 1.8.2005 – 31.07.2012, University of Helsinki
- 1.8.2012 – 31.01.2013 University researcher, University of Helsinki
- Research coordinator at the department of information and computer science at Aalto university 1.2.2013–31.1.2015
- Academic coordinator at the department of computer science at Aalto university 1.2.2015–31.5.2016

6. Most important visits abroad: During the past five years, several regular research visits to the Nordic Institute of Theoretical Physics (NORDITA), Stockholm; several research visits to the University of Newcastle upon Tyne, Uppsala University, LAOMP Toulouse, Leibniz Institute for Astrophysics, Potsdam, and Max Planck Institute for Solar System Research, Göttingen.

7. Scientific and academic administrative positions:

- During 1.1.2014–31.12.2019, the team leader of the Academy of Finland Centre of Excellence ReSoLVE
- Principal senior scientist of the magnetohydrodynamics group since 2005 (Department of Astronomy 2005–2009, Department of Physics 2009–2012), University of Helsinki
- Substitute member in the department council, Department of Physics, University of Helsinki, 2010–2012.
- Member of the Aalto University Large Infrastructures steering committee (2013–2016)
- Member of the Science-IT HPC infrastructure Executive Committee (2013–2016)

8. Research grants and honors:

- May 1997: Faculty of Science yearly award for the best Pro Gradu dissertation, University of Oulu
- January 1998: Faculty of Science travel and research grant, for the rapidly advanced postgraduate studies and to help the completion of Licentiate studies, University of Oulu
- February 1998: Research grant, Finnish Culture Foundation (for one year of postgraduate studies)
- May 1998: Research grant, Ella and Georg Ehrnrooth Foundation
- November 1998: Research grant, Väisälä Foundation
- March 2000: Travel grant for the best oral presentation at the 34th Annual Meeting of the Finnish Physical Society
- May 2000: Research grant, Ella and Georg Ehrnrooth Foundation
- April 2000: The yearly award of the Finnish Academy of Science and Letters for high level Ph.D. thesis
- September 2000: University of Oulu yearly award for the best Ph.D. thesis

9. Teaching experience:

Studies in pedagogy, andragogy and didactic of natural sciences, 20 credits, at the Department of Teacher Education, Univ. of Helsinki,

- **During 1998–present, supervised 7 M.Sc. thesis, 3 Ph.D. thesis, and is currently supervising/instructing 4 Ph.D. students (2 in UH, 2 in Aalto).**

- Lectured the course Introduction to Astronomy: practical exercises, 2 credits, approbatur-level (Univ. of Oulu, fall 1996, spring 2000, fall 2001).
- Prepared and lectured the course Practical methods in numerical MHD, 7 credits, laudatur-level (Univ. of Helsinki, fall 2006, 2011)
- Prepared and lectured the course Magnetohydrodynamics, 7 credits, laudatur-level (Univ. of Helsinki, spring 2009, fall 2010).
- Prepared and lectured the course Stellar magnetic activity, 7 credits, laudatur-level (Univ. of Helsinki, 2008, 2010, 2012)
- Prepared and lectured the course Stellar structure, 6 credits, cum laude-level (Univ. of Helsinki, spring 2011, 2013).
- Lectured the course Mathematical methods in astronomy, 8 credits, cum laude-level (Univ. of Helsinki, 2012)
- Lectured the course Introduction to astronomy II, 5 credits, approbatur-level (Univ. of Helsinki, 2013)
- Acted as a guest lecturer in the course of Solar Physics, 10 credits, advanced level, the main lecturer Doc. Rami Vainio, at the Physics Department, University of Helsinki, during the lectures dealing with the solar dynamo (Univ. of Helsinki, spring 2010).
- Acted as a teacher in the NORDITA winter school on 'Dynamos: above, below, and in the laboratory', January 2010.
- Acted as a lecturer in the CSC-course on 'Complex Flows', 2 September 2010, on the topic of 'Magnetohydrodynamics'.
- Acted as a lecturer in the CSC summer school on 'Scientific and High-Performance Computing', Nuukio, 23 May - 3 June 2011

9. Most important research funding:

- October 2001: Research grant, Wihuri foundation, for the research group
- November 2001: Research grant, Väisälä Foundation, for the group
- August 2005: Research grant of 128 000 euros, Academy of Finland, for the group 2005-2010
- Fall 2007: Budget of 450 000 SEK from NORDITA to carry out the Nordita-program 'Turbulence and Dynamos' held in Stockholm during the spring 2008.
- Spring 2008: Budget of 450 000 SEK from NORDITA to carry out the Nordita-program 'Solar and stellar dynamos and cycles' held in Stockholm during the fall 2009.
- April 2009: Grant from the Royal Academy of Sciences for Prof. Anvar Shukurov to work as a visiting scientist at the Observatory, University of Helsinki
- Spring 2009: Funding for the international conference 'Astrophysical Magnetohydrodynamics' (10 000 euros of support received from ESF/ASTROSIM-project, 150 000 SEK of support from NORDITA, 5000 euros from Finnish Learned Societies

- June 2010: Research grant of 89 000 euros, Academy of Finland, for the group 2010–2013
- November 2010: Co-investigator in the proposal 'Active Suns: development of new GPU-algorithms for magnetohydrodynamics' PId by Doc. Petri Käpylä, University of Helsinki, 2011-2013, 560 000 euros
- Spring 2011: Budget of 450 000 SEK from NORDITA to carry out the Nordita-program 'Differential Rotation and Magnetism across the HR Diagram' held in Stockholm during the spring 2013.
- Fall 2013: Budget of roughly 700 000 euros for the CoE DYNAMO team 2014-2016 (Academy of Finland, Aalto University); the CoE status awarded for 2014–2019.
- Winter 2015: Budget of roughly 50 000 euros for the Aalto EUCLID team (2016-2020) (Academy of Finland, Aalto University); EUCLID cosmology mission is a project selected to the Finnish Infrastructure roadmap.

10. Research leadership

- 1996 - present: Co-I and PI (since 2011) in the computational project 'MHD-turbulence; dynamos; stellar surface mapping' at Scientific Computing Ltd., Espoo.
- 2003 - 2014: Co-I and PI (since 2011) in the observing program 'Magnetic field polarity in active late-type stars' carried out at the Nordic Optical Telescope at La Palma, Spain.
- March-April 2008: Coordinator (with Anvar Shukurov and Kandaswamy Subramanian) of the international NORDITA-program 'Turbulence and dynamos' held in Stockholm (<http://agenda.albanova.se/conferenceDisplay.py?confId=325>)
- Fall 2008: Principal investigator in the CSC Grand Challenge programme DYNAMO08 (1.5 million CPU hours)
<http://www.csc.fi/csc/julkaisut/tieteentietotekniikka/2010/1/korpi>
- April 2009: Principal organizer of the international conference on 'Astrophysical magnetohydrodynamics' <http://agenda.albanova.se/conferenceDisplay.py?confId=884> held in Kiljavanranta, Finland.
- Fall 2009 Principal investigator in the DEISA/DECI -programme CONVDYN (0.9 million CPU hours)
<http://www.deisa.eu/science/deci/projects2008-2009/CONVDYN>
- September-October 2009: Coordinator (with Prof. Alexander Kosovichev) of the international NORDITA-program 'Solar and stellar magnetic activity' held in Stockholm (<http://agenda.albanova.se/conferenceDisplay.py?confId=686>).
- Spring 2010 - present: acted as a host in the HPC2-Europa Transnational Access Program. During 2010-2012 the applicant has hosted three HPC2-visits by Frederick Gent (Univ. of Newcastle), one visit by Dhrubaditya Mitra (NORDITA), and a visit by Jörn Warnecke (NORDITA).
- Fall 2010 - present: Principal investigator of the international computing project 'Modelling interstellar turbulence and dynamo action' at CSC, 0.8 million CPU hours granted for 2010, and additional 0.5 million for 2011.

- Spring 2011: Principal investigator in the CSC Grand Challenge project SNDYN (2 million CPU hours)
http://www.csc.fi/english/csc/news/news/gc_sndyn
- Member of the Local Organizing Committee of the 45th annual meeting of the Finnish Physical Society & the second Nordic physics meeting 'Sharing methods, exchanging ideas', Helsinki, 29.-31.3.2011
- Member of the Scientific Organizing Committee of the IAU Symposium 'Solar and Astrophysical Dynamos and Magnetic Activity', held during the 58th IAU General Symposium in Beijing, 27.-31.8.2012
- Participation in the construction of the Finnish Grid Infrastructure; The 'Active Suns' project financed 6.5 GPU-nodes of the Helsinki University cluster 'alcyone'.
- Member of the Local Organizing Committee of "Astronomers' Days 2012", the biannual meeting of Finnish astronomers, organised by the Finnish Astronomical Society, held in the Haikko estate during 4.-6.6.2012.
- Member of the Local Organizing Committee of the "PENCIL CODE user meeting 2012", the yearly workshop bringing together the PENCIL CODE user and developer community, held in the University of Helsinki, 11.-13.6.2012.
- Spring 2012: Co-investigator in the CSC Grand Challenge project NEMPI (2.1 million CPU hours)
- PI of the observing project "Magnetic activity in late-type stars" to be carried out with SOFIN@GREGOR, with 15 percent share of the night time observations to be carried out with the solar telescope GREGOR at Tenerife.
- April-May 2013: Coordinator (with Petri Käpylä and Rainer Arlt) of the international NORDITA-program 'Differential Rotation and Magnetism across the HR Diagram' held in Stockholm (<http://www.nordita.org/events/diff2013/>)
- July 2013: principal organizer of the EWASS13 symposium 'Stellar magnetic activity across the HR diagram', Turku, July 2013.
- Co-investigator of the ESO-observing program 'Active Suns: Spectropolarimetry of rapidly rotating solar-type stars', coordinated from the University of Helsinki, September 2013
- Fall 2013: Co-investigator in the CSC Grand Challenge project DYNAMO13 (3.9 million CPU hours)
- Spring 2014: Co-investigator in the EU PRACE project SOLDYN (33 million CPU hours)
- University of Aalto representative in the EUCLID consortium (since fall 2014); SDC-FI HPC, PI of the FIRI roadmap infrastructures Academy of Finland project (2016-2020). infrastructure specifications, participation in simulation work packages.
- 2015 - 2018: PI of the large-scale observing program 'Topology and evolution of surface magnetic fields in active late-type stars', carried out at the Nordic Optical Telescope at La Palma, Spain.

- Member of the Scientific Organizing Committee of the Space Climate 6 Symposium and Winter School, Levi, Finland, spring 2016.
- Co-investigator in the CSC Grand Challenge project NEOCON (12 million CPU hours)

11. Other scientific expert positions and scientific achievements:

- Since 2001, acted as referee for Astoronomy and Astrophysics, Astrophysical Journal Letters, Astrophysical Journal, and Astronomical Notes
- Guest editor of the Special issue of Astronomische Nachrichten (Astronomical Notes), Vol. 331, Issue 1, the proceedings of the international conference 'Astrophysical Magnetohydrodynamics', held in the honor of the 50th birthday of Prof. Axel Brandenburg in Kiljava, Finland, during 6.–11.4.2009.
- Spring 2010–2013: member of the Physics-Chemistry -network of the Center for Scientific Computing, CSC.
- 2010–2012: Member of the board of the Finnish Astronomers' society.
- Summer 2012: Nomination as a reviewer for the PRACE HPC regular call for Tier-0 systems.; evaluated applications since 2012.

12. Scientific and societal impact of research:

- Written over 70 peer-reviewed articles, with 1713/1372 citations and the h-index of 23/22 (Google Scholar/NASA ADS).
- Nearly 30 other publications in conference proceedings and other publications intended for the scientific community, of which 3 are invited reviews to international conferences, and one is a special issue in Astronomical Notes guest-edited by the applicant as the proceedings for the 'Astrophysical Magnetohydrodynamics' Conference held in Kiljava, Finland, in 2009.
- Several appearances in public media (newspaper Helsingin Sanomat, Tähdet ja Avaruus, Kaleva, Aamulehti, Prisma Studio in YLE-TV1)