

Curriculum Vitae

Dr. rer. nat. Urs Ganse
 Year of Birth: 1983
 Nationality: German

ORCID: 0000-0003-0872-1761
 eMail: urs.ganse@helsinki.fi
 Date of CV: 05.03.2021

Education and degrees completed

2012-11-08	<i>Doctor in Natural Sciences</i> , Universität Würzburg, Germany, thesis on “Kinetic Simulations of Solar Type II Radiobursts” (Magna cum laude)
2009-03-25	<i>Diploma</i> in physics, Universität Würzburg, Germany
2007-07-11	<i>Master of Physics</i> in physical science with honours of the first class, Heriot-Watt University Edinburgh, Scotland

Current Position

since 2020	University Researcher in Space Physics, University of Helsinki, Department of Physics, as part of the Centre of Excellence in Research of Sustainable Space (FORESAIL), leading modeling efforts through kinetic simulations of the near-Earth plasma environment
------------	---

Previous work experience

2017-2019	Postdoctoral Researcher in Space Physics, University of Helsinki
Jun-Dec 2016	Postdoctoral Researcher in Physics of Earth’s Magnetosphere, Finnish Meteorological Institute, Department of New Observation Processes, performing kinetic simulations of near-Earth space
Jan-May 2016	Postdoctoral Researcher in Space Physics, University of Turku, funded through ESA’s Space Situational Awareness programme, developing a model of the radiation environment in low Earth orbit
2014-2015	Grant-funded Researcher, PI of a 2 year German Research Foundation (DFG) research grant “Electron Instabilities in the Heliosphere”, University of Helsinki, Finland / North-West University Potchefstroom, South Africa
2013-2014	Postdoctoral Researcher in Heliospheric Physics, University of Helsinki, studying shock acceleration and scattering processes using various numerical approaches
2009-2012	Research Assistant, Department of Physics, University of Würzburg

Personal research funding and grants

2021-2024	Co-investigator and work package leader of academy research project ICT-SUNVAC, Academy of Finland
2020-2021	Co-investigator for a PRACE Tier-0 Supercomputing grant
2016-2019	Co-investigator for two <i>Grand Challenge</i> Supercomputing grants, CSC Center for Scientific Computing, Espoo, Finland (PI: Minna Palmroth)
2015-2016	Co-investigator for a PRACE Supercomputing grant (PI: Minna Palmroth)
2014-2015	PI of 2 year full-time equivalent DFG research grant “Electron Instabilities in the Heliosphere”, University of Helsinki / North-West University Potchefstroom, South Africa
2013	Travel grant by the Wilhelm und Else Heraeus Foundation for the annual meeting of the German physics society (DPG) in Jena, Germany
2011-2012	PI of a <i>Grand Challenge</i> Supercomputing grant, CSC Centre for Scientific Computing, Espoo, Finland
2009-2012	PhD Scholarship of the Elite Network of Bavaria

Leadership and supervision experience

since 2018	Supervision of two PhD theses and one Master thesis, University of Helsinki
since 2015	<i>Lead Developer</i> and <i>Member of the PI team</i> of the Vlasiator simulation system and software collaboration
2013	Bachelor thesis supervision of one Student, University of Helsinki
2009-2012	<i>Lead Developer</i> of the ACRONYM Particle-in-Cell simulation system for kinetic plasma simulations, and head of the associated research collaboration
2012	Master thesis supervision of one student, University of Würzburg, Germany
2012	Bachelor thesis supervision of two students, University of Würzburg, Germany

Teaching Experience

2020	Lecture series “Advanced Space Plasma Physics”, University of Helsinki
2017	Visiting Lecturer for Advanced Plasma Physics lecture, University of Helsinki
2015, 16 & 17	Visiting Lecturer for Space Medicine lecture, RWTH Aachen, Germany
winter 2013/2014	Tutor for Lecture “Theoretical Electrodynamics”, University of Helsinki
winter 2011/2012	Tutor for Lecture “Mathematics 3: Differential Equations”, University of Würzburg, Germany
2009, 10 & 11	Tutor for Lecture “Numerical Methods in Astrophysics”, University of Würzburg, Germany
2008, 09, 10 & 11	Tutor for Lecture “Introduction to Plasma Physics”, University of Würzburg, Germany
2006	Instructor for C programming course, University of Würzburg, Germany
2005 & 2006	Supervisor for physics junior lab, University of Würzburg, Germany

Successfully passed university pedagogics courses “Teaching and Learning at Universities” (Spring 2020), “Feedback and Evaluation” (Fall 2020), “Constructive Alignment in Course Design” (Spring 2021) and “Supervision at the University” (Spring 2021).

Experience of organising scientific meetings

2018	2nd International Vlasiator Science Hackathon, member of the local organizing committee (LOC)
2017	1st International Vlasiator Science Hackathon, LOC member
2011	Wesenstein Summer School in Space & Astrophysics, LOC member

Patents, Inventions, awards and honours

2015 & 2016	<i>Meteoriks</i> Award for real-time generative computer graphics, “Best Highend Intro” category
2011	European Solar Physics Poster Prize (ESPM 13)

Other key scientific or academic merits

- National delegate for Finland to URSI commission H (“Waves in plasmas”)
- Author of popular science book “The Spacefarer’s Handbook: Science and Life Beyond Earth”, 295 pages, Springer Verlag Heidelberg
- Author of a popular science book “Das kleine Handbuch für angehende Raumfahrer”, 279 pages, Springer Verlag Heidelberg
- Author of peer-reviewed publications in other research fields beyond physics (two in computer graphics, one in medicine)

- A multitude of outreach presentations and youtube science videos, including “Wie baut man eigentlich Raumschiffe”, “How to survive in spacecraft”, *The Science Basement* Podcast, the Night of science, and the Science Corner of the University of Helsinki
- Pre-examiner of one PhD thesis (North-West University Potchefstroom, South-Africa)
- Review of scientific publications for Astronomy & Astrophysics, *Annales Geophysicae*, *Solar Physics*, *Journal of Atmospheric and Solar-Terrestrial Physics* and multiple conference proceedings
- 6 invited and 32 contributed talks and 9 posters at international conferences

Miscellaneous qualifications

- Languages:
German (Mother tongue)
English (Excellent verbal and written skills)
Finnish (Intermediate verbal and written skills)
French (Basic verbal and written skills)
- Programming languages: C/C++, Python, Perl
- Numerical concepts: Parallelization with OpenMP and MPI, GPU programming with Cuda and OpenCL
- 3D graphics, animation, audio synthesis, compression methods and compact binaries.
- HPC experience on all major supercomputing platforms.

List of Publications (excerpt)

- Vainio, R.; Valtonen, E.; Heber, B.; Malandraki, O. E.; Papaioannou, A.; Klein, K.-L.; Afanasiev, A.; Agueda, N.; Aurass, H.; Battarbee, M.; Braune, S.; Dröge, W.; **GANSE, U.**; Hamadache, C.; Heynderickx, D.; Huttunen-Heikinmaa, K.; Kiener, J.; Kilian, P.; Kopp, A.; Kouloumvakos, A.; Maisala, S.; Mishev, A.; Miteva, R.; Nindos, A.; Oittinen, T.; Raukunen, O.; Riihonen, E.; Rodriguez-Gasén, R.; Saloniemi, O.; Sanahuja, B.; Scherer, R.; Spanier, F.; Tatischeff, V.; Tziotziou, K.; Usoskin, I. G. & Vilmer, N.: 'The first SEPServer event catalogue 68-MeV solar proton events observed at 1 AU in 1996-2010', *Journal of Space Weather Space and Space Climate* 3 , A12 (2013).
- Palmroth, M.; **GANSE, U.**; Pfau-Kempf, Y.; Battarbee, M.; Turc, L.; Brito, T.; Grandin, M.; Hoilijoki, S.; Sandroos, A.; von Alfthan, S.: 'Vlasov methods in space and astrophysics' *Living Reviews in Computational Astrophysics*, 1(1), (2018)
- Hoilijoki, S.; **GANSE, U.**; Pfau-Kempf, Y.; Cassak, P. A.; Walsh, B. M.; Hietala, H.; von Alfthan, S. & Palmroth, M. (2017), 'Reconnection rates and X line motion at the magnetopause: Global 2D-3V hybrid-Vlasov simulation results', *JOURNAL OF GEOPHYSICAL RESEARCH: SPACE PHYSICS* 122 (3), 2877–2888.
- **GANSE, U.**; Kilian, P.; Vainio, R.; Spanier, F.: Emission of Type II Radio Bursts - Single Beam versus Two-Beam Scenario. *SOLAR PHYSICS*, Volume 280, Issue 2, pp.551-560 (2012).
- Palmroth, M.; Archer, M.; Vainio, R.; Pfau-Kempf, Y.; Hoilijoki, S.; Hannuksela, O.; **GANSE, U.**; Sandroos, A.; von Alfthan, S. & Eastwood, J. P.: 'ULF foreshock under radial IMF: THEMIS observations and global kinetic simulation Vlasiator results compared', *JOURNAL OF GEOPHYSICAL RESEARCH* 120 (10), 8782–8798 (2015).
- **GANSE, U.**; Kilian, P.; Spanier, F.; Vainio, R.: Nonlinear Wave Interactions as Emission Process of Type II Radio Bursts. In: *THE ASTROPHYSICAL JOURNAL* 751-2, 145(6pp) (2012)

- **GANSE, U.**; Kilian P.; Spanier F.; Vainio, R.: Fundamental and harmonic plasma emission in different plasma environments. *ASTRONOMY & ASTROPHYSICS*, Volume 564, pp. A15 (2014)
- Hoilijoki, S.; Palmroth, M.; Walsh, B. M.; Pfau-Kempf, Y.; von Alfthan, S.; **GANSE, U.**; Hannuksela, O. & Vainio, R.: Mirror modes in the Earth's magnetosheath: Results from a global hybrid-Vlasov simulation. *JOURNAL OF GEOPHYSICAL RESEARCH: SPACE PHYSICS* 121 (5), 4191-4204 (2016).
- Pfau-Kempf, Y.; Hietala, H.; Milan, S. E.; Juusola, L.; Hoilijoki, S.; **GANSE, U.**; von Alfthan, S. & Palmroth, M.: 'Evidence for transient, local ion foreshocks caused by dayside magnetopause reconnection', *Annales Geophysicae* 34 (11), 943–959 (2016).
- Burkart, T.; Elbracht, O.; **GANSE, U.**; Spanier, F.: The Influence of the Mass Ratio on the Acceleration of Particles by Filamentation Instabilities. In: *The Astrophysical Journal* 720 (2010) 1318-1324
- Kempf, A.; **GANSE, U.**; Kilian, P.; Spanier, F.: Note on the use of Yee-lattices in (semi-) implicit particle-in-cell codes *Journal of Computational Physics*, Volume 237, p. 56-60.
- Raukunen, O.; Vainio, R.; Tylka, A. J.; Dietrich, W. F.; Jiggins, P.; Heynderickx, D.; Dierckx, M.; Crosby, N.; **GANSE, U.** & Siipola, R.: 'Two solar proton fluence models based on ground level enhancement observations', *Journal of Space Weather and Space Climate* 8 , A04 (2018).
- Palmroth, M.; Hoilijoki, S.; Juusola, L.; Pulkkinen, T. I.; Hietala, H.; Pfau-Kempf, Y.; **GANSE, U.**; von Alfthan, S.; Vainio, R. & Hesse, M.: 'Tail reconnection in the global magnetospheric context: – Vlasov first results', *Annales Geophysicae* 35 (6), 1269–1274 (2017).
- Jarvinen, R.; Vainio, R.; Palmroth, M.; Juusola, L.; Hoilijoki, S.; Pfau-Kempf, Y.; **GANSE, U.**; Turc, L. & von Alfthan, S.: 'Ion acceleration by flux transfer events in the terrestrial magnetosheath', *Geophysical Research Letters* (accepted).
- Keinert, B.; Schäfer, H.; Korndörfer, J.; **GANSE, U.** & Stamminger, M.: 'Improved Ray Casting of Procedural Distance Bounds', *Journal of Graphics Tools* 17 (4), 127-138 (2015).