

# Curriculum vitae

## 1. Full name and date

Name: **Peter Hilding Johansson**

Gender: Male

Date of writing the CV: 24.01.2025

## 2. Date and place of birth

Place of birth: Kokkola, Finland

Citizenship: Finnish

Current address: Department of Physics,

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## 3. Education and degrees awarded

- Doctor of Philosophy in Astronomy, Institute of Astronomy, University of Cambridge, degree awarded on 03.10.2006
- Master of Science in Astronomy, Department of Astronomy, University of Helsinki, degree awarded on 14.09.2001
- Bachelor of Science in Astronomy, Department of Astronomy, University of Helsinki, degree awarded on 14.09.2001
- Docent (Habilitation) in Astronomy, Department of Astronomy, University of Helsinki, awarded on 26.10.2009

## 4. Other education and training, qualifications and skills

- Attended the training program for research group leaders and supervisors at the University of Helsinki, 2023-2024.
- Attended the Unilead program for superiors at the University of Helsinki, 2015.
- System administrator of the SGI-Altix 3700 Bx2 supercomputer hosted at the University Observatory Munich, 2007-2010.

## 5. Linguistic skills

Swedish (mother tongue)

Finnish (mother tongue)

English (fluent)

German (fluent)

French (basic)

## 6. Current position

**Professor of Astrophysics** (Astrofysiikan professori), Department of Physics, University of Helsinki, since **01.09.2017**.

## 7. Previous work experience and career breaks

- Associate Professor of Astrophysics (Apulaisprofessori), Department of Physics, University of Helsinki, 01.09.2014-31.08.2017
- Assistant Professor of Astrophysics (Apulaisprofessori), Department of Physics, University of Helsinki, 01.09.2011-31.08.2014
- University Researcher (Yliopistotutkija) at the Finnish Centre for Astronomy with ESO, University of Turku (based at the Department of Physics, University of Helsinki), 01.01.2011-31.08.2011.
- Research Scientist (Senior postdoc) in the Computational Astrophysics Group, University Observatory Munich, Ludwig-Maximilians-Universität (LMU), 01.02.2008-31.12.2010.
- Research Associate (Postdoc) in the Computational Astrophysics Group, University Observatory Munich, Ludwig-Maximilians-Universität (LMU), 01.09.2006-31.01.2008.
- Postgraduate student supervised by Prof. George Efsthathiou at the Institute of Astronomy, University of Cambridge, funded by Finnish scholarships, 01.10.2002-31.08.2006.
- Research Assistant, Researcher and Postgraduate student, Department of Astronomy, University of Helsinki, 19 months in total during 01.08.2000-30.09.2002.
- Research Assistant, Metsähovi Radio Observatory, 22.05.2000-31.07.2000.
- Career breaks: Mandatory military service, 15.07.1997-11.03.1998.

## 8. Research funding as well as leadership and supervision

### **Awarded research funding:**

- **Altogether about 4 000 000€ (not corrected for inflation)**
- Faculty of Science support funding for ERC grantees, University of Helsinki: Funding period 01.08.2024-31.12.2025: 8 000€
- Research grant from The Finnish Society of Sciences and Letters 19.03.2024: Funding period 01.05.2024-31.12.2025: 19 850€.
- Academy of Finland project grant awarded 03.06.2021 for the project "The role of supermassive black holes in the cosmological formation of massive galaxies": Funding period 01.09.2021-31.08.2025: 686 045€, of which the Academy of Finland funds 70%.
- European Research Council (ERC) Consolidator Grant 2018 for the project "Post-Newtonian modelling of the dynamics of supermassive black holes in galactic-scale hydrodynamical simulations" Funding period 01.07.2019-30.06.2024: 1 953 569€
- Faculty of Science support funding, University of Helsinki: Funding period 01.09.2018-31.12.2019: 35 000€
- Ruth och Nils-Erik Stenbäcks Foundation Young investigator grant awarded 28.04.2017. Funding period 01.05.2017-30.04.2019: 20 000€.
- Magnus Ehrnrooth Foundation large grant awarded 28.04.2017 for high impact astronomical research: Funding period 01.07.2017-31.12.2019: 100 000€.
- Ruth och Nils-Erik Stenbäcks Foundation Young investigator grant awarded 29.04.2015 for Theoretical extragalactic research: Funding period 01.05.2015-30.04.2017: 35 000€.
- Academy of Finland project grant awarded 12.06.2014 for the project "The formation of elliptical galaxies": Funding period 01.09.2014-31.08.2018: 840 068€, of which the Academy of Finland funds 70%.

- Magnus Ehrnrooth Foundation 50th anniversary grant awarded 06.03.2013 for the project "Supermassive black holes in massive galaxies":  
Funding period 01.07.2013-31.12.2015: 130 000€.
- Three-year project funding from the research funds of the University of Helsinki awarded 29.11.2011 for the project "Formation and evolution of galaxies":  
Funding period 01.01.2012-31.12.2015: 119 000€.
- The Wihuri Foundation scholarship for postgraduate studies at the University of Cambridge awarded on 09.10.2002 for one year of study: 13 500€.
- The Oskari Huttunen Foundation scholarship for postgraduate studies at the University of Cambridge awarded on 25.09.2002 for three years of study: 57 000€.
- The Magnus Ehrnrooth Foundation scholarship granted by The Finnish Society of Sciences and Letters for postgraduate studies awarded on 06.03.2002 for 6 months of study: 6 250€.
- Väisälä Foundation scholarship granted by The Finnish Academy of Science and Letter for postgraduate studies awarded on 12.12.2001 for one year of study: 14 000€.

#### **Leadership in research work:**

- Head of the Theoretical Extragalactic research group at the University of Helsinki since 01.09.2011. Currently twelve members in the group (P.I. + 1 university researcher + 3 postdocs + 4 Ph.D. students + 3 undergraduate students).
- Vice head of the Finnish participation in ESA Euclid space mission since 01.06.2012 (P.I. Dr. Hannu Kurki-Suonio).

#### **Supervision of post-doc researchers (all at the University of Helsinki):**

- Main supervisor of Toni Tuominen, 01.06.2024-
- Main supervisor of Bastian Reinoso, 15.05.2024-
- Main supervisor of Ruby Wright, 13.02.2023-31.08.2024
- Main supervisor of Jessica Hislop, 01.11.2022-16.02.2024
- Main supervisor of Dimitrios Irodoutou, 01.09.2021-31.03.2024
- Main supervisor of Shihong Liao, 01.09.2020-30.11.2023
- Main supervisor of Francesco Rizzuto, 01.01.2022-30.9.2023
- Main supervisor of Pauli Pihajoki, 01.02.2015-07.08.2020
- Main supervisor of Till Sawala, 01.10.2015-31.08.2017
- Main supervisor of John Regan, 01.07.2013-30.09.2015
- Secondary supervisor of Gabor Racz, 01.08.2024-
- Secondary supervisor of Stuart McAlpine, 01.09.2018-

#### **Supervision of post-graduate students (at the University of Helsinki):**

- Main supervisor of Max Matteredo, 01.06.2024- (in progress)
- Main supervisor of Atte Keitaanranta, 12.07.2022- (in progress)
- Main supervisor of Alexander Rawlings, 01.06.2021- (in progress)
- Main supervisor of Matias Mannerkoski, 01.05.2018-31.12.2022  
(thesis defended October, 2022)
- Main supervisor of Natalia Lahén, 01.06.2015-30.09.2020  
(thesis defended June, 2020)
- Main supervisor of Antti Rantala, 01.05.2014-30.09.2019  
(thesis defended July, 2019)
- Secondary supervisor of Jenni Häkkinen, 01.07.2024- (in progress)
- Secondary supervisor of Simon Karl (2011), Ludwig Oser (2011) and Rhea-Silvia Remus (2015) at the **Ludwig-Maximilians-Universität (LMU)**, main supervisor Prof. Andreas Burkert.

**Officially appointed supervisor:**

- Official supervisor of the Ph.D. thesis of Antti Rantala, Natalia Lahén, Matias Mannerkoski, Alexander Rawlings, Atte Keitaanranta and Max Mattero (University of Helsinki).
- Official supervisor of 13 MSc. theses (University of Helsinki).
- Official supervisor of 23 BSc. theses (University of Helsinki).

## 9. Merits in teaching and pedagogical competence

**Involvement in curriculum planning:**

- Vice-head of the Master programme in Particle Physics and Astrophysical Sciences at the Department of Physics, University of Helsinki (01.03.2016–)
- Board Member of the Graduate school in Particle Physics and Universe Science at the Department of Physics, University of Helsinki (01.01.2014–)
- Co-ordinator of the Graduate school in Particle Physics and Universe Science at the Department of Physics, University of Helsinki (01.03.2013–31.12.2013)
- Member of the Astronomy teaching council in charge of setting the Astronomy curriculum at the University of Helsinki (01.09.2011–)

**Teaching at the University of Helsinki:**

- Introduction to the physical sciences (Fysikaalisten tieteiden esittely & Presentation av de fysikaliska vetenskaperna) Bachelor level, I have given the Astronomy lecture in both Finnish and Swedish (2011–).
- Galaxies and Cosmology (Galaksit ja kosmologia) Bachelor level (2011–).
- Elementary courses in Astrophysics I and II (Astrofysiikan peruskurssit I ja II), Bachelor level (2001 and from 2012–).
- Galactic Structure (Linnunradan rakenne), Bachelor level (2012–).
- Galactic Dynamics, Master level (2011–).
- Open Problems in Modern Astrophysics, Master level (2012–).
- Galaxy formation and evolution, Master level (2013–).
- Co-organiser of the weekly Astronomy seminar series (2011–).
- Main organiser of the weekly Astro-ph journal club meetings (2011–2021).

**Teaching at the University Observatory Munich (LMU):**

- Supervising students in the Astrophysical Practicals (Astrophysikalisches Praktikum), 4 hours/week (01.09.2006-31.12.2010).
- Supervising students in the the Astrophysical Student seminars (Hauptseminar zur Astrophysik), 2 hours/week. (01.09.2006-31.12.2010).
- Main organiser of weekly group meetings and Astro-ph journal club meetings for the Computational Astrophysics Group, 2 hours/week. (01.09.2006-31.12.2010).

## 10. Honours and awards

- Elected fellow of the Finnish Academy of Science and Letters (2024)
- Elected fellow of the Finnish Society of Sciences and Letters (2020)
- Elected fellow of the Swedish Academy of Engineering Sciences in Finland (2016)
- European Research Council (ERC) Consolidator grant (2018)
- Magnus Ehrnrooth Foundation large grant (2017)
- Ruth och Nils-Erik Stenbäcks Foundation Young investigator grant (2015)
- Magnus Ehrnrooth Foundation 50th anniversary grant (2013)

## 11. Other academic merits

### **Evaluation of docent applications**

- External evaluator of the docent application of Alexandra Veledina, University of Turku (11.03.2022).
- External evaluator of the docent application of Erkki Kankare, University of Turku (15.01.2021).

### **Pre-examiner or opponent of a doctoral dissertation**

- Opponent of the Ph.D. thesis of Thibaut Francois, University of Strasbourg (03.10.2024).
- Pre-examiner of the Ph.D. thesis of Irene Varglund, Aalto University (02.08.2024).
- Pre-examiner of the Ph.D. thesis of Maria Stone, University of Turku (26.01.2024).
- Pre-examiner of the Ph.D. thesis of Tuomas Kangas, University of Turku (14.03.2017).
- Pre-examiner of the Ph.D. thesis of Pauli Pihajoki, University of Turku (11.04.2014).
- Pre-examiner of the Ph.D. thesis of Heidi Lietzen, University of Turku (25.08.2012).

### **Evaluation of funding applications and computing time applications**

- Referee for research proposals at the Swedish Research council,  $\sim 30$  proposals per year, (2016, 2017 and 2018).
- Referee for research proposals at the National Science Centre, Poland (2020-2024).
- Referee for computing time proposal at the DiRAC supercomputing facility, STFC, United Kingdom (2018).
- Referee for research proposal at the Netherlands Organisation for Scientific Research (NWO) (2010)

### **Membership in national of international expert groups**

- Director of the Kumpula Space Centre (25.4.2014-30.4.2020)
- Finnish representative on the Euclid steering board (1.8.2018-)
- Member of the LISA consortium and the astrophysics working group (1.7.2018-)
- Member of the Publication Forum in Finland (1.1.2018-)
- Member of the European Southern Observatory Observing Programmes Committee (OPC) P101-103 (1.10.2017-1.12.2018)
- External panelist of the Hubble Space telescope review panel (Cycles 28 & 29) (1.1.2020-31.12.2021)
- Head of the Astronomy and Space Physics Division of the Finnish Physical Society (22.3.2011-17.3.2015)
- Member in doctoral dissertation committees: 8 times, of which 4 times as the chair.
- Evaluator of faculty positions: 7 times

### **Membership in scientific and scholarly societies**

- Fellow of the Finnish Society of Sciences and Letters (2020-)
- Fellow of the Swedish Academy of Engineering Sciences in Finland (2016-)
- Member of the International Astronomical Union (IAU) (2009-)
- Fellow of the Royal Astronomical Society (2011-)
- Member of the Astronomische Gesellschaft (2011-)
- Member of the Finnish Astronomical Society (2001-)
- Member of the Finnish Physical Society (Fyysikkoseura) (2011-)
- Member of the Physical Society in Finland (Fysikersamfundet) (2011-)

## Referee for scientific and scholarly journals

- Science, referee.
- Scientific Reports, referee.
- Astrophysical Journal Letters, referee.
- Astrophysical Journal, referee.
- Astrophysical Journal Supplement Series, referee.
- Monthly Notices of the Royal Astronomical Society, referee.
- Monthly Notices of the Royal Astronomical Society Letters, referee.
- Astronomy & Astrophysics, referee.
- Astronomische Nachrichten (Astronomical Notes) referee.
- Astronomy & Computing, referee.
- Computer Physics Communications, referee.
- Modern Physics Letters A, referee.

## Conference organisation

- Member of the Local Organising Committee for the Euclid 2019 Consortium Meeting (Helsinki, Finland, 04.06-07.06.2019)
- Member of the Scientific Organising Committee for the Finnish Astronomers' Days 2018 (Kuusamo, Finland 28.05-30.05.2018)
- Member of the Scientific Organising Committee for the Finnish Astronomers' Days 2016 (Tampere, Finland 23.05-25.05.2016)
- Member of the Local Organising Committee for the Physics Days 2015 conference (Helsinki, Finland, 17.03-19.03.2015)
- Member of the Scientific Organising Committee for the European Week of Astronomy and Space Science 2013 (Turku, Finland, 08.07-12.07.2013)
- Member of the Scientific Organising Committee for the Finnish Astronomers' Days 2012 (Haikko, Finland 04.06-06.06.2012)

## Selected Invited presentations

- Annually about 3-5 invited presentations at conferences, workshops and seminars. Below some representative examples
- *Simulating black hole dynamics and gravitational wave emission in galaxy formation simulations*, Ringberg Workshop - Breakthroughs in Galaxy Formation, Ringberg, Germany (10/2024)
- *Resolving the complex dynamical evolution of supermassive black holes in cosmological simulations using the KETJU code*, Challenges in collisional N-body dynamics Workshop, MPA, Garching, Germany (03/2024)
- *Resolving the complex dynamical evolution of supermassive black holes in cosmological simulations using the KETJU code*, Oskar Klein Centre @15 Workshop, Stockholm, Sweden (10/2023)
- *Simulating black hole dynamics and gravitational wave emission in galaxy formation simulations*, Royal Observatory Edinburgh Colloquium, Edinburgh, United Kingdom (10/2023)
- *Resolving the complex dynamical evolution of supermassive black holes in cosmological simulations*, Ringberg Computational Galaxy Formation Workshop 2022, Ringberg, Germany (03/2022)
- *Simulating black hole dynamics and gravitational wave emission in galaxy formation simulations*, Leiden Astronomy Colloquium on Zoom, 2022, Leiden, Netherlands (03/2022)
- *Simulating black hole dynamics and gravitational wave emission in galactic-scale simulations*, Heidelberg Joint Astronomy Colloquium on Zoom, 2021, Heidelberg, Germany (02/2021)

- *Simulating black hole dynamics and gravitational wave emission in galactic-scale simulations*, Gravitational Wave Probes of Fundamental Physics workshop, 2019, Amsterdam, Netherlands (11/2019)
- *Simulating the formation of cores in massive galaxies using KETJU*, Ringberg Computational Galaxy Formation Workshop 2018, Garching, Germany (03/2018)
- *Why are there galaxies in the Universe*, Symposium of the Finnish Society of Sciences and Letters, Helsinki, Finland (05/2017)
- *Forming direct collapse black holes in the very early Universe*, MPA-UWC Workshop on Modeling Gas in and Around Galaxies, Stellenbosch, South Africa (11/2016)
- *Simulating the formation of early-type galaxies and the dynamics of their supermassive black holes*, George Efstathiou at 60 symposium: "From Galaxies to Large Scale Structure", Cambridge, United Kingdom (09/2015)
- *Regularized black hole dynamics in Gadget-3*, Virgo Consortium Meeting, Durham, United Kingdom (07/2015).
- *Black hole feedback in galaxy simulation*, The triggering Mechanisms for Active Galactic Nuclei, Lorentz Center, Leiden, Netherlands (07/2013).
- *Assembly histories and observational properties of simulated Early-type galaxies*, EWASS, "Mystery of ellipticals", 2013, Turku, Finland (07/2013).
- *Forming Early-type galaxies in  $\Lambda$ CDM simulations*, Ringberg Galaxy Formation Workshop 2011, Garching, Germany (03/2011).
- *Forming Early-type galaxies in  $\Lambda$ CDM simulations*, Institute of Astronomy Astrophysics seminar, Cambridge, United Kingdom (05/2010).
- *Gravitational heating helps make massive galaxies red and dead*, Thinkshop-Open problems in Galaxy formation, Potsdam, Germany (05/2009).
- *Equal- and unequal-mass mergers of disk and elliptical galaxies with black holes*, 8th Sino-German Workshop, Kunming, China (02/2009).
- *Gravitational Energy Input into Gas in Massive Galaxies*, Santa Cruz Galaxy Workshop 2008, Santa Cruz, USA (08/2008).

## 12. Scientific and societal impact of research

### Nature and scope of publications

- **90 refereed publications.**  
(7 1st author + 18 2nd author + 19 3rd author + 46 nth author).
- **Total of 7438 citations** to 90 refereed publications.
- Total of 2383 citations to 25 refereed first and second author publications.
- Total of 645 citations to 7 refereed first author publications.
- **h-index: 42**
- The number of NASA Astrophysics Data System citations is given for each refereed paper in parenthesis as of 24/01/2025.

### Research interests

- Formation and evolution elliptical galaxies, disk galaxies and black holes.
- Modelling the dynamics of supermassive black holes.
- Dynamics of the interstellar medium and star formation.
- Computational astrophysics – numerical N-Body, SPH simulations.
- Observational studies of high-redshift and local galaxies.

### **Societal impact of research**

- Television appearances: About 1-2 TV interview annually on astronomical topics for YLE TV näytt.
- Radio interviews: About 2-3 radio interviews annually on astronomical topics for YLE tiedeykkönen.
- Interviews in printed media: About 3-4 written comments annually.
- About 3-4 popular astronomy talks annually aimed at the general public.

## **13. Societal positions of trust**

- Member of the editorial board for the cross-disciplinary Finnish science journal: "Tieteessä tapahtuu" (2017-2022)
- Written statement for the "Future committee" of the Finnish Parliament (Eduskunnan tulevaisuusvaliokunta) (2017)

January 24, 2025