

# Johanna Hartke

## Curriculum Vitae

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## Research Experience and Employment

- 2018–present **Postdoctoral Fellowship**, *European Southern Observatory (Santiago, CL)*.  
Research (50%): understanding the formation of the extended metal-poor halos around galaxies in group and cluster environments  
Observatory duties (50%): support astronomer at the Very Large Telescope, MUSE instrument fellow
- 2015–2018 **PhD Research**, *European Southern Observatory (Garching, DE)*, Dr. Magda Arnaboldi & Prof. Dr. Ortwin Gerhard.  
Substructures, accretion events, and surrounding diffuse intra-group light in bright ETGs
- 2014–2015 **Master Research**, *University of Groningen (NL)*, Prof. Dr. Eline Tolstoy & Dr. Shoko Jin.  
Dynamical modelling of the dwarf spheroidal galaxies Ursa Minor and Draco
- 2013–2015 **Research project**, *University of Groningen (NL)*, Dr. Robyn Sanderson & Prof. Dr. Amina Helmi.  
Using tidal streams to determine the mass distribution of dark halos
- January - **Bachelor Research**, *Jacobs University Bremen (DE) & University of Groningen (NL)*,  
May 2013 Prof. Dr. Amina Helmi & Prof. Dr. Joachim Vogt.  
Fitting orbits to stellar streams in the Aquarius Simulation
- July - **Research Internship**, *Australian National University (Canberra, AUS)*, Prof. Dr. Ken  
September Freeman.  
2012 Dynamics of the Aquarius star stream

## Education

- 2015–2018 **PhD**, *Ludwig-Maximilians-Universität (International Max Planck Research School)*, "magna cum laude".  
Astronomy
- 2013–2015 **Master of Science**, *University of Groningen*, "cum laude".  
Astronomy
- 2010–2013 **Bachelor of Science**, *Jacobs University Bremen*, GPA 1.6 (awarded on a scale from 5 to 1, with 1 being the highest grade).  
Physics
- 2004–2010 **Abitur**, *Gymnasium Lohne*, GPA 1.5 (awarded on a scale from 5 to 1, with 1 being the highest grade).

## Computer Skills

Programming Python, C, Iraf, IDL, Mathematica, html5

Pipelines SDFRED (Subaru Telescope), PN.S (William Herschel Telescope), Astromatic software suite, esorex, ESO reflex  
Typesetting LATEX, Microsoft Office, Markdown

## Languages

German	Native	French	Intermediate
English	Fluent	Dutch	Basic
Spanish	Basic		

## Awards, Scholarships, and Grants

October 2016 **IAU Grant.**  
Travel grant to attend IAU Symposium 323

2011–2015 **Scholarship and Grant**, *Studienstiftung des dt. Volkes*.  
German Academic Scholarship Foundation, awarded for academic excellence

2012–2013 **President's List Award**, *Jacobs University Bremen*.  
Awarded to students with GPA better than 1.5

2010–2013 **Scholarship**, *Jacobs University Bremen*.  
Entrance scholarship awarded for duration of BSc studies

2012 **Scholarship**, *DAAD (German Academic Exchange Service)*, RISE worldwide internship program.  
Travel and lodging subsidy for internship at Australian National University

## Publications

### Refereed publications

S. Bhattacharya, M. Arnaboldi, **J. Hartke**, O. Gerhard, V. Comte, A. McConnachie, and N. Caldwell. The survey of planetary nebulae in Andromeda (M 31). I. Imaging the disc and halo with MegaCam at the CFHT. *A&A*, 624:A132, Apr 2019.

**J. Hartke**, M. Arnaboldi, O. Gerhard, A. Agnello, A. Longobardi, L. Coccato, C. Pulsoni, K. C. Freeman, and M. Merrifield. Three dynamically distinct stellar populations in the halo of M49. *A&A*, 616:A123, August 2018.

**J. Hartke**, M. Arnaboldi, A. Longobardi, O. Gerhard, K. C. Freeman, S. Okamura, and F. Nakata. The halo of M 49 and its environment as traced by planetary nebulae populations. *A&A*, 603:A104, July 2017.

R. E. Sanderson, **J. Hartke**, and A. Helmi. Modeling the Gravitational Potential of a Cosmological Dark Matter Halo with Stellar Streams. *ApJ*, 836:234, February 2017.

## Proceedings

**J. Hartke**, M. Arnaboldi, A. Longobardi, O. Gerhard, K. Freeman, and S. Okamura. The halo of M49 and its environment as traced by planetary nebulae. *Proceedings of the International Astronomical Union*, 12(S323):293–297, 2016.

S. Jin, M. Irwin, E. Tolstoy, J. Lewis, and **J. Hartke**. Stellar Kinematics and Metallicities in the Draco and Ursa Minor Dwarf Spheroidal Galaxies from WHT/AF2-WYFFOS. In I. Skillen, M. Barcells, and S. Trager, editors, *Multi-Object Spectroscopy in the Next Decade: Big Questions, Large Surveys, and Wide Fields*, volume 507 of *Astronomical Society of the Pacific Conference Series*, page 241, October 2016.

R. E. Sanderson, **J. Hartke**, A. Helmi, and D. W. Hogg. Inferring the Galactic gravitational potential with Gaia and friends. In *American Astronomical Society Meeting Abstracts*, volume 225 of *American Astronomical Society Meeting Abstracts*, page 119.02, January 2015.

## Press releases

October 2018 Three Dynamically Distinct Stellar Populations in the Halo of M49, <http://www.ing.iac.es/PR/press/pns.html>

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## Conference contributions and Seminars

### Scientific Talks

- June 2019 Contributed talk "Low-mass and metal-poor satellites as progenitors of the intragroup light stars around M49: a challenge for hydrodynamical simulations?" (Light in the suburbs: structure and chemodynamics of galaxy halos, Sexten, Italy)
- April 2018 Contributed talk "Tracing the transition from galaxy halos to the intra-cluster light with stellar kinematics" (EWASS, Liverpool, UK)
- October 2017 Contributed talk "Three dynamically distinct stellar populations in the halo of M49" (IMPRS symposium, Garching, Germany)
- July 2017 Contributed talk "Baryons at low densities: M49's intra-group light discovered with planetary nebulae" (MIAPP, Garching, Germany)
- October 2016 Contributed talk "The halo of M49 and its environment as traced by PNe populations" (IAUS 323, Beijing, China)
- October 2016 Contributed talk "The halo of M49 and its environment as traced by PNe populations" (IMPRS symposium, Garching, Germany)

### Seminars and Colloquia

- July 2019 "Dynamics of Planetary Nebulae in the Leo I Group" (ESO Wine and Cheese Seminar, Garching, Germany)
- July 2019 "Using planetary nebulae as tracers of halo assembly in galaxy groups and clusters: the case of M49" (Lunch talk, Kapteyn Astronomical Institute, University of Groningen, NL)
- December 2018 "Using planetary nebulae as tracers of halo assembly in galaxy groups and clusters" (Colloquium, Department of Astronomy, Universidad de Concepción, Chile)
- February 2018 "Tracing the transition from galaxy halos to the intra-cluster light with stellar kinematics" (Galaxy Cluster Discussion Group, Garching, Germany)
- January 2018 "Three dynamically distinct stellar populations in the halo of M49" (ESO Wine and Cheese Seminar, Garching, Germany)

## Poster Presentations

- July 2018 "Tracing the build-up of M49's extended halo and surrounding intra-group light with stellar kinematics" (Stellar Halos, Heidelberg)
- April 2018 "The diffuse intra-cluster and intra-group light in the Virgo Cluster" (EWASS, Liverpool, UK)
- July 2017 "Baryons at very low densities: M49's extremely blue intra-group light discovered using Planetary Nebulae" (The Galaxy Ecosystem, Garching, Germany)
- June 2017 "The Intragroup Light around M49 discovered using Planetary Nebulae" (EWASS, Prague, Czech Republic)
- May 2015 "New optical spectroscopy of Ursa Minor and Draco dSphs" (Dutch Astronomy Conference, Nunspeet, The Netherlands)
- May 2014 "Using tidal streams to determine the mass distribution of dark halos" (Dutch Astronomy Conference, Nordwijk, The Netherlands)

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## Observing Experience and Time Allocation

### Successful Proposals

- 2019A **PN.S@WHT**, *PI: M. Merrifield*, 3.5 nights, W/2019A/02.  
The Origin of the Blue Stellar Halos around Massive Group-Dominant Galaxies
- 2019A **PN.S@WHT**, *PI: K. Kuijken*, 3.5 nights, W19AN001.  
The Origin of the Blue Stellar Halos around Massive Group-Dominant Galaxies
- 2018B **MegaCam@CFHT**, *PI: Arnaboldi*, 26 hours, 2018BC013.  
Glimpse of green light in Andromeda (M31): A survey of Planetary Nebulae in the inner halo ( $R \approx 50$  kpc) with Megacam@CFHT
- 2017A **PN.S@WHT**, *PI: M. Merrifield*, 7 nights, W/2017A/05.  
How do the metal-poor stellar halos around massive galaxies form?
- 2015A **AF2-WYFFOS@WHT**, *PI: Tolstoy*, 5 nights, W15AN012.  
Stellar Kinematics and Metallicities in the Draco and Ursa Minor Dwarf Spheroidal Galaxies

### Observing Experience

- November 2018–present ESO fellow with duties at Paranal Observatory (80 nights/year), MUSE instrument fellow
- April 2019 7 nights with PN.S-WHT (counter-dispersed imaging, PI Merrifield/Kuijken)
- October 2017 4 nights sitting in on observations at ESO Paranal Observatory (mainly with UT4-MUSE and UT4-SINFONI)
- March 2017 7 nights with PN.S-WHT (counter-dispersed imaging, PI Merrifield)
- May 2015 5 nights with AF2/WYFFOS-WHT (multi-object spectroscopy, PI Tolstoy)
- April 2014 4 nights with WFC-INT (multi-band imaging, University of Groningen coursework)

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## Teaching and Supervision

- April–July 2017 "In search of the green light in the remote outskirts of galaxies: The survey of Planetary Nebulae in the halo of Andromeda (M31)", co-supervision of MSc internship of V. Comte
- Spring Semester 2012 "General Physics IIB – Modern Physics", Teaching Assistant for Prof. Dr. T. Heine

## Training and Soft Skills

- May 2018 Conflict Management (2 day training)
- January 2018 Science Communication Skills (1 day training)
- December 2017 Fair treatment, Courtesy, and Respect (1 day training)
- February 2017 Presentation Skills (1 day training)

## Service and Outreach

- May - November 2019 LOC member: Extragalactic spectroscopic surveys: past, present and future of galaxy evolution (GALSPEC2019), Santiago
- May 2019 Member of the ESO Workshop selection committee
- March 2019 Volunteer at the ESO Vitacura open house day
- 2016-2018 ESO Outreach & Supernova volunteer
- 2016-2018 ESO students and fellows coffee organiser
- 2015-2018 IMPRS student representative
- 2016 Scientific Assistant at ESO OPC P98 and P99
- 2014-2015 Volunteer at the Blaauw Sterrenwacht, Groningen