

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
- 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*, 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*, Dr. Robyn Sanderson & Prof. Dr. Amina Helmi.
Using tidal streams to determine the mass distribution of dark halos
- January - **Bachelor Research**, *Jacobs University Bremen & University of Groningen*, Prof. Dr. Amina Helmi & Prof. Dr. Joachim Vogt.
May 2013 Fitting orbits to stellar streams in the Aquarius Simulation
- July - **Research Internship**, *Australian National University*, Prof. Dr. Ken Freeman.
September 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

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|-------------|-----------------------------------|-------------|-------------------------|
| Programming | Python, C, IDL, IRAF, Mathematica | Typesetting | LATEX, Microsoft Office |
| Pipelines | SDFRED, PN.S, | | |
| | Astromatic software suite | | |

Languages

German Native
English Fluent
Spanish Basic

French Intermediate
Dutch 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, W. E. Harris, and N. Caldwell. The survey of Planetary Nebulae in Andromeda (M31): I. Imaging the disk and halo with MegaCam@CFHT. *arXiv e-prints*, page arXiv:1903.02597, Mar 2019 (Accepted for publication in A&A).

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.

In preparation

J. Hartke, M. Arnaboldi, O. Gerhard, and L. Coccato et al. The halo of M105 and its group environment as traced by planetary nebulae populations. 2019.

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>

Conference contributions and Seminars

Scientific Talks

- 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

- 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" (ESO 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)

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)
- 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)

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

Service and Outreach

- 2016-2018 ESO Supernova volunteer
- 2015-2018 IMPRS student representative
- 2016 Scientific Assistant at ESO OPC P98 and P99
- 2014-2015 Volunteer at the Blaauw Sterrenwacht, Groningen