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Daniela Huppenkothen

Curriculum Vitae

Experience

Associate Director and DIRAC Postdoctoral Fellow <i>DIRAC Institute, University of Washington, USA</i>	2017–present
Data Science Fellow <i>eScience Institute, University of Washington, USA</i>	2017–present
James Arthur Postdoctoral Fellow <i>Center for Cosmology and Particle Physics & Center for Data Science, New York University, USA</i>	2016–2017
Moore-Sloan Data Science Postdoctoral Fellow <i>Center for Data Science, New York University, USA</i>	2014–2017

Education

PhD Astronomy & Astrophysics <i>Anton Pannekoek Institute for Astronomy, University of Amsterdam, The Netherlands</i> Thesis: <i>A New Statistical Toolbox for Studying Variability in Fast Transients</i> Supervisors: Dr Anna Watts and Prof Michiel van der Klis	2010–2014
MSc Astronomy & Astrophysics <i>Anton Pannekoek Institute for Astronomy, University of Amsterdam, The Netherlands</i>	2008–2010
BSc Geosciences & Astrophysics <i>Jacobs University Bremen, Germany</i>	2005–2008

Publications

27 refereed; 6 non-refereed. List attached.

Presentations

12 invited, 18 seminars and 13 contributed. List attached.

External Grants

Co-PI: Call for 7th and 8th Cambridge Astronomy Kavli Workshops <i>Astro Hack Week: Data Science for Next-Generation Astronomy</i> £15,000	2018
PI: NASA Astrophysics Data Analysis Program <i>Accurate Black Hole Spin Measurements with ABC</i> \$385,000	2017-present
Co-PI: Astro Hack Week Funding Proposal to Google Inc. <i>Astro Hack Week: Enabling Young Astronomers to Develop Data Science Skills</i> \$20,000	2017-2018
PI; Fermi Guest Investigator Program <i>Unravelling Solar Flare Variability with Fermi/GBM</i> \$55,000	2016

	PI; LSSTC Enabling Science Program	2015	
	<i>Astro Hack Week: Enabling Young Astronomers to Develop Data Science Skills</i>		
	\$5,000		
	PI: Astro Hack Week Funding Proposal to GitHub Inc.	2015	
	<i>Astro Hack Week: Enabling Young Astronomers to Develop Data Science Skills</i>		
	\$5,000		
Honours and Awards	Third prize, SciPy John Hunter Excellence in Plotting Contest	2018	
	HSP Huygens scholarship covering tuition and a living stipend	2008-2010	
	Scholarship awarded by “Studienstiftung des Deutschen Volkes” (German National Academic Foundation)	2005-2010	
	€200 per month for study-related expenses		
	Merit-based scholarship awarded by Jacobs University Bremen	2005-2008	
	€7500 per year for tuition costs		
	Member of “President’s List” (students with GPA better than 1.5)	2005-2008	
Award of the Deutsche Physikalische Gesellschaft (German Society of Physicists) for best graduating student in physics	2005		
Software	Stingray		
	<i>Lead developer of open-source Python time series methods library for astronomy:</i>		
	<i>http://github.com/StingraySoftware/stingray</i>		
	Entrofy		
	<i>Lead developer of open-source Python package for cohort selection:</i>		
	<i>http://github.com/dhuppenkothen/entrofy</i>		
Magnetron			
<i>Bayesian Hierarchical Inference for X-ray light curves: http://ascl.net/1502.014</i>			
BayesPSD			
<i>Bayesian time series methods for detection of periodic signals:</i>			
<i>https://github.com/dhuppenkothen/BayesPSD</i>			
Teaching	Lectures	IESC Summer School: Analytics, Inference, and Computation in Cosmology: Advanced methods	2018
		<i>Three interactive lectures on Bayesian hierarchical inference, probabilistic models and machine learning</i>	
	Astro Hack Week	2014-2018	
	<i>Lectures on data visualization, exploratory data analysis, statistics to an audience of researchers at all academic ranks</i>		
	LSST Data Science Fellowship Program	2017	
	<i>Two lectures on data visualization and interpretability of machine learning algorithms to an audience of graduate students</i>		
	IMPRS Heidelberg Summer School on Astrostatistics and Data Mining	2016	
	<i>Five lectures and three problem classes on Bayesian and frequentist statistics, counting statistics, time series analysis and Fourier methods to an audience of graduate students and postdocs</i>		
Deutsche Schülerakademie	2012		
<i>Ten-day course in astronomy for gifted high-school students</i>			

Teaching Assistant
Posts

- Accretion Flows (M.Sc. course), University of Amsterdam 2008–2014
- Astrophysics II (B.Sc. course), University of Amsterdam
- Introduction to Astronomy and Cosmology (B.Sc. course), University of Amsterdam
- Fluid Dynamics, (M.Sc. course), University of Amsterdam
- Geosciences and Astrophysics II (B.Sc. course), Jacobs University Bremen

Research Supervision

- Leah Fulmer, graduate student (University of Washington) 2018-present
Project title: “Unsupervised Machine Learning for Irregularly Sampled Astronomical Time Series from the ZTF Survey”
- Margaret Lazzarini, graduate student (University of Washington) 2018-present
Project title: “Accurate Black Hole Spin Measurements through ABC”
- Christina Lindberg, post-bacchalaurete student (University of Washington) 2018-present
Project title: “Precise Measurements of Asteroid Periods using Gaussian Processes”
- Chris Ick, Fermi Guest Investigator Programme student (New York University) 2017-present
Project title: “Unravelling Solar Flare Variability with Fermi/GBM”
- Himanshu Mishra, Google Summer of Code 2016
Project title: “A Library of Time Series methods”
- Viviana Meerstra, BSc project (University of Amsterdam) 2012
Project title: “Timing analysis of gamma-ray bursts using Bayesian statistics”
- Oliver Gurney-Champion, MSc project (University of Amsterdam) 2011
Project title: “Modeling of the ionizing effects of black holes on their environment”

Mentoring and
Outreach

- Astronomy on Tap 2018
How to Teach an AI to Study Black Holes
- NYAS Project *1000 Girls, 1000 Futures*: mentored a female high school student interested in the natural sciences 2016-2017
- Project *CyberMentor*: mentored two female high school students interested in the natural sciences 2011-2012

Professional
Development

- Leadership Academy, German Scholars Organization 2018
5-day intensive workshop on leadership and management practices

Service to
Profession

- Scientific Advisory Committee, ASTRON, The Netherlands 2018-present
- Chair, DIRAC Postdoctoral Fellows Hiring Committee 2017-present
- Scientific Organizing Committee, Astro Hack Week (chair in 2015, 2017, and 2018) 2014-present
<http://astrohackweek.org/2018/>
- Invited referee for Nature, ApJ, MNRAS, A&A 2013-present
- Mini-Symposium Chair, SciPy 2018
<https://scipy2018.scipy.org/>
- Scientific Organizing Committee, Python in Astronomy 2017-2018
<http://openastronomy.org/pyastro/2018/>

Program Committee, JupyterCon	2017
Organizer, NYU Center for Data Science Lunch Seminar Series	2016
Organizer, Journal Club at the Astronomical Institute of the University of Amsterdam	2013-2015
Local Organizing Committee, LOFT Science Meeting	2011
Local Organizing Committee, 2nd Summer School on Multiwavelength Astronomy, Amsterdam	2010

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Publications

Lead Author

- Hack Weeks as a Model for Data Science Education and Collaboration
Huppenkothen, D. et al.; *Proceedings of the National Academy of Sciences* (2018)
- On the Statistical Properties of Cospectra
Huppenkothen, D. & Bachetti, M.; *Astrophys. J. Sup.* 236 p.11pp (2018)
- Exploring the Long-Term Evolution of GRS 1915+105
Huppenkothen, D. et al.; *Mon. Not. R. Astron. Soc.* 466 p.2364-2377. (2017)
- Detection of Very Low-Frequency Quasi-Periodic Oscillations in the 2015 Outburst of V404 Cygni
Huppenkothen, D. et al.; *Astrophys. J.* 834 17 pp. (2017)
- Dissecting magnetar variability with Bayesian hierarchical models
Huppenkothen, D. et al.; *Astrophys. J.* 810 22 pp. (2015)
- Quasi-periodic Oscillations in Short Recurring Bursts of Magnetars SGR 1806-20 and SGR 1900+14 Observed with RXTE
Huppenkothen, D. et al.; *Astrophys. J.* 795 114 pp. (2014)
- Intermittency and Lifetime of the 625 Hz Quasi-periodic Oscillation in the 2004 Hyperflare from the Magnetar SGR 1806-20 as Evidence for Magnetic Coupling between the Crust and the Core
Huppenkothen, D. et al.; *Astrophys. J.* 793 129 pp. (2014)
- Quasi-Periodic Oscillations in the Short Recurring Bursts of the Soft Gamma Repeater J1550-5418
Huppenkothen, D. et al.; *Astrophys. J.* 787 128 pp. (2014)
- Quasi-Periodic Oscillations and Broadband Variability in Short Magnetar Bursts
Huppenkothen, D. et al.; *Astrophys. J.* 768 87 pp. (2013)

Contributing Author

- Constraining the limiting brightness temperature and Doppler factors for the largest sample of radio bright blazars
Liodakis, I.; Hovatta, T.; Huppenkothen, D. et al.; *Astrophys. J.* (in press).
- The first tidal disruption flare in ZTF: from photometric selection to multi-wavelength characterization
van Velzen, S. et al.; incl. Huppenkothen, D. et al.; *Astrophys. J.* (in press).
- Detection of non-thermal X-ray emission in the lobes and jets of Cygnus A
de Vries, M.; Wise, M. W.; Huppenkothen, D. et al.; *Mon. Not. R. Astron. Soc.* 478 p.4010-4029 (2018).
- No Time for Dead Time: Use the Fourier Amplitude Differences to Normalize Dead-time-affected Periodograms
Bachetti, M. & Huppenkothen, D.; *Astrophys. J.* 853 6 pp. (2018)
- The rotational phase dependence of magnetar bursts
Elenbaas, C.; Watts, A.L.; Huppenkothen, D.; *Mon. Not. R. Astron. Soc.* 476 p.1271-1285 (2018)
- APO Time-resolved Color Photometry of Highly Elongated Interstellar Object 1I/'Oumuamua
Bolin, B. et al.; including Huppenkothen, D.; *Astrophys. J.* 852 10 pp. (2018)
- Magnetar giant flare high-energy emission
Elenbaas, C.; Huppenkothen, D. et al.; *Mon. Not. R. Astron. Soc.* 471 p.1856-1872 (2017)

X-ray and radio observations of the magnetar SGR J1935+2154 during its 2014, 2015, and 2016 outbursts

Younes, G. et al, including Huppenkothen, D.; *Astrophys. J.* 847 15 pp. (2017)

Burst and Outburst Characteristics of Magnetar 4U 0142+61

Gögüs, E. et al., including Huppenkothen, D.; *Astrophys. J.* 835 8 pp. (2017)

Magnetar-like X-Ray Bursts from a Rotation-powered Pulsar, PSR J1119-6127

Gögüs, E. et al., including Huppenkothen, D.; *Astrophys. J. Letters* 829 7 pp. (2016)

False periodicities in quasar time-domain surveys

Vaughan, S. et al., including Huppenkothen, D.; *Mon. Not. R. Astron. Soc.* 461 3145 pp. (2016)

The wind nebula around magnetar Swift J1834.9-0846

Younes, G. et al., including Huppenkothen, D.; *Astrophys. J.* 824 12 pp. (2016)

The Five Year Fermi/GBM Magnetar Burst Catalog

Collazzi, A.C. et al., including Huppenkothen, D.; *Astrophys. J. Sup.* 218 11 pp. (2015)

Time Resolved Spectroscopy of SGR J1550-5418 for the Fermi/GBM Bursts

Younes, G. et al., including Huppenkothen, D.; *Astrophys. J.* 785 52 pp. (2014)

The Outflow History of Two Herbig-Haro Jets in RCW 36: HH1042 and HH1043

Ellerbroek, A.M. et al., including Huppenkothen, D.; *Astron. Astrophys.* 551 A5 pp. (2013)

Detection of Spectral Evolution in the Bursts Emitted During the 2008-2009 Active Episode of SGR J1550-5418

von Kienlin, A. et al., including Huppenkothen, D.; *Astrophys. J.* 755 150 pp. (2012)

Using the X-ray Morphology of Young Supernova Remnants to Constrain Type, Ejecta Distribution and Chemical Mixing

Lopez, L.A. et al., including Huppenkothen, D.; *Astrophys. J.* 732 114 pp. (2011)

Typing Supernova Remnants Using X-ray Line Emission Morphologies

Lopez, L.A. et al., including Huppenkothen, D.; *Astrophys. J.* 706 106 pp. (2009)

Non-refereed

ZTF Bright Transient Survey Classifications

Graham, M.L. et al., including Huppenkothen, D.; *Astronomer's Telegram* 11745 (2018)

The LOFT mission concept: a status update

Feroci, M et al., including Huppenkothen, D.; *Proceedings of the SPIE* 9905 20 pp. (2016)

eXTP – enhanced X-ray Timing and Polarimetry Mission

Zhang, S.N. et al., including Huppenkothen, D.; *Proceedings of the SPIE* 9905 16 pp. (2016)

Python in Astronomy 2016 Unproceedings

Robitaille, T. et al., including Huppenkothen, D.; DOI: 10.5281/zenodo.56793

FERMI/Gamma-ray Burst Monitor upper limits assuming a magnetar origin for the repeating Fast Radio Burst source, FRB 121102

Younes, G. et al., including Huppenkothen, D.; *Astronomer's Telegram*, 8781

New Methods for Timing Analysis of Transient Events, Applied to Fermi/GBM Magnetar Bursts

Huppenkothen, D. et al.; Proceedings of the 4th International Fermi Symposium, 2013, arXiv: 1303.1370

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Presentations

Invited

- Hack Weeks as a Model for Data Science Education and Collaboration 2018
Keynote Presentation, Moore-Sloan Data Science Summit, Park City, UT, USA
- Bayesian Inference for X-ray Timing 2018
42nd COSPAR Scientific Assembly, Pasadena, CA, USA
- Data Science: Notes from an Emerging Field 2018
Open Questions in Astrophysics, Copenhagen, Denmark
- Machine Learning in the Age of Survey Astronomy 2018
XMM-Newton 2018 Science Workshop, Madrid, Spain
- From Asteroids to Black Holes: Data Science in Time Domain Astronomy 2018
University of Washington Data Science Summit, Seattle, WA, USA
- Classifying Black Hole States: Lessons Learned in Machine Learning 2018
231st Meeting of the American Astronomical Society
- The Whole is Greater than the Sum of its Parts: Better Inference Through Bayesian Hierarchical Modelling 2017
16th Meeting of the High-Energy Astrophysics Division of the American Astronomical Society
- Time Series Analysis for a Multiwavelength Future 2016
HAP Workshop: Monitoring the Non-Thermal Universe, Cochem, Germany
- Timing V404 Cygni during its 2015 outburst 2016
11th INTEGRAL Conference, Amsterdam, The Netherlands
- Ripples in a Stormy Sea: Quasi-Periodic Oscillations in the Fermi Gamma-Ray Burst Monitor 2015
6th International Fermi Symposium, Arlington, VA, USA
- Probing Neutron Star Physics with Quasi-Periodic Oscillations in Magnetar Bursts 2015
Spring Meeting of the American Physical Society, Baltimore, MD, USA
- Magnetars, QPOs and the Neutron Star Crust 2014
FUSTIPEN Topical Meeting "Structure of the neutron star crust: experimental and observational signatures", Caen, France

Colloquia & Seminars

- Fun Statistics with Fourier Spectra 2018
Harvard-California Astrostatistics Collaboration Seminar, Center for Astronomy, Harvard University, USA
- X-ray Astronomy in the Era of Data Science 2018
Physics Colloquium, University of Delaware, USA
- Data Science for X-ray Astronomy 2017
Astronomy Colloquium, University of Washington, USA
- Wrong But Useful: Statistics and Machine Learning for High-Energy Astrophysics 2017
Physics Colloquium, Rheinisch-Technische Universität Aachen, Germany
- How to Time a Black Hole: Time series Analysis for the Multi-Wavelength Future 2017
Astronomy Seminar, Technical University Dortmund, Germany

Improving Candidate Selection for Academic Conferences and Beyond <i>Seminar at the European Space Research and Technology Centre (ESTEC), The Netherlands</i>	2017
Exploring the Long-Term Evolution of Black Holes with Machine Learning <i>Leiden Faculty colloquium</i>	2017
How to Time a Black Hole: Unravelling fundamental physics with X-ray variability <i>Chodera Lab Seminar, Memorial Sloan-Kettering Cancer Center, USA</i>	2017
How to Time a Black Hole: Time Series Analysis for the Multi-Wavelength Future <i>Astronomy Seminar, University of Würzburg, Germany</i>	2017
Why your field needs a hack week <i>BIDS Data Science Lecture Series, University of California Berkeley, USA</i>	2016
Exploring the Violent Universe: A Data Science Approach to X-ray Astronomy <i>The 4th Annual DC/VA/MD Summer Astrophysics Meeting, George Washington University, Washington, DC, USA</i>	2016
Timing Black Holes: Unravelling Fundamental Physics with X-ray Variability <i>Statistics colloquium, University of Auckland, New Zealand</i>	2016
Exploring the Violent Universe: A Data-Driven Approach to X-ray Astronomy <i>Physics colloquium, George Washington University, Washington, DC, USA</i>	2015
Are magnetar short bursts caused by star quakes? Using burst variability to constrain magnetar physics <i>HEAD lunch seminar, Center for Astrophysics, Harvard University, Cambridge, MA, USA</i>	2015
Unravelling Magnetar Variability: A data-driven approach to X-ray timing <i>Chandra X-ray Telescope Grou, MIT, Cambridge, MA, USA</i>	2015
Searching the Haystack of Magnetar Bursts <i>SPIMAX Seminar, University of Oxford, Oxford, UK</i>	2014
A Zoo of Magnetar Bursts: Understanding Magnetar Variability <i>Monash University, Melbourne, Australia</i>	2013
Assessing the Impact of UV/X-ray Emission from Accreting Black Holes on the ISM <i>Colloquium, Dr. Karl Remeis-Sternwarte Bamberg, Germany</i>	2010

Contributed

Here Be Dragons: Effective (X-ray) Timing with the Cospectrum <i>231st Meeting of the American Astronomical Society, Washington DC, USA</i>	2018
Entropy your Cohort <i>Moore-Sloan Data Science Summit</i>	2017
Using Python to Study Black Holes <i>PyGotham 2016, New York, USA</i>	2016
Detection of Low-Frequency Quasi-Periodic Oscillations in the 2015 Outburst of V404 Cygni <i>15th Meeting of the High Energy Astrophysics Division of the American Astronomical Society, Naples, FL, USA</i>	2016
Entropy: Participant Selection Made Easy <i>Python in Astronomy 2016, University of Washington, Seattle, USA</i>	2016
Quasi-periodic Oscillations in V404 Cygni <i>Time Domain Astrophysics with Swift, Clemson, SC, USA</i>	2015
New Statistical Tools for Studying Variability in Transient Light Curves <i>Hot-Wiring the Transient Universe IV, Santa Barbara, CA, USA</i>	2015

New Methods To Understand Variability in Astrophysical Transients <i>Maximum Entropy and Bayesian Inference, Canberra, Australia</i>	2013
Timing Transients: New Methods To Understand Transient Variability <i>Astroinformatics 2013, Sydney, Australia</i>	2013
Timing Transients: Understanding Magnetar Variability <i>Explosive Transients, Lighthouses of the Universe, Santorini, Greece</i>	2013
Understanding Magnetar Variability: A Magnetar Burst Zoology <i>NS2013: Latest Results from the Neutron-Star Laboratory, Amsterdam, The Netherlands</i>	2013
New Methods for Timing Analysis of Transient Events <i>NOVA Network 3 Meeting, Nijmegen, The Netherlands</i>	2012
New Methods for Timing Analysis of Transient Events <i>4th International Fermi Symposium, Monterey, CA, USA</i>	2012