

Daniela Huppenkothen
Curriculum Vitae
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Center for Data Science,
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E-mail: daniela.huppenkothen[at]nyu.edu
Nationality: German

Work Experience

Moore-Sloan Data Science Fellow
Postdoctoral fellowship at New York University's Center for Data Science,
November 2014-present

Education

Ph.D. in Astronomy, October 2014
University of Amsterdam, Netherlands
Supervisors: Dr Anna Watts, Prof Michiel van der Klis
Thesis: New Statistical Tools for Variability Analysis in Transient Events and Applications

M.Sc. in Astronomy and Astrophysics, September 2010
University of Amsterdam, Netherlands
Supervisor: Dr Sera Markoff

B.Sc. in Geosciences and Astrophysics, June 2008
Jacobs University Bremen
Adviser: Prof Stephan Rosswog

Research Interests

- high-energy transient phenomena: magnetar bursts and giant flares, GRBs, X-ray binaries
- non-stationary time series in astronomy
- Bayesian inference: parameter estimation and model selection for astronomical applications
- machine learning

Experience and Technical Skills

Fermi Gamma-Ray Space Telescope (FGST), 2010-present

- developed novel statistical tools for time series analysis
- implemented machine learning algorithms and advanced sampling techniques
- applied tools to magnetar bursts

CLOUDY (Photoionization Code), 2009-2010

- built computational models of HII regions around galactic black hole binaries (master's thesis work)

Chandra X-ray Observatory (CXO), 2007-2008

- performed wavelet analysis of supernova remnants observed with the CXO

Research Vessel Sonne (2006)

- maintained and controlled seismic and echosounding equipment
- monitored data acquisition and system performance
- processed hydroacoustic Parasound data for deep-sea drilling proposal

Electron-Beam Ion Trap (EBIT) at Max-Planck Institute for Nuclear Physics (internship), 2003-2004

- set up and tested a laser ion source

Teaching

Astro Hack Week 2014

- devised and lectured a 1/2-day workshop on classical statistics

Deutsche Schülerakademie (German Student Academy), 2012

- devised and lectured a 10-day course in Astronomy for gifted high school students

Teaching Assistant Posts

- Accretion Flows (M.Sc. course), 2012, University of Amsterdam
- Astrophysics II (B.Sc. course), 2012 University of Amsterdam
- Introduction to Astronomy and Cosmology (B.Sc. course), 2011+2012, University of Amsterdam
- Fluid Dynamics, (M.Sc. course), 2011, University of Amsterdam
- Geosciences and Astrophysics II (B.Sc. course), 2007 + 2008, Jacobs University Bremen

Research Supervision and Mentoring

Timing Analysis of Gamma-Ray Bursts using Bayesian Statistics, bachelor student project (co-supervisor with Anna Watts), 2012

The Ionizing Effect of the High-Mass X-ray Binary LMC X-1 on its Surroundings, master student project (co-supervisor with Sera Markoff), 2010-2011

project CyberMentor: mentored two female high school students interested in the natural sciences, 2011-2012

Honours and Awards

- HSP Huygens scholarship, 2008-2010
- scholarship awarded by "Studienstiftung des Deutschen Volkes" (German National Academic Foundation), 2005-2008 (B.Sc.) and 2008-2010 (M.Sc.)
- merit-based scholarship awarded by Jacobs University Bremen, 2005-2008 (B.Sc.)

- member of “President’s List” (students with GPA better than 1.5*), 2005-2008 (B.Sc.)
- award of the Deutsche Physikalische Gesellschaft (German Society of Physicists) for best graduating student in physics, 2005

Service to the Community

- Leading the organising committee for Astro Hack Week 2015
- co-organiser for Astro Hack Week 2014
- Journal Club organisation at the Astronomical Institute of the University of Amsterdam, 2013 - 2015
- Local Organising Committee, 2nd Summer School on Multiwavelength Astronomy, Amsterdam, 2010
- Local Organising Committee, LOFT Science Meeting, 2011

Courses Attended

- NIJMEGEN12: 4th International Summer School on Astroparticle Physics, 2012
- *Formation of Structures: Natural Phenomena and Models*, workshop at the German National Academic Foundation Summer Academy, 2006

Professional Membership

- International Astrostatistics Association
- Deutsche Physikalische Gesellschaft (German Society of Physicists)

Selected Talks

Exploring the Violent Universe: A Data-Driven Approach to X-ray Astronomy
invited colloquium at George Washington University, May 2015

Probing Neutron Star Physics with Quasi-Periodic Oscillations in Magnetar Bursts
invited presentation, Spring Meeting of the American Physical Society,
April 11, 2015

Are magnetar short bursts caused by star quakes? Using burst variability to constrain magnetar physics
invited HEAD lunch talk, Center for Astrophysics, Harvard University,
March 18, 2015

Unravelling Magnetar Variability: A data-driven approach to X-ray timing
invited talk for the Chandra X-ray telescope group, MIT, March 19, 2015

Magnetars, QPOs and the Neutron Star Crust,
invited talk at the FUSTIPEN topical meeting “Structure of the neutron star crust:
experimental and observational signatures”, May 26, 2014

Searching the Haystack of Magnetar Bursts
invited SPIMAX seminar, University of Oxford, Feb 12, 2014

New Methods To Understand Variability in Astrophysical Transients
contributed talk at Maximum Entropy and Bayesian Inference, Canberra,
December 20, 2013

* grade scale 1 to 5, with 1 highest mark, 5 fail

- Timing Transients: New Methods To Understand Transient Variability*
contributed talk at Astroinformatics 2013, Sydney, December 10, 2013
- Timing Transients: Understanding Magnetar Variability*
contributed talk at Explosive Transients, Lighthouses of the Universe, Santorini, September 17, 2013
- A Zoo of Magnetar Bursts: Understanding Magnetar Variability*
talk at the Transients Group, University of Sydney, Australia, July 4, 2013
- A Zoo of Magnetar Bursts: Understanding Magnetar Variability*
talk at the Neutron Star Group, University of Melbourne, Australia, June 24, 2013
- A Zoo of Magnetar Bursts: Understanding Magnetar Variability*
invited seminar speaker, Monash University, Melbourne, Australia, June 11, 2013
- Understanding Magnetar Variability: A Magnetar Burst Zoology*
contributed talk at the NS2013 Symposium: Latest Results from the Neutron-Star Laboratory, Amsterdam, 2013
- New Methods for Timing Analysis of Transient Events*
contributed talk at the NOVA Network 3 Meeting, Nijmegen, 2012
- New Methods for Timing Analysis of Transient Events*
contributed talk at the 4th International Fermi Symposium, Monterey, USA, 2012
- New Methods for Timing Analysis of Transient Events*
Theory Lunch Discussion, UC Berkeley, USA, October 24, 2012
- Search for Quasi-Periodic Oscillations in Fermi/GBM Observations of SGR J0501+4516*
talk at the Fermi/GBM group, Marshall Space Flight Center, Huntsville, USA, September 14, 2011
- Assessing the Impact of UV/X-ray Emission from Accreting Black Holes on the ISM*
invited seminar speaker, Dr. Karl Remeis-Sternwarte Bamberg, Germany, December 3, 2010
- Assessing the Impact of UV/X-ray Emission from Accreting Black Holes on the ISM*
colloquium speaker, University of Amsterdam, August 27, 2010

Refereed Publications (Lead Author)

Dissecting magnetar variability with Bayesian hierarchical models, D. Huppenkothen et al., accepted for publication in The Astrophysical Journal, arXiv: 1501.05251

Quasi-periodic Oscillations in Short Recurring Bursts of Magnetars SGR 1806-20 and SGR 1900+14 Observed with RXTE, D.Huppenkothen et al., The Astrophysical Journal 795 (2014) 114

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, D. Huppenkothen et al., The Astrophysical Journal 793 (2014) 129

Quasi-Periodic Oscillations in the Short Recurring Bursts of the Soft Gamma Repeater J1550-5418, D. Huppenkothen et al., The Astrophysical Journal 787 (2014), 128, arXiv:1404.2756

Quasi-Periodic Oscillations and Broadband Variability in Short Magnetar Bursts, D.Huppenkothen et al., The Astrophysical Journal 768 (2013), 87, arXiv: 1212.1011

Refereed Publications (Contributing Author)

The Five Year Fermi/GBM Magnetar Burst Catalog,
A. C. Collazzi, C. Kouveliotou, A. J. van der Horst, G.A. Younes, Y. Kaneko, E. Göğüş, L. Lin, J. Granot, M.H. Finger, V. L. Chaplin, **D. Huppenkothen**, A. L. Watts, A. von Kienlin, M.G. Baring, D. Gruber, P. N. Bhat, M. H. Gibby, N. Gehrels, J. McEnery, M. van der Klis, R. A. M. J. Wijers, The Astrophysical Journal Supplement Series, 218 (2015) 11, arXiv 1503.04152

Time Resolved Spectroscopy of SGR J1550-5418 for the Fermi/GBM Bursts
G. Younes, C. Kouveliotou, A.J. van der Horst, M.G. Baring, J. Granot, A.L. Watts, P.N. Bhat, A. Collazzi, C.R. D'Angelo, N. Gehrels, N. Gorgone, E. Göğüş, D. Gruber, S. Grunblatt, **D. Huppenkothen**, A. von Kienlin, Y. Kaneko, L. Lin, J. McEnery, M. van der Klis, T. van Putten, R.A.M.J. Wijers, The Astrophysical Journal 785 (2014) 52, arXiv 1402.6015

The Outflow History of Two Herbig-Haro Jets in RCW 36: HH1042 and HH1043,
L.E. Ellerbroek, L. Podio, L. Kaper, H. Sana, **D. Huppenkothen**, A. de Koter, L. Monaco, Astronomy and Astrophysics 551 (2013), A5, arXiv: 1212.4144

Detection of Spectral Evolution in the Bursts Emitted During the 2008-2009 Active Episode of SGR J1550-5418, A. von Kienlin, D. Gruber, C. Kouveliotou, J. Granot, M. Baring, E. Göğüş, **D. Huppenkothen** et al., Astrophysical Journal 755 (2012), L150-L161, arXiv: 1206.4915

Using the X-ray Morphology of Young Supernova Remnants to Constrain Type, Ejecta Distribution and Chemical Mixing, L.A. Lopez, E. Ramirez-Ruiz, **D. Huppenkothen**, C. Badenes, D.A. Pooley, *Astrophysical Journal* 732 (2011), L114-L132, arXiv: 1011.0731

Typing Supernova Remnants Using X-ray Line Emission Morphologies, L.A. Lopez, E. Ramirez-Ruiz, C. Badenes, **D. Huppenkothen**, T.E. Jeltema, D.A. Pooley, *Astrophysical Journal Letters* 706 (2009), L106-L109, arXiv: 0910.3208

Non-Refereed Publications

New Methods for Timing Analysis of Transient Events, Applied to Fermi/GBM Magnetar Bursts, D. Huppenkothen et al., *Proceedings of the 4th International Fermi Symposium*, 2013, arXiv: 1303.1370