

# Dr. Johannes Buchner

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## Academic career

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- 03/01/2019 – now **Postdoctoral researcher** in the high-energy group at Max Planck for Extraterrestrial Physics (MPE), **Germany**  
 Researching the co-evolution of galaxies and black holes. MPE leads the eROSITA/SRG space mission (launched in July 2019) with an all-sky survey of over 1 million black holes.  
Chair of the Active Galactic Nuclei eROSITA working group  
Chair of the SDSS-V working group “AGN Demographics”  
Chair of the ATHENA science working group “Formation and growth of earliest SMBH”
- 01/06/2019 –02/28/2019 **Visiting researcher at Harvard University / Center for Astrophysics, USA**  
 Collaboration with Dr. F. Civano towards reliably associating the Chandra Source Catalog (315,000 X-ray sources) to optical and infrared all-sky catalogs.
- 05/01/2015 –12/14/2018 **FONDECYT fellow** at Pontificia Universidad Católica (PUC), **Chile**  
 Researching galaxy-black hole co-evolution, uncovering the nuclear and galactic obscuration near the black hole with X-ray and multi-wavelength surveys.  
 Developed novel radiative transfer code for testing X-ray obscurer models and cosmological simulations of the origin of black holes, now in heavy use for the HEX-P mission proposal.
- 10/03/2011 –04/30/2015 **Doctoral thesis in Astronomy** awarded 14/04/2015 by Ludwig-Maximilian University, **Germany**  
 Thesis title: “On the obscuration of the growing supermassive black hole population”  
 Advisor: Prof. Kirpal Nandra, Director of the Max Planck for Extraterrestrial Physics (MPE)  
  
 Researching black hole evolution since the Big Bang. Investigation of the nuclear obscurer. Developing novel statistical analysis techniques for large surveys, handling many sources from biased samples and low count statistics.
- 07/20/2009 –06/27/2011 **MSc degree** (awarded 27/07/2012) in Computer Science at AUT University (**New Zealand**), at IRASR radio telescope institute. Thesis advisor: Prof. Sergei Gulyaev  
 Preparatory research for SKA. Machine learning and genetic algorithms for astronomy needs.
- 10/01/2006 –07/01/2009 **BSc degree** for Software Engineering at TU Vienna and studying towards BSc in Astronomy at University of Vienna, **Austria**  
 Analysis of sun-like pulsating stars, under Prof. Werner W. Weiss

## Formal roles

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- 01/18/2023 – now **Chair** of the AGN working group in the German eROSITA consortium (55 members)
- 06/01/2019 – now **Head** of X-ray spectral analysis work package for the German eROSITA AGN working group
- 01/04/2021 – now **Chair** of the Athena science working group “Formation and growth of earliest SMBH” (SWG2.1)
- 02/26/2021 – now **Chair** of the SDSS-V Black Hole Mapper “Demographics” working group (40 members)
- 09/27/2021 – now PhD committee member for Michigan State University
- 2022 – now Member of Euclid & 4MOST consortia and the LSST AGN science collaboration

## Outreach

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I actively engage in outreach activities for the general public:

05/30/2023	Internships for research experience, 2 school interns (age 14) for 1 week
2019 – now	eROSITA social medial outreach team, @eROSITA_SRG on Twitter, radio interview
06/21/2019	Interview on the radio show DasDing, targeting young people. About the space telescope eROSITA
02/11/2019	Fundraising for “Girl Up” UN program on Day for Women and Girls in Science at Harvard University
10/10/2015	IX Fiesta de la Ciencia y la Tecnología 2015 - PUC outreach (2 days)

## Participation in industry innovation

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Two examples of how my research software has had an impact beyond astrophysics:

2013 – now	I developed an image similarity analysis package called imagehash which has been favorited by over 2700 developers on GitHub and re-used (“forked”) in 352 software projects, in part for building image search engines. <a href="https://github.com/JohannesBuchner/imagehash">https://github.com/JohannesBuchner/imagehash</a>  This code was adopted by Thorn, a organisation founded by Demi Moore and Ashton Kutcher, to build a platform (used by Flickr, Imgur, Slack, Vimeo and others) to stop the spread of child abuse material online.
06/24/2015 –08/11/2017	Assisting medical research of Dr. med. Mats Leif Moskopp at the Institute for Physiology, TU Dresden with the PyMultiNest analysis software

## List of Awards & Funding

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All my previous research positions were funded through fellowships.

2015	Awarded FONDECYT post-doctoral fellowship at PUC, 3 years	ca. 100,000\$
2011	Awarded Max Planck doctoral stipend at MPE in 2011, 3.5 years	ca. 60,000\$
2010	Awarded Kordia Scholarship for second MSc year at AUT University	
2008	Awarded merit stipend by University of Vienna	

The successful project execution of these funding opportunities is demonstrated by my publication record.

## Service for the community and institute

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- Chairing working groups in the eROSITA, SDSS-V and Athena collaborations, coordination and conflict resolution
- Hiring committee member in 2 post-doc and 3 PhD position calls; Launched initiatives to reduce unconcious biases
- Scientific organising committee member
  - eROSITA international conference 2024
  - “Frontiers of nested sampling” workshop / MaxEnt2023
- Regular refereeing for ApJ, A&A and MNRAS, Nature Astronomy
- Commenting on PhD, MSc and BSc theses, informal co-advising of high-energy group students
- Editing press releases for scientific breakthroughs in German

I am among the most active members of the Astrostatistics Facebook group with over 6000 members. I regularly answer statistics questions by colleagues world-wide. Within the institute (PUC previously and MPE), I actively make myself available for consulting on machine learning, statistics, computing and astrophysics.