

# Peter Boorman

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✍ 17 papers 👍 184 citations 📈 h-index: 9 💬 38 presentations

## >\_ Research Interests.....

### *Extragalactic astrophysics*

- Classifying obscured Active Galactic Nuclei (AGN)
- AGN obscured fraction
- AGN evolution and feedback

### *Theoretical & computation*

- Cosmic X-ray Background population synthesis
- Monte Carlo radiative transfer modelling
- Big data analysis and machine learning methods

### *Observational*

- X-ray imaging and spectroscopy
- Optical spectroscopy and modelling
- Infrared photometric surveys



## 🎓 Education.....

10/2015–07/2019 **Ph.D.** in Astrophysics, Advisor: Dr. Poshak Gandhi, University of Southampton

10/2011–07/2015 **Bachelors + Masters** in Physics, University of Southampton  
**Result:** 1st Class Honours & top of year

## 🏢 Employment History.....

09/2019–01/2020 **Postdoctoral researcher:** at the Astronomical Institute of the Czech Academy of Sciences

06/2019–09/2019 **MoleGazer Data Analyst:** > £21,000 funding awarded by the STFC Impact Acceleration Accounts to analyse the temporal evolution of naevi into melanoma in medical images using astronomical photometric techniques and machine learning algorithms

## 💡 Notable Activities.....

June 2020 **Textbook co-author:** wrote the X-ray imaging section of *Tutorial Guide to X-ray and Gamma-ray Astronomy* - [link.springer.com/book/10.1007/978-981-15-6337-9](https://link.springer.com/book/10.1007/978-981-15-6337-9)

Aug 2020 **Team Leader for the Lindau online Sciathon:** led efforts to nourish a mutually respectful publishing process with researchers - [sciathon.org/project/group-su/](https://sciathon.org/project/group-su/)

July 2019 **Lindau Nobel Laureate Attendee:** Nominated & Selected 1/580 young researchers from 89 countries to attend the 69th Lindau Nobel Laureate Meeting in July 2019 with 39 Nobel Laureates of physics

July 2019 **Max Planck Visitor:** Selected to visit the Max Planck Institute for Extraterrestrial Physics in Munich following the Lindau Nobel laureate meeting.

2016–present **Lead-analyst for the 4 Ms NuLANDS Survey** with *NuSTAR*, *Swift*, *XMM-Newton*, *Chandra* & *Suzaku*

Jan 2016 **Press Release:** American Astronomical Society Winter Meeting

2016 **Finalist:** Nationwide I'm a Scientist competition

2017 & 2018 **Two-time nominee:** University of Southampton Doctoral College Citizen & Community Award

## 🏆 Grants & Awards

2020 **Springer Thesis Award** - [www.phys.soton.ac.uk/news/6711](http://www.phys.soton.ac.uk/news/6711)

2017 **£4,500 prize funding to organize a conference** - [sites.google.com/site/broadbandlook/home](https://sites.google.com/site/broadbandlook/home)

2016–2018 **£1,500 of Travel Grants** from Royal Astronomical Society to present contributed talks in Zürich & Chile

2018 **£200 Bursary** from the Institute of Physics to collaborate in Chile

July 2015 **Most Outstanding Performance:** Ranked top of 127 physics masters students at the University of Southampton - [www.phys.soton.ac.uk/news/4744](http://www.phys.soton.ac.uk/news/4744)

## ★ Skills

**Developer** Python,  $\text{\LaTeX}$ , tcl

**Expert** Xspec, PyXspec, Sherpa, tcsh, Mac, unix, Topcat, git, Windows

**Experienced** Fortran, Aladin, DS9, bash, HTML

**Languages** English (native), French (intermediate), Spanish (basic), Czech (basic)

## 📊 Awarded Observing Time

2020 *NuSTAR*; **Boorman, P. et al.**, *Validating a new AGN selection as a means to construct the local census of AGN*, 200 ks Priority A, 100 ks Priority B

2020 *Swift*; **Boorman, P.**, *Target of Opportunity*, 7 ks

2020 *NuSTAR*; **Boorman, P.**, *Directors Discretionary Time*, 40 ks

2016–2019 *NuSTAR*; Gandhi, P., **Boorman, P. et al.**, *The NuSTAR Local AGN  $N_H$  Distribution Survey, (NuLANDS), NuSTAR Legacy Survey*, 1 Ms

2019–2020 VISIR; Asmus, D. et al., *Toward a truly representative sample of local AGN*, 90 hours Rank B

2019 *XMM-Newton*; **Boorman, P. et al.**, *Probing the Extreme X-ray Emission Mechanisms of Green Pea Galaxies*, 150 ks Priority B, 150 ks Priority C

2019 VLA; Borkar, A. et al., *Revealing the Elusive Power Source of Green Pea Galaxies*, 19 hours, Priority C

2019 *XMM-Newton*; Svoboda, J. et al., *What powers the galaxies with Lyman continuum escape?*, 100 ks Priority C

2020 X-SHOOTER; Asmus, D. et al., *X-SHOOTER follow-up of R90 AGN candidates from LASr*, 15.3 hours, Filler time

- 2019 SALT; **Boorman, P. et al.**, *Resolving AGN obscuration biases with robust optical classifications*, 7.5 hours Priority 3
- 2019 ALMA; Izumi, T. *et al.*, *Diffuse cold atomic gas in Seyfert galaxies: to reveal multi-phase nature of AGN obscuration*
- 2019 ALMA; Alonso-Herrero, A. *et al.*, *Resolving the molecular tori and nuclear outflows in the most luminous Seyferts in the local Universe*
- 2018 XMM-Newton; **Boorman, P. et al.**, *Completing an Unbiased Census of AGN Obscuration*, 126 ks Priority C
- 2017 NuSTAR; LaMassa, S. *et al.*, *Modeling the Obscuration Around Extreme AGN NGC 4968*, 40 ks Priority A
- 2016 XMM-Newton; **Boorman, P. et al.**, *Quantifying obscuration bias in hard X-ray AGN selection*, 126 ks Priority C

## **International Collaborations & Memberships**.....

- 2019–present **Member of the SHIVA Team:** Searching for a Holistic Interpretation of Variable Accretion
- 2019–present **Lindau Nobel Laureate Alumni**
- 2015–present **Member of the NuSTAR AGN Science team:** worldwide collaboration for AGN-related research using the NuSTAR satellite
- 2019–present **Member of the GATOS Team:** Galaxy Activity, Torus, and Outflows Survey.
- 2016–present **Founded:** Southampton Accretion Group
- 2016–present **Memberships:** Royal Astronomical Society & Institute of Physics

## **Teaching Experience**.....

- Nov 2019 **NuSTAR Data Analysis workshop:** led a week-long data analysis workshop delivered to the Slovakia Institute of Technology for NuSTAR data analysis and products extraction
- 2016–2018 **Demonstrator:** University of Southampton undergraduate Python Computer Labs & Electromagnetism courses

## **Academic Service & Outreach**.....

- April 2020 **Skype a Scientist:** Answered questions with members of the public about black holes and space.
- July 2019 **Video Interviewee:** Interview available worldwide about my research at the 69th Nobel Laureate Lindau Meeting
- 2015, 2019 **Conference local organiser:** XCalibur 2019 international high-resolution X-ray spectroscopy workshop - July 2019 & TORUS 2015 international conference - Sep 2015
- 2018 **Academic paper referee:** Astrophysical Journal, Astrophysics & Space Science, MDPI
- Sep 2018 **Charity work:** Led efforts for DataDive hosted by DataKind UK - Southampton
- 2016–present **Departmental organiser:** Accretion meetings, Journal Clubs & weekly seminars
- 2016–2017 **Observing:** Keck/LRIS & Palomar/DBSpec; 3 nights total

July 2018 **Nature Community writer:** Nature Community article about *NuSTAR*

## 🗨 Presentations, Seminars & Press Releases

38 Total.....

### Press Releases

Jan 2016 *American Astronomical Society Winter Meeting* (featured in global media outlets; NASA/JPL, The Guardian, The Independent, The Daily Mail, University of Southampton, Durham University)

### Invited

Mar 2018  
**Contributed** *ESO Headquarters Chile - Local hard X-ray selected AGN across the multi-wavelength spectrum*

Jun 2017  
**Seminar** *Sussex University Astronomy Department, UK*

### Contributed & Seminars

Nov 2020  
**Seminar** *IISER, Mohali, Punjab, India*

Jun 2020  
**Seminar** *SPI-MAX, University of Oxford, UK*

Mar 2020  
**Seminar** *Charles University, Prague*

Mar 2020  
**Seminar** *Masaryk University, Brno, Czechia*

Feb 2020  
**Seminar** *European Space Agency Center, Madrid, Spain*

Mar 2020  
**Contributed** *Ondřejov Astronomical Institute of the Czech Academy of Sciences, Czechia*

Nov 2019  
**Contributed** *AGN Spectral States workshop, Vila Lanna*

Nov 2019  
**Seminar** *Cologne–Prague Meeting, Prague Astronomical Institute, Czechia*

Nov 2019  
**Talk** *High Energy Kaffeerunde, Max Planck Institute for Extraterrestrial Physics, Garching, Germany*

July 2019  
**Talk** *Max Planck Institute for Extraterrestrial Physics Infrared Group, Garching, Germany*

July 2019  
**Poster** *XCalibur High-resolution X-ray Spectroscopy Meeting, Winchester, UK*

July 2019  
**Poster** *69th Lindau Nobel Laureate Meeting, Germany*

Jun 2019 *Prague Relativistic Astrophysics Group, Prague Astronomical Institute, Czechia*  
**Seminar**

Dec 2018 *TORUS2018 meeting, Puerto Varas, Chile*  
**Contributed**

Dec 2018 *Universidad Diego Portales, Santiago, Chile*  
**Seminar**

Oct 2018 *Harvard Centre for Astrophysics Quasar Tea, Cambridge, Boston*  
**Talk**

Oct 2018 *Harvard Black Hole Initiative, Cambridge, Boston*  
**Seminar**

Oct 2018 *MIT High Energy Group Meeting, Cambridge, Boston*  
**Seminar**

July 2018 *University of Hertfordshire, UK*  
**Seminar**

May 2018 *Institute for Cosmology & Gravitation, University of Portsmouth, UK*  
**Seminar**

Mar 2018 *Pontificia Universidad Católica, Santiago, Chile*  
**Seminar**

Apr 2018 *From Micrometres to Megaparsecs, University of Southampton, UK*  
**Contributed**

Oct 2017 *Bun Club Talk, Institute of Astronomy, University of Cambridge, UK*  
**Talk**

Sep 2017 *New Results in X-ray Astronomy & Athena Consortium Meeting, University of Durham, UK*  
**Contributed**

Sep 2017 *New Results in X-ray Astronomy & Athena Consortium Meeting, University of Durham, UK*  
**Poster**

Feb 2017 *Timing and Spectroscopy in the New Era of X-ray Astronomy, Royal Astronomical Society Specialist Discussion Meeting, Burlington House, UK*  
**Poster**

Nov 2016 *AstroGrav Seminar, University of Southampton, UK*  
**Seminar**

Nov 2016 *NuSTAR group, Caltech, USA*  
**Seminar**

Nov 2016 *HEX-P Concept & NuSTAR Science Meeting, Caltech, USA*  
**Poster**

Oct 2016 *David Gross Nobel Lecture, University of Southampton, UK*  
**Poster**

Sep 2016 *New Results in X-ray Astronomy, Mullard Space Science Laboratory, UK*  
**Contributed**

Feb 2016 *X-ray View of Black Hole Activity in the Local Universe, ETH, Zürich*  
**Contributed**

## Outreach

Mar 2019 *Three-Minute Thesis*, University of Southampton, UK  
**Outreach Talk**

Feb 2019 *Basingstoke Astronomy Society*, UK  
**Outreach Talk**

2016–present *> 20 University of Southampton Astrodome shows*, University of Southampton, UK  
**Planetarium Shows**

## Publication List

**17 Total, 184 Citations, h-index: 9**

1. *IC 3639 – A New Bona Fide Compton-Thick AGN Unveiled by NuSTAR*  
**Boorman, P.**, Gandhi, P., Harrison, F., Ricci, C., Stern, D. *et al.* 2016, ApJ, 833, 245.
2. *An Iwasawa-Taniguchi effect for Compton-thick AGN*  
**Boorman P.**, Gandhi P., Baloković M., Brightman M. *et al.* 2018, MNRAS, 477, 3775.
3. *NuSTAR Uncovers an Extremely Local Compton-thick AGN in NGC 4968*  
LaMassa, S., Yaqoob, T., **Boorman, P.** *et al.* 2019, ApJ, 887, 173.
4. *Chandra Reveals Heavy Obscuration and Circumnuclear Star Formation in Seyfert 2 Galaxy NGC 4968*  
LaMassa, S., Yaqoob, T., Levenson, N., **Boorman, P.** *et al.* 2017, ApJ, 835, 91.
5. *The NuSTAR Extragalactic Surveys: Source Catalog and the Compton-thick Fraction in the UDS Field*  
Masini, A., Civano, F., Comastri, A., Fornasini, F., Ballantyne, D. R., Lansbury, G., Treister, E., Alexander, D., **Boorman, P.** *et al.* 2018, ApJ, 235, 17.
6. *X-Ray Bolometric Corrections for Compton-thick AGN*  
Brightman, M., Baloković, M., Ballantyne, D., Bauer, F., **Boorman, P.** *et al.* 2017, ApJ, 844, 10.
7. *The weak Fe fluorescence line and long-term X-ray evolution of the Compton-thick active galactic nucleus in NGC 7674*  
Gandhi, P., Annuar, A., Lansbury, G., Stern, D., Alexander, D., Bauer, F., Bianchi, S., Boggs, S., **Boorman, P. G.** *et al.* 2017, MNRAS, 467, 4606.
8. *The X-Ray Reflection Spectrum of the Radio-loud Quasar 4C 74.26*  
Lohfink, A., Fabian, A., Ballantyne, D., Boggs, S., **Boorman, P.** *et al.* 2017, ApJ, 841, 80.
9. *Broad-band X-ray spectral analysis of the Seyfert 1 galaxy GRS 1734-292*  
Tortosa, A., Marinucci, A., Matt, G., Bianchi, S., La Franca, F., Ballantyne, D., **Boorman, P.** *et al.* 2017, MNRAS, 466, 4193.
10. *A New Compton-thick AGN in our Cosmic Backyard: Unveiling the Buried Nucleus in NGC 1448 with NuSTAR*  
Annuar, A., Alexander, D., Gandhi, P., Lansbury, G., Asmus, D., Ballantyne, D., Bauer, F., Boggs, S., **Boorman, P.** *et al.* 2017, ApJ, 836, 165.
11. *NuSTAR Observations of WISE J1036+0449, a Galaxy at  $z \sim 1$  Obscured by Hot Dust*  
Ricci, C., Assef, R., Stern, D., Nikutta, R., Alexander, D., Asmus, D., Ballantyne, D., Bauer, F., Blain, A., Boggs, S., **Boorman, P.** *et al.* 2017, ApJ, 835, 105.

12. *The Phoenix galaxy as seen by NuSTAR*  
Masini, A., Comastri, A., Puccetti, S., Baloković, M., Gandhi, P., Guainazzi, M., Bauer, F., Boggs, S., **Boorman, P.** et al. 2017, A&A, 597, 100.
13. *Unveiling the 100 pc scale nuclear radio structure of NGC 6217 with e-MERLIN and the VLA*  
Williams, D., McHardy, I., Baldi, R., Beswick, R., Argo, M., Beri, A., **Boorman, P.** et al. 2019, MNRAS, 486, 4962.
14. *Local AGN survey (LASr): I. Galaxy sample, infrared colour selection, and predictions for AGN within 100 Mpc*  
Asmus, D., Greenwell, C. L., Gandhi, P., **Boorman, P.** et al. 2020 MNRAS, 494, 1784.
15. *Multi-phase environment of Centaurus A galaxy*  
Borkar, A., Adhikari, T. P., Róžańska, A., Markowitz, A. G., **Boorman, P.** et al. 2020 arXiv:2006.01099.
16. *NuSTAR Observations of Four Nearby X-ray Faint AGN: Low Luminosity or Heavy Obscuration?*  
Annuar, A., Alexander, D. M., Gandhi, P., Lansbury, G. B., Asmus, D., Balokovic, M., Ballantyne, D. R., Bauer, F. E., **Boorman, P.** et al. 2020 MNRAS, 497, 229.
17. *NuSTAR Survey of Obscured Swift/BAT-selected Active Galactic Nuclei: II. Median High-energy Cutoff in Seyfert II Hard X-ray Spectra*  
Baloković, M., Harrison, F. A., Madejski, G., Comastri, A., Ricci, C., Annuar, A., Ballantyne, D. R., **Boorman, P.** et al. 2020 MNRAS, 497, 229.