

Jean-Paul BREUER

PERSONAL DATA

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POSITIONS

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| 2026 - present | Postdoctoral Researcher at School of Physics and Astronomy at Shanghai Jiao Tong University, China. Research group of Dr. Haiguang Xu |
| 2024 - 2026 | Assistant Professor at Department of Physics, the Graduate School of Advanced Science and Engineering at Hiroshima University, Japan. Research group of Dr. Yasushi Fukazawa |

EDUCATION

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| 2018 - 2024 | Doctor of Philosophy (Ph.D.) , HIGH ENERGY ASTROPHYSICS: “ <i>Spatially resolved X-ray spectroscopy of dynamically active clusters and constraints on intra-cluster medium physics</i> ” at Masaryk University, Czech Republic. Advisor: Dr. Norbert Werner
Observing Experience: APEX telcspe. (Chile - 2 Weeks); IRAM 30m telcspe. (Spain - 1 Week)
Awarded Grants: ESO Studentship (€24,000); IGA MU Grant (€25,000) |
| 2015 - 2017 | Master of Science in Engineering (MScEng) , EARTH AND SPACE PHYSICS AND ENGINEERING: “ <i>Distribution of the Gas Temperature in the Galaxy Cluster A2256</i> ” at Technical University of Denmark (DTU), Denmark; Advisor: Dr. Desiree Della Monica Ferreira
Study Line: SPACE RESEARCH – DATA PROCESSING IN ASTROPHYSICS |
| 2011 - 2015 | Bachelor of Science (BSc) in EARTH AND SPACE SCIENCES: “ <i>Mapping of Earth’s Bow Shock using Cluster Spacecraft Crossings</i> ” at Jacobs University Bremen, Germany; Advisor: Dr. Joachim Vogt |

FIRST AUTHOR PUBLICATIONS

Refereed:

- **J.-P. Breuer**, N. Werner, T. Plšek, F. Mernier, K. Umetsu, A. Simionescu, M. Devlin, L. Di Mascolo, T. Dibblee-Barkman, S. Dicker, B. S. Mason, T. Mroczkowski, C. Romero, C. L. Sarazin, J. Sievers. The thermodynamic structure and large-scale structure filament in MACS J0717.5+3745. *Astronomy and Astrophysics*. Volume 703, A231. November 2025. doi:10.1051/0004-6361/202452908.
- **J.-P. Breuer**, N. Werner, F. Mernier, T. Mroczkowski, A. Simionescu, T.E. Clarke, J.A. Zuhone and Mascolo L. Di. The mergers in Abell 2256: displaced gas and its connection to the radio-emitting plasma. *Monthly Notices of the Royal Astronomical Society*. MALDEN: WILEY, 2020, vol. 495, No 4, p. 5014-5026. ISSN 0035-8711. doi:10.1093/mnras/staa1492.

Proceedings:¹

- **Breuer, J.-P.***, Yokota, M.*, et al. 2026. Instrument response generation using high-resolution 3D voxelization of GRBAAlpha and VZLUSAT-2 satellites with MEGALib. *Space Telescopes and Instrumentation 2026: Ultraviolet to Gamma Ray*, 14146, 1414651. doi:10.1117/12.3102333
- **Breuer, J.-P.***, Galgóczi, G.*, et al. 2022. Athena charged particle diverter simulations: effects of micro-roughness on proton scattering using Geant4. *Space Telescopes and Instrumentation 2022: Ultraviolet to Gamma Ray*, 12181, 1218143. doi:10.1117/12.2630076
- Galgóczi, G.*, **Breuer, J.-P.***, et al. 2022. Geant4 simulation of the residual background in the ATHENA wide field imager from protons deflected by the charged particle diverter. *Space Telescopes and Instrumentation 2022: Ultraviolet to Gamma Ray*, 12181, 1218140. doi:10.1117/12.2629994

In prep:

- *in prep.* **Breuer, J.-P.**, et al. An X-ray derived view of the thermodynamic structure of the galactic center.

¹* indicates shared first authorship.

WORK EXPERIENCE

OCT 2015 - JUL 2017 Copenhagen, Denmark	Student Assistant at DTU Space and National Space Institute • Prepared code and magnetometer data for participants in the International Space Science Institute (ISSI) workshop on Field-Aligned Currents. • Created a database of Interplanetary Coronal Mass Ejections using both the Richardson and Cane database and NASA's Space Weather Database Of Notifications, Knowledge, Information (DONKI). • Generated daily orbit files containing magnetometer data for SWARM satellites; built a real time STEREO A Beacon data aggregation tool for ESA related space weather forecasting.
JUN 2016 - SEP 2016 Greenbelt, USA	Visiting Researcher at NASA Goddard Spaceflight Center; HELIOPHYSICS AND SPACE WEATHER, COMMUNITY COORDINATED MODELING CENTER • Processed and analyzed satellite data regarding the effects of geomagnetic storms, radiation belt enhancement events, and ionizing doses over various shielding thicknesses • Obtained neutron and magnetometer data for an analysis of correlation regarding single event upsets on ground based data centers
JUN 2014 - SEP 2014 Munich, Germany	Visiting Researcher at Max Planck Institut für Astrophysik Excellence Cluster Universe • Acquired a basic understanding of the current research areas of gravitational lensing and the cosmic microwave background radiation (CMB) through literature study and discussions with experts. Became familiar with basic numerical simulations and data analysis techniques in astrophysics (in particular regarding gravitational lensing and CMB). • Developed, implemented, and tested a python software module for simulating and analyzing observations of gravitational lensing of the CMB in the flat-sky approximation using Information Field Theory, resulting in cheaper, higher-resolution CMB lensing.

OTHER PROJECTS

OCT 2015 -FEB 2019 Copenhagen, Denmark	Founder of CopenHacks at Microsoft Development Center Copenhagen • Founded and organized an international student hackathon in Denmark for several hundreds participants from more than 30 nationalities that took place in the Microsoft Development Center in Copenhagen; securing 100,000+ Danish Kroner (€13,000) from sponsors and supporters such as Microsoft, Bloomberg, and Major League Hacking. • Responsibility acquired by Microsoft on February 18th, 2019.
OCT 2026 - <i>present</i> Rio de Janeiro, Brazil	Founder of Celephais Laboratories • Founded an independent software development company providing custom software and consulting services.

SKILLS & EXPERTISE

Operating Systems: Linux, macOS (*Proficient*); Windows (*Working Knowledge*)

Software Packages, Modeling, and Mapping Platforms: Matlab, CIAO, XMM/SAS/ESAS, HEAsoft/FTOOLS, XSPEC/Sherpa, Blender, GIMP (*Proficient*); IDL, R, Unity3D, ArcGIS/KML, GMT/ ISIS (*Working Knowledge*)

Typesetting, Scripting, and Frameworks: Bash, LaTeX, Python, Javascript, HTML/CSS (*Proficient*); MEGALib/Geant4, C++/C#, (*Working Knowledge*); Angular.JS/Node.JS, Java/XML, SwiftUI/React Native (*Basic Skills*)

Languages: English, Portuguese (*Native*); Spanish, Chinese [HSK3] (*Conversational*); German [B1], Klingon, Japanese [JLPT4] (*Limited*); Czech (*Basic*)