

Tomáš Plšek

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Scientific Education

since 2021	PhD: <i>Studying the physics of hot galactic atmospheres</i> (to be defended in May 2026), Department of Theoretical Physics and Astrophysics, Masaryk University, Brno, CZ
2019 – 2021	MSc: <i>The relation between Bondi accretion rate and jet power in giant elliptical galaxies</i> , Department of Theoretical Physics and Astrophysics, Masaryk University, Brno, CZ
2016 – 2019	BSc: <i>Dark matter modelling of galaxy clusters</i> , Department of Theoretical Physics and Astrophysics, Masaryk University, Brno, CZ

Work Experience

since 2021	Researcher at Department of Theoretical Physics and Astrophysics, Masaryk University, Brno, CZ
2019 – 2020	Researcher at Department of Physical Electronics, Masaryk University, Brno, CZ
2017 – 2018	Astronomical Demonstrator at Vyškov Observatory, CZ

Honors & Awards

2022 | **Dean's Award 2022**, Faculty of Science, Masaryk University, Brno

Supervision & Co-supervision

since 2025	Consultant: <i>ML-powered detection of accretion shocks in IllustrisTNG simulation</i> , Master's thesis by Barbora Miklošová, Masaryk University, Brno
since 2024	Consultant: <i>Search for galaxy clusters in XMM data of the Euclid Fornax Deep Field</i> , Master's thesis by Martin Kolář, Masaryk University, Brno
2025	Supervisor: <i>Probing the radio-mechanical AGN feedback using multi-cavity systems</i> , Bachelor's thesis by Barbora Miklošová, Masaryk University, Brno
2024	Consultant: <i>X-ray spectroscopy of the cosmic web</i> , Bachelor's thesis by Martin Kolář, Masaryk University, Brno
2023	Consultant: <i>Machine learning enhanced search for transient events in light curves</i> , Master's thesis by Bc. Martin Chobola, Masaryk University, Brno
2023	Consultant: <i>Studying the brightest galaxies in the epoch of reionisation</i> , Master's thesis by Klaudia Protušová, Masaryk University, Brno
2023	Consultant: <i>Studying the heating/cooling balance in galaxy clusters with the Athena X-ray observatory</i> , Master's thesis by Eva Bařková, Masaryk University, Brno

Teaching & Scientific Outreach

2024 – 2025	Astronomical camp group leader (<i>Astronomická expedice</i>)
Jan 26 2022	Guest speaker: 'Talks about Cosmos' (<i>Rozhovory o Vesmíru</i>)
2023 – 2026	Teaching assistance: F4500 Python for Physicists @MUNI
2024 – 2026	Teaching assistance: F6550 Structure and Evolution of the Universe @MUNI
2022 – 2024	Teaching assistance: F9888 High Energy Astrophysics @MUNI
2021 – 2024	Teaching assistance: F5611 Introduction to Machine Learning for Astronomers @MUNI

Selected Conference Talks

Jun 27 2025	Conference: <i>Cavity Detection Tool (CADET)</i> , EAS 2025, Cork, Ireland
Jun 25 2025	Conference: <i>The Abundance Drop in the Core of the Centaurus cluster</i> , EAS 2025, Cork, Ireland
Oct 16 2024	Seminar: <i>Cavity Detection Tool, Virtual Astronomy Software Talks (VAST)</i>
Sep 19 2024	Conference: <i>Studying radio-mechanical AGN feedback with X-ray cavities</i> , GALCROSS, Brno, Czech Republic
Jun 4 2024	Conference: <i>Studying radio-mechanical AGN feedback with X-ray cavities</i> , Galactic Nuclei in the Cosmological Context, University of Szczecin, Poland
Jul 11 2023	Seminar: <i>Cavity Detection Tool (CADET)</i> , seminar of XOC group, Stanford University, USA
Jul 11 2023	Seminar: <i>The relation between accretion rate, black hole mass, and jet power in massive early-type galaxies</i> , KIPAC Tea Talk, Stanford University, USA
Jul 2 2023	Workshop: <i>Cavity Detection Tool (CADET)</i> , High Resolution X-ray Spectroscopy Workshop, MIT, Cambridge, USA
Mar 25 2023	Workshop: <i>Cavity Detection Tool (CADET)</i> , AHEAD2020 High Resolution X-ray Spectroscopy School, Alicante, Spain
Nov 22 2022	Seminar: <i>The relation between accretion rate, black hole mass, and jet power in massive early-type galaxies</i> , Institute of Physics, Silesian University, Opava, Czech Republic
Aug 15 2022	Workshop: <i>Cavity Detection Tool</i> , 6th ICM Theory and Computation Workshop, Niels Bohr Institute, Copenhagen, Denmark
Jun 3 2022	Conference: <i>Relation between accretion rate and jet power in early-type galaxies</i> , Cologne-Prague-Brno meeting, Brno, Czech Republic

Conference organization

Aug 20-24 2026	LOC: 8th ICM Theory and Computation Workshop, Brno, Czech Republic
May 18-22 2026	LOC: IAU Symposium: Traversing the Galactic Center in Space and Time, Brno, Czech Republic
Sep 16-20 2024	LOC: Galaxies at Crossroads: Outflows and IMF in the VLT/ELT/ALMA/JWST Era, Brno, Czech Republic
Sep 6-8 2022	LOC: Monitoring the High-Energy Sky with Small Satellites, Brno, Czech Republic
Jun 1-3 2022	LOC: Cologne Prague Brno meeting, Brno, Czech Republic

Involvement in the scientific community

- **Member of the XRISM Collaboration**

I am an external member of the Centaurus target team. I am involved in several XRISM Collaboration published or submitted publications, which utilise PV+GO Resolve observations of the core of the Centaurus cluster, where I was responsible for the complementary analysis of *Chandra* data.

I have actively participated in XRISM Science Team meetings (March 2024 Tokyo, Sep 2024 Tokyo, Feb 2025 Phoenix, Jul 2025 Leiden).

- **Member of the Athena collaboration**

I am involved in testing the capabilities of the *NewAthena/XIFU* detector for spatially mapping the cold gas and the heating/cooling balance of hot intracluster medium (ICM).

Programming & Software Skills

- **Python:** Anaconda, Matplotlib, Numpy, Scipy, Astropy, Pandas, Jupyter
- **Machine learning:** Scikit-learn, Keras, Tensorflow, JAX
- **Bayesian analysis:** PyMC3, UltraNest
- **X-ray data analysis:** CIAO, HEASoft, SAOImageDS9
- **X-ray spectral fitting:** Xspec, SPEX, Sherpa, BXA
- **X-ray simulators:** PyXsim, SOXS, SIXTE, MARX
- **Cosmological simulations:** Gadget-2, IllustrisTNG data
- **Linux:** Bash scripting, SSH, git
- **Text & Web:** \LaTeX , Markdown, HTML