

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
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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 Baťková, Masaryk University, Brno

Teaching & Scientific Outreach

- 2024–2025 | **Astronomical camp group leader** (Astronomická expedice)
- Jan 26 2022 | **Guest speaker:** 'Talks about Cosmos' (Rozhovory o Vesmíru)
- 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:** *Cavity Detection Tool (CADET)*, EAS 2025, Cork, Ireland
- Jun 25 2025 | **Conference:** *The Abundance Drop in the Core of the Centaurus cluster*, EAS 2025, Cork, Ireland
- Oct 16 2024 | **Seminar:** *Cavity Detection Tool, Virtual Astronomy Software Talks (VAST)*
- Sep 19 2024 | **Conference:** *Studying radio-mechanical AGN feedback with X-ray cavities*, GALCROSS, Brno, Czech Republic
- Jun 4 2024 | **Conference:** *Studying radio-mechanical AGN feedback with X-ray cavities, Galactic Nuclei in the Cosmological Context*, University of Szczecin, Poland
- Jul 11 2023 | **Seminar:** *Cavity Detection Tool (CADET)*, seminar of XOC group, Stanford University, USA
- Jul 11 2023 | **Seminar:** *The relation between accretion rate, black hole mass, and jet power in massive early-type galaxies*, KIPAC Tea Talk, Stanford University, USA
- Jul 2 2023 | **Workshop:** *Cavity Detection Tool (CADET)*, High Resolution X-ray Spectroscopy Workshop, MIT, Cambridge, USA
- Mar 25 2023 | **Workshop:** *Cavity Detection Tool (CADET)*, AHEAD2020 High Resolution X-ray Spectroscopy School, Alicante, Spain
- Nov 22 2022 | **Seminar:** *The relation between accretion rate, black hole mass, and jet power in massive early-type galaxies*, Institute of Physics, Silesian University, Opava, Czech Republic
- Aug 15 2022 | **Workshop:** *Cavity Detection Tool*, 6th ICM Theory and Computation Workshop, Niels Bohr Institute, Copenhagen, Denmark
- Jun 3 2022 | **Conference:** *Relation between accretion rate and jet power in early-type galaxies*, 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

Involve ment 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