

KRZYSZTOF KOTYSZ

SOFTWARE & INFRASTRUCTURE ENGINEER | PYTHON | LINUX | AUTOMATION

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PROFESSIONAL SUMMARY

Software and infrastructure engineer working across Python, Linux, distributed observatories, and scientific instrumentation. For BHTOM, coordinated observations across more than 100 telescopes and helped standardise and containerise automatic CCD reduction; during an on-site visit to Las Cumbres Observatory, integrated the complete processing pipeline with Prefect. Independently built the current ALPS public website and develops software for telescope operation and automation. Brings 8+ years of experience from systems where software must work reliably with remote hardware and scientifically validated data.

TECHNOLOGY STACK

Languages and frameworks: Python | Django | Flask | JavaScript | Fortran

Data and applications: InfluxDB | SQLite | NumPy | SciPy | pandas | Astropy | PySide6

Infrastructure and delivery: Linux | Docker | Docker Compose | Prefect | Nginx | Gunicorn | Git | GitHub Actions | VPN

Interfaces and systems: REST / JSON APIs | Web Workers | networking | CCD cameras | sensors | telescope control

EXPERIENCE

BHTOM Engineering Specialist and Contractor

Feb 2024 - Present

University of Warsaw - Astronomical Observatory

employment and project contracts through Dec 2026

- Operated BHTOM, a portal used to synchronise, supervise, and conduct observations across multiple observatories; was responsible for monitoring a worldwide network of more than 100 telescopes.
- Worked on unifying the automated CCD image-reduction system and packaging it in containers for distributed observatory deployments.
- During an on-site collaboration at Las Cumbres Observatory in Goleta, California (8-17 Feb 2025), integrated the complete existing BHTOM pipeline with Prefect and resolved integration details directly with the LCO team.

Assistant and Academic Teacher

2019-2020 | 2021-2022 | 2024-2025 | 2026

University of Wrocław - Institute of Astronomy

Employment periods: 1 Mar 2019-31 Jan 2020; 1 Nov 2021-28 Feb 2022; 8 Oct 2024-30 Nov 2025; 24 Feb-30 Sep 2026

- Authored software supporting observations with the 60-cm Cassegrain telescope and contributed to modernising the Białków Observatory; also works on automation and robotisation of its 32-cm telescope.
- Built analysis programs for heterogeneous photometric time series from space missions and ground-based observatories, including workflows for screening, Fourier analysis, and tracking variability.
- Operated and diagnosed professional instruments during 168 observing nights: 87 at Białków and 81 across four campaigns at remote observatories in Chile.
- Secured and delivered NCN PRELUDIUM-17 project 2019/33/N/ST9/01818, covering proposal preparation, data acquisition, analysis, documentation, and reporting.
- Taught mathematics, astronomy, statistics, Python, Fortran, and Linux and presented research through talks and posters at national and international conferences, translating specialist concepts for classroom and expert audiences.

EDUCATION

PhD in Astronomy (in progress)

2018 - Present

University of Wrocław

large-scale time-series and spectroscopic data analysis

MSc in Astronomy

2016 - 2018

University of Wrocław

satellite data correction and stellar variability analysis

BSc in Astronomy

2013 - 2016

University of Wrocław

precision astrometry using more than a decade of observations

PROJECTS

Distributed Observation and Workflow System - BHTOM

2024 - Present**Stack:** Python | Django | Docker | Prefect | Linux | REST APIs

- Supported a portal that synchronises observations performed by many observatories and supervised the operational state of more than 100 telescopes distributed worldwide.
- Worked on a uniform, containerised automatic CCD-reduction workflow; integrated the complete pipeline with Prefect during direct engineering work with LCO in California.

ALPS - Public Web and Measurement Infrastructure

2018 - Present**Stack:** JavaScript | InfluxDB | REST / JSON APIs | sensors | networking

- Independently designed and implemented the complete current ALPS public website: station map, live network status, SQM light-pollution measurements, environmental data, and project content.
- Contributes across the wider multi-site system connecting measurement stations in Poland, sensors, software, infrastructure, and data processing.

Observatory Software and Telescope Automation

Stack: Python | Linux | networking | CCD cameras | telescope control

- Writes custom tools that support observers using a 60-cm Cassegrain telescope and incorporates feedback gathered during 87 nights of operation at Białków.
- Contributes to automation and robotisation of a 32-cm telescope, joining control software, instrument testing, fault diagnosis, and data-quality checks.

Photometric Time-Series Analysis Software

Stack: Python | Fortran | NumPy | SciPy | pandas | Astropy | PySide6

- Built programs for heterogeneous data from space missions and ground-based observatories, covering data preparation, screening, Fourier analysis, and long-term variability tracking.
- At scale, screened more than 4,000 light curves and selected 90 objects for detailed study; prepared more than 70 spectra to complement photometric classification.

PORTFOLIO, PUBLICATIONS AND CONFERENCES

- Public GitHub portfolio presents selected projects with descriptions, documentation, and reviewable code samples across scientific software and technical tooling.
- Co-author of 13 peer-reviewed papers in journals including MNRAS, Astronomy & Astrophysics, The Astrophysical Journal, and Acta Astronomica, plus two proceedings.
- Conference and workshop locations, 2017-2021: Niepołomice, Poland (17-21 Sep 2017); Vienna, Austria (19-23 Aug 2019); Olsztyn, Poland (9-12 Sep 2019); Kraków, Poland (20-21 Sep 2019); Warsaw, Poland (20-22 Feb 2020); Sopot and Szczecin, Poland (13-17 Sep 2021); Łódź, Poland (24-25 Sep 2021).
- Conference and workshop locations, 2022-2025: Ballyconnell, Ireland (8-13 May 2022); Leuven, Belgium (11-15 Jul 2022); Busan, South Korea (2-11 Aug 2022); Salerno, Italy (15 Apr 2024); Naples, Italy (16-18 Apr 2024); Heraklion, Greece (23-27 Sep 2024 and 30 Sep-2 Oct 2024); Wrocław, Poland (2-5 Sep 2025); La Laguna, Spain (29 Sep-3 Oct 2025).

LANGUAGES

Polish: native | **English:** professional working proficiency; international technical collaboration and scientific writing**Spanish:** basic; semester course and simple travel situations