

Arif Solmaz, PhD

Assistant Professor — Exoplanet Science, Computational Astrophysics & Scientific ML

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Location: Istanbul, Turkey

PROFILE

Astronomer specializing in exoplanet transit photometry and timing analysis, with emphasis on characterizing systematic effects from stellar activity. I develop Bayesian and machine learning pipelines to extract precise transit parameters from TESS, JWST, and ground-based data, with particular focus on transit timing variations (TTVs) and starspot-induced biases. I contribute to international collaborations including the ExoClock Project and EXPLORE, coordinating multi-site observing campaigns across 50+ countries. I teach computational methods and programming at the undergraduate level and maintain reproducible, open-source research workflows.

EDUCATION

PhD in Physics Jan 2023
Çukurova University Adana, Turkey

- Dissertation: *Effects of Starspot Occultations on Exoplanet Transit Mid-time Measurements*
- Advisors: Prof. Dr. Aysun Akyüz & Prof. Dr. Özgür Baştürk (Ankara University)

MSc in Space Sciences and Technologies Oct 2010
Çanakkale Onsekiz Mart University Çanakkale, Turkey

- Thesis: *Extrasolar Planetary Systems: a status review*
- Advisor: Prof. Dr. Mehmet Emin Özel

BSc in Physics Jan 2008
Çanakkale Onsekiz Mart University Çanakkale, Turkey

- Advisor: Prof. Dr. Faruk Soyduğan

ACADEMIC APPOINTMENTS

Assistant Professor May 2024 – Present
İstanbul Health and Technology University (İSTÜN) Istanbul, Turkey
Department of Mechatronics Engineering, Faculty of Engineering & Natural Sciences. Teaching programming, data structures, and machine learning courses; leading research in exoplanet science and applied ML.

Lecturer Sep 2015 – Jun 2023
Çağ University, Faculty of Arts and Sciences Mersin, Turkey
Taught statistics, programming, and quantitative methods while completing PhD in parallel. Developed digital learning materials and supervised student projects.

Research Assistant Feb 2011 – Sep 2015
Çağ University, Faculty of Arts and Sciences Mersin, Turkey
Supported teaching and observational research activities; contributed to TÜBİTAK-funded meteor monitoring and stellar astrophysics programs.

SELECTED PUBLICATIONS

Complete list at arifsolmaz.github.io.

Peer-Reviewed Journal Articles:

- A high geometric albedo and small size for the Haumea cluster member (24835) 1995 SM55 determined from a stellar occultation and photometric observations
Astronomy & Astrophysics, 703, A147, 2025
- Testing the performance of cross-correlation techniques to search for molecular features in JWST NIRSpec G395H observations of transiting exoplanets
Monthly Notices of the Royal Astronomical Society, 543, 3456, 2025
- ExoClock Project IV: A homogeneous catalogue of 620 updated exoplanet ephemerides
The Astrophysical Journal Supplement Series, 283, 5, 2026 · 100+ authors
- ExoClock Project III: 450 New Exoplanet Ephemerides from Ground and Space Observations
The Astrophysical Journal Supplement Series, 265, 4, 2023 · 60+ authors
- Leke Örtümlerinin Ötegezegen Geçiş Ortası Zaman Ölçümlerine Etkisi
Turkish Journal of Astronomy and Astrophysics, 4, 147, 2023
- Physical properties of the trans-Neptunian object (38628) Huya from a multi-chord stellar occultation
Astronomy & Astrophysics, 664, A130, 2022
- BO Ari Light Curve Analysis using Ground-Based and TESS Data
New Astronomy, 86, 101571, 2021
- The First Light Curve Solutions and Period Study of BQ Ari
Astronomy Letters, 47, 402, 2021

Selected Conference Contributions:

- Artificial Intelligence in Planetary Science and Astronomy: Applications and Research Potential
EPSC-DPS Joint Meeting 2025 · Invited presentation
- Europlanet Machine Learning Working Group: a year of progress
EPSC-DPS Joint Meeting 2025

FUNDED PROJECTS

As Principal Investigator / Coordinator:

- **Geometric Modeling and Analysis of Exoplanet Transit Observations** — University Scientific Research Project. 2019–2020.
Bayesian parameter estimation from transit photometry; handling stellar activity systematics.
- **MILAGE: Technology Use in Mathematics Education** — EU Erasmus+ Programme. 2015–2018.
Coordinated multi-country partnership on digital tools in education.
- **Turkey Meteor Monitoring Systems and Network (Continuation)** — University Scientific Research Project. 2019–2020.
- **Light Pollution Measurement Studies** — University Scientific Research Project. 2019–2020.

As Team Member:

- **ML-Based Microscopic Wood Species Identification System** — TÜBİTAK-1002. *Ongoing*.
Deep learning models for automated classification from microscopic images.
- **Turkey Meteor Monitoring Systems and Network: National Impact Craters and Meteorites Database** — TÜBİTAK-1001. 2014–2017.
- **Multi-faceted Analyses of Binary and Multiple Star Systems** — TÜBİTAK-1010 EVRENA. 2010–2013.

SOFTWARE & TOOLS

- **TransitKit**: Python toolkit for exoplanet transit light curve analysis — Bayesian fitting, MCMC sampling, systematic detrending, publication-quality output
- **arXiv Monitor**: Automated daily aggregator for exoplanet literature with AI-generated summaries ([source](#))

TECHNICAL SKILLS

- **Programming**: Python, C, Bash; Git/GitHub; Linux environments
- **Scientific Stack**: NumPy, SciPy, Pandas, Matplotlib; Astropy, Photutils, Lightkurve
- **Statistics & ML**: Bayesian modeling, MCMC (emcee, PyMC), Gaussian processes (celerite); Scikit-learn, TensorFlow/Keras; CNNs, transfer learning
- **Other**: LaTeX, Jupyter; Turkish (native), English (advanced — YÖKDİL 87.5/100)

COLLABORATION & SERVICE

- **ExoClock Collaboration**: Ground-based observation coordination and ephemeris refinement; 100+ observers, 50+ countries; supporting ESA Ariel mission scheduling
- **EXPLORE Project**: International TTV observing campaign; contributing photometric data and analysis to the AAVSO Exoplanet Database pipeline
- **Europlanet ML Working Group**: Coordinating community efforts in AI/ML applications for planetary science
- **Multi-Site Stellar Occultation Campaigns**: Data analysis and coordination for physical characterization of trans-Neptunian objects
- **Peer Review**: Referee for international astronomy and planetary science journals

TEACHING

Current (2025–2026, İSTÜN): Computer Programming I & II, Object-Oriented Programming, Data Structures & Algorithms, Robotics, Machine Learning — all in English.

Previous (Çağ University): Statistics, Quantitative Methods, introductory–advanced Programming.

OUTREACH & LEADERSHIP

- **ESO Science Outreach Network**, Turkey Contact Point 2010–2022
- **Universe Awareness (UNAWA)**, Turkey Representative 2011–2015
- **BAP Coordinator**, Çağ University Research Projects Unit 2020–2021
- **Executive Board**, Çağ University Observatory (UZAYMER) 2012–2023
- Multiple TÜBİTAK-funded science communication projects 2018–2021

PROFESSIONAL MEMBERSHIPS

International Astronomical Union (IAU), European Astronomical Society (EAS), Turkish Astronomical Society (TAD), European Association for Astronomy Education (EAAE — Board Member).

Complete publication list, research code, and teaching materials at arifsolmaz.github.io. References available upon request.