Seyit Hökelek

Astrophysicist · Researcher · Data Scientist

Erciyes University, Department of Astronomy and Space Sciences, Kayseri, Türkiye

sthokelek@gmail.com · seyithokelek.github.io · ORCID: 0000-0002-2534-0584

Education

Ph.D. Candidate in Astronomy and Space Sciences **Sep. 2023 – Present**
Erciyes University *Kayseri, Türkiye*

- **Research Topic:** The Baldwin Effect in Quasars: Investigation of Processes and Mechanisms
- **Supervisor:** Assist. Prof. Dr. Nurten FİLİZ AK

M.Sc. in Astronomy and Space Sciences **Sep. 2020 – Jun. 2023**
Erciyes University *Kayseri, Türkiye*

- **Thesis:** Discovery of Active Galaxies
- **Supervisor:** Assist. Prof. Dr. Nurten FİLİZ AK

B.Sc. in Astronomy and Space Sciences **Sep. 2016 – Jun. 2020**
Erciyes University *Kayseri, Türkiye*

- **Thesis:** Orbital Mechanics of LEO Satellites
- **Supervisor:** Assoc. Prof. Dr. Hasan AK

Research Interests

- **Active Galactic Nuclei (AGN) & Quasars:** Variability, spectral analysis, redshift estimation.
- **Time-Domain Astronomy:** Quasar wind variability, transient events.
- **Photoionization Modeling:** Physical conditions of BAL regions.
- **Machine Learning:** Random Forest, SVR for parameter prediction.
- **Observational Cosmology:** High-luminosity quasar discovery.

Research Experience

M.Sc. Researcher **2020 – 2023**
Discovery of Six Low-z, High-Luminosity Quasars *Erciyes University*

- Utilized optical spectroscopy data from the RTT-150 telescope to confirm six previously unclassified sources.
- Measured emission lines (Hβ, [OIII], Hα) to estimate black hole masses and Eddington ratios.
- Confirmed classification as high-luminosity, low-redshift quasars. Published in *PASP*.

Observing Experience

Principal Investigator / Co-Investigator **2020 – Present**
RTT-150 Telescope (1.5m) *TÜBİTAK National Observatory*

- Completed over **80 nights** of fully remote observing.
- Performed optical long-slit and multi-object spectroscopy, as well as broad-band photometry, using **TFOSC** (TUG Faint Object Spectrograph and Camera).
- Carried out full spectroscopic and photometric data reduction: bias, dark, flat-fielding, cosmic-ray removal, wavelength and flux calibration.
- Executed spectral verification of quasar candidates and photometric analysis of imaging data.

PUBLICATIONS

Refereed Journal Articles

[1] **Hokelek, S.**, Kaçan, E. S., & Ak, N. F. (2024). "Discovery of Six Low-z, High-luminosity, and High-mass Quasars". *Publications of the Astronomical Society of the Pacific*, 136(11), 114101. [Link]

Refereed Conference Proceedings

[2] **Hökelek, S.**, Filiz Ak, N. (2022). "Quasars Discovered by RTT-150 TFOSC Spectral Observations". *TJAA*, 3(3), 6-9. [Link]

[3] Kaçan, E. S., **Hökelek, S.** & Filiz Ak, N. (2022). "Determining Redshift in Quasars: zFinder". *TJAA*, 3(3), 27-32. [Link]

[4] **Hökelek, S.**, Filiz Ak, N. (2023). "Quasar Wind Variabilty Prediction with Machine Learning Methods". *TJAA*, 4(3), 195-198. [Link]

[5] Filiz Ak, N., **Hökelek, S.**, Boztepe, T., et al. (2023). "AGN Studies of TUG-SRG Colloboration". *TJAA*. [Link]

[6] Utku, B., Filiz Ak, N., & **Hökelek, S.** (2025). "Modeling Blazar TEDs with Simple Regression". *TJAA*. [Link]

[7] Barbaros, E., **Hökelek, S.**, Ak, H., & Filiz Ak, N. (2025). "Bayesian Radial Velocity Solver: BRaVe". *TJAA*. [Link]

[8] **Hökelek, S.**, Kacan, E. S., & Filiz Ak, N. (2025). "Spectral Verification of 6 Low-z Quasars with RTT-150". *TJAA*. [Link]

SCIENTIFIC EVENTS & PRESENTATIONS

Talks & Conference Contributions

- **[Speaker]** "Spectral Verification of 6 Low-z Quasars with RTT-150"
  National Astronomy Congress (UAK-2024), Istanbul University, 2024.
- **[Contributor]** "Bayesian Radial Velocity Solver: BRaVe"
  National Astronomy Congress (UAK-2024), Istanbul University, 2024.
- **[Contributor]** "Modeling Blazar TEDs with Simple Regression"
  National Astronomy Congress (UAK-2024), Istanbul University, 2024.
- **[Speaker]** "Predicting Quasar Wind Variations with Machine Learning"
  National Astronomy Congress (UAK-2022), Ege University, 2022.
- **[Contributor]** "AGN Studies of TUG-SRG Collaboration"
  National Astronomy Congress (UAK-2022), Ege University, 2022.
- **[Speaker]** "Four Quasars Discovered by RTT150 Observations"
  4th Dilhan Eryurt Astronomy Day, METU (Online), 2021.
- **[Speaker]** "Four Quasars Discovered by RTT150 Observations"
  Current Graduate Studies in Astrophysics Workshop, Ege University (Online), 2021.
- **[Contributor]** "Determining Redshift in Quasars: zFinder"
  Current Graduate Studies in Astrophysics Workshop, Ege University (Online), 2021.

Advanced Schools & Training

- **High Energy Astrophysics Winter School (HEAP'26)** *Feb 2026*
  TÜBİTAK TBAE – Focused on high-energy processes and multi-messenger astronomy.
- **ZTF Summer School: AI in Astronomy** *Jul – Aug 2024*
  University of Minnesota – Hands-on training in AI and ML applications for time-domain astronomy.
- **Cosmology School** *Sep 2021*
  Istanbul Theoretical Physics Days (ITFG) – Comprehensive training on the Standard Cosmological Model,

dark matter dynamics, and large-scale structure perturbations.

- **ALÜP Graduate Summer School** *Sep 2021*
  ATASAM, Atatürk University – Hands-on training in photometric data reduction, calibration pipelines using IRAF, and Python-based analysis via Astropy.
- **ALİP Undergraduate Summer School** *Sep 2019*
  ATASAM, Atatürk University – Foundational training in infrared astronomy, adaptive optics (AO) operations, and hands-on photometric data reduction at the Eastern Anatolia Observatory (DAG).

Conferences & Workshops Attended

- Internal Structure and Evolution of Planets (GİYE) Workshop, *Ege University*, Nov 2023.
- Pulsating Components in Eclipsing Binaries (PEBS) Workshop, *Çanakkale Onsekiz Mart University*, Feb 2023.
- 19th Physics Week, *Istanbul Technical University (ITU)*, Nov 2022.
- Current Developments in Stellar Structure and Evolution Workshop, *Ege University Observatory*, Nov 2021.
- Multi-object Spectroscopy for Statistical Measures of Galaxy Evolution, *STScI*, May 2021.
- Crimean AGN Conference, *International*, Sep 2021.
- COSMO'21 Conference, *NCSA*, Aug 2021.
- AGN and Polarimetry Conference, *International*, Jan 2021.
- Eclipsing Binaries in Astrophysics Workshop, *Ege University Observatory*, May 2021.
- Nature of Accretion Disks Workshop, *Ege University Observatory*, Feb 2021.
- 18th Physics Week, *Istanbul Technical University (ITU)*, Oct 2021.
- 21st National Astronomy Congress (UAK-2018), *Erciyes University*, Sep 2018.

Professional Activities

Collaboration Member **2022 – 2024**
TUG-SRG AGN Collaboration *International*

- Active member of the joint Turkish-Russian AGN follow-up program using RTT-150 and SRG/eROSITA data.
- Contributing to target selection, optical spectroscopic follow-up, and physical parameter estimation.

Developer & Contributor
Open Source Astrophysics Software

- **EasyReduct:** Contributor to the RTT-150 data reduction and analysis pipeline.
- **BRaVe:** Bayesian Radial Velocity Solver for precise RV measurements.
- **zFinder:** Redshift estimation tool for quasar spectra.

Software & Technical Skills

- **Astrophysics Software:** IRAF, DS9, TOPCAT, AstroImageJ, XSPEC.
- **Programming:** Python (Astropy, SciPy, NumPy, Pandas, Matplotlib, Scikit-learn), MATLAB, Fortran, Bash.
- **AI & Machine Learning:** Deep Learning for Transients, Time-Domain AI Analytics (ZTF).
- **Development Tools:** Git, GitHub, LaTeX, Beamer, Linux/Unix Environment.
- **Observational Techniques:** Optical Spectroscopy (Long-slit), CCD Photometry, Data Reduction, Flux Calibration, Remote Observing Operations.

References

Assist. Prof. Dr. Nurten Filiz Ak
Erciyes University
Department of Astronomy and Space Sciences
nfilizak@gmail.com

Assist. Prof. Dr. Mustafa Kürşad Yıldız
Erciyes University
Department of Astronomy and Space Sciences
astro.yildiz@gmail.com