Eleni Koutsiona

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Primary Research Interests: Active Galactic Nuclei (AGN), galaxy evolution, high-redshift active galaxies, AGN feedback, Circumgalactic Medium (CGM), IFU spectroscopy.

Education

Heidelberg University | *Heidelberg, Germany* — **Oct 2024 – Expected 2027**

Master of Science in Physics (Astrophysics)

- **M.Sc. Thesis:** *Probing Dust, Gas, and Feedback in $z \sim 3$ Radio Galaxies through Lyα/Hα Mapping*
  Advisor: Prof. Dr. Dominika Wylezalek (Astronomisches Rechen-Institut / ZAH)
  Spatially resolved Lyα/Hα mapping with VLT/MUSE and JWST to constrain the escape of resonantly scattered Lyα photons, dust geometry, and multiphase gas distribution in high-z galaxies.

University of Crete | *Heraklion, Greece* — **Sept 2018 – June 2024**

Bachelor of Science in Physics

- **B.Sc. Thesis:** *Spatially Resolved Dust Attenuation in Luminous Infrared Galaxies*
  Advisor: Dr. Tanio Diaz-Santos (Institute of Astrophysics – FORTH)
  Utilized JWST near/mid-IR hydrogen recombination line observations to obtain spatially resolved maps of the dust attenuation towards star-forming regions in nearby luminous infrared galaxies.

Aarhus University | *Aarhus, Denmark* — **Feb 2021 – June 2021**

Erasmus+ Exchange | Department of Physics and Astronomy

Publications & Observing Time

Publications

- Kangas, T., et al. (including **E. Koutsiona**), *The enigmatic double-peaked stripped-envelope SN 2023aew*. **Astronomy & Astrophysics (A&A)**, 689, A182 (2024). [DOI: 10.1051/0004-6361/202449420]
  - Reduced optical spectra from the 3.8m Seimei Telescope (see section 2.2).
- Mandarakas, N., et al. (including **E. Koutsiona**), *Zero-polarization candidate regions for calibration of wide-field optical polarimeters*. **Astronomy & Astrophysics (A&A)**, 684, A132 (2024). [DOI: 10.1051/0004-6361/202348099]
  - Conducted wide-field optical polarimetric observing runs using the Skinakas 1.3m telescope.

Awarded Observing Time

- **NOEMA** | *The ISM conditions in the dominant star-forming population at $z \sim 1$–2* — **2025 – 2026**
  Programs **S26CD** (35.8 hrs) & **S25BV** (39.0 hrs) | **Co-I** (PI: Dr. U. Dudzeviciute)
  Contributed to target selection, derived spectroscopic redshifts and metallicity constraints, and contributed science justification figure.

Astronomical Circulars

- **Transient Name Server (TNS):** Contributed to spectroscopic classification of three optical transients using KOOLS-IFU on the Seimei 3.8m telescope: **SN 2023uta**, **SN 2023ucy**, and **SN 2024dop**.
- **Pan-STARRS (Supernova Hunters):** Co-identified optical transients **AT 2022ynb** and **AT 2022xwl** (credited in the Pan-STARRS discovery reports) — **Oct 2022**

Research Experience

European Space Agency (ESA / ESTEC) | *Noordwijk, Netherlands* — **Sep 2026 – Present**

Trainee | Supervisor: Dr. Bert Vander Meulen

- *Reverberation Mapping Simulations of AGN*: Performing radiative transfer simulations in 3D circumnuclear media and analysing the resulting delay curves to infer geometrical information on the AGN environment.

Max Planck Institute for Astronomy (MPIA) | *Heidelberg, Germany* — **April 2026 – July 2026**

Research Assistant (HIWI) | Supervisors: Dr. Eduardo Bañados, Dr. Silvia Belladitta

- Spectroscopic data reduction of archival LUCI observations from the Large Binocular Telescope (LBT), of high-redshift quasars using PypeIt.

Max Planck Institute for Astronomy (MPIA) | *Heidelberg, Germany* — **July 2024 – Aug 2024**

Intern | Supervisor: Dr. Ugne Dudzeviciute

- Measured rest-frame optical emission lines in dusty star-forming galaxies from VLT/KMOS and FORS2 data to determine redshifts, metallicities, and ionized gas kinematics, motivating the accepted NOEMA proposals.

Kyoto University / Okayama Observatory | *Kyoto & Okayama, Japan* **Oct 2023 – March 2024**

Intern (KyotoNova Group) | Supervisor: Prof. Keiichi Maeda

- On-site and remote optical spectroscopy and photometry of supernovae using the 3.8m Seimei Telescope; reduction of optical spectral time series for SN 2023rky.

Skinakas Observatory / IA–FORTH | *Crete, Greece* **May 2023 – Oct 2023**

Intern | Supported by National Strategic Reference Framework (NSRF)

- Executed 40+ nights of on-site observations (linear polarimetry, long-slit spectroscopy, multi-band optical photometry) using the 1.3m Ritchey-Chrétien telescope.

Talks & Presentations

- **Internal Seminar:** *Hydrogen Line Diagnostics: Gas, Dust, and Feedback in Extreme Galaxies with JWST and MUSE*, Breakfast Seminar, ESA-ESTEC **Sept 2026**
- **Internal Seminar:** *Kinematics and Spectroscopic Properties of High-z Dusty Galaxies*, Galaxies & Cosmology Dept. Seminar, MPIA Heidelberg **Aug 2024**
- **Working Group Seminar:** *Machine Learning Approaches for Supernova Classification*, Department of Astronomy, Kyoto University **Jan 2024**
- **Contributed Talk:** *Support Vector Machines: from Remote Sensing to Supernovae Classification*, Transient and Supernova Workshop, Kagoshima, Japan **Dec 2023**
- **Contributed Talk:** *Near- and Mid-Infrared Line Emission Analysis of Starburst Galaxy NGC 7469*, Theoretical Astronomy Workshop, Arima, Japan **Dec 2023**

Summer Schools & Workshops

Summer Schools

- **Junge Astronomische Gesellschaft (jAG) Meeting 2026**, Hamburg Observatory **June 2026**
- **WE-Heraeus & NARIT Cosmology School: Galaxies and Beyond**, Chiang Mai, Thailand **Oct 2025**
  Contributed Talk: Dust Attenuation and Spatially Resolved Properties of LIRGs
- **High-Redshift Transients with JWST**, Space Telescope Science Institute (STScI) **Aug 2025**
  Participation partially funded by ESA travel grant
- **EXCOSM Summer School: Large-scale structure of the Universe: from galaxies to cosmology**, Univ. of Tartu **July 2025**
- **Astrostatistics in Crete**, Univ. of Crete **June 2025**
- **Junge AG Meeting 2025**, Leibniz-Institut für Astrophysik Potsdam (AIP) **June 2025**

Workshops

- **Machine Learning in Astrophysical Studies (ML4Astro)**, MPIA, ZAH, IWR, & HITS **June 2026**
- **Julia in Research on Universe and Matter**, online attendance **Feb 2026**
- **GitHub and Advanced Python for Science**, Max Planck Institute for Astronomy **July 2024**
- **Machine Learning in Astrophysics**, University of Crete **July – Aug 2023**
- **Introduction to Data Analysis with Python**, Department of Physics, University of Crete **Oct 2022**

Instrumentation, Software & Technical Skills

- **Telescopes & Facilities:** 3.8m Seimei (KOOLS-IFU spectroscopy), 1.3m Skinakas (RoboPol/polarimetry, long-slit spectroscopy), archival JWST (NIRSpec/MIRI), VLT (MUSE, KMOS, FORS2), LBT (LUCI).
- **Astronomical Data Analysis:** Astropy, SKIRT, DS9, IRAF/PyRAF, PypeIt, QGIS.
- **Computing & Machine Learning:** Python (NumPy, SciPy, Pandas, PyTorch, Scikit-learn, TensorFlow, Xarray, Emcee), Bash, Git, HPC, CUDA, LaTeX.
- **Languages:** Greek (Native), English, German (Intermediate), Italian (Beginner).

Teaching & Outreach

- **Project Mentoring:** Assisting with supervision of B.Sc. student at Univ. of Crete **2025 – Present**
- **Seminar Instruction:** Organised and instructed biweekly online graduate seminar on radiative transfer in astrophysics under the supervision of Prof. Keiichi Maeda **June – Sept 2023**
- **Tutoring:** Peer tutor at Univ. of Crete for Physics I, Computational Physics, and ODEs **2019 – 2024**
- **Science Communication:** Content writer for online astronomy magazine Uni-mag **2023**
- **Public Outreach:** Board member of UoC Student Astronomy Club (meetings, public observing nights, podcast); led 1.3m telescope tours for Skinakas Observatory; science volunteer for ESA ESTEC Open Day **2018 – 2026**
- **Community Engagement:** Organised participating team for IAU NameExoWorlds (2022); Referee for FIRST LEGO League Robotics Competition (2023); Researchers' Night, World Space Week at IA–FORTH (2020–2024)