

Eleni Tsaprazi

POSTDOCTORAL RESEARCH ASSOCIATE · COSMOLOGY

Imperial College London, Imperial Centre for Inference and Cosmology (ICIC) Astrophysics group, Department of Physics,
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Research interests

Cosmology: large-scale structure, gravitational lensing, galaxy clustering, supernovae, peculiar velocities

Data analysis: Bayesian statistics, forward modelling, field-level inference, cosmological simulations

Employment

Oct 2023 - **Postdoctoral Research Associate**, Imperial College London

Education

Stockholm University

PHD PHYSICS

• Thesis: Physics-informed inferences of galaxy clustering, supervisor: Dr. Jens Jasche

Stockholm, Sweden

Sep 2019 - Sep 2023

Sorbonne University

MSc NUCLEI, PARTICLES, ASTROPARTICLES AND COSMOLOGY

• Thesis: The large-scale flow of galaxies: effects on cosmological data, supervisor: Dr. Roya Mohayaee
• Internship: Detection of X-rays of astrophysical origin, supervisor: Dr. Jean-Luc Sauvageot

Paris, France

Sep 2018 - Jun 2019

Aristotle University of Thessaloniki

BSc PHYSICS

• Thesis: Relativistic approach to the kinematics of large-scale peculiar velocities, supervisor: Prof. Christos Tsagas

Thessaloniki, Greece

Sep 2014 - Jun 2018

Publications

Lamman C., **Tsaprazi E.**, Shi J., Šarčević N., Pyne S., Legnani E., Ferreira T., The IA Guide: A Breakdown of Intrinsic Alignment Formalisms, *The Open Journal of Astrophysics*, vol. 7, id. 14, February 2024

Tsaprazi E., Nguyen N. M., Jasche J., Schmidt S., Lavaux G., Field-level inference of galaxy intrinsic alignment from the SDSS-III BOSS survey, *Journal of Cosmology and Astroparticle Physics*, vol. 2022, no. 8, August 2022

Tsaprazi E., Jasche J., Goobar A., Peiris H. V., Andreoni I., Coughlin M. W., Fremling C. U., Graham M. J., Kasliwal M., Kulkarni S. R., Mahabal A. A., Riddle R., Sollerman J., Tzanidakis A., The large-scale environment of thermonuclear and core-collapse supernovae, *Monthly Notices of the Royal Astronomical Society*, Volume 510, Issue 1, 366–372, February 2022

Tsaprazi E., Tsagas C. G., Relativistic approach to the kinematics of large-scale peculiar motions, *The European Physical Journal C*, 80, 757, August 2020

Preprints

Boonkongkird C., Lavaux G., Peirani S., Dubois Y., Porqueres N., **Tsaprazi E.**, Ly α -Net: A high-efficiency Lyman- α forest simulation with a neural network, 2023, arXiv: 2303.17939

Tsaprazi E., Jasche J., Lavaux G., Leclercq F., Higher-order statistics of the large-scale structure from photometric redshifts, 2023, arXiv: 2301.03581

Grants

2023. Travel grant, Balzan Cosmological Studies Program, University of Oxford, £2,000

- 2022.** Project grant, Royal Swedish Academy of Sciences, kr 20,000
- 2021.** Research stipend, Birger och Gurli Grundströms foundation, kr 5,000
- 2021.** Travel grant, Fonden för främjande av fysisk forskning, kr 5,000

Honours & awards

- 2024.** Elected Member, Astronomy Large Awards Sift Panel, UK Research and Innovation
- 2018.** Full MSc scholarship, Institut Lagrange de Paris

Invited talks

- 2024.** *Modern Cosmology: Opportunities & Challenges*, PHYSTAT: Statistics meets ML, UK
- 2024.** *Advancements in large-scale structure reconstructions in light of cosmological tensions*, Standard Cosmology at the threshold of change, Greece
- 2023.** *Physics-informed inferences of galaxy clustering*, Institut d' Astrophysique de Paris, France
- 2023.** *Physics-informed inferences of galaxy clustering*, LCDM meeting, The London Institute of Cosmology
- 2023.** *Field-level inferences of intrinsic alignment*, HoI-IA Workshop, Lorentz Center, Leiden University
- 2023.** *High-order statistics of photometric galaxy clustering*, BIPAC Journal Club, Oxford University (remote)
- 2023.** *High-order statistics of photometric galaxy clustering*, Photometric Redshifts Working Group, LSST DESC Collaboration (remote)
- 2023.** *High-order statistics of photometric galaxy clustering*, Additional GC Probes working group, Euclid Consortium (remote)
- 2022.** *Field-level analyses of galaxy surveys*, Advances in Cosmology through Numerical Simulations, MIAPbP, Germany (remote)
- 2022.** *Bayesian inference of intrinsic alignment in the large-scale structure*, ML for Simulations, Euclid Consortium (remote)
- 2022.** *Bayesian inference of intrinsic alignment in the large-scale structure*, Cosmology Seminar Series, MPIA (remote)
- 2021.** *Tracing the cosmic web with supernovae*, Cosmology Journal Club, University of Cambridge (remote)

Conference talks

- 2024.** *Field-level inferences of galaxy clustering*, Cosmo21 conference, Greece
- 2021.** *Supernova clustering in the large-scale structure*, LSST Dark Energy Science Collaboration Meeting
- 2021.** *Improving redshift accuracy through the large-scale structure*, 3rd ATh Alumni Workshop on Theoretical Physics
- 2017.** *The accelerating expansion of the Universe for observers in bulk flows*, Modern Physics at All Scales, Leiden University
- 2016.** *The deceleration parameter for observers in bulk flows*, The ISM-SPP Olympian School of Astrophysics, Greece

Teaching Experience

- 2024.** Lectures & tutorials: *Machine Learning classification*, postgraduate courses, Imperial College
- 2024.** Lecturer, *Bayesian inference in practice*, ICIC Data Analysis Workshop, Imperial College
- 2024.** Demonstrator on Bayesian inference methods, ICIC Data Analysis Workshop, Imperial College
- 2023.** *Open questions in Cosmology*, textbook author, Stockholm University
- 2015.** Electricity – Magnetism, Teaching assistant, Aristotle University of Thessaloniki
- 2014.** Informatics laboratory, Teaching assistant, Aristotle University of Thessaloniki

Mentoring

2022. Co-supervisor of MSc student Somaya Bakhsh, Searching for the ISW effect in large-scale structure surveys
Stockholm University

Technical skills

Programming: Python, C, C++, MATLAB, Fortran, SQL query

Scientific computing: Shell, HPC, OpenMP, MPI, N-body simulations, MCMC, Linux/Unix, Bayesian programming [PyMC, nested sampling (Dynesty, Ultranest)], Gibbs sampling, slice sampling, Hamiltonian Monte Carlo

Version control: Bitbucket, Github, Gitlab

Website building: WordPress, MediaWiki, Indico

Languages: English, French, Greek

Leadership, Involvement & Outreach

LEADERSHIP

- 2024 **Lead of the Bayesian Pipelines Topical Team, Dark Energy Science Collaboration,** Statistical consultation and coding for Bayesian field-level cosmological inference projects, coordination with the Weak Lensing Working Group
- 2024 **Elected member of the Diversity Committee, Euclid Consortium,** Development of Diversity and Inclusion material for dissemination across the Science Working Groups, participation in panels to ensure fair and just representation, review of organisational documents
- 2024 **Postdoctoral Representative, Physics Department, Imperial College London,** Liaising between the postdoctoral community and the College, advocating for policy improvements
- 2023 **Elected PhD representative of the Incident Contact Unit, Aquila Consortium,** Organised a framework for the reporting of harassment incidents, contributed to the development of policies addressing misconduct and researcher well-being.

ORGANISATION

- 2024 **Co-organiser of the Soft-skills Roundtable,** Imperial College London
- 2024 **Co-organiser of the Astrophysics seminars,** Imperial College London
- 2023 **Chair of plenary session, February Collaboration Meeting,** LSST DESC
- 2022 **Co-author of the Aquila Consortium Code of Conduct,** Aquila Consortium
- 2022 **Co-organiser of the Aquila Consortium fall meeting,** Aquila Consortium
- 2021 **Co-organiser of the Cosmology & Gravitation meetings,** Stockholm University
- 2020 **Co-organiser of the Supernova & Cosmology meetings,** Stockholm University

OUTREACH

Podcast & article series, Co-founder, The Scientia Publica project, [scientia .publica .gr](http://scientia publica .gr)
Research vlog series, tsaprazi .eu/research/
Science philosophy blog, <https://textsfromspace.wordpress.com>
Scientific content translator, NASA HiRISE mission, <https://www.uahirise.org/gr/>

TRAINING

Active bystander, Challenging poor behaviours and bringing cultural change

*Imperial
College
London*

SCIENTIFIC MEMBERSHIPS

Euclid Consortium, Galaxy Clusters Working Group

LSST Dark Energy Science Collaboration, Bayesian Pipelines Topical Team

Aquila Consortium, Field-level inferences of galaxy clustering

Zwicky Transient Facility Collaboration, Supernovae in the large-scale structure

LSST Informatics and Statistics Science Collaboration,

International Astronomical Union,

Fellow of the Royal Astronomical Society,