CURRICULUM VITAE

Charalambia Varnava

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Education

- 2024: Ph.D. in Computing/Computer Science, Department of Computer Science and Engineering, European University Cyprus

  Ph.D. Thesis: "A Bayesian method for fitting spectral energy distributions of galaxies with radiative transfer models"

  Supervisor: Prof. Andreas Efstathiou

  Research Group: Aristarchus Research Center

- 2015: M.Sc. in Applied Mathematics (ranked 1st), Department of Mathematics and Statistics, University of Cyprus

  Grade: Excellent (9.43/10)

  M.Sc. Thesis: "Robust exponential convergence in a balanced norm for an *hp* finite element method applied to fourth order singularly perturbed problems" (Thesis' Grade: Excellent)

  Supervisor: Prof. Christos Xenophontos

- 2013: B.Sc. in Mathematics, Department of Mathematics and Statistics, University of Cyprus

  Grade: Very good

Professional Experience

- May 2020 – *present*: Researcher, Aristarchus Research Center, Department of Computer Science and Engineering, European University Cyprus

- Academic years 2022 – 2024: Scientific Collaborator, Department of Computer Science and Engineering, European University Cyprus

Instructor for:

MAT115 Statistics I

AEF105 Business Statistics

AED105 Business Statistics (E-Learning)

- January 2019 – March 2020: Post-Graduate Researcher, In-Silico Modelling Group, Department of Mechanical and Manufacturing Engineering, University of Cyprus

Awards & Scholarships

- Full academic scholarship for the Ph.D. Program of Computing/Computer Science, granted by European University Cyprus (2020)
- Award of highest academic record during the Master's degree program in Applied Mathematics, granted by the Faculty of Pure and Applied Sciences of the University of Cyprus (2015)
- Sievert Larsson/Ancoria Excellence Award of highest academic record during the Master's degree program in Applied Mathematics, granted by the Department of Mathematics and Statistics of the University of Cyprus (2015)

Participation in Research Projects

- November 2022 – *present*: Further development of CYprus models for Galaxies and their NUclear Spectra (CYGNUS+), funded by the European Space Agency (ESA)
- May 2020 – August 2021: CYprus models for Galaxies and their NUclear Spectra (CYGNUS), funded by ESA
- January 2019 – March 2020: In-silico tumoroid growth, University of Cyprus internal research program

Software

SMART: **S**pectral energy distributions **M**arkov chain **A**nalysis with **R**adiative **T**ransfer models

doi: 10.1093/mnras/stae1141 https://www.ascl.net/2406.003

An open-source tool that implements a Bayesian Markov chain Monte Carlo (MCMC) method to fit the ultraviolet to millimetre spectral energy distributions (SEDs) of galaxies exclusively with radiative transfer models

Fields of Scientific Interest

Computational mathematics

MCMC model fitting

Bayesian inference

Differential equations

SED fitting

Finite element method

Memberships

Founding member of Women in Mathematical Sciences in Cyprus (WMSC)

Research Publications

- Efstathiou, A., Lonsdale, C. J. and Varnava, C., 2024. Constraints on the starburst and active galactic nucleus activity of heavily obscured quasars at redshifts z~0.3–3. *Monthly Notices of the Royal Astronomical Society*, in preparation
- Varnava, C. and Efstathiou, A., 2024. Constraints on the starburst and active galactic nucleus activity of local ultraluminous infrared galaxies from a broad range of torus models. *Monthly Notices of the Royal Astronomical Society*, in preparation
- Varnava, C. and Efstathiou, A., 2024. Exploring the properties of the obscured quasar COS-87259 at z=6.853. *Monthly Notices of the Royal Astronomical Society Letters*, in preparation
- Sykopetritou, I., Xenophontos, C. and Varnava, C., 2024. hp Finite Element Methods for singularly perturbed 4th order boundary value problems with two small parameters. *Mediterranean Journal of Mathematics*, under review
- Varnava, C. and Efstathiou, A., 2024. SMART: Spectral energy distribution (SED) fitter. *Astrophysics Source Code Library*, ascl:2406.003

- Varnava, C. and Efstathiou, A., 2024. SMART: Spectral energy distributions Markov chain Analysis with Radiative Transfer models. *Monthly Notices of the Royal Astronomical Society*, 531(2), pp. 2304–2329

- Xenophontos, C., Constantinou, P. and Varnava, C., 2017. An hp Finite Element Method for Fourth Order Singularly Perturbed Problems. *Lecture Notes in Computational Science and Engineering*, 119, pp. 681–692

- Constantinou, P., Varnava, C. and Xenophontos, C., 2016. An hp finite element method for 4th order singularly perturbed problems. *Numerical Algorithms*, 73(2), pp. 567–590

Invited Talks

- Portrait presentation. *1st WMSC Workshop: Portraits of Women in Mathematical Sciences in Cyprus, Nicosia, Cyprus, 2023*

- Uncovering obscured supermassive black holes at high redshift with a new MCMC SED fitting code. *Cyprus Astrophysics Workshop 2022: A close look at Luminous and Ultraluminous Infrared Galaxies, Nicosia/Paphos, Cyprus, 2022*

Conference Presentations & Proceedings

- Panayidou, K., Efstathiou, A., Varnava, C. and Skrekas, P., 2024. Machine learning pipeline for speeding up SED fitting with radiative transfer models. *COSMO 21: Statistical Challenges in 21st Century Cosmology, Chania, Greece*

- Varnava, C. and Efstathiou, A., 2023. SMART: A new MCMC code for SED fitting with radiative transfer models in the JWST era. *European Astronomical Society Annual Meeting 2023, Krakow, Poland*

- Varnava, C., 2023. SMART: A new MCMC code for studying galaxy evolution. *4th Pancyprian Conference in Statistics, Nicosia, Cyprus*

- Varnava, C., 2023. SMART: Spectral energy distributions Markov chain Analysis with Radiative Transfer models. *2nd Doctoral Colloquium of the Rectors' Conference of Cyprus Universities, Nicosia, Cyprus*

- Varnava, C., Efstathiou, A. and Lesta, V.P., 2022. Uncovering obscured supermassive black holes at high redshift with a new MCMC SED fitting code. *COSPAR 44th Scientific Assembly, Athens, Greece.*

- Varnava, C., Efstathiou, A. and Lesta, V.P., 2022. Bayesian SED fitting with radiative transfer models for studying galaxy evolution. *European Astronomical Society Annual Meeting 2022, Valencia, Spain (Poster)*

- Varnava, C., Efstathiou, A. and Lesta, V.P., 2022. Bayesian model fitting for studying galaxy evolution. *BNP 2022 Networking Workshop, Nicosia, Cyprus (Poster)*

- Varnava, C., Efstathiou, A. and Lesta, V.P., 2021. MCMC model fitting methods for studying galaxy evolution. *Conference on Multiscale Physical and Biological Systems, Paphos, Cyprus (Poster)*

- Efstathiou, A., Papadopoulou, V., Michos, I., Pavlou, O., Papaefthymiou, E., Varnava, C., Papadopoulos, M., 2020. How to discover supermassive black holes in galaxies. *European Researchers' Night 2020, Nicosia, Cyprus*

- Tzirakis, K., Varnava, C., Hadjicharalambous, M., Wijeratne, P., Vavourakis, V., 2019. A Quantitative In Silico Framework to Simulate Cytotoxic and Nanoparticle Cancer Drug Delivery. *25th Congress of the European Society of Biomechanics, Vienna, Austria (Poster)*

- Xenophontos, C., Constantinou, P., Varnava, C., 2016. An hp Finite Element Method for Fourth Order Singularly Perturbed Problems. *ICOSAHOM 2016, Rio de Janeiro, Brazil.*

- Xenophontos, C., Constantinou, P., Varnava, C., 2016. Robust exponential convergence of hp finite element method for 4 th order singularly perturbed problems. *13th Annual Workshop on Numerical Methods for Problems with Layer Phenomena, Moscow State University, Russia*

- Xenophontos, C., Constantinou, P., Varnava, C., 2015. An hp finite element method for 4 th order singularly perturbed problems. *12th Annual Workshop on Numerical Methods for Problems with Layer Phenomena, TU Dresden, Germany*

Further Skills

Language Skills:

- Greek: Native language
- English: Fluent

IT and Computer Skills:

- Operating Systems: Windows, Linux, Mac
- Programming Languages: Python, Matlab
- Communications: LaTeX and Microsoft Office