Tamara Evstafyeva

Email: te307@cam.ac.uk
Github: https://github.com/tamaraevst
ResearchGate: https://www.researchgate.net/profile/Tamara-Evstafyeva

About me

I am a third year PhD student at the University of Cambridge pursuing research in the General Relativity group at DAMTP. The focus of my work has been studying the phenomenology of binary black hole and boson star binaries through a prism of numerical simulations. My work also extends to certain modified theories of gravity and test of general relativity using Bayesian inference. I enjoy working in interdisciplinary fields combining mathematics, theoretical physics and data science.

Education

- **University of Cambridge** — Cambrige, UK
  PhD in Applied Mathematics and Theoretical Physics — *2020 - present*
- **University College London, UCL** — London, UK
  MSci in Mathematics; 1st class — *2016 - 2020*
  Main courses: *General Relativity, Cosmology, Differential Geometry, Numerical Analysis, Fluid Dynamics*
- **Mander Portman Woodward College** — London, UK
  A-levels; (AAA) — *2015-2016*
- **XXI Century Integration International School** — Moscow, Russia
  Bilingual IB Diploma; (42 points) — *2013-2015*

Skills Summary

- **Coding**: Python, C, C++, Bash, Mathematica, MATLAB
- **Languages**: English, Russian, French

Professional associations

- **GRChombo numerical relativity code member**: implementation of EsGB/dCS theories of gravity using an order reduction scheme and initial data construction for unequal-mass boson stars
- **LIGO/Virgo member**: participation in Testing General Relativity (TGR) group
- **Einstein Telescope member**: general member

Publications

- **Unequal-mass boson-star binaries. Initial data and merger dynamics**: T. Evstafyeva, U. Sperhake, and et.al., 2022, 10.48550/arXiv.2212.08023
- **Measuring the ringdown scalar polarization of gravitational waves in Einstein scalar Gauss-Bonnet gravity**: T. Evstafyeva, M. Agathos, J. Ripley, 10.48550/arXiv.2212.11359
- **The gravitational afterglow of boson stars**: R.Croft, T.Helfer, B. Ge, M. Radia, T. Evstafyeva, E. A. Lim, U. Sperhake, K. Clough, 2022, 10.48550/arxiv.2207.05690

Ongoing projects

- **Boson star waveforms for tests of General Relativity**: production of high resolution quasi-circular boson star waveforms for LIGO/Virgo analysis.
- **Boson stars in scalar-tensor theory**: Implementation of boson star solver in scalar-tensor theory of Damour and Esposito-Farese. Study of the solution properties and exploration of the parameter space.

Conference Talks and Outreach

- **Frontiers in Numerical Relativity (Jena)**: "Unequal-mass boson-star binaries. Initial data and merger dynamics", (2022).
- **GRChombo annual meeting**: "Visualisation with ParaView": tutorial on visualisation using ParaView, (2022).
- **GRChombo annual meeting**: "Binary black hole ringdown in Einstein-scalar-Gauss Bonnet (EsGB) gravity", (2022).
- **Diversity at DAMTP**: presentation of my research to undergraduate students, (2022).
- **HE Plus lecture on black holes**: lecture on black holes to high school students, (2020).

Teaching and Depatmental Activities

- Supervision of Part II Electrodynamics, (2020 - 2022).
- Supervision of Part II General Relativity, (2020 - present).
- Organiser of Numerical Relativity group meetings at DAMTP, (2021 - present).
- IB Mathematics Higher Level tutor at Westminster Academy, (2019).
- Mathematics tutor at JK Educate, (2018-2020).
- Teach First Insight internship participant: offered a graduate job (2018).