STEFAN TRKLJA COUNTRYMAN

Physics Ph.D. Candidate at Columbia University working in Gravitational Wave (GW) Multi-messenger Astrophysics (MMA)

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EXPERIENCE

Physics Ph.D. Student/Graduate Research Assistant

Columbia University

September 2014 – Present | New York, NY

- Designed and coded world's first online search for neutrinos from GW sources, LLAMA (`http://multimessenger.science`)
  - Best-in-class framework for generalized statistical analysis of heterogeneous observational data streams
  - Fastest GW MMA search pipeline since introduction in 2016
  - Added Bayesian statistical method upgrade for 2019/LIGO O3
  - Includes world's first high-performance multi-resolution HEALPix vector math library for incorporation of spatial priors in MMA searches
  - The most feature-rich, extensible, performant, reliable, and mature MMA software library in existence, with interfaces to all major MMA infrastructure and over 300 pages of rich documentation
- Maintained LIGO's timing system, developed and installed systems and tools for its independent diagnostic system, and documented all of it
- Applied detector and software expertise to other group science goals
- 1,000s of hours of teaching and tutoring experience in math & physics

Science and Programming Outreach Consultant

World Science Festival

April 2015 – May 2016 | New York, NY

- Advised Chairman Prof. Brian Greene on outreach/education tech
- Transitioned World Science U to superior, open-source technology stack
- Designed & coded in-browser physics simulations (`kinematica.github.io`)

Founder

West End Coaching *and* skilld.co

Mid 2013 – Late 2014 | New York, NY

- Founded/operated highly-profitable tutoring company *West End Coaching*
- Founded on-demand marketplace `skilld.co` and tested MVP app

SELECTED PUBLICATIONS

Journal Articles

- Countryman, S. et al. (2019). "Low-Latency Algorithm for Multi-messenger Astrophysics (LLAMA) with Gravitational-Wave and High-Energy Neutrino Candidates". In: *arXiv e-prints*. arXiv: `1901.05486 [astro-ph.HE]`.
- Bartos, I. et al. (2018). "Bayesian Multi-Messenger Search Method for Common Sources of Gravitational Waves and High-Energy Neutrinos". In: *arXiv e-prints*. arXiv: `1810.11467 [astro-ph.HE]`.

HONORS & AWARDS

Special Breakthrough Prize in Fundamental Physics
For contributions to LIGO's Nobel-prize-winning first detection of gravitational waves, GW150914

Gruber Cosmology Prize
Also for GW150914

TECHNICAL SKILLS

High-performance computing | Python | UNIX | Bash | Docker | PostgreSQL | Statistics | Git | MATLAB | Julia | C | Writing | DevOps | JavaScript | FPGA | Electronics | HTML | CSS | Adobe CC

LANGUAGES

English
Bosnian/Serbian/Croatian
French
Italian

EDUCATION

Ph.D. in Physics *(in-progress)*

Columbia University

September 2014 – August 2019

M.Sc. and M.Phil. in Physics

Columbia University

September 2014 – May 2017

B.Sc. in Applied Mathematics

Columbia University

September 2009 – October 2013

with English minor