

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 Statistics MATLAB
Julia C Writing DevOps JavaScript
FPGA Electronics 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