John D. Soltis

Johns Hopkins University - Department of Physics & Astronomy
Bloomberg Center for Physics and Astronomy
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EDUCATION:

Johns Hopkins University 2019 - Present Baltimore, MD
Krieger School of Arts & Sciences
M.A. in Physics
Ph.D in Astronomy and Astrophysics

University of Michigan 2014 - 2018 Ann Arbor, MI
Honors Program, College of Literature, Science, and the Arts
B.S. in Physics and Mathematical Physics

Brother Rice High School 2010 - 2014 Bloomfield Hills, MI
Salutatorian of Class of 2014

SKILLS:

General
Machine Learning, Hierarchical Bayesian Modeling, Data Analysis

Software Packages & Languages
Python, Pytorch, Tensorflow, Unix, LaTeX, MATLAB, Microsoft Excel, C++

RESEARCH PROJECTS & EMPLOYMENT:

Robustness of Cosmological Simulations 2023 - Present
Center for Computational Astrophysics, Flatiron Institute *Advisor: Lehman Garrison*
Investigating the robustness of dark matter halo mass accretion rates in cosmological simulations.

Deep Learning Applications in Galaxy Cluster Cosmology 2021 - Present
Johns Hopkins University & Space Telescope Science Institute *Advisor: Michelle Ntampaka*
Using convolutional neural networks to characterize galaxy cluster properties and improve observations.

Maryland Space Grant Observatory Fellow 2021 - 2022
Johns Hopkins University *Advisor: Matt Collinge*
Hosted open house events, trained perspective observers on the telescope, and helped run the MDSGC symposium.

Tip of Red Giant Branch Calibration 2019 - 2020
Johns Hopkins University & Space Telescope Science Institute *Advisor: Adam Riess*
Measured the Hubble constant using updated position data of Milky Way stars.

Machine Learning Applications in Wildfire Detection 2018 - 2019
Lawrence Berkeley National Laboratory *Advisor: Carl Pennypacker*
Used images from wildfire detection cameras in California and Nevada to train a convolutional neural network to detect wildfires early.

Testing Statistical Isotropy with Type Ia Supernovae 2017 - 2018
University of Michigan *Advisor: Dragan Huterer*
Implemented a novel and robust test of statistical isotropy in the Universe using type Ia supernovae residuals.

Learning Assistant in Introductory Physics 2018
University of Michigan *Advisors: Timothy McKay & Yuri Popov*
Answered students' questions in class and in office hours for the introductory physics course.

Simulation of Laser-Driven Plasma Instabilities 2015 - 2016
University of Michigan *Advisor: Matthew Trantham*
Simulated laser-driven plasma instabilities with a variety of experimental conditions. Results were used to improve experimental design.

Summer Scholar Internship Program 2015
Lawrence Livermore National Laboratory *Advisors: John Heebner & Jason Chou*
Improved the accuracy of laser waveform generation in order to aid experiments at the National Ignition Facility.

EXTRACURRICULARS:

Graduate Representative Organization 2021 - 2023
General Council Representative for the Physics & Astronomy Department

Public Forum Debate Judge 2020 - 2022
Judged for Michigan Interscholastic Forensics Association Public Forum League

Michigan Journal of International Affairs 2014 - 2016
Writer for the Asia Region

Brother Rice Debate Team 2010 - 2014
Varsity in Public Forum Debate

PUBLICATIONS & POSTERS:

J. Soltis, M. Ntampaka, J. Wu, J. ZuHone, A. Evrard, A. Farahi, M. Ho, D. Nagai. "A Machine Learning Approach to Enhancing eROSITA Observations", *The Astrophysical Journal*, 940, 1, 60 (2022)

J. Soltis, M. Ntampaka. "Predicting Follow-Up Observations of Galaxy Clusters Using Machine Learning", American Astronomical Society Meeting #240, id. 139.19. *Bulletin of the American Astronomical Society*, Vol. 54, No. 6 e-id 2022n6i139p19 (2022)

J. Soltis, S. Casertano, A. G. Riess. "The Parallax of Omega Centauri Measured from Gaia EDR3 and a Direct, Geometric Calibration of the Tip of the Red Giant Branch and the Hubble Constant", *The Astrophysical Journal*, 908, L5 (2021)

J. Soltis, A. Farahi, D. Huterer, C. M. Liberato. "Percent-Level Test of Isotropic Expansion Using Type Ia Supernovae", *Phys. Rev. Lett.*, 122, 091301 (2019)

M. Ho, **J. Soltis**, A. Farahi, D. Nagai, A. Evrard, M. Ntampaka. "Benchmarks and Explanations for Deep Learning Estimates of X-ray Galaxy Cluster Masses", *Monthly Notices of the Royal Astronomical Society*, 524, 3, 3289-3302, (2023)