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 - A.G.D. 05/2025, flexible Baltimore, MD
Krieger School of Arts & Sciences
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:

Deep Learning Applications in Galaxy Cluster Cosmology 2021 - Present
Johns Hopkins University & Space Telescope Science Institute *Advisor: Michelle Ntampaka*
Predicted high quality observations of galaxy clusters from shorter lower quality observations using a convolutional neural network (CNN). Currently investigating using group-equivariant CNN's to estimate key galaxy cluster properties from observations.

Maryland Space Grant Observatory Fellow 2021 - 2022
Johns Hopkins University *Advisor: Matt Collinge*
Managed the Maryland Space Grant Consortium (MDSGC) Observatory. 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 Institute *Advisors: Adam Riess & Stefano Casertano*
Calibrated the tip of the Red Giant Branch using Milky Way Globular Clusters and provided an estimate of the Hubble constant. Worked with hierarchical Bayesian models, Hamiltonian Monte Carlo, and kernel density estimation.

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.

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)

W.C. Wan, G. Malamud, A. Shimony, C.A. Di Stefano, M.R. Trantham, S.R. Klein, **J.D. Soltis**, D. Shvarts, R.P. Drake, C.C. Kuranz. "Impact of ablator thickness and laser drive duration on a platform for supersonic, shockwave-driven hydrodynamic instability experiments", *High Energy Density Physics*, 22, (2017)

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