# John D. Soltis

Johns Hopkins University - Department of Physics & Astronomy
Bloomberg Center for Physics and Astronomy
3400 N. Charles Street, Baltimore, MD 21218
https://orcid.org/0000-0002-0104-3593 | https://github.com/johnsoltis


## EDUCATION:

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

**Johns Hopkins University** 2019 - 2023 Baltimore, MD
Krieger School of Arts & Sciences
M.A. in Physics

**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**
Science Communication, 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
*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.

**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)