



Nathan Golovich

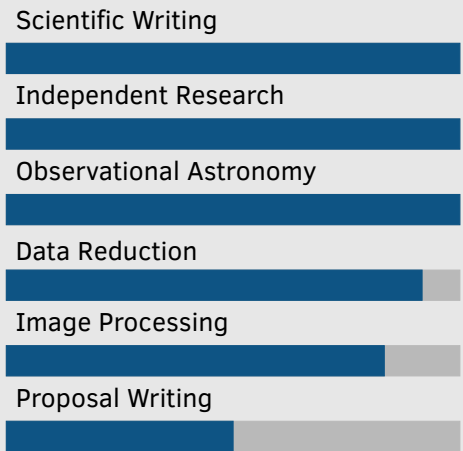
Physics Ph.D. Candidate

+1 2316750507
www.nathangolovich.com
nrgolovich@gmail.com

Research interests

I am an observational cosmologist who studies merging galaxy clusters in order to constrain understanding of dark matter, plasma physics, and galaxy evolution. These goals are achieved through multi-wavelength observations including optical photometry, spectroscopy, X-ray, and radio waves. I utilize these diverse observations to constrain the dynamical properties of merging galaxy clusters and to compare the distributions of dark matter and baryonic matter. I am also interested in observational and simulation synergy. Merging galaxy clusters are notoriously difficult to model; unifying observations with simulations and theory is essential to proceed with the stated science goals.

Skills



(*)[The skill scale is from Fundamental Awareness to Expert.]

Education

- Since 2012 Ph.D. candidate in Physics University of California, Davis
Probing Dark Matter and Plasma Physics in a Radio Selected Multi-Wavelength Survey of Merging Clusters of Galaxies. Expected graduation: September 2017
- 2008-2012 B.S.E. cum laude University of Michigan
Majoring in Engineering Physics, Emphasis in Nuclear Engineering

Experience

- 2011 Undergraduate Researcher Dept. of Mathematics, University of Michigan
Developed and studied a new predator-prey model with age related predation. Advised by Prof. Charles Doering as part of UM Math REU Program
- 2012-2014 Teaching Assistant Dept. of Physics, University of California, Davis
Led discussion and laboratory sections of undergraduate level introductory physics students. 500 hours of classroom time.
- 2013-2015 Private physics and mathematics tutor Davis, CA
Tutored high school and college students by assisting in understanding of concepts, completion of homework, and in preparation for exams including the MCAT, OAT, and GRE for a total of 300 hours experience.
- Since 2013 Graduate Researcher Dept. of Physics, University of California, Davis
Observed merging galaxy clusters with world class telescopic facilities. Analyzed large data sets with novel analysis routines. Presented research in academic journals, conferences, and seminars. Advised by Prof. David Wittman
- Summer 2017 Visiting Research Intern Lawrence Livermore National Laboratory
Will develop faint object detection software to enhance scientific value of astronomical images for high redshift galaxy studies.

Publications

- 2017 Nature Astronomy <https://arxiv.org/abs/1701.01439>
The Case for Electron Re-Acceleration at Galaxy Cluster Shocks: van Weeren, Andrade-Santos, Dawson, Golovich, Lal, et al.
- 2016 Astrophysical Journal <https://arxiv.org/abs/1608.01329>
Dynamical Analysis of the Merging Galaxy Cluster MACS J1149.5+2223: Golovich, Dawson, Wittman, Ogreaan, van Weeren, et al.
- 2016 Astrophysical Journal <https://arxiv.org/abs/1603.06010>
Deep Chandra Observations of the Complex Merger MACS J1149.6+2223: Ogreaan, van Weeren, Jones, Forman, Dawson, et al.
- 2015 MNRAS <https://arxiv.org/abs/1508.02901>
A Powerful Double Radio Relic System Discovered in PSZ1 G108.18-11.53: Evidence for a Shock with Non-Uniform Mach Number: de Gasperin, Intema, van Weeren, Dawson, Golovich, et al.
- 2015 Astrophysical Journal <https://arxiv.org/abs/1410.2893>
Galaxy Imaging and Redshift Analysis of the Merging Cluster CIZA J2242.8+5301: Dawson, Jee, Stroe, Ng, Golovich, et al.
- In press Astrophysical Journal Accepted March 13, 2017
Multi-Wavelength and Dynamical Analysis of the Merging Galaxy Cluster ZWCL 0008.8+5215: An Older and Less Massive Bullet Cluster: Golovich, van Weeren, Dawson, Jee, & Wittman
- In press Astrophysical Journal <https://arxiv.org/abs/1701.05877>
The Mis-measure of Mergers: Revised Limits on Self-interacting Dark Matter in Merging Galaxy Clusters: Wittman, Golovich, & Dawson



Nathan Golovich

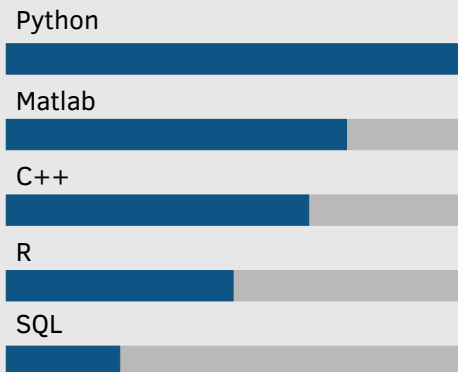
Physics Ph.D. Candidate

- +1 2316750507
- www.nathangolovich.com
- nrgolovich@gmail.com

About me

I grew up on a farm in Northern Michigan, which has instilled in me an appreciation for hard work and dedication. I am naturally curious with an approach to problem solving that has propelled me to the frontiers of astronomy, astrophysics, and data science. As an astronomer, I leverage my planning skills to observe the cosmos with the world's leading telescopic facilities. As a data scientist, I produce novel schemes to learn from data obtained through my observations. As an astrophysicist, I apply this information to constrain dark matter and plasma physics. I am interested in leveraging my research skills to broaden my scope and further my expertise in these disciplines. I enjoy a well rounded set of hobbies including, hiking, traveling, surfing, reading, and writing. I am currently studying modern Turkish at UC Berkeley.

Skills



(*)[The skill scale is from Fundamental Awareness to Expert.]

Observational Experience

- Keck:DEIMOS Eight Nights 2013B, 2014A, 2015A, 2015B semesters
Observation plan, target selection, slit mask design, observing, and data reduction
- Subaru:HSC One night 2015B semester
Observation plan, target selection, observing
- Subaru:SC Eight Nights 2013A, 2013B, 2014A, 2015A, 2015B semesters
Data reduction

Presentations

- 2017 Talk at Kavli Institute for Particle Astrophysics and Cosmology
- 2017 Talk at University of California, Berkeley Dept. of Astronomy
- 2017 Talk at University of California, Irvine Dept. of Physics and Astronomy
- 2015 Poster at SnowCluster - The Physics of Galaxy Clusters Conference

Accepted Proposals

- 2015 Keck DEIMOS / Subaru Hyper-Suprime-Cam Co-I
M3CPO: Merging Cluster Collaboration Chandra-Planck Observations
- 2015 Chandra X-ray Observatory Cycle 17 Co-I
Shock acceleration or re-acceleration?
- 2015 Gemini GMOS/ Subaru Suprime-Cam, 2015A Co-I
Two new radio relics
- 2015 National Science Foundation Co-I
Anatomy of a Merger: Understanding the Dynamics of Galaxy Cluster Mergers
- 2014 Keck DEIMOS / Subaru Suprime-Cam, 2014A Co-I
Merging Clusters as Dark Matter Colliders

Teaching

- Physics 7B Teaching Assistant UC Davis Physics Dept.
Led discussion and laboratory sections for undergraduate students in introductory (non-calculus based) physics including fluid dynamics, Newton's Laws, Conservation of Momentum.
- Physics 7C Teaching Assistant UC Davis Physics Dept.
Led discussion and laboratory sections for undergraduate students in introductory (non-calculus based) physics including optics, electricity and magnetism, and wave mechanics.
- Physics 9A Teaching Assistant UC Davis Physics Dept.
Led laboratory sections for undergraduate students in introductory (calculus based) classical mechanics.
- Physics 9B Teaching Assistant UC Davis Physics Dept.
Led laboratory sections for undergraduate students in introductory (calculus based) electricity and magnetism.
- Physics 110B Teaching Assistant UC Davis Physics Dept.
Led discussion and homework sessions and graded assignments for upper level undergraduate students in electricity and magnetism.
- Physics 152 Teaching Assistant UC Davis Physics Dept.
Assisted students with assignments and graded assignments and exams for upper level undergraduate students in galactic structure and the interstellar medium.

References

- +1 5307545354 Prof. David Wittman, thesis adviser, UC Davis
- +1 2146039277 Dr. William Dawson, Lawrence Livermore National Laboratory
- +1 5307526762 Prof. Marusa Bradac, UC Davis
- +82 221232684 Prof. James Jee, Yonsei University