

Darryl Seligman

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Research Interests

Astrophysical Fluid Dynamics, Magnetohydrodynamics, Dynamics, Interstellar Asteroids, Exoplanets, Stellar Structure, Neuroscience

Education

- 2017–Present **Ph.D. Candidate**, *Yale University*, New Haven, CT.
Astronomy, Advisor: Gregory Laughlin
- 2017 **M.Sc., M.Phil.**, *Yale University*, New Haven, CT.
Astronomy, Advisors: Gregory Laughlin, Priyamvada Natarajan
- 2015 **B.A.**, *University of Pennsylvania*, Philadelphia, PA.
B.A. Mathematics, B.A. Physics, Magna Cum Laude

Publications

Wang, S., Wu, D., Zhou, G., Barclay, T., **Seligman, D.**, Shporer, A., Liu, L., Huang, C., and Laughlin, G., "Updated Masses for the TRAPPIST-1 Planets" In Prep

Seligman, D., Laughlin, G. "The Feasibility and Benefits of In Situ Exploration of 'Oumuamua-like Objects." *AJ*,155,5

Seligman, D., Laughlin, G. "A Vorticity-preserving Hydrodynamical Scheme for Modeling Accretion Disk Flows." 2017, *ApJ*, 848, 54

Seligman, D., Petrie, G. J. D., Komm, R. "A Combined Study of Photospheric Magnetic and Current Helicities and Subsurface Kinetic Helicities of Solar Active Regions during 2006-2013." 2014, *ApJ*, 795, 113

Kim, B., **Seligman, D.**, Kable, J., "Preference Reversals in Risky Decision-making are Accompanied by Changes in Attention to Different Attributes." *Frontiers in Decision Neuroscience*, 2012.

Research Positions

- 2016 – **Yale University, Astronomy Department.**
- Present
- Stephen B. Butler Fellow
 - Gruber Fellow
 - Ph.D. Advisor: Professor Gregory Laughlin

- 2015 **Yale University, Astronomy Department.**
- First Year Project: Characterizing the Effects of Strong Gravitational Lensing on Luminosity Functions in the Hubble Frontier Fields
 - Advisor: Professor Priyamvada Natarajan
- 2014 – 2015 **University of Pennsylvania, Physics and Astronomy Department.**
- Honors Senior Thesis: "Integrated Image Subtraction and Source Detection: Optimizing the Dark Energy Survey Difference Image Analysis"
 - Advisors: Professor Masao Sako, Professor Gary Bernstein
- Summer 2013 **National Solar Observatory REU in Solar Physics, Tucson, AZ .**
- Recipient of NSF REU
 - Advisor: Dr. Gordon Petrie
- Spring 2012 – **University of Pennsylvania, Physics and Astronomy Department.**
- Fall 2012
- Recipient of CURF PURM Award for Observational Cosmology
 - Developed electronics for MUSTANG2, a receiver at the Green Bank Telescope
 - Advisor: Professor Mark Devlin
- Summer 2011 **University of Pennsylvania, Neuroscience Department.**
- Research Assistant
 - Conducted an eye-tracking study for preference reversals during decision-making
 - Advisor: Professor Joseph Kable

Invited Talks

- April 2018 "The Feasibility and Benefits of In Situ Exploration of 'Oumuamua-like Objects." University of Wisconsin, Milwaukee, Center for Gravitation, Cosmology and Astrophysics
- April 2018 "The Feasibility and Benefits of In Situ Exploration of 'Oumuamua-like Objects." Columbia University, Thursday Seminar
- August 2017 "A Vorticity-Preserving Hydrodynamical Scheme for Modeling Accretion Disk Flows." Cornell University, Astrophysics Lunch
- March 2017 "Nonlaminar Flow in Protostellar Disks." University of Florida, Florida Star and Planet Formation Days
- March 2017 "Vorticity-Preserving Hydrodynamical Simulations." University of Florida, AS-TROWIN Florida Astrophysics Winter Workshop

Scientific Presentations

- April 2018 "'Oumuamua" 2017 Gruber Symposium, Yale University, New Haven, CT (Oral)
- April 2018 "The Feasibility and Benefits of In Situ Exploration of 'Oumuamua-like Objects." American Astronomical Society, Division for Dynamical Astronomy, San Jose, CA. (Oral)
- November 2017 "A Vorticity-Preserving Hydrodynamical Scheme for Modeling Accretion Disk Flows." Habitable Worlds 2017: A System Science Workshop, Laramie, Wyoming (Poster)
- September 2017 "A Vorticity-Preserving Hydrodynamical Scheme for Modeling Accretion Disk Flows." NY Area Computational Hydro Workshop, Flatiron Institute, Center for Computational Astrophysics (Oral)

- June 2017 "A Compressible, Vorticity-Preserving Hydrodynamical Scheme for Modeling Accretion Disk Flows." Emerging Researchers in Exoplanet Science (ERES) III, Yale University, New Haven, CT (Oral)
- May 2017 "A Vorticity-Preserving Hydrodynamical Scheme for Modeling Protostellar Disk Flows." 2017 Gruber Symposium, Yale University, New Haven, CT (Oral)
- March 2017 "A Vorticity-Preserving Hydrodynamical Scheme for Modeling Protostellar Disks." 2017 Aspen Winter Conference, Formation and Dynamical Evolution of Exoplanets, Aspen, CO, March 2017 (Poster)
- January 2014 "A Combined Study of Photospheric Magnetic and Current Helicities and Subsurface Kinetic Helicities of Solar Active Regions during 2006 – 2012." 223rd AAS Conference: Presentation 158.01 (Poster)
- August 2013 "A Comparison Between Photospheric Magnetic and Current Helicities and Subsurface Kinetic Helicity during 2007 – 2012" National Solar Observatory/National Optical Astronomy Observatory Tucson, AZ (Oral)
- September 2012 PCBs for Astronomical Instrumentation" at CURF Fall Research Symposium University of Pennsylvania (Poster)

Awards

- 2017–Present Stephen B. Butler Fellowship
- 2017 NSF Honorable Mention
- 2015–Present Gruber Fellowship
- 2013 NSF REU, National Solar Observatory, Tucson, Az
- 2012 UPenn Center for Undergraduate Research PURM Award
- 2012 Scuba Diving Certificate, Kona Hawaii
- 2011 Eagle Scout, Merion Liberty Troop
- 2011 Lower Merion Senior Scholar Athlete Award

Grants Received

- 2016 American Physical Society Outreach Grant for Open Labs, \$10,000, co-PI

Observational Experience

- 10/18/2017 Palomar Observatory
- 10/12/2017 Palomar Observatory
- 07/2013 Kitt Peak

Teaching

- Fall 2017 Teaching Assistant, Earth in its Cosmic Context, Yale University
- Spring 2017 Teaching Assistant, Frontiers and Controversies in Astrophysics, Yale University
- Fall 2016 Teaching Assistant, Introduction to Astronomical Observing, Yale University

Professional Activities and Services

March 2017 - Scientific and Local Organizing Committee Member, Emerging Researchers in
June 2017 Exoplanet Science (ERES) Conference III

Leadership & Outreach

2015-2017 Open Labs Director and Co-Founder
2015-2016 Yale Graduate and Professional Student Senate Senator and Community Service Representative
2015-2016 Coordinator for Talented and Gifted (TAG) weekly visits to Leitner Planetarium
2015-2016 Member of Yale Science Diplomats

Outreach Presentations

February 2016 "The Quantum Factory: Creating Solar Storms, Particles, and Uncertainty." Science in the News, Yale Science Diplomats.
November 2015 "Stellar Astrophysics." Meantime Presenter at Yale University GPSS
October 2015 "Stellar Astrophysics." Open Labs Science Cafe at Yale University GPSS
October 2014 "Scientific Innovation at Lower Merion." Lower Merion Innovation Center