Ryan Rubenzahl

Contact Information

California Institute of Technology
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Education

California Institute of Technology, Pasadena, CA

Ph.D. in Astrophysics — **Anticipated 2024**

University of Rochester, Rochester, NY

B.S. in Physics & Astronomy — **May 2018**

- *Magna cum laude* with highest distinction
- Minor in Mathematics
- Thesis Title: *Identifying Type Ia Supernovae in Extragalactic Spectra*
- Thesis Advisor: Segev BenZvi

Research Interests

Observational astronomy, large-sky & exoplanet surveys:
Exoplanet detection and characterization, exoplanet demographics, instrumentation for exoplanet surveys, data analysis of large surveys, transients, time-domain astronomy

Honors and Awards

2018	Stoddard Prize, U. of Rochester Physics & Astronomy
2018	Janet Fogg Prize, U. of Rochester Physics & Astronomy
2018	Undergraduate Teaching Award, U. of Rochester Physics & Astronomy
2018	NSF Graduate Research Fellowship
2017	Barry M. Goldwater Scholarship
2017	Award for Excellence in Programming: Earth Hour, U. of Rochester
2016, 2017	Continuing Student Scholarship, U. of Rochester
2014	Bausch and Lomb Honorary Science Award, U. of Rochester

Research Experience

University of Rochester, Rochester, NY

Research Assistant — **September 2017 – May 2018**
Adviser: Prof. Segev BenZvi

- Project: Identifying Type Ia Supernovae in Extragalactic Spectra
- Developed a robust classification technique to identify type Ia supernova in galaxy spectra

Research Assistant — **January 2017 – August 2017**
Adviser: Prof. Segev BenZvi

- Project: Searching for gamma-ray bubbles in M31 with HAWC
- Used gamma-ray observations from the HAWC Observatory to investigate possible "Fermi Bubble" structures around the M31 Andromeda Galaxy and place upper limits on the TeV flux from such structures

Research Assistant **August 2015 – January 2017**
Adviser: Prof. Segev BenZvi

- Project: Analyzing TeV gamma-ray binary candidates with HAWC
- Conducted a likelihood analysis of gamma-ray data from HAWC using the Multi-Mission Maximum Likelihood framework (3ML) in Python and Lomb-Scargle periodogram tests for detecting periodicity in rare binaries

Research Assistant **January 2015 – August 2015**
Adviser: Prof. Segev BenZvi

- Project: Simulating water-Cherenkov detectors for HAWC
- Wrote models of water-Cherenkov detectors in C++ using GEANT4 and the simulation software AERIE to determine the optimal tank specifications to be used in an expansion of the HAWC Observatory

Teaching & Advising Experiences

University of Rochester, Rochester, NY

Peer Adviser (Physics & Astronomy)

College Center for Advising Services **Fall 2017 – Spring 2018**

- Advising and counseling service for undergraduate students
- Advise students with their majors, course selection, research opportunities, networking, independent study, study abroad, etc.

Teaching Assistant

Department of Physics & Astronomy **Spring 2015 – Spring 2018**

- AST 142: Elementary Astrophysics (Honors), Spring 2018
- AST 111: The Solar System & Its Origin, Fall 2017
- AST 142: Elementary Astrophysics, Spring 2017
- PHY 141 Laboratory: Mechanics (Honors), Fall 2016
- AST 102: Relativity, Black Holes, and the Big Bang, Spring 2016
- AST 106: Cosmic Origins of Life, Fall 2016
- AST 104: The Solar System, Spring 2016

Leadership & Service Positions

C.E.K. Mees Observatory, Naples, NY

Student Tour Guide **Summers 2015 – 2018**

- Present the history of the observatory and general astronomy facts
- Operate 24-inch computerized Cassegrain telescope

University of Rochester, Rochester, NY

President, *Astronomy Club* **Fall 2015 – Fall 2017**

- Make major decisions regarding club's direction, preside over meetings, and manage all club events

Secretary, *Society of Physics Students (SPS)* **Fall 2015 – Fall 2016**

- Organize and manage the tutoring program

Conference Proceedings

[1] **R. Rubenzahl**, S. BenZvi, and J. Wood, *Limits on the Emission of Gamma Rays from M31 (The Andromeda Galaxy) with HAWC*, in *Proceedings of 35th ICRC*, PoS(ICRC2017)594 (1708.03012), 2017.

[2] C.D. Rho, **R. Rubenzahl**, and S. BenZvi, *Searching for TeV Gamma-ray Emission from Binary Systems with HAWC*, in *Proceedings of 35th ICRC*, PoS(ICRC2017)742 (1708.03726), 2017.

Conference Presentations

[1] **R. Rubenzahl**, S. BenZvi, and J. Wood, *Limits on the Emission of Gamma Rays from M31 (The Andromeda Galaxy) with HAWC*, AAS Meeting 231, poster 250.05, 2018.

[2] **R. Rubenzahl**. *Analyzing TeV Binary Candidates with the HAWC Observatory*, Rochester Symposium for Physics Students, talk, April 2017. On-line published abstract.

[3] **R. Rubenzahl**. *Simulating Outrigger Tanks Around HAWC*, Rochester Symposium for Physics Students, talk, April 2016. On-line published abstract.

Professional Memberships

American Astronomical Society (AAS)
American Physical Society (APS)
Phi Beta Kappa Academic Honor Society (ΦBK)
Sigma Pi Sigma, National Physics Honor Society (ΣΠΣ)

Computer and Hardware Skills

Computer Programming & Data Analysis:

- Python, Java, C, C++, Mathematica
- UNIX shell scripting (Bash)
- Simple Linux Utility for Resource Management (SLURM)
- TheSky6, CCDSoft, CCDStack, SAOImage DS9, Igor Pro

Document Editing and Productivity Software:

- TEX (LATEX, BIBTEX)
- Microsoft Office, Mac iWork Suite, Google Docs

Operating Systems:

- Mac OS, Linux

Technical Skills

- Trained to operate the University of Rochester's C.E.K. Mees Observatory's 24-inch computerized Cassegrain telescope
- Proficiency in astronomical imaging with 4k CCD camera and Mees telescope