RYAN LOW

Physics Graduate Student

SKILLS

- **Python** 7+ yrs
- **C/C++** 7+ yrs
- **Linux** 7+ yrs
- **Java** 6+ yrs
- **Mathematica** 5+ yrs
- **MPI** 3+ yrs

CONTACT

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EDUCATION

PhD. Physics. (Expected Defense: May 2025) 2020 - Present
University of Kansas

Current research is using N-Body cosmological simulations to constrain self-interacting dark matter models. Performing these simulations requires working in a high performance computing cluster, while analysis involves handling big data with both C/C++ and Python. Major projects include studying how modified dark matter physics affects small scale structure formation. Some research topics I am interested in include how galaxies formed and evolved over cosmic time and how relaxing assumptions in ΛCDM affect structure formation.

B. Sc. Physics. (Cum Laude/Highest Distinction) 2016 - 2020
University of California, San Diego

The topic for the Bachelor's thesis was followup observations and classification of low mass star candidates found in the LaTE-MoVeRS proper motion catalog.

PUBLICATIONS

Spectroscopic Confirmation of an M6 Dwarf Companion to the Nearby Star BD-08 2582

Ryan Low, Adam J. Burgasser, Céline Reylé, Roman Gerasimov, Chih-Chun Hsu, and Christopher A. Theissen 2021 Res. Notes AAS 5 26

Reporting the observation and spectroscopic classification of a dwarf binary 15 pc from the sun.

Inferring Warm Dark Matter Masses with Deep Learning

Jonah C. Rose, Paul Torrey, Francisco Villaescusa-Navarro, Mark Vogelsberger, Stephanie O'Neil, Mikhail V. Medvedev, **Ryan Low**, Rakshak Adhikari, and Daniel Angles-Alcázar 2023 MNRAS (Submitted)

Endothermic self-interacting dark matter in Milky Way-like dark matter haloes

Stephanie O'Neil, Mark Vogelsberger, Saniya Heeba, Katelin Schutz, Jonah C. Rose, Paul Torrey, Josh Borrow, **Ryan Low**, Rakshak Adhikari, Mikhail V. Medvedev, Tracy R. Slatyer, and Jesús Zavala, 2022 MNRAS (Submitted)

PRESENTATIONS

Numerical Studies of Inelastic Dark Matter Cosmology

American Physical Society April Meeting 2023

Presenting results on the effects of of inelastic two-component dark matter on the matter power spectrum and halo mass function using the `Arepo` simulation code with IllustrisTNG physics.

Lyman-alpha Forest Studies of Cosmological Simulations with Inelastic Two-Component Dark Matter (2cDM)

American Physical Society April Meeting 2022

Presenting preliminary results on the effects of inelastic two-component dark matter on the high redshift matter power spectrum using the `Arepo` simulation code with IllustrisTNG physics.

RESEARCH EXPERIENCE

Cosmological Simulations of Two-Component Dark Matter 2020-Present
Advisor - Dr. Mikhail Medvedev

Using Arepo with IllustrisTNG physics to explore the properties of inelastic dark matter self interactions.

Observation and Analysis of KAST-Red Spectra 2018-2020
Advisor - Dr. Adam Burgasser

Observations of low mass stars and brown dwarfs. Developing an analysis pipeline from observation to data reduction to classification for low resolution optical spectroscopy.

Data Reduction and Analysis of IRTF-SpeX Spectra 2017-2018
Advisor - Dr. Adam Burgasser

Using standard tools to analyze and classify infrared spectra.

TEACHING ASSISTANTSHIP

Modern Optics Laboratory 2022-Present
University of Kansas

Mechanics Laboratory 2020-2022
University of Kansas

Quantum Mechanics I 2020
University of California, San Diego