

LOREN I. MATILSKY

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EDUCATION

Cornell University, Ithaca, NY

2011-2015

B.A. cum laude in Physics and Mathematics

AWARDS and HONORS

- Carl Hansen Graduate Fellowship May 2017
- CU Boulder Chancellor Fellowship 2015-present
- Phi Beta Kappa January 2015
- NASA/New York Space Grant Consortium (summer research funding) Summer 2014

RESEARCH EXPERIENCE

APS Department, CU Boulder

Graduate Research

2015-present

Research Advisors: Dr. Juri Toomre & Dr. Bradley Hindman

- Analysis of three-dimensional subsurface solar flows using high-resolution ring diagram analysis.
- Measurements of solar convection zone's turbulent torques, magnetic field evolution and angular momentum transport.
- Self-consistent modeling of the dynamics of the solar Near Surface Shear Layer (NSSL) using advanced supercomputer simulations and hydrodynamic theory.

Department of Astronomy, Cornell University

Undergraduate Research

2014-2015

Research Advisor: Dr. Richard Lovelace

- Numerical simulations of the Rossby-vortex instability in thin Keplerian accretion disks.
- Analysis of the angular momentum transport and dust-trapping properties of Rossby vortices and implications for planet formation in protoplanetary disks.

RESEARCH INTERESTS

- Theoretical and computational study of the solar magnetic field and fluid motions.
- Stability analysis of thermal convection in rotating, stratified, magnetized shells.
- Theoretical models for turbulence and mathematical chaos.
- Numerical solutions to nonlinear PDEs.

TEACHING EXPERIENCE

University of Colorado, Boulder

Fall 2016

Lab Assistant, ASTR 2020 (Instructor: John Bally)

- Led student observing sessions at the campus observatory.
- Explained basic telescope optics and answered astronomy questions during these sessions.

Cornell Office of Academic Diversity Initiatives (OADI)

2013-2015

Physics & Mathematics Tutor

- Provided one-on-one peer tutoring to students in introductory physics and calculus courses from backgrounds historically underrepresented on campus.

Cornell Learning Strategies Center (LSC)

2012-2015

Physics Tutor

- Provided peer tutoring to students in Cornell's introductory mechanics and electricity and magnetism courses.
- Worked with students on homework sets, test preparation and study skills.

Summer Institute For the Gifted (SIG), UC Berkeley sessions I-II

Summers 2012 & 2013

Counselor/TA

- Counselor/TA for high school students ages 15-17 during both of SIG's three-week academic summer programs.
- Acted as TA in four classes per day, took notes on students' individual progress and occasionally gave entire lectures on subjects such as algebra, trigonometry, SAT preparation, and a course called Cosmic Proportions that discussed various aspects of physics and cosmology.

PRESENTATIONS

- *Using Helioseismology to Probe Torque Balance in the Near Surface Shear Layer*, poster presentation presented at the 2017 Boulder Solar Day, Boulder, CO.
- *Growth & Merger of Rossby Vortices in Flared Accretion Disks*, poster presentation at the 2015 Cornell Astronomy Undergraduate Poster Session, Ithaca, NY.
- *Rossby Wave Instability in Thin Keplerian Accretion Disks*, slide show presentation at the Cornell Astronomy 2014 Summer REU Program, Ithaca, NY.