

DANIEL GOLE

Astrophysicist and aspiring Data Scientist

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EXPERIENCE

Research Assistant: Computational Fluid Dynamics and Planet Formation

CU Boulder

📅 August 2014 – August 2019 📍 Boulder, CO

- Performed highly parallelized 3D magnetohydrodynamic simulations of protoplanetary disks on the Summit and Stampede2 supercomputers using the c-based code library "Athena". Added a module to drive turbulence with an arbitrary power-spectrum. Utilized about 5 million CPU-hours over 3 projects.
- Analyzed tens of TB of data from simulations, primarily using python, numpy, and scipy. Utilized many methods including temporal correlation analysis, perturbation analysis, spatial and temporal spectra. Fit models to simulation results using maximum-likelihood methods and MCMC sampling.
- Created a pipeline in python to track gravitationally bound clumps of particles. Demonstrated that previous studies had overestimated clump masses by a factor of about 3.
- Used matplotlib to make graphics and visualizations to present the results of simulations in presentations and publications.

Graduate Part Time Instructor

CU Boulder

📅 July 2018 – August 2018 📍 Boulder, CO

Instructor of record for an introductory-level astrobiology course: "The Search for Life in the Universe". Taught concepts from physics, astronomy, chemistry, biology, and geology to students from a variety of academic backgrounds.

Research Assistant: Photometric Data Reduction

SUNY Geneseo

📅 May 2011 – May 2013 📍 Geneseo, NY

- Implemented a pipeline to reduce, standardize, and analyze images of clusters of stars from the WIYN 1m telescope.
- Used Bash scripts to automate many phases of the analysis, reducing the human-hours required to analyze a data set by a factor of at least 2.
- Used a Mathematica-based N-Body code to compute the long term behavior of the large stars in the trapezium cluster.

Research Experience for Undergraduates (REU): Pilot Survey Data Analysis

Rensselaer Polytechnic Institute

📅 May 2012 – August 2012 📍 Troy, NY

- Analyzed the first data release from the LAMOST Pilot Survey.
- Calculated three dimensional positions and velocities of Milky Way stars by merging our survey data with proper motion and photometric catalogs.
- Looked for kinematic and chemical trends in the thin and thick disk components of the Milky Way and examined the sensitivities of these trends to systematic errors in the data.

EDUCATION

Ph.D in Astrophysical and Planetary Sciences

University of Colorado at Boulder

📅 August 2019 📍 Boulder, CO

Thesis: "Magnetic Fields and Turbulence in Protoplanetary Disks"

Advisors: Philip Armitage, Jacob Simon

B.A. in Physics

SUNY Geneseo

📅 May 2013 📍 Geneseo, NY

magna cum laude | Minor: Mathematics

Advisors: Aaron Steinhauer, David Meisel

SKILLS

Python, Numpy, Matplotlib ●●●●●

Linux, Bash, Git/Github, Latex, Statistics, Mathematica, High Performance Computing ●●●●●

C, C++, Docker Pandas, sklearn ●●●●●

Other Skills: Effective and concise communicator, presenter, and writer. Work well both individually and as a team member.

HONORS & AWARDS

- R.N. Thomas Research Award (2017)
- Ray Mace Smith Fellowship (2017)
- John W. Padalino Research Scholarship (2013)
- Sigma Pi Sigma Physics Honor Society (2013)

FIND ME ONLINE

- Website: dangole.net
- Linkedin: <https://linkedin.com/in/daniel-gole>
- Github: <https://github.com/dgole>