Andrew Emerick

Postdoctoral Researcher in Astronomy - Data Scientist
Pasadena, CA – Open to relocation

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Experience

- **Pasadena Fellow in Theoretical Astrophysics** — **Pasadena, CA**
  Carnegie Observatories - California Institute of Technology — *2019-Present*
  - Extensive experience utilizing national, high performance supercomputers to run massively parallel simulations (100s - 1000s of CPUs), generating and analyzing 100s of TBs of volumetric data.
  - Secured 3.5 million CPU hours on the Stampede-2 supercomputer for novel research (2020-2021)
  - Engaged in new collaborations with multiple researchers across institutions, notably contributing new code development (C++) for novel models of galaxy evolution.
  - Published 2 first-author and 4 co-authored papers, for a total of 8 first-/6 co- authored papers.
- **Ph.D. Candidate** — **New York, NY**
  Columbia University — *Spring 2013 - Fall 2019*
  - Pushed improvements to multiple community-driven, open-source code projects – Enzo, Enzo-E / Cello, and Grackle (C++ / Python / Fortran) – to enable research for many scientists across dozens of institutions.
  - Developed novel model for star formation in galaxy-scale astrophysical hydrodynamics simulations
  - Secured competitive funding: Blue Waters Graduate Fellowship; National Science Foundation Graduate Fellowship
- **Researcher** — **Minneapolis, MN**
  University of Minnesota — *Fall 2009 - Spring 2013*
  - Conducted research in multiple fields: medical physics (Dr. Pablo Yepes - Rice U.), nuclear physics (Dr. Ralf Rapp - Texas A&M U.), and astronomy (Dr. Lawrence Rudnick, Dr. Thomas W. Jones- U. of Minnesota).

Education

- **Ph.D. Astronomy** — **New York, NY**
  Columbia University — *Spring 2013 - Fall 2019*
- **B.S. Physics – B.S. Astrophysics** — **Minneapolis, MN**
  University of Minnesota — *Fall 2009 - Spring 2013*

Projects

- Collaborative developer for open-source code projects, with a total user-base of 100s of researchers:
  - **Enzo:** (C++/Fortran - MPI) Seven years working with ∼20 active developers to further optimize, test, and add new features to this well-used astrophysical hydrodynamics code. Contributed 27 active/merged pull-requests containing over 29,000 lines of code. Github: enzo-dev.
  - **Enzo-E/Cello:** (C++/Fortran - MPI) Made critical advancements in final development of this modern, exascale-computing enabled astrophysical hydrodynamics code. Contributed 15 active/merged pull-requests containing over 11,000 lines of code. Github: enzo-e.
  - **Grackle:** (C++/Fortran/Python) Implemented vital new functionality to enable more accurate simulations across a variety of contexts for 100s of scientists in this library of physics routines for astrophysical simulations. Contributed 12 pull-requests containing over 1000 lines of code. Github: grackle.

Skills

- **Programming:** Python, Cython, C, C++, FORTRAN, R (basic), Octave (basic); git; shell scripting; Make; LaTex;
- **Software/Tools:** NumPy, SciPy, matplotlib; Jupyter notebooks; Microsoft Office

Hobbies

- Anything and everything outdoors, especially rock climbing, trail running, hiking, and cycling; I am always excited to introduce new people to each of these sports.