

# Nathan J. Goldbaum

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## Experience

### *Recurse Center*

Participant

May 2019 – Present

- Transitioned from academia to industry by attending a self-directed educational retreat.
- Implemented a Rust client for the Mercurial version control system while sharing experiences with the community via blog posts.

### *National Center for Supercomputing Applications*

Postdoctoral Researcher

August 2015 – April 2017

Research Scientist

May 2017 – April 2019

- Primary maintainer for The `yt` Project, an open source toolkit for analysis and visualization of 3D simulation data in Python.
- More than 650 merged pull requests for `yt` alone. Many other merged pull requests in popular open source projects such as `Matplotlib`, `Mercurial`, `xonsh`, `conda-forge`, `Homebrew`, `h5py`, `IPython`, `ipywidgets`, and `nbconvert`.
- Led the effort to triage code review tasks and issue reports, led user and developer workshops, and member of the project steering committee.

## Projects

### `unyt`

- A Python library for working with data that has physical units.
- 100% test coverage along with extensive documentation for use as a command-line helper for quick calculations and as a component of a larger Python project.

### Improved support for particle data in `yt`

- Improved performance and memory usage for common analysis tasks by 10x to 100x by leveraging a novel system for spatially indexing particle data via EWAH-compressed Morton codes.
- Enabled production data pipelines leveraging gigabyte and terabyte scale simulation outputs.
- Presented work to community at a SciPy conference talk.

### PlotWindow Plotting Interface

- Created an interface for visualizing slices and projections in `yt` by wrapping `Matplotlib`.
- Enables quick data visualization through an API that focuses on what the simulation data physically represent rather than how they are laid out on disk.
- Used in dozens of published journal articles written by `yt` users.

## Skills

Python, Cython, C/C++, Rust, NumPy, Matplotlib, Jupyter, Git, GitHub, Mercurial,  $\text{\LaTeX}$

## Education

### *University of California Santa Cruz*

Ph.D. Astronomy & Astrophysics

August 2011 – July 2015

### *University of Colorado Boulder*

B.A. Physics, *Summa Cum Laude*

August 2005 – 2009