Brent Tan

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Summary

Research Scientist/Computational Astrophysicist. My research focus lies in computational modelling of galactic weather. I use fluid simulations to probe and understand the complex physics in turbulent systems that drive galaxy evolution.

Technical Skills

Programming Languages: Python, C++, Linux/Bash

Deep Learning Frameworks: PyTorch, JAX

Libraries & Tools: NumPy, SciPy, Git, LaTeX

Skills: High Performance Computing, Fluid Simulations, Neural ODEs

Experience

Flatiron Research Fellow 2023 – 2024
Flatiron Institute, Simons Foundation *New York, NY*

Graduate Researcher 2017 – 2023
University of California, Santa Barbara *Santa Barbara, CA*

Education

University of California, Santa Barbara Santa Barbara, CA
Ph.D. in Physics/Astronomy *2017 – 2023*

Carnegie Mellon University Pittsburgh, PA
B.S. in Physics (Astrophysics Concentration) with Computer Science Minor *2013 – 2017*

Projects

Neural Infalling Cloud Equations (NICE) 2024
Deep Learning Project *Python, JAX, Diffax, Equinox, PySR*

• Increasing the Efficacy of Subgrid Models and Scientific Equation Discovery using Neural ODEs and Symbolic Regression

Cool Things That Matter 2017-2023
High Performance Computing, Modelling *Python, C++*

• Thesis topic spanning research publications. Used simulations and anlytical theory to invetigate the multiphase dynamics of galactic atmospheres.

Extended Townsend Algorithm 2022
Fluid Simulation *C++*

• Designed and implemented a general version of the Townsend Algorithm for a rapid and accurate radiative cooling module in the MHD code Athena++

Selected Publications

• Neural ODE paper

• A complete list of my papers can be found here.