Nicholas M. Davila

Computational Physics Major
ndavila@utexas.edu
SA/Austin, TX
(210)-243-8984

linkedin.com/in/nickmdavila
github.com/nickdavila
ndavila.myportfolio.com

EDUCATION

The University of Texas at Austin, Austin TX — Senior graduating in: December 2023
Major: Bachelor of Science in Computational Physics — Minor: Entrepreneurship — Certificate: Elements of Computing

SKILLS

- Technical Skills (Advanced): • *Python(VPython, Scipy, Numpy, Matplotlib, Pandas, Astropy, Tensorflow) • Data Analysis • Data Manipulation • LaTeX • Adobe Creative Suite • Graphic Design(Logo, Website, Brand, Comms) • Video Editing*
- Technical Skills (Intermediate): • *Machine Learning • MATLAB • C++ • HTML • Blender • OS Terminals • CSS/JavaScript • Excel • Computer/Lab hardware • Laser operation (safety certified) • Git Version Control*
- Languages: *Fluent in Spanish and English*

RESEARCH EXPERIENCE

Galaxy Evolution Vertically Integrated Project (VIP), University of Texas at Austin, Austin TX — 11/2020 - Present
Undergraduate Astrophysics Researcher (15 hrs/wk) | PI: Dr. Steven Finkelstein

- Developing a machine learning algorithm to classify astronomical objects (more info in PROJECTS section)
- Classified close to 1000 different types of astronomical objects in hopes of finding Lyman-alpha emitting galaxies from a Hobby-Eberly Telescope Dark Energy Experiment (HETDEX) survey
- Designed the logo and website for the Galaxy Evolution Vertically Integrated Project

Pancreatic Cancer Treatment Research, University of Texas at San Antonio, San Antonio TX — 01/2020 - 06/2020
Undergraduate Biophysics Researcher (19 hrs/wk) | PI: Dr. Lyle Hood

- Extracted pancreas samples and conducted thermo-physical research on the samples
- Utilized high powered lasers to determine the efficiency of nanoparticles in distributing heat in sensitive organs
- Worked on the computational modeling of plasmonic heating as a treatment planning tool for pancreatic cancer
- Modeled data gathered into useful formats for advisors/team

PROJECTS

- ***Classifying Lyman-Alpha Emitters With Machine Learning —*** Developing a machine learning algorithm in Python to classify Lyman-Alpha emitting galaxies from large sets of astronomical data (published on my GitHub). Began with mapilutation of data sets with millions of different types of data to get desired samples. Currently in machine learning algorithm (random forest) implementation phase of project.
- ***3D Simulation of Restricted Three-Body Problem —*** Wrote a paper exploring Lagrange's solution to the restricted three-body problem. Simulated the motion of a Sun-Jupiter-Satelite system (with VPython) using his solution of five points in the orbital plane that have quasi-gravitational stability (published on my GitHub).
- ***Plasma Physics Research Intro Project —*** Recently began reading papers and code to join a plasma research lab at the University of Texas at Austin. I'm joining as an undergraduate to help with a project called the Simplified Kinetic Model (SKiM) which often gives an acceptably accurate estimate of the ITG/TEM growth rate, but is many orders of magnitude faster than gyro-kinetic simulations. Together with optimization of neoclassical transport, this can be used to develop stellarator geometries with exceptionally high energy confinement.

CAMPUS EMPLOYMENT/INVOLVEMENT

STEM Undergraduate Teaching Assistant, University of Texas at Austin, Austin TX — 08/2022 - Present
Undergraduate Teaching Assistant (10 hrs/wk)

- Mentored a core of 180+ students in physics and astronomy, and delivered private lectures to students in need
- Assisted in development of course materials to best help students succeed and graded assignments for the class

Texas Undergraduate Research Journal, University of Texas at Austin, Austin TX — 09/2020 - 09/2022
Executive Director of Communications (18 hrs/wk)

- Set strategic direction for communications and marketing and led internal meetings for the staff + graduate guests
- Directed journal staff of 25 people in re-branding and developed a new website
- Supervised the quality and timeliness of communication team's projects
- Developed new design guidelines/logo and led design team of 7 in re-branding, which grew our social media and website traffic by over 250%