

# DHRUV MULEY

June 2020

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## EDUCATION

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**B.A. Physics, B.A. Astrophysics**, University of California, Berkeley 2016—2020  
Major GPA: 3.861/4.000 · Overall GPA: 3.845/4.000 · *Honors to Date*

**Research Interests** numerical hydrodynamics, exoplanets/protoplanetary disks, galaxy evolution

**Relevant Coursework** *Undergrad-level:* Statistical and Thermal Physics, Quantum Mechanics I-II, Classical Mechanics, Mathematical Methods in Physics, Stellar Physics  
*Radio Astronomy Laboratory*  
*Grad-level:* General Relativity, Radiative Processes in Astrophysics, Classical Electrodynamics, Geophysical and Astrophysical Fluid Dynamics, Galaxies

## PUBLICATIONS

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1. **Muley, Dhruv**; Wheeler, Coral; Hopkins, Philip; *et al.* “The effects of progenitor mass-dependent yields on dwarf galaxies,” *Monthly Notices of the Royal Astronomical Society* (in prep.)
2. Fung, Jeffrey; **Muley, Dhruv**. “A staggered semi-analytic method for simulating dust grains subject to gas drag,” *The Astrophysical Journal Supplement Series*, 244, 2 (2019; ArXiv:1909.02006)
3. **Muley, Dhruv**; Fung, Jeffrey; van der Marel, Nienke. “PDS 70: A transition disk sculpted by a single planet,” *The Astrophysical Journal Letters*, 879, 1 (2019; ArXiv:1902.07191)

## RESEARCH

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**Research Assistant**, University of Victoria 2020—  
Advisor: Prof. Ruobing Dong  
Running hydrodynamical simulations of protoplanetary disks and performing radiative-transfer post-processing.

**Undergraduate Researcher**, University of California, Berkeley 2020—  
Advisor: Dr. Sivan Ginzburg  
Developing scaling relations for planetary gap depths and migration rates.

**SURF Fellow**, California Institute of Technology 2019—  
Advisor: Dr. Coral Wheeler, Prof. Philip F. Hopkins  
Implemented progenitor-dependent yields and event rates for supernovae and stellar winds, from the NuGrid suite, into the GIZMO hydrodynamics code. Currently running simulations to measure the resulting changes in metal abundances in dwarf galaxies, *with a paper in prep.* Caltech SURF fellowship award was \$6350 in 2019.

**Undergraduate Researcher**, University of California, Berkeley 2018–19  
Advisor: Dr. Jeffrey Fung

Studied the morphology of the PDS 70 transition disk with the GPU-hydrodynamics code PEnGUI. Subsequently, helped devise an improved method for integrating the trajectories of dust grains (e.g., in disks) subject to gas drag.

**Affiliate**, Lawrence Berkeley National Laboratory 2017–18  
 Advisor: Dr. Carlton Pennypacker

**Undergraduate Researcher**, Columbia University (remote) 2016  
 Advisor: Prof. David Kipping

## TECHNICAL SKILLS

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<b>Advanced</b>	Python, C/C++, Unix
<b>Intermediate</b>	CUDA, Java, Mathematica, L <sup>A</sup> T <sub>E</sub> X
<b>Basic</b>	HTML, JavaScript, Photoshop, MPI

## TALKS AND CONFERENCES

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| 1. “PDS 70: A laboratory for disk-planet interaction”<br><b>Oral talk</b> (main presenter) at Bay Area Planetary Science Meeting (Stanford) | November 22, 2019  |
| 2. <b>Discussion leader</b> at ExoCoffeeTea exoplanet journal club (UC Berkeley)  | September 25, 2019 |
| 3. “PDS 70: A transition disk sculpted by a single planet”<br><b>Oral talk</b> (main presenter) at Astronomy Thursday Lunch (UC Berkeley)   | February 14, 2019  |

## TEACHING

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<b>Undergraduate Student Instructor</b> , Physics 5BL, University of California, Berkeley Instructor: Dr. Gurpreet Kaur Helped students conduct experiments and graded lab reports for 25 students in Physics 5BL, Berkeley’s laboratory course for first-year physics majors focusing on springs and waves.	2019
<b>Reader</b> , Physics 137B, University of California, Berkeley Instructor: Prof. Michael Crommie Graded roughly 60 homework assignments biweekly for Physics 137B, the second semester of upper division quantum mechanics at Berkeley, during Spring 2019.	2019
<b>Undergraduate Student Instructor</b> , Astronomy C10, University of California, Berkeley Instructor: Prof. Alex Filippenko Ran weekly discussion sections, devised worksheets and study materials, and graded exams for approximately 60 students in Astronomy C10, UC Berkeley’s survey course on astronomy for non-majors, during the Fall 2018 semester.	2018
<b>Reader</b> , Astronomy C10, University of California, Berkeley Instructor: Prof. Alex Filippenko Graded roughly 100 homework assignments per week for Astronomy C10.	2017

## OUTREACH

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**Mentor**, SPLASH, University of California, Berkeley 2020

Gave an “Introduction to Theoretical Astrophysics” seminar class to high-school students in the San Francisco Bay Area, emphasizing order-of-magnitude reasoning skills.

**Member**, Undergraduate Astrophysics Service Committee, University of California, Berkeley 2019—  
Advisor: Amber Banayat, Prof. Mariska Kriek  
Helped improve recruitment and retention of astrophysics majors.

**Mentor**, Be a Scientist program, Martin Luther King Jr. Middle School, Berkeley 2018  
Advisor: Darlene Yan  
Worked with students in Berkeley aged 11-14 to develop scientifically testable hypotheses, devise and conduct experiments, and analyze results.

## LANGUAGES

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**English** Fluent; professional working proficiency

**Spanish** Professional working proficiency

**Marathi** Basic

## REFERENCES

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**Jeffrey Fung**, Member, Institute for Advanced Study

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Princeton, NJ

Relationship Supervisor for numerical protoplanetary-disk projects.

**Sivan Ginzburg**, 51 Pegasi b Fellow, University of California, Berkeley

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Berkeley, CA 94720

Relationship Supervisor for analytical protoplanetary-disk project.