BAYLEE BORDWELL

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EDUCATION

University of Colorado Boulder, Boulder, CO
Doctor of Philosophy, Astrophysics, in progress
Master of Science, Astrophysics
G.P.A. 3.8/4.0

University of California Berkeley, Berkeley, CA
Bachelor of Art, Astronomy
Bachelor of Art, Molecular and Cell Biology: Biological Chemistry
G.P.A. 3.5/4.0

RESEARCH EXPERIENCE

Transport in Jovian atmospheres   Advisor: Ben Brown
University of Colorado, Boulder   Spring 2015-Present

In this project, I am using the novel pseudospectral framework Dedalus, together with modern chemical reaction network software, to explore mixing processes, chemical evolution, and energy transport in Jovian atmospheres both within our Solar system and without.

FIRST Data Analysis Pipeline   Advisor: Gaspard Duchene
University of California, Berkeley   Fall 2012-Fall 2014

In this project I translated, from Yorick to IDL, a pipeline that analyzes data from the innovative FIRST instrument, which seeks to obtain diffraction limited ground-based images of high dynamic range using single-mode fiber optic cables and interferometry in the optical regime.

Blue Supergiant Metallicities in IC 10   Advisors: Marla Geha, Michael West
Maria Mitchell Observatory   May 2013-January 2014

In this project I determined the metallicities and ages of blue supergiants in the dwarf irregular galaxy IC 10 utilizing spectral data from the DEIMOS instrument on the Keck II telescope and photometric data from previous studies to gain insight into the evolutionary processes of transitioning dwarf galaxies.

Genomic Mapping of ems071801   Advisor: Jay Hollick
University of California, Berkeley   Spring 2011-Summer 2012

In this project I worked to map out the location of a gene involved in a pathway responsible for a specific type of non-Mendelian inheritance known as paramutation using bulk segregant analysis and recombinant mapping.

TEACHING AND OUTREACH

CU STARs Graduate Lead
University of Colorado, Boulder   Fall 2015-present

CU STARs (CU Science and Technology Astronomy Recruits) is an outreach group made up of undergraduate and graduate students, supervised by a faculty mentor. The motivation of CU STARs is to provide a community to support undergraduate students (especially under-represented

populations) throughout their time at CU Boulder, while teaching them invaluable teaching skills through outreach trips to under-served high schools in Colorado. Support is provided through weekly meetings, tutoring, community-building activities, lessons on issues present through academia like burnout and imposter syndrome, and instruction on topics like reading scientific literature and creating CVs. Beyond this support, CU STARs teaches these students how to design and implement lessons on astronomy and physics, which are then taken to high school students around Colorado, and taught by the undergraduate mentors. As a graduate student lead, I help manage both support and outreach activities, attend weekly organizational meetings, provide tutoring, and perform presentations on our group and the results of our outreach at conferences.

oSTEM Queer Symposium Event Coordinator
University of Colorado, Boulder   Fall 2017

oSTEM (out in STEM) is a national group for undergraduate and graduate students who identify as LGBTQ* and/or queer. As a member of the CU Boulder chapter, I facilitated a day long symposium featuring LGBTQ*/queer-identified speakers from the tech industry, academia, and national research labs, to provide visibility of those identities in STEM professions for the wider Boulder community. In this role, I managed speakers, the event location, and some aspects of advertising and other event needs (e.g., meals).

ASTR 2600 Instructor
University of Colorado, Boulder   Summer 2017

ASTR 2600 is a sophomore- and junior-level majors course in astronomy teaching how to work in the Python (v. 2.7) programming language through astrophysical examples using interactive learning techniques and hands-on tutorials. As a (co-)instructor of record, I designed course documents, lectures, tutorials, homeworks, and project-based assessments, gave lectures, managed a course website, graded assignments and managed the grades of all students in the course. I also held regular and by-appointment office hours and maintained email contact with students outside of these hours.

ASTR 3520 Teaching Assistant
University of Colorado, Boulder   Fall 2016

ASTR 3520 is a junior- and senior-level majors course in astronomy teaching how to perform and analyze spectroscopic observations using an on-campus telescope and PyRAF software. As a teaching assistant, I performed all of the labs independently, provided help with in-class tutorials, observations, and general questions about assignments, held extensive office hours and graded all lab reports and tutorials.

ASTR 3510 Teaching Assistant
University of Colorado, Boulder   Fall 2016

ASTR 3510 is a junior- and senior-level majors course in astronomy teaching how to perform and analyze image observations using an on-campus telescope and PyRAF software. As a teaching assistant, I performed all of the labs independently, provided help with in-class tutorials, observations, and general questions about assignments, held extensive office hours and graded all lab reports, tutorials and exams.

SBO Graduate Student Representative
University of Colorado, Boulder   Fall 2014-Summer 2015

As the graduate student representative for the Sommers-Bausch Observatory at the University of Colorado, I ensure that there are graduate student and faculty volunteers for public observing every Friday night, serve as a point of contact between graduate students and the observatory, and attend committee meetings.

ASTR 3800 Teaching Assistant
University of Colorado, Boulder   Spring 2015, Fall 2015

ASTR 3800 is a junior-level majors course in astronomy teaching statistics and programming in the Python programming language. As a TA, I generated course materials, taught several lectures on Python, version control, and data resources in astronomy, guided students through the process of picking and working on final projects, held extensive office hours and graded all non-written assignments.

ASTR 1200 Teaching Assistant
University of Colorado, Boulder   Spring 2015

ASTR 1200 is a general non-majors course on stars, galaxies and cosmology, with similar responsibilities to ASTR 1000, but with a class size of 120.

ASTR 1000 Teaching Assistant
University of Colorado, Boulder   Spring 2015

ASTR 1000 is a general non-majors course on the Solar System, which touches on basic physics without calculus. As a TA, my responsibilities include holding office hours and review sessions for homeworks and exams, grading exams, and managing the homework graders, as well as generally being on-call resource for students in two sections of 200 people each.

Astro 120 UGSI
University of California, Berkeley   Spring 2014

The radio astronomy laboratory (Astro 120) is a small upper division laboratory course for astronomy and earth and planetary science majors that proceeds through four labs touching upon digital and analog radio astronomy, interferometry and HI mapping. As a UGSI my responsibilities included acting as a constant resource for students with questions in regards to the equipment, science and course work; providing regular lectures during the course period and generating course materials; testing and repairing lab equipment and telescopes; and investigating and generating relevant Python programming for the usage of the lab telescopes, which had previously been operated in IDL and C.

Python Decal Instructor
University of California, Berkeley   Spring 2014

The Python decal is a student-designed and student-led course on the usage of Python, LaTeX, and basic UNIX, with an emphasis on astronomy applications. We teach an average of 25 students per semester, with varying levels of experience.

IDL Decal Instructor
University of California, Berkeley   Spring 2013-Fall 2013

The IDL decal is a student-designed and student-led course on the usage of IDL, LaTeX, and basic UNIX and Python, with an emphasis on astronomy applications. We teach an average of 25 students per semester, with varying levels of experience.

Astronomy Intern
Maria Mitchell Observatory   Summer 2013

As part of the NSF REU program, I worked with the Maria Mitchell Association guiding observatory tours (average 5 people) and leading public observation nights several times a week (average 40 people), as well as performing various other outreach activities.

PROFESSIONAL DEVELOPMENT
Princeton Center for Theoretical Science Convection in Nature workshop 2018
Division of Fluid Dynamics Conference 2017
Compressible Convection Conference 2017
Other Worlds Laboratory (OWL) Summer School 2017
Planetary Faculty Search committee member 2017
Promoting an Inclusive Community in Astronomy (PICA) Lead
Department of Astrophysical and Planetary Sciences Planetary Search Committee 2017
American Geophysical Union Fall Conference 2016
Division of Fluid Dynamics Conference 2016
Exoclimes Conference 2016
Heliophysics 2015 Summer School
American Astronomical Society 225th Conference
La Serena 2014 Winter Data Science School
American Astronomical Society 223rd Conference

TALKS
"Convective dynamics and disequilibrium chemistry in the atmospheres of substellar objects" (Winter 2018), Convection in Nature workshop (invited)
"Convective dynamics and disequilibrium chemistry in the atmospheres of self-luminous giant planets and brown dwarfs" (Summer 2017), CASA/JILA Friday Seminar Series (invited)
Graduate Student Life Panel (Winter 2017), Conference of Undergraduate Women in Physics
"Building a STEM identity through intentional community and outreach" (Winter 2017), Conference of Undergraduate Women in Physics
"Dynamics and chemistry in Jovian atmospheres: 2-D hydrodynamical simulations" (Fall 2016), American Geophysical Union Fall conference
"Chemically reacting fluid flow in exoplanet and brown dwarf atmospheres" (Fall 2016), Division of Fluid Dynamics Conference
"Bugs: The Menace from Outer Space" (Spring 2016), Astronomy on Tap Denver
"Forgotten Foundations: The lost legacy of women in physics in astronomy" (Fall 2016), Fiske Planetarium Above and Beyond Lecture Series

PUBLICATIONS
Bordwell, B., Brown, B.P., & Oishi, J.S., "Convective dynamics and disequilibrium chemistry in the atmospheres of giant planets and brown dwarfs", 2018, *The Astrophysical Journal*, 384, 8 (doi: 10.3847/1538-4357/aaa551)

COMPUTER SKILLS
Experienced in the usage of both Windows and Unix/Linux systems
Advanced programming skills in IDL, LaTeXand Python.
Basic skills in Yorick, HTML, SQL, PyRAF, and bash scripting.

HONORS AND AWARDS
Comprehensive Exam II High Pass
NSF Graduate Research Fellowships Program Honorable Mention 2016
CU Boulder Department of Astrophysical and Planetary Sciences Graduate Student Teaching Award Fall 2015 - Spring 2016

Rose Hill Fellowship Summer 2014
Dean's Honors Spring 2013
Leadership Award Fall 2010