Cody Dirks – Curriculum Vitae

Address Dept. of Physics & Astronomy
Northwestern University
2145 Sheridan Road
Evanston IL, 60608

Website sites.northwestern.edu/cdirks
Phone (217) 341-7597
Email codydirks2017@u.northwestern.edu

Personal Profile

My research focuses on understanding the multi-phase nature of the interstellar medium (ISM), from small-scale structure in the diffuse ISM to the molecular content and physical conditions of cold, dense gas where star formation could potentially occur. My thesis specifically focuses on characterizing cold gas identified by the *Planck* satellite through the use of UV absorption line spectroscopy using the *Hubble Space Telescope*. I'm also passionate about engaging the public in science through a variety of formal and informal initiatives.

Education

2012- Ph.D. in Physics & Astronomy - Northwestern University
Thesis: "Probing the Transition from the Diffuse to the Molecular ISM" (June 2018)
Advisor: Dr. David Meyer

2015 M.S. in Physics & Astronomy - Northwestern University

2008-2012 B.Sc. Magna Cum Laude in Physics – Southern Illinois University - Edwardsville
Minor in Computer Science
Minor in Mathematics

Capstone Project - Preparing a Large-Scale Astronomical Observatory for Taking Data

Employment

Sep 2013 - Jun 2014 Northwestern University
Astronomy Teaching Assistant

Assisted for the introductory astronomy sequence, which consists of 3 separate courses covering topics in astronomy, cosmology, and astrobiology.

- Held office hours, proctored and graded quizzes and exams.
- Was responsible for holding weekly observing sessions with students using the campus telescope.

Jun 2015 - Aug 2015 Northwestern University
Physics Teaching Assistant

Served as discussion T.A. for the summer sequence of algebra-based physics. This sequence covered the introductory physics curriculum (classical physics, electromagnetism, and modern physics) in a 9-week span.

- Held daily discussion sections consisting of review of previous day's material and problem solving.
- Wrote, proctored, and graded daily quizzes.

Aug 2012 - Present Northwestern University
Research Assistant

Performed research while supported by several research grants from the National Science Foundation and the Space Telescope Science Institute.

Research Funding

Dirks, C.L. and Meyer, D.M., "Investigating the Gas within the Planck Galactic Cold Clumps." Awarded $79,217 for *Hubble Space Telescope* Cycle 23.
Dirks, C.L. and Meyer, D.M., "Probing CO-dark Gas within the Planck Galactic Cold Clumps." Awarded $100,696 for *Hubble Space Telescope* Cycle 25.

Research Presentations

2015, Poster, 225th Meeting of the AAS (141.29)
2016, Brown Bag Lunch Seminar, Northwestern University
2017, Poster, 229th Meeting of the AAS (340.32)
2018, Contributed Dissertation Presentation, 231st Meeting of the AAS

Education & Public Outreach

Aug 2015 - Dec 2017 NSF – Improving Undergraduate STEM Education

Participated in the NSF-IUSE grant "Engaging Introductory Astronomy Students in Authentic Research through Citizen Science" as a graduate student researcher and teaching assistant. This grant was used to develop an online platform that could be integrated into existing introductory astronomy courses for non-science majors. This included a series of in-class activities, a research project, and software tools to ease the technical burden of dealing with large datasets.

- Developed curricula elements
- Helped implement this platform by working directly with the instructor of Northwestern's Highlights of Astronomy course.
- Served as a Teaching Assistant, interacting with students to explain both technical and science elements of their research projects.

Jul 2014 - Jun 2015 NSF – Reach for the Stars (GK-12)
Graduate Fellow

Spent an academic year working with a local science teacher as a "resident scientist" in her high school physics classes.

- Developed lessons tying current astronomy research into a high school physics curriculum. This included coding interactive applets for students to use, lecturing, and creating worksheets to serve as homework.
- Sat in on classroom once a week to answer questions and offer insight in order to enhance the curriculum material.

Oct 2016 - Current Astronomer Evenings at Dearborn Observatory

Helped organize a monthly lecture/discussion series that occurred in conjunction with public observation at Northwestern's Dearborn observatory. These events included short talks to the general public and lengthy Q&A sessions.

- Helped brainstorm topics for talks.
- Wrote and delivered several talks on various topics, including my research, telescope instrumentation, and solar eclipses.

Mar 2016 - Current Astronomy on Tap - Chicago

Assisted in starting a Chicago chapter of Astronomy on Tap, a worldwide series of free astronomy-themed events held at local bars.

- Worked with event coordinators at local bars and breweries to design events.
- Wrote and delivered several talks, focusing on current events in astronomy.
- Wrote astronomy-themed trivia rounds for events.

Apr 2017 Guest Speaker at Haven Middle School

Gave a presentation to twelve classrooms of middle school (7th - 8th grade) students.

- Wrote a middle-school level talk on space telescopes, highlighting the cases of the *Hubble Space Telescope* and the *James Webb Space Telescope*.
- Fielded questions from students on various topics in astronomy.

Service and Memberships

Junior Member, American Astronomical Society (2014 - present)
Curriculum Committee Chair, NU Physics & Astronomy Graduate Student Council (2015 - present)
Organizer, Northwestern University Brown Bag Lunch Seminar Series (2014-2015)

Publications

Peer-Reviewed Journal Articles

Dirks, C.L., Meyer, D.M., "Temporal Variability of Interstellar Na I Absorption toward the Monoceros Loop", 2016, ApJ, 819, 45

Meeting Abstracts

Dirks, C.L., "HST Ultraviolet Spectroscopy of the Dusty, Molecular Gas in Planck Cold Clumps", 2018, AAS Meeting Abstract, 231

Dirks, C.L., Meyer, D.M., "Probing Planck Cold Clump Sightlines through HST STIS UV Spectroscopy", 2017, AAS Meeting Abstracts, 229, 340.32

Becker, V.R., **Dirks, C.L.**, Meyer, D.M., Cartledge, S.I.B., "HST STIS Observations of Interstellar Chlorine", 2017, AAS Meeting Abstracts, 229, 340.27

Dirks, C.L., Meyer, D.M., "Exploring the ISM Supershell Structure Toward the Jewel Box", 2015, AAS Meeting Abstracts, 225, 141.29

Meyer, D.M., **Dirks, C.L.**, Lauroesch, J.T., "A Survey of AU-Scale Na I Structure in the Diffuse ISM", 2015, AAS Meeting Abstracts, 225, 141.23

Software Skills

- **Programming Languages**

  Python - IPython, JuPyter, AstroPy, SciPy, NumPy
  C++
  SQL

- **Miscellaneous**

  git - source version control

References

Dr. David Meyer
Professor
Northwestern University
davemeyer@northwestern.edu

Dr. Laura Trouille
Sr. Director of Citizen Science
Adler Planetarium
trouille@zooniverse.org

Dr. Giles Novak
Professor
Northwestern University
g-novak@northwestern.edu