SOFIA KRAVIS

The University of Oklahoma
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Norman, OK 73069
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EDUCATION

The University of Oklahoma **Expected May 2028**
Doctor of Philosophy, Astrophysics; Master of Science, Engineering Physics

University of Illinois at Chicago **Conferred August 2022**
Master of Science, Physics
Completed 18 credit hour astronomy doctorate core curriculum at University of Chicago, 2021-2022

DePaul University **Conferred June 2020**
Bachelor of Science, Physics; Bachelor of Science, Mathematics; Bachelor of Arts, Chemistry
Minor: Geography
Study Abroad: Completed 24 credit hours at Monash University, Australia, Autumn 2017
Completed 15 credit hours in organic chemistry at Northwestern University, Summer 2018

CERTIFICATIONS

The University of Oklahoma **Completed May 2024**
Graduate Certificate, Finance
Completed graduate courses in investments, derivatives, corporate finance, international finance, and financial modeling

University of Illinois at Chicago **Completed August 2022**
Graduate Certificate, Geospatial Analysis and Visualization
Completed graduate courses in urban planning, cartography, and geographic information systems

RESEARCH EXPERIENCE

Astrodynamics Research Assistant **September 2022 – Present**
School of Aerospace and Mechanical Engineering, The University of Oklahoma
Probe conditions for particle orbit stability in double star systems, through use of numerical simulations. Incorporate perturbative effects including radiation pressure and general relativity. Initial conditions and simulation mechanics are determined through theoretical considerations. Use the University of Oklahoma OSCER supercomputer to run computations. Programming done using Python.

Particle Physics Research Assistant **January 2021 – July 2022**
Department of Physics, University of Illinois at Chicago
Collect data using the Fermi National Laboratory high-energy proton test beam on candidate sensors for the High Luminosity Upgrade of the Compact Muon Solenoid experiment at the Large Hadron Collider at CERN. Run Fermilab alignment software (Monicelli) and analysis software (Chewie) to process raw data. Study trends in pixel cluster size and shape for data collected across varying thresholds and test beam incident angles. Programming done using C++ and ROOT.

Astrophysics Research Assistant **June – November 2019**
Department of Physics and Astrophysics, DePaul University
Investigated whether the scale at which the Universe is isotropic and homogenous changes as a function of redshift through use of a two-point correlation function. Studied the change in amplitude of galaxy clustering as redshift is varied. Created simulations of galaxy clusters over changing redshift. Used data from the Sloan Digital Sky Survey. Programming done in MATLAB.

TEACHING EXPERIENCE

Astronomy Teaching Assistant **August 2022 – Present**
Department of Physics and Astronomy, The University of Oklahoma
Teach lab and discussion sessions for General Astronomy course, making use of the campus observatory to observe astrophysical objects with students. Grade upper level and graduate astronomy courses including Introductory Astrophysics, Stellar Astrophysics, Introduction to Research, and Advanced Observatory Methods. Use Canvas to relay student grade information and feedback.

Teaching Assistant Coordinator **August 2021 – August 2022**
Department of Physics, University of Illinois at Chicago
Coordinated with professor of General Physics I Classical Mechanics to set grading deadlines and discussion standards for teaching assistants. As main point of contact for teaching assistants, met weekly and maintained regular communication to enforce deadlines and provide teaching support. Regularly uploaded student assignments using Blackboard and created submission dropboxes using Gradescope.

Physics Teaching Assistant **August 2020 – August 2022**
Department of Physics, University of Illinois at Chicago
Lead laboratory exercises and discussion sessions for physics and astronomy courses. Promptly graded student lab manuals, discussion worksheets, homework, and exams and submitted grades using Blackboard and Gradescope. Maintained frequent communication with students to ensure their success. Courses taught included General Physics I Classical Mechanics, Mechanics for Life Sciences, and Introductory Astronomy.

Supplemental Instruction Leader **September 2019 – August 2020**
Center for Teaching and Learning, DePaul University
Planned and conducted biweekly supplemental instruction sessions for students enrolled in precalculus. During sessions, facilitated active learning techniques to improve student comprehension. Completed quarterly projects to aid in promotion of student success, including creating feedback forms for students to select topics to review in future sessions, analyzing three years of supplemental instruction leader logs to determine which topics are most difficult in each supplemental instruction class, and providing training for new supplemental instruction leaders on effect of instructor engagement on student success.

Math Grader **March 2019 – March 2020**
Department of Mathematical Sciences, DePaul University
Worked in collaboration with professors to grade student homework. Graded work consistently and reasonably, demarking specific trouble areas in the homework and providing swift feedback. Courses taught included Calculus I-III and Multivariable Calculus I-II.

Math Tutor **September 2018 – August 2020**
Department of Mathematical Sciences, DePaul University
Taught and explained math concepts to undergraduate students, providing tailored instruction to assist with subject mastery. Worked with online homework sites and programs including MyLabs Plus, WebAssign, and Maple. Subjects taught included algebra, precalculus, trigonometry, calculus, quantitative reasoning, discrete mathematics, multivariable calculus, linear algebra, ordinary differential equations, partial differential equations, mathematical modeling, probability and statistics, and numerical analysis.

PUBLICATIONS

Lasky-Headrick, S., Merguizo-Sanchez, D. (2024, August). The Dynamics of Particles in Very Close Binary Star Systems. American Astronautical Society Astrodynamics Specialist Conference. Conference Proceedings.

Lasky-Headrick, S., Merguizo-Sanchez, D. (2024, January). On the Existence and Stability of Rings around Small Bodies. American Institute of Aeronautics and Astronautics SciTech Forum and Exposition. Conference Proceedings. doi:10.2514/6.2024-0421

Lasky-Headrick, S., Nimmo, C., Palmer, V., Thomas, A.R., Merguizo-Sanchez, D. (2024, January). Mercurial Array of Probing Seismographs. American Institute of Aeronautics and Astronautics SciTech Forum and Exposition. Conference Proceedings. doi:10.2514/6.2024-1056

Lasky-Headrick, S. (2022, August). Performance Before and After Irradiation of 3D Silicon Sensors for the HL-LHC CMS Tracker. University of Illinois at Chicago. Thesis. doi:10.25417/uic.21516741.v1

PRESENTATIONS

ORAL PRESENTATIONS:

Lasky-Headrick, S. (2024, August). The Dynamics of Particles in Very Close Binary Star Systems. Astrodynamics Specialist Conference, Broomfield, CO.

Lasky-Headrick, S. (2024, January). On the Existence and Stability of Rings around Small Bodies. SciTech Forum and Exposition, Orlando, FL.

Lasky-Headrick, S., Nimmo, C., & Thomas, A.R. (2024, January). Mercurial Array of Probing Seismographs. SciTech Forum and Exposition, Orlando, FL.

ORAL AND POSTER PRESENTATION:

Lasky-Headrick, S., & Muñoz, A. (2019, November). The Scale of the Cosmological Principle. Undergraduate Research Showcase, DePaul University, Chicago, IL.

TECHNICAL SKILLS

Programs: C++, Maple, Mathematica, MATLAB, Python, R, ROOT
Operating Systems: Linux, Mac, Windows
Software: Adobe Photoshop, InDesign, and Illustrator; Microsoft Excel, Word, PowerPoint, and Outlook; SketchUp; SPSS; Gaussian; Geographic Information Systems; Igor Pro
Learning Management Systems: Blackboard, Canvas, Gradescope
Laboratory Skills: Centrifugation, Column Chromatography, High-Performance Liquid Chromatography, Thin Layer Chromatography, Gel Electrophoresis, Mass Spectrometry, Raman, Fluorescence Spectroscopy, IR Spectroscopy, UV-Visible Spectroscopy, ^{1}H and ^{13}C Nuclear Magnetic Resonance Spectroscopy, Titration, Rotary Evaporation

CONFERENCE ATTENDANCE

2024 National Astrodynamics Specialist Conference, Broomfield, CO.
2024 National SciTech Forum and Exposition, Orlando, FL.
2019 Regional Conference for Undergraduate Women in Physics, University of Chicago, Chicago, IL.
2019 National Conference for the Society for the Advancement of Chicanos and Native Americans in Science, University of Hawaii, Honolulu, HI
2018 Regional Conference for Undergraduate Women in Physics, Northwestern University, Chicago, IL.

VOLUNTEERING

Litter Patrol Member **June 2022 – Present**
Chickasaw National Recreation Area
Responsible for removal of litter in the park trough use of trash picker and bag. Litter picked up along trails, picnic areas, campgrounds, and off-trail in the wilderness and in creeks. Creek litter patrol performed through use of water shoes and dry bag. Maintain record of park trails using Hiking Project.

National Map Corps Member **May 2022 – Present**
United States Geological Survey
Use aerial imagery base layers and internet research to verify, update, create, and delete structural points in an online mapping editor in order to provide the Nation with accurate mapping information. Structural points may be schools, hospitals, or other important places in the US, Puerto Rico, and the US Virgin Islands.

Trail Crew Member **February 2021 – June 2022**
Indiana Dunes National Park
Responsible for hiking trails and reporting any issues, such as downed trees, flooding, erosion, amazed or missing signs, and damaged boardwalks and stairs. Assist in trail maintenance such as sawing logs, lopping branches, and repairing infrastructure. Identify and report invasive species along trails.

Tutoring Program Coordinator **February 2018 – March 2020**
Bernhard Moos Elementary School, Chicago Public Schools
Coordinated a tutoring program between DePaul University and Moos Elementary by recruiting DePaul students as tutors and planning tutoring sessions with Moos faculty. Assisted middle school age students with homework and classwork. Mentored students on their life goals, such as college or employment plans.

HONORS AND ACTIVITIES

CLUBS AND ACTIVITIES:
OU Graduate Physics Student Initiative (2022–Present)
OU Lunar Sooners (2022–Present)
OU Astronomy Journal Club (2022–Present)
OU Graduate Student Senate (2022–2023)—Physics and Astronomy student senator
UIC Astronomy Club (2020–2022)—Secretary (2021–2022)
UIC Physics Club (2020–2022)
DePaul Astrophysical Society (2019–2020)
Society for the Advancement of Native Americans and Chicanos in Science (2018–2020)
Society of Physics Students (2018–2020)—Secretary of DePaul Chapter (2019–2020)
DePaul Society of Women in Physics (2018–2020)
DePaul Mathematics Club (2017–2020)—President (2019–2020)
National Society of Collegiate Scholars (2017–2020)—Vice President of DePaul Chapter (2018–2020)
DePaul Admissions and Student Hospitality (2017–2020)—Hosted prospective students
DePaul Model United Nations (2017–2019)—Organized Crosstown Classic Conference in Fall 2018

SCHOLARSHIPS:
OU Physics and Astronomy Teaching Assistantship Full Tuition Waiver Awarded 2022
UIC Physics Teaching Assistantship Full Tuition Waiver Awarded 2020-2022
Briefs-Waters Memorial Endowed Scholarship Awarded 2020
DePaul Mathematics Scholarship Awarded 2020
DePaul Presidential Scholarship Awarded 2016-2020

HONORS AND AWARDS:
DePaul College of Science in Health Outstanding Student in Mathematical Sciences Award 2020
Virginia Tech Regional Mathematics Contest Score of 1, 2019
William Lowell Putnam Math Competition Score of 2 (2018), Score of 1 (2019)
DePaul College of Science and Health Pathways Honors Program (2016–2020)
DePaul University Dean's List Autumn 2016, Spring 2017, Spring 2018, Winter 2018, Spring 2019, Autumn 2019, Winter 2020, Spring 2020
DePaul Department of Residential Education Academic Achievement Award Autumn 2016

AFFILIATIONS

American Institute of Aeronautics and Astronautics

LANGUAGES

English Native level, **Spanish** Proficient level, **Russian** Intermediate level, **German** Intermediate level