

## University of Maryland – Department of Astronomy

### Undergraduate Honors Research Projects

<b>TITLE</b>	<b>STUDENT</b>	<b>ADVISOR(S)</b>	<b>YEAR</b>
<b><i>Turbulent Motion in Molecular Cores: Perseus B1, L1451, L1455</i></b>	Maureen Clark	Lee Mundy	2024
<b><i>Qualifying High Extinction Levels in Molecular Clouds by the Introduction of Spitzer IRAC Data</i></b>	Nicholas Gobs	Tracy Huard, Lee Mundy	2024
<b><i>Examining Self-Consistent Hot Jupiter Emission Spectra Models With and Without Aerosols</i></b>	Madeline Lessard	Eliza Kempton	2024
<b><i>Using the JWST NIRCam and MIRI Imagers to Constrain Dust Properties in Star-Forming Galaxies</i></b>	Steven Shockley	Sylvain Veilleux	2024
<b><i>Investigating Tropical Cyclones on TRAPPIST-1e: Dependence on Atmospheric CO<sub>2</sub></i></b>	Cole Smith	Tad Komacek	2024
<b><i>Star-Forming Regions and Young Stellar Objects within Dark Molecular Cloud L723</i></b>	Lacey Allee-Press	Lee Mundy	2023
<b><i>The Kinematic and Dynamical Properties of HBC 494's Wide-Angle Outflows</i></b>	Austen Fourkas	Lee Mundy	2023
<b><i>Star Cluster Formation and Survival in the First Galaxies</i></b>	Fred Garcia	Massimo Ricotti	2023
<b><i>The Coupled Impacts of Atmospheric Composition and Obliquity on the Climate Dynamics of TRAPPIST-1e</i></b>	Tobi Hammond	Tad Komacek	2023
<b><i>Bimodal Star Formation in Simulations of Strongly Magnetized Giant Molecular Clouds</i></b>	Ronan Hix	Massimo Ricotti	2023
<b><i>Dust Extinction in the Cosmic Cliffs: Insights from Early-Release JWST Observations</i></b>	Shreya Karthikeyan	Tracy Huard, Lee Mundy	2023
<b><i>Towards Globular Cluster Formation Channel Constraints from Tidal Disruptions by Intermediate-Mass Black Holes</i></b>	Nicholas Magnelli	Cole Miller	2023

<i>A Relationship between Extinction and Far-Infrared Optical Depth in Molecular Clouds</i>	Rachel Weller	Lee Mundy	2023
<i>Analysis of Assumptions and Calculations Relevant to Binary Black Holes in AGN Accretion Disks</i>	Kate Futrowsky	Cole Miller	2022
<i>Eight Outbursting Event of Comet 7P/Pons-Winnecke</i>	Ky Hyunh	Michael Kelley, Jessica Sunshine	2022
<i>Climatological Effects on Transit Spectroscopic Measurements of TRAPPIST-13</i>	Yoav Rotman	Thaddeus Komacek	2022
<i>Characterizing HII Regions of the Small Magellanic Cloud</i>	Daniel Stapleton	Elizabeth Tarantino, Alberto Bolatto	2022
<i>Analyzing Two SEP Events Using Proton Flux Data from STEREO A/B, SOHO, and SolO</i>	Lucy Wilkerson	Surja Sharma	2022
<i>Finding the Masses of Molecular Clouds Using Herschel Emission Data</i>	Lea Feuillet	Lee Mundy	2021
<i>Ghostly Halos: The Need to Look Deeper</i>	Kathleen Hamilton-Campos	Massimo Ricotti	2021
<i>Simulating the propagation speed of a seismic signal through a granular medium</i>	Katie Hancock	Derek Richardson	2021
<i>Joint Parameter Inference Derivation from Segmented Inference from Galactic Binary LISA Data Analysis</i>	Benjamin Johanson	John Baker, Cole Miller	2021
<i>Polarimetric Analysis of Comets 2I/Borisov and C/2011 KP36 (Spacewatch)</i>	Renee Kirk	Ludmilla Kolokolova, Jessica Sunshine	2021
<i>A Novel Comb Filter for Type Ia and IIp Supernovae Photometric Redshift Estimations</i>	Scott Martin	Drake Deming	2021
<i>Exploring the Formation of Primordial Black Holes Using the Fast Fourier Transform and Two Point Correlation Function</i>	Valentina Petroni	Massimo Ricotti	2021
<i>Microphysics of Localized Structures in the Magnetosphere from Multispacecraft MMS Data</i>	Elizabeth Wraback	Jason Shuster, Surja Sharma	2021

<b><i>The Detectability of Plausible Atmospheric and Surface Compositions of LHS 3884b with JWST</i></b>	Emily Whittaker	Matej, Malik, Eliza Kempton	2021
<b><i>Multi-Method Investigation of Small-Mass Meteors Using Optical, Radar, and Spectral Observations</i></b>	Emma Mirizio	Robert Michell, Derek Richardson	2020
<b><i>Methodologies for Analyzing and Evaluating Models of Quasar Variability</i></b>	Jacob Golomb	Cole Miller	2020
<b><i>Signatures of Clouds in Hot Jupiter Atmospheres: Modeled High Resolution Emission Spectra from 3D General Circulation Models</i></b>	Caleb Harada	Eliza Kempton	2020
<b><i>Investigations into Blazar Flare Mechanics</i></b>	Claire Hinrichs	Richard Mushotzky	2020
<b><i>Calibration and Data Simulation for RIMAS, the Rapid Infrared Imager-Spectrometer</i></b>	Jillian Kunze	Alexander Kuttyrev, Sylvain Veilleux	2020
<b><i>Exploring Spatial and Temporal changes in Hydration on the Lunar South Pole</i></b>	Kristen Laferriere	Lori Feaga, Jessica Sunshine	2020
<b><i>Probing Hot Jupiter Temperatures with TESS Photometry</i></b>	Ryan Morris	Drake Deming	2020
<b><i>Cross-Dispersion System for an Integrated Photonic Spectrograph</i></b>	Meghna Sitaram	Sylvain Veilleux	2020
<b><i>Developing a New Software Pipeline to Spectroscopically Classify BCUs</i></b>	Ryan Skoletsky	Roopesh Ojha, Richard Mushotzky	2020
<b><i>Using Granular Dynamics Simulations with Cohesion to Create Fluffy Regolith</i></b>	Matthew Wilkin	Derek Richardson	2020
<b><i>K2 and Spitzer Transits of Four Super-Earth Exoplanets</i></b>	Alison Duck	Drake Deming	2019
<b><i>Dust Abundances in Molecular Clouds</i></b>	Benjamin Flaggs	Tracy Huard, Lee Mundy	2019
<b><i>K2 Legacy Data: Killing Planet Candidates with EVEREST and Searching for Candidates with Halo Photometry</i></b>	Michael Greklek-McKeon	Drake Deming	2019
<b><i>A New Method of Fitting Extinction Toward Molecular Clouds</i></b>	Kevin Hall	Lee Mundy	2019

<i>Search for Orbital Decay in WASP-126b and WASP-18b</i>	Justin Harrell	Drake Deming	2019
<i>Ionization Mechanisms in Quasar Outflows</i>	Jason Hinkle	Sylvain Veilleux	2019
<i>Mapping Water-Ice and Silicates Using Broadband Photometry of Background Stars</i>	Melanie Rowland	Tracy Huard, Lee Mundy	2019
<i>Exploring Star Formation in Five Compact Cores</i>	Emma Schwartzman	Lee Mundy, Isabelle Joncour	2019
<i>Distribution of Exoplanet Radii Determined from TESS Data</i>	Edward Williams	Drake Deming	2019
<i>Tidal Stresses in the 2029 Close Encounter with Earth of Proposed APEX Mission Target 99942 Apophis</i>	Joseph DeMartini	Derek Richardson	2018
<i>Removing Terrestrial Alteration from Meteorite Sample GRA 06128/9 Via Chemical Leaching</i>	Anna Engle	Jessica Sunshine	2018
<i>Assessing the Quality of Grid-Based Gravitational Fields</i>	Mark Hubbert	Doug Hamilton	2018
<i>Effects of Anisotropic Viscosity on the Evolution of AGN Bubbles in Galaxy Clusters</i>	Matthew Kingsland	Karen Yang, Richard Mushotzky	2018
<i>Asteroids Under Stress: Constraining Strength and Evolution Through Spin-Up Simulations</i>	Andrew Leisner	Derek Richardson	2018
<i>Exploring Shear-free Ringlet Formation with Direction Simulations of Saturn's A and B Rings</i>	Yuxi (Lucy) Lu	Derek Richardson	2018
<i>Finding Escaper YSOs in the Serpens Cloud Complex</i>	Roxana Popescu	Isabelle Joncour, Lee Mundy	2018
<i>Prospects for Ground-Based Detection and Follow-Up of TESS-Discovered Planets</i>	Matthew Varakian	Drake Deming	2018
<i>Sky Localization, Electromagnetic Follow-up, and Cosmology for Third Generation Gravitational Wave Detectors</i>	Shreya Anand	Leo Singer, Cole Miller	2017
<i>Suppression of AGN-Driven Turbulence by Magnetic Fields in a Magnetohydrodynamic Model of the Intracluster Medium</i>	Christopher Bambic	Cole Miller, Chris Reynolds	2017

<b><i>Characterizing Hot Jupiters with Secondary Eclipses: A Statistical Study Using Pixel-Level Decorrelation</i></b>	Emily Garhart	Drake Deming	2017
<b><i>Primordial Black Holes as Dark Matter Candidates: A Numerical Model of Primordial Black Hole Binary Formation and Evolution</i></b>	Victor Meszaros	Massimo Ricotti	2017
<b><i>Heating in Intracluster Gas via Gravity Waves</i></b>	Xiao (Jennifer) Liang	Chris Reynolds	2016
<b><i>Confirming Variability in the Secondary Eclipse Depth of the Super-Earth 55 Cnc e</i></b>	Patrick Tamburo	Drake Deming	2016
<b><i>Library of Tools for Manipulating 3-D Grids Including the Production of Numerically Determined Gravitational Fields</i></b>	Harry Arnold	Doug Hamilton	2015
<b><i>Tracing Exotic Photon Trajectories around Black Holes</i></b>	Allison Bostrom	Cole Miller, Chris Reynolds	2015
<b><i>Tracing Dense Gas in NGC 1333</i></b>	Kenneth Koester	Lee Mundy	2015
<b><i>Testing and Exploration of the Rotating Neutron Star Code</i></b>	Justin Tervala	Cole Miller	2015
<b><i>Assessing Flat Field Quality at the University of Maryland Observatory</i></b>	David Blankenship	Andrew Harris	2014
<b><i>Global Variations in Lunar Highlands Composition</i></b>	Lily Mannoia	Jessica Sunshine	2014
<b><i>The Formation of the Kepler-36 Planetary System</i></b>	Thomas Rimlinger	Doug Hamilton, Derek Richardson	2014
<b><i>Characterizing Star Formation in the Perseus Cloud</i></b>	Lauren Bittle	Lee Mundy	2013
<b><i>Numerical Studies of Stochastically Perturbed Accretion Discs</i></b>	Philip Cowperthwaite	Chris Reynolds	2013
<b><i>Formation Scenarios and Evolution of the Milky Way's Old Globular Cluster Population</i></b>	Harley Katz	Massimo Ricotti	2013
<b><i>The Modeling and Observation of Exoplanetary Transits</i></b>	Nolan Matthews	Drake Deming	2013
<b><i>Neutron Star Radii: Theoretical Tests of Frequency-Dependent Light curve Analysis</i></b>	Bryan Holler	Cole Miller	2012

<i>Numerical Modeling of Rotational Fission of Contact Binary Asteroids</i>	Brett M. Morris	Derek Richardson	2012
<i>Modes of Two Planet Migration via Planetesimal Scattering using HNBody</i>	James Keane	Douglas P. Hamilton	2011
<i>Tracking Energetic Particle Trajectories in Simulations of Collisionless Magnetic Reconnection</i>	Kalman Knizhnik	Massimo Ricotti	2011
<i>Tilting Uranus—Toward a Collisionless Model</i>	Lauren Woolsey	Douglas P. Hamilton	2011
<i>Measurements of the Mass and Radius of the Neutron Star 4U 1636-53 Using Millisecond Brightness Oscillations during Thermonuclear X-ray Bursts</i>	Ryan Abrahams	Cole Miller	2010
<i>Mass and Radius Constraints of 4U 1728-34</i>	Brian Prager	Cole Miller	2010
<i>Mass Segregation around Supermassive Black Holes</i>	Ashley King	Cole Miller	2009
<i>Resonant Origins for Pluto’s High Inclination</i>	Curran Muhlberger	Douglas P. Hamilton	2008
<i>Calibration of the Baryonic Tully-Fisher Relation Using Gas Dominated Galaxies</i>	David V. Stark	Stacy McGaugh	2008
<i>A Chandra X-ray Study of NGC 5775</i>	Diana Hanson	Chris Reynolds	2007
<i>Dynamics of Uranian Dust Sheets</i>	Alexandra Lockwood	Douglas P. Hamilton	2007
<i>Searching for Low Surface Brightness Galaxies</i>	Daniel Schwartz	Stacy McGaugh	2007
<i>Magnetorotational Instability: Theory and Experiment in Accretion Disk Dynamics</i>	Barbara Brawn	Eve Ostriker	2006
<i>CCD Photometry of the Globular Cluster ESO452-SC11</i>	Alexis Cornish	Suchitra Balachandran	2006
<i>Numerical Experiments with Rubble Piles: Critical Breakup Densities for Oblate Spheroids</i>	Pradeep Elankumaran	Douglas Hamilton	2006
<i>Dust Transfer Between Earth and Mars</i>	Paul Ries	Douglas Hamilton	2005
<i>A Computational Study of Core Rotation in Globular Clusters</i>	Mia Bovill	Cole Miller	2004
<i>Optical Monitoring of Blazars MRK421 and PKS1406-076</i>	Jessica Ennis	Christopher Reynolds	2004

<i>An Analytical Approach to the Distribution of Oort Cloud- Originating Comets</i>	Jeremy Miller	Douglas Hamilton	2004
<i>The Orbital Evolution of the Galilean Satellites</i>	Kaveh Pahlevan	Douglas Hamilton	2004
<i>Determination of the Density of Jupiter's Moon Amalthea</i>	Robyn Sanderson	Douglas Hamilton	2003
<i>Interaction of a Planar Shock Wave with Cloud Material in the Interstellar Medium</i>	Eric Schindhelm	James Stone, Douglas Hamilton, Cole Miller	2003
<i>Orbital Dynamics of Asteroidal Dust</i>	Patrick Taylor	Douglas Hamilton	2003
<i>Undergraduate Comprehension of Cosmology by Gender and Informal Education</i>	Elizabeth Miller	Grace Deming	2002
<i>Dynamical Evolution of the Jovian Satellite System</i>	Amada Proctor	Douglas Hamilton	2002
<i>A Superstar Cluster in NGC 3690</i>	Stacy Teng	Lee Mundy	2002
<i>Cosmological Constraints from Rotation Curves of Low Surface Brightness Galaxies</i>	Michael Barker	Stacy McGaugh	2001
<i>Optical and Far-Ultraviolet Morphology of Galaxies</i>	Melanie Freed	Sylvain Veilleux	2001
<i>Origins of the Terrestrial Planets: Numerical Simulations to Explore Planetary Formation</i>	Amir Caspi	Douglas Hamilton	2000
<i>Seeking Evidence of Frame Dragging in Active Galactic Nuclei</i>	Sheri Calvo	Wan Chen	1999
<i>Emission Line Observations of Comet Hale-Bopp</i>	Nathaniel Doane	Michael A'Hearn	1999
<i>Dusty Rings around Saturn</i>	Linda Harden	Douglas Hamilton	1998
<i>Modeling of CO Line Emission from Circumstellar Disks</i>	Stephanie McLaughlin	Lee Mundy	1998
<i>An Infrared Study of Saturn's Rings during the Ring Plane Crossing of 1995</i>	Lori Lanier	Douglas Hamilton	1997