

RESEARCH INTERESTS

My research aims to better understand the relationship between star formation on parsec scales (star clusters and star-forming regions) and the evolution of galaxies in the local Universe. I have found and characterized relationships between host galaxies and both star clusters and star-forming regions. Currently, I am leading the largest area ($\sim 3\pi$) emission-line galaxy survey to help focus the search for electromagnetic counterparts to gravitational wave events. In addition, I am building a large sample of extreme galaxies to better understand star formation on global galaxy scales.

EDUCATION

Ph.D. in Astrophysics/Physics, U OF WYOMING August, 2015
B.S. in Astrophysics, U OF MINNESOTA May 2008
B.S. in Physics, U OF MINNESOTA May 2008
B.S. in Chemistry, U OF MINNESOTA August 2004

RESEARCH EXPERIENCE

CALTECH
Postdoctoral Scholar Sept 2015 – Present

- Local Collaborators: Mansi Kasliwal & Janice Lee
- Lead of the Census of the local Universe (CLU) H α galaxy survey covering 3π of the sky
- Constructed a catalog of nearby galaxies to help search for EM counterparts to aLIGO triggers
- Lead of star clusters in LEGUS dwarf galaxies

UNIVERSITY OF WYOMING
Graduate Student 2009 – Aug 2015

- Advisor: Daniel Dale
- Identify star-forming regions in 258 LVL galaxies
- Discovered a relationship between the distributions of star-forming regions and galaxy environment
- Completed optical photometry for LVL
- Measured dust and physical properties of LVL galaxies
- Star cluster identification in LEGUS dwarf galaxies
- Expanded undergraduate thesis project to star clusters in all ANGST dwarf galaxies

Academic Professional Research Scientist July 2008 – Aug 2009

- Supervisor: Daniel Dale
- All data reduction for the 5 year H α galaxy survey (WYSH)
- Observations of H α and optical imaging for WYSH (8 nights a month for 1.5 years)

MCDONALD OBSERVATORY Summer 2007
REU Summer Intern

- Advisor: Mathew Shetrone
- Derived α -abundances of the Leo II dwarf galaxy

UNIVERSITY OF MINNESOTA Sept 2006 – June 2008
Undergraduate Researcher

- Advisor: Evan Skillman
- Identify and derive properties of star clusters in one ANGST galaxy

AWARDS/FUNDING

NASA-HST “Dwarfs and Giants: Massive Stars in Little Dwarf Galaxies” as Co-PI: \$1,000 (2017-2019)
NASA-HST AR-14285 “The Young Star Groups in Dwarf Galaxies” as Co-PI: \$10,000 (2016-2018)
NASA-AURA “LEGUS: Legacy ExtraGalactic UV Survey” as Co-PI: \$36,749 (2014-2015)
NASA-WY Space Grant, Graduate Fellowship - \$26,000 (2010-2011)
NASA-AURA “ANGST: ACS Nearby Galaxy Treasury Survey” as Co-PI: \$23,000 (2009 – 2010)

PROFESSIONAL COLLABORATIONS

ZTF – Host galaxy science for transient discoveries (2017-Present)
PTF/iPTF – Lead of CLU, H α galaxy survey covering 3π of the sky (2016 – Present)
LEGUS – Lead of star clusters in LEGUS dwarf galaxies (2015 – Present)
LVL – Responsible for star-forming regions in all LVL galaxies (2012 – 2016)
ANGST – Responsible for star clusters in ANGST dwarf galaxies (2008 – 2012)

SELECTED PUBLICATIONS

- **Cook+2018**, in Prep, “Star Clusters Catalogs in the LEGUS Dwarf Galaxies”
- Hunter, Gallardo, Zhang, Adamo, **Cook**, +21 authors, **2018**, *ApJ*, “A Study of Two Dwarf Irregular Galaxies with Asymmetrical Star Formation Distributions”
- Abbott+**2017**, *ApJL*, “Multi-messenger Observations of a Binary Neutron Star Merger”
- Kasliwal, Nakar, Singer, Kaplan, **Cook**, +73 authors, **2017**, *Science*, “Illuminating gravitational waves: A concordant picture of photons from a neutron star merger”
- **Cook+2017**, Submitted, “Census of the Local Universe (CLU) I: Characterization of Galaxy Catalogs from Preliminary Fields”
- Adamo, Ryon, Messa, Kim, Grasha, **Cook**, +51 authors, **2017**, *ApJ*, “Legacy ExtraGalactic UV Survey with The Hubble Space Telescope: Stellar Cluster Catalogs and First Insights Into Cluster Formation and Evolution in NGC 628”
- Dale, **Cook+2016**, *ApJ*, 837, 1, “Updated 34-band Photometry for the Sings/KINGFISH Samples of Nearby Galaxies”
- Kasliwal+**2016**, *ApJL*, 824, 2, “iPTF Search for an Optical Counterpart to Gravitational-wave Transient GW150914”
- **Cook+2016**, *MNRAS*, 462, 4, “The Connection Between Galaxy Environment and the Luminosity Function Slopes of Star-Forming Regions”
- **Cook+2014**, *MNRAS*, 245, 1, “Spitzer Local Volume Legacy (LVL) SEDs and Physical Properties”
- **Cook+2014**, *MNRAS*, 245, 1, “The Spitzer Local Volume Legacy (LVL) Global Optical Photometry”
- **Cook+2014**, *MNRAS*, 245, 1, “Empirical ugr-iUBVRc Transformations for Galaxies”
- **Cook+2012**, *ApJ*, 751, 100, “The ACS Nearby Galaxy Survey Treasury. X. Quantifying the Star Cluster Formation Efficiency of Nearby Dwarf Galaxies”
- Cannon+**2011**, *ApJ*, 735, 1, “The M81 Group Dwarf Irregular Galaxy DDO165.II. Connecting Recent Star Formation with ISM Structures and Kinematics”
- Dale+**2010**, *ApJ*, 712, 189, “The Wyoming Survey for H α . II. H α Luminosity functions at $z \sim 0.16$, 0.24, 0.32, and 0.40”
- Shetrone+**2008**, *AJ*, 137, 62, “Chemical Abundances of the Leo II Dwarf Galaxy”

OBSERVING**Total Observing: 370+ nights****Cerro Tololo Inter-American Observatory (CTIO), La Serena, Chile**

- Blanco 4m Telescope -5 nights, NEWFIRM near-infrared imager

W. M. Keck Observatory, Kamuela, HI

- Keck-I 10m Telescope -3 nights, Multi-Object Spectrograph for Infrared Exploration (MOSFIRE)

McDonald Observatory, U of Texas at Austin

- HET 11m Telescope -1 night, Low Resolution Spectrograph (LRS)
- Smith 2.7m Telescope -2 nights, Large Cass Spectrometer (LCS)
- Struve 2.1m Telescope -12 nights, Cass Echelle (CE) spectrograph
- 0.8m Telescope -6 nights, Prime Focus Corrector (PFC) imager

Palomar Observatory, Caltech

- Hale 5.1m Telescope – 5 nights, Wide-field Infrared Camera (WIRC)
- Hale 5.1m Telescope – 20 nights, Double Spectrograph (DBSP)

Steward Observatory, U of Arizona

- BOK 2.3m Telescope – 15 nights, 90 prime imager

Wyoming InfraRed Observatory (WIRO), U of Wyoming

- 2.3m Telescope – 300+ nights, Prime Focus Camera (PFC) imager
- 2.3m Telescope – 4 nights, Longslit Spectrograph

COMPUTER AND PROGRAMMING SKILLS**Advanced**

- IDL
- IRAF
- LaTeX
- Python

Intermediate

- HTML
- psqI/sql
- cgi
- Shell scripting

Basic

- C/C++

PROFESSIONAL SERVICES

ZTF summer school – Co-Organized, Summer 2017

Caltech Tea Talks – Co-Organizer, 2016-2017

JWST Nearby Galaxies Workshop – member of Local Organizing Committee, Jan 2017

PTF summer school – assisted with python workshop, Summer 2016

Member – Internal Caltech TAC (Palomar and Keck), 2016

Referee – Monthly Notices of the Royal Astronomical Society (MNRAS), 2013 – Present

ORAL PRESENTATIONS

- “Census of the local Universe (CLU): Preliminary Fields”
• **Caltech** (2017), **U of Wisconsin – Milwaukee** (2016, 2017)), **AAS Meeting #231** (2018)
- “Star Clusters in LEGUS Dwarf Galaxies”
• **Sexten, Italy** (2017), **AAS Meeting #229** (2017)
- “Spitzer Local Volume Legacy (LVL) Star-Forming Regions: Luminosity Functions”
• **U of Wisconsin – Milwaukee** (2016), **Caltech/IPAC** (2016), **StSci** (2016)
- “Spitzer Local Volume Legacy (LVL) Dust Properties in Low-Mass Galaxies”
• **Caltech/IPAC** (2015), **StSci** (2014), **U of Arizona** (2014)
- “Clustered Star Formation in Nearby Dwarf Galaxies”
• **Denver University** (2013), **U of Minnesota** (2013), **Macalester College** (2013)

TEACHING

- CALTECH**
Co-Coordinator, ZTF Undergraduate Research Summer School June 2017
• Organized Observatory tours and hands-on python tutorials
- UNIVERSITY OF WYOMING**
Instructor, Survey of Astronomy (ASTRO 1050) Summer 2013
• Developed studio-style class; combined lecture and lab format
• Received the highest evaluation in all teaching related categories
- Substitute instructor, graduate level interstellar medium (ISM) course** 1 wk, Fall 2012
• Presented lectures on graduate level course material
• Instructed class in short journal article presentations.
- Substitute instructor, graduate level cosmology course** 1 wk, Fall 2013
• Presented lectures on graduate level course material
- Graduate Teaching Assistant, Survey of Astronomy** 2009-2010
• Led laboratories utilizing inquiry-based strategies
- Physics at Night Tutor** 2009 - 2012
• Assisted students with homework problems in all levels of physics
- UNIVERSITY OF MINNESOTA**
Undergraduate Teaching Assistant, Introduction to Astronomy 2007-2008
• Led weekly laboratories for introductory astronomy class.

MENTORING

- Bethany Sutter (Caltech Undergraduate Student) Summer, 2017
• Improved color-color selection cuts for extreme galaxies found in CLU
• Poster presentation at SURF symposium, Caltech
- Jessica Sutter (U of Wyoming Graduate Student) Summer, 2016
• Automated Determination of CLU Galaxy Properties from Spectroscopic Observations
• Poster presentation at AAS Meeting #229, 428.05
- Enia XH (Lafayette College Undergraduate Student) Summer, 2016
• Finding Nova Shells Around Cataclysmic Variable Stars in PTF Data
• Xhakaj et al. (2017; submitted)

PUBLIC OUTREACH

- CALTECH**
• Presentation on finding the EM counterpart to GW170817, Nov 2017
• Panelist for AAS press event at Palomar Observatory, January 2016
• Conducted public and private tours of Hale telescope at Palomar Observatory, 2015-Present
- U OF WYOMING**
• AAS Chambliss judge, Seattle, WA, January 2015
• Astronomy career presentation, 1st graders, Summer 2013
• Judge at Junior Science and Humanities Symposium, March 2012, 2013, 2014, 2015
• Judge for Wyoming State Science Fair, March 2011, 2013, 2014
• Wyoming Astro-Camp supernovae presentation and demonstration (Summer 2010, 2011)
• Conducted star parties and physics demonstrations at the Wyoming State Science Fair (2010-2015)
• Conducted private & public tours of the Wyoming InfraRed Observatory (WIRO) (2008-2015)
- MCDONALD OBSERVATORY**
• Assisted with star parties including a constellation tour (Summer 2007)

**PROFESSIONAL
REFERENCES**

Dr. Mansi Kasliwal, Assistant Professor, Caltech
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