Kathleen Eckert, Ph.D.

University of Pennsylvania
Department of Physics & Astronomy
209 S 33rd St. Philadelphia, PA 19104

keckert@sas.upenn.edu | +1 (804) 512-4925 (c)
Website: https://keckert7.github.io/
Github: github.com/keckert7

Education

University of North Carolina at Chapel Hill
Ph.D., Physics — 2016
Dissertation Title: *A Mass Census of the Nearby Universe with the RESOLVE Survey*
Dissertation Advisor: Sheila Kannappan
M.S., Physics — 2013

University of Pennsylvania
B.A., Physics *cum laude* — 2008

Current Position

University of Pennsylvania
Postdoctoral Fellow — 2016 – present
Project: Developing new estimators of shape measurement and shear estimation for large galaxy surveys
Advisor: Gary Bernstein

Research Experience

The RESOLVE Survey — 2009 – present
- Planned and led kinematic observations across four telescopes
- Lead author of three refereed papers and coauthor of 6 papers
- PI of three awarded proposals
- Developed new statistical technique to interpret censored data

The Euclid Survey — 2016 – present
- Developing and implementing BFD shear measurement method within Euclid Development Environment
- Performing sensitivity testing of shear measurement methods

The Dark Energy Survey — 2016 – present
- Implementing BFD shear measurement method for DES Y3 data
- Performing validation tests with Balrog and image simulations groups

Awards

Fellowships

- Lovick P. Corn Dissertation Completion Fellowship — 2015 – 2016
- North Carolina Space Grant — 2015
- Sigma Xi Grant-in-Aid of Research — 2012
- North Carolina Space Grant — 2010 – 2011
- Sigma Xi Grant-in-Aid of Research — 2010
- Board of Governor's Fellowship in Science and Technology — 2008 – 2009

Telescope Proposals

- JVLA, 30.9 hours *An HI view of Quenching in Nascent Groups* (PI) — 2016
- AAT + KOALA IFU, 3 nights *Dynamical Masses of Gas-rich Dwarf Galaxies for the RESOLVE Velocity Function* (PI) — 2014
- Blanco + DECam, 1 night *The Low Mass End of the Baryonic Mass Function in Two Extreme Environments* (PI) — 2013
- co-I on 20+ proposals for SOAR, SALT, Arecibo, GBT, AAT, ALMA, and Gemini telescopes

Teaching Experience

University of Pennsylvania

- Guest Lecturer for Astronomy 001 — 2018

University of North Carolina at Chapel Hill

- Graduate Assistant to CAP REU program — 2015
- Teaching Assistant for Astronomy 301 — 2012
- Graduate Leader of SMART program — 2010 – 2011
- Astronomy Lab 001 Instructor — 2009 – 2010

Skills

Observing Experience

- Goodman Spectrograph, SOAR telescope – 50+ nights
- Spartan Imager, SOAR telescope – 3 nights
- L-band receiver, Arecibo Telescope – 12 hours
- DECam imager, Blanco Telescope – 1 night
- RSS spectrograph, SALT telescope – queue $>$ 100 hrs
- VLA telescope – queue 20 hrs

Computational & Statistical Techniques

- Developed new framework for estimating galaxy gas fractions, galaxy mass functions
- Proficient in Python, IDL, IRAF, LaTeX, and other specialized astronomy programs (e.g., SExtractor, SWARP, GAIA, Ds9)
- Experience with SQL, GitHub, pPXF, velfit/diskfit, group finding, and abundance matching codes

Instrumentation

- Image Slicer: Helped to design, build, and commission novel image slicer design for Goodman spectrograph (SOAR) allowing RESOLVE to take data across three slices of a galaxy at once.
- Grating holder: Designed holder with SolidWorks to fit newly purchased grating in pre-existing frame.

Presentations

Invited Talks

- *Weighing galaxies with the RESOLVE survey*, Bryn Mawr College — Mar 9, 2018
- *Studying the Role of Group Environment in Shaping the Galaxy Mass Function with the RESOLVE survey*, Columbia University — Mar 1, 2018
- *The Mass Functions of Galaxies and Galaxy Groups in the RESOLVE Survey*, Rutgers University — Oct 12, 2017
- *The Baryonic Mass Function and its Dependence on Environment*, Vanderbilt University — Apr 10, 2013

Contributed Talks

- *Applying BFD to DES Y3*, DES Collaboration Meeting — May 15, 2018
- *A Mass Census of the Nearby Universe with RESOLVE and ECO*, AAS meeting 229 — Jan 4, 2017
- *The Mass Census for RESOLVE and ECO*, AAS meeting 227 — Jan 7, 2016
- *The Mass Functions: Stellar and Baryonic Mass Functions and their Environment Dependence* , RESOLVE team meeting — Jul 15, 2014
- *Stellar and Baryonic Mass Functions*, RESOLVE Team Meeting — Jan 18, 2013

Outreach

- *How do Astronomers measure distance?*, Philadelphia Science Festival Star Party at the Woodlands — Apr 2018
- *The Distribution of Matter in the Local Universe*, Greensboro Astronomy Club — May 2013

Presentations

Posters

- *Examining the Tightness of the Red Sequence with the RESOLVE Survey*, AAS Meeting 331 — Jan 2018
- *Status of The Dynamical Census of Galaxies and Groups in the RESOLVE*, AAS Meeting 227 — Jan 2016
- *Galaxy and Group Baryonic Mass Functions for the RESOLVE Survey*, AAS Meeting 225 — Jan 2015
- *The Environment Driven shape of the Baryonic Mass Function*, AAS Meeting 223 — Jan 2014
- *Toward a Better Mass Census of Dwarf Galaxies in the Nearby Universe*, AAS Meeting 215 — Jan 2010

Mentoring

- S. Bobhate (Undergraduate, Penn) — 2018
  Summer project to examine proper motions of stars in DES to look for brown dwarfs and measure the proper motions of Milky Way satellite galaxies.
- K. Storey-Fisher (Undergraduate, Brown) — 2014
  Halo abundance matching project (UNC CAP REU program)
- K. Hall (Undergraduate, UNC) — 2013 – 2015
  Project to design code for fitting Halpha + NII emission lines for RESOLVE image slicer spectroscopy (UNC CAP REU and senior honors thesis)
- Mentored several undergraduates and graduate students in optimizing, constructing, and testing image slicers (D. Hendel, K. Hall, A. Baker, D. Rosenberg, R. Beauchemin, D. Guynn) — 2012 – 2015

Outreach

Demo Shows and Museum Events

Franklin Institute After Hours and Night Skies events	2017
Cadette Girl Scout Overnight at Morehead Observatory	2014
Astronomy Days at Raleigh Museum of Natural Sciences	2014
Annual Demo Show with UNC Physics Outreach Crew	2010 – 2015

School Activities

Shadow day with Mastery Shoemaker high school student	2018
Mastery Shoemaker Career Day	2017
Marjorie Lee Browne Day	2011 – 2013
Galaxy Classification Activity at Stars School	2011

Professional Activities

Journal Club Organizer	2018 –
NASA Panel Reviewer	2018
Reviewer for the Astrophysical Journal	2017 –
Organizer for Conference for Undergraduate Women in Physics	2015
Member of Graduate Student Affairs Committee	2013 – 2014
Leader of UNC Physics Outreach Crew	2010 – 2011
Member of American Astronomical Society	2009 –

References

Gary Bernstein
Department of Physics & Astronomy
University of Pennsylvania
garyb@physics.upenn.edu

Sheila Kannappan
Department of Physics & Astronomy
University of North Carolina
sheila@physics.unc.edu

Andreas Berlind
Department of Physics & Astronomy
Vanderbilt University
a.berlind@vanderbilt.edu

Chris Clemens
Department of Physics & Astronomy
University of North Carolina
clemens@physics.unc.edu

Publications

C. E. Hood, ...**K. D. Eckert**... et al., *The Origin of Faint Tidal Features around Galaxies in the RESOLVE Survey.* ApJ 857, 144 (2018).

K. D. Eckert, S. J. Kannappan, C. del P. Lagos, A. D. Baker, A. A. Berlind, et al., *The Baryonic Collapse Efficiency of Galaxy Groups in the RESOLVE and ECO surveys.* ApJ 849, 20 (2017).

D. V. Stark, S. J. Kannappan, **K. D. Eckert,** J. Florez, K. Hall, et al., *The RESOLVE Survey Atomic Gas Census and Environmental Influences on Galaxy Gas Reservoirs.* ApJ 832, 126 (2016).

K. D. Eckert, S. J. Kannappan, D. V. Stark, A. J. Moffett, A. A. Berlind, and M. A. Norris. *RESOLVE and ECO: The Environment-dependent Shape of Galaxy Stellar and Baryonic Mass Functions.* ApJ 824, 124 (2016).

K. D. Eckert, S. J. Kannappan, D. V. Stark, A. J. Moffett, M. A. Norris; E. M. Snyder, and E. A. Hoversten. *RESOLVE Survey Photometry and Volume-Limited Calibration of the Photometric Fractions Technique.* ApJ 810, 166 (2015).

A. J. Moffett, S. J. Kannappan, A. A. Berlind, **K. D. Eckert,** D. V. Stark, et al., *ECO and RESOLVE: Galaxy Disk Growth In Environmental Context.* ApJ 812, 89 (2015).

M. A. Norris, ...**K. D. Eckert**... et al., *The AIMSS Project - I. Bridging the star cluster-galaxy divide.* MNRAS 443, 1151 (2014).

S. J. Kannappan, D. V. Stark, **K. D. Eckert,** A. J. Moffett, L. H. Wei, et al., *Connecting Transitions in Galaxy Properties to Refueling.* ApJ 777, 42 (2013).

D. V. Stark, S. J. Kannappan, L. H. Wei, A. J. Baker, A. K. Leroy, **K. D. Eckert,** S. N. Vogel. *The Fueling Diagram: Linking Galaxy Molecular-to-atomic Gas Ratios to Interactions and Accretion.* ApJ 769, 82 (2013).

Conference Proceedings

K. D. Eckert, S. J. Kannappan, M. A. Norris. *Estimating Dwarf Galaxy Gas Masses.* EAS Publications Series, Volume 48, 301 (2011).