

Patrick M. Treuthardt, Ph.D.

CONTACT INFORMATION	North Carolina Museum of Natural Sciences 11 West Jones Street Raleigh, NC 27601, U.S.A.	<i>Phone:</i> (+1) 919 707 9278 <i>E-mail:</i> patrick.treuthardt@naturalsciences.org <i>Website:</i> treuthardt.github.io
EDUCATION	2007	Ph.D., Physics with Astronomy specialization Supervised by Professor Ronald J. Buta University of Alabama, Tuscaloosa, Alabama
	2000	M.S., Physics with Astronomy specialization University of Alabama, Tuscaloosa, Alabama
	1998	B.S., Physics with an option in Astrophysics Awarded with Honors New Mexico Institute of Mining and Technology, Socorro, New Mexico
	1996	A.G.S. Awarded Magna Cum Laude Macomb Community College, Clinton Township, Michigan
SUMMARIZED EXPERIENCE	North Carolina Museum of Natural Sciences, Raleigh, North Carolina Present – 2013	Assistant Head, Astronomy & Astrophysics Research Lab
	Osher Lifelong Learning Institute – NCSU, Raleigh, North Carolina 2019 – 2015	Instructor
	University of Arkansas at Little Rock, Little Rock, Arkansas 2015 – 2010 2013 – 2010 2013 – 2012 2012 – 2009	Part-time Lecturer Affiliate Graduate Faculty Visiting Research Associate Postdoctoral Research Fellow
	Secondary Affiliation: Arkansas Center for Space and Planetary Sciences, University of Arkansas at Fayetteville 2012 – 2009	Mentor
	North Carolina State University, Raleigh, North Carolina 2014	Temporary Instructor
	University of Oulu, Oulu, Finland 2008 2007 2003 2002	Visiting Researcher Visiting Student Visiting Student Visiting Student
	University of Alabama, Tuscaloosa, Alabama 2008 2007 – 1999 2005 – 1998	Intern Graduate Research Assistant Graduate Teaching Assistant
	Kitt Peak National Observatory, Tucson, Arizona 2006 2004	Visiting Observer Visiting Observer
	Observatoire de Haute-Provence, St. Michel l'Observatoire, France 2004	Visiting Observer

Refer to the following pages for detailed experience.

2020

- Hewitt, I. B. & **Treuthardt, P.** *Comparison of Galaxy Spiral Arm Pitch Angle Measurements Using Manual and Automated Techniques*, Monthly Notices of the Royal Astronomical Society, 493, 3854-3865.
 - **In the top 5% of all research outputs ever tracked** by Altmetric.
 - Press coverage including: Breitbart, Discover Magazine, Heritage Daily, Science Daily, SciTechDaily, Space Daily, UPI, etc.

2018

- Seigar, M. S., Harrington, A., & **Treuthardt, P.** *Determination of resonance locations in NGC 613 from morphological arguments*, Monthly Notices of the Royal Astronomical Society, 481, 5394-5400.
- Mutlu Pakdil, B., Seigar, M., Hewitt, I., **Treuthardt, P.**, Berrier, J., & Koval, L. *The Illustris Simulation: Supermassive Black Hole – Galaxy Connection Beyond the Bulge*, Monthly Notices of the Royal Astronomical Society, 474, 2594-2606.

2017

- Mutlu Pakdil, B., Mangedarage, M., Seigar, M. S., & **Treuthardt, P.** *A photometric study of the peculiar and potentially double ringed, non-barred galaxy: PGC 1000714*, Monthly Notices of the Royal Astronomical Society, 466, 355-368.
 - **In the top 5% of all research outputs ever tracked** by Altmetric.
 - Press coverage including: Astronomy Magazine, CBC News, CNN, CTV News, Daily Mail, Engadget, Fox News, Gizmodo, IFLScience.com, The Independent, International Business Times, International Business Times UK, MPR News, Sci-News.com, Science Daily, SciWorks Radio, Tech Times, WFAE 90.7, Space.com, Wired UK, etc.

2015

- Sierra, A., Seigar, M. S., **Treuthardt, P.**, & Puerari, I., *Determination of Resonance Locations in Barred Spiral Galaxies Using Multiband Photometry*, Monthly Notices of the Royal Astronomical Society, 450, 1799-1811.

2014

- Al-Baidhany, I., Seigar, M., **Treuthardt, P.**, Sierra, A., Davis, B., Kennefick, D., Kennefick, J., Lacy, C., Toma, Z. A., & Jabbar, W. *A Study of the Relation between the Spiral Arm Pitch Angle and the Kinetic Energy of Random Motions of the Host Spiral Galaxies*, Journal of the Arkansas Academy of Science, Vol. 68, 25-36.

2012

- **Treuthardt, P.**, Seigar, M. S., Sierra, A. D., Al-Baidhany, I., Salo, H., Kennefick, D., Kennefick, J. & Lacy, C. H. S., *On the Link Between Central Black Holes, Bar Dynamics, and Dark Matter Halos in Spiral Galaxies*, Monthly Notices of the Royal Astronomical Society, 423, 3118-3133.

2009

- **Treuthardt, P.**, Salo, H., & Buta, R., *Dynamical Simulations of NGC 2523 and NGC 4245*, The Astronomical Journal, 137, 19-33.

2008

- **Treuthardt, P.**, Salo, H., Rautiainen, P., & Buta, R., *The Bar Pattern Speed of NGC 1433 Estimated Via Sticky-Particle Simulations*, The Astronomical Journal, 136, 300-311.

2007

- **Treuthardt, P.**, Buta, R., Salo, H., & Laurikainen, E., *The Kinematically Measured Pattern Speeds of NGC 2523 and NGC 4245*, The Astronomical Journal, 134, 1195-1205.

2004

- Keel, W. C., Holberg, J. B., & **Treuthardt, P.**, *Far-Ultraviolet Spectroscopy of Star-Forming Regions in Nearby Galaxies: Stellar Populations and Abundance Indicators*, The Astronomical Journal, 128, 211-223.

2000

- Buta, R., **Treuthardt, P. M.**, Byrd, G. G., & Crocker, D. A., *Circumnuclear Star Formation in the Early-Type Resonance Ring Barred Spiral Galaxy NGC 1326*, The Astronomical Journal, 120, 1289-1305.

BOOKS

2014

- *Structure and Dynamics of Disk Galaxies*. Proceedings of a Conference held 12-16 August 2013 at the Winthrop Rockefeller Institute, Petit Jean Mountain, Arkansas, USA. Edited by M. S. Seigar and **P. Treuthardt**. ASP Conference Proceedings, Vol. 480. San Francisco: Astronomical Society of the Pacific.

SOFTWARE

Present – 2019

- *P2DFFT*. Hewitt, I. B. & **Treuthardt, P.** <https://doi.org/10.5281/zenodo.3165700>.

CITIZEN SCIENCE
PROJECTS

Present – 2019

- *Spiral Graph*. **Treuthardt, P.**, Hewitt, I. B., Scott, A., Dasanaik, N., Ehrlich, E., Lamb, E., & Wilkinson, T. <https://www.zooniverse.org/projects/astro-lab-ncmns/spiral-graph>.

CONFERENCE
PRESENTATIONS

2020

- **Treuthardt, P.**, Hewitt, I., & Scott, A. *Spiral Graph Citizen Science Data for Determining the Pitch Angles of Spiral Galaxies*, American Astronomical Society Meeting 235, #167.09.

2019

- **Treuthardt, P.**, Scott, A., & Hewitt, I. B. *Searching for Intermediate Mass Black Holes in Spiral Galaxies Using Pitch Angles Gathered by Citizen Scientists*, North Carolina Astronomers' Meeting 2019.
- **Treuthardt, P.**, Scott, A., & Hewitt, I. B. *Searching for Intermediate Mass Black Holes in Spiral Galaxies Using Pitch Angles Gathered by Citizen Scientists*, American Astronomical Society Meeting 234, #202.03.
- **Treuthardt, P.**, Scott, A., & Hewitt, I. *Searching for Intermediate Mass Black Holes in Spiral Galaxies Using Pitch Angles Gathered by Citizen Scientists*, Citizen Science Association Conference 2019.

2018

- Hewitt, I. & **Treuthardt, P.** *A Comparison of Galaxy Spiral Arm Pitch Angle Measurements Using Manual and Automated Techniques*, IAU General Assembly, Meeting #30.
- Hewitt, I. & **Treuthardt, P.** *A Comparison of Galaxy Spiral Arm Pitch Angle Measurements Using Manual and Automated Techniques*, American Astronomical Society Meeting 231, #248.04.

2017

- Seigar, M., Mutlu-Pakdil, B., Mangedarage, M., & **Treuthardt, P.** *The Nonbarred Double-Ringed Galaxy, PGC 1000714*, American Astronomical Society Meeting 229, #145.19.
- Mutlu-Pakdil, B., Seigar, M., Davis, B., **Treuthardt, P.**, & Berrier, J. *Testing SMBH scaling relations using cosmological simulations and optical/near-IR imaging data*, American Astronomical Society Meeting 229, #107.01.

2015

- **Treuthardt, P.**, & Grouchy, R. *A Further Examination of Manifold Theory*, IAU General Assembly, Meeting #29, id.2257756.

2014

- **Treuthardt, P.**, Beauchemin, R., & De Los Reyes, M. *The Dust Lane Curvature in a Sample of Galactic Bars*, American Astronomical Society Meeting 223, #453.12.
- Al-Baidhany, I., Seigar, M., **Treuthardt, P. M.**, Sierra, A., Davis, B. N., Kennefick, D., Kennefick, J. D., & Lacy, C. H. *A Study of Supermassive Black Holes and the Properties of Their Host Galaxies*, American Astronomical Society Meeting 223, #453.09.
- Sierra, A., Seigar, M., **Treuthardt, P. M.**, & Puerari, I. *Determination of Resonance Locations in Spiral Galaxies using Multi-band Photometry*, American Astronomical Society Meeting 223, #309.02.

2013

- **Treuthardt, P.**, Seigar, M. S., Salo, H., Kennefick, D., Kennefick, J., & Lacy, C. H. S. *NGC 3124: A Resonance Ring Disk Galaxy with a Skewed Bar*, Structure and Dynamics of Disk Galaxies.
- Sierra, A., Seigar, M. S., **Treuthardt, P.**, & Puerari, I. *Determination of Resonance Locations in NGC 4145 Using Multiband Photometry*, Structure and Dynamics of Disk Galaxies.

2012

- **Treuthardt, P. M.**, Seigar, M., Salo, H., Kennefick, D., Kennefick, J., & Lacy, C. H. S. *Dynamical Models Of NGC 3124: A Galaxy With An Apparent Counter-Winding Bar-Spiral Hybrid*, International Astronomical Union Special Session #3.
- **Treuthardt, P. M.**, Seigar, M., Salo, H., Kennefick, D., Kennefick, J., & Lacy, C. H. S. *Dynamical Models Of NGC 3124: A Galaxy With An Apparent Counter-Winding Bar-Spiral Hybrid*, American Astronomical Society Meeting 220, #433.02.
- Sierra, A., Seigar, M. S., **Treuthardt, P.**, Mears, T., & Puerari, I. *Determination of Resonance Locations in a Sample of Barred Spiral Galaxies*, American Astronomical Society Meeting 220, #433.04.
- Ahdulla Akhlite Al-Baidhany, I., Seigar, M. S., **Treuthardt, P.**, Kennefick, D., Kennefick, J., Lacy, C. H. S., & Davis, B. *A Comparison of Four Methods for Measuring Supermassive Black Hole Masses*, American Astronomical Society Meeting 220, #433.06.
- **Treuthardt, P.**, Seigar, M. S., Salo, H., Kennefick, D., Kennefick, J., & Lacy, C. H. S. *Dynamical Models of NGC 3124: A Galaxy with an Apparent Counter-Winding Bar-Spiral Hybrid*, Cyberinfrastructure Day at the University of Arkansas at Little Rock.
- **Treuthardt, P.**, Seigar, M. S., Salo, H., Kennefick, D., Kennefick, J., & Lacy, C. H. S. *Dynamical Models of NGC 3124: A Galaxy with an Apparent Counter-Winding Bar-Spiral Hybrid*, MidAmerican Regional Astrophysics Conference.
- Al-Baidhany, I., Seigar, M. S., **Treuthardt, P.**, Kennefick, D., Kennefick, J., Lacy, C. H. S., & Davis, B. *A Comparison of Methods for Measuring Supermassive Black Holes*, American Astronomical Society Meeting 219, #346.07.
- **Treuthardt, P.**, Seigar, M., Kennefick, D., Kennefick, J., & Lacy, C. H. S., *The Apparent Counter-Winding Bar-Spiral Hybrid of NGC 3124*, American Astronomical Society Meeting 219, #346.18.

2011

- **Treuthardt, P.**, Seigar, M., Sierra, A., Al-Baidhany, I., Salo, H., Kennefick, D., Kennefick, J., & Lacy, C. H. S., *On the Link Between Central Black Holes, Bar Dynamics, and Dark Matter Halos in Spiral Galaxies*, Galaxy Formation.

- **Treuthardt, P.**, Seigar, M. S., Sierra, A. D., & Al-Baidhany, I. *On the Link Between Central Black Holes, Bar Dynamics, and Dark Matter Halos in Spiral Galaxies*, MidAmerican Regional Astrophysics Conference.
- Sierra, A., Seigar, M. S., **Treuthardt, P.**, & Puerari, I. *Determination of Resonance Locations in Barred Spiral CGS Galaxies*, MidAmerican Regional Astrophysics Conference.
- Sierra, A., Seigar, M. S., **Treuthardt, P.**, & Puerari, I. *Determination of Resonance Locations in the Barred Spiral Galaxy, NGC 613*, American Astronomical Society Meeting 217, #246.15.
- Ahdualla Akhlite Al-Baidhany, I., Seigar, M. S., **Treuthardt, P.**, Davis, B., Kennefick, D., Kennefick, J., Lacy, C. H. S., & Bentz, M. *A Comparison of Two Independent Techniques for Measuring Supermassive Black Hole Masses*, American Astronomical Society Meeting 217, #246.09.

2010

- **Treuthardt, P.**, Seigar, M., & Salo, H. *Pattern Speed Estimates of Barred Galaxies from CING: A Connection Between Central Dark Halo Concentration and SMBH Mass?*, Dynamics and Evolution of Disc Galaxies.
- Seigar, M. S., Kennefick, D., Kennefick, J., Lacy, C. H. S., Berrier, J. C., **Treuthardt, P.**, Al-Baidhany, I. A., Barrows, R. S., Davis, B., Hughes, J. A., Schilling, A., Shields, D. W., & Sierra, A. D. *The Arkansas Galaxy Evolution Survey: Supermassive Black Holes in the Universe*, International Astronomical Union Symposium #267.

2008

- **Treuthardt, P.**, Buta, R., Salo, H., & Laurikainen, E., *The Kinematically Measured Pattern Speeds of NGC 2523 and NGC 4245*, A National Meeting of Finnish ESO Scientists and Students.

2007

- **Treuthardt, P. M.**, *The Kinematics and Dynamics of Three Resonance Ring Barred Spiral Galaxies*, American Astronomical Society Meeting 211, #69.05.

2006

- **Treuthardt, P.** & Buta, R., *The Kinematically Measured Pattern Speeds of NGC 2523 and NGC 4245*, International Astronomical Union Symposium #235.

2005

- **Treuthardt, P. M.**, Buta, R. J., & Salo, H., *A Dynamical Study of Resonances in Disk Galaxies*, American Astronomical Society Meeting 206, #13.04.

2001

- **Treuthardt, P.**, Keel, W. C., Holberg, J., & Steidel, C., *FUSE Spectra of Nearby Star-Forming Regions and Comparison to High-Redshift Galaxies*, American Astronomical Society Meeting 199, #55.03.

1999

- Buta, R., **Treuthardt, P.**, Crocker, D. A., & Byrd, G. G., *An HST Study of Star Formation in the Nuclear Ring of NGC 1326*, American Astronomical Society Meeting 195, #104.04.

POPULAR
PUBLICATIONS

2020

- **Treuthardt, P.**, Hewitt, I. B., & Sharma, P., *The Fundamentals of Galaxies*, Online Learning Modules.

2017

- **Treuthardt, P.**, *The Great American Eclipse*, North Carolina Naturalist, Vol. 25, Num. 3, 9.
- **Treuthardt, P.**, *Introducing a New and Extremely Rare Galaxy*, North Carolina Naturalist, Vol. 25, Num. 1, 6.

2016

- **Treuthardt, P.**, *Topic of upcoming event: Searching for life beyond Earth*, The News & Observer, SciTech, (17 Jan).

2015

- **Treuthardt, P.**, *Inside NC Science: Ancient supernova shrouded in mystery*, The News & Observer, SciTech, (3 May).

2014

- **Treuthardt, P.**, *Black holes continue to fascinate masses*, The News & Observer, Health & Science Newsletter, (14 Dec).

2013

- **Treuthardt, P.**, *A Spiral Galaxy with a Twist*, NatureSearch Newsletter, Issue 3.

SCIENCE
COMMUNICATION

Present – 2013

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| • Solar observing
North Carolina Museum of Natural Sciences, Raleigh, North Carolina | Host |
| • <i>International Sun-Day</i>
North Carolina Museum of Natural Sciences, Raleigh, North Carolina | Speaker |
| • <i>Astronomy Days</i>
North Carolina Museum of Natural Sciences, Raleigh, North Carolina | Speaker |

2020

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| • CBS 17 News
Raleigh, North Carolina | Interview |
| • <i>Skype-a-Scientist</i>
Pacific Crest Middle School, Bend, Oregon | Speaker |
| • <i>Spiral Graph: A Citizen Science Project with a Twist</i>
Grand Strand Amateur Astronomy Club, Myrtle Beach, South Carolina | Speaker |
| • <i>SkySimplified</i> podcast
SkySimplified.com, Raleigh, North Carolina | Interview |
| • <i>Updates from Spiral Graph,
the Astronomy Citizen Science project with a Twist</i>
North Carolina Museum of Natural Sciences, Raleigh, North Carolina | Speaker |
| • <i>Into the Zooniverse, Volume 2</i>
Adler Planetarium, Chicago, Illinois | Interview |
| • <i>From Science Fiction to Science Fact</i>
North Carolina Museum of Natural Sciences, Raleigh, North Carolina | Speaker |
| • <i>World Science Academy Citizen Science Summer 2020</i>
World Science Festival, New York, New York | Speaker |
| • <i>Celebrating the Hubble Space Telescope's 30th Anniversary</i>
North Carolina Museum of Natural Sciences, Raleigh, North Carolina | Speaker |
| • <i>Citizen Science while Stargazing with Astronomy Mag and SciStarter</i>
SciStarter.org, Tempe, Arizona | Speaker |

• <i>Can You Help Us Study Spiral Galaxies?</i> Supercluster.com, New York, New York	Interview
• <i>Spiral Graph: A Citizen Science Project with a Twist</i> The Triad Starfest, Jamestown, North Carolina	Speaker
• <i>Shedding Some Light on Black Holes</i> Rotary Club of Raleigh, Raleigh, North Carolina	Speaker
• <i>Searching for Intermediate Mass Black Holes in Spiral Galaxies with the Help of Citizen Scientists</i> North Carolina Museum of Natural Sciences, Raleigh, North Carolina	Speaker
2019	
• <i>Teen Science Cafe: Ask an Astronomer</i> North Carolina Museum of Natural Sciences, Raleigh, North Carolina	Speaker
• <i>Finally Friday: Mars Attacks!</i> North Carolina Museum of Natural Sciences, Raleigh, North Carolina	Speaker
• <i>Press Briefing: Searching for Intermediate Mass Black Holes in Spiral Galaxies with Citizen Scientists</i> American Astronomical Society Meeting 234, St. Louis, Missouri	Speaker
• <i>Astronomers Need a (Steady) Hand Tracing Spiral Galaxies to Find Black Holes</i> Space.com, New York, New York	Interview
• <i>Scientists ask the public to help search for a rare breed of black hole</i> Astronomy.com, Waukesha, Wisconsin	Interview
• <i>Scientists ask the public to help search for a rare breed of black hole</i> InsideScience.org, College Park, Maryland	Interview
• <i>Searching for Intermediate Mass Black Holes in Spiral Galaxies with the Help of Citizen Scientists</i> Raleigh Astronomy Club, Raleigh, North Carolina	Speaker
• <i>Black Holes</i> Rotary Club of the Capital City, Raleigh, North Carolina	Speaker
• <i>Live From the International Space Station Viewing Party</i> North Carolina Museum of Natural Sciences, Raleigh, North Carolina	Panel Member
• <i>Solar Observing: Transit of Mercury</i> North Carolina Museum of Natural Sciences, Raleigh, North Carolina	Host
• <i>Finally Friday: Bill & Ted's Excellent Adventure</i> North Carolina Museum of Natural Sciences, Raleigh, North Carolina	Speaker
• <i>Astronomical photobombs and the trouble with SpaceX's Starlink</i> NewAtlas.com	Interview
• <i>Searching for Intermediate Mass Black Holes in Spiral Galaxies with Citizen Scientists</i> North Carolina Astronomers' Meeting, Jamestown, North Carolina	Speaker
2018	
• <i>Finally Friday: Star Trek II: The Wrath of Khan</i> North Carolina Museum of Natural Sciences, Raleigh, North Carolina	Speaker
• <i>The Milky Way - Our Home Galaxy</i> North Carolina Museum of Natural Sciences, Raleigh, North Carolina	Speaker
• <i>The Milky Way</i> North Carolina State University – iMOM, Raleigh, North Carolina	Speaker
• <i>SciChat: Galaxies</i> North Carolina Museum of Natural Sciences, Raleigh, North Carolina	Speaker

2017

- *Teen Science Cafe: Getting Serious about the Sun* Speaker
North Carolina Museum of Natural Sciences, Raleigh, North Carolina
- Galaxy Presentation Speaker
Holly Springs High School, Holly Springs, North Carolina
- *Wrap-Up: The Great American Eclipse* Speaker
North Carolina Museum of Natural Sciences, Raleigh, North Carolina
- *Lifelong Adventure: Solar Eclipse Adventure* Trip Co-Leader
North Carolina Museum of Natural Sciences, Raleigh, North Carolina
- Eclipse Presentation Speaker
Atria Southpoint Walk, Durham, North Carolina
- Careers in Astronomy Speaker
Clayton Middle School, Clayton, North Carolina
- *Astronomy on Tap Triangle* Speaker
Fullsteam Brewery, Durham, North Carolina
- Facebook Live: TRAPPIST-1 Discussion Speaker
North Carolina Museum of Natural Sciences, Raleigh, North Carolina
- *Discovering a New Galaxy* Interview
UNC-TV, Research Triangle Park, North Carolina
- Discovery of PGC 1000714 Speaker
Univ. of Denver - Ricks Center for Gifted Children, Denver, Colorado
- *Burcin's Galaxy, The Universe And Sort-Of Time Travel* Interview
SciWorks Radio, Winston-Salem, North Carolina
- *NC Astrophysicist Helps Find New Type of Galaxy* Interview
WFAE, Charlotte, North Carolina
- *Ultra-rare galaxy could be 'one of a kind'* Interview
CNN, Atlanta, Georgia
- *The Arlene Bynon Show* Interview
SiriusXM's *Canada Talks*, Toronto, Canada
- *PGC 1000714: The rare galaxy 'nobody has ever seen before'* Interview
CTV's *Your Morning*, Toronto, Canada
- *Explained by the Author: Burcin's Galaxy* Presenter
North Carolina Museum of Natural Sciences, Raleigh, North Carolina

2016

- *Science Cafe: Star Trek: The Golden Anniversary* Panelist
The Daily Planet Cafe, Raleigh, North Carolina
- *Raleigh event will celebrate 50th anniversary of Star Trek* Interview
The News & Observer, Raleigh, North Carolina
- *Ask a Scientist: How do black holes make ripples in space?* Interview
The News & Observer, Raleigh, North Carolina
- *Science Cafe: The Sun: Common and Uncommon Events* Speaker
The Daily Planet Cafe, Raleigh, North Carolina
- *Careers in Astronomy* Panelist
Cary Academy, Cary, North Carolina
- *Science in the Movies: Space on the Silver Screen* Panelist
North Carolina State University
- *Life in the Universe* Speaker
Rotary Club of the Capital City, Raleigh, North Carolina
- *The Science of The Martian* Panelist
North Carolina Museum of Natural Sciences, Raleigh, North Carolina

2015		
• <i>Neutrino Day</i>	North Carolina Museum of Natural Sciences, Raleigh, North Carolina	Speaker
• WRAL-TV	Raleigh, North Carolina	Interview
• Astronomy Club	Raleigh Charter High School, Raleigh, North Carolina	Speaker
• Science Seminar	Durham Technical Community College, Durham, North Carolina	Speaker
2014		
• <i>Science Cafe</i>	The Daily Planet Cafe, Raleigh, North Carolina	Speaker
• <i>Mystery Roach</i> (radio program)	WKNC, Raleigh, North Carolina	Guest
• <i>Bring Your Child to Work Day</i>	Siemens, Cary, North Carolina	Speaker
• <i>STEM Expo</i>	Appalachian State University, Boone, North Carolina	Presenter
2013		
• <i>Astronomy</i>	Fred A. Olds Elementary School, Raleigh, North Carolina	Speaker
• <i>International Observe the Moon Night</i>	North Carolina Museum of Natural Sciences, Raleigh, North Carolina	Speaker
• Colloquium for Astronomy Department	North Carolina State University, Raleigh, North Carolina	Speaker
• Colloquium for Astronomy Department	University of North Carolina, Chapel Hill, North Carolina	Speaker
• Non-Traditional Career Paths for Physics Graduate Students	University of North Carolina, Chapel Hill, North Carolina	Speaker
2012		
• <i>Young Adult Summer Program</i>	Roosevelt Thompson Library, Little Rock, Arkansas	Speaker
• <i>Central Arkansas Regional Science and Engineering Fair</i>	University of Arkansas at Little Rock, Little Rock, Arkansas	Judge
2010		
• Society of Physics Students	University of Arkansas at Little Rock, Little Rock, Arkansas	Speaker
2008		
• Colloquium for Astronomy Division, Dept. of Physical Sciences	University of Oulu, Oulu, Finland	Speaker
• Colloquium for Astronomy Department	University of Alabama, Tuscaloosa, Alabama	Speaker
2005		
• <i>Astronomy</i>	Rock Quarry Elementary School, Tuscaloosa, Alabama	Speaker

RESEARCH
EXPERIENCE

Present – 2013

Assistant Head, Astronomy & Astrophysics Research Lab
North Carolina Museum of Natural Sciences, Raleigh, North Carolina

- Conduct ongoing research into the morphology and dynamics of disk galaxies.
- Led the development of *Spiral Graph*, an online citizen science project dedicated to measuring the pitch angle of spiral arms in galaxies.

2013 – 2012

Visiting Research Associate
University of Arkansas at Little Rock, Little Rock, Arkansas

- Investigated the skewness of galaxy bars through simulation modeling in conjunction with photometric and kinematic data.

2012 – 2009

Postdoctoral Research Fellow
Supervised by Associate Dean, Marc S. Seigar
University of Arkansas at Little Rock, Little Rock, Arkansas
Secondary Affiliation: Arkansas Center for Space and Planetary Sciences
University of Arkansas, Fayetteville, Arkansas

- Developed detailed numerical models of the gaseous and stellar components of an unusual barred spiral galaxy.
- Developed numerical models of the gaseous component of 40 barred spiral galaxies in order to compare observational and theoretical parameters.
- Collaborated in the development of a pipeline script to process and analyze digital multi-waveband images of galaxies.

2008

Visiting Researcher
Supervised by Professor Heikki Salo
University of Oulu, Oulu, Finland

- Collaborated in the development of numerical models of the gaseous and stellar components of 23 barred spiral galaxies in order to compare observational and theoretical parameters.

2007 – 1999

Graduate Research Assistant
University of Alabama, Tuscaloosa, Alabama

- Processed and analyzed digital 1D stellar spectra.
- Processed and analyzed digital near-infrared images of galaxies.
- Used digital images and 2D spectra of galaxies, in conjunction with a sophisticated numerical simulation code, to compare observational and theoretical parameters.
- Developed IDL software for analysis of images, spectra, and simulation models.
- Analyzed digital images and spectra of nearby starburst galaxies to determine the source of escaping Lyman- α radiation.
- Processed and analyzed digital images of galaxies to derive structural parameters for a statistical study.

2007

Visiting Student
University of Oulu, Oulu, Finland

- Collaborated in the development of numerical models of the gaseous and stellar components of two ringed barred spiral galaxies in order to compare observational and theoretical parameters.
- Collaborated in the development of custom IDL software for analysis of galaxy simulation results and comparison with observed morphology.

2006	Visiting Observer Kitt Peak National Observatory, Tucson, Arizona
•	Granted 2 nights of observing time by NOAO and obtained long slit spectra of 2 galaxies using the Ritchey-Chretien Focus Spectrograph on the 4 meter telescope.
2004	Visiting Observer Kitt Peak National Observatory, Tucson, Arizona
•	Granted 3 nights of observing time by NOAO and obtained near-infrared images of 9 galaxies using the FLAMINGOS instrument on the 2.1 meter telescope.
2004	Visiting Observer Observatoire de Haute-Provence, St. Michel l'Observatoire, France
•	Granted 4 nights of observing time by the Institut National des Sciences de l'Univers and obtained 2D spectra of 6 galaxies using a Fabry-Perot interferometer on the 1.93 meter telescope.
2003	Visiting Student University of Oulu, Oulu, Finland
•	Collaborated in the development of numerical models of the gaseous and stellar components of ringed barred spiral galaxies in order to compare observational and theoretical parameters.
•	Developed custom IDL software for analysis of galaxy simulation results and comparison with observed morphology and kinematics.
2002	Visiting Student University of Oulu, Oulu, Finland
•	Trained in the use of a proprietary Fortran numerical simulation program to model the gaseous and stellar components of spiral galaxies in order to compare observational and theoretical parameters.
•	Developed custom IDL software for analysis of galaxy simulation results and comparison with observed morphology and kinematics.
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2020	Guest Lecturer Appalachian State University, Boone, North Carolina
•	Developed and presented a lecture for an undergraduate level astrobiology classes.
2019 – 2015	Instructor Osher Lifelong Learning Institute – NCSU, Raleigh, North Carolina
•	Developed lectures and taught adult education classes on various topics in astronomy.
2015 – 2010	Part-Time Lecturer University of Arkansas at Little Rock, Little Rock, Arkansas
•	Instructor for a classroom-based and online <i>Introduction to Astronomy</i> lecture.
•	Instructor for an online <i>Introduction to Astronomy</i> laboratory
2014	Temporary Instructor North Carolina State University, Raleigh, North Carolina
•	Developed and administered an upper level undergraduate astrophysics course titled <i>Stars and Galaxies</i> .
2013 – 2010	Affiliate Graduate Faculty

University of Arkansas at Little Rock, Little Rock, Arkansas

- Member of Dissertation Examination Committees for two Astronomy graduate students.
- Substitute instructor for the graduate/senior-undergraduate level *Classical Mechanics* course.

2013

Guest Lecturer

Appalachian State University, Boone, North Carolina

- Developed and presented lectures for undergraduate level astrobiology classes.

2012

Mentor

University of Arkansas at Little Rock, Little Rock, Arkansas

- Assisted with instructing, overseeing, and directing the dissertation research of two Astronomy graduate students.

2008

Intern

University of Alabama, Tuscaloosa, Alabama

- Responsible for grading assignments and exams for the graduate/senior-undergraduate level *Theoretical Astrophysics* course.
- Responsible for grading assignment for the undergraduate level *Astronomy Beyond the Solar System* course.

2005 – 1998

Graduate Teaching Assistant

University of Alabama, Tuscaloosa, Alabama

- Instructor for a classroom-based *Introduction to Astronomy* laboratory.

GRANTS AND
AWARDS

2019

- *FAMOUS* Travel Grant
American Astronomical Society

2018

- *State of North Carolina Internship Program* funding
NC Council for Women & Youth Involvement
- *International Travel Grant*
American Astronomical Society

2015

- *International Travel Grant*
American Astronomical Society

2013

- *State of North Carolina Internship Program* funding
NC Council for Women & Youth Involvement

2012

- *International Travel Grant*
American Astronomical Society

2011

- *International Travel Grant*
American Astronomical Society

2006

- 2 nights, RC Spectrograph, 4-meter telescope
Kitt Peak National Observatory

- 2005
- *Outstanding Teaching by a Graduate Student*
University of Alabama
- 2004
- 3 nights, FLAMINGOS, 2.1-meter telescope
Kitt Peak National Observatory
 - 4 nights, Fabry-Perot interferometer, 1.9-m telescope
Observatoire de Haute-Provence
 - *Conference and Research Fund*
University of Alabama
- 2003
- *Conference and Research Fund*
University of Alabama
- 1998 – 1996
- *Competitive Scholarship*
New Mexico Institute of Mining and Technology

SERVICE

- Ongoing
- *Astronomy and Astrophysics* **Manuscript Referee**
 - *Astronomy and Computing* **Manuscript Referee**
 - *Monthly Notices of Royal Astronomical Society* **Manuscript Referee**
 - *National High School Journal of Science* **Manuscript Referee**
 - Various undergraduate students **Mentor**
 - Various Astronomy & Astrophysics Research Lab volunteers/interns **Supervisor**
- 2020
- NC Space Grant Graduate Research Fellowship Program **Proposal Reviewer**
- 2019
- NC Space Grant Graduate Research Fellowship Program **Proposal Reviewer**
- 2018
- NASA Postdoctoral Program **Review Panelist**
 - Western Governors University **Astronomy Exam Beta Tester**
- 2017
- NASA Postdoctoral Program **Review Panelist**
 - Western Governors University **Astronomy Exam Beta Tester**
- 2014
- NASA Astrophysical Data Analysis Program **Proposal Reviewer**
 - Department of Physics & Astronomy
University of Arkansas at Little Rock **Dissertation Committee Member**
(Amber Sierra)
 - Department of Physics & Astronomy
University of Arkansas at Little Rock **Dissertation Committee Member**
(Ismaeel Al-Baidhany)

2013

- *Structure and Dynamics of Disk Galaxies* **Sci. Organizing Committee Member**
Petit Jean Mountain, Arkansas
- *Structure and Dynamics of Disk Galaxies* **Session Chair**
Petit Jean Mountain, Arkansas

2012

- *Galaxy Evolution Through Secular Processes* session 10 **IAU SpS3 Chair**
IAU XXVIII General Assembly
- *20th Annual Arkansas Space Grant Consortium Symposium* **Session Chair**
Morrilton, Arkansas

2010

- *94th Annual Meeting of The Arkansas Academy of Science* **Session Chair**
Little Rock, Arkansas
- *94th Annual Meeting of The Arkansas Academy of Science* **Presentation Judge**
Little Rock, Arkansas

SPECIAL SKILLS

Proficient

- Atom
- Emacs
- German language
- Git/GitHub
- HTML
- IDL
- IRAF
- Keynote
- LaTeX
- Linux OS
- Mac OS
- Microsoft Office Suite
- OpenOffice Suite
- Public speaking
- Python
- Teaching
- Windows OS

Experienced

- C/C++
- LabVIEW
- Pascal
- Unix shell scripting
- Use of large telescopes and supporting software for near-IR imaging and both 1D and 2D spectroscopy
- Writing competitive proposals for telescope observing time