

Dhanesh Krishnarao (DK)

Ph.D. Astronomy | **Interstellar Medium, Ionization, Galactic Dynamics**

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Colorado College, Department of Physics

Research Interests : Interstellar/Circumgalactic Medium, Galactic Structure / Dynamics, Ionized Gas, Machine Learning, Outreach/Education

APPOINTMENTS

8/2022 - Current	Assistant Professor - Colorado Springs, CO	Colorado College
7/2021 - 8/2022	NSF Astronomy & Astrophysics Postdoctoral Fellow - Baltimore, MD	Johns Hopkins University
1/2021 - 7/2021	Postdoctoral Fellow - Baltimore, MD	Space Telescope Science Center
8/2020 - 1/2021	Postdoctoral Fellow - Madison, WI	University of Wisconsin-Madison

EDUCATION

2020	Ph.D. Astronomy, University of Wisconsin-Madison Thesis Title : <i>The Impact of Galactic Structure on the Distribution and Ionization of Gas in Galaxies</i> Thesis Advisors : Christy Tremonti, Robert A. Benjamin, L. Matthew Haffner
2017	M.S. Astronomy, University of Wisconsin-Madison
2015	B.S. Physics, American University
2015	B.S. Mathematics, American University

GRANTS & FUNDING

TOTAL : ~ \$1,440,000 TOTAL @CC : \$1,072,029

2024	Partnerships in Astronomy & Astrophysics R & E (PAARE) - PI, NSF AST-2425222	\$701,118
	Community-Engaged Learning (CEL) Curriculum Support Grants, Colorado College	\$500
	Hubble Space Telescope GO-17757 - Co-I, NASA STScI	29 Orbits
	Education & Professional Development Mini-Grant - Co-I, AAS	\$3,162
	Dean of the Faculty Research Grant, Colorado College	\$4,800
	Student Collaborative Research Grant (SCoRe), Colorado College	\$5,400
2023	Natural Science R&D Fund, Colorado College	\$6,370
	Sloan Digital Sky Survey FAST Faculty Liaison - PI, ARC-SDSS	\$22,835
2022	SEGway Research Grant - Galactic Center, Colorado College	\$4,500
	SEGway Research Grant - Cataloging the Universe, Colorado College	\$5,000
	Student Collaborative Research Grant (SCoRe), Colorado College	\$4,500
	Natural Science R&D Fund, Colorado College	\$5,000
	Hubble Space Telescope Theory AR-17060 - PI, NASA STScI	\$216,940
	Hubble Space Telescope AR-17053 - Co-I, NASA STScI	\$11,201
	Sloan Digital Sky Survey FAST Faculty Liaison - PI, ARC-SDSS	\$18,203
2021	Hubble Space Telescope Legacy AR-16602 - Co-I, NASA STScI	\$67,000
	Grants Held at Colorado College are above.	↑
2020	Astronomy and Astrophysics Postdoctoral Fellowship, National Science Foundation	\$300,000
	International Travel Grant, American Astronomical Society (unused; COVID-19)	~ \$1,500
2019	Student Research Travel Grant, UW-Madison	\$2,400
	International Travel Grant, American Astronomical Society	~ \$1,500
2018	Student Research Travel Grant, UW-Madison	\$1,200
	International Travel Grant, American Astronomical Society	~ \$3,000
2017	Fluno Family Graduate Fellowship, UW-Madison Astronomy	~ \$50,000
	Bautz Fellowship [Travel Grant], UW-Madison Astronomy	\$1,500
	Student Research Travel Grant, UW-Madison	\$1,200
	International Travel Grant, American Astronomical Society	~ \$1,500

- Since Start at CC Mishra, S., Fox, A. J., **Krishnarao, D.**, et al., The Truncated Cool Circumgalactic Medium of the LMC, (**ApJL**, in review)
- Poudel, S., Horton, A., ... **Krishnarao, D.** (9th Author), et al., The Gaseous Blowout of the 30 Doradus Starburst Region, (**ApJ**, in review)
- Kreckel, K., ..., **Krishnarao, D.**, ..., 2024, SDSS-V Local Volume Mapper (LVM) : A Glimpse into Orion, [A&A](#), in press
- Drory, N., ..., **Krishnarao, D.**, ..., 2024, The SDSS-V Local Volume Mapper (LVM) : Scientific Motivation and Project Overview, [AJ](#), in press
- Luisi, M., **Krishnarao, D.**, Butterfield, N., et al., (2024) Radio Recombination Line Observations towards the Fermi Bubbles, [RNAAS](#), 8, 186
- McCallum, L., ..., **Krishnarao, D.** (5th Author), et al., (2024), The persistence of high altitude non-equilibrium diffuse ionized gas in simulations of star forming galaxies, [MNRAS](#), 530, 2548
- Cashman, F.H., ..., **Krishnarao, D.** (7th Author), et al. 2023, Caught in the Act : A Metal-Rich High-Velocity Cloud in the Inner Galaxy, [ApJ](#), 944 65C
- Smart, B., ..., **Krishnarao, D.** (6th Author), et al. 2023, The Diffuse Ionized Gas Halo of the Large Magellanic Cloud, [ApJ](#), 948, 118
- SDSS Collaboration, ..., **Krishnarao, D.**, ..., 2023, The Eighteenth Data Release of the Sloan Digital Sky Surveys : Targeting and First Spectra from SDSS-V, [ApJS](#), 267, 44
- Krishnarao, D.**, Fox, A. J., D’Onghia, E., et al., 2022b, Observations of the Magellanic Corona, [Nature](#)
- Before Joining CC **Krishnarao, D.**, Pace, Z. A., D’Onghia, E., et al., 2022a, Photometric Signature of Ultraharmonic Resonances in Barred Galaxies, [ApJ](#), 929, 112
- SDSS Collaboration, ..., **Krishnarao, D.**, ..., 2022, The Seventeenth Data Release of the Sloan Digital Sky Surveys : Complete Release of MaNGA, MaStar, and APOGEE-2 Data, [ApJS](#), 259, 35
- Cashman, F.H., ..., **Krishnarao, D.** (5th Author), et al. 2021, Molecular Gas within the Milky Way’s Nuclear Wind, [ApJL](#), 923, L11
- Masters, K. L., ..., **Krishnarao, D.** (10th Author), et al. 2021, Galaxy Zoo : 3D - crowdsourced bar, spiral, and foreground star masks for MaNGA target galaxies, [MNRAS](#), 507, 3923M
- Boardman, N., ..., **Krishnarao, D.** (9th Author), et al. 2020, Are the Milky Way and Andromeda unusual? A comparison with Milky Way and Andromeda Analogs, [MNRAS](#), 498, 4943B
- Krishnarao, D.**, Benjamin, R. A., Haffner, L. M., 2020c, Discovery of High-velocity H α Emission in the Direction of the Fermi Bubble, [ApJL](#), 899, L11
- Krishnarao, D.**, Tremonti, C., Fraser-McKelvie, A., et al., 2020b, The Effect of Bars on the Ionized ISM : Optical Emission Lines from Milky Way Analogs, [ApJ](#), 898, 116
- Krishnarao, D.**, Benjamin, R. A., Haffner, L. M., 2020a, Discovery of diffuse optical emission lines from the inner Galaxy : Evidence for LI(N)ER-like gas, [SciA](#), 6, 9711
- Fraser-McKelvie, A., ..., **Krishnarao, D.** (8th Author), et al. 2020, SDSS-IV MaNGA : The Gas Properties of Barred Galaxies, [MNRAS](#)
- SDSS Collaboration, ..., **Krishnarao, D.**, ..., 2020, The 16th Data Release of the Sloan Digital Sky Surveys : First Release from the APOGEE-2 Southern Survey and Full Release of eBOSS Spectra, [ApJS](#), 249, 3
- Krishnarao, D.**, 2019, whampy : Python Package to Interact with, Visualize, and Analyze the Wisconsin H-Alpha Mapper - Sky Survey, [JOSS](#), 4(44), 1940
- Krishnarao, D.**, Haffner, L. M., Benjamin, R. A., et al., 2017, A Study of the Warm ionized Medium throughout the Sagittarius-Carina Arm, [ApJ](#), 838, 43
- In Prep Cashman, F., Fox, A. J., ... **Krishnarao, D.**, et al., Ultraviolet Observations of Multi-phase Gas in the Inner-Galaxy Spiral Arms, (**ApJ**, in prep.)
- McCallum, L., ... **Krishnarao, D.**, et al., Time-dependent metal ionization in the diffuse ionized gas of star forming galaxies, (**MNRAS**, in prep.)
- Krishnarao, D.**, Wenger, T. B., Soler, J. D., Variations in the Vertical ISM : Measuring Large Scale Feedback in the Milky Way, (**in prep.**)

Invited
Conference

The Diffuse Gas in the Milky Way : The Warm/Hot Ionized Medium across the Milky Way, AAS - Diffuse Gas in the Milky Way, AAS, 244, Madison, WI, June, **2024**
 Ionizing Radiation Escaping Galactic Center, Interstellar Institute 6, Pascal Institute, Paris, France : July, **2023**
 High-Ion Absorption around the LMC : The Magellanic Corona, Interstellar Institute - With Two Eyes, Pascal Institute, Paris, France : July, **2022**
 Anomalous Velocity Gas near Galactic Center, Galactic and Extragalactic High Velocity Clouds, Green Bank Telescope, WV, USA : June, **2022**
 Identifying the Effects of Resonances in Galaxies using Photometry, Interstellar Institute - The Grand Cascade, Pascal Institute, Paris, France : July, **2021**
 Effects of Bars on Galaxies : Gas Ionization and Stellar Distributions, SDSS Milky Way as A Galaxy Symposium Series I, (Virtual : June, **2021**)
 Bars in Galaxies : A Galactic/Extragalactic Review of Stars and Gas, Joint Plenary Talk with Sten Hasselquist, SDSS Collaboration Meeting, New York, NY, (Virtual : June, **2020**)
 Discovery of Optical Line Emission Towards the Fermi Bubbles, AAS - The Fermi Bubbles : Progress and Prospects, AAS, 236, Madison, WI, (Virtual : June, **2020**)
 The Ionized ISM Around Bars : Using galaxies to Understand The Galaxy, Ψ^2 The Self Organized Star Formation Process, Pascal Institute, Paris, France, (September, **2019**)
 Physical Conditions of Ionized Gas in the Inner Galaxy, Ψ^2 The Milky Way in the Age of Gaia, Institut d'Astrophysique Spatiale, Paris, France, (October, **2018**)
 Distribution of the Warm Ionized Medium in Spiral Arms, Ψ^2 The Interstellar Medium Beyond 3D, Institut d'Astrophysique Spatiale, Paris, France, (July, **2017**)

Invited Seminar /
Colloquium

Tracing Ionized Gas and Ionizing Radiation Surrounding Galactic Center, Green Bank Observatory, Green Bank, WV (March 28, **2024**)
 Escape from the Galactic Center : Gas and the Radiation Field from the Milky Way Nucleus, Villanova University, Villanova, PA, (September, **2023**)
 Hunt for the Magellanic Corona and Feedback Driven Winds, University of Utah, Salt Lake City, UT, (October 20, **2022**)
[🔗](#) High-Ion Absorption around the LMC : A Magellanic Corona , Space Telescope Science Institute / Johns Hopkins University - CoolSci, (Virtual : Feb, **2022**)
 The Inner Milky Way : Gas Flows in the Bar and Fermi Bubbles, University of Hertfordshire, Hatfield, United Kingdom, (Virtual : June 9, **2021**)
 The Inner Milky Way : Ionized Gas in the Bar and Fermi Bubbles, Indiana University Lunch Talk, Bloomington, Indiana, (Virtual : March 5, **2021**)
[🔗](#) An Optical View of Galactic Center : Ionized Gas in the Bar and Fermi Bubbles , Dominion Radio Astrophysical Observatory, Penticton, British Columbia, Canada, (Virtual : October 14, **2020**)
 Optical Emission from the Inner Milky Way : Ionized Gas in the Bar and Fermi Bubbles, Green Bank Telescope, Green Bank, West Virginia, (Virtual : September 3, **2020**)
 The Inner Milky Way : Our New Closest LI(N)ER, Kavli Institute for Cosmological Physics, University of Chicago, Chicago, Illinois, (February 28, **2020**)

Contributed
Conference

Optical and Radio Emission Line Observations of the Fermi Bubbles, ESO SKA 2024 : Cosmic Ecosystems in Radio & Optical, Busselton, Australia, (December, **2024**)
 Multiphase LMC CGM : Extended Corona and Truncated Cool CGM, ESO Resolving the Circumgalactic Medium and its Impact on Galaxy Evolution, Santa Cruz, Colchagua, Chile (November, **2024**)
 ***[🔗](#) Solo-Tutorial Extensions : Formative Assessments in Upper Level Undergraduate Astrophysics, AAS 244, Madison, WI, (June, **2024**)
 ***SDSS-V FAST (Faculty And Student Teams) & FAST 4Ward, SDSS-V Collaboration Meeting, Las Cruces, NM, (June, **2024**)
 ***Towards an Antiracist Physics Classroom, AAS 243, New Orleans, LA, (January, **2024**)
 ***SDSS-V FAST (Faculty And Student Teams), SDSS-V Collaboration Meeting, New York, NY, (August, **2023**)
 Observations of the Magellanic Corona, New Views on Feedback & the Baryon Cycle in Galaxies, Healesville, Australia, (July, **2023**)
 Dark Gaps are the the inner 4:1 UHR, Galactic Bars 2023, Granada, Spain, (July, **2023**)
 New Observations of the Fermi Bubbles : in-situ Conditions and Galactic Center Workshop, Granada, Spain, (April, **2023**)
 Diffuse Gas and Galactic Structure : New Insight from the Milky Way and Beyond, AAS 241, Seattle, WA, (January, **2023**)
 ***Cataloging the Universe - An Audio-Course for 5th Grade Science, NSF Symposium, AAS 241, Seattle, WA, (January, **2023**)

[🔗 Finding the Ultra-Harmonic Resonance from Photometry Alone](#), AAS Division on Dynamical Astronomy Meeting 52, (Virtual : May, **2021**)
 Using Faint Optical Emission to Study Ionization Around Galactic Center, CHANGE-ES Collaboration Meeting, Albuquerque, NM, (Virtual : July, **2020**)
 The Relation Between LI(N)ERs and WIM : New Results from the Inner Galaxy, Warm Ionized Medium in Galaxies - Workshop, Green Bank, WV, (October, **2019**)
 Diagnostics of Diffuse Ionized Gas in the Milky Way Galaxy and Milky Way Analogs, SDSS MaNGA Team Meeting, Oxford, UK, (April, **2019**)
 Using MaNGA to Understand Milky Way Diffuse Ionized Gas Near Galactic Center and at Large Heights, SDSS Collaboration Meeting, Seoul, South Korea, (June, **2018**)
 Evidence for a Tilted Elliptical Ionized Gas Disk in Galactic Center, The Role of Gas in Galaxy Dynamics, Valletta, Malta, (October, **2017**)
 Students' Feedback - Forecasting Space Weather (with Michelangelo Romano), 7th Community Coordinated Modeling Center Community Workshop, Research and Education Support, Annapolis, MD, (March, **2014**)

*** Education/Outreach focus

UNDERGRADUATE RESEARCH MENTEES @CC

Sean Lam	Optical emission in the context of 3D dust maps	Spring 2024 - current
Sabra Catalano	UV Absorption line fitting to search for Winds from the LMC.	Summer 2024 - current
Aliana Instanbullu	Dynamical effects of spirals and bars on distribution of galaxy parameters.	Summer 2024 - current
Patrick Loos	Mapping azimuthal variations of physical conditions in barred galaxies.	Summer 2024 - current
Joshua McFeeters	Separating atmospheric and Galactic [NII] emission from WHAM.	Summer 2023 - current
Anders Ripley	Diagnosing LMC winds in relation to LMC disk properties.	Summer 2023 - current
Owen Cox	Do sdOB stars lead to LI(N)ER-like emission in galaxies?	Summer 2023 - Spring 2024
Wanyan Yuan	Mapping UV absorption line results alongside star formation tracers	Summer 2023 - Spring 2024
Natalie Van Tol	UV Absorption line fitting for cool gas outflowing from the LMC.	Summer 2023 - Spring 2024
Katie Joslyn	Synthetic Observations of Ionized Gas in the Milky Way.	Spring 2024, Block 8
Will Taylor	Ionization Sources in the Milky Way.	Spring 2024, Block 8
Dominic Schwein	Stellar & Gas Kinematic Offsets in Low-mass Galaxies.	Spring 2024, Block 8
Andrew Biesiada	Large Astronomical Dataset Analysis & Visualization.	Spring 2024, Block 8

</> SOFTWARE

PYONIZED


 [GITHUB.COM/DEECH08/PYONIZED](https://github.com/DEECH08/PYONIZED)

 Python Package for Modeling Ionized Gas in 4D (3D Space + Velocity)

Student Led Code Development [Sean Lam; Katie Joslyn] Will be used with SDSS-V LVM Project

GALRAD

 [GITHUB.COM/DEECH08/GALRAD](https://github.com/DEECH08/GALRAD)

 Provides an easy way to estimate the Ionizing photon flux around the CGM environment of Milky Way and Magellanic Clouds.


Used in  Nature Paper on LMC Corona.

WHAMPY

 [GITHUB.COM/DEECH08/WHAMPY](https://github.com/DEECH08/WHAMPY)

 ReadTheDocs : <https://whampy.readthedocs.io/>  PyPi : <https://pypi.org/project/whampy/>

Provides an easy way to load, view, and do science with the Wisconsin H-Alpha Mapper (WHAM) Sky Survey.

 JOSS DOI : [10.21105/joss.01940](https://doi.org/10.21105/joss.01940)

MODSPECTRA

 [GITHUB.COM/DEECH08/MODSPECTRA](https://github.com/DEECH08/MODSPECTRA)

 ReadTheDocs : <https://modspectra.readthedocs.io/>

Provides an easy way to create synthetic 3D data cubes of HI and H-Alpha spectra in the Galaxy.

Used in  Science Advances Paper on Tilted Disk.

- Presenter **Krishnarao, D.**, Observations of LMC Coronal Gas and a Multiphase CGM, IAU GA 2024, Cape Town, South Africa, (August, **2024**)
- Krishnarao, D.**, New Observations of the Fermi Bubbles : Tracing Nuclear Feedback and in-situ Conditions, IAU GA 2024, Cape Town, South Africa, (August, **2024**)
- Krishnarao, D.**, How Well do Dark Gaps Track the Location of Bar Resonances?, Galactic Bars 2023, Granada, Spain, (July, **2023**)
- ***Krishnarao, D.**, Cataloging the Universe - An Audio-Course for 5th Grade Science, AAS, 241, Seattle, WA, (January, **2023**)
- Krishnarao, D.**, Tremonti, C., Fraser-McKelvie, A., et al., Optical Emission, Bars, LI(N)ERS and Beyond : Bridging the Milky Way with Extragalactic Surveys, AAS, 235, Honolulu, HI (January, **2020**)
- Krishnarao, D.**, Tremonti, C., Benjamin, R. A., Haffner, L. M., Ionized Gas Near Galactic Center : LI(N)ER Emission Close to Home, New Horizons in Galactic Center Astronomy and Beyond, Yokohama, Japan (October, **2019**)
- Krishnarao, D.**, Tremonti, C., Benjamin, R. A., Haffner, L. M., Observational Comparisons of Diffuse Ionized Gas in the Milky Way Galaxy with Milky Way Analogs, Linking the Milky Way and Nearby Galaxies, Helsinki, Finland (June, **2019**)
- Krishnarao, D.**, Benjamin, R. A., Haffner, L. M., Ionized Gas Near Galactic Center : Physical Parameters and Mass Estimates, AAS, 233, Seattle, WA (January, **2019**)
- ***Krishnarao, D.**, Townsend, R. H. D., Heinz, S., Online Astronomy Education at the University of Wisconsin-Madison, AAS, 233, Seattle, WA (January, **2019**)
- Krishnarao, D.**, Benjamin, R. A., Haffner, L. M., A Modified Kinematic Model of Neutral and Ionized Gas in Galactic Center, Hendrik van de Hulst Centennial Symposium : The Interstellar Medium of Galaxies, Leiden, Netherlands (November, **2018**)
- Krishnarao, D.**, Benjamin, R. A., Haffner, L. M., New Insight on the Physical Conditions near Galactic Center, The Olympian Symposium 2018, Paralia Katerini, Greece (June, **2018**)
- Krishnarao, D.**, Benjamin, R. A., Haffner, L. M., A Modified Kinematic Model of Neutral and Ionized Gas in Galactic Center, AAS, 231, National Harbor, MD (January, **2018**)
- Krishnarao, D.**, Haffner, L. M., Benjamin, R. A., Interplay Between the Vertical Structure of Halo Gas and the Galactic Disk, 6 years of ISM-SPP, Cologne, Germany (February, **2017**)
- Krishnarao, D.**, Haffner, L. M., Benjamin, R. A., The Vertical Structure of Diffuse Ionized Gas in Galactic Spiral Arms, AAS, 229, Grapevine, TX (January, **2017**) [Chambliss Poster Award]
- Krishnarao, D.**, Haffner, L. M., Benjamin, R. A., The Vertical Extent of Ionized Gas in the Sagittarius-Carina Arm, ViaLactea : The Milky Way as a Star Formation Engine, Rome, Italy (September, **2016**)
- Krishnarao, D.**, Haffner, L. M., Benjamin, R. A., WHAM Observations of Ionized Gas in the Carina Arm, Star Formation, Magnetic Fields, and Diffuse Matter in the Galaxy, Madison, WI (May, **2016**)
- Krishnarao, D.**, Smart, B., Haffner, L. M., Barger, K., Madsen, G. J., Hill, A. S., Gaensler, B. M., The Extended Ionized Halos and Bridge of the Magellanic Clouds, AAS, 227, ID : 136.13, Kissimmee, FL (January, **2016**)
- Robinson, M., **Krishnarao, D.**, Analyzing Wireless Communication Network Vulnerability with Homological Invariants, 2nd IEEE Global Conference on Signal and Information Processing, Atlanta, GA (December **2014**)
- Krishnarao, D.**, Pulkkinen, A., STEREO EUVI as X-Ray Proxy, European Space Weather Week, Open Session on Space Weather Applications and Engineering Concerns, Liege, Belgium (November, **2014**)
- Krishnarao, D.**, Zheng, Y, Maddox, M., Schiewe, T., Development of the Spacecraft Environmental Anomalies Expert System (SEAES) at NASA, Spacecraft Operations and Space Weather, Liege, Belgium (November, **2014**)
- Krishnarao, D.**, Zheng, Y, Maddox, M., Schiewe, T., Development of the Spacecraft Environmental Anomalies Expert System (SEAES) at NASA, APS Mid-Atlantic Section, ID : F1.60, State College, PA (October, **2014**)
- Krishnarao, D.**, Sofia, U. J., The Effect of Sulfur on Interstellar Extinction, APS April Meeting, ID : L1.012, Savannah, GA (March, **2014**)

- Co-Author ****McFeeters, J., Krishnarao, D.,** [🔗](#) Mapping [NII] Emission in the Milky Way with the Wisconsin H-Alpha Mapper (WHAM), AAS, 243, New Orleans, LA (January, 2024)
- **Cox, O., Krishnarao, D.,** [🔗](#) Could sdOB or white dwarf stars be responsible for causing LI(N)ER-like emission?, AAS, 243, New Orleans, LA (January, 2024)
- **Yuan, W., Ripley, A., Van Tol, N., Krishnarao, D.,** [🔗](#) A Stellar Feedback Odyssey : Galactic Winds in the Large Magellanic Cloud as seen through ULYSSES, AAS, 243, New Orleans, LA (January, 2024)
- Horton, April, ..., **Krishnarao, D.,** et al. A Tale of Winds and Tides : Characterizing the Properties of the Magellanic Stream, AAS, 243, New Orleans, LA (January, 2024)
- Gebhart, Stone, ..., **Krishnarao, D.,** et al. Explosive galactic weather : Winds from the largest cloud in the local group, AAS, 243, New Orleans, LA (January, 2024)
- Horton, April, ..., **Krishnarao, D.,** et al. Blowing in the Galactic Winds : Surveying the Stellar-Driven Outflows of the LMC, AAS, 243, New Orleans, LA (January, 2024)
- Horton, April, ..., **Krishnarao, D.,** et al. Our Windy Neighbor : Characterizing the Galactic Winds Generated by Supernovae Explosions in the Large Magellanic Cloud Galaxy, AAS, 243, New Orleans, LA (January, 2024)
- ***Morris, M. Krishnarao, D.,** Lopez, A., et al., University of Wisconsin-Madison Astronomers Promoting Lasting Equity (UW-MAPLE), AAS, 235, Honolulu, HI (January, 2020)
- Benjamin, R. A., **Krishnarao, D.,** Haffner, L. M., An Investigation of the Ionization Structure of the Carina Spiral Arm with WHAM, AAS, 231, National Harbor, MD (January, 2018)
- Smart, B., Haffner, L. M., Barger, K., **Krishnarao, D.,** The WHAM H α Magellanic Stream Survey : Progress and Early Results, AAS, 229, Grapevine, TX (January, 2017)
- ***Education/Outreach focus** ****Undergraduate Student First Author**
- Co-Author Talk Abstracts Benjamin, Robert, ..., **Krishnarao, D.,** et al., [🔗](#) Passage Through the Carina Spiral Arm as the Origin of Major Star Forming Complexes in the Solar Neighborhood, AAS 244, Madison, WI, (June, 2024)
- Poudel, Suraj, ..., **Krishnarao, D.,** et al., [🔗](#) Exploring the Gaseous Eruption in the 30-Doradus Starburst Region, AAS 243, New Orleans, LA, (January, 2024)
- Smart, Brianna, ..., **Krishnarao, D.,** et al., [🔗](#) The Diffuse Ionized Gas of the Large Magellanic Cloud , AAS 241, Seattle, WA, (January, 2023)
- Barger, Kathleen, ..., **Krishnarao, D.,** et al., [🔗](#) The LMC's Galactic Feedback , AAS 241, Seattle, WA, (January, 2023)
- Fox, Andrew, **Krishnarao, D.,** et al., [🔗](#) The Magellanic Corona , AAS 241, Seattle, WA, (January, 2023)
- Cashman, Frances, ..., **Krishnarao, D.,** et al., [🔗](#) Caught in the Act : A Metal-Rich High-Velocity Cloud in the Inner Galaxy, AAS 241, Seattle, WA, (January, 2023)
- Benjamin, Robert, Clarke, Leonardo, **Krishnarao, D.,** [🔗](#) Beyond the Break in the Galactic Stellar Disk : A Search for Red Clump Giants, AAS 237, Seattle, WA, (January, 2021)
- Haffner, L. M., Benjamin, R. A., **Krishnarao, D.,** [🔗](#) Discovery of Ionized Gas Associated with the Tilted Inner Disk of the Milky Way, AAS, 231, National Harbor, MD (January, 2018)

SELECT PRESS CONTENT

- LMC Corona [🔗](#) Galactic Atmospheres - by **Krishnarao, D.,** Fox, A. J., & D'Onghia, E.,
[🔗](#) NASA Press Release (>760M Impressions after 1 month)
[🔗](#) Colorado College News Story
[📺](#) Youtube Video (140K views)
[🔗](#) CNET
[🔗](#) Inverse
[🔗](#) IFL Science
[🔗](#) AltMetric Summary Info
- Fermi Bubble [🔗](#) UW-Madison Press Release
[🔗](#) ERAU Press Release
[🔗](#) Cosmos Magazine
[🔗](#) Science News
[🔗](#) Universe Today
[🔗](#) IFL Science
- Tilted Disk [🔗](#) UW-Madison Press Release
[🔗](#) ERAU Press Release
[🔗](#) Inverse
[🔗](#) Universe Today
[🎧](#) SpaceTime (Podcast)
[🔗](#) AltMetric Summary Info

HONORS & AWARDS

- 2022 American Astronomical Society Rodger Doxsey Travel Prize - Honorable Mention
- 2021 NSF Astronomy and Astrophysics Postdoctoral Fellowship
- 2017 NSF Graduate Research Fellowship Program - Honorable Mention
Chambliss Graduate Astronomy Achievement Award, American Astronomical Society
- 2016 Stebbins Award, UW-Madison Astronomy
- 2015 Outstanding Community Service Award, American University Physics
Outstanding Honors Senior, American University
- 2014 Robert H. Goddard Customer Service Exceptional Achievement Award [team Award], NASA Goddard
Outstanding TA of the Year, American University Physics
Jacob Kastner Memorial Scholarship, American University
- 2013 Outstanding TA of the Year, American University Physics
Jacob Kastner Memorial Scholarship, American University
- 2012 Jacob Kastner Memorial Scholarship, American University

RESEARCH TRAINING

- August 2022 | NSF Astronomy & Astrophysics Postdoctoral Fellow | Johns Hopkins University, (BALTIMORE, MD),
July 2021
 - > How have the Magellanic Clouds survived their tumultuous journey falling into the Milky Way?
 - > Can a diffuse, protective Magellanic Corona be directly observed surrounding the Large Magellanic Cloud?

HST FUSE Python Optical/UV Spectroscopy Machine Learning
- July 2021 | Postdoctoral Fellow | Space Telescope Science Institute, (BALTIMORE, MD), High-Velocity Ionized Gas
January 2021
 - > How has the ionizing radiation field escaping from the Galactic Center evolved over time?
 - > How can observations be used to constrain the hot halo of the Magellanic Clouds?
 - > How can stellar spectra observations in SDSS-V be used to map the ISM in 3D space and kinematics?

HST WHAM SDSS-V Python Optical/UV Spectroscopy Machine Learning
- January 2021 | Postdoctoral Researcher | University of Wisconsin-Madison, ASTRONOMY, Photoionization Modeling
August 2020
 - > What are the sources of ionization in the inner Milky Way and LI(N)ERs?
 - > How does the radiation field vary in the inner Milky Way?
 - > What photoionization models are necessary to predict the observed gas physical conditions?

HST WHAM SDSS-MaNGA Python IDL Optical/UV Spectroscopy Cloudy Photoionization
- August 2020 | Graduate Research Assistant | University of Wisconsin-Madison, ASTRONOMY, Diffuse Gas in Galaxies
August 2015
 - > How does star formation in the disk of the Galaxy influence the diffuse halo gas?
 - > How does the vertical extent of diffuse ionized gas influence cold, dense gas and star formation?
 - > How do physical conditions and the distribution of diffuse gas change throughout the Galaxy?
 - > How is gas near the center of the Galaxy distributed, behave kinematically and interact with the bar?

WHAM SDSS-MaNGA Python IDL Optical Spectroscopy Bayesian Statistics
- September 2015 | Space Weather Forecaster II+ / Researcher | NASA Goddard Space Flight Center, HELIOPHYSICS,
June 2013
 - > Advisors : Yihua Zheng, Antti Pulkkinen
 - > How can accurate forecasting models be built for solar flares using low cadence imaging?
 - > How can real-time space environment conditions be predicted for specific spacecraft orbits?
 - > How can spacecraft operators easily assess space weather conditions and risks in real-time?

SDO IDL WSA-ENLIL SEA⁵
- May 2015 | Research Assistant | American University, MATHEMATICS, Algebraic Topology
August 2014
 - > Advisor : Michael Robinson
 - > How can Algebraic Topology be used to analyze network strengths and weaknesses?

Python Matlab Wireless Networks
- May 2014 | Research Assistant | American University, PHYSICS, Interstellar Extinction
September 2013
 - > Advisor : Ulysses J. (UJ) Sofia
 - > What is the chemical composition of interstellar dust : specifically the role of sulfur?
 - > Does sulfur preferentially distribute towards specific dust grain sizes?

HST/STIS IDL UV Spectroscopy Voigt-profile Fitting

TEACHING EXPERIENCE

August 2022 Present	Assistant Professor Colorado College, PHYSICS, ~ 150 students <ul style="list-style-type: none">> Courses:Astronomy (PC133), Modern Physics (PC251), Electronics (PC261), Astrophysics (PC357), Observational Astronomy (PC362)> Labs/lecture for intro astronomy (32 students/class)> Lecture for intermediate/advanced physics for majors/minors (10-25 students/class)> Lab-based intermediate electronics for majors/minors (15 students/class)> Field-Trip based advanced observational astronomy for majors/minors (12 students/class) <p>Group Work Project Based Collaborative/Alternative Assessments Field Trips Self Grading Ungrading</p>
April 2022 May 2022	Visiting Assistant Professor Colorado College, PHYSICS, ~ 30 students <ul style="list-style-type: none">> Course:Astronomy (PC-133)> Primary instructor of introductory astronomy course for Block 8 course (3.5 weeks)> Designed collaborative worksheet based lectures with projects <p>Introductory Astronomy Writing Intensive Group Work</p>
July 2018 January 2018	Instructor / Course Developer University of Wisconsin-Madison, ASTRONOMY, > 2, 000 total students <ul style="list-style-type: none">> Course:Online–The Evolving Universe : Stars, Galaxies, and Cosmology (ASTRON 103).> Built the departments first online only intro astronomy course and co-taught it (~ 30 students).> Recorded ~30 hours of educational videos, and designed writing assignments, discussion questions, projects, and exams.> Course has been re-used annually since in summers and extensively during Spring 2020, Fall 2020 (> 2000 students). <p>Online Introductory Astronomy Writing Intensive</p>
May 2017 January 2017	Teaching Assistant University of Wisconsin-Madison, ASTRONOMY, ~ 100 students/course <ul style="list-style-type: none">> Course:Planets and the Solar System (ASTRON 104)> Designed and led 6 weekly discussion sections. <p>Introductory Astronomy</p>
May 2015 August 2013	Teaching Assistant American University, PHYSICS, ~ 10 – 150 students/course <ul style="list-style-type: none">> Course (# of semesters) : Intro Astronomy (4), Modern Physics (2), General Physics II (1), E&M (1), Cosmology (1) <p>Introductory Physics Advanced Undergraduate Physics</p>
May 2013 August 2012	Supplemental Instruction Leader / Trainer American University, ACADEMIC SUPPORT AND ACCESS CENTER, ~ 10 – 150 students/course <ul style="list-style-type: none">> Course (# of semesters) : General Physics I (1), General Physics II (1) <p>Introductory Physics</p>
May 2015 August 2012	Private Tutor / Learning Disability Student Tutor American University, ACADEMIC SUPPORT AND ACCESS CENTER, <ul style="list-style-type: none">> Relevant Topics:Intro Math, Calculus I - III, Statistics, All levels of Physics <p>Introductory Physics Introductory Mathematics Advanced Physics</p>

OTHER LEADERSHIP EXPERIENCE

Current September 2024	Crown Center Faculty Fellow Alternative Assessment in STEM, COLORADO COLLEGE, <ul style="list-style-type: none">> Build an Educator Learning Community at CC to discuss, develop, implement, and assess alternative assessment strategies in STEM courses.> Gather data on select strategies in preparation for larger scale assessment and publication. <p>Faculty Development Formative Assessment</p>
December 2019 September 2015	Volunteer Coach / Instructing Mentor Hamilton Middle School, SCIENCE OLYMPIAD, ~ 15 students <ul style="list-style-type: none">> Coach students for written physics portions through interactive teaching methods.> Students have placed 1st in multiple regional and state competitions - compete nationally <p>Middle School Students High School Students Introductory Physics Physics Experiments</p>
June 2017 July 2015	Assistant A/V Manager NewSpace Conference, SPACE FRONTIER FOUNDATION, > 2000 participants <ul style="list-style-type: none">> Coach students for written physics portions through interactive teaching methods.> Students have placed 1st in multiple regional and state competitions - compete nationally <p>Middle School Students High School Students Introductory Physics Physics Experiments</p>



SERVICE AND OTHER

(Service after starting at CC are shown in dark red)

- 2024 CC Crown Center Faculty Fellow - Alternative Assessment in STEM
Hubble Space Telescope Cycle 32 External Reviewer
Session Chair for Summer American Astronomical Society Meeting, Madison, WI
Co-Organized 2 Special Sessions on Education and SDSS-IV for Summer AAS, Madison, WI
- 2021-current SDSS-V FAST Program Coordinator & Liaison
- 2021-current SDSS-V Local Volume Mapper Data Release Manager
- 2023-2025 Member of Committee on Financial Aid and Admissions - Colorado College
- 2023 Taught Mock Astronomy Course for CC Accepted/Admitted Students
Session Chair for January American Astronomical Society Meeting, Seattle, WA
Hubble Space Telescope Cycle 31 External Reviewer
Invited Participant : [Interstellar Institute - 6](#) (Paris, France)
Referee for Publication in *Astrophysical Journal*
- 2022 Referee for Publication in *Astronomy & Astrophysics*
Invited Participant : [With Two Eyes - Interstellar Institute](#) (Paris, France)
- 2020 Invited Participant : [The Grand Cascade - Interstellar Institute](#) (Paris, France)
- 2019 Invited Participant : [\$\Psi^2\$: SoStar](#) (Paris, France)
Graduate Student-Faculty Liaison - UW-Madison Department of Astronomy (AY 2018-2019)
- 2018 Invited Participant : [\$\Psi^2\$: The Milky Way in the Age of Gaia](#) (Paris, France)
- 2017 Invited Participant : [\$\Psi^2\$: The Interstellar Medium Beyond 3D](#) (Paris, France)
Member of Graduate Admissions Committee, UW-Madison
- 2016 Member of Graduate Admissions Committee, UW-Madison
Member of Local Organizing Committee : SDSS Collaboration Meeting (Madison, WI)
Member of Local Organizing Committee : CHANGE-ES Collaboration Meeting (Madison, WI)
Participated in American Astronomical Society Congressional Visits Day
- 2015 American Astronomical Society Astronomy Ambassador (2015 - Present)
- 2014 Nominated and Ran for American Physical Society Mid-Atlantic Section Student Board Member
Featured in NASA Goddard Space Flight Center [Intern Profile](#)
Featured in Connections, American University College of Arts of Sciences' Magazine