Dhanesh Krishnarao (DK)

Ph.D. Astronomy | Interstellar Medium, Galactic Structure, Ionization

www.astronomy.dk github.com/Deech08 @DK_and_a_bit dkrishnarao@coloradocollege.edu

Colorado College, Department of Physics

Research Interests : Interstellar/Circumgalactic Medium, Galactic Structure, 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
8/2019 - 1/2021	Postdoctoral Fellow - Madison, WI	University of Wisconsin-Madison

Education

2020 Ph.D. Astronomy, University of Wisconsin-Madison
Thesis Title : *The Impact of Galactic Structure on the Distribution and Ionization of Gas in Galaxies*
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

Honors & Awards

2022 **American Astronomical Society Rodger Doxsey Travel Price - 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

Grants & Funding

Total : $\sim \$695,000$ [+$\$1,168,040$ submitted for review]

2023	**Natural Science R&D Fund**, Colorado College	$6370
	Sloan Digital Sky Survey FAST Faculty Liaison - PI, ARC-SDSS	$22,835
	Astronomy & Astrophysics Research Grant - PI, NSF, *submitted*	[$1,168,040]
2022	**SEGway Research Grant - Galactic Center**, Colorado College	$4500
	SEGway Research Grant - Cataloging the Universe, Colorado College	$5000
	Student Collaborative Research Grant (SCoRe), Colorado College	$4500
	Natural Science R&D Fund, Colorado College	$5000
	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
2020	**Astronomy and Astrophysics Postdoctoral Fellowship**, National Science Foundation	$300,000
	International Travel Grant, American Astronomical Society (unused; COVID-19)	$\sim$ $1,500
2019	**Student Research Travel Grant**, UW-Madison	$2,400
	International Travel Grant, American Astronomical Society	$\sim$ $1,500
2018	**Student Research Travel Grant**, UW-Madison	$1,200
	International Travel Grant, American Astronomical Society	$\sim$ $3,000
2017	**Fluno Family Graduate Fellowship**, UW-Madison Astronomy	$\sim$ $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	$\sim$ $1,500

Select Press Content

Magellanic Corona	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

Research Training

August 2022 – July 2021 | **NSF Astronomy & Astrophysics Postdoctoral Fellow | Johns Hopkins University, (Baltimore, MD),**
- 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 – January 2021 | **Postdoctoral Fellow | Space Telescope Science Institute, (Baltimore, MD), High-Velocity Ionized Gas**
- 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 – August 2020 | **Postdoctoral Researcher | University of Wisconsin-Madison, Astronomy, Photoionization Modeling**
- 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 – August 2015 | **Graduate Research Assistant | University of Wisconsin-Madison, Astronomy, Diffuse Gas in Galaxies**
- 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 – June 2013 | **Space Weather Forecaster II+ / Researcher | NASA Goddard Space Flight Center, Heliophysics,**
- 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 | SEA^5

May 2015 – August 2014 | **Research Assistant | American University, Mathematics, Algebraic Topology**
- Advisor : Michael Robinson
- How can Algebraic Topology be used to analyze network strengths and weaknesses?

Python | Matlab | Wireless Networks

May 2014 – September 2013

Research Assistant | American University, Physics, Interstellar Extinction

- 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, ~ 75 students

- Courses:Astronomy (PC133), Modern Physics (PC251), Electronics (PC261), Astrophysics (PC357)
- Labs/lecture for intro astronomy (32 students/class)
- Lecture for intermediate/advanced physics for majors/minors (15-25 students/class)
- Lab-based intermediate electronics lab for majors/minors (15 students/class)

Group Work | Project Based | Collaborative Assessments | Field Trips | Self Grading

April 2022 – May 2022

Visiting Assistant Professor | Colorado College, Physics, ~ 30 students

- Course:Astronomy (PC-133)
- Primary instructor of introductory astronomy course for Block 8 course (3.5 weeks)
- Designed collaborative worksheet based lectures with projects

Introductory Astronomy | Writing Intensive | Group Work

July 2018 – January 2018

Instructor / Course Developer | University of Wisconsin-Madison, Astronomy, ~ 30 students

- Course:Online–The Evolving Universe : Stars, Galaxies, and Cosmology (ASTRON 103)
- Built the departments first online only intro astronomy course and co-taught it.
- Recorded $\sim$30 hours of educational videos, and designed writing assignments, discussion questions, projects, and exams.
- Course has been re-used during Summer 2019, Summer 2020, ...

Online | Introductory Astronomy | Writing Intensive

May 2017 – January 2017

Teaching Assistant | University of Wisconsin-Madison, Astronomy, ~ 100 students

- Course:Planets and the Solar System (ASTRON 104)
- Designed and led 6 weekly discussion sections.

Introductory Astronomy

May 2015 – August 2013

Teaching Assistant | American University, Physics, $\sim 10 - 150$ students

- Course (# of semesters) : Intro Astronomy (4), Modern Physics (2), General Physics II (1), E&M (1), Cosmology (1)

Introductory Physics | Advanced Undergraduate Physics

May 2013 – August 2012

Supplemental Instruction Leader / Trainer | American University, Academic Support and Access Center, $\sim 10 - 150$ students

- Course (# of semesters) : General Physics I (1), General Physics II (1)

Introductory Physics

May 2015 – August 2012

Private Tutor / Learning Disability Student Tutor | American University, Academic Support and Access Center,

- Relevant Topics:Intro Math, Calculus I - III, Statistics, All levels of Physics

Introductory Physics | Introductory Mathematics | Advanced Physics

Other Leadership Experience

December 2019 – September 2015

Volunteer Coach / Instructing Mentor | Hamilton Middle School, Science Olympiad, ~ 15 students

- Coach students for written physics portions through interactive teaching methods.
- Students have placed 1st in multiple regional and state competitions - compete nationally

Middle School Students | High School Students | Introductory Physics | Physics Experiments

June 2017 – July 2015

Assistant A/V Manager | NewSpace Conference, Space Frontier Foundation, > 2000 participants

- Coach students for written physics portions through interactive teaching methods.
- Students have placed 1st in multiple regional and state competitions - compete nationally

Middle School Students | High School Students | Introductory Physics | Physics Experiments

Service and Other

2021-current	SDSS-V FAST Program Liaison
2021-current	SDSS-V Local Volume Mapper Data Release Manager
2023-2024	Member of Committee on Financial Aid and Admissions - Colorado College
2023	Session Chair for January American Astronomical Society Meeting, Seattle, WA
	Hubble Space Telescope Cycle 31 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 : Ψ^2 : SoStar (Paris, France)
	Graduate Student "Czar" - UW-Madison Department of Astronomy (AY 2018-2019)
2018	Invited Participant : Ψ^2 : The Milky Way in the Age of Gaia (Paris, France)
2017	Invited Participant : Ψ^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

Paper Publications

First Author	**Krishnarao, D.**, Fox, A. J., & D'Onghia, E., **2023**, UV Observations of a Magellanic Corona, Galactic Atmospheres
	Krishnarao, D., Fox, A. J., D'Onghia, E., et al., **2022b**, Observations of the Magellanic Corona, Nature
	Krishnarao, D., Pace, Z. A., D'Onghia, E., et al., **2022a**, Photometric Signature of Ultraharmonic Resonances in Barred Galaxies, ApJ, 929, 112
	Krishnarao, D., Benjamin, R. A., Haffner, L. M., **2020c**, Discovery of High-velocity Hα 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
	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.	Poudel, S., Horton, A., ... **Krishnarao, D.**, et al., The Gaseous Blowout of the 30 Doradus Starbust Region, **(in prep.)**
	Luisi, M., **Krishnarao, D.**, Butterfield, N., et al., Radio Recombination Line Observations towards the Fermi Bubbles, **(in prep.)**
	Krishnarao, D., Wenger, T. B., et al., Variations in the Vertical ISM : Measuring Large Scale Feedback in the Milky Way, **(in prep.)**
Core Team	McCallum, L., ..., **Krishnarao, D.** (5th Author), et al., The persistence of high altitude non-equilibrium diffuse ionized gas in simulations of star forming galaxies, **(submitted to MNRAS)**
	Smart, B., ..., **Krishnarao, D.** (6th Author), et al. **2023**, The Diffuse Ionized Gas Halo of the Large Magellanic Cloud, ApJ, 948, 118
	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
	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
	Fraser-McKelvie, A., ..., **Krishnarao, D.** (8th Author), et al. **2020**, SDSS-IV MaNGA : The Gas Properties of Barred Galaxies, MNRAS
	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

Collaboration

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

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

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

</> Software

GALRAD 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 Magellanic Corona.

WHAMPY 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

MODSPECTRA 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.

Talks & Seminars

Invited Conference

Krishnarao, D., Interstellar Institute 6, Pascal Institute, Paris, France : July, **2023**)

Krishnarao, D., High-Ion Absorption around the LMC : The Magellanic Corona, Interstellar Institute - With Two Eyes, Pascal Institute, Paris, France : July, **2022**)

Krishnarao, D., Anomalous Velocity Gas near Galactic Center, Galactic and Extragalactic High Velocity Clouds, Green Bank Telescope, WV, USA : June, **2022**)

Krishnarao, D., Identifying the Effects of Resonances in Galaxies using Photometry , Interstellar Institute - The Grand Cascade, Pascal Institute, Paris, France : July, **2021**)

Krishnarao, D., Effects of Bars on Galaxies : Gas Ionization and Stellar Distributions, SDSS Milky Way as A Galaxy Symposium Series I, (Virtual : June, **2021**)

Krishnarao, D. & Hasselquist, S., Bars in Galaxies : A Galactic/Extragalactic Review of Stars and Gas, Joint Plenary Talk, SDSS Collaboration Meeting, New York, NY, (Virtual : June, **2020**)

Krishnarao, D., Discovery of Optical Line Emission Towards the Fermi Bubbles, AAS - The Fermi Bubbles : Progress and Prospects, AAS, 236, Madison, WI, (Virtual : June, **2020**)

Krishnarao, D., 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**)

Krishnarao, D., 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**)

Krishnarao, D., 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

Krishnarao, D., Escape from the Galactic Center : Gas and the Radiation Field from the Milky Way Nucleus, Villanova University, Villanova, PA, (September, **2023**)

Krishnarao, D., Hunt for the Magellanic Corona and Feedback Driven Winds, University of Utah, Salt Lake City, UT, (October 20, **2022**)

Krishnarao, D., High-Ion Absorption around the LMC : A Magellanic Corona , Space Telescope Science Institute / Johns Hopkins University - CoolSci, (Virtual : Feb, **2022**)

Krishnarao, D., The Inner Milky Way : Gas Flows in the Bar and Fermi Bubbles, University of Hertfordshire, Hatfield, United Kingdom, (Virtual : June 9, **2021**)

Krishnarao, D., The Inner Milky Way : Ionized Gas in the Bar and Fermi Bubbles, Indiana University Lunch Talk, Bloomington, Indiana, (Virtual : March 5, **2021**)

Krishnarao, D., 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**)

Krishnarao, D., 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**)

Krishnarao, D., 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

***Krishnarao, D., et al., Towards and Antiracist Physics Classroom, AAS 243, New Orleans, LA, (January, 2024)
***Krishnarao, D., SDSS-V FAST (Faculty And Student Teams), SDSS-V Collaboration Meeting, New York, NY, (August, 2023)
Krishnarao, D., Observations of the Magellanic Corona, New Views on Feedback & the Baryon Cycle in Galaxies, Healesville, Australia, (July, 2023)
Krishnarao, D., Dark Gaps are the the inner 4:1 UHR, Galactic Bars 2023, Granada, Spain, (July, 2023)
Krishnarao, D., New Observations of the Fermi Bubbles : in-situ Conditions and Galactic Center Workshop, Granada, Spain, (April, 2023)
Krishnarao, D., Diffuse Gas and Galactic Structure : New Insight from the Milky Way and Beyond, AAS 241, Seattle, WA, (January, 2023)
***Krishnarao, D., Cataloging the Universe - An Audio-Course for 5th Grade Science, NSF Symposium, AAS 241, Seattle, WA, (January, 2023)
Krishnarao, D., et al., Finding the Ultra-Harmonic Resonance from Photometry Alone , AAS Division on Dynamical Astronomy Meeting 52, (Virtual : May, 2021)
Krishnarao, D., Using Faint Optical Emission to Study Ionization Around Galactic Center, CHANGE-ES Collaboration Meeting, Albuquerque, NM, (Virtual : July, 2020)
Krishnarao, D., 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)
Krishnarao, D., Diagnostics of Diffuse Ionized Gas in the Milky Way Galaxy and Milky Way Analogs, SDSS MaNGA Team Meeting, Oxford, UK, (April, 2019)
Krishnarao, D., Using MaNGA to Understand Milky Way Diffuse Ionized Gas Near Galactic Center and at Large Heights, SDSS Collaboration Meeting, Seoul, South Korea, (June, 2018)
Krishnarao, D., Evidence for a Tilted Elliptical Ionized Gas Disk in Galactic Center, The Role of Gas in Galaxy Dynamics, Valletta, Malta, (October, 2017)
Krishnarao, D., Romano, M., Students' Feedback - Forecasting Space Weather, 7th Community Coordinated Modeling Center Community Workshop, Research and Education Support, Annapolis, MD, (March, 2014)
***Education/Outreach focus

Posters

Presenter

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**)

***Morris, M. **Krishnarao, D.**, Lopez, A., et al., University of Wisconsin-Madison Astronomers Promoting Lasting Equity (UW-MAPLE), AAS, 235, Honolulu, HI (January, **2020**)

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**)

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 Hα Magellanic Stream Survey : Progress and Early Results, AAS, 229, Grapevine, TX (January, **2017**)

***Education/Outreach focus **Undergraduate Student First Author