J. Sebastian Monzon

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Bay Area, CA

EDUCATION

University of California, Santa Cruz September 2015 - June 2019
B.S. Physics (Astrophysics)
Advisor: Professor Enrico Ramirez-Ruiz

RESEARCH INTERESTS

+ observational cosmology, galaxy clusters and evolution, intergalactic medium
+ interstellar medium, massive star formation, astro-chemistry
+ big data, machine learning, software development

RESEARCH

Research Intern, NASA Ames February 2020 - present
PIs: Dr. Naseem Rangwala, Dr. Sarah Nickerson
Astrochemical Observations of Hot Molecular Cores with SOFIA

· Analyzing high-resolution mid-infrared SOFIA/EXES spectra of the Orion IRc2 hot molecular core. Helping creating a chemical inventory of the region to better understand the massive regime of pre-protostellar environments. Identifying molecular species and predicting thier physical properties, with emphasis on H2O in the ISM.

Gemini/HST Cluster Project Intern, Gemini N. Observatory May 2020 - September 2020
PIs: Dr. Inger Jorgensen, Dr. Kristin Chiboucas
HST Cluster Project

· Studied cluster galaxy evolution in terms of scaling relations and structural properties of passive cluster galaxies. Processed spectroscopic data of redshift 0.5 galaxy cluster obtained with the multi-object spectrograph GMOS on Gemini North.

USRA Research Assistant, NASA Ames June 2019 - February 2020
PI: Dr. Randolf Klein
Modeling the SEDs of Early Massive Clumps

· Investigated physical parameters derived from three different modeling techniques designed to fit the SEDs of $\sim$ 170 pre-protostellar cores imaged by several different instruments, including USRA's SOFIA/FORCAST. Used Principal Component Analysis to analyze the results of the fitting across techniques and selected the most successful method with Bayesian formalism.

Undergraduate Researcher / Lamat REU, UC Santa Cruz June 2017 - June 2019
Advisors: Prof. J. Xavier Prochaska
The Effective Opacity of the Intergalactic Medium from Galaxy Spectra Analysis

· Created composite or "stacked" spectra using data from $\sim$ 200 distant Lyman Break Galaxies. Fit unabsorbed stellar population models to these galaxy composites and traced the redshift evolution of the effective opacity of the IGM. Investigated the evolution using Gaussian processes.

PUBLICATIONS

Monzon J., Prochaksa J.X., Lee K.G., Chisholm J. doi:10.3847/1538-3881/ab94c2
"Effective Opacity of the Intergalactic Medium from Galaxy Spectra Analysis"

Monzon J., Nickerson S., Rangwala N. in prep.
"High Spectral Resolution Observations of H2O Towards Orion IRc2 with SOFIA/EXES"

Klein R. et al. in prep.
"Modeling the SEDs of Early Massive Clumps"

CONFERENCES AND PRESENTATIONS

235th AAS Conference Winter 2020
Competed in the Chambliss poster competition with IGM research. Helped create slides for short talk on preliminary results from proto-stellar core research. (Honolulu, Hawaii)

Revealing Cosmology and Reionization History with the IGM Summer 2018
Short talk and poster presentation on IGM research for professional audiences at the Kavli Institute. (Tokyo, Japan)

NASA Ames Center-Wide Internship Presentations Summer, Fall 2020
End of term poster and slide presentations on SOFIA/EXES project for research groups and mentors. (Mountain View, California)

SOFIA Journal Club Winter 2020
Short presentation of published IGM work for SOFIA scientists. (Mountain View, California)

Society of Physics Students UCSC Spring 2019
Slide presentation on IGM research and how to effectively network faculty for physics cohort. (Santa Cruz, California)

UCSC Undergraduate Research Symposium Summer 2018
Poster presentation on IGM research for general audiences (Santa Cruz, California)

AWARDS AND RECOGNITION

Senior Thesis Honors	2019
Lamat REU Fellowship	2017, 2018
Dean's Honors	2015, 2017, 2019

LEADERSHIP AND TEACHING

UCSC Academic Excellence Program (ACE) Spring 2016 - Fall 2019
Session co-leader and tutor for large group of students in the introductory series of physics and mathematics. Tutored and advised lower-division undergraduates in their academic prospects and research opportunities.

Lick Observatory's "La Noche De Las Estellas" Summer 2018
Group guide and mentor for high school seniors of Spanish speaking backgrounds interested in astronomy and astrophysics.

TECHNICAL AND PROFESSIONAL SKILLS

-Python, IDL, IRAF, Github

-Linux, MAC OS, Windows

-LaTeX, Microsoft Office

-Fluent in speaking and writing in Spanish