

## Principle Investigator: Dale Mercado

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**EDUCATION**      **Rochester Institute of Technology**, Rochester, NY  
M.S., Astrophysical Sciences and Technology  
Expected 2022

**Rochester Institute of Technology**, Rochester, NY  
B.S., Physics  
2020

**RESEARCH EXPERIENCE**      **Graduate Student Researcher**      **Sep 20 - Current**  
Design and assembly of an automated Infrared Fourier Transform Spectrometer (FTS) as a primary calibrating device for the next generation of infrared spectrometers. The FTS is an automated interferometer with the use of an Arduino to maintain position and speed.

**Undergraduate Student Researcher**      **May 19 - May 20**  
Creating of a data analysis pipeline to detect the Sunyaev-Zeldovich Effect in galaxies clusters. Using Hershel-SPIRE infrared data as well as creating a pipeline to simulate these observations in order to isolate the SZ effect which can then be used to determine the temperature of the galaxy cluster. Utilizing a wide verity of programming from the original code written in IDL to then reconstruction and further develop in python.

**Undergraduate Student Researcher**      **May 17 - Jan 19**  
Spectral energy distribution (SED) fitting to galaxies in the COSMOS15 catalog in order to isolate Active Galactic Neculei (AGN) candidates. Using a two different fitting programs MAGPHYS and SED3FIT which both require significant computing time. Using the more rudimentary MAGPHYS to run and identify potential AGN candidates from the catalogue quickly, to then utilize the more intense fitting routine SED3FIT to acquire a higher quality SED fits. These SED fits are then used to determine the properties of the host galaxy such as the star formation rates.

## PRESENTATIONS

**RIT Undergraduate Symposium 2019** *Presentation, Creating a Data Analysis Pipeline for the rSZ effect in the Herschel SPIRE bands.*

**RIT Undergraduate Symposium 2017** *Presentation, CASTOFF: making CANDELS field AGN SED Tables of Flux Fits.*

**RIT Undergraduate Symposium 2016** *Poster, Infrared Contributions from Star Formation and AGN.*

## ABSTRACTS AND PROCEEDINGS

- Mercado, D.; Barry, P.; Filippini, J.; Nie, R.; Patel, G.; Shirokoff, E.; Tramm, S.; Trappe, N.; Zemcov, M., "Design of a FIR Infrared Fourier Transform Spectrometer for the Calibration of On-Chip FIR Spectrometers", (AAS Meeting 237, id. 549.03)
- Tramm, S.; Barry, P.; Filippini, J.; Mercado, D.; Nie, R.; Patel, G.; Shirokoff, E.; Trappe, N.; Zemcov, M., "Development of an On-Chip Integrated Spectrometer for FIR Wavelengths", (AAS Meeting 237, id. 549.02)
- Butler, V.; Feder, R.; Mantz, A.; Mercado, D.; Montana, A.; Sayers, J.; Vaughan, B.; Zemcov, M.; Zitrin, A., "Determining Thermodynamic Properties of Cluster Gas Using Herschel-SPIRE", (AAS Meeting 237, id. 512.06)
- Kartaltepe, Jeyhan S., Cooke, Kevin C., Tyler, Krystal, Mercado, Dale. 2019, "Quantifying the Role of Galaxy Mergers Among Starburst Galaxies in COSMOS and CANDELS", *American Astronomical Society, (AAS Meeting 233, id.407.05)*