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Type : **Poster**

First Mid-Infrared Characterization of the Galactic Center WR Star Population

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This research presents the first mid-infrared characterization of the Galactic Center (GC) Wolf-Rayet (WR) and Ofpe/WN9 star population using integral-field spectroscopy from the JWST Mid-Infrared Instrument MRS. Data consist of calibrated, three-dimensional FITS spectral cubes spanning $\lambda \in [4.9, 27.9] \mu\text{m}$ at resolving power $R \in [1330, 3750]$. As an initial application, the spectrum of the Ofpe/WN9 star IRS 16NW is analyzed in Channel 1, being corrected for extinction, foreground H_2O rovibrational absorption, defects, and back/foreground emission. Spectral features are identified and deblended with multi-component Gaussian or quartic fits, then assessed for association with IRS 16NW using measurements of its line-of-sight velocity and expected line width.

WR and Ofpe/WN9 stars undergo radiatively driven mass loss through stellar winds. Expelled material from approximately 30 WR or Ofpe/WN9 stars is consistent with supplying all material available for accretion onto Sgr A; *wind metallicity can therefore have implications for the accretion rate: higher metal abundances enhance radiative cooling, allowing shocked winds to lose thermal pressure support and reach smaller radii. By identifying the intrinsic mid-IR spectral contributions of these stars and separating them from surrounding GC structures, the analysis further constrains the composition/metallicity of the accretion environment of Sgr A.* Metal-line ratios are derived either directly from detected stellar emission or, for non-detections, constrained using Monte Carlo injection-recovery tests.

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Yes

What is your career level?

Undergraduate

Which keyword describes the area of focus of this talk?

Stars & stellar clusters

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