Contribution ID: **43** Type: **Contributed talk**

A Multi-wavelength Study of the Galactic Point Sources in the MeerKAT Galactic Plane Survey with GAIA DR3

Tuesday, 5 September 2023 14:30 (15 minutes)

The MeerKAT Galactic Plane Survey is a radio continuum survey conducted in the L band (~1.4 GHz) in the Galactic plane, covering a wide range of galactic longitudes, spanning from 0 to 60 degrees and 250 to 360 degrees and mostly within a latitude range of $|b| \leq 1.5$ degrees. The survey resulted in the detection of approximately 5×105 sources. In this study, we present our analysis of the Galactic sources by cross-matching the radio point sources with the GAIA Data Release 3 (DR3) catalog using a Bayesian cross-match approach. To refine our sample and mitigate spurious and extragalactic counterparts, we imposed a selection criterion based on GAIA parallax over error, focusing on sources with a parallax measurement accuracy of at least 10. This restriction reduced our initial crossmatch sample size to approximately 3000 sources. Leveraging the GAIA extinction measurements along the line of sight and the reddening parameter, we applied extinction corrections to the magnitudes and dereddened the colors of the selected sources. Utilizing the dereddened colors and extinction-corrected magnitudes, we constructed a color-magnitude diagram (CMD). The CMD analysis revealed a diverse population of stellar objects, ranging from massive OB stars, white dwarfs, RS CVn binaries, high-mass X-ray binaries (HMXB), YSOs and dMe flare stars. Additionally, we conducted spectroscopic observations of some of the young stars using the Mokodi instrument on the 1-m Lesedi telescope at SAAO. These observations revealed the presence of H-alpha emission, a characteristic emission associated with coronally and chromospherically active radio stars. Our findings provide valuable insights into the radio stellar populations within the Galactic plane, showcasing the diverse range of stellar objects detected in the MeerKAT Galactic Plane Survey. This study highlights the power of cross-matching radio surveys with multi-wavelength datasets, enabling comprehensive characterization of Galactic sources and advancing our understanding of stellar evolution in our galaxy.

Primary author: EGBO, Okwudili Daniel (University of Cape Town/South African Astronomical Observatory)

Presenter: EGBO, Okwudili Daniel (University of Cape Town/South African Astronomical Observatory)

Session Classification: WG2. The Life and Death of Stars (II). Chair: Ivanka Stateva