How does the JWST impact on our understanding of interstellar dust grains?

Takashi Onaka
University of Tokyo

JWST observations provide an unprecedented quality of infrared data for the study of interstellar physics and chemistry as well as interstellar dust grains. This talk focuses on the JWST observations of the Orion Bar region, an Early Release Science (ERS) program, PDR4sAll, Radiative Feedback from Massive Stars (Berné et al. 2022; Habart et al. 2024; Peeters et al. 2024). The observations have been successfully performed to obtain near- to mid-infrared spectra across the ionized to molecular regions of the Orion Bar, a prototypical photo-dissociation region, with NIRSpec and MIRI/MRS integral field units (IFUs). They provide significant data for Aromatic Infrared Bands (AIBs) and their carriers (Chown et al. 2024; Elyajouri et al. 2024; Pasquini et al. 2024; Goicoechea et al. 2025; Khan et al. 2025). This talk gives an overview of the observations of PDRs4All and discusses several results relating to interstellar dust grains. A study of excess emission in the near-infrared continuum based on the spectroscopic observations of the Orion Bar is also presented.

References

Berné, O., et al. 2022, PASP, **134**, 05301
Chown, R., et al. 2024, A&A, **685**, A75
Elyajouri, M., et al. 2024, A&A, **685**, A76
Goicoechea, J. R., et al. 2025, A&A, **696**, A100
Habart, E., et al. 2024 A&A, **685**, A73
Khan, B., et al. 2025, A&A, in press
Pasquini, S., et al. 2024 A&A, **685**, A77
Peeters, E., et al. 2024, A&A, **685**, A74