

David Rebolledo (JAO/NRAO)

From cloud to cores: A multi-scale view of the ISM distribution in the Carina Nebula

The Carina Nebula Complex (CNC) is a spectacular star-forming region located at a distance of 2.3 kpc, which is close enough to observe a wide range of size scales in detail. With more than 65 O-stars and more than 900 young stellar objects identified it is also the nearest analogue of more extreme star forming regions, such as 30 Doradus. I will present the latest results of a major effort to study the relationship between the different gas phases in the Carina region from 100 pc to 0.01 pc using the Australia Telescope Compact Array (ATCA), the Mopra telescope and ALMA. The Mopra CO images, combined with far-infrared data from Herschel, have allowed us to determine the overall molecular mass and its global distribution across the CNC (Rebolledo *et al.* 2016). On the other hand, high resolution and sensitivity HI 21-cm line map obtained with the ATCA has provided a global view of the atomic gas across the whole nebula. Detection of HI self-absorption features has revealed the presence of cold neutral gas, signalling the phase transition between atomic and molecular gas (Rebolledo *et al.* 2017). I will also present high-quality images of the ionised gas obtained from the radio continuum at 2 GHz obtained with ATCA, which can then be compared with the structures seen in atomic and molecular gas maps. Additionally, I will present the latest results of an ALMA campaign to study the effect of massive star feedback on the location, mass, and kinematics of the small-scale fragments within massive star-forming clumps in two distinctive regions of the CNC using the dust continuum and important diagnostic lines of the abundant molecular species such as HCO⁺, HCN and SiO.