Characterising the inner region of protoplanetary discs using MIRC-X, PIONIER, and GRAVITY

Isabelle Codron*[1], Stefan Kraus[1], and Aaron Labdon[2]

[1]University of Exeter – United Kingdom
[2]European Southern Observatory – Chile

Abstract

In the last 10 years, protoplanetary disc observations have revealed a wide variety of substructures including gaps, asymmetries and misalignments/warps that are often interpreted as signposts of planet formation. These enormous advancements thanks to instruments like SPHERE and ALMA have, however, been very biased towards the outer regions of protoplanetary discs. In contrast, we still know little about the inner region of discs even though constraining their structure and evolution is fundamental to understanding how and when the ubiquitous close-in planets form. This knowledge gap is quickly being filled thanks to optical interferometry instruments such as MIRC-X at CHARA, and PIONIER and GRAVITY at the VLTI, which allow us to resolve these small scales. In this talk, I will present new MIRC-X and PIONIER observations of HD143006, a disc known to have shadows and asymmetries in its outer disk. My observations resolve and constrain the orientation of this system's inner disc, revealing a best-fit misalignment of the inner/outer disc of 45◦ and thus confirming the origin of the shadows seen in scattered light images. I will also present the first detailed characterisation of the inner regions of 4 further Herbig discs from GRAVITY data, as well as preliminary results on the origin of the asymmetries seen in their non-zero closure phases.

*Speaker