

Colloquium

SFB 956

Conditions and Impact of Star Formation

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Monday 3:30 pm

Physikalische Institute Köln

Video stream / Host: Peter Schilke

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Peering into the Dark: Probing the Formation and Early Evolution of Massive Stars

This presentation will focus on recent work aimed at understanding the formation and early evolution of massive protostars. The massive ($M > 8 M_{\text{sol}}$) stars into which these evolve are the primary drivers of galactic ecosystems. The energy and nuclear processed material these massive stars inject into their environment during their lives and ultimately as supernovae, shapes the physical and chemical evolution of the ISM in galaxies. These stars are the precursors of a range of important astrophysical phenomena including pulsars, blackholes and gamma-ray bursts. Understanding the formation and early evolution of massive protostars is therefore essential for building comprehensive models of star formation and galactic evolution. Infrared dark clouds (IRDCs) are dense regions which are not (yet) dominated by the feedback from star formation and so are important regions for studying the initial conditions for the formation of massive stars, and their associated clusters of lower mass stars.

In this presentation I will discuss recent results from a number of studies of infrared dark clouds which shed light on the formation of these regions and the protostars which are forming within them. Using data from ALMA and other telescopes I will describe the evidence for infall over pc-scale sized regions around the most massive IRDCs and explore the extent to which observations can constrain the properties of the infall. I will then move on to discuss the initial results from TEMPO, an ALMA survey to investigate the chemical properties of a sample of massive protostars as a probe of their evolutionary stage.