

Colloquium

SFB 956

Conditions and Impact of Star Formation

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Monday 4:30 pm

Physikalische Institute Köln

[Video stream](#) / Host: [Stefanie Walch-Gassner](#)

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The C⁺ Universe

The interstellar medium (ISM) and its interaction with massive stars are central to galactic evolution. Interstellar gas is known to exist as atomic (HI) clouds and star forming molecular clouds. Recent observations reveal that half of the interstellar gas is in CO-dark molecular gas that has eluded detailed characterization because of lack of suitable tracer. Hence, its physical conditions and relationship to other gas reservoirs are largely unknown. Atomic and CO-dark molecular gas are heated by far-UV photons from massive stars through photo-electrons from large molecules, producing (inter)cloud phases of the ISM and controlling its emission characteristics. Through winds and explosions, stars also stir up the ISM dynamically. This source of turbulent pressure supports clouds & the gas disk against (self)gravity, disrupts molecular clouds, and compresses gas, triggering new star formation.

However, until recently, there was no good tracer for this dynamic interaction. LOFAR has opened up the low frequency sky to efficient surveys, providing a sensitive diagnostic of physical conditions and kinematics of HI and CO-dark molecular gas. Development of sensitive THz heterodyne receiver arrays combined with SOFIA's nimble telescope allow large scale surveys at sub-km/s resolution, probing coupling of radiative and mechanical energy from massive stars to their environment. Centered on these new observing opportunities, I will review our current understanding of the interstellar medium.