

# Colloquium

SFB 956

Conditions and Impact of Star Formation

17 June 2019 | supplementary colloquium

Monday 3:00 pm

Physikalische Institute Köln

Lecture Hall III

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## Radiative feedback and PDRs in Orion

Young massive stars regulate the dynamics, ionization, and fate of their parental molecular cloud. Modern day telescopes provide a wealth of spectroscopic tracers to better understand and quantify stellar feedback processes at very different spatial scales: from a few hundred AU (with ALMA mosaics) to several parsec scales (with Herschel, SOFIA and IRAM 30m maps). The detection of very extended emission from  $C^+$ , PAHs, vibrationally excited  $H_2$ , mid-J CO lines, and reactive molecular ions such as  $CH^+$ , probes the interaction between stellar far-UV radiation ( $E < 13.6$  eV) - emitted by nearby hot stars - and their interstellar environment. In this seminar I will summarize the main results of our program to observe the famous Orion (M42) region with the above observatories. I will try to demonstrate the dynamical and non-equilibrium nature of the interaction between stellar far-UV radiation and winds with their parental cloud. These questions are at the core of our understanding of stellar feedback, a collection of complicated processes that take place at many galactic scales and drive the evolution of the ISM. Our detailed view of Orion allows us to reveal the underlying physical and chemical processes. These can later be generalized to other far-UV irradiated environments, including proplyds, planetary nebulae, molecular cloud surfaces, as well as much more massive and extreme star forming regions in starburst galaxies.

