

# Colloquium

SFB 956

Conditions and Impact of Star Formation

21 January 2019 | supplementary colloquium

Monday 3:00 pm

Physikalische Institute Köln

Lecture Hall III

Zülpicher Straße 77 | 50937 Köln

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## New Simulations and Observations of Highly-complex Molecules in Star-forming Regions

The interstellar medium (ISM) is replete with molecules, and high-mass star-formation regions in particular are host to some of the most complex organic molecules yet detected outside of our solar system. Millimeter/sub-millimeter wavelength spectral data from the ALMA telescope allows us to explore the chemistry of such regions in much greater detail than ever before. The ALMA 3mm line survey EMOCA („Exploring Molecular Complexity with ALMA“) of the chemically-rich Galactic Center source Sagittarius B2(N) has not only identified several new molecules in that source, but has led to the identification of new hot cores - a total of five are now known to exist in Sgr B2(N).

I will give a brief overview of the molecular detections made by EMOCA toward Sgr B2(N). I will also present chemical kinetics models of the coupled gas-phase and grain-surface/ice-mantle chemistry occurring in Sgr B2(N) related to these molecules, with an emphasis on the treatment of the recently-detected branched carbon-chain molecule iso-propyl cyanide (i-C<sub>3</sub>H<sub>7</sub>CN). I will assess the possibilities for the presence and detectability of other branched carbon-chain molecules in the ISM. I will also present recent work that uses complex molecule abundances to constrain the cosmic-ray ionization rates and chemical timescales within different hot cores.

