

# Colloquium

**SFB 956**

Conditions and Impact of Star Formation

**11 December 2017**

Monday 3:00 pm

**Physikalische Institute Köln**

Lecture Hall III

Zülpicher Straße 77 | 50937 Köln

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## Resolving the Physical State of Cold Gas and the Star Formation Process on Cloud-scales across the Local Galaxy Population

State-of-the-art instrumentation like ALMA, NOEMA, JVLA, and VLT/MUSE is revolutionizing our view on the gas-star formation cycle in nearby galaxies. I will highlight recent results from several concerted large surveys targeting galaxies inside and outside the Local Group. These observations resolve the interstellar medium (ISM) and young stellar population down to individual molecular clouds and young stars. These observations provide a view as detailed as so far only known from within the Milky Way but now across the local galaxy population. This includes (a) the multi-scale structure of the atomic and molecular gas and the finding of significant diffuse molecular gas. (b) Constrains on ISM properties on cloud-scale and their systematic dependence on galactic environments. (c) These local ISM properties relate to observed variations in the gas-star formation (Kennicutt-Schmidt) relation and allow for tests of theoretical models that predict the efficiency of star formation from local ISM properties. (d) I highlight how we measure molecular cloud lifetimes and test theories of their formation. In summary, new high-resolution observations of nearby galaxies transform our understanding on how ISM properties and star formation process depend on galactic environment and regulate each other.