

# Colloquium

**SFB 956**

Conditions and Impact of Star Formation

**9 Jan 2017**

Monday 3:00 pm

**Physikalische Institute Köln**

Lecture Hall III

Zülpicher Straße 77 | 50937 Köln

**Sergio Molinari**

National Institute for Astrophysics - Institute for Space Astrophysics  
and Planetology Rome, Italy

## **VIALACTEA: The Milky Way as a Star Formation Engine**

The Milky Way Galaxy, our home, is a complex ecosystem where a cyclical transformation process brings diffuse barionic matter into dense unstable condensations to form stars, that produce radiant energy for billions of years before releasing chemically enriched material back into the ISM in their final stages of evolution. Star formation is the trigger of this process, eventually driving the evolution of ordinary matter in the Universe from its primordial composition to the present-day chemical diversity necessary for the birth of life.

I will present an overview of the results of the Hi-GAL (Herschel infrared Galactic Plane Survey) key-project, a 720 square-degree survey of the entire Galactic Plane in five bands between 70 and 500 micron carried out with the HERSCHEL satellite. From diffuse ISM clouds, through a pervasive network of filamentary structures, down to the formation of dense clumps, the Hi-GAL survey traces the morphology and physics of dust structures at all spatial scales from the individual star formation site to the panoramic view of entire spiral arms.

Hi-GAL is the keystone of a suite of latest-generation Galactic Plane continuum and spectroscopic surveys from the infrared to the radio. With the VIALACTEA project we organised and analysed these datasets in a unified framework, deploying a homogeneous analysis and classification scheme for nearly 30,000 candidate filamentary structures and more than 100,000 dense clumps with heliocentric distance determinations. We are now able to complete the first resolved map of the Star Formation Rate in the Milky Way and analyse in detail its variation with Galactocentric distance and with respect to spiral arms, as well as in comparison to star formation triggering agents.

