Mathematisch – Naturwissenschaftliche Fakultät
der Universität zu Köln
- Der Dekan -

Einladung

zu der am Dienstag, den 11. November 2014, um 16.45 Uhr
im Hörsaal III der Physikalischen Institute,
Zülpicher Straße 77

stattfindenden öffentlichen

Antrittsvorlesung

von Frau

Prof'in Dr. Stefanie Walch

(I. Physikalisches Institut)

über das Thema

The full life-cycle of molecular clouds

Molecular clouds are cold, dense, and turbulent filamentary structures that condense out of the multi-phase interstellar medium. They are also the sites of star formation. The minority of new-born stars is massive, but these stars are particularly important for the fate of their parental molecular clouds.
I will present results from high-performance, three-dimensional simulations that show the formation and dispersal of molecular clouds within representative pieces of disk galaxies. Apart from stellar feedback and self-gravity, we employ an accurate description of gas heating and cooling as well as a small chemical network including molecule formation and self-shielding. Gravitational collapse is compensated by stellar feedback, leading to the establishment of a dynamical equilibrium of the interstellar medium within the disk. I will discuss results for disks at different gas surface densities which e.g. demonstrate that the molecular gas mass fraction increases with gas surface density. Moreover, I will show that outflows generated by supernovae that explode within the parental molecular clouds may contain a significant fraction of diffuse molecular hydrogen that is not well traced by CO.
These simulations will bring forth a modern paradigm for the full life cycle of moleclar clouds with important implications for galaxy evolution.

A. Büschges
Dekan