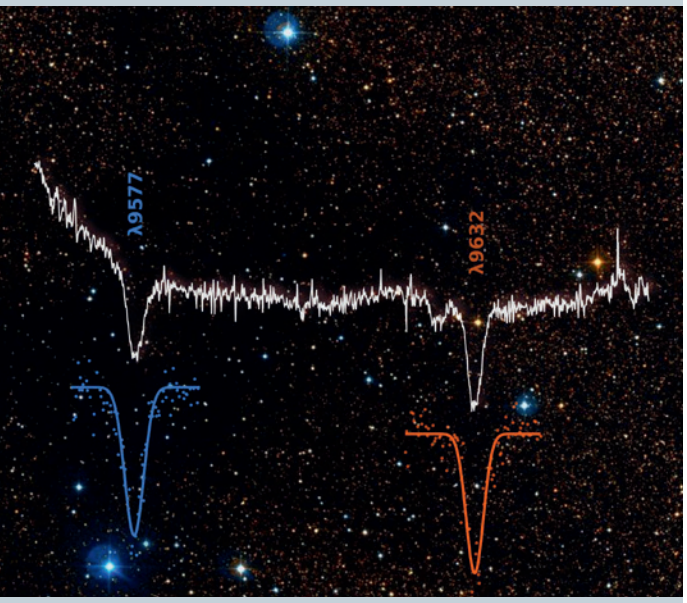
Colloquium

SFB 956

Conditions and Impact of Star Formation

19.10.2015
Monday 4:00 pm

Physikalische Institute Köln
Lecture Hall III
Zülpicher Straße 77 | 50937 Köln



John Maier
Universität Basel, Switzerland

Electronic Spectra of Organic Radicals and Ions of Relevance to Interstellar Space

Focus of our research is the measurement of the hitherto unknown electronic spectra of radicals and cations containing mainly carbon atoms, which are of astrophysical and combustion relevance. Initial information on the systems is often obtained by measuring the absorption in 6K neon matrices using a mass-selected ion beam. In the gas phase the spectra of the neutral radicals are obtained by a resonant two colour photoionisation approach, whereas a radio-frequency trap is used for the cations.
The mass-selected ions are restrained there and cooled by collisions with cryogenically cooled helium to 6–20 K prior to the measurement of the electronic transitions. The spectra have been obtained by a one- or two-colour, two-photon excitation-dissociation approach. A method to detect transitions using the difference in the rate of the complex formation with helium in the ground and excited electronic state has been demonstrated.
The availability of gas phase spectra allows the in situ monitoring of the transient species in combustion processes and a direct comparison with astronomical observations. Such laboratory measurements at 6 K in the gas phase have led to the first definitive identification of two diffuse interstellar bands to C_{60}^{+}.