Universitaet zu Koeln

Partner contact person : S. Schlemmer

The Cologne group of laboratory astrophysics has been founded by Gisbert Winnewisser

and is lead by Stephan Schlemmer. The laboratory group concentrates on the molecular physics of species relevant for astrophysics. The laboratory group is situated in an astrophysics institute with three astronomy groups, involved in Herschel and SOFIA instrumentation and observations. The current focus of the laboratory group lies on high-resolution spectroscopy in the Infrared (2 – 20 µm) and Far-Infrared (100 µm – 1 cm) wavelength ranges. Other foci concern ion-molecule reactions in cold ion traps, the preparation of transient species like radicals and ions in cells, discharges and supersonic jets.

Detailed information on the group activities and equipment can be found at *http://www.astro.uni-koeln.de/node/119*
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Based on the main scientific expertise of the Cologne group the Cologne Database for Molecular Spectroscopy (CDMS) has been built over the last couple of years with significant support inside a national collaborative research effort (SFB494). Meanwhile it contains ~ 450 species, ~ 40,000 experimental lines and more than 800,000 predicted lines with very high accuracy. To date CDMS turned into the leading database in the sub-mm wavelength regime.

Recent laboratory work in the Cologne group includes high resolution spectra on complex organic molecules, e.g. dimethyl ether, with a focus on excited states which are missing in the databases, rotational and ro-vibrational spectroscopy of H_2^+, and other cations, the IR and FIR spectroscopy of carbon chain molecules which are one of the main targets to be found by Herschel observations via their low lying vibrations. The constant development of state-of-the-art radiation sources ensures a leading role in spectroscopy. Superlattice devices fabricated by one of our collaborators, D. Paveliev, are used to generate sub-mm waves at

highest frequencies and a home-made cw-OPO laser system is currently used for high resolution IR spectroscopy of molecular ions. Molecular Physics taught by the Cologne group is one of the seven main topics chosen by physics students at the university. Several young students enter the group every year.

Key persons :

S. Schlemmer, Professor

Expertise : physicist, head of laboratory group, molecular spectroscopy, reaction dynamics, ion chemistry, trapping, jets

Role in VAMDC project : Coordinator of JRA1 (with CNRS) , Participation to NA1, NA2, SA1, JRA3

C. Endres

Role in VAMDC project : WP2, WP3, WP4, WP6, WP8

T. Giesen, Researcher

Expertise : physicist, molecular spectroscopy, carbon chemistry, jets

Role in VAMDC project : NA2, SA1, JRA3

F. Lewen, Researcher

Expertise : physicist, molecular spectroscopy, THz radiation (generation & detection)

Role in VAMDC project : NA2, SA1, JRA3

H. Müller, Researcher

Expertise : chemist, molecular spectroscopy, leading CDMS scientist

Role in VAMDC project : WP3, WP4, WP6, WP8

J. Stutzki, Professor

Expertise : physicist and astronomer, head of astronomy group, PI on several sub-mm astronomy projects

Role in VAMDC project : NA2, SA1, JRA3

P. Schilke, Senior Researcher

Expertise : astronomer, PI on several sub-mm astronomy projects, joining institute later in 2008

Role in VAMDC project : NA2, SA1, JRA3

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