CFEL SCIENCE

SEMINAR

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Building 49, Seminar Room (108)

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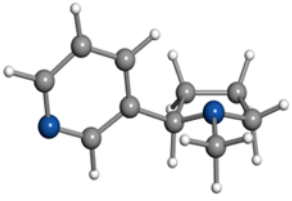
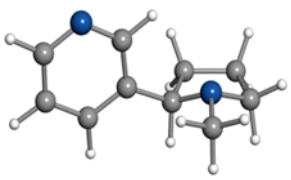
Precise Molecular Structure, Dynamics- and Particle Physics: Molecular Rotation Spectra

Larger molecular systems are not only important technologically - they are also an attractive academic resource, with numerous questions on their chemical behaviour as well as problems in fundamental physics waiting to be answered. Targeted by high resolution spectroscopy they impose a number of challenges, theoretically and experimentally.

From the theoretical point of view, multiple internal interactions are causing complicated energy level schemes and the resulting spectra will be rather difficult to predict. From an experimental point of view, these spectra are difficult to assess and assign. Using narrow-banded techniques, even though very sensitive, finding and identifying such spectral features can become very time consuming. Nevertheless, the unrivalled resolution of these techniques provides a window to tackle fundamental questions in physics – potentially even beyond the standard model.

Quantitative information on the structure, charge distribution, characterization of the chemical bond, details on internal dynamics, and - at the highest precision available to date – evidence for tiny yet significant interactions can be encoded in pure rotational spectra obtained by microwave spectroscopy. Right now, new exciting technical developments promise rapid progress. Recent examples and future directions for rotational spectroscopy will be presented.





Host: Melanie Schnell - CFEL Molecular Physics seminar