



High resolution mm-wave absorption spectroscopy of flexible COMs

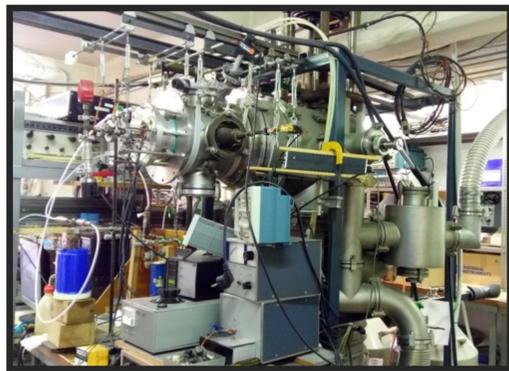
Laboratory spectrum of 1,2-butanediol

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WE CAN...

Spectrometers

Development and Testing of New Instrumentation



Free-Jet Absorption Millimetre Wave
50-110 GHz

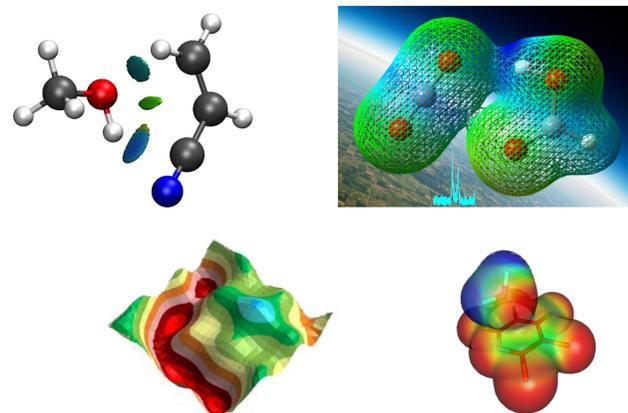


Pulsed-Jet Fourier Transform MicroWave
with and without Laser Ablation, 6-18 GHz

... Chirped Pulsed FTMW *under construction*

Quantum-mechanical simulations

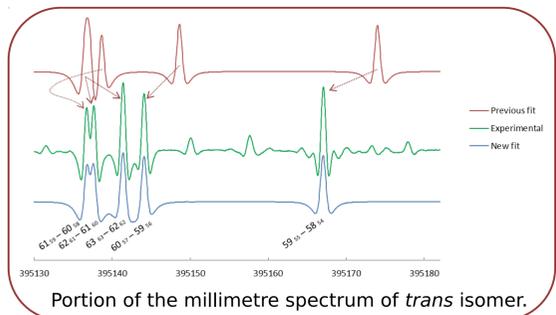
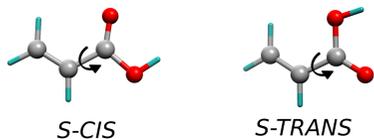
for the Characterization of the Molecular and Spectroscopic Properties: Geometry Optimizations, Potential Energy Surfaces, NBO and AIM Analysis, Anharmonic Vibrational Frequency Calculations...



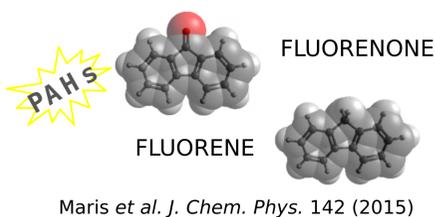
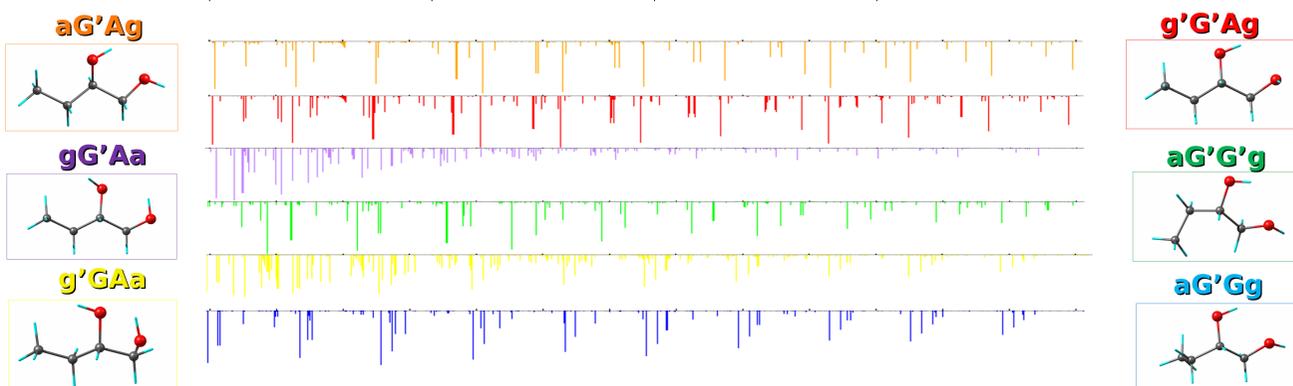
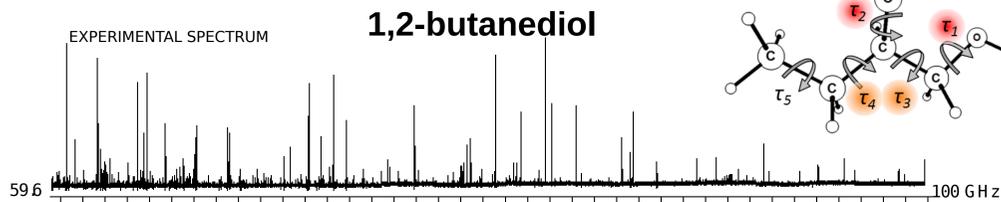
WE DO...

Recording and Analysis of Spectra of complex organic molecules, biomolecules, prebiotics precursors and weakly bound molecular complexes in the gas phase

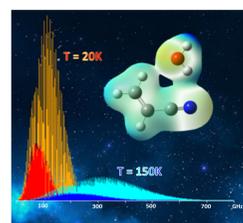
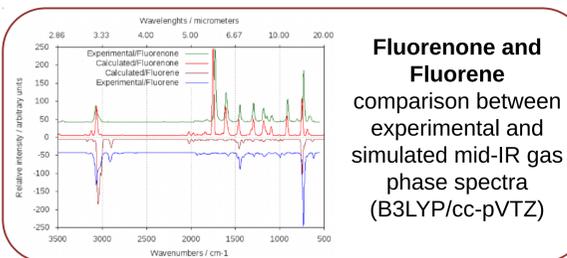
Acrylic Acid up to 397 GHz



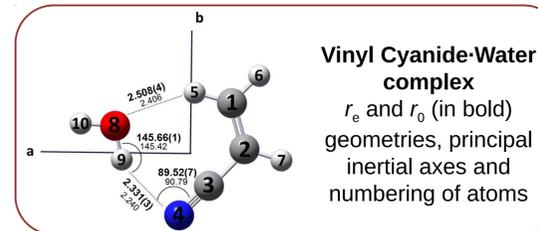
Portion of the millimetre spectrum of *trans* isomer.
Calabrese et al. *Mol. Phys.*, 113 (2015) 2290



Maris et al. *J. Chem. Phys.* 142 (2015)

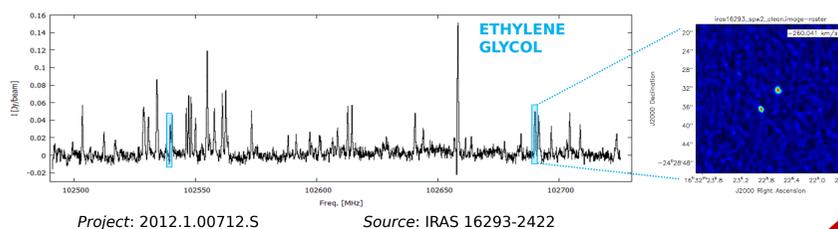


Calabrese et al. *J. Phys. Chem. A*, 119 (2015) 11674-11682



Vinyl Cyanide-Water complex
 r_e and r_0 (in bold) geometries, principal inertial axes and numbering of atoms

Analysis of Surveys and ALMA Data
Reduction and Analysis for the recognition of molecular species in the interstellar medium



WE WANT...

- Perform new experiments in order to extend the accurate laboratory dataset
- Exploit the advent of new telescopes able to acquire a large amount of data with increasing sensitivity and resolution
- Pursue a strong interplay between scientific communities fielding our spectroscopist skills with the astrochemical fellowship in order to deepen the understanding of the astrophysical processes which regulate the evolution of the interstellar medium

SINCE THE HIGH COMPLEXITY OF THIS FIELD
WE BELIEVE THAT COLLABORATION IS THE WAY TO REACH THE GOAL

