

Physical and Chemical processes of astrophysical interest: Towards the detection of new species
Saint Florent (Corsica), June 12 – 15th 2023

Monday, June 12

08:30 – 09:00 *Welcome*

Session 1 (Chair: D. Neufeld)

09:00 - 09:10 *Opening remarks*

F. Lique

09:10 - 09:50 *Detection of new molecules: theoretical aspects*

R. Dawes

09:50 - 10:30 *Detection of new molecules: experimental aspects*

R. Wester

10:30 - 11:00 Coffee break

11:00 - 11:40 *Detection of new molecules: observational aspects*

B. McGuire

11:40 - 12:10 *Theoretical reactive rate constants to reproduce the abundances of newly observed species in the ISM*

O. Roncero

12:10 - 12:30 *Collisional excitation of radical molecules in the interstellar medium*

P. Pirlot

12:30 - 13:30 Lunch, CESM St Florent

Session 2 (Chair: O. Roncero)

14:00 - 14:30 *Spectroscopic studies of large carbonaceous molecular systems and nanoparticles of astrophysical relevance and some actual hypothesis for the identification of the ISM broad spectral features*

T. Pino

14:30 - 15:00 *QUIJOTE and the search of new molecular species in space*

J. Cernicharo

15:00 - 15:20 *Hyperfine resolved rate coefficients of $\text{HCNH}^+/\text{H}^{13}\text{CNH}^+$ induced by collision with He and H_2 : towards HCNH^+ abundance modeling and $\text{H}^{13}\text{CNH}^+$ line intensity prediction*

C. Bop

15:20 - 15:30 break

15:30 - 16:00 *VUV spectroscopy and photodynamic on a few recently detected astrophysical molecules*

L. Nahon

16:00 - 16:20 *Collisional excitation of HCN and HCN by water in comets*

M. Zoltowski

16:30 - 18:30 Paddle, Kayaking
19:30 - 21:00 Diner, CESM St Florent

Tuesday June 13

Session 3 (Chair: J. Loreau)

09:00 – 09:30 *Organic molecules in Sagittarius B2*
A. Belloche
09:30 - 10:00 *Accurate first principles schemes for the prediction of the spectroscopic and thermodynamical properties of small and medium sized molecular systems*
M. Hochlaf
10:00 - 10:30 *Laboratory astrophysics in Lille: from molecule's characterization to detection in ISM*
L. Margules
10:30 - 11:00 Coffee break
11:00 - 11:30 *The oldest molecule in the Universe, the helium hydride cation*
D. Neufeld
11:30 - 11:50 *On the reactivity at low temperatures. Studying the $C_3N + X$ ($X = H_2$ and CH_4) and $H + CH^+$ reactions as a test of concept*
R. Jara Toro
11:50 - 12:10 *Fine and hyperfine excitation of CCS isotopologues induced by collisions with He*
A. Godard
12:10 - 12:30 *Rotational Excitation of Aromatic Benzonitrile ($c-C_6H_5CN$) by He at low temperature*
M. Ben Khalifa
12:30 - 13:30 Lunch, CESM St Florent
14:00 - 17:00 Sailing, diving, hiking, free

Session 4 (Chair: F. Lique)

17:30 – 18:00 *Do predictions of new species validate astrochemical models?*
JC Loison
18:00 - 18:30 *Generating the Potential Energy Surfaces for complexes relevant to cometary astrochemistry*
D. Kedziera
18:30 - 19:00 *Optical frequency comb spectroscopy in supersonic jets for precision measurements of molecular absorption*
L. Rutkowski

Wednesday June 14

Session 5 (Chair: A. Faure)

- 09:00 - 09:30 *Towards cold and controlled reactive scattering*
A. Tsoukala
- 09:30 - 10:00 *Scattering involving polyatomic molecules: from methanol to fullerenes*
J. Klos
- 10:00 - 10:30 *Dynamics, dust and chemistry in the winds of evolved asymptotic giant branch and red supergiant stars: the ATOMIUM project*
F. Herpin
- 10:30 - 11:00 Coffee break
- 11:00 - 11:30 *MQCT2023 – A program for calculations of inelastic scattering of two molecules*
D. Babikov
- 11:30 - 11:50 *Hibridon: what's up?*
G. Raffy
- 11:50 - 12:10 *Excitation of vinyl cyanide by He atoms*
K. Sogomonyan
- 12:10 - 12:30 *Collision-induced excitation of ammonia in hot interstellar environments*
S. Demes
- 12:30 - 13:30 Lunch, CISM St Florent
- 14:00 - 17:00 Sailing, diving, hiking, free

Session 6 (Chair: L. Margules / A. Belloche)

- 17:30 - 18:00 *(Sub-)Millimeter-wave spectroscopy of astrophysical molecules at ISMO: Experimental set-ups and current projects*
M.A. Martin
- 18:00 - 18:30 *Shock-induced destruction of fullerenes and cosmic dust analogues: insights from experiments and theory*
L. Biennier
- 18:30 - 19:00 *Round table discussion*
- 19:30 - 22:00 Corsican diner, CISM St Florent

Thursday June 15

Session 7 (Chair: B. McGuire)

- 09:00 - 09:30 *The high-resolution spectroscopic study of multiple vibrational excitations in floppy molecules*
C. Lauzin
- 09:30 - 10:00 *Origin of complex chemistry during star formation: towards statistical studies*

10:00 - 10:30	T. Csengeri <i>The role of electron-molecule collisions in kinetic modelling of ionized media</i> V. Laporta
10:30 - 11:00	Coffee break
11:00 - 11:20	<i>Sensitivity analysis, Simplicity and other Strategies for meeting observational need</i> M. Gueguen
11:20 - 11:40	<i>The "Lego brick" approach: a low-cost strategy to predict accurate rotational spectra</i> F. Tonolo
11:40 - 12:00	<i>TBD</i> M. Drissi
12:00 - 12:30	<i>New molecular precursors of the RNA-world in the interstellar medium: the G+0.693 astrochemical mine</i> V. Rivilla
12:30 - 12:45	<i>Round table and Conclusions</i>
12:45 - 13:45	Lunch, CESM St Florent
14:00 - 18:00	Agriates desert boat trip
19:30 - 22:00	BBQ, CESM St Florent