

**Physical and Chemical processes of astrophysical interest:
Astrochemistry at the JWST era**

Saint Florent (Corsica), June 9 – 12th 2025

Monday, June 9

08:30 – 09:00 *Welcoming*

Chair: Marie-Aline Martin

09:00 - 09:10 *Opening remarks*

09:10 - 09:40 *Novel insights into planet forming disk chemistry from JWST/MINDS*

Inga Kamp

09:40 - 10:10 *Recent high-resolution spectroscopic studies of astrochemically interesting cations*

Sven Thorwirth

10:10 - 10:40 *Rovibrational transitions in diatomic and triatomic molecules of interest in astrophysics through full-dimensional quantum scattering calculations and machine learning models*

Naduvalah Balakrishnan

10:40 - 11:10 *Coffee break*

11:10 - 11:40 *Methods for PES construction with applications: General and special cases, diabaticization, and the long range*

Richard Dawes

11:40 - 12:00 *Collisional rate coefficients for chloronium cation with non-LTE analysis of its interstellar emission lines*

Sandor Demes

12:00 - 12:20 *Collisional excitation of OH⁺ by molecular hydrogen: Toward modeling reactive systems in cold ISM*

Paul Pirlot

12:20 - 12:40 *Molecules at planet-forming scales in the ALMA/JWST era*

Romane Le Gal

12:45 - 13:45 *Lunch, CESM St Florent*

Chair: Dmitri Babikov

14:00 - 14:30 *Collisional excitation of water vibration and rotation modes: An assessment of the Waterstars project*

Thierry Stoecklin

14:30 - 14:45 *Excitation of HC_3N in collisions with H_2 at high temperature*

Shan Gao

14:45 - 15:00 *Towards efficient, low-scaling algorithms for quantum scattering in astrochemical applications*

Hubert Jozwiak

15:00 - 15:20 Short break

15:20 - 15:50 *Solar system science with ALMA and JWST*

Martin Cordiner

15:50 - 16:10 *CS in cometary atmospheres*

Amélie Godard

16:30 - 18:30 Paddle, Kayaking

19:30 - 21:00 Cocktail, CESM St Florent

Tuesday, June 10

Chair: Cristina Puzzarini

09:00 – 09:30

Observations of icy dust with JWST: the contribution of laboratory astrophysics

Jennifer Noble

09:30 - 10:00

A cryogenic ion trap beamline at FELIX for astrochemical studies

Sandra Brünken

10:00 - 10:30

Rigorous testing of mixed quantum/classical theory for molecular collisions against full-quantum benchmarks

Dmitri Babikov

10:30 - 11:00

Coffee break

11:00 - 11:30

Unveiling exotic chemistry and molecules in the interstellar medium

Cristina Puzzarini

11:30 - 11:50

The dusty output of AGB stars and its refractory organic coating

Marie van der Sande

11:50 - 12:10

Cosmic dust growth in astrophysical environments: A combined dynamics and machine learning study

Duncan Bossion

12:10 - 12:25

Collisional excitation of interstellar cyanocyclopentadiene at low temperature

Karina Sogomonyan

12:30 - 13:30

Lunch, CESM St Florent

14:00 - 17:00

Free

Chair: Martin Cordiner

17:00 – 17:20

SUL4LIFE: Sulfur and CO ice as regulators of surface chemistry

Daniel Navarro Almaida

17:20 - 17:40

Unraveling the CN + H₂CS reaction mechanism: Implications for sulfur chemistry in the ISM

Boutheina Kerkeni

17:40 - 18:00

The Hibridon program package: What's new?

Guillaume Raffy

18:00 - 18:20

The excitation of CH₃CN and CH₃CCH by He and H₂

Malek Ben Khalifa

18:30 - 19:15

Outreach talk: L'Univers Moléculaire

François Lique & Marie-Aline Martin-Drumel

Wednesday, June 11

Chair: Alexandre Faure

- 09:00 – 09:30** *Probing molecular collisions using rotational spectroscopy*
Brian Hays
- 09:30 - 10:00** *Recent advances in the Symmetry Adapted Perturbation Theory: open-shells, degeneracies, properties: new tools for potential energy surfaces and dipole moment surfaces*
Piotr Zuchowski
- 10:00 - 10:30** *Kinetic isotope effects in proton transfer reactions involving isotopologues of H_2^+ and H_3^+*
Xavier Urbain
- 10:30 - 11:00** Coffee break
- 11:00 - 11:20** *On-going gas-phase chemistry observed in the Orion Bar*
Marion Zannesse
- 11:20 - 11:50** *The destruction of CH^+ with atomic hydrogen at low temperature finally understood: a detailed non-adiabatic dynamical study*
Octavio Roncero
- 11:50 - 12:10** *Computational tools to predict gas-phase reactivity in space: the reaction between CH_3^+ and C_2H_4*
Francesca Tonolo
- 12:10 - 12:25** *Exploratory modeling in astrochemistry*
Antonios Papaioanou
- 12:30 - 13:30** Lunch, CESM St Florent
- 14:00 - 17:00** Free

Chair: Jennifer Noble

- 17:30 – 18:00** *Collisional excitation of CH_3CHO -He system*
Michal Zoltowski and Darek Kezdiera
- 18:00 - 18:20** *Strong overtones in the mid-infrared: analysis of the $2\nu_5$ band of HC_3N and its associated resonances*
Luca Bizzocchi
- 18:20 - 18:40** *Recent progress on formation of negative molecular ions in the interstellar space*
Slava Kokoouline
- 18:40 - 19:00** *New horizon and new challenges of protostellar ice chemistry in the era of JWST*
Yao-Lun Yang
- 19:00 – 19:20** *Mid-infrared frequency comb spectroscopy for laboratory astrophysics*
Lucile Rutkowski
- 19:30 - 22:00** Corsican diner, CESM St Florent

Thursday, June 12

Chair: Jérôme Loreau

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|----------------------|---|
| 09:00 – 09:30 | <i>Laboratory ion spectroscopy for astronomical consideration</i>
Ugo Jacovella |
| 09:30 - 09:50 | <i>The role of the electron-molecule collisions in the cometary coma modelling</i>
Vincenzo Laporta |
| 09:50 - 10:20 | <i>Shocked-induced evolution of PAHs in astrophysical environments</i>
Ludovic Biennier |
| 10:20 - 10:50 | Coffee break |
| 10:50 - 11:20 | <i>Probing isotopic ratios in Space: Windows into the chemical evolution of the interstellar medium</i>
Nami Sakai |
| 11:20 - 12:00 | Round table and Conclusions |
| 12:15 - 13:15 | Lunch, CESM St Florent |
| 13:30 - 18:00 | Agriates desert boat trip |
| 19:30 - 22:00 | Dinner (city center) |