

# CRAQ

## Comprendre l'Univers Understanding the Universe

Centre de Recherche en Astrophysique du Québec

Rencontre annuelle/Annual meeting  
Auberge du Lac-à-l'Eau-Claire, Saint-Alexis-des-Monts  
Mai/May 9–11, 2023



- Session 1: Galaxies (Prés/Chair: Julie Hlavacek-Larrondo).
- Session 2: Exoplanètes I/Exoplanets I (Prés/Chair: René Doyon).
- Session 3: Mini-présentations/Mini-talks (Prés/Chair: David Lafrenière).
- Session 4: Exoplanètes II/Exoplanets II (Prés/Chair: Clémence Fontanive)
- Session 5: Instrumentation (Prés/Chair: Loïc Albert)
- Session 6 : Invité/Guest: Marcin Sawicki (Prés/Chair: David Lafrenière)
- Session 7 Apprentissage automatique / Machine Learning (Prés/Chair: Paul Charbonneau)
- Session 8 SITELLE (Prés/Chair: Laurent Drissen)
- Session 9 Exoplanètes III/Exoplanets III (Prés/Chair: David Lafrenière)
- Session 10 Équité, diversité, inclusion/Equity, diversity, inclusion (Prés/Chair: David Lafrenière)
- Session 11 Rayonnement/Outreach (Prés/Chair: David Lafrenière)
- Session 12 Étoiles/Stars (Prés/Chair: Andrew Cumming)
- Session 13 Naines brunes/Brown Dwarfs (Prés/Chair: Andrew Cumming)

## PROGRAMME

Conférences invitées/Invited talks: 50 mn + 10 mn questions.

Autres présentations/Contributed talks: 10 mn + 2 mn questions.

----- Mardi 9 mai/Tuesday May 9th-----

### **14:00 – 14:15 Mot de bienvenue/Welcoming address: David Lafrenière**

### **14:15 – 15:30 Session 1 Galaxies**

14:15 – 14:27 : Marie-Lou Gendron-Marsolais

Ce que les galaxies radio nous enseignent sur leur environnement

14:27 – 14:39 Hyunseop Choi

Windy Quasars: Investigating the Physical Properties of Broad Absorption Line Outflows with SimBAL

14:39 – 14:51 Alexandre Adam

Posterior samples of source galaxies in strong gravitational lenses with score-based priors

14:51 – 15:03 Andreas Filipp

Simulation-guided Galaxy Evolution Inference: A Case Study with Strong Lensing Galaxies

15:03 – 15:15 Matthew Lundy

Searching UFOs for dark matter with VERITAS

15:15 – 15:27 Samantha Wong

LIV Laugh Love: Searches for Lorentz invariance violation with ground-based gamma-ray telescopes

### **15:30 – 16:00 Pause Café/Coffee Break**

### **16:00 – 17:25 Session 2 Exoplanètes I/Exoplanets I**

16:00 – 16:12 Olivia Lim

JWST Reconnaissance Transmission Spectroscopy of the Earth-Sized Exoplanets TRAPPIST-1 b and g

16:12 – 16:24 Raphaël Hardy

Oscillations torsionnelles magnétohydrodynamiques dans les Jupiters chaudes

16:24 – 16:36 Simon Delisle

Clouds asymmetry and temperature contrast between the morning and evening terminators of WASP-39b

16:36 – 16:48 Mahesh Herath

Thermal evolution of Lava planets and their dependency on mass and Core Mass Fractions

16:48 – 17:00 Dereck-Alexandre Lizotte

Technical analysis of the transit wavelength solution of JWST observations

17:00 – 17:12 Jared Splinter  
Using Longitudinally Resolved Spectra on Exoplanet Phase Curves  
17:12 – 17:24 Caroline Piaulet  
Revealing a population of water worlds among small exoplanets

**17:25 – 17:35 Session 3 Mini-Présentations /Mini-Talks**

17:25 Michael Barth  
17:26 Matias Castro Tapia  
17:27 Valérie Gendron  
17:28 Amalia Karalis  
17:29 Alexandrine L'Heureux  
17:30 Michaël Lévesque  
17:31 Leslie Moranta  
17:32 Vincent Savignac  
17:33 Hugo Schérer

**17:35 – 19: 00 Pause/Break**

**19:00 Souper/Dinner**

**21:00 Feu de joie/Bonfire**

----- Mercredi 10 mai/Wednesday May 10th-----

**8:45 – 10:21 Session 4 Exoplanètes II/Exoplanets II**

8 :45 – 8 :57 Anne Boucher  
Chasing Shadows: Shedding Light on the Nightside Emission of an Ultra Hot Jupiter with SPIRou  
8 :57 – 9 :09 Antoine Darveau-Bernier  
Sonder l'atmosphère des Jupiter Chaudes grâce au CO. WASP-33b sous la loupe de SPIRou.  
9 :09 – 9 :21 Charles Cadieux  
Analyse des vitesses radiales du système planétaire LHS 1140 avec le formalisme «line-by-line»  
9 :21 – 9 :33 Stefan Pelletier  
WASP-121b's dayside atmosphere as viewed with ESPRESSO and CRIRES+  
9 :33 – 9 :45 Lisa Dang  
The Ultimate Spitzer Phase Curve Survey  
9 :45 – 9 :57 Michael Matesic  
Bayesian Assessment of Kepler's Small Long-Period Exoplanet Candidates with Gaussian Processes and Nested Sampling  
9 :57 – 10 :09 Christopher Mann  
Thumbs Up or Down? Validating TESS Exoplanet Candidates  
10 :09 – 10 :21 Marylou Fournier Tondreau

Stellar contamination in transmission spectroscopy: Modelling spot-crossing events in transit light curves

**10 :21 – 10 :50 Pause/Break**

**10:50 – 11 :30 Session 5 Instrumentation**

10:50 – 11:02 Etienne Artigau

SPIRou, 5 ans après les premières lumières: Quelles sont les leçons à retenir?

11:02 – 11:14 Romain Allart

First light and results for NIRPS

11:14 – 11:26 André Beaudoin

Simulation de détection d'atmosphères d'exoplanètes avec ANDES

**11:30 – 12 :30 Session 6 Invité/Guest: Marcin Sawicki**

JWST's distant universe as seen from Canada

**12:30 – 14:00 Diner/Lunch**

**14:00 – 15:15 Session 7 Apprentissage automatique / Machine Learning**

14 :00 – 14 :12 Carter Rhea

A New Paradigm in X-ray Spectral Analysis

14 :12 – 14 :24 David Chemaly

Heavy Lifting: Leveraging Machine Learning to Measure the Masses of Supermassive Black Holes

14:24 – 14:36 Ronan Legin

Overcoming inference challenges using score-based generative models

14:36 – 14:48 Maria Sadikov

Classifier les amas de galaxies à l'aide de l'apprentissage automatique

14:48 – 15:00 Charles Wilson

A new neural network for fast multi-plane gravitational lensing

15:00 – 15:12 Hasti Nafisi

Reconstructing Background Galaxies via Sparse Horseshoe Prior and Starlet Basis

**15:15 – 16:00 Méditation/Yoga**

**16:00 – 16:30 Pause/Break**

**16:30 – 17:27 Session 8 SITELLE**

16:30 – 16:42 Thomas Martin

Towards an assumption-free reconstruction of the Crab Nebula 3D structure.

16:42 – 16:54 Maxime Royer

Tackling the Orion Nebula with SITELLE : a thermodynamic approach

16:54 – 17:06 Damien Beaulieu

The HII Regions of NGC925 as Observed With SITELLE

17:06 – 17:18 Marianne Ruest

La bulle Wolf-Rayet NGC 6888 sous toutes ses coutures

17:18 – 17:30 Cyril Dumontier

Étude de la bulle WR, Le casque de Thor (NGC 2359), à partir de données SITELLE

17:30 – 17:42 Benjamin Vigneron

Observations à très haute résolution spectrale de la nébuleuse filamentaire entourant la galaxie NGC 1275 avec SITELLE.

**17:45 – 19: 30 Pause/Break**

**19:30 Souper/Dinner**

----- Jeudi 11 mai/Thursday May 11th-----

**9:00 – 10:00 Session 9 Exoplanètes III/Exoplanets III**

9 :00 – 9 :12 Vigneshwaran Krishnamurthy

Atmosphere of low-mass star radius-gap planets

9 :12 – 9 :24 Giang Nguyen

The meteorology of non-global atmospheres on lava planets

9 :24 – 9 :36 Keavin Moore

The Role of Magma Oceans in Maintaining Surface Water on Rocky Planets Orbiting M-Dwarfs

9 :36 – 9 :48 Pierre-Alexis Roy

Water absorption in the transmission spectrum of the water-world candidate GJ 9827 d

**9 :48 – 10 :00 Session 10 Équité, diversité, inclusion/Equity, diversity, inclusion**

9 :48 - 10 :00 Gilles Joncas

EDI : sommaire des activités de notre comité

**10 :00 – 10 :12 Session 11 Rayonnement/Outreach**

10:00 – 10:12 Guillaume Poulin

Dernières nouvelles de l'ASTROLab et de la Réserve internationale de ciel étoilé du Mont-Mégantic.

**10:15 – 10:45 Pause/Break**

**10:45 – 11:45 Session 12 Étoiles/Stars**

10:45 – 10:57 Amy Steele

Exploring remnant exo-planetary material with white dwarf stars

10:57 – 11:09 Christian Thibeault

Solar flare forecasting through data assimilation with avalanche models

11:09 – 11:21 Henri Lamarre

Predicting Solar Flares with Avalanche models

11:21 – 11:33 Nicholas Vieira

Inferring the abundances of the heavy elements from neutron star mergers with SPARK.  
11:33 – 11:45 Nicole Ford

Exploring Neutron Star Merger Spectral Features with Dimensionality Reduction

11:45 – 11:57 Nayyer Raza

Insights into the predictions of a machine learning classifier for gravitational-wave events

**11:57 – 12 :22 Session 13 Naines brunes/Brown Dwarfs**

11 :57 – 12 :09 William Frost

Direct Test of Brown Dwarf Model Predictions Through Secondary Eclipse Spectroscopy of LHS 6343 C

12 :09 – 12 :21 Clémence Fontanive

Unlocking the Secrets of our Coolest Neighbours: Distances and Atmospheres of the Y Brown Dwarf Population

12 :21 – 12 :33 Loïc Albert

Découverte de la première naine brune binaire Y-Y avec JWST - WISE-0336-01 /  
Discovery of the first Y-Y brown dwarf binary with JWST - WISE 0336-01

**12:34 Prix étudiant/Student prize**

**12:35 Conclusion/Concluding remarks: David Lafrenière**

**12:40 Diner/Lunch**