



Centre de Recherche en Astrophysique du Québec
Rencontre annuelle/Annual meeting

Auberge du Lac-à-l'Eau-Claire, Saint-Alexis-des-Monts

Mai/May 8–10, 2019



Université
de Montréal



McGill



UNIVERSITÉ
LAVAL



UNIVERSITÉ
BISHOP'S
UNIVERSITY

- Session 1: Exoplanètes I/Exoplanets I.** (Prés/Chair: David Lafrenière).
- Session 2: Invité/Guest: Prof. Falk Herwig.** (Prés/Chair: Hugo Martel).
- Session 3: Étoiles & MIS/Stars & ISM.** (Prés/Chair: Gilles Joncas).
- Session 4: Hautes énergies/High energies.** (Prés/Chair: René Doyon).
- Session 5: Éducation & Communauté/ Education & Community.** (Prés/Chair: Sylvie Beaulieu).
- Session 6: Objets compacts/Compact objects.** (Prés/Chair: Pierre Bergeron).
- Session 7: Galaxies.** (Prés/Chair: Nicole St-Louis).
- Session 8: Invité/Guest: Dr. Farah Alibay.** (Prés/Chair: Laurent Drissen).
- Session 9: Exoplanètes II & Exobiologie/Exoplanets II & Exobiology.**
(Prés/Chairs: Christian Carles & Étienne Artigau).
- Session 11: Sursauts Radio Rapides/Fast Radio Bursts.** (Prés/Chair: Tracy Webb).
- Session 12: Télescopes & Instruments/Telescopes & Instruments.**
(Prés/Chair: Thomas Martin).

PROGRAMME

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

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

Mercredi/Wednesday

14:10 - 14:18: Mot de bienvenue/Welcoming address: Hugo Martel.

14:18 - 15:30: Session 1: Exoplanètes I/Exoplanets I (Prés/Chair: David Lafrenière).

14:18: Taylor Bell: “Mass loss from the exoplanet WASP-12b inferred from Spitzer phase curves.”

14:30: Caroline Piaulet: “Transit and eclipse characterization of the keystone exoplanet WASP-107b.”

14:42: Björn Benneke: “A sub-neptune exoplanet with a low-metallicity methane-depleted atmosphere and mie-scattering clouds.”

14:54: Anne Boucher: “The transit of HD189733b in the eye of SPIRou . I - A search for atmospheric molecular signature.”

15:06: Antoine Darveau-Bernier: “The transit of HD189733b in the eye of SPIRou . II - The metastable helium absorption.”

15:18: Lisa Dang: “Constraining the dynamical and radiative properties of the eccentric hot Jupiter XO-3b.”

15:30 - 16:00: Pause Café/Coffee Break

16:00 - 17:00: Session 2: Invité/Guest: Prof. Falk Herwig (Prés/Chair: Hugo Martel).

“3D stellar hydrodynamics and nuclear astrophysics simulations of the formation of the elements in the early universe.”

RÉSUMÉ/ABSTRACT: The most metal-poor stars contain the fossil record of the formation of the elements in the first generations of stars in the nascent universe. Nuclear astrophysics, stellar hydrodynamics and abundance observations are coming together current frontiers nuclear astrophysics and stellar hydrodynamics, and how these fields come together and interact with observations to advance our understanding the many ways in which the elements form in stars and stellar explosions. Specifically, I will discuss the C-enhanced metal-poor stars (CEMP) which carry enormous overabundances of not only C and often O, but also of many heavy elements, such as Ba, La and Eu, with respect to the solar abundances relative to Fe. For over a decade the heavy-element abundance features of these stars have defied a satisfactory explanation, as no combination of previously known neutron-capture processes (notably the slow and rapid process) would naturally yield the observed abundance patterns. A recent breakthrough has been the realization that intermediate neutron-capture regimes of nucleosynthesis are not only possible, but that several stellar sites, such as rapidly accreting white dwarfs, could naturally explain the observed abundances. These advances have been possible, in part, due to a new generation of large-scale 3D hydrodynamic simulations of convection in the stellar interiors. I will describe our extensive program in 3D hydro, of both shell convection and core convection simulation, and close with and outlook at new frontiers, to use asteroseismology to validate our 3D hydrodynamic simulations.

17:00 - 18:36: Session 3: Étoiles & MIS/Stars & ISM (Prés/Chair: Gilles Joncas).

17:00: Benoit Tremblay: “Réseau de neurones pour produire des données synthétiques du Soleil.”

17:12: Christian Thibeault: “Assessing the predictive capabilities of avalanche models of solar flares.”

17:24: Farbod Jahandar: “High-resolution spectroscopy and characterization of M dwarfs using deep learning.”

17:36: Dominic Couture: “Âge cinématique de l’association jeune β -Pictoris.”

17:48: Jonathan Gagné: “Young stellar associations in the era of Gaia.”

18:00: Thomas Martin: “M1 through the eyes of SITELLE.”

18:12: Marcel Sévigny: “À qui le prochain? Les victimes de SITELLE...”

18:24: Maxime Royer: “Étude thermodynamique de la région HII Sh2-158.”

18:36 - 19:30: Pause/Break

19:30: Souper/Dinner

09:00 - 09:15: Assemblée des membres du CRAQ/CRAQ general assembly: Pierre Bergeron.

09:15 - 10:03: Session 4: Hautes énergies/High energies (Prés/Chair: René Doyon).

09:15: Soud Al Kharusi: “Supernova neutrinos with nEXO.”

09:27: Thomas Rosin: “Calibration of the aerogel tiles for the HELIX RICH.”

09:39: Emma Ellingwood: “Calibrating aerogel using an electron beam for HELIX.”

09:51: Elie Bouffard: “Change points in Sgr A*’s X-ray flaring rate: fact or artifact?”

10:03 - 10:39: Session 5: Éducation & Communauté/ Education & Community

(Prés/Chair: Sylvie Beaulieu).

10:03: Frédérique Baron: “Les activités de rayonnement de l’institut de recherche sur les exoplanètes.”

10:15: Julie Bolduc-Duval: “L’astronomie et les objectifs de développement durable de l’UNESCO.”

10:27: Carolina Cruz-Vinaccia: “A data-driven approach to assessing and increasing diversity and inclusivity in canadian astrophysics: A first step and a call for partners”

10:39 - 11:12: Pause Café/Coffee Break

11:12 - 12:36: Session 6: Objets compacts/Compact objects (Prés/Chair: Pierre Bergeron).

11:12: Antoine Bédard: “L’évolution spectrale des étoiles naines blanches chaudes.”

11:24: Simon Blouin: “L’évolution spectrale des étoiles naines blanches froides.”

11:36: Maude Fortin-Archambault: “Analyse de l’absorption circumstellaire du système WD1145+017.”

11:48: Olivier Vincent: “À la recherche d’étoiles naines blanches de type ZZ Ceti dans l’échantillon Gaia.”

12:00: Matt Caplan: “Hybrid crusts during the epoch of crust replacement on accreting neutron stars.”

12:12: Simon Guichandut: “Mass loss from super-Eddington winds in type 1 X-ray bursts.”

12:24: Annabelle Richard-Laferrrière: “La chasse aux trous noirs les plus massifs de l’Univers à l’aide du Télescope Spatial Hubble.”

12:36 - 14:00: Diner/Lunch

14:00 - 15:24: Session 7: Galaxies (Prés/Chair: Nicole St-Louis).

14:00: Christian Carles: “Efficacité de la formation stellaire dans les galaxies spirales barrées.”

14:12: Paul Charlton: “Gemini imaging of the host galaxies of changing-look quasars.”

14:24: Amélie Dumont: “Dwarf galaxies formation in gas-rich galaxy mergers at $z = 3$.”

14:36: Connor Bottrell: “The importance of realism in image-based deep neural network classifications of galaxy interactions.”

14:48: Hugo Martel: “Clocking the formation of today’s largest galaxies: wide field integral spectroscopy of Brightest Cluster Galaxies and their surroundings.”

15:00: Carter Rhea: “X-ray investigation of a high-redshift galaxy cluster undergoing elevated stellar formation,”

15:12: Tracy Webb: “Star formation and molecular gas in high redshift cluster galaxies.”

15:24 - 15:48: Pause Café/Coffee Break

15:48 - 16:48: Session 8: Invité/Guest: Dr. Farah Alibay (Prés/Chair: Laurent Drissen).

“InSight mission overview: revealing the hidden secrets of Mars.”

RÉSUMÉ/ABSTRACT: On Monday, November 26th 2018, the InSight (short for “Interior Exploration using Seismic Investigations”) Mars Lander touched down safely on the surface of Mars, in a region called Elysium Planitia. It was accompanied by a pair of small brief-case sized spacecraft (CubeSats), that were part of a separate mission named Mars Cube One (MarCO). MarCO performed a flyby of Mars on that day, and provided InSight with telemetry during its Mars Entry, Descent, and Landing (EDL) phase. InSight’s goal is to study the interior structure of Mars, in order to understand its evolution. Studying Mars’ interior structure answers key questions about the early formation of rocky planets in our inner solar system – Mercury, Venus, Earth, and Mars – more than 4 billion years ago, as well as rocky exoplanets. InSight also measures ongoing tectonic activity and meteorite impacts on Mars.

In this presentation, the highlights of both the InSight and MarCO missions will be discussed. A background of the science investigations being performed by the lander and an overview of the spacecraft’s instruments will be presented. Finally, Dr. Alibay will share some insights (pun intended) of what life in a Mars lander control room looks like, along with details of some of the challenges and findings from InSight’s first few months on Mars.

16:48 - 18:36: Session 9: Exoplanètes II & Exobiologie/Exoplanets II & Exobiology
(Prés/Chairs: Christian Carles & Étienne Autigau).

16:48: Étienne Artigau: “Dernières nouvelles de SPIROU.”

17:00: Lison Malo: “C’est un départ pour VROOMM: Vélocimètre à haute Résolution en Optique pour l’Observatoire du Mont-Mégantic.”

17:12: Keavin Moore: “Water cycling and atmospheric loss on terrestrial exoplanets.”

17:24: Stefan Pelletier: “The Hot Jupiter tau Boo b through the eyes of SPIROU.”

17:36: Jonathan Chan: “Ground-based transit spectroscopy of the TRAPPIST-1 system with a PCA approach.”

17:48: Merrin Peterson: “Wolf 503 b and new planets near the exoplanet radius gap.”

18:00: Geert Jan Talens: “Don’t blink: detecting transiting exoplanets with MASCARA.”

18:12: Simon-Gabriel Beauvais: “Impact des raies d’absorption telluriques sur les mesures de vélocimétrie radiale de haute précision.”

18:24: Alexandre Champagne-Ruel: “La criticalité dans un système évolutif artificiel.”

18:36 - 19:30: Pause/Break

19:30: Souper/Dinner

Vendredi/Friday

09:15 - 10:39: Session 10: Sursauts Radio Rapides/Fast Radio Bursts (Prés/Chair: Tracy Webb).

09:15: Andrew Zwaniga: "Towards coordinated follow-up observations of fast radio bursts with CHIME/FRB using the VOEvent."

09:27: Mohit Bhardwaj: "Discerning the true identity of low DM FRBs: galactic or extragalactic?"

09:39: Bridget Andersen: "Fast Radio Burst flux calibration with CHIME."

09:51: Pragya Chawla: "Constraining the locations of Fast Radio Bursts in their host galaxies."

10:03: Ziggy Pleunis: "Fast radio burst morphology with CHIME."

10:15: Matthew Lundy: "VERITAS observations of Fast Radio Bursts."

10:27: Bryce Cyr: "Cosmic strings as astrophysical probes."

10:39 - 11:15: Pause Café/Coffee Break

11:15 - 12:27: Session 11: Télescopes & Instruments/Telescopes & Instruments
(Prés/Chair: Thomas Martin).

11:15: Deniz Ölçek: "Status of the HIRAX array."

11:27: Guillaume Allain: "HiCIBaS - High-Contrast Imaging Balloon System: intégration, lancement et résultats."

12:39: Tristan Chabot: "Conceptual optical design of GIRMOS."

11:51: Sylvie Beaulieu: "Dernières nouvelles de l'Observatoire du Mont-Mégantic."

12:03: Laurent Drissen: "Dernières nouvelles de SITELLE."

12:15: Emmanuel Fonseca: "A pulsar-timing backend for the Canadian Hydrogen Intensity Mapping Experiment."

12:27: Prix étudiant/Student prize

12:28: Conclusion/Concluding remarks: Hugo Martel.

12:30 - 14:00: Diner/Lunch