



CANADIAN SCIENCE PROGRAMS WITH THE WEBB TELESCOPE (GO)

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CANADIAN SCIENCE

At least 5% of Webb's time will be given to Canada:

- 450 hours of Guaranteed Time Observations, incl. 2 200h programs
- 13 proposals (331h) led by Canadians during Webb's 1st year, and 72 more with Canadian collaborators
- 1 Early Release Science program co-led by a Canadian astronomer



Le télescope Webb : un nouveau chapitre de l'astronomie

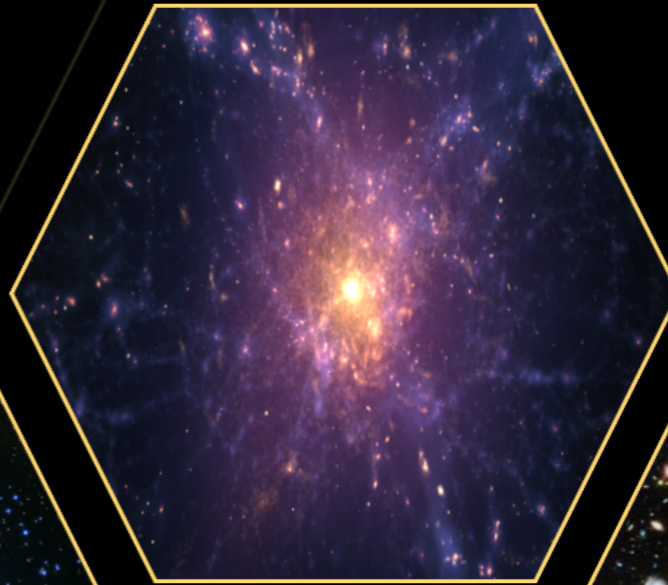
Webb: A new chapter in astronomy



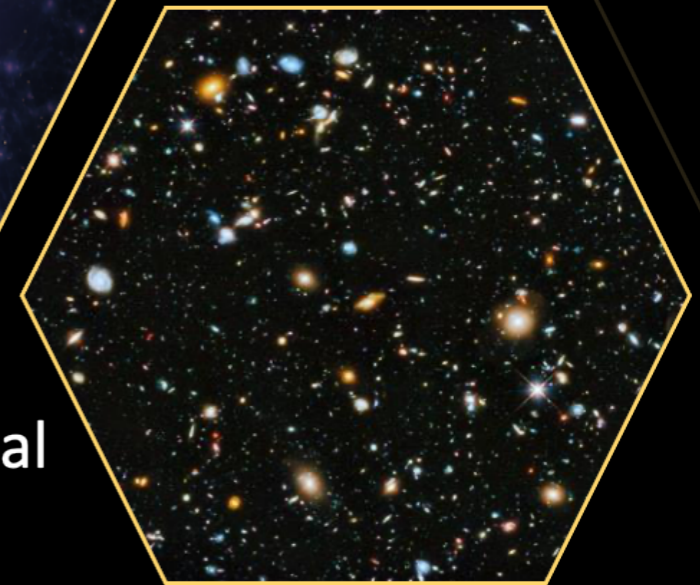
Other worlds
Autres mondes



Star lifecycle
Vie des étoiles



Early universe
Univers primordial



Galaxies over time
Évolution des galaxies

TRANS-NEPTUNIAN OBJECTS

1568 - An Ultra-Sensitive Pencil Beam Search for 10 km TNOs

- **Co-PI:** Wesley Fraser (DAO)
- **Alloted time:** 45.1 hours
- **Instruments:** NIRCam (Imaging)
- **Scientific Goals:** Search for the faintest TNOs ever detected (30 objects down to 7km out to 45 AU); probing size regime of Centaurs and Jupiter Family Comets (sources from TNOs); better understanding the dynamical and chemical evolution in the distant Solar System



Herzberg

LAVA PLANETS

2347 - A Hell of a Phase Curve: Mapping the Surface and Atmosphere of a Lava Planet K2-141b

- **PI:** Lisa Dang (McGill)
- **Alloted time:** 24.9 hours (3 full-orbit phase curves)
- **Instruments:** MIRI (LRS)
- **Scientific Goals:** Perform atmospheric and surface characterisation of a lava planet ($T = 2125$ K, $P = 6.7$ h); search for rock clouds and supersonic winds; test theories of cloud formation and atmospheric loss for a planet skimming its star's corona



ROCKY EXOPLANETS

2589 - Atmospheric Reconnaissance of the TRAPPIST-1 Planets

- **PI:** Olivia Lim (UdeM)
- **Alloted time:** 53.7 hours
- **Instruments:** NIRISS (SOSS) and NIRSpec (BOTS)
- **Scientific Goals:** Observe 2 transits each of T-1 b, c, g and h; provide the community with T-1 data right away (no proprietary period!); characterize the level of stellar contamination; compare the performance of NIRISS and NIRSpec for faint targets; potentially observe CO₂ and H₂O (b,c) and CO₂ and O₃ (g,h)



FORMATION OF HOT JUPITERS

2437 - Diamonds are Forever: Probing the Carbon Budget and Formation History of the Ultra-Puffy Hot Jupiters WASP-127 b

- **PIs:** Stefan Pelletier, Björn Benneke and Romain Allart (UdeM)
- **Alloted time:** 13.1 hours (1 transit)
- **Instruments:** NIRSpec (BOTS)
- **Scientific Goals:** Determine the dominant carbon species of WASP-127 b's atmosphere to constrain the C/O ratio; answer questions about the formation process of Hot Jupiters and giant planets in general



CLOUDS IN HOT JUPITERS

2488 - Real Time Exoplanet
Meteorology: Direct Measurements
of Cloud Dynamics on the High-
Eccentricity Hot Jupiter HD80606 b

- **PI:** James Sikora (Bishop's)
- **Alloted time:** 25 hours
- **Instruments:** NIRSpec (BOTS)
- **Scientific Goals:** Place constraints on cloud composition/condensation predictions and formation/dissipation timescales; use HD80606 b's high eccentricity (and extreme temperature changes) to study cloud dynamics



COLD BROWN DWARFS

2473 - Multiplicity Survey of 20 Y Dwarfs with NIRCam Kernel Phase Interferometry

- **PI:** Loïc Albert (UdeM)
- **Alloted time:** 38.8 hours
- **Instruments:** NIRCam (Imaging)
- **Scientific Goals:** Search for companions around the coldest, lowest-mass and most abundant type of brown dwarfs (20 targets); potentially discover an object cooler than 250 K, bridging the gap between the coldest known Y dwarf and Jupiter



DWARFS IN GLOBULAR CLUSTERS

2559 - Brown Dwarfs, White Dwarfs and Planetary Disks in an Ancient Stellar System

- **Co-PI:** Harvey Richer (UBC)
- **Alloted time:** 20.7 hours
- **Instruments:** NIRCam (Imaging)
- **Scientific Goals:** Observe the cooling brown dwarf sequence and hunt for ancient planetary systems and debris discs around white dwarfs in the 47 Tuc globular cluster; improve age estimate for the cluster; improve understand of atmospheric properties and systematic issues in current white dwarf models



KILONOVAE

2091 - Detecting the Synthesis of the Heaviest Elements with Photometry of a Kilonova in the Optically Thin Phase

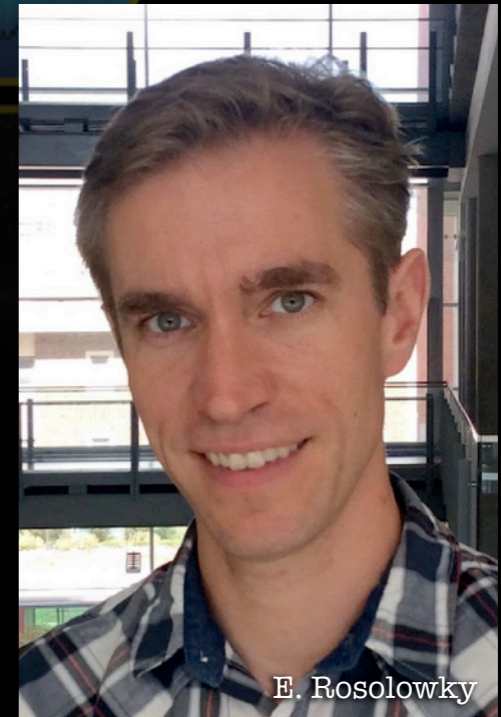
- **PI:** Maria Drout (U of Toronto)
- **Alloted time:** 9.3 hours (non-disruptive ToO)
- **Instruments:** NIRCam and MIRI (Imaging)
- **Scientific Goals:** Observe a kilonova 30 to 120 days post-merger; determine the importance of neutron star mergers in the synthesis of heavy elements (beyond Fe) via rapid neutron capture process



STAR FORMATION IN GALAXIES

2128 - The First Resolved View of Individual Star Formation Across a Spiral Arm

- **PI:** Erik Rosolowsky (U of Alberta)
- **Alloted time:** 22.8 hours (+8h parallel)
- **Instruments:** MIRI (Imaging)
- **Scientific Goals:** Produce the first ever high-resolution view of star formation across a propagating spiral arm; quantify the timescales of star formation and stellar cluster assembly; measure spatially-resolved SFHs, PAH cooking and embedded stellar cluster populations



E. Rosolowsky

BLACK HOLES IN VIRGO

2567 - Do Massive Black Holes Come in Small Packages? A Census of Black Holes in Compact Stellar Systems in the Virgo Cluster

- **PIs:** Matthew Taylor and Patrick Côté (NRC-Herzberg)
- **Alloted time:** 41.2 hours
- **Instruments:** NIRSpec (IFU)
- **Scientific Goals:** Hunt for black holes in compact stellar systems such as globular clusters and compact dwarf galaxies; solidify the existence of intermediate mass black holes and their importance in the formation of SMBHs



ANDROMEDA GALAXY

2301 - Unearthing the Fossilized Andromeda Galaxy: A Spectroscopic Pilot Survey of M31 Giants

- **PI:** John Mackereth (CITA)
- **Alloted time:** 12.1 hours
- **Instruments:** NIRSpec (MOS)
- **Scientific Goals:** Map the element abundances of M31's stellar populations to provide anchoring constraints to galaxy evolution models (in addition to prior constraints determined in the Milky Way); help reconstruct the SFH and fully the history of mass assembly in M31



MASSIVE GALAXIES

2362 - Dawn of the Monsters: JSWT Characterization of Extremely Massive Galaxies at $z \sim 5$

- **PIs:** Cemile Marsan and Adam Muzzin (York)
- **Alloted time:** 8.6 hours
- **Instruments:** NIRSpec (FS) and NIRCам (Imaging)
- **Scientific Goals:** Confirm redshifts and stellar masses of 3 extremely massive galaxies at the peak of their star formation histories; measure the SFRs, SFHs and mass distributions of these galaxies to constrain their assembly history; determine if these galaxies contain a prominent AGN



HIGH-Z QUASARS

1813 - Unveiling Stellar Light from Host Galaxies of $z \sim 6$ Quasars

- **PI:** Madeline Marshall (NRC-Herzberg)
- **Alloted time:** 15.9 hours
- **Instruments:** NIRCam (Imaging)
- **Scientific Goals:** Observe 2 high-z quasars to prove the detectability of their host galaxies; gain insight into the growth of black holes and galaxies in the early Universe and of the relationship between black holes and their host galaxies



M. Marshall