

Thomas Vandal

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Education

PhD in Physics <i>Astronomy and astrophysics, Université de Montréal</i> Advisor: Prof. René Doyon, fast track from M.Sc. in May 2021	Montréal 2020-...
Bachelor of Science (B.Sc.) <i>Major Physics, McGill University</i> Final project: <i>Modelling Stellar Activity with Gaussian Processes: Application to the β Pictoris System</i> Advisor: Prof. René Doyon	Montréal 2017-2020
Diploma of Collegial Studies <i>Natural Sciences, Collège Shawinigan</i>	Shawinigan 2015-2017

Research Experience

PhD Student <i>Trottier Institute for Research on Exoplanets (IREx), Université de Montréal</i> High-resolution spectroscopy, precise radial velocity, aperture masking and kernel phase interferometry, orbit modelling	Montréal 2020-...
Research Assistant <i>Université de Montréal</i> Contribution to the APERO data reduction software for high resolution spectroscopy and precision radial velocity	Montréal 2020-...
Undergraduate researcher <i>Trottier Institute for Research on Exoplanets (IREx)</i> Disentangling Stellar Activity in β Pictoris with Gaussian Processes Advisors: Prof. René Doyon, Dr. Julien Rameau and Dr. Lauren Weiss	Montréal 2018-2019
Summer intern in photonics <i>AEPONYX</i> Computer-aided design, finite element analysis	Trois-Rivières 2017

Publications and Presentations

Refereed Publications

Vandal, T., Rameau, J., Doyon, R. *Dynamical Mass Estimates of the β Pictoris Planetary System through Gaussian Process Stellar Activity Modeling*. 2020, [AJ](#), **160**, 243.

Deslières, A. et al. (incluant **Vandal, T.**). *The Gl 229 System Revisited with the Line-by-line Framework: Planetary Signals Now Appear as Stellar Activity Ghosts*. 2025, [AJ](#), **169**, 182.

Albert, L. et al. (incluant **Vandal, T.**). *JWST 1.5 μ m and 4.8 μ m Photometry of Y Dwarfs*. 2025, [AJ](#), **169**, 163.

Blakely, D. et al. (incluant **Vandal, T.**). *The James Webb Interferometer: Space-based Interferometric Detections of PDS 70 b and c at 4.8 μ m*. 2025, [AJ](#), **169**, 137.

Cooper, R. et al. (incluant **Vandal, T.**). *Commissioning and calibration of the JWST aperture masking interferometry mode*. 2024, [SPIE Astronomical Telescopes and Instrumentation](#).

Malo, L. et al. (incluant **Vandal, T.**). *NIRPS near-infrared spectrograph: AITV phase at ESO3.6m/La Silla*. 2024, [SPIE Astronomical Telescopes and Instrumentation](#).

Artigau, É. et al. (incluant **Vandal, T.**). *NIRPS first light and early science: breaking the 1 m/s RV precision barrier at infrared wavelengths*. 2024, [SPIE Astronomical Telescopes and Instrumentation](#).

Jahandar, F. et al. (incluant **Vandal, T.**). *Comprehensive High-resolution Chemical Spectroscopy of Barnard's Star with SPIRou*. 2024, [ApJ](#), 966, 56.

Moutou, C. et al. (incluant **Vandal, T.**). *Characterizing planetary systems with SPIRou: M-dwarf planet-search survey and the multiplanet systems GJ 876 and GJ 1148*. 2023, [A&A](#), 678, A207.

Doyon, R. et al. (incluant **Vandal, T.**). *The Near Infrared Imager and Slitless Spectrograph for the James Webb Space Telescope. I. Instrument Overview and In-flight Performance*. 2023, [PASP](#), 135, 098001.

Calissendorff, P. et al. (incluant **Vandal, T.**). *JWST/NIRCam Discovery of the First Y+Y Brown Dwarf Binary: WISE J033605.05-014350.4*. 2023, [ApJ](#), 937, L30.

Sivaramakrishnan, A. et al. (incluant **Vandal, T.**). *The Near Infrared Imager and Slitless Spectrograph for the James Webb Space Telescope – IV. Aperture Masking Interferometry*. 2022, [PASP](#), 135, 014502.

Kammerer, J., Cooper, R., **Vandal, T.** et al. *The Near Infrared Imager and Slitless Spectrograph for JWST – V. Kernel Phase Imaging and Data Analysis*. 2022, [PASP](#), 135, 014502.

Kammerer, J. et al. (incluant **Vandal, T.**). *Performance of near-infrared high-contrast imaging methods with JWST from commissioning*. 2022, [SPIE Astronomical Telescopes and Instrumentation](#).

Cadieux, C. et al. (incluant **Vandal, T.**). *TOI-1452 b: SPIRou and TESS reveal a super-Earth in a temperate orbit transiting an M4 dwarf*. 2022, [AJ](#), 164, 96.

Artigau, É et al. (incluant **Vandal, T.**). *Line-by-line Velocity Measurements: an Outlier-resistant Method for Precision Velocimetry*. 2022, [AJ](#), 164 84.

Martioli, E. et al. (incluant **Vandal, T.**). *TOI-1759 b: A transiting sub-Neptune around a low mass star characterized with SPIRou and TESS*. 2022, [A&A](#), 660, A86.

Artigau, É et al. (incluant **Vandal, T.**). *TOI-1278 B: SPIRou unveils a rare Brown Dwarf Companion in Close-In Orbit around an M dwarf.*. 2021, [AJ](#), 162, 144.

Pelletier, S et al. (incluant **Vandal, T.**). *Where is the Water? Jupiter-like C/H ratio but strong H₂O depletion found on τ Boötis b using SPIRou*. 2021, [AJ](#), 162, 73.

Oral Presentations (Conferences and Seminars).....

Extreme Solar Systems V	Christchurch
<i>From HR 8799 to Y-dwarf binaries: Understanding planet formation across the stellar IMF with JWST Interferometry</i>	2024
Improving JWST Data Products Workshop	Baltimore
<i>A Kernel Phase Pipeline for High-Contrast Imaging below the Diffraction Limit with JWST</i>	2023
Center for research in astrophysics of Quebec (CRAQ) annual meeting	Orford
<i>Infrared interferometric imaging below the diffraction limit with JWST</i>	2022
IREx Café	Montréal
<i>Trottier Institute for Research on Exoplanets (IREx), Seminar</i>	2022
2022: <i>Introduction to Aperture Masking and Kernel Phase Interferometry</i>	
2021: <i>Introduction to Hamiltonian Monte-Carlo</i>	
2019: <i>Gaussian Processes and their Applications in Astrophysics</i>	
SPIRou Legacy Survey Science Meeting	Montréal
<i>Long term RV trend analysis and correction</i>	2021
Canadian Undergraduate Physics Conference (CUPC)	Montréal
<i>Disentangling Stellar Activity in β Pictoris with Gaussian Processes</i>	2019

Poster Presentations

Canadian Astronomical Society (CASCA) Annual Meeting <i>Detecting Hot Close-in Gas Giants Through Infrared High-Dispersion Spectroscopy</i> Available online: https://vandalt.github.io/casca2022/	Online 2022
ComSciCon-QC <i>Chasseurs d'exoplanètes: à la recherche de planètes habitables avec les élèves du secondaire</i> Available online: https://vandalt.github.io/poster-comscicon-sprint-k218/	Online 2021
Exoplanets III <i>Dynamical Mass Estimates of the beta Pictoris Planetary System through Gaussian Process Stellar Activity Modeling</i>	Online 2020
Canadian Astronomical Society (CASCA) Annual Meeting <i>Dynamical Mass Estimates of the beta Pictoris Planetary System through Gaussian Process Stellar Activity Modeling</i>	Online 2020

Teaching and Mentoring

Teaching Assistant <i>Université de Montréal</i> PHY3051/6051 - Modern data analysis in physics (Joint class BSc/PhD, Winter 2022-2024) PHY1234 - Introduction to numerical physics (Fall 2021, 2023) PHY1901 - Classical mechanics and modern physics (Fall 2020)	Montréal 2020-...
Individual Mentoring <i>Centre de services scolaire de Montréal</i> One-to-one meetings with a gifted elementary school student	Montréal 2024
Individual Tutoring <i>Cégep de Shawinigan</i> Physics, mathematics, French literature	Shawinigan 2016-2017

Additional scientific, volunteering and community activities

Conferences and workshop

Improving JWST Data Products Workshop <i>Space Telescope Science Institute</i>	Baltimore 2023
Dot Astronomy 12 <i>Flatiron Institute</i> Workshop in an "unconference" format about the use of modern computing facilities and software in astronomy	New-York 2023
SPIE Astronomical Telescopes and Instrumentation <i>SPIE</i>	Montréal 2022
Aperture Masking and Kernel Phase Hackathon <i>University of California Irvine</i> Presentations and discussions about state-of-the-art techniques and standards for the years to come	Online 2021
AstroComm <i>Center for research in astrophysics of Quebec (CRAQ)</i> Workshop about science communication for graduate students in astronomy	Online 2021
ComSciCon-QC <i>ComSciCon workshop series</i> Workshop about science communication for graduate students	Online 2021

CASCA Annual Meeting <i>Canadian Astronomical Society (CASCA)</i>	Online 2020-2022
Canadian Undergraduate Physics Conference (CUPC) <i>McGill University</i>	Montréal 2019
Science Communication and Citizen Science	
IREx Career Days <i>Trottier Institute for Research on Exoplanets (IREx), Volunteer</i> Presentation and discussion with high-school students	Montréal 2022-2025
Summer Interns Welcome Day <i>Trottier Institute for Research on Exoplanets (IREx), Presenter</i> Presentation about tools used in astronomy	Montréal 2021 and 2022
Grande conférence de l'IREx 2021 <i>Trottier Institute for Research on Exoplanets (IREx), Volunteer</i> Welcoming the public and taking part in the Q&A at the end	Montréal 2021
InitiaSciences <i>InitiaSciences, Treasurer and founding member</i> Non-profit enabling high-school students to do research, supervised by graduate students	Montréal 2021-2022
Un astronome dans votre classe Conferences <i>Trottier Institute for Research on Exoplanets (IREx) and 24h de sciences, Speaker</i> Conference about astronomy for elementary schools, 3 presentations	Montréal 2021-...
Ma vie de chercheur en astronomie Conferences <i>Trottier Institute for Research on Exoplanets (IREx) and</i> <i>Regroupement des cégeps de Montréal (programme acceScience), Speaker</i> 5 presentations	Montréal 2021-...
Séjours d'immersion <i>Projet SEUR, Université de Montréal, Speaker</i> Presentation about studying physics and exoplanet research	Montréal 2021
Sprint de sciences <i>Coeur des sciences, Université du Québec à Montréal, Speaker</i> Interactive conference about exoplanets for high-schools, approximately 10 per semester	Montréal 2020-2025
Open-source software contributions <i>Contribution to software projects used in astronomy</i> Full list available on GitHub: https://github.com/vandalt	2020-...
CRAQ Calendar <i>Center for research in astrophysics of Quebec (CRAQ), Volunteer</i> Translation and management of the distribution list	Montréal 2020 and 2021
AstroMIL: Astronomy Day on the MIL Campus <i>Université de Montréal, Volunteer</i>	Montréal 2018 and 2019
Eurêka! Festival <i>CRAQ and Faculté des Arts et Sciences de l'Université de Montréal, Presenter</i>	Montréal 2018 and 2022
Organisation d'événements	
Canadian Undergraduate Physics Conference (CUPC) <i>McGill University, Vice-president of events</i> Sponsorship search and event planification	Montréal 2019

Awards & Recognitions

Université de Montréal

ESP Excellence Scholarship - Alma Mater

Études supérieures et postdoctorales (ESP), Université de Montréal, \$10,000 2022

Lumbroso IREx Ambassador Grant

Trottier Institute for Research on Exoplanets (IREx), \$2000 2022

Doctoral research scholarship (B2X)

Fonds de recherche du Québec - Nature et technologies, \$84,000 2022-2026
\$21,000 per year for 4 years

Teaching Award "Petit Nobel - NanoNobel"

Department of Physics, Université de Montréal 2022

Excellence in teaching award for a teaching assistant, voted by 3rd year undergraduate students

Financial support scholarship

Université de Montréal, \$3000 2022

Awarded for the excellence of my 2021-2022 NSERC application

Bourse d'études 3e cycle (Doctoral Scholarship)

Fondation des Anciens de Shawinigan, \$5000 2022

Bourse pour passage accéléré au doctorat (Scholarship for fast track to PhD)

Université de Montréal, \$7000 2021

Master's research scholarship (B1X)

Fonds de recherche du Québec - Nature et technologies, \$21,000 2021

Value adjusted for PhD after fast track

Bourse d'études 2e cycle (Master's Scholarship)

Fondation des Anciens de Shawinigan, \$2000 2020

Technologies for Exo Planetary Science Scholarship

NSERC (CREATE program), \$7500 2020

McGill University

Trottier Excellence Grant for Summer Interns

Trottier Institute for Research on Exoplanets (IREx), \$6000 2018

R.E. Powell Scholarship

Entrance Scholarship, McGill University, \$5000 2017

Cégep de Shawinigan

Governor General's Academic Medal

Highest R-score, Cégep de Shawinigan 2017