

Nicolas B. Cowan

CONTACT	McGill Space Institute 3550 rue University Montréal, QC H3A 2A7 Canada	514-398-1967 (office) nicolasbcowan (Skype) nicolas.cowan@mcgill.ca
INTERESTS	Inverse problems in exoplanet remote sensing. Low-order climate models.	
EMPLOYMENT	McGill University , Montréal, QC Assistant Professor, Physics, Earth & Planetary Sciences (8/2015–) Space Science Institute , Boulder, CO Senior Research Scientist (7/2015–8/2015) Amherst College , Amherst, MA Assistant Professor, Physics & Astronomy (7/2014–6/2015) Northwestern University , Evanston, IL CIERA Postdoctoral Fellow, Physics & Astronomy (9/2010–8/2014)	
EDUCATION	University of Washington , Seattle, WA Research Associate, Astronomy (9/2009–8/2010) Ph.D. Astronomy, w/Certificate in Astrobiology 12/2009 McGill University , Montréal, QC B.Sc. Physics w/First Class Honours, 2/2004	
STUDENTS Current <i>Grad</i>	James Bushong (University of Washington), Lisa Dang (McGill), Wanda Feng (Smith), Pablo Fuentes (University of Chile), Christopher Hansen (Northwestern), Ned Kleiner (Amherst), Virginia Klemm (University of Washington), Daniel Law (Amherst), Carl Majeau (Columbia), <i>Sara Rastegar</i> (Northwestern), Joel Schwartz (Northwestern), Louis Shekhtman (Northwestern), Jyotsana Singh (McGill), Talia Strait (Northwestern), Veenu Suri (Michigan), Mashiyat Zaman (Amherst)	
TEACHING	EPSC 182, <i>Astrobiology</i> , McGill University (Winter 2016) ASTR 112, <i>Alien Worlds</i> , Amherst College (Spring 2015) EARTH 450, <i>Exoplanets as Planets</i> , Northwestern University (Winter 2013) ASTR 192, <i>Pre-Major in Astronomy Program</i> , University of Washington (Autumn 2007)	
LEADERSHIP & SERVICE	PI: <i>Exo-Cartography Inverse Problem</i> (International Space Science Institute) Executive Committee: NASA Exoplanet Program Analysis Group (2013–2016) Chair: <i>Exoplanet Atmospheres with JWST and Beyond</i> (ExoPAG SAG 10) Member: Hubble Exoplanet Advisory Committee (2015–2016) Chair: <i>ExoClimes 2012</i> (Aspen, CO), <i>ExoClimes 2016</i> (Squamish, BC) PI/Co-I for 17 successful Spitzer and Hubble Space Telescope proposals Referee/Reviewer: A&A, A&A Letters, ApJ, ApJL, Astrobiology, CanTac, CRC Press, Exper. Astro., FWO Pegasus, <i>Hubble</i> , Icarus, IEEE Spectrum, MNRAS, MNRAS Letters, NASA ROSES/PATM, Nature, PASP, <i>Spitzer</i>	
PUBLICATIONS	$\gtrsim 50$ papers, $\gtrsim 2100$ citations, h -index = 26	

INVITED TALKS
(RECENT)

Exoplanets I, Davos, CH (July, 2016)
NASA Goddard, Astrophysics Colloquium (Mar 15, 2016)
Université de Montréal, Astronomy Seminar (Feb 4, 2016)
Kavli Frontiers of Science, Irvine, CA (Nov, 2015)
Exploring the Universe with JWST, ESTEC, NLD (Oct, 2015)
MIT, Astronomy Colloquium (Sept 22, 2015)
Comparative Climates of Terrestrial Planets II, Mountain View, CA (Sep, 2015)
ETH, Geoscience Seminar (July 24, 2015)
Université de Genève, Astronomy Seminar (July 21, 2015)
NYU Abu Dhabi, Physics Colloquium (May 11, 2015)
McGill University, Physics, Earth & Planetary Sciences (Feb 12, 2015)
California Academy of Sciences, Benjamin Dean Astronomy Lecture (Dec 8, 2014)
University of Massachusetts, Astronomy Colloquium (Nov 13, 2014)
University of Arizona, Theoretical Astrophysics Colloquium (Oct 20, 2014)
Trinity College, Physics Seminar (Sept 26, 2014)
SciTech Cafe, Amherst, MA (Sept 22, 2014)
Bard College, Physics Seminar (Sep 17, 2014)
Max Planck Institute for Astronomy, Joint Astronomy Colloquium (July 15, 2014)
Institut de Planétologie et d'Astrophysique de Grenoble, Seminar (July 3, 2014)
Adler Planetarium, Astronomy Seminar (May 23, 2014)
Jet Propulsion Laboratory, Astrophysics Seminar (May 15, 2014)
Space Telescope Science Institute, Astronomy Colloquium (April 17, 2014)
Texas Tech University, Geosciences Colloquium (March 14, 2014)
Amherst College, Physics & Astronomy (March 11, 2014)
Harvard-Smithsonian CfA, Institute for Theory and Computation (Dec 3, 2013)
Lake County Astronomical Society, Fox Lake, IL (Oct 18, 2013)
Chicago Ideas Week, Chicago, IL (Oct 15, 2013)
ExoPAG Meeting 8, Denver, CO (Oct 5, 2013)
From Our Own Backyard to the World, Evanston, IL (Sept 12, 2013)
Ohio State University, Astronomy (Aug 29, 2013)

EXTENDED VISITS

ETH Zurich, PlanetS Visiting Scholar (Summer 2015)
Institut de Planétologie et d'Astrophysique de Grenoble (Summer 2014)
Aspen Center for Physics (Summer 2011, 2012)
Kavli Institute for Theoretical Physics (Spring 2010)
Harvard-Smithsonian Center for Astrophysics (Summer 2008)

AWARDS &
HONORS

Kavli Frontiers Fellow (2013, 2015)
CIERA Postdoctoral Fellowship (2010–2015)
NSERC Postgraduate Scholarship (2006–2009)
FQRNT Master's Scholarship (2004–2006)

PRINT & RADIO

Walking on Water, Uptown Radio 1 (March 28, 2014)
Maata näkyvissä supermaapalloilla, Tähdet ja Avaruus (March 2014)
Planetology comes of age, The Economist (Jan 11, 2014)
Heat and Tidally-Locked Planets, Academic Minute (Sept 2013)
Earth from an exoplanetary perspective, Sky at Night (May 2011)
Earth Through Time, Sky & Telescope (Aug 2010)
5 Questions, Discover Magazine (Oct 2009)
Un camaïeu de bleus, Ciel & Espace (juillet 2009)
How to Map an Exoplanet's Oceans, New Scientist (May 16, 2009)
Mapping Uncharted Territories, SEED Magazine (December 2008)
Gassy Windbags, Quirks & Quarks, CBC Radio (Jan 13, 2007)

SELECTED
PUBLICATIONS

(My students and I are **bold**)

“Inferring Planetary Obliquity Using Rotational & Orbital Photometry”
Schwartz, Sekowski, Haggard, Pallé & **Cowan**, *MNRAS*, accepted, 2016

“Balancing the Energy Budget of Short-Period Giant Planets”
Schwartz & **Cowan**, *MNRAS*, 449, 4192, 2015

“Features in the Broadband Eclipse Spectra of Exoplanets: Signal or Noise?”
Hansen, **Schwartz** & **Cowan**, *MNRAS*, 444, 3632, 2014

“Water Cycling Between Ocean and Mantle: Super-Earths Need Not be Waterworlds”
Cowan & Abbot, *ApJ*, 781, 27, 2014

“Lightcurves of Stars & Exoplanets: Estimating Inclination, Obliquity and Albedo”
Cowan, **Fuentes** & Haggard, *MNRAS*, 434, 2465, 2013

“Stabilizing Cloud Feedback Expands the Habitable Zone of Tidally Locked Planets”
Yang, **Cowan** & Abbot, *ApJL*, 771, 45, 2013

“Determining Reflectance Spectra of Surfaces and Clouds on Exoplanets”
Cowan & **Strait**, *ApJL*, 765, 17, 2013

“Thermal Phases of Earth-Like Planets”
Cowan, Voigt & Abbot, *ApJ*, 757, 80, 2012

“A False Positive for Ocean Glint on Exoplanets”
Cowan, Abbot & Voigt, *ApJL*, 752, 3, 2012

“A Two-Dimensional Map of the Extrasolar Planet HD 189733b”
Majeau, Agol & **Cowan**, *ApJL*, 747, 20, 2012

“Thermal Phase Variations of WASP-12b”
Cowan, Machalek, Croll, **Shekhtman** et al., *ApJ*, 747, 82, 2012

“Rotational Variability of Earth’s Polar Regions”
Cowan et al., *ApJ*, 731, 76, 2011

“The Statistics of Albedo and Energy Recirculation on Hot Exoplanets”
Cowan & Agol, *ApJ*, 729, 54, 2011

“A Model for Thermal Phase Variations of Circular and Eccentric Exoplanets”
Cowan & Agol, *ApJ*, 726, 82, 2011

“Alien Maps of an Ocean-Bearing World”
Cowan et al., *ApJ*, 700, 915, 2009

“Inverting Phase Functions to Map Exoplanets”
Cowan & Agol, *ApJL*, 678, 129, 2008

“Hot Nights on Extrasolar Planets: Mid-IR Phase Functions of Hot Jupiters”
Cowan, Agol & Charbonneau, *MNRAS*, 379, 641, 2007

OTHER
PUBLICATIONS

“3.6 and 4.5 μm *Spitzer* Phase Curves of the Hot Jupiters WASP-19b and HAT-P-7b”
Wong et al., *ApJ*, submitted, 2015

“3.6 and 4.5 μm Phase Curves of the Eccentric Hot Jupiter WASP-14b”
Wong et al., *ApJ*, 811, 122, 2015

“*Spitzer* Secondary Eclipse Observations of Three Cool Giant Planets”
Kammer et al., *ApJ*, 810, 118, 2015

“Brief Follow-up on Recent Studies of Theia’s Accretion”
Kaib & **Cowan**, *Icarus Note*, 258, 14, 2015

“*Spitzer* Eclipses of the Dense, Modestly-Irradiated, Giant Exoplanet HAT-P-20b”
Deming et al., *ApJ*, 805, 132, 2015

“The Feeding Zones of Terrestrial Planets and Insights Into Moon Formation”
Kaib & **Cowan**, *Icarus*, 252, 161, 2015

“Atmospheric Circulation and Variability of the Eccentric Hot Jupiter XO-3b”
Wong et al., *ApJ*, 794, 134, 2014

“The 4.5 μm Full-Orbit Phase Curve of the Hot Jupiter HD 209458b”
Zellem et al., *ApJ*, 790, 53, 2014

“Atmospheric Characterization of the Hot Jupiter Kepler-13Ab”
Shporer et al., *ApJ*, 788, 92, 2014

“Inference of Inhomogeneous Clouds in an Exoplanet Atmosphere”
Demory et al., *ApJL*, 776, 25, 2013

“Secondary Eclipse Photometry of Exoplanet WASP-5b with Warm *Spitzer*”
Baskin et al., *ApJ*, 773, 124, 2013

“Warm *Spitzer* Photometry of Hot Jupiters HAT-P-3b, HAT-P-4b and HAT-P-12b”
Todorov et al., *ApJ*, 770, 102, 2013

“Orbital Phase Variations of the Eccentric Giant Planet HAT-P-2b”
Lewis et al., *ApJ*, 766, 95, 2013

“Land Fraction and Habitability”
Abbot, **Cowan** & Ciesla, *ApJ*, 756, 178, 2012

“3.6 and 4.5 μm Phase Curves of HD 189733b”
Knutson et al., *ApJ*, 754, 22, 2012

“*Spitzer*/MIPS 24 μm Observations of HD 209458b”
Crossfield et al., *ApJ*, 752, 81, 2012

“Warm *Spitzer* Observations of XO-4b, HAT-P-6b, and HAT-P-8b”
Todorov et al., *ApJ*, 746, 111, 2012

“Measures of Galaxy Environment I — What is *Environment?*”
Muldrew et al., *MNRAS*, 419, 2670, 2012

- “A Spitzer Transmission Spectrum for the Exoplanet GJ 436b”
Knutson et al., *ApJ*, 735, 27, 2011
- “Secondary Eclipse Photometry of WASP-4b with Warm Spitzer”
Beerer et al., *ApJ*, 727, 23, 2011
- “Warm Spitzer Photometry of the Transiting Exoplanets CoRoT-1b and CoRoT-2b”
Deming et al., *ApJ*, 726, 95, 2011
- “The Climate of HD 189733b from Fourteen Transits and Eclipses Measured by Spitzer”
Agol et al., *ApJ* 721, 1861, 2010
- “The 8 micron Phase Variation of the Hot Saturn HD 149026b”
Knutson et al., *ApJ*, 703, 769, 2009
- “The Mass-Metallicity Relation in Galaxy Clusters”
Ellison et al., *MNRAS*, 396, 1257, 2009
- “Multi-Wavelength Constraints on the Day-Night Circulation Patterns of HD 189733b”
Knutson et al., *ApJ*, 690, 822, 2009
- “The Environment of Galaxies at Low Redshift”
Cowan & Ivezić, *ApJL*, 674, 13, 2008
- “A Map of the Day-Night Contrast of the Extrasolar Planet HD 189733b”
Knutson et al., *Nature*, 447, 7141, 2007
- “TIGRESS Highly-Segmented High-Purity Germanium Clover Detector”
Scraggs et al., *Nuclear Instruments and Methods*, A543, 431, 2005
- “Position sensitivity of the TIGRESS 32-fold segmented HPGe clover detector”
Svensson et al., *Nuclear Instruments and Methods*, A540, 348, 2005
- “Regarding Large Mission Concepts to Study for the 2020 Decadal Survey”
Gaudi et al., ExoPAG Report to Paul Hertz, 2016
- “Water On—and In—Terrestrial Planets”
Cowan, CCTP2 NASA Conference Proceedings, 2015
- “Characterizing Transiting Planet Atmospheres through 2025”
Cowan, Greene et al., *PASP*, 127, 311, 2015
- “The Exoplanet Opportunity: Top-Down Planetary Science”
Cowan, *Eos*, 95, 209, 2014
- “Inverting Phase Curves to Map Exoplanets”
Cowan & Agol, IAU Symposium, 253, 544, 2009
- “Transits and secondary eclipses of HD 189733 with Spitzer”
Agol, **Cowan**, **Bushong** et al. IAU Symposium, 253, 209, 2009
- “Observations of Extrasolar Planets During the non-Cryogenic Spitzer Mission”
Deming, Agol, Charbonneau, **Cowan**, Knutson & Marengo, AIPC, 943, 89, 2007

REVIEWS,
REPORTS &
PROCEEDINGS