

Nicolas Cowan | Associate Professor | McGill University

Tier 2 Canada Research Chair in Planetary Climate

McGill Space Institute
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Employment & Education

- **McGill University**, Montréal, QC
Associate Professor, Physics and Earth & Planetary Sciences (6/2019–)
Assistant Professor, Physics and Earth & Planetary Sciences (8/2015–5/2019)
- **Space Science Institute**, Boulder, CO
Senior Research Scientist (7/2015–12/2015)
- **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)
Research Assistant Professor, Earth & Planetary Sciences (12/2012–8/2014)
- **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

Awards & Honours

- Heising-Simons Scialog Fellow: Signatures of Life in the Universe (2020)
- Tier 2 Canada Research Chair in Planetary Climate (2019–2024)
- Canadian Astronomical Society’s Harvey B. Richer Gold Medal (2019)
- Kavli Frontiers Fellow (2013, 2015)
- Inaugural PlanetS Visiting Scholar, Switzerland (2015)
- CIERA Postdoctoral Fellowship (2010–2014)
- NASA Group Achievement Award for EPOXI Mission (2010)
- NSERC Postgraduate Scholarship—Doctoral (2006–2009)
- FRQNT Master’s Scholarship (2004–2006)

Instrument Planning & Leadership

- Transiting Planet Working Group for the James Webb Space Telescope’s Near Infrared Imager and Slitless Spectrograph (JWST/NIRISS), scheduled for launch in 2021
- Consortium Member for ARIEL (*Atmospheric Remote-Sensing Infrared Exoplanet Large-survey*) and member of NASA’s approved contribution of opportunity, CASE (*Contribution to ARIEL Spectroscopy of Exoplanets*). ESA’s approved M4 mission is due to launch in 2028.

- Science PI for CSA Microsat Concept *Extrasolar Planet Polarimetry Experiment (ÉPPÉ)*¹
- Member of Science Team for Near Infrared Planet Searcher (NIRPS) on La Silla 3.6 m, scheduled for first light in 2020.
- Member of Science Legacy Survey for the SpectroPolarimètre Infra-Rouge (SPIRou) on CFHT, first light in 2018.
- Science and Technology Definition Team for NASA’s Large UV–Visible–Infrared telescope (LUVOIR), a contender for the Astro 2020 flagship mission

Funding

- IAU Office of Astronomy for Development (2019–2020): €5000 for education and outreach *Astronomy in Indigenous Communities (AIC)*
- Tier 2 Canada Research Chair (2019–2024): \$600,000 for 1 investigator *Planetary Climate*
- CSA Space Exploration Concept Study (2018–2019): \$175,000 for 6 investigators *Extrasolar Planet Polarimetry Explorer (ÉPPÉ)*
- FRQNT Équipe (2018–2021): \$212,000 for 4 investigators *Caractérisation d’atmosphères d’exoplanètes avec le télescope spatial James Webb*
- FRQNT Regroupement Stratégique (2017–2023): \$2,598,000 for 25 investigators *Centre the Recherche en Astrophysique du Québec (CRAQ)*
- NSERC Discovery Grant (2016–2021): \$135,000 for 1 investigator *Observing the Atmospheres and Surfaces of Earth Analogs*
- NSERC CREATE (2016–2022): \$1,650,000 for 10 investigators *Technologies for Exo-Planetary Science (TEPS)*
- McGill Start-Up Funds (2015–2020): \$150,000 for 1 investigator *McGill Exoplanet Characterization Alliance (MEChA)*
- FRQNT Nouveau Chercheur (2017–2019): \$40,000 for 1 investigator *The Climate of Short-Period Planets: Clouds and Temperature Gradients*

Teaching

- EPSC 645 Planets, McGill University (Winter 2020, 2021)
- EPSC/PHYS 186 *Astrobiology*, McGill University (Winter 2017, 2018, 2019, 2020, 2021)
- ATOC/PHYS 404 *Climate Physics*, McGill University (Fall 2017, 2019, 2020)
- PHYS 642 *Radiative Processes*, McGill University (Winter 2018)
- PHYS 214 *Intro to Astrophysics*, McGill University (Fall 2018)
- *Atmospheres 101*, at CRAQ Exoplanet Atmospheres Summer School (2017)
- PHYS 641 *Observational Astronomy*, McGill University (Autumn 2016)
- ANAT/EPSC 182 *Astrobiology*, McGill University (Winter 2016)
- ASTR 112 *Alien Worlds*, Amherst College (Spring 2015)
- EARTH/ASTR 450/441 *Exoplanets as Planets*, Northwestern University (Winter 2013)
- ASTR 192 *Pre-Major in Astronomy Program*, University of Washington (Autumn 2007)

¹Also known as l’Explorateur polarimétrique de planètes extrasolaires (ÉPPÉ) ... I devised the bilingual palindrome to satisfy the CSA’s peculiar acronym rules.

International & National Service

- Chair of CanTAC Galactic Panel (2020–)
- Member of Sustainability Committee of the Canadian Astronomical Society (2020–)
- Board Member, Association of Canadian Universities for Research in Astronomy (ACURA; 2019–)
- Membre du Comité d'évaluation interdisciplinaire du Fonds de Recherche du Québec (2018–)
- Canadian Time Allocation Committee (CanTAC) member (2018–)
- Deputy Director of TEPS CREATE Program (2018–)
- Conseil Scientifique de l'iREx (2018–)
- Member of CFHT/SPIRou Legacy Survey (2018–)
- Star & Planet Science Working Group for Maunakea Spectroscopic Explorer (2018–)
- Thirty Meter Telescope Exoplanet International Science Development Team (2017–)
- Canadian Euclid Consortium Steering Committee (2017–)
- Member of Nominating Committee for the Canadian Astronomical Society (2019–2020)
- Hubble Space Telescope – Transiting Exoplanet Survey Satellite (HST-TESS) Advisory Committee (2019)
- Moderator of arXiv astro-ph Earth and Planetary category (2016–2018)
- Undergraduate Fellowships Committee, Institute for Research on Exoplanets (2017–2018)
- Seminar Coordinator for TEPS CREATE Program (2015–2018)
- ACURA-CASCA Thirty Meter Telescope Alternative Site Committee (2016)
- Consultant for Rio Tinto Alcan Planetarium Exo Show (2016)
- Canadian Space Agency's *Origins* and *Astrobiology* Topical Teams
- Hubble Exoplanet Advisory Committee (2015–2016)
- Executive Committee of the NASA Exoplanet Program Analysis Group (2013–2016)
- Time Allocation Committees: Hubble Space Telescope, Spitzer Space Telescope, CanTAC (Gemini Telescopes and Canada-France-Hawaii Telescope)
- Reviewer: Austrian Science Fund, Cottrell Scholar Award, CRC Press, European Research Council, FWO Pegasus, NASA ROSES/PATM, NASA Exoplanet Research Program, NSERC Discovery Grant (Geosciences and Physics), NSERC Steacie Fellowship, STFC Astronomy Grants Panel
- Referee: Astronomy & Astrophysics (A&A), A&A Letters, Astrophysical Journal (ApJ), ApJ Letters, Astrobiology, Experimental Astronomy, Icarus, IEEE Spectrum, Journal of Geophysical Research, Monthly Notices of the Royal Astronomical Society (MNRAS), MNRAS Letters, Nature, Publications of the Astronomical Society of the Pacific, Space Science Series

Conference Organizing

- *ExoClimes* Steering Committee (2015–)
- SOC for *Extreme Solar Systems IV* (Reykjavik, Iceland)
- SOC for *ExoClimes 2019* (Oxford, UK)
- Co-Chair, *Canadian Astronomical Society Meeting 2019* (Montréal, QC)
- Co-Organizer, *Multi-dimensional characterization of distant worlds 2018* (Ann Arbor, MI)

- SOC for CRAQ 2017 Summer School: *Exoplanet Atmospheres* (Montréal, QC)
- Chair of *ExoClimes 2016* (Squamish, BC)
- Co-Convener, “Mapping Other Worlds” at *Pathways to Habitable Planets II* (Bern, CH)
- SOC of *ExoClimes 2014* (Davos, CH)
- Chair of *ExoClimes 2012* (Aspen, CO)
- Co-Convener, “The Geoscience of Exoplanets” at *AGU 2011* (San Francisco, CA)
- SOC for *Future of Astronomy Conference 2011* (Evanston, IL)
- LOC for *Astrobiology Graduate Student Conference 2009* (Seattle, WA)

Service: Physics

- Committee on Equity, Diversity and Inclusion (2020–)
- Contingency Committee (2020–)
- Preliminary Exam Review Committee (2019–)
- Undergraduate Curriculum Committee (2017–)
- Chief Undergraduate Advisor (2017–)
- Hiring Committee for Undergraduate Coordinator (2020)
- Convocation Committee (2020)
- Work Disruption Committee (2020)
- Hiring Committee for Undergraduate Coordinator (2018)
- Exoplanet Search Committee (2017–2018)
- Exoplanet Search Committee (2016–2017)
- U1 Advisor (2016–2017)
- U0 Advisor (2015–2016)

Service: Earth & Planetary Sciences

- Departmental Tenure Committee (2020–)
- Committee on Equity, Diversity and Inclusion (2019–)
- Colloquium Committee (2018–)
- Graduate Admissions Committee (2017–2018)
- Graduate Student Awards Committee (2017)

Service: McGill Space Institute

- Organizer for “Climate Through Deep Space and Time” Symposia (2020–)
- Planet Lunch organizer (2016–)
- Seminar Committee (2018–2019)

Thesis Committees

- *PhD Committee Member* for Elizabeth McBride (PHYS 2020–)
- *PhD Committee Member* for Emilie Parent (PHYS, 2017–)
- *PhD Committee Member* for Rafael Fuentes (PHYS, 2018–)
- *PhD Defense External Member* Matthew Henry (ATOC 2019)
- *PhD Committee Member* for Paul Charlton (PHYS, 2017–2019)
- *Pro-Dean* for Bruno Marot (URBP, 2018)
- *Pro-Dean* for Karine Choquet (HGEN, 2018)
- *MSc External Reviewer* for David Berardo (PHYS, 2017)
- *MSc External Reviewer* for Ying Ran Lin (EPSC, 2017)
- *PhD Internal Examiner* for Anna Delahaye (PHYS, 2017)
- *PhD Defense External Member* for Walaa Al Tamini (PHYS, 2016)
- *PhD Defense External Member* Maziar Bani Shahabadi (ATOC, 2016)
- *PhD Defense External Member* Nina Bonaventura (PHYS, 2016)

Postdoctoral Scholars

- Thomas Navarro* w/Gomez & Merlis, MSI Postdoctoral Fellow at McGill University (2019–)
- Holly Sheets, iREx Postdoctoral Fellow at McGill University (2016–2018)
→ Lecturer in Physics and Astronomy at Sam Houston State University
- Joel Schwartz, Postdoctoral Scholar at McGill University (2016–2017)
→ Data scientist in Chicago

Graduate Students

- Melissa Marquette* w/Doyon, MSc EPS (2018–). *TEPS Fellow*
(René Doyon at l'Université de Montréal contributes knowledge of CFHT/SPIRou)
- Keavin Moore, PhD EPS (2018–). *Tomlinson & NSERC Fellow*
- Taylor Bell* w/Bastien, MSc→PhD Physics (2016–). *NSERC Fellow*
(Pierre Bastien at l'Université de Montréal contributes on polarimetry)
- Lisa Dang, MSc→PhD Physics (2016–). *NSERC, IPAC & TEPS Fellow*
- Dylan Keating, MSc→PhD Physics (2016–). *TEPS Fellow*
- Claire Guimond, MSc EPS (2016–2018). *TEPS Fellow*
Determining the orbit of directly-imaged exoplanets
→ PhD student at the University of Cambridge
- Joel Schwartz, PhD Physics Northwestern (2013–2016). *GK-12 Fellow*
I Think I See the Light Curve: The Good (and Bad) of Exoplanetary Inverse Problems
→ Data scientist in Chicago
- Sara Rastegar, MSc Physics Northwestern (2012–2014)
Seasonal variations of eccentric exoplanets
→ Adjunct Faculty, Harold Washington College

Visiting Graduate Students & Secondary Advising

- T. Giang Nguyen* w/J. Moores (PhD Earth & Space Sci. and Eng., York University, 2019–)
Atmospheres and Oceans of Lava Worlds
- Lucas Teinturier, École Centrale de Lyon (MEng Intern, Winter–Summer 2020)
Removing Clouds from Disk-Integrated Images of Exoplanets
→ MSc student at Imperial College London
- Mathilde Mâlin, Université Paris-Sud (MSc Intern, Summer 2019)
Analytic Orbit Retrieval of Directly-Imaged Exoplanets
→ PhD student in Astronomy & Astrophysics at Observatoire de Paris
- Élie Bouffard* w/D. Haggard, MSc Physics (2017–2019). *N SERC Fellow*
(I contributed knowledge of statistics for time-resolved photometry)
→ Data scientist at Giro

Undergraduate Researchers (*coadvised)

47. Dhvani Doshi, Waterloo Physics & Astronomy (Co-Op internship, Winter 2021)
46. Felix Thiel, McGill Physics & CS (PHYS-478, Fall 2020)
The Anti-Greenhouse on Titan
45. Audrey Bourdon, McGill Physics (Honours Thesis 2019–2020)
Analytic orbit estimation
44. Margaret Bruna, McGill Physics (Honours Thesis 2019–2020)
Numerical orbit estimation
43. Numa Karolinski, McGill Physics & CS (Honours Thesis 2019–2020 and SURA 2020)
Analytic harmonic lightcurves
42. Lauryn Talbot, McGill Atmospheric Sciences & Physics (Fall 2019)
Developing Climate App modules
41. Youssef Bestavros, McGill Physics (SURA & TEPS intern and 396, Summer–Fall 2019)
Cloud Killer 2.0
40. Agnibha Banerjee, IISER Kolkata Physics (MITACS Globalink Intern, Summer 2019)
Illumination of ultra-short period planets
39. Émilie Lafèche, McGill Planetary Sciences (iREx & USRA intern, Summer 2019)
Retrievals of planetary rotation
38. Lan Xi Zhu, McGill Physics & Computer Science (Winter–Summer 2019)
Climate App 3.0
37. Zachary Yetman* w/Bell, John Abbot College Pure & Applied Sciences (Winter 2019)
Accelerating energy balance models
→ BEng student in Aerospace Engineering at Concordia University
36. Nicholas Vieira, McGill Physics (Winter 2019)
Cloud Killer
→ MSc student at McGill University
35. Claude Cournoyer-Cloutier, McGill Physics (Honours Research 2018–2019)
Determining the rotation rate of directly-imaged planets
→ MSc student at McMaster University

34. Jérémie Gagnon, McGill Physics (Honours Research 2018–2019)
Analytic lightcurves of exoplanets
33. Elisa Jacquet, McGill Physics (Fall 2018)
Removing clouds from maps of Earth
→ MSc student at Imperial College London
32. Anthony Courchesne, McGill Computer Science (Fall 2018)
Climate App 2.0
→ MEng student in Robotics and Embodied AI Lab, Université de Montréal
31. Emily Pass, University of Waterloo Physics & Astronomy (iREx & USRA intern 2018)
Estimating dayside temperatures of exoplanets
→ PhD student in Astronomy at Harvard University
30. Juliette Geoffrion, McGill Physics (Summer 2018)
Removing clouds from EPIC maps of Earth
→ MSc student in Physics at Université de Montréal
29. Claudia Bielecki, McGill Physics (Summer 2018)
Eccentricity is Not Responsible for Odd Harmonics
28. Shereen Elaidi, McGill Honours Math & CS (Summer Intern 2018)
Analytic lightcurves of exoplanets
27. Evelyn Macdonald, McGill Physics (Honours Research 2017–2018 & SURA intern 2018)
Empirical infrared transit spectrum of Earth
→ PhD student in Physics at University of Toronto
26. Jack Sklar, McGill Physics & CS (Winter 2018)
Gaussian Processes to estimate exoplanet spectra
→ Research Fellow at NIAID → Data Scientist at NIST
25. Laurent Jacob* w/Sheets, Université de Montréal Physics (iREx Fellow 2017)
Searching for refraction in transit lightcurves
→ Data Scientist in Montréal
24. Veenu Suri* w/Rauscher, University of Michigan Astronomy & CS (2015–2017)
Eclipse mapping of exoplanets
→ High School teacher in Illinois → Physics teacher at Bronx Prep High
23. Jackson Hoffart* w/Schwartz, McGill Physics (Honours Research 2016–2017)
Gaussian Process model of Spitzer detector
→ Machine Learning Engineer in Toronto → Analyst at 2° Investing Initiative
22. Maximilien Lamberti* w/Schwartz, McGill Physics (Honours Research 2016–2017)
Gaussian Process model of Spitzer detector
→ Data Scientist in Berlin → MEng at UC Berkeley
21. Holly Marginson, McGill Earth & Planetary Sciences (Honours Research 2016–2017)
Exoplanet lightcurve analysis
→ Tutor at Progressive Learning Academy
20. Louis Richez, McGill Physics (Independent Research 2016)
Mapping Earth with EPIC data
→ Medical Physics at McGill University
19. Élie Bouffard, Université de Sherbrooke Physics (iREx Fellow 2016)
Periodograms of Kepler hot Jupiters
→ MSc student at McGill University → Analyst-Programmer at Giro Inc.

18. Sudarsan Sundarajan* w/Dang (Google Summer of Code 2016)
Spitzer data reduction pipeline
→ Associate Software Engineer at NortonLifeLock Inc.
17. Diana Jovmir, McGill Mathematics & Physics (Summer intern 2016)
Out-of-transit baseline for parameter estimation
→ MSc at University of Montréal → Analyst at Statistics Canada
16. Victoria Chayes* w/Haggard, Bard College Math & Physics (2015–2016)
Inclination-dependence of exoplanet lightcurves
→ PhD student at Rutgers University
15. Dhruv Bisaria, McGill Physics (2016)
Marginalizing over limb-darkening for transit fits
→ PhD student in Astronomy at Queen’s University
14. Brendan Gordon, McGill Computer Science (2016)
Using Compute Canada for MCMC error analysis
→ MD student at the University of Manitoba
13. Lisa Dang, McGill Physics (2015)
Cross-validation for error estimation
→ PhD student at McGill University
12. Jyotsana Singh, McGill Earth & Planetary Sciences (2015)
Eclipse uncertainties
→ making music in Montréal
11. Daniel Law, Amherst College Math & Computer Science (2015)
Photometry of exoplanets
→ Data Scientist at Facebook
10. Mashiyat Zaman, Amherst College Astronomy (2015)
Evaluating Uncertainty Estimators of Occultation Models
→ Data Engineer at RCO
9. Ned Kleiner, Amherst College Physics (2015)
Mapping exoplanets
→ PhD student in Earth & Planetary Sciences at Harvard University
8. Wanda Feng, Smith College Astronomy (2014–2015)
Energy balance models of eccentric planets
→ PhD student at Arizona State University
7. Christopher Hansen, Northwestern Physics & Astronomy (2013–2014)
Atmospheric retrieval in the face of systematic errors
→ Product Specialist at Qualtrics
6. Pablo Fuentes, University of Chile Astronomy (2011–2013)
Harmonic Reflected and Thermal Lightcurves
→ Monitor at Observatorio Astronomico Andino
5. Talia Strait, Northwestern Physics & Astronomy (2011–2013)
The effects of clouds on rotational unmixing
→ Director, Digital Analytics at Catalina USA
4. Louis Shekhtman, Northwestern Physics & Astronomy (2011)
Ellipsoidal variations in short-period planets
→ PhD student at Bar-Ilan University → Postdoc at Northeastern University

3. Carl Majeau* w/Agol, Columbia University Computer Science (2010)
Two-dimensional Infrared Map of an Extrasolar Planet
→ Computer programmer in New York City
2. James Bushong* w/Agol, University of Washington Astronomy (2008)
Transits and secondary eclipses of HD 189733 with Spitzer
→ Quality Assurance Engineer at Amazon
1. Virginia Klemm* w/Agol, Astronomy at University of Washington (2006)
Photometry with Spitzer
→ National Weather Service Meteorologist

Public Lectures

26. Sun & Science (online, July 2020)
25. Hot Science at St. Georges School, Montréal, QC (Apr 2020, cancelled due to COVID-19)
24. Astronomie en fût, Sans Taverne, Montréal, QC (Nov 2019)
23. Pint of Science, Montréal, QC (May 2019)
22. Soup & Science, Montréal, QC (Jan 2019)
21. Homer's Physics, Montréal, QC (Sep 2018)
20. Resident Astronomer, Camp Nominique (Aug 2018)
19. Astronomie en fût, L'île Noire, Montréal, QC (Apr 2018)
18. Solar Eclipse Fireside Chat, Sun Valley ID (Aug 2017)
17. Lunch Talk, Santa Fe Institute, NM (Jul 2017)
16. Pint of Science, Montréal, QC (May 2017)
15. Astronomie en fut, Montréal, QC (Apr 2017)
14. Royal Montreal Curling Club, Montréal, QC (Apr 2017)
13. Physics Matters, Montréal, QC (Apr 2017)
12. Royal Astronomical Society of Canada, Ottawa, ON (Feb 2017)
11. Soup & Science, Montréal, QC (Jan 2017)
10. Homer's Physics, Montréal, QC (Nov 2016)
9. Astro Night, Montréal, QC (Jul 2016)
8. Astro Talk, Montréal, QC (Nov 2015)
7. Benjamin Dean Astronomy Lecture, San Francisco, CA (Dec 2014)
6. *SciTech Cafe*, Amherst, MA (Sep 2014)
5. Lake County Astronomical Society, Fox Lake, IL (Oct 2013)
4. *Chicago Ideas Week*, Chicago, IL (Oct 2013)
3. *From Our Own Backyard to the World*, Evanston, IL (Sep 2013)
2. Tacoma Astronomical Society, Tahoma, WA (Sep 2007)
1. Boeing Employees' Astronomical Society, Seattle, WA (Apr 2007)

Selected Press

- *Un biomarqueur découvert dans l'atmosphère de Vénus: un signe de vie?*, Québec Science (14 sept, 2020)
- *Astronomers may have found hints of life in clouds of Venus*, CBC News (Sep 14, 2020)
- *Finding Earth-Like Planets*, Weekly Space Hangout (Oct 30, 2019)
- *An infrared selfie*, Nature Astronomy (Sept 2019)
- *Habitable zones on a tidally locked planet?*, Universe Today (Sept 26, 2019)
- *La face obscure de certaines exoplanètes se révèle*, Radio Canada (28 août 2019)
- *Astronomers Find Water on an Exoplanet Twice the Size of Earth*, Scientific American (Sep 11, 2019)
- *Hawaï: quand un projet astronomique et une contestation autochtone se télescopent*, Le Devoir (août 2019)
- *Emerging Fields in Astrophysics* Global News (June 2019)
- *En route vers l'infini et encore plus loin encore* Le Devoir (juin 2019)
- *For every exoplanet we see transiting a star, how many go unseen?* Quirks & Quarks, CBC Radio (Jan 12, 2019)
- *Hints of Oort clouds around other stars may lurk in the universe's first light*, Science News (Nov 2018)
- *La neuvième planète existe-t-elle?*, Québec Science (juillet 2018)
- *Natasha Hall Show*, CJAD 800 AM (Jun 2017, Apr 2018)
- *Exoplanet Everests May Be Detectable When Giant Telescopes Come Online*, Scientific American (March 2018)
- *Des vents défient nos théories sur l'exoplanète CoRoT-2b*, Radio Canada (23 jan 2018)
- *Signes de vie: comment scruter les exoplanètes à la recherche de vie extraterrestre*, (avr 2017)
- *What Newly Discovered Planets Can Tell Us*, CTV News (Feb 2017)
- *Découverte de 3 planètes potentiellement habitables*, Québec Science (fev 2017)
- *Planet Nine*, Cosmic Front Next, Japan Broadcasting Corporation (Aug 2016)
- *Des nouvelles de Jupiter*, La Presse (26 juin 2016)
- *Sommes nous seuls dans le cosmos?* Québec Science (juillet 2016)
- *Planet Nine Hunters Enlist Big Bang Telescopes*, New Scientist (Feb 24, 2016)
- *The light of other worlds*, Nature (Feb 18, 2016)
- *NASA's Next Space Telescope Promises the Stars—and Planets, Too*, Scientific American (Feb 9, 2015)
- *Nick Cowan on Exoplanets*, California Academy of Sciences (Dec 8, 2014)
- *Walking on Water*, Uptown Radio 1 (March 28, 2014)
- *Maata näkyvissä supermaapalloilla*, Tähdet ja Avaruus (March 2014)
- *Balvaniranje na prelazu neodvisnosti*, Beta Magazine (Aug 2012)
- *Planetology comes of age*, The Economist (Jan 11, 2014)
- *Heat and Tidally-Locked Planets*, Academic Minute (Sept 2013)
- *60 Billion Earth-like Planets Could Exist in Milky Way*, Voice of America (June 2013)

- *Mapping Distant Planet Surfaces Possible*, Inside Science (Jan 2013)
- *Can Astronomers Detect Exoplanet Oceans?* Astrobiology Magazine (Jul 2012)
- *Earth from an exoplanetary perspective*, Sky at Night (May 2011)
- *Mapping New Worlds*, Astronomy Now (Sep 2010)
- *Earth Through Time*, Sky & Telescope (Aug 2010)
- *5 Questions*, Discover Magazine (Oct 2009)
- *Out There: Water, Water Everywhere*, Space.com (Oct 2009)
- *Scientist Like Me: Faces of Discovery*, Pacific Science Center (Autumn 2009)
- *Un camaïeu de bleus*, Ciel & Espace (juillet 2009)
- *The New Exoplanetology*, Wired (May 29, 2009)
- *How to spot oceans on alien worlds*, Scientific American (May 28, 2009)
- *Exoplanet Mapping Tested on Earth*, Sky & Telescope (May 28, 2009)
- *Boffins develop interstellar alien ocean-spotting tool*, The Register (May 27, 2009)
- *How to Map an Exoplanet's Oceans*, New Scientist (May 16, 2009)
- *UW-led team's work means we may be able to find oceans[...]*, Seattle PI (June 9, 2009)
- *Mapping Uncharted Territories*, SEED Magazine (December 2008)
- *Gassy Windbags*, Quirks & Quarks, CBC Radio (Jan 13, 2007)

Invited Talks & Reviews

14. *Small-Satellite Astronomy*, **Long Range Planning Town Hall at CSA**, QC (Oct 2019)
13. *Richer Prize Talk: McGill Exoplanet Characterization*, **CASCA Meeting**, QC (June 2019)
12. *Char. Terrestrial Exoplanets*, **Compar. Climate of Terr. Planets 3**, TX (Aug 2018)
11. *The Future of Direct Imaging from Space*, **Exoclipse**, ID (Aug 2017)
10. *Energy Budgets of Short Period Planets*, **CASCA Meeting**, AB (May 2017)
9. *Energy Budgets of Short Period Planets*, **Exoplanets I**, CH (Jul 2016)
8. *Short Period Planets*, **Kavli Frontiers of Science**, CA (Nov 2015)
7. *Transiting Temperate Terrestrials*, **Expl. the Uni. with JWST**, ND (Oct 2015)
6. *Water On and In Rocky Worlds*, **Comp. Clim. of Terr. Planets 2**, CA (Sep 2015)
5. *Hot Jupiters*, **Stochastic Flows and Climate Modeling**, CO (Jun 2012)
4. *Phase Variations of WASP-12b*, **Future of Astronomy**, IL (Sept 1, 2011)
3. *EPOXI Observations of Earth*, **Exoplanet Sci. from SS Probes**, CA (May 2010)
2. *Obs. in the Cruise Phase of a Mission*, **The View from 5 AU**, CA (March 2010)
1. *Thermal Phase Variations of Planets*, **Exoplanets for Planet. Sci.**, FL (2010)

Colloquia & Seminars

51. Earth & Planetary Sciences Symposium, **Harvard University** (Nov 2, 2020, online)
50. Origins Seminar, **University of Arizona** (Mar 2020, online)
49. Physics Colloquium, **Carleton University** (Feb 2020)
48. Physics & Astronomy Colloquium, **McMaster** (Nov 2019)

47. Atmospheres, Oceans & Climate Colloquium, **MIT** (Apr 2019)
46. Atmospheric & Oceanic Sciences Seminar, **McGill** (Feb 2019)
45. Astrophysics Colloquium, **Jet Propulsion Laboratory** (May 2018)
44. Geology Colloquium, **University of Colorado** (Apr 2018)
43. Physics Colloquium, **Royal Military College of Canada** (Feb 2018)
42. Physics Colloquium, **Université de Montréal** (Dec 2017)
41. Physics Colloquium, **University of Oregon** (Oct 2017)
40. Astrophysics Seminar, **Los Alamos National Laboratory** (Jul 2017)
39. TEPS Seminar, **York University** (May 2017, online)
38. Astronomy Seminar, **University of Michigan** (Mar 2017)
37. Geology Colloquium, **St. Lawrence University** (Oct 2016)
36. Astronomy Seminar, **Université de Montréal** (Apr 2016)
35. Astrophysics Colloquium, **NASA Goddard** (Mar 2016)
34. Astronomy Colloquium, **MIT** (Sep 2015)
33. Geoscience Seminar, **ETH** (Jul 2015)
32. Astronomy Seminar, **Université de Genève** (Jul 2015)
31. Physics Colloquium, **NYU Abu Dhabi** (May 2015)
30. Physics Seminar **McGill University** (Feb 2015)
29. Astronomy Colloquium, **University of Massachusetts** (Nov 2014)
28. Theoretical Astrophysics Colloquium, **University of Arizona** (Oct 2014)
27. Physics Seminar, **Trinity College** (Sep 2014)
26. Physics Seminar, **Bard College** (Sep 2014)
25. Joint Astronomy Colloquium, **Max Planck Institute for Astronomy** (Jul 2014)
24. Seminar, **Institut de Planétologie et d'Astrophysique de Grenoble** (Jul 2014)
23. Astronomy Seminar, **Adler Planetarium** (May 2014)
22. Astrophysics Seminar, **Jet Propulsion Laboratory** (May 2014)
21. Astronomy Colloquium, **Space Telescope Science Institute** (Apr 2014)
20. Geosciences Colloquium, **Texas Tech University** (Mar 2014)
19. Physics & Astronomy Colloquium, **Amherst College** (Mar 2014)
18. ITC Seminar, **Harvard-Smithsonian CfA** (Dec 2013)
17. Astronomy Colloquium, **Ohio State University** (Aug 2013)
16. Institute of Astronomy, **University of Cambridge** (Apr 2013)
15. Astronomy Colloquium, **University of Florida** (Apr 2013)
14. Earth, Atmospheric & Planetary Sciences Colloquium, **Purdue University** (Apr 2013)
13. Physics Seminar, **San Francisco State University** (Feb 2013)
12. Earth and Planetary Sciences Colloquium, **Northwestern University** (Nov 2012)
11. Astronomy Colloquium, **California Institute of Technology** (Nov 2012)
10. Center for Space and Habitability Colloquium, **University of Bern** (Apr 2012)
9. Physics and Astronomy Colloquium, **University of Western Ontario** (Apr 2012)

8. Astrophysics Colloquium, **University of Illinois**, (Nov 2011)
7. Astronomy Colloquium, **University of Michigan** (Feb 2011)
6. Astronomy & Astrophysics, **Michigan State University** (Feb 2011)
5. Cosmology Seminar, **UC Davis** (Mar 2010)
4. Natural Science Colloquium, **Seattle University** (Feb 2010)
3. Astrophysics Seminar, **Institute for Advanced Study** (Jan 2010)
2. Astronomy Seminar, **Hertzberg Institute of Astrophysics** (Oct 2009)
1. Planetary Science Seminar, **NASA Goddard Space Flight Center** (Sep 2009)

Refereed Publications

99 publications (40 led by group members)

Google Scholar: $\gtrsim 6600$ citations, $h=43$, $i10=71$

NASA Astrophysics Data System: $\gtrsim 4900$ citations, $h=39$, $i10=71$

Group members bolded: **undergrads**, **grads**, **postdocs**.

99. A Comprehensive Reanalysis of Spitzer's 4.5 μm Phase Curves, and the Phase Variations of the Ultra-hot Jupiters MASCARA-1b and KELT-16b
Taylor J. Bell, **Lisa Dang**, **Nicolas B. Cowan**, Jacob Bean, Jean-Michel Désert, Jonathan J. Fortney, **Dylan Keating**, Eliza Kempton, Laura Kreidberg, Michael R. Line, Megan Mansfield, Vivien Parmentier, Kevin B. Stevenson, Mark Swain, and Robert T. Zellem submitted to *Monthly Notices of the Royal Astronomical Society*, 2020.
98. Cloud Killer: Mapping the Surface of Cloudy Exoplanets
L. Teinturier, **N. Vieira**, **E. Jacquet**, **J. Geoffrion**, **Y. Bestavros**, and **N. B. Cowan** submitted to *Monthly Notices of the Royal Astronomical Society*, 2020.
PRESS
97. Phase Curves of Hot Neptune LTT 9779b Suggest a High-Metallicity Atmosphere with Non-zero Albedo
Ian J. M. Crossfield, Diana Dragomir, **Nicolas B. Cowan**, Tansu Daylan, Ian Wong, Tiffany Kataria, Drake Deming, Laura Kreidberg, Thomas Mikal-Evans, Varoujan Gorjian, James Jenkins, Björn Benneke, Karen A. Collins, Christopher J. Burke, Christopher E. Henze, Scott McDermott, Ismael Mireles, David Watanabe, and Bill Wohler submitted to AAS Journals, 2020.
96. A survey of exoplanet phase curves with Ariel
B. Charnay; J. Mendonça; L. Kreidberg; **N.B. Cowan**; J. Taylor; **T.J. Bell**; O. Demangeon; B. Edward; C. Haswell; G. Morello; L. Mugnai; E. Pascale; G. Tinetti; P. Tremblin; R. Zellem submitted to *Experimental Astronomy*, 2020.
95. **TESS unveils the optical phase curve of KELT-1b**
C. von Essen, M. Mallonn, **N. B. Cowan**, A. Piette, N. Madhusudhan, E. Agol, V. Antoci, K. Poppenhaeger, K.G. Stassun, S. Khalafinejad, and G. Tautvaišienė submitted to *Astronomy & Astrophysics*, 2020.
94. **Cloud Atlas: Unraveling the vertical cloud structure with the time-series spectrophotometry of an unusually red brown dwarf**
Ben W.P. Lew, Daniel Apai, Mark Marley, Didier Saumon, Glenn Schneider, Yifan Zhou, **Nicolas B. Cowan**, Theodora Karalidi, Elena Manjavacas, L. R. Bedin, Paulo A. Miles-Paez
Astrophysical Journal, in press, 2020.

93. Modelling the atmosphere of lava planet K2-141b: implications for low and high resolution spectroscopy
T. Giang Nguyen, **Nicolas B. Cowan**, **Agnibha Banerjee**, John E. Moores
Monthly Notices of the Royal Astronomical Society, in press, 2020.
92. Pixel Level Decorrelation in Service of the *Spitzer* Microlens Parallax Survey
Lisa Dang, S. Calchi Novati, S. Carey and **N. B. Cowan**
Monthly Notices of the Royal Astronomical Society, 497, 5309, 2020.
91. Keeping M-Earths Habitable in the Face of Atmospheric Loss by Sequestering Water in the Mantle
Keavin Moore & **Nicolas B. Cowan**
Monthly Notices of the Royal Astronomical Society, 496, 3786, 2020.
90. Smaller than expected bright-spot offsets in *Spitzer* phase curves of the hot Jupiter Qatar-1b
Dylan Keating, Kevin B. Stevenson, **Nicolas B. Cowan**, Emily Rauscher, Jacob L. Bean, **Taylor Bell**, **Lisa Dang**, Drake Deming, Jean-Michel Désert, Y. Katherina Feng, Jonathan J. Fortney, Tiffany Kataria, Eliza M.-R. Kempton, Nikole Lewis, Michael R. Line, Megan Mansfield, Erin May, Caroline Morley, and Adam P. Showman
Astronomical Journal, 159, 225, 2020.
89. Cloud Atlas: High-precision HST/WFC3/IR Time-Resolved Observations of Directly-Imaged Exoplanet HD106906b
Yifan Zhou, Dániel Apai, Luigi Bedin, Ben Lew, Glenn Schneider, Adam Burgasser, Elena Manjavacas, Theodora Karalidi, Stanimir Metchev, Paulo Alberto Miles Paez, Patrick J. Lowrance, **Nicolas Cowan**, and Jacqueline Radigan
Astronomical Journal, 159, 140, 2020.
88. Cloud Atlas: Weak color modulations due to rotation in the planetary-mass companion GU Psc b and 11 other brown dwarfs
Ben W.P. Lew, Dániel Apai, Yifan Zhou, Jacqueline Radigan, Mark Marley, Glenn Schneider, **Nicolas B. Cowan**, Paulo A. Miles-Paéz, Elena Manjavacas, Theodora Karalidi, L. R. Bedin, Patrick J. Lowrance, and Adam J. Burgasser
Astronomical Journal, 159, 125, 2020.
87. Evaluating Climate Variability of the Canonical Hot Jupiters HD 189733b & HD 209458b through Multi-Epoch Eclipse Observations
B. M. Kilpatrick, T. Kataria, N. K. Lewis, R. T. Zellem, G. W. Henry, **N. B. Cowan**, J. de Wit, J. J. Fortney, H. K. Knutson, S. Seager, A. P. Showman, G. S. Tucker
Astronomical Journal, 159, 51, 2020.
86. Evidence for H₂ Dissociation and Recombination Heat Transport on KELT-9b
Megan Mansfield, Jacob L. Bean, Kevin B. Stevenson, Thaddeus D. Komacek, **Taylor J. Bell**, Xianyu Tan, Matej Malik, Thomas G. Beatty, **Nicolas B. Cowan**, **Lisa Dang**, Jean-Michel Désert, Jonathan J. Fortney, B. Scott Gaudi, **Dylan Keating**, Eliza M.-R. Kempton, Laura Kreidberg, Michael R. Line, Vivien Parmentier, Keivan G. Stassun, Mark R. Swain, Robert T. Zellem
Astrophysical Journal Letters, 888, L15, 2020.
PRESS
85. Cloud Atlas: Variability in and out of the Water Band in the Planetary-mass HD 203030B Points to Cloud Sedimentation in Low-gravity L Dwarfs
Miles-Páez, Paulo A.; Metchev, Stanimir; Apai, Dániel; Zhou, Yifan; Manjavacas, Elena; Karalidi, Theodora; Lew, Ben W. P.; Burgasser, Adam J.; Bedin, Luigi R.; **Cowan, Nicolas**;

- Lowrance, Patrick J.; Marley, Mark S.; Radigan, Jacqueline; Schneider, Glenn
Astrophysical Journal, 883, 181, 2019.
84. [Mass Loss from the Exoplanet WASP-12b Inferred from Spitzer Phase Curves](#)
T. J. Bell, M. Zhang, P. E. Cubillos, **L. Dang**, L. Fossati, K. O. Todorov, **N. B. Cowan**,
D. Deming, R. T. Zellem, K. B. Stevenson, I. J. M. Crossfield, I. Dobbs-Dixon, J. J. Fortney,
H. A. Knutson, M. R. Line.
Monthly Notices of the Royal Astronomical Society, 489, 1995, 2019.
83. [A Universal Nightside Temperature on Hot Jupiters due to Nocturnal Clouds](#)
Keating, D., **Cowan, N. B.**, **Dang, L.**
Nature Astronomy, 3, 1092, 2019.
PRESS
82. [Constraining dayside effective temperatures of hot Jupiters through Gaussian process regression](#)
Pass, E. K., **Cowan, N. B.**, Cubillos, P. E., **Sklar, J. G.**
Monthly Notices of the Royal Astronomical Society, 489, 941, 2019.
81. [An empirical infrared transit spectrum of Earth: opacity windows and biosignatures](#)
Macdonald, E. J. R., **Cowan, N. B.**
Monthly Notices of the Royal Astronomical Society, 489, 196, 2019.
PRESS
80. [Constraining Exoplanet Metallicities and Aerosols with the Contribution to ARIEL Spectroscopy of Exoplanets \(CASE\)](#)
Zellem, Robert; Swain, Mark; **Cowan, Nicolas**; Bryden, Geoffrey; Komacek, Thaddeus;
Colavita, Mark; Ardila, David; Roudier, Gael; Fortney, Jonathan; Bean, Jacob; Line, Michael;
Griffith, Caitlin; Shkolnik, Evgenya; Kreidberg, Laura; Moses, Julianne; Showman, Adam;
Stevenson, Kevin; Wong, Andre; Chapman, John; Ciardi, David; Howard, Andrew; Kataria,
Tiffany; Kempton, Eliza; Latham, David; Mahadevan, Suvrath; Melendez, Jorge; Parmentier,
Vivien.
Publications of the Astronomical Society of the Pacific, 131, 1003, 2019.
79. [Empirical Predictions for the Period Distribution of Planets to be Discovered by the Transiting Exoplanet Survey Satellite](#)
Jonathan H. Jiang, Xuan Ji, **Nicolas Cowan**, Renyu Hu, Zonghong Zhu.
Astronomical Journal, 158, 96, 2019.
78. [Three direct imaging epochs could constrain the orbit of Earth 2.0 inside the habitable zone](#)
Guimond, C.M. & **Cowan, N.B.**
Astronomical Journal, 157, 188, 2019.
77. [Cloud Atlas: Rotational Spectral Modulations and Potential Sulfide Clouds in the Planetary-Mass, Late T-Type Companion Ross 458C](#)
Elena Manjavacas, Daniel Apai, Ben W. P. Lew, Yifan Zhou, Glenn Schneider, Adam J.
Burgasser, Theodora Karalidi, Paulo A. Miles-Paez, Patrick J. Lowrance, **Nicolas Cowan**,
Luigi R. Bedin, Mark S. Marley, Stan Metchev, and Jacqueline Radigan
Astrophysical Journal Letters, 875, 15, 2019.
76. [Cloud Atlas: High-Contrast Time-Resolved Observations of Planetary-Mass Companions](#)
Y. Zhou, D. Apai, B. W. P. Lew, G. Schneider, E. Manjavacas, L. R. Bedin, **N. B. Cowan**,
M. S. Marley, J. Radigan, T. Karalidi, P. J. Lowrance, P. A. Miles-Páez, S. Metchev, A. J.
Burgasser.
Astronomical Journal, 157, 128, 2019.

75. [Cloud Atlas: Hubble Space Telescope Near-IR Spectral Library of Brown Dwarfs, Planetary-Mass Companions, and Hot Jupiters](#)
Elena Manjavacas, Daniel Apai, Yifan Zhou, Ben W. P. Lew, Glenn Schneider, Stan Metchev, Paulo A. Miles-Paez, Jacqueline Radigan, Mark S. Marley, **Nicolas Cowan**, Theodora Karalidi, Adam J. Burgasser, Luigi R. Bedin, Patrick J. Lowrance, and Parker Kauffmann.
Astronomical Journal, 157, 101, 2019.
74. [A More Informative Map: Inverting Thermal Orbital Phase and Eclipse Lightcurves of Exoplanets](#)
Rauscher, E., **Suri, V.**, **Cowan, N. B.**
Astronomical Journal, 156, 5, 2018.
[astrobit.es](#)
73. [A Framework for Prioritizing the TESS Planetary Candidates Most Amenable to Atmospheric Characterization](#)
Kempton, Eliza M. -R.; Bean, Jacob L.; Louie, Dana R.; Deming, Drake; Koll, Daniel D. B.; Mansfield, Megan; Lopez-Morales, Mercedes; Swain, Mark R.; Zellem, Robert T.; Ballard, Sarah; Barclay, Thomas; Barstow, Joanna K.; Batalha, Natasha E.; Beatty, Thomas G.; Berta-Thompson, Zach; Birkby, Jayne; Buchhave, Lars A.; Charbonneau, David; Christiansen, Jessie L.; **Cowan, Nicolas B.**; Crossfield, Ian; de Val-Borro, Miguel; Doyon, Rene; Dragomir, Diana; Gaidos, Eric; Heng, Kevin; Kane, Stephen R.; Kreidberg, Laura; Mallonn, Matthias; Morley, Caroline V.; Narita, Norio; Nascimbeni, Valerio; Palle, Enric; Quintana, Elisa V.; Rauscher, Emily; Seager, Sara; Shkolnik, Evgenya L.; Sing, David K.; Sozzetti, Alessandro; Stassun, Keivan G.; Valenti, Jeff A.; von Essen, Carolina
Publications of the Astronomical Society of the Pacific, 130, 114401, 2018.
72. [exocartographer: A Bayesian Framework for Mapping Exoplanets in Reflected Light](#)
Farr, B., Farr, W. M., **Cowan, N. B.**, Haggard, H. M., Robinson, T.
Astronomical Journal, 156, 4, 2018.
71. [Analytic Reflected Lightcurves for Exoplanets](#)
Haggard, H. M. & **Cowan, N. B.**
Monthly Notices of the Royal Astronomical Society, 478, 371, 2018.
70. [The Direct Imaging Search for Earth 2.0: Quantifying Planetary False Positives](#)
Guimond, C.M. & **Cowan, N.B.**
Astronomical Journal, 155, 230, 2018.
[astrobit.es](#)
69. [Increased Heat Transport in Ultra-Hot Jupiter Atmospheres Through H₂ Dissociation/Recombination](#)
Bell, T. J. & **Cowan, N. B.**
Astrophysical Journal Letters, 857, 20, 2018.
[PRESS](#)
68. [Detection of a Westward Hotspot Offset in the Atmosphere of Hot Gas Giant CoRoT-2b](#)
Dang, L., **Cowan, N. B.**, **Schwartz, J. C.**, Emily Rauscher, Michael Zhang, Heather A. Knutson, Michael Line, Ian Dobbs-Dixon, Drake Deming, **Sundararajan, S.**, Jonathan J. Fortney, Ming Zhao
Nature Astronomy, 2, 220, 2018
[astrobit.es](#), [PRIZE](#), [PRESS](#)
67. [Rotational Modulations in the L/T Transition Brown Dwarf Companion HN Peg B](#)
Zhou, Y., Apai, D., Metchev, S., Lew, B. W. P., Schneider, G., Marley, M.S., Karalidi, T., Manjavacas, E., Bedin, L. R., **Cowan, N. B.**, Miles-Páez, P.A., Lowrance, P.J., Radigan,

- J., Burgasser, A. J.
Astronomical Journal, 155, 132, 2018.
66. [Phase curves of WASP-33b and HD 149026b and a New Correlation Between Phase Curve Offset and Irradiation Temperature](#)
Zhang, M. Knutson, H. A., Kataria, T., **Schwartz, J. C.**, **Cowan, N. B.**, Showman, A. P., Burrows, A., Fortney, J. J., Todorov, K., Desert, J.-M., Agol, E., Deming, D.
Astronomical Journal, 155, 83, 2018.
 65. [Cloud Atlas: Discovery of Rotational Spectral Modulations in a Low-mass, L-type Brown Dwarf Companion to a Star](#)
Manjavacas, Elena; Apai, Dániel; Zhou, Yifan; Karalidi, Theodora; Lew, Ben W. P.; Schneider, Glenn; **Cowan, Nicolas**; Metchev, Stan; Miles-Páez, Paulo A.; Burgasser, Adam J.; Radigan, Jacqueline; Bedin, Luigi R.; Lowrance, Patrick J.; Marley, Mark S. *Astronomical Journal*, 155, 11, 2018.
 64. [Wavelength Does Not Equal Pressure: Vertical Contribution Functions and their Implications for Mapping Hot Jupiters](#)
Dobbs-Dixon, I., **Cowan, N. B.**, 2017
Astrophysical Journal, 851, 26.
[astrobit.es](#)
 63. [Phase Offsets and the Energy Budgets of Hot Jupiters](#)
Schwartz, J. C., Kashner, Z., **Jovmir, D.**, **Cowan, N. B.** 2017.
Astrophysical Journal, 850, 154.
 62. [Revisiting the Energy Budget of WASP-43b: Enhanced Day-Night Heat Transport](#)
Keating, D., **Cowan, N. B.** 2017.
Astrophysical Journal Letters, 849, L5.
 61. [Rotational Spectral Unmixing of Exoplanets: Degeneracies between Surface Colors and Geography](#)
Fujii, Y., Lustig-Yaeger, J., **Cowan, N. B.** 2017.
Astronomical Journal, 154, 189.
 60. [Quantifying the Impact of Spectral Coverage on the Retrieval of Molecular Abundances from Exoplanet Transmission Spectra](#)
Chapman, J. W., Zellem, R. T., Line, M. R., Vasisht, G., Bryden, G., Willacy, K., Iyer, A. R., Bean, J., **Cowan, N. B.**, Fortney, J. J., Griffith, C. A., Kataria, T., Kempton, E. M.-R., Kreidberg, L., Moses, J. I., Stevenson, K. B., Swain, M. R. 2017.
Publications of the Astronomical Society of the Pacific, 129, 104402.
 59. [Phase curves of WASP-33b and HD 149026b and a New Correlation Between Phase Curve Offset and Irradiation Temperature](#)
Zhang, M., Knutson, H. A., Kataria, T., **Schwartz, J. C.**, **Cowan, N. B.**, Showman, A. P., Burrows, A., Fortney, J. J., Todorov, K., Desert, J.-M., Agol, E., Deming, D. 2017.
Astronomical Journal, 155, 2.
 58. [The Very Low Albedo of WASP-12b from Spectral Eclipse Observations with Hubble](#)
Bell, T. J., Nikolov, N., **Cowan, N. B.**, Barstow, J. K., Barman, T. S., Crossfield, I. J. M., Gibson, N. P., Evans, T. M., Sing, D. K., Knutson, H. A., Kataria, T., Lothringer, J. D., Benneke, B., **Schwartz, J. C.** 2017.
Astrophysical Journal Letters, 847, L2.
[PRESS](#)

57. [Zones, spots, and planetary-scale waves beating in brown dwarf atmospheres](#)
 Apai, D., Karalidi, T., Marley, M. S., Yang, H., Flateau, D., Metchev, S., **Cowan, N. B.**, Buentzli, E., Burgasser, A. J., Radigan, J., Artigau, E., Lowrance, P. 2017.
Science, 357, 683-687.
[PRESS](#)
56. [Low-resolution near-infrared spectroscopic signatures of unresolved ultracool companions to M dwarfs](#)
 Cook, N. J., Pinfield, D. J., Marocco, F., Burningham, B., Jones, H. R. A., Frith, J., Zhong, J., Luo, A. L., Qi, Z. X., **Cowan, N. B.**, Gromadzki, M., Kurtev, R. G., Guo, Y. X., Wang, Y. F., Song, Y. H., Yi, Z. P., Smart, R. L. 2017.
Monthly Notices of the Royal Astronomical Society, 467, 5001-5021.
55. [Odd Harmonics in Exoplanet Photometry: Weather or Artifact?](#)
Cowan, N. B., **Chayes, V.**, **Bouffard, É.**, Meynig, M., Haggard, H. M. 2017.
Monthly Notices of the Royal Astronomical Society, 467, 747-757.
54. [Mapping Exoplanets](#)
Cowan, N. B., Fujii, Y. 2017.
Handbook of Exoplanets, Ed. by H. J. Deeg and J. A. Belmonte, 147.
53. [Planet-induced Stellar Pulsations in HAT-P-2's Eccentric System](#)
 de Wit, J., Lewis, N. K., Knutson, H. A., Fuller, J., Antoci, V., Fulton, B. J., Laughlin, G., Deming, D., Shporer, A., Batygin, K., **Cowan, N. B.**, Agol, E., Burrows, A. S., Fortney, J. J., Langton, J., Showman, A. P. 2017.
Astrophysical Journal Letters, 836, L17.
[PRESS](#)
52. [Knot a Bad Idea: Testing BLISS Mapping for Spitzer Space Telescope Photometry](#)
Schwartz, J. C., **Cowan, N. B.** 2017.
Publications of the Astronomical Society of the Pacific, 129, 014001.
51. [Cloud Atlas: Discovery of Patchy Clouds and High-amplitude Rotational Modulations in a Young, Extremely Red L-type Brown Dwarf](#)
 Lew, B. W. P., Apai, D., Zhou, Y., Schneider, G., Burgasser, A. J., Karalidi, T., Yang, H., Marley, M. S., **Cowan, N. B.**, Bedin, L. R., Metchev, S. A., Radigan, J., Lowrance, P. J. 2016.
Astrophysical Journal Letters, 829, L32.
50. [Transiting Exoplanet Studies and Community Targets for JWST's Early Release Science Program](#)
 Stevenson, K. B., Lewis, N. K., Bean, J. L., Beichman, C., Fraine, J., Kilpatrick, B. M., Krick, J. E., Lothringer, J. D., Mandell, A. M., Valenti, J. A., Agol, E., Angerhausen, D., Barstow, J. K., Birkmann, S. M., Burrows, A., Charbonneau, D., **Cowan, N. B.**, Crouzet, N., Cubillos, P. E., Curry, S. M., Dalba, P. A., de Wit, J., Deming, D., Désert, J.-M., Doyon, R., Dragomir, D., Ehrenreich, D., Fortney, J. J., García Muñoz, A., Gibson, N. P., Gizis, J. E., Greene, T. P., Harrington, J., Heng, K., Kataria, T., Kempton, E. M.-R., Knutson, H., Kreidberg, L., Lafrenière, D., Lagage, P.-O., Line, M. R., Lopez-Morales, M., Madhusudhan, N., Morley, C. V., Rocchetto, M., Schlawin, E., Shkolnik, E. L., Shporer, A., Sing, D. K., Todorov, K. O., Tucker, G. S., Wakeford, H. R. 2016.
Publications of the Astronomical Society of the Pacific, 128, 094401.
49. [3.6 and 4.5 \$\mu\text{m}\$ Spitzer Phase Curves of the Highly Irradiated Hot Jupiters WASP-19b and HAT-P-7b](#)

- Wong, I., Knutson, H. A., Kataria, T., Lewis, N. K., Burrows, A., Fortney, J. J., **Schwartz, J.**, Shporer, A., Agol, E., **Cowan, N. B.**, Deming, D., Désert, J.-M., Fulton, B. J., Howard, A. W., Langton, J., Laughlin, G., Showman, A. P., Todorov, K. 2016.
Astrophysical Journal, 823, 122.
48. [Cosmologists in Search of Planet Nine: The Case for CMB Experiments](#)
Cowan, N. B., Holder, G., Kaib, N. A. 2016.
Astrophysical Journal Letters, 822, L2.
[astrobit.es](#), [PRESS](#)
47. [Inferring planetary obliquity using rotational and orbital photometry](#)
Schwartz, J. C., Sekowski, C., Haggard, H. M., Pallé, E., **Cowan, N. B.** 2016.
Monthly Notices of the Royal Astronomical Society, 457, 926-938.
46. [3.6 and 4.5 \$\mu\text{m}\$ Phase Curves of the Highly Irradiated Eccentric Hot Jupiter WASP-14b](#)
Wong, I., Knutson, H. A., Lewis, N. K., Kataria, T., Burrows, A., Fortney, J. J., **Schwartz, J.**, Agol, E., **Cowan, N. B.**, Deming, D., Désert, J.-M., Fulton, B. J., Howard, A. W., Langton, J., Laughlin, G., Showman, A. P., Todorov, K. 2015.
Astrophysical Journal, 811, 122.
45. [Brief follow-up on recent studies of Theia's accretion](#)
Kaib, N. A., **Cowan, N. B.** 2015.
Icarus, 258, 14-17.
44. [Spitzer Secondary Eclipse Observations of Five Cool Gas Giant Planets and Empirical Trends in Cool Planet Emission Spectra](#)
Kammer, J. A., Knutson, H. A., Line, M. R., Fortney, J. J., Deming, D., Burrows, A., **Cowan, N. B.**, Triaud, A. H. M. J., Agol, E., Desert, J.-M., Fulton, B. J., Howard, A. W., Laughlin, G. P., Lewis, N. K., Morley, C. V., Moses, J. I., Showman, A. P., Todorov, K. O. 2015.
Astrophysical Journal, 810, 118.
43. [Balancing the energy budget of short-period giant planets: evidence for reflective clouds and optical absorbers](#)
Schwartz, J. C., **Cowan, N. B.** 2015.
Monthly Notices of the Royal Astronomical Society, 449, 4192-4203.
42. [Spitzer Secondary Eclipses of the Dense, Modestly-irradiated, Giant Exoplanet HAT-P-20b Using Pixel-level Decorrelation](#)
Deming, D., Knutson, H., Kammer, J., Fulton, B. J., Ingalls, J., Carey, S., Burrows, A., Fortney, J. J., Todorov, K., Agol, E., **Cowan, N.**, Desert, J.-M., Fraine, J., Langton, J., Morley, C., Showman, A. P. 2015.
Astrophysical Journal, 805, 132.
41. [The feeding zones of terrestrial planets and insights into Moon formation](#)
Kaib, N. A., **Cowan, N. B.** 2015.
Icarus, 252, 161-174.
[astrobit.es](#)
40. [Characterizing Transiting Planet Atmospheres through 2025](#)
Cowan, N. B., Greene, T., Angerhausen, D., Batalha, N. E., Clampin, M., Colón, K., Crossfield, I. J. M., Fortney, J. J., Gaudi, B. S., Harrington, J., Iro, N., Lillie, C. F., Linsky, J. L., Lopez-Morales, M., Mandell, A. M., Stevenson, K. B. 2015.
Publications of the Astronomical Society of the Pacific, 127, 311.

39. [Features in the broad-band eclipse spectra of exoplanets: signal or noise?](#)
Hansen, C. J., Schwartz, J. C., Cowan, N. B. 2014.
Monthly Notices of the Royal Astronomical Society, 444, 3632-3640.
38. [Constraints on the Atmospheric Circulation and Variability of the Eccentric Hot Jupiter XO-3b](#)
Wong, I., Knutson, H. A., **Cowan, N. B.**, Lewis, N. K., Agol, E., Burrows, A., Deming, D., Fortney, J. J., Fulton, B. J., Langton, J., Laughlin, G., Showman, A. P. 2014.
Astrophysical Journal, 794, 134.
37. [The 4.5 \$\mu\text{m}\$ Full-orbit Phase Curve of the Hot Jupiter HD 209458b](#)
Zellem, R. T., Lewis, N. K., Knutson, H. A., Griffith, C. A., Showman, A. P., Fortney, J. J., **Cowan, N. B.**, Agol, E., Burrows, A., Charbonneau, D., Deming, D., Laughlin, G., Langton, J. 2014.
Astrophysical Journal, 790, 53.
36. [The Exoplanet Opportunity: Top-Down Planetary Science](#)
Cowan, N. B. 2014.
EOS Transactions, 95, 209-210.
35. [Atmospheric Characterization of the Hot Jupiter Kepler-13Ab](#)
Shporer, A., O'Rourke, J. G., Knutson, H. A., Szabó, G. M., Zhao, M., Burrows, A., Fortney, J. J., Agol, E., **Cowan, N. B.**, Desert, J.-M., Howard, A. W., Isaacson, H., Lewis, N. K., Showman, A. P., Todorov, K. O. 2014.
Astrophysical Journal, 788, 92.
34. [Water Cycling between Ocean and Mantle: Super-Earths Need Not Be Waterworlds](#)
Cowan, N. B., Abbot, D. S. 2014.
Astrophysical Journal, 781, 27.
[PRESS](#)
33. [Inference of Inhomogeneous Clouds in an Exoplanet Atmosphere](#)
Demory, B.-O., de Wit, J., Lewis, N., Fortney, J., Zsom, A., Seager, S., Knutson, H., Heng, K., Madhusudhan, N., Gillon, M., Barclay, T., Desert, J.-M., Parmentier, V., **Cowan, N. B.** 2013.
Astrophysical Journal Letters, 776, L25.
[astrobit](#)
32. [Light curves of stars and exoplanets: estimating inclination, obliquity and albedo](#)
Cowan, N. B., Fuentes, P. A., Haggard, H. M. 2013.
Monthly Notices of the Royal Astronomical Society, 434, 2465-2479.
[PRESS](#)
31. [Secondary Eclipse Photometry of the Exoplanet WASP-5b with Warm Spitzer](#)
Baskin, N. J., Knutson, H. A., Burrows, A., Fortney, J. J., Lewis, N. K., Agol, E., Charbonneau, D., **Cowan, N. B.**, Deming, D., Desert, J.-M., Langton, J., Laughlin, G., Showman, A. P. 2013.
Astrophysical Journal, 773, 124.
30. [Stabilizing Cloud Feedback Dramatically Expands the Habitable Zone of Tidally Locked Planets](#)
Yang, J., **Cowan, N. B.**, Abbot, D. S. 2013.
Astrophysical Journal Letters, 771, L45.
[RADIO](#)

29. [Warm Spitzer Photometry of Three Hot Jupiters: HAT-P-3b, HAT-P-4b and HAT-P-12b](#)
Todorov, K. O., Deming, D., Knutson, H. A., Burrows, A., Fortney, J. J., Lewis, N. K., **Cowan, N. B.**, Agol, E., Desert, J.-M., Sada, P. V., Charbonneau, D., Laughlin, G., Langton, J., Showman, A. P. 2013.
Astrophysical Journal, 770, 102.
28. [Orbital Phase Variations of the Eccentric Giant Planet HAT-P-2b](#)
Lewis, N. K., Knutson, H. A., Showman, A. P., **Cowan, N. B.**, Laughlin, G., Burrows, A., Deming, D., Crepp, J. R., Mighell, K. J., Agol, E., Bakos, G. Á., Charbonneau, D., Désert, J.-M., Fischer, D. A., Fortney, J. J., Hartman, J. D., Hinkley, S., Howard, A. W., Johnson, J. A., Kao, M., Langton, J., Marcy, G. W. 2013.
Astrophysical Journal, 766, 95.
27. [Determining Reflectance Spectra of Surfaces and Clouds on Exoplanets](#)
Cowan, N. B., **Strait, T. E.** 2013.
Astrophysical Journal Letters, 765, L17.
26. [Thermal Phases of Earth-like Planets: Estimating Thermal Inertia from Eccentricity, Obliquity, and Diurnal Forcing](#)
Cowan, N. B., Voigt, A., Abbot, D. S. 2012.
Astrophysical Journal, 757, 80.
25. [Indication of Insensitivity of Planetary Weathering Behavior and Habitable Zone to Surface Land Fraction](#)
Abbot, D. S., **Cowan, N. B.**, Ciesla, F. J. 2012.
Astrophysical Journal, 756, 178.
24. [3.6 and 4.5 \$\mu\text{m}\$ Phase Curves and Evidence for Non-equilibrium Chemistry in the Atmosphere of Extrasolar Planet HD 189733b](#)
Knutson, H. A., Lewis, N., Fortney, J. J., Burrows, A., Showman, A. P., **Cowan, N. B.**, Agol, E., Aigrain, S., Charbonneau, D., Deming, D., Désert, J.-M., Henry, G. W., Langton, J., Laughlin, G. 2012.
Astrophysical Journal, 754, 22.
23. [A False Positive for Ocean Glint on Exoplanets: The Latitude-Albedo Effect](#)
Cowan, N. B., Abbot, D. S., Voigt, A. 2012.
Astrophysical Journal Letters, 752, L3.
22. [Spitzer/MIPS 24 \$\mu\text{m}\$ Observations of HD 209458b: Three Eclipses, Two and a Half Transits, and a Phase Curve Corrupted by Instrumental Sensitivity Variations](#)
Crossfield, I. J. M., Knutson, H., Fortney, J., Showman, A. P., **Cowan, N. B.**, Deming, D. 2012.
Astrophysical Journal, 752, 81.
21. [A Two-dimensional Infrared Map of the Extrasolar Planet HD 189733b](#)
Majeau, C., Agol, E., **Cowan, N. B.** 2012.
Astrophysical Journal Letters, 747, L20.
[PRESS](#)
20. [Thermal Phase Variations of WASP-12b: Defying Predictions](#)
Cowan, N. B., Machalek, P., Croll, B., **Shekhtman, L. M.**, Burrows, A., Deming, D., Greene, T., Hora, J. L. 2012.
Astrophysical Journal, 747, 82.
19. [Warm Spitzer Observations of Three Hot Exoplanets: XO-4b, HAT-P-6b, and HAT-P-8b](#)
Todorov, K. O., Deming, D., Knutson, H. A., Burrows, A., Sada, P. V., **Cowan, N. B.**, Agol,

- E., Desert, J.-M., Fortney, J. J., Charbonneau, D., Laughlin, G., Langton, J., Showman, A. P., Lewis, N. K. 2012.
Astrophysical Journal, 746, 111.
18. [Measures of galaxy environment - I. What is 'environment'?](#)
Muldrew, S. I., Croton, D. J., Skibba, R. A., Pearce, F. R., Ann, H. B., Baldry, I. K., Brough, S., Choi, Y.-Y., Conselice, C. J., **Cowan, N. B.**, Gallazzi, A., Gray, M. E., Grützbauch, R., Li, I.-H., Park, C., Pilipenko, S. V., Podgorzec, B. J., Robotham, A. S. G., Wilman, D. J., Yang, X., Zhang, Y., Zibetti, S. 2012.
Monthly Notices of the Royal Astronomical Society, 419, 2670-2682.
 17. [A Spitzer Transmission Spectrum for the Exoplanet GJ 436b, Evidence for Stellar Variability, and Constraints on Dayside Flux Variations](#)
Knutson, H. A., Madhusudhan, N., **Cowan, N. B.**, Christiansen, J. L., Agol, E., Deming, D., Désert, J.-M., Charbonneau, D., Henry, G. W., Homeier, D., Langton, J., Laughlin, G., Seager, S. 2011.
Astrophysical Journal, 735, 27.
 16. [Rotational Variability of Earth's Polar Regions: Implications for Detecting Snowball Planets](#)
Cowan, N. B., Robinson, T., Livengood, T. A., Deming, D., Agol, E., A'Hearn, M. F., Charbonneau, D., Lisse, C. M., Meadows, V. S., Seager, S., Shields, A. L., Wellnitz, D. D. 2011.
Astrophysical Journal, 731, 76.
 15. [The Statistics of Albedo and Heat Recirculation on Hot Exoplanets](#)
Cowan, N. B., Agol, E. 2011.
Astrophysical Journal, 729, 54.
 14. [Secondary Eclipse Photometry of WASP-4b with Warm Spitzer](#)
Beerer, I. M., Knutson, H. A., Burrows, A., Fortney, J. J., Agol, E., Charbonneau, D., **Cowan, N. B.**, Deming, D., Desert, J.-M., Langton, J., Laughlin, G., Lewis, N. K., Showman, A. P. 2011.
Astrophysical Journal, 727, 23.
 13. [Warm Spitzer Photometry of the Transiting Exoplanets CoRoT-1 and CoRoT-2 at Secondary Eclipse](#)
Deming, D., Knutson, H., Agol, E., Desert, J.-M., Burrows, A., Fortney, J. J., Charbonneau, D., **Cowan, N. B.**, Laughlin, G., Langton, J., Showman, A. P., Lewis, N. K. 2011.
Astrophysical Journal, 726, 95.
 12. [A Model for Thermal Phase Variations of Circular and Eccentric Exoplanets](#)
Cowan, N. B., Agol, E. 2011.
Astrophysical Journal, 726, 82.
 11. [The Climate of HD 189733b from Fourteen Transits and Eclipses Measured by Spitzer](#)
Agol, E., **Cowan, N. B.**, Knutson, H. A., Deming, D., Steffen, J. H., Henry, G. W., Charbonneau, D. 2010.
Astrophysical Journal, 721, 1861-1877.
 10. [The 8 \$\mu\text{m}\$ Phase Variation of the Hot Saturn HD 149026b](#)
Knutson, H. A., Charbonneau, D., **Cowan, N. B.**, Fortney, J. J., Showman, A. P., Agol, E., Henry, G. W. 2009.
Astrophysical Journal, 703, 769-784.
 9. [Alien Maps of an Ocean-bearing World](#)
Cowan, N. B., Agol, E., Meadows, V. S., Robinson, T., Livengood, T. A., Deming, D.,

- Lisse, C. M., A'Hearn, M. F., Wellnitz, D. D., Seager, S., Charbonneau, D., EPOXI Team 2009.
Astrophysical Journal, 700, 915-923.
[PRESS](#)
8. [The mass-metallicity relation in galaxy clusters: the relative importance of cluster membership versus local environment](#)
 Ellison, S. L., Simard, L., **Cowan, N. B.**, Baldry, I. K., Patton, D. R., McConnachie, A. W. 2009.
Monthly Notices of the Royal Astronomical Society, 396, 1257-1272.
 7. [Multiwavelength Constraints on the Day-Night Circulation Patterns of HD 189733b](#)
 Knutson, H. A., Charbonneau, D., **Cowan, N. B.**, Fortney, J. J., Showman, A. P., Agol, E., Henry, G. W., Everett, M. E., Allen, L. E. 2009.
Astrophysical Journal, 690, 822-836.
 6. [Inverting Phase Functions to Map Exoplanets](#)
Cowan, N. B., Agol, E. 2008.
Astrophysical Journal Letters, 678, L129.
 5. [The Environment of Galaxies at Low Redshift](#)
Cowan, N. B., Ivezić, Ž. 2008.
Astrophysical Journal Letters, 674, L13.
 4. [Hot nights on extrasolar planets: mid-infrared phase variations of hot Jupiters](#)
Cowan, N. B., Agol, E., Charbonneau, D. 2007.
Monthly Notices of the Royal Astronomical Society, 379, 641-646.
[RADIO](#)
 3. [A map of the day-night contrast of the extrasolar planet HD 189733b](#)
 Knutson, H. A., Charbonneau, D., Allen, L. E., Fortney, J. J., Agol, E., **Cowan, N. B.**, Showman, A. P., Cooper, C. S., Megeath, S. T. 2007.
Nature, 447, 183-186.
[PRESS](#)
 2. [TIGRESS highly-segmented high-purity germanium clover detector](#)
 Scraggs, H. C., Pearson, C. J., Hackman, G., Smith, M. B., Austin, R. A. E., Ball, G. C., Boston, A. J., Bricault, P., Chakrawarthy, R. S., Churchman, R., **Cowan, N.**, Cronkhite, G., Cunningham, E. S., Drake, T. E., Finlay, P., Garrett, P. E., Grinyer, G. F., Hyland, B., Jones, B., Leslie, J. R., Martin, J.-P., Morris, D., Morton, A. C., Phillips, A. A., Sarazin, F., Schumaker, M. A., Svensson, C. E., Valiente-Dobón, J. J., Waddington, J. C., Watters, L. M., Zimmerman, L. 2005.
Nuclear Instruments and Methods in Physics Research A, 543, 431-440.
 1. [Position sensitivity of the TIGRESS 32-fold segmented HPGe clover detector](#)
 Svensson, C. E., Hackman, G., Pearson, C. J., Schumaker, M. A., Scraggs, H. C., Smith, M. B., Andreoiu, C., Andreyev, A., Austin, R. A. E., Ball, G. C., Boston, A. J., Chakrawarthy, R. S., Churchman, R., **Cowan, N.**, Drake, T. E., Finlay, P., Garrett, P. E., Grinyer, G. F., Hyland, B., Jones, B., Martin, J. P., Morton, A. C., Phillips, A. A., Roy, R., Sarazin, F., Starinsky, N., Valiente-Dobón, J. J., Waddington, J. C., Watters, L. M. 2005.
Nuclear Instruments and Methods in Physics Research A, 540, 348-360.

White Papers, Proceedings, Editorials, and Research Notes

38. Ariel (Atmospheric Remote-sensing Infrared Exoplanet Large-survey): Enabling planetary science across light-years
Tinetti et al. 2020
Definition Study Report for the European Space Agency
37. The Martian Atmospheric Gas Evolution (MAGE) Experiment: an Off-Axis Integrated Cavity-enhanced Output Spectrometer (OA-ICOS) enabling high-frequency near-surface trace gas measurements on Mars
Haley M. Sapers et al. 2020
Planetary Decadal Survey White Paper
36. Keys of a Mission to Uranus or Neptune, the Closest Ice Giants
Tristan Guillot, Jonathan Fortney, Emily Rauscher, Mark Marley, Vivien Parmentier, Mike Line, Hannah Wakeford, Yohai Kaspi, Ravit Helled, Masahiro Ikoma, Heather Knutson, Kristen Menou, Diana Valencia, Daniele Durante, Shigeru Ida, Scott Bolton, Cheng Li, Kevin Stevenson, Jacob Bean, **Nicolas Cowan**, Mark Hofstadter, Ricardo Hueso, Jeremy Leconte, Liming Li, Christoph Mordasini, Olivier Mousis, Nadine Nettelmann, Krista Soderlund, Michael H. Wong
White Paper for the Decadal Survey of Planetary Sciences and Astrobiology, 2020
35. Clearing up the Clouds on Hot Gas Giants
Nicolas B. Cowan & Emily Rauscher
Nature Astronomy, in press, 2020
34. [Astronomy in Indigenous Communities](#)
Ismaël Moumen, Laurie Rousseau-Nepton, **Nicolas Cowan**, Samar Safi-Harb, Julie Bolduc-Duval, Mary Beth Laychak
Communicating Astronomy with the Public (CAP) Journal, 27, 27, 2020
33. [Optimal Strategies for Hubble Space Telescope Follow up of TESS-discovered Exoplanets](#)
Dániel Apai, **Nicolas Cowan**, Kevin Heng, Laura Kreidberg, Mercedes López-Morales, Caroline Morley, John Mackenty, Iain Neill Reid
Report prepared for the Director of the Space Telescope Science Institute, 2019
32. [Exoplanet instrumentation in the 2020s: Canada’s pathway towards searching for life on potentially Earth-like exoplanets](#)
Björn Benneke, **Nick Cowan**, Jason Rowe, Christian Marois, Stanimir Metchev, John Moores, Eve Lee, Aaron Boley, René Doyon, Andrew Cumming, Jaymie Matthews, David Lafrenière, Kimberly Strong, Brett Gladman, Kristen Menou, Diana Valencia, Dimitri Mawet, Neil James Cook, Ngo Henry, Étienne Artigau, Loïc Albert, Paul Godin, Akash Chauhan, Antoine Darveau-Bernier, Junchan Lee, Stefan Pelletier, Louis-Phillippe Coulombe, Paulo Miles-Páez, **Melissa Marquette**, **Taylor Bell**, Michael Radica, Benjamin L. Gerard, Nathalie Ouellette, **Lisa Dang**, Marie-Eve Naud, **Keavin Moore**, Olivia Lim, Yanqin Wu, Prashansa Gupta, Pierre Bastien, Lison Malo, Jonathan Gagné, Simon-Gabriel Beauvais, Ryan Cloutier, Charles Cadieux, Geert Jan Talens, Miranda Herman, Christopher Mann, Caroline Piaulet, Lauren Weiss, Jonathan Chan, Jessica Speedie, Josh Hedgepeth, Mohamad Ali-Dib, Alex Ellery, Christopher Lee, Daniel Thorngren, **Thomas Navarro**, Giang Nguyen, **Dylan Keating**, Tim Hallatt
White Paper prepared for the Canadian Long Range Plan 2020
31. [Astronomy in a Low-Carbon Future](#)
Christopher D. Matzner, **Nicolas B. Cowan**, René Doyon, Vincent Hénault-Brunet, David

- Lafrenière, Martine Lokken, Peter G. Martin, Sharon Morsink, Magdalen Nomandeu, Nathalie Ouellette, Mubdi Rahman, Joel Roediger, James Taylor, Rob Thacker, Marten van Kerkwijk
White Paper prepared for the Canadian Long Range Plan 2020
30. [Industrial Initiatives and Collaborations](#)
Kim Venn, **Nick Cowan**, Frederic Grandmont, Scott Roberts, Neil Rowlands , Michael Rupen, Dave Andersen, Pauline Barmby, Dean Chalmers, Rene Doyon, Sarah Gallagher, John Hutchings, David Naylor, John Moores, Simon Thibault
White Paper prepared for the Canadian Long Range Plan 2020
29. [Continuing Canadian Leadership in Small-satellite Astronomy](#)
Stanimir Metchev, Étienne Artigau, **Taylor Bell**, Björn Benneke, Aaron Boley, Eric Choi, **Nicolas Cowan**, Colin Goldblatt, Frederic Grandmont, Kelsey Hoffman, JJ Kavelaars, Jean-François Lavigne, Catherine Lovekin, Christian Marois, Jaymie Matthews, Paulo Miles-Páez, Anthony Moffat, Alice Murphy, Hilding Neilson, Lorne Nelson, Jason Rowe, Slavek Rucinski, Warren Soh, Nicole St-Louis, Gregg Wade
White Paper prepared for the Canadian Long Range Plan 2020
28. [Entering a new Era of Astrophysics with the James Webb Space Telescope](#)
René Doyon, Chris Willott, Loïc Albert, Etienne Artigau, Roberto Abraham, Björn Benneke, Jan Cami, **Nicholas Cowan**, Ruobing Dong, Laura Ferrarese, David Lafrenière, John Hutchings, Doug Johnstone, Adam Muzzin, Nathalie Ouellette, Els Peeters, Jason Rowe, Marcin Sawicki
White Paper prepared for the Canadian Long Range Plan 2020
27. [Exoplanet Imaging: a technological and scientific road-map for finding Life signatures on other Worlds.](#)
Christian Marois, Benjamin Gerard, William Thompson, Ruobing Dong, Stanimir Metchev, Nienke van der Marel, Suresh Sivanandam, Simon Thibault, Étienne Artigau, Frédérique Baron, Jason Row, Scott Chapman, Frédéric Grandmont, Eve Lee, Bruce Macintosh, Scott Roberts, Björn Benneke, Célia Blain, Aaron Boley, Colin Bradley, Greg Burley, Adam Butko, Neil Cook, **Nicolas Cowan**, René Doyon, Colin Goldblatt, Tim Hardy, Olivier Lardière, Brenda Matthews, Max Millar-Blanchar, Jean-Pierre Véran
White Paper prepared for the Canadian Long Range Plan 2020
26. [CASTOR: A Flagship Canadian Space Telescope](#)
Patrick Cote, Bob Abraham, Michael Balogh, Peter Capak, Ray Carlberg, **Nick Cowan**, Oleg Djazovski, Laurent Drissen, Maria Drout, Jean Dupuis, Chris Evans, Nicholas Fantin, Laura Ferrarese, Wes Fraser, Sarah Gallagher, Terry Girard, Robert Gleisinger, Frederic Grandmont, Patrick Hall, Martin Hellmich, Tim Hardy, Paul Harrison, Renee Hlozek, Daryl Haggard, Vincent Henault-Brunet, John Hutchings, Viraja Khatu, JJ Kavelaars, Denis Laurin, Jean-Francois Lavigne, Doug Lisman, Christian Marois, David McCabe, Stan Metchev, Thibaud Moutard, Barth Netterfield, Shouleh Nikzad, Nathalie Ouellette, Emily Pass, Laura Parker, John Pazder, Will Percival, Jason Rhodes, Carmelle Robert, Jason Rowe, Ruben Sanchez-Janssen, Greg Sivakoff, Charles Shapiro, Marcin Sawicki, Alan Scott, Ludovic Van Waerbeke, Kim Venn
White Paper prepared for the Canadian Long Range Plan 2020
25. [The Maunakea Spectroscopic Explorer](#)
Pat Hall, Michael Balogh, Pauline Barmby, John Blakeslee, Jo Bovy, Colin Bradley, Terry Bridges, Jan Cami, Scott Chapman, Francois Chateaneuf, **Nick Cowan**, Patrick Côté, Ivana Damjanov, Maria Drout, Gwendolyn Eadie, Sara Ellison, Laura Ferrarese, Wesley Fraser,

- Bryan Gaensler, Sarah Gallagher, Daryl Haggard, Vincent Henault-Brunet, Falk Herwig, Alexis Hill, Julie Hlavacek-Larrondo, Mike Hudson, Matt Johnson, Viraja Khatu, Chervin Laporte, Alan McConnachie, Brian McNamara, Faizan Mohammad, Adam Muzzin, Hilding Neilson, James Nemecek, Christopher O’dea, Laura Parker, David Patton, Will Percival, Jesse Rogerson, John J. Ruan, Charli Sakari, Marcin Sawicki, Doug Simons, Greg Sivakoff, Kei Szeto, Solomon Tesfamariam, Karun Thanjavur, Simon Thibault, Guillaume Thomas, Ludovic Van Waerbeke, Kim Venn, Tracy Webb, Jon Willis, Joanna Woo
White Paper prepared for the Canadian Long Range Plan 2020
24. [The Euclid Mission](#)
Will Percival, Michael Balogh, Dick Bond, Jo Bovy, Raymond Carlberg, Scott Chapman, Patrick Cote, **Nicolas Cowan**, Sebastien Fabbro, Laura Ferrarese, Stephen Gwyn, Renée Hložek, Michael Hudson, John Hutchings, JJ Kavelaars, Dustin Lang, Alan McConnachie, Adam Muzzin, Laura Parker, Chris Pritchett, Marcin Sawicki, David Schade, Douglas Scott, Kendrick Smith, Kristine Spekkens, James Taylor, Chris Willott
White Paper prepared for the Canadian Long Range Plan 2020
 23. [The LUVOIR Mission Concept Study Final Report](#)
The LUVOIR Team (including **Nicolas Cowan** and **C.M. Guimond**)
Report for the Astro2020 Decadal Survey
 22. [A Statistical Comparative Planetology Approach to Maximize the Scientific Return of Future Exoplanet Characterization Efforts](#)
Checlair, Jade H.; Abbot, Dorian S.; Webber, Robert J.; Feng, Y. Katherina; Bean, Jacob L.; Schwieterman, Edward W.; Stark, Christopher C.; Robinson, Tyler D.; Kempton, Eliza; Alcabes, Olivia D. N.; Apai, Daniel; Arney, Giada; **Cowan, Nicolas**; Domagal-Goldman, Shawn; Dong, Chuanfei; Fleming, David P.; Fujii, Yuka; Graham, R. J.; Guzewich, Scott D.; Hasegawa, Yasuhiro; Hayworth, Benjamin P. C.; Kane, Stephen R.; Kite, Edwin S.; Komacek, Thaddeus D.; Kopparapu, Ravi K.; Mansfield, Megan; Marounina, Nadejda; Montet, Benjamin T.; Olson, Stephanie L.; Paradise, Adiv; Popovic, Predrag; Rackham, Benjamin V.; Ramirez, Ramses M.; Rau, Gioia; Reinhard, Chris; Renaud, Joe; Rogers, Leslie; Walkowicz, Lucianne M.; Warren, Alexandra; Wolf, Eric. T.
Astro 2020 white paper
 21. [The Sun-like Stars Opportunity](#)
Arney, Giada; Batalha, Natasha; Britt, Amber V.; **Cowan, Nicolas**; Domagal-Goldman, Shawn D.; Dressing, Courtney; France, Kevin; Fujii, Yuka; Kopparapu, Ravi; Kane, Stephen; Krissansen-Totton, Joshua; Lincowski, Andrew; Lehmer, Owen; Lopez, Eric; Lustig-Yaeger, Jacob; Meadows, Victoria S.; Olson, Stephanie; Paranteau, M. Niki; Pascucci, Ilaria; Ramirez, Ramses Reinhard, Christopher; Roberge, Aki; Robinson, Tyler D.; Schwieterman, Edward; Stark, Christopher; Wolf, Eric. T.; Youngblood, Allison
Astro 2020 white paper
 20. [Eccentricity is Not Responsible for Odd Harmonics in HAT-P-7 and Kepler-13A](#)
Bielecki, C. I., Cowan, N. B., 2018.
AAS Research Notes, 2, 198.
 19. [A Search for Refraction in Kepler Photometry of Gas Giants](#)
Sheets, H. A., Jacob, L., N.B. Cowan, Deming, D., 2018.
AAS Research Notes, 2, 153.
 18. [The Large UV Optical Infrared Surveyor \(LUVOIR\) Interim Report](#)
LUVOIR Study Team (incl. **N.B. Cowan** and **C.M. Guimond**)

17. [Additional Exoplanet Science Enabled by FINESSE](#)
Zellem, Robert T.; Fortney, Jonathan J.; Swain, Mark R.; Bryden, Geoffrey; Chapman, John W.; **Cowan, Nicolas B.**; Kataria, Tiffany; Kreidberg, Laura; Line, Michael R.; Moses, Julianne I.; Parmentier, Vivien; Roudier, Gael M.; Stevenson, Kevin B. arXiv:1803.07163.
16. [The Importance of Multiple Observation Methods to Characterize Potentially Habitable Exoplanets: Ground- and Space-Based Synergies](#)
Arney, Giada; Batalha, Natasha; **Cowan, Nicolas**; Domagal-Goldman, Shawn; Dressing, Courtney; Fujii, Yuka; Kopparapu, Ravi; Lincowski, Andrew; Lopez, Eric; Lustig-Yaeger, Jacob; Youngblood, Allison arXiv:1803.02926
15. [The Science Case for an Extended Spitzer Mission](#)
Yee, J. C., Fazio, G. G., Benjamin, R., Kirkpatrick, J. D., Malkan, M. A., Trilling, D., Carey, S., Ciardi, D. R., Apai, D., Ashby, M. L. N., Ballard, S., Bean, J. L., Beatty, T., Berta-Thompson, Z., Capak, P., Charbonneau, D., Chesley, S., **Cowan, N. B.**, Crossfield, I., Cushing, M. C., de Wit, J., Deming, D., Dickinson, M., Dittmann, J., Dragomir, D., Dressing, C., Emery, J., Faherty, J. K., Gagne, J., Gaudi, B. S., Gillon, M., Grillmair, C. J., Harris, A., Hora, J., Ingalls, J. G., Kataria, T., Kreidberg, L., Krick, J. E., Lowrance, P. J., Mahoney, W. A., Metchev, S. A., Mommert, M., Migo Mueller, M., Shvartzvald, Y., Smith, H., Stevenson, K. B., Teplitz, H. I., Willner, S. P. 2017. arXiv:1710.04194.
14. [Exploring Other Worlds: Science Questions for Future Direct Imaging Missions \(EXOPAG SAG15 Report\)](#)
Apai, D., **Cowan, N.**, Kopparapu, R., Kasper, M., Hu, R., Morley, C., Fujii, Y., Kane, S., Maley, M., del Genio, A., Karalidi, T., Komacek, T., Mamajek, E., Mandell, A., Domagal-Goldman, S., Barman, T., Boss, A., Breckinridge, J., Crossfield, I., Danchi, W., Ford, E., Iro, N., Kasting, J., Lowrance, P., Madhusudhan, N., McElwain, M., Moore, W., Pascucci, I., Plavchan, P., Roberge, A., Schneider, G., Showman, A., Turnbull, M. 2017. arXiv:1708.02821.
13. [“Origins Topical Team Report”](#)
Abraham et al. (incl. **N.B. Cowan**), report for the Canadian Space Agency, 2017
12. [A Vision for Canadian Space Exploration](#)
Caiazzo et al. (incl. **N.B. Cowan**), white paper for Canadian Government, 2017
11. [Astrobiology Topical Team Report](#)
Slater et al. (incl. **N.B. Cowan**), report for the Canadian Space Agency, 2017
10. [Report of the Hubble Space Telescope Exoplanet Committee](#)
Deming, Berta-Thompson, **Cowan**, Fortney et al., report to Ken Sembach, 2016
9. [Exoplanet Exploration Program Analysis Group \(ExoPAG\) Report to Paul Hertz Regarding Large Mission Concepts to Study for the 2020 Decadal Survey](#)
Gaudi, B. S., Agol, E., Apai, D., Bendek, E., Boss, A., Breckinridge, J. B., Ciardi, D. R., **Cowan, N. B.**, Danchi, W. C., Domagal-Goldman, S., Fortney, J. J., Greene, T. P., Kaltenegger, L., Kasting, J. F., Leisawitz, D. T., Leger, A., Lille, C. F., Lisman, D. P., Lo, A. S., Malbet, F., Mandell, A. M., Meadows, V. S., Mennesson, B., Nemati, B., Plavchan, P. P., Rinehart, S. A., Roberge, A., Serabyn, E., Shaklan, S. B., Shao, M., Stapelfeldt, K. R., Stark, C. C., Swain, M., Taylor, S. F., Turnbull, M. C., Turner, N. J., Turyshev, S. G., Unwin, S. C., Walkowicz, L. M., ExoPAG, o. b. o. t. 2015. arXiv:1601.00008.
8. [Water On -and In- Terrestrial Planets](#)
Cowan, N. B. 2015. arXiv:1511.04444.
[astrobites](#)

7. [Inverting Phase Curves to Map Exoplanets](#)
Cowan & Agol, IAU Symposium, 253, 544, 2009
6. [Transits and secondary eclipses of HD 189733 with Spitzer](#)
Agol, Cowan, Bushong et al. IAU Symposium, 253, 209, 2009.
5. [Increasing the Number of Underrepresented Minorities in Astronomy Through K-12 Education and Public Outreach \(Paper II\)](#)
Norman, D., Ernst, D. J., Agueros, M., Anderson, S. F., Baker, A., Burgasser, A., Cruz, K., Gawiser, E., Krishnamurthi, A., Lee, H.-c., Mighell, K., McGruder, C., Norman, D., Sakimoto, P. J., Sheth, K., Soderblom, D., Strauss, M., Walter, D., West, A., Agol, E., Murphy, J., Garner, S., Bellovary, J., Schmidt, S., Cowan, N., Gogarten, S., Stilp, A., Christensen, C., Hilton, E., Haggard, D., Loebman, S., Rosenfield, P., Munshi, F. 2009. astro2010: The Astronomy and Astrophysics Decadal Survey, 2010.
4. [Increasing the Number of Underrepresented Minorities in Astronomy at the Undergraduate, Graduate, and Postdoctoral Levels \(Paper I\)](#)
Norman, D., Ernst, D. J., Agueros, M., Anderson, S. F., Baker, A., Burgasser, A., Cruz, K., Gawiser, E., Krishnamurthi, A., Lee, H.-c., Mighell, K., McGruder, C., Norman, D., Sakimoto, P. J., Sheth, K., Soderblom, D., Strauss, M., Walter, D., West, A., Agol, E., Murphy, J., Garner, S., Bellovary, J., Schmidt, S., Cowan, N., Gogarten, S., Stilp, A., Christensen, C., Hilton, E., Haggard, D., Loebman, S., Rosenfield, P., Munshi, F. 2009. astro2010: The Astronomy and Astrophysics Decadal Survey, 2010.
3. [Increasing the Number of Underrepresented Minorities in Astronomy: Executive Summary](#)
Norman, D., Ernst, D. J., Agueros, M., Anderson, S. F., Baker, A., Burgasser, A., Cruz, K., Gawiser, E., Krishnamurthi, A., Lee, H.-c., Mighell, K., McGruder, C., Norman, D., Sakimoto, P. J., Sheth, K., Soderblom, D., Strauss, M., Walter, D., West, A., Agol, E., Murphy, J., Garner, S., Bellovary, J., Schmidt, S., Cowan, N., Gogarten, S., Stilp, A., Christensen, C., Hilton, E., Haggard, D., Loebman, S., Rosenfield, P., Munshi, F. 2009. astro2010: The Astronomy and Astrophysics Decadal Survey, 2010.
2. [Pre-MAP: A Case Study in Evaluating Astronomy Diversity Efforts](#)
Haggard, Garner & Cowan, *Spectrum* June 2008
1. [Observations of Extrasolar Planets During the non-Cryogenic Spitzer Space Telescope Mission](#)
Deming, D., Agol, E., Charbonneau, D., Cowan, N., Knutson, H., Marengo, M. 2007. The Science Opportunities of the Warm Spitzer Mission Workshop, 943, 89-100.