

Alexander (Alex) James Cridland

Vismarkt 4, 2311 EH, Leiden, South Holland, The Netherlands
Nationality: Canadian, Phone: +31-6-34033418

RESEARCH INTERESTS

- Exoplanetary atmosphere characterization
- Formation and evolution of planetary systems
- Astrochemical structure of protoplanetary disks
- Physical structure and evolution of protoplanetary disks
- The link between astrochemical disks and protoplanetary atmospheres

EDUCATION

Ph.D. Science, Astrophysics
Supervisor: Dr. Ralph Pudritz
McMaster University, Hamilton, ON, Canada
Thesis title: Connecting the Chemical Composition of Planetary Atmospheres with Planet Formation
Defence: August 2017

WORK EXPERIENCE

Postdoctoral Research Associate 2017 – present
Sterrewacht Leiden, Supervisor: Ewine van Dishoeck
Leiden University, Leiden, South Holland, The Netherlands

Graduate Researcher 2013 – 2017
Department of Physics and Astronomy
McMaster University, Hamilton, ON, Canada

- Semi-analytic models of planet formation with the goal of computing the bulk chemical composition of exoplanetary atmospheres

Graduate Researcher 2011 – 2013
Department of Physics and Astronomy
McMaster University, Hamilton, ON, Canada

- Direct numerical simulations of magnetic helicity conserving astrophysical dynamos

SUPERVISORY EXPERIENCE

Leiden/ESA Astrophysics Program for Summer students (LEAPS) supervisor Summer 2018
Student: Pongpichit (Tak) Chuanraksasat
Project: Photochemistry in exoplanetary atmospheres and the observability of nitrogen carrying species with JWST

Leiden/ESA Astrophysics Program for Summer students (LEAPS) supervisor Summer 2019
Student: Vanesa Ramírez
Project: The effect of the bulk elemental abundances in exoplanetary atmospheres on the abundance and spectral signature of TiO

COMPUTER SKILLS

Languages & Software: L^AT_EX, Fortran (77/90/95), Python, RADMC3D, ChemApp, Microsoft Office Suite, C++
Operating Systems: Linux, Unix, Macintosh, Windows

RECENT PRESENTATION EXPERIENCE	<p><i>Presenter (contributed)</i> 2019 Connecting planet formation and astrochemistry: The role of refractory carbon depletion on Hot Jupiter atmospheric C/O - Poster presentation Extreme Solar Systems IV, Reyjavik, Iceland</p> <p><i>Presenter (contributed)</i> 2019 Connecting planet formation and astrochemistry: The role of refractory carbon depletion on Hot Jupiter atmospheric C/O - Poster presentation Gordon Research Conference, Mount Holyoke College, South Hadley, MA, USA</p> <p><i>Presenter (contributed)</i> 2019 Connecting planet formation and astrochemistry: The role of refractory carbon depletion on Hot Jupiter atmospheric C/O Gordon Research Seminar, Mount Holyoke College, South Hadley, MA, USA</p> <p><i>Presenter (contributed)</i> 2019 Connecting planet formation and astrochemistry: The role of refractory carbon depletion on Hot Jupiter atmospheric C/O From Stars to Planets II, Gothenburg, Sweden</p> <p><i>Presenter (invited)</i> 2019 Connecting planet formation and astrochemistry: Volatiles, refractories and C/O in exoplanetary atmospheres NRAO colloquium, Charlottesville VA, USA</p> <p><i>Presenter (invited)</i> 2019 Connecting planet formation and astrochemistry: Volatiles, refractories and C/O in exoplanetary atmospheres Astronomy Journal club, McMaster University, Hamilton, Canada</p> <p><i>Presenter (contributed)</i> 2018 Nitrogen Chemistry in Exoplanetary atmospheres - Prospects with JWST-MIRI Astrochemistry Past-Present-Future, Pacedena CA, USA</p> <p><i>Presenter (contributed)</i> 2018 Predicting the bulk elemental abundance of exoplanetary atmospheres from formation models UK exoplanet community meeting, Oxford, UK</p>	
PROFESSIONAL HONORS	<p>Keith Leppmann Teaching Assistance Excellence Award Nominee 2016 NSERC Alexander Graham Bell CGSD/PGS Doctoral Scholarship 2014 – 2017</p>	
VOLUNTEER SERVICE	<p>Astronomy on Tap organizing team volunteer 2018-present Guest Supervisor for Integrated Science 3A12: LUE (Light, the Universe, and Everything) 2012-2017</p>	
REFERENCE CONTACT INFORMATION	<p>Dr. Ewine van Dishoeck, Professor, Leiden Observatory, email: ewine@strw.leidenuniv.nl, phone: +31-71-5275814 Dr. Ralph Pudritz, Professor, McMaster University, email: pudritz@mcmaster.ca, phone: +1-905-525-9140 x23180 Dr. Yamila Miguel, Assistant Professor, Leiden Observatory, email: ymiguel@strw.leidenuniv.nl, phone: +31-71-5275737</p>	

- PUBLICATIONS** Ramírez V. & **Cridland, A.J.** in prep. The connection between atmospheric C/O and TiO abundance.
- Bosman, A.D. & **Cridland, A.J.** submitted to A&A. Jupiter formed from pebble pile outside of the N₂ iceline.
- Miguel, Y., **Cridland, A.**, Ormel, C.W., Fortney, J.J., & Ida, S. (Accepted to MNRAS), arXiv:1909.12320
- Cridland, A.J.**, Bosman, A.D, & van Dishoeck E.F., submitted to A&A. Vertical gas accretion impacts the carbon-to-oxygen ratio of gas giant atmospheres
- Cridland, A.J.**, van Dishoeck, E.F., Alessi, M, & Pudritz, R.E. submitted to A&A. Connecting planet formation and astrochemistry. A main sequence for C/O in hot-exoplanetary atmospheres. arXiv:1910.13171
- Cridland, A.J.**, Eistrup, C., & van Dishoeck, E.F. (2019). Connecting planet formation and astrochemistry. Refractory carbon depletion leading to super-stellar C/O in giant planetary atmospheres. A&A **627**: A127.
- Cridland, A.J.**, Pudritz Ralph E., & Alessi Matthew (2019). Physics of planet trapping with applications to HL Tau. MNRAS **484**: 345.
- Pudritz, R.E., **Cridland A.J.**, & Alessi M. (2018). Connecting Planetary Composition with Formation. Handbook of Exoplanets, ISBN 978-3-319-55332-0. Springer International Publishing AG, part of Springer Nature, 2018, id.144.
- Cridland, A.J.** (2018). Magnetically induced termination of giant planet formation. A&A **619**: A165.
- Cridland, A.J.**. Connecting the Chemical Composition of Planetary Atmospheres with Planet Formation. PhD Thesis. MacSphere: <http://hdl.handle.net/11375/22005>. 2017.
- Cridland, A.J.**, Pudritz Ralph E., Birnstiel Tilman, Cleaves L. Ilseidore & Bergin Edwin A. (2017) Composition of Early Planetary Atmospheres II: Coupled Dust and Chemical Evolution in Protoplanetary Disks. MNRAS **469**: 3910.
- Cridland, A.J.**; Pudritz, Ralph E & Birnstiel, T. (2017). Radial Drift of Dust: The Evolution of Ice lines and Dead zones in Protoplanetary Disks. MNRAS **465**: 3865.
- Alessi, Matthew; Pudritz, Ralph E & **Cridland, Alex J.** (2017). On the Formation and Chemical Composition of Super Earths. MNRAS **464**: 428.
- Cridland, A.J.**; Pudritz, R.E. & Alessi, M. (2016). Composition of early planetary atmospheres - I. Connecting disc astrochemistry to the formation of planetary atmospheres. MNRAS **461**: 3274.
- Cridland, A.J.**. Direct Numerical Simulations of Magnetic Helicity Conserving Astrophysical Dynamos. MSc Thesis. MacSphere: <http://hdl.handle.net/11375/13636>. 2014.
- Wilson, C.D.; **Cridland, A.**; et al. Cold Dust but Warm Gas in the Unusual Elliptical Galaxy NGC 4125. ApJL **776**: 30. 2013.