

Maxwell A. Millar-Blanchaer | Curriculum Vitae

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My work focuses on furthering our understanding of planetary system formation and evolution through the direct imaging of exoplanets and debris disks, and the development of new instrumentation for future exoplanet studies.

Current Position

Robert A. Millikan Fellow

California Institute of Technology

Sept 2019–2021

Previous Position

NASA Hubble Fellow

Jet Propulsion Laboratory

Sept 2016–2019

Education

Academic Qualifications.....

PhD in Astronomy & Astrophysics

University of Toronto

Toronto, ON, Canada

2011 – 2016

Bachelor of Science – Physics

Queen's University

Kingston, ON, Canada

2005 – 2009

Bachelor of Applied Science – Electric Engineering

Queen's University

Kingston, ON, Canada

2003 – 2009

Other Training.....

How Learning Works: Creating Inclusive Environments in STEM (and Everywhere)

Keynote Talk and Workshop

Caltech

January 2019

Undergraduate Mentoring Series

A series designed to help mentors navigate the mentoring experience

Caltech

Summer 2017

Publications

First Author.....

Polarization due to cloud bands in the nearby Luhman 16 brown dwarf binary

M. A. Millar-Blanchaer, J. Girard, M. Marley et al.

Accepted

Jan 2020

Polarimetry of Exoplanets

M. A. Millar-Blanchaer, Suniti Sanghavi, Sloane Wiktorowicz, Rebecca Jensen-Clem et al.
National Academy Call for White Papers: Exoplanet Science Strategy Feb 2018

High Contrast Observations of Circumstellar Disks with the Gemini Planet Imager's Polarimetry Mode

M. A. Millar-Blanchaer, T. M. Esposito, K. Stahl et al.
SPIE Conference Proceedings, Polarization Science and Remote Sensing VIII; 104070V Sept 2017

Imaging an 80 AU Radius Dust Ring Around the F5V Star HD 157587

M. A. Millar-Blanchaer, J. Wang, P. Kalas et al.
The Astronomical Journal, Volume 152, Issue 5 Nov 2016

Gemini Planet Imager Observational Calibrations XIV: Polarimetric Contrasts and New Data Reduction Techniques

M. A. Millar-Blanchaer, M. D. Perrin, L.-W. Hung et al.
SPIE Conference Proceedings, Ground-based and Airborne Instrumentation for Astronomy VI, 990836 Aug 2016

On-sky Tests of a Polarization Grating for Visible Astronomy

M.A. Millar-Blanchaer, D.-S. Moon, J. R. Graham, M. Williams
SPIE Conference Proceedings, Ground-based and Airborne Instrumentation for Astronomy VI, 990821 Aug 2016

β Pictoris' Inner Disk in Polarized Light and New Orbital Parameters for β Pictoris b

M. A. Millar-Blanchaer, J. R. Graham, L. Pueyo et al
Astrophysical Journal, vol. 811, p. 18 Sept 2015

Polarization Gratings for Visible and Near-Infrared Astronomy

M. Millar-Blanchaer, D.-S. Moon, J. R. Graham, and M. Escuti
SPIE Conference Proceedings, Advances in Optical and Mechanical Technologies for Telescopes and Instrumentation, vol. 9151, p. 4 June 2014

Other Selected Significant Contributions.....

Achieving a Spectropolarimetric Precision Better than 0.1% in the Near-Infrared with WIRC+Pol

S. Tinyanont, M. A. Millar-Blanchaer, N. Jovanovic et al.
SPIE Optical Engineering + Applications: Volume 11132, Polarization Science and Remote Sensing IX; 1113209 Aug 2019

WIRC+Pol: A low-resolution near-infrared spectropolarimeter

S. Tinyanont, M. A. Millar-Blanchaer, R. Nilsson et al.
Publications of the Astronomical Society of the Pacific, Volume 131, Issue 996, pp. 025001 Feb 2019

Automated data processing architecture for the Gemini Planet Imager Exoplanet Survey

J. Wang, M. D. Perrin, D. Savransky, P. Arriaga, J. Chilcote, R. De Rosa, M. A. Millar-Blanchaer et al.
Journal of Astronomical Telescopes, Instruments and Systems, Volume 4, 018002 Jan 2018

Point Source Polarimetry with the Gemini Planet Imager: Sensitivity Characterization with T5.5 Dwarf Companion HD 19467B

R. Jensen-Clem, M. A. Millar-Blanchaer, D. Mawet et al.
The Astrophysical Journal, Volume 820, Issue 2 Apr 2016

Peering into the Giant Planet Formation Region of the TW Hydrae Disk with the Gemini Planet Imager

V. A. Rapson, J. H. Kastner, M. A. Millar-Blanchaer et al.
The Astrophysical Journal, Volume 815, Issue 2 Sept 2015

Polarimetry with the Gemini Planet Imager: Methods, Performance at First Light and the Circumstellar Ring around HR 4796A

M. D. Perrin, G. Duchene, M. A. Millar-Blanchaer et al.

The Astrophysical Journal, vol. 799, p. 182

Feb 2015

Preliminary DIMM and MASS Nighttime Seeing Measurements at PEARL in the Canadian High Arctic

E. Steinbring, M. Millar-Blanchaer et al.

Publications of the Astronomical Society of the Pacific, vol. 125, 11p.

July 2013

Invited Talks

Directly Imaging Exoplanetary Systems in Polarized Light

Colloquium, University of Toronto

Jan 2019

Debris Disks in Polarized Light with the Gemini Planet Imager

Colloquium, Institute for Astronomy, University of Hawaii

March 2019

Polarization Gratings for High Efficiency Spectropolarimetry

Engineering Coffee, Arizona State University

Nov 2018

(spectro)Polarimetry of Brown Dwarfs with WIRC+Pol, GPI & NACO

Schmid Group Meeting, ETH Zurich

Oct 2018

Near-Infrared Spectropolarimetry of Brown Dwarfs with WIRC+Pol

ESO Lunch talk, ESO Vitacura, Santiago

Apr 2018

(spectro)Polarimetry of Exoplanets and Brown Dwarfs

Colloquium, Department of Physics, McGill University

Jan 2018

(spectro)Polarimetry of Exoplanets and Brown Dwarfs

Physics Tea, Stanford University

Jan 2018

(spectro)Polarimetry of Exoplanets and Brown Dwarfs

Center for Integrative Planetary Science Seminar, University of California, Berkeley

Jan 2018

(spectro)Polarimetry of Exoplanets and Brown Dwarfs

Sagan Fellow Symposium, Caltech

Nov 2017

High Contrast Observations of Circumstellar Disks with the Gemini Planet Imager's Polarimetry Mode

SPIE Optical Engineering + Applications, Polarization Science and Remote Sensing VIII

Aug 2017

Characterizing ExoPlanetary Systems with Polarized Light

CASS - Astrophysics Seminar, University of California San Diego

May 2017

Characterizing ExoPlanetary Systems with Polarized Light

Lunch Seminar Series, Leiden Observatory, University of Leiden

April 2017

Contributed Conference Presentations

Contributed Talks.....

Planetary System Polarimetry with TMT-PSI

TMT Science Forum, Pasadena, CA, USA

Dec. 2018

Spectropolarimetry of Brown Dwarfs with WIRC+Pol

ExoSoCal, Caltech, USA

Sept 2018

(spectro)Polarimetry of Brown Dwarfs with WIRC+Pol and NACO <i>The Cloud Academy, Les Houches School of Physics, France</i>	Sept 2018
(spectro)Polarimetry of Exoplanets and Brown Dwarfs <i>BDEXOCON – The brown dwarf exoplanet connection 2017, University of Delaware, USA</i>	Sept 2017
Studying Exoplanet Formation through Disk Observations with GPI <i>Exoplanet Science Initiative Symposium, NASA Jet Propulsion Laboratory, USA</i>	Mar 2017
β Pictoris as seen by GPI: Polarized disk detection and multi-epoch astrometry of the directly imaged planet <i>Spirit of Lyot 2015, Montreal, Canada</i>	June 2015
Gemini Planet Imager: Speckle Suppression and the HD 61005 Debris Disk <i>Astropol 2014, Grenoble, France</i>	May 2014
Posters.....	
Characterizing Extrasolar Planetary Systems in Polarized Light with TMT-PSI <i>AO4ELT6, Quebec City, QC, Canada</i>	June 2019
Resolving the late planet formation stages around young M-stars in Upper Sco with HST/STIS <i>AAS Winter Meeting, Seattle, USA</i>	January 2019
Gemini Planet Imager Observational Calibrations XIV: Polarimetric Contrasts and New Data Reduction Techniques <i>SPIE Astronomical Telescopes + Instrumentation 2016, Edinburgh, Scotland</i>	June 2016
On-sky tests of a polarization grating for visible astronomy <i>SPIE Astronomical Telescopes + Instrumentation 2016, Edinburgh, Scotland</i>	June 2016
Polarization Gratings for Visible and Near-Infrared Astronomy <i>SPIE Astronomical Telescopes + Instrumentation 2014, Montreal, QC, Canada</i>	June 2014
Gemini Planet Imager Observational Calibrations VII: On-Sky Polarimetric Performance <i>SPIE Astronomical Telescopes + Instrumentation 2014, Montreal, QC, Canada</i>	June 2014
Polarimetry with the Gemini Planet Imager: Instrument Characterization and Future Science <i>IAU Symposium 299: Exploring the formation and evolution of planetary systems, Victoria, BC, Canada</i>	June 2013
Polarimetric Performance of the Gemini Planet Imager <i>SPIE Astronomical Telescopes + Instrumentation 2012, Amsterdam, The Netherlands</i>	June 2012

Awards and Scholarships

Jui Lin (Allen) Yen Award in Astronomy and Astrophysics <i>University of Toronto</i>	\$1000 Jan 2016
Ontario Graduate Scholarship <i>University of Toronto</i>	\$15,000/year Sept 2013, 2014, 2015
Frank S. Hogg Memorial Fellowship <i>University of Toronto</i>	\$2,200/year Sept 2013
Robert Shelley Graduate Scholarship <i>University of Toronto</i>	\$4,500/year Sept 2011
Dunlap Institute for Astronomy & Astrophysics Graduate Scholarship <i>University of Toronto</i>	\$5,000/year Sept 2011, 2012

Carl Reinhardt
University of Toronto

\$2,000/year
Sept 2011

Competitively Obtained Telescope Time as PI

Gemini South - GPI <i>GPI Spectroscopy and Polarimetry of CS Cha B</i>	4.3 hr <i>2019A</i>
Very Large Telescope - NaCo <i>Characterizing the polarized clouds in the Luhman 16 system with NACO</i>	3 nights <i>2019A</i>
Very Large Telescope - NaCo <i>An Unambiguous Detection of Clouds in the Nearest Brown Dwarf using NACO Polarimetry</i>	1 night <i>2018A</i>
Gemini South - GPI <i>Resolved Polarimetry of Neptune's Clouds with the Gemini Planet Imager</i>	3.4 hr <i>2017A</i>
Hubble Space Telescope - STIS <i>Resolving the late planet formation stages around young M-stars</i>	9 orbits <i>2017, 2018</i>
Gemini South - GPI <i>Constraining the dust grain population of Beta Pic's inner disk</i>	8.6 hr <i>2015B</i>
Gemini South - GPI <i>Characterizing the inner regions of the GJ 581 debris disk</i>	2 hr <i>2015A</i>

Teaching Experience

*All teaching carried out at the University of Toronto

AST 325/326: Introduction to Practical Astronomy <i>Teaching assistant - Responsible for administering laboratory tutorials and guest lectures</i>	<i>Sept 2012 - Apr 2016</i>
AST 251: Life on Other Worlds <i>Teaching assistant - Responsible for administering tutorials, and marking assignments/exams</i>	<i>July 2014 - Aug 2015</i>
AST 221: Stars and Planets <i>Teaching assistant - Responsible for administering tutorials, and marking assignments/exams</i>	<i>Sept 2013 - Dec 2013</i>
AST 101: The Sun and its Neighbours <i>Teaching assistant - Responsible for administering tutorials, and marking assignments/exams</i>	<i>May 2012 - June 2012</i>

Leadership and Outreach

Lorentz Center Workshop - Lead Organizer <i>Directly Imaging Exoplanets in Polarized Light with ELTs</i>	<i>Dec 2019</i>
Direct Imaging Journal Club - Organizer <i>A group meeting to discuss recent publications occurring once every two weeks</i>	<i>Jan 2018 - Present</i>
Astronomy on Tap Pasadena - Volunteer <i>A public outreach event that includes short talks, interactive activities and games, held at a local bar every month</i>	<i>May 2017 - Present</i>
Astronomy on Tap T.O. - Co-Founder and Organizer <i>A public outreach event that includes short talks, interactive activities and games, held at a local bar ~3 months</i>	<i>Sept 2014 - Sept 2016</i>

Star Formation and Exoplanet Discussion Group – Co-Founder and Organizer

A weekly discussion group covering topics related to exoplanets and stellar physics

Sept 2013 – Sept 2016

University of Toronto AstroTours – Telescope Operator/Planetarium Presenter

A monthly outreach event that includes a public lecture, planetarium shows and telescope observing

Sept 2012 – Sept 2016

University of Toronto Graduate Student Association – President

Duties include acting as the student representative to faculty, attending faculty meetings, overseeing graduate student initiatives, petitioning for increased funding packages, etc.

Sept 2012 – Sept 2014