

# 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 circumstellar disks, and the development of new instrumentation for future exoplanet studies.

## Current Position

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### Assistant Professor

University of California, Santa Barbara

Nov 2020 –

## Previous Positions

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### Robert A. Millikan Fellow

California Institute of Technology

Sept 2019–Oct 2020

### NASA Hubble Fellow

Jet Propulsion Laboratory

Sept 2016–2019

## Education

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### 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.....

#### Reimagining Instruction for the Student Experience (RISE) Institute

4-week Workshop

UCSB

August 2021

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

Workshop

Caltech

January 2019

#### Undergraduate Mentoring Series

A series designed to help mentors navigate the mentoring experience

Caltech

Summer 2017

## Service on PhD Committees

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**Jenny Smith**

*Department of Physics*

**UCSB**

*Mar 2021 - Present*

**Hawkins Clay**

*Department of Physics*

**UCSB**

*June 2021 - Present*

## Publications

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### First Author.....

**The polarization aberrations of the Gemini Telescope as seen by the Gemini Planet Imager**

*M. A. Millar-Blanchaer, R. Anche, M. Nguyen, J. Maire*

SPIE Conference Proceedings, Ground-based and Airborne Instrumentation for Astronomy IX, 121843X

*Aug 2022*

**WIRC-POL: 0.1% polarimetric precision on-sky with the installation of a HWP modulator**

*M. A. Millar-Blanchaer, S. Tinyanont, N. Jovanovic et al.*

PIE Conference Proceedings, Ground-based and Airborne Instrumentation for Astronomy VIII; 114475Y

*Mar 2021*

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

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

The Astrophysical Journal, vol. 894, Issue 1

*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*

**$\beta$  Pictoris' Inner Disk in Polarized Light and New Orbital Parameters for  $\beta$  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.....

**Polarization aberrations in next-generation giant segmented mirror telescopes (GSMTs). I. Effect on the coronagraphic performance**  
*R. Anche, J. Ashcraft, S. Haffert, M. A. Millar-Blanchaer et al.*  
Astronomy & Astrophysics, Volume 672, id.A121, 17 pp. Apr 2023

**Differential speckle polarimetry with SCEXAO VAMPIRES**  
*B. Safonov, M. A. Millar-Blanchaer, Z. Manxuan et al.*  
Journal of Astronomical Telescopes, Instruments, and Systems, Volume 9, id. 028005 Apr 2023

**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

**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

### Conferences Talks and Colloquia

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**The inner working angle you need to detect ocean glints with HabWorlds**  
*SPIE Optics and Photonics* Aug 2023

**Direct imaging and spectroscopy of exoplanetary systems with the JWST early release science program**  
*SPIE Astronomical Telescopes and Instrumentation* July 2022

**Characterizing Extrasolar Systems in Polarized Light**  
*ExSoCal 2020 Conference, Online* Sept 2020

**Characterizing Extrasolar Systems in Polarized Light**  
*ExSoCal 2020 Conference, Online* Sept 2020

**Characterizing Extrasolar Clouds in Polarized Light**  
*Colloquium, University of California, Santa Barbara* Jan 2020

**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

<b>Planetary System Polarimetry with TMT-PSI</b> <i>TMT Science Forum, Pasadena, CA, USA</i>	<i>Dec. 2018</i>
<b>Polarization Gratings for High Efficiency Spectropolarimetry</b> <i>Engineering Coffee, Arizona State University</i>	<i>Nov 2018</i>
<b>(spectro)Polarimetry of Brown Dwarfs with WIRC+Pol, GPI &amp; NACO</b> <i>Schmid Group Meeting, ETH Zurich</i>	<i>Oct 2018</i>
<b>Spectropolarimetry of Brown Dwarfs with WIRC+Pol</b> <i>ExoSoCal, Caltech, USA</i>	<i>Sept 2018</i>
<b>(spectro)Polarimetry of Brown Dwarfs with WIRC+Pol and NACO</b> <i>The Cloud Academy, Les Houches School of Physics, France</i>	<i>Sept 2018</i>
<b>Near-Infrared Spectropolarimetry of Brown Dwarfs with WIRC+Pol</b> <i>ESO Lunch talk, ESO Vitacura, Santiago</i>	<i>Apr 2018</i>
<b>(spectro)Polarimetry of Exoplanets and Brown Dwarfs</b> <i>Colloquium, Department of Physics, McGill University</i>	<i>Jan 2018</i>
<b>(spectro)Polarimetry of Exoplanets and Brown Dwarfs</b> <i>Physics Tea, Stanford University</i>	<i>Jan 2018</i>
<b>(spectro)Polarimetry of Exoplanets and Brown Dwarfs</b> <i>Center for Integrative Planetary Science Seminar, University of California, Berkeley</i>	<i>Jan 2018</i>
<b>(spectro)Polarimetry of Exoplanets and Brown Dwarfs</b> <i>Sagan Fellow Symposium, Caltech</i>	<i>Nov 2017</i>
<b>(spectro)Polarimetry of Exoplanets and Brown Dwarfs</b> <i>BDEXOCAN – The brown dwarf exoplanet connection 2017, University of Delaware, USA</i>	<i>Sept 2017</i>
<b>High Contrast Observations of Circumstellar Disks with the Gemini Planet Imager's Polarimetry Mode</b> <i>SPIE Optical Engineering + Applications, Polarization Science and Remote Sensing VIII</i>	<i>Aug 2017</i>
<b>Characterizing ExoPlanetary Systems with Polarized Light</b> <i>CASS - Astrophysics Seminar, University of California San Diego</i>	<i>May 2017</i>
<b>Characterizing ExoPlanetary Systems with Polarized Light</b> <i>Lunch Seminar Series, Leiden Observatory, University of Leiden</i>	<i>April 2017</i>
<b><math>\beta</math> Pictoris as seen by GPI: Polarized disk detection and multi-epoch astrometry of the directly imaged planet</b> <i>Spirit of Lyot 2015, Montreal, Canada</i>	<i>June 2015</i>
<b>Gemini Planet Imager: Speckle Suppression and the HD 61005 Debris Disk</b> <i>Astropol 2014, Grenoble, France</i>	<i>May 2014</i>
<b>Posters</b> .....	
<b>Characterizing Extrasolar Planetary Systems in Polarized Light with TMT-PSI</b> <i>AO4ELT6, Quebec City, QC, Canada</i>	<i>June 2019</i>
<b>Resolving the late planet formation stages around young M-stars in Upper Sco with HST/STIS</b> <i>AAS Winter Meeting, Seattle, USA</i>	<i>January 2019</i>
<b>Gemini Planet Imager Observational Calibrations XIV: Polarimetric Contrasts and New Data Reduction Techniques</b> <i>SPIE Astronomical Telescopes + Instrumentation 2016, Edinburgh, Scotland</i>	<i>June 2016</i>

<b>On-sky tests of a polarization grating for visible astronomy</b> <i>SPIE Astronomical Telescopes + Instrumentation 2016, Edinburgh, Scotland</i>	June 2016
<b>Polarization Gratings for Visible and Near-Infrared Astronomy</b> <i>SPIE Astronomical Telescopes + Instrumentation 2014, Montreal, QC, Canada</i>	June 2014
<b>Gemini Planet Imager Observational Calibrations VII: On-Sky Polarimetric Performance</b> <i>SPIE Astronomical Telescopes + Instrumentation 2014, Montreal, QC, Canada</i>	June 2014
<b>Polarimetry with the Gemini Planet Imager: Instrument Characterization and Future Science</b> <i>IAU Symposium 299: Exploring the formation and evolution of planetary systems, Victoria, BC, Canada</i>	June 2013
<b>Polarimetric Performance of the Gemini Planet Imager</b> <i>SPIE Astronomical Telescopes + Instrumentation 2012, Amsterdam, The Netherlands</i>	June 2012

## Teaching Experience

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<b>Physics 140: Optics, UC Santa Barbara</b> <i>Course Instructor</i>	Mar 2023 – Jun 2023
<b>Physics 132: Stellar Structure and Evolution, UC Santa Barbara</b> <i>Course Instructor</i>	Jan 2023 – Mar 2023
<b>Physics 134L: Observational Astrophysics, UC Santa Barbara</b> <i>Course Instructor</i>	Mar 2022 – Jun 2022
<b>Physics 134L: Observational Astrophysics, UC Santa Barbara</b> <i>Course Instructor</i>	Sept 2021 – Dec 2021
<b>Physics 134L: Observational Astrophysics, UC Santa Barbara</b> <i>Course Instructor</i>	Sept 2021 – Dec 2021
<b>Physics 4: Basic Physics, UC Santa Barbara</b> <i>Course Instructor</i>	Mar 2021 – Jun 2021
<b>AST 325/326: Introduction to Practical Astronomy, University of Toronto</b> <i>Teaching assistant – Responsible for administering laboratory tutorials and guest lectures</i>	Sept 2012 – Apr 2016
<b>AST 251: Life on Other Worlds, University of Toronto</b> <i>Teaching assistant – Responsible for administering tutorials, and marking assignments/exams</i>	July 2014 – Aug 2015
<b>AST 221: Stars and Planets, University of Toronto</b> <i>Teaching assistant – Responsible for administering tutorials, and marking assignments/exams</i>	Sept 2013 – Dec 2013
<b>AST 101: The Sun and its Neighbours, University of Toronto</b> <i>Teaching assistant – Responsible for administering tutorials, and marking assignments/exams</i>	May 2012 – June 2012

## Leadership and Outreach

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<b>Scientific Organizing Committee Member</b> <i>Techniques and Instrumentation for Detection of Exoplanets XI</i>	Aug 2023
<b>Scientific Organizing Committee Member</b> <i>Keck Science Meeting 2022</i>	Sept 2022

**2-day Online Workshop – Lead Organizer**  
*Visible Light Science with Keck 2022* June 2022

**Scientific Organizing Committee Member**  
*University of California Observatories Keck Time Allocation Committee* Mar 2021 - Ongoing

**Scientific Organizing Committee Member**  
*Keck Science Meeting 2021* Sept 2021

**Lorentz Center Workshop – Lead Organizer**  
*Directly Imaging Exoplanets in Polarized Light with ELTs* Dec 2019

**Direct Imaging Journal Club - Organizer, Caltech**  
*A group meeting to discuss recent publications occurring once every two weeks* Jan 2018 – Mar 2020

**Astronomy on Tap Pasadena – Volunteer**  
*A public outreach event that includes short talks, interactive activities and games, held at a local bar every month* May 2017 – Mar 2020

**Astronomy on Tap T.O. – Co-Founder and Organizer**  
*A public outreach event that includes short talks, interactive activities and games, held at a local bar ~3 months* Sept 2014 – Sept 2016

**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