

Dana Simard

PHD CANDIDATE · DEPARTMENT OF ASTRONOMY & ASTROPHYSICS · UNIVERSITY OF TORONTO

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Research Interests

- the interaction of emission from compact radio sources with the intervening plasma
- studies of the ISM on 0.1-AU scales using multi-epoch pulsar Very Long Baseline Interferometry (VLBI)
- theoretical models of scattering
- the removal of scintillation from timing observations
- interstellar scattering as a probe of pulsar emission

Education

University of Toronto

PHD IN ASTRONOMY AND ASTROPHYSICS

Toronto, Ontario, Canada

September 2015 - Exp. August 2019

University of Toronto

MSC IN PHYSICS

Toronto, Ontario, Canada

September 2014 - August 2015

Queen's University

BSC(HONS) IN PHYSICS

Kingston, Ontario, Canada

September 2010 - April 2014

Journal Articles

Disentangling interstellar plasma screens with pulsar VLBI: Combining auto- and cross-correlations

D. SIMARD, U.-L. PEN, V.R. MARTI AND W. BRISKEN, 2018

submitted to *Monthly Notices of the Royal Astronomical Society*, arXiv:1810.07231

Predicting pulsar scintillation from refractive plasma sheets

D. SIMARD AND U.-L. PEN, 2018

Monthly Notices of the Royal Astronomical Society, Volume 478, Issue 1, 983-994

Conference Proceedings

The stellar mass of M31 as inferred by the Andromeda Optical and Infrared Disk Survey

J. SICK, S. COURTEAU, J.-C. CUILLANDRE ET AL. (INCL. D. SIMARD)

Proceedings of the International Astronomical Union, 10(S311), 82-85

Selected Presentations

Five hundred meter Aperture Spherical Telescope (FAST)

MEASURING SEPARATIONS AND MOTIONS OF PULSE COMPONENTS WITH PULSAR SCINTILLOMETRY

Kedu, Guizhou, China

October 2018

Global Radio Scintillometry Astrophysics 2018, contributed presentation

RECONSTRUCTING COMPLEX PULSAR SCATTERING ENVIRONMENTS WITH GLOBAL VLBI

Shanghai, China

October 2018

Max Planck Institut fuer Radioastronomie

RECONSTRUCTING COMPLEX PULSAR SCATTERING ENVIRONMENTS WITH GLOBAL VLBI

Bonn, Germany

October 2018

ASTRON

RECONSTRUCTING COMPLEX PULSAR SCATTERING ENVIRONMENTS WITH GLOBAL VLBI

Dwingeloo, Holland

October 2018

Anton Pannekoek Institute for Astronomy

RECONSTRUCTING COMPLEX PULSAR SCATTERING ENVIRONMENTS WITH GLOBAL VLBI

Amsterdam, Holland

October 2018

Jodrell Bank Center for Astrophysics

RECONSTRUCTING COMPLEX PULSAR SCATTERING ENVIRONMENTS WITH GLOBAL VLBI

Manchester, UK

October 2018

EVN Symposium 2018, contributed presentation

RECONSTRUCTING COMPLEX PULSAR SCATTERING ENVIRONMENTS WITH GLOBAL VLBI

Granada, Spain

October 2018

Scintillometry Workshop 2017, contributed presentation

A PREDICTIVE MODEL OF PULSAR SCINTILLATION

Toronto, Canada

October 2017

NRAO lunch talk

A PREDICTIVE MODEL OF PULSAR SCINTILLATION

Socorro, USA

September 2017

International Union of Radio Science General Assembly, contributed presentation

A PREDICTIVE, PHYSICAL MODEL OF SCINTILLATION

McGill, Canada

June 2018

Scintillometry Workshop 2016 at MPIfR, contributed presentation

PREDICTING PULSAR SCINTILLATION

Bonn, Germany

September 2016

Canadian Undergraduate Physics Conference 2012, contributed presentation

THE INNER MASS PROFILE OF M31

Vancouver, Canada

October 2012

Other Attended Meetings

- 16th Synthesis Imaging Workshop, NRAO, Socorro, USA, May 2018
- Cosmic Flows (and other novelties on large scales), Perimeter Institute, Waterloo, Canada, August 2015
- Introduction to Astronomical Instrumentation Summer School, Dunlap Institute, Toronto, Canada, August 2013
- Mauna Kea Graduate School, February 2013

Selected Honors & Awards

Postgraduate Scholarship at the University of Toronto

NATIONAL SCIENCE AND ENGINEERING RESEARCH COUNCIL OF CANADA

\$21000/yr

September 2016 - Present

Dunlap Institute Graduate Fellowship at the University of Toronto

DUNLAP INSTITUTE FOR ASTRONOMY AND ASTROPHYSICS

\$5000/yr

September 2015 - August 2017

Allen Yen Award for students who have undertaken particularly notable research

UNIVERSITY OF TORONTO

\$1000/yr

January 2017

Medal in Physics for the top Physics graduate

QUEEN'S UNIVERSITY

June 2014

Prince of Wales Prize, Hon. Mention for the top BSc graduate

QUEEN'S UNIVERSITY

June 2014

Undergraduate Student Research Award at Queen's University at Kingston

NATIONAL SCIENCE AND ENGINEERING RESEARCH COUNCIL OF CANADA

\$4500/yr

May 2014 to August 2014

Helen McLeod Reeve Scholarship

QUEEN'S UNIVERSITY AT KINGSTON

\$1725/yr

September 2013 to April 2014

Undergraduate Student Research Award at the University of Toronto

NATIONAL SCIENCE AND ENGINEERING RESEARCH COUNCIL OF CANADA

\$4500/yr

May 2013 to August 2013

Undergraduate Student Research Award at Queen's University at Kingston

NATIONAL SCIENCE AND ENGINEERING RESEARCH COUNCIL OF CANADA

\$4500/yr

May 2012 to August 2012

Arthur Loudon Scholarship

QUEEN'S UNIVERSITY AT KINGSTON

\$6260/yr

September 2011 to April 2012

Successful PI Proposals

Evolution of the Scattering Screen of PSR B1133+16

CYCLE 33

GMRT

48 hours

Scintillation of FRB121102 and the associated persistent radio sources

CYCLE 17B

VLBA/HSA

50 hours

Measuring the scattering screen of PSR B1508+55

DIRECTOR'S DISCRETIONARY TIME DURING CYCLE 33

GMRT

5 hours

Research Experience

PhD Thesis

ADVISOR: UE-LI PEN

University of Toronto

September 2015 - present

- Investigation of the phenomenon of scintillation arcs in pulsar secondary spectra via analysis of multi-epoch, large bandwidth pulsar observations and modelling of scattering within the ISM.

MSc Thesis

ADVISOR: UE-LI PEN

University of Toronto

September 2014 - August 2015

- Explored the use of semi-analytical models in the stiff approximation to calculate the evolution of the neutrino power spectrum in a Λ CDM cosmology.

BSc Thesis and summer research

ADVISOR: STÉPHANE COURTEAU

Queen's University

April 2012 - August 2014

- Constrained multi-component mass models of M31 using kinematic data and multi-band luminosity profiles coupled with models of non-axisymmetries in the disk and Bayesian statistical techniques.

Undergraduate Student Research Assitanship

ADVISOR: ROBERTO ABRAHAM

University of Toronto

Summer 2013

- Developed an automated procedure for the rapid reduction of optical observational data from the Dragonfly Array, a telescope array optimized for low surface brightness imaging of galaxies.

Teaching Experience

AST325/326 - Practical Astronomy

TEACHING ASSISTANT, DEPT. OF ASTRONOMY & ASTROPHYSICS

University of Toronto

Winter 2019, Fall 2018

- responsible for planning and leading tutorials, holding lab sessions, holding help sessions, marking

AST222 - Galaxies and Cosmology

TEACHING ASSISTANT, DEPT. OF ASTRONOMY & ASTROPHYSICS

University of Toronto

Winter 2018

- responsible for planning and leading tutorials, holding help sessions, marking

AST 101 - The Sun and Its Neighbours

TEACHING ASSISTANT, DEPT. OF ASTRONOMY & ASTROPHYSICS

University of Toronto

Fall 2017, Fall 2016, Fall 2015

- responsible for leading and facilitating tutorials, marking term projects, and mentoring students

PHY132 - Introduction to Physics

TEACHING ASSISTANT, DEPT. OF PHYSICS

University of Toronto

Winter 2015, Fall 2014

- responsible for leading tutorials, marking, and mentoring students

ENPH/PHYS 239 - Electromagnetism

MARKER, DEPT. OF PHYSICS, ENGINEERING PHYSICS, AND ASTRONOMY

Queen's University at Kingston

Winter 2014

- responsible for marking of assignments

Advising Experience

Fardin Syed, Undergraduate summer project

CO-SUPERVISED WITH UE-LI PEN

University of Toronto

Summer 2018

- Resolving the magnetosphere of PSR B1133+16

Ariel Amaral, AST1501 project

CO-SUPERVISED WITH UE-LI PEN

- The distance to the scattering screen of PSR B1133+16

University of Toronto

Fall 2017, Winter 2018

Béatrice Déry, Undergraduate summer project

CO-SUPERVISED WITH UE-LI PEN

- Reconstructing the scattered image of PSR B0834+06

University of Toronto

Summer 2017

Outreach and Service

University of Toronto Dept. of Physics Mentorship Network

MENTOR TO UNDERGRADUATE STUDENTS

September 2017 - present

- Mentor to undergraduate students interested in pursuing an academic career in astrophysics
- Assisted with course selection, networking, applications to summer research positions, applications to graduate studies, etc.

Astro Workshop 2018: Professional Development for Teachers of Astronomy

MEMBER OF THE WORKSHOP DESIGN TEAM

August 2018

- Part of a team that designed hands-on activities for teachers of grades 6-12 to use in the classroom. Teachers carried out the activities and learned background astronomy material at a 3 day workshop.

Scintillometry Workshop 2017

MEMBER OF THE LOCAL ORGANIZING COMMITTEE

October 2017

Astronomy on Tap TO, organized by the Dunlap Institute, Toronto, ON

PUBLIC TALK: UNCOVERING PULSARS FROM ALGONQUIN PARK

August 2017

University of Toronto Graduate Astronomy Student Association Mental Health Committee

COMMITTEE MEMBER

April 2017 - October 2018

- Organized mental health workshops for graduate students, and coordinating with faculty and post-docs to facilitate similar workshops tailored towards them.

University of Toronto AstroTours

CO-PRESIDENT

September 2016 - December 2017

- AstroTours is a graduate student outreach initiative that includes monthly public lectures and open-house events
- Duties included planning and coordinating events, marketing AstroTours, and overseeing the AstroTours team.

Scintillometry Workshop 2016

MEMBER OF THE SCIENTIFIC ORGANIZING COMMITTEE

September 2016

University of Toronto AstroTours

PERSONNEL MANAGER

September 2015 - September 2016

- AstroTours is a graduate student outreach initiative that includes monthly public lectures and open-house events
- As personnel manager, my duties included organizing events, recruiting volunteers for events, and ensuring that volunteers received the correct training.