

# Dr. Nathan Deg

Department of Astronomy  
University of Cape Town  
Cape Town, South Africa

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## Degrees and Academic Positions

- **University of Cape Town** Cape Town, SA  
*SARChI Postdoctoral Fellow* 2015 – present
- **Queen’s University** Kingston, ON  
*Ph.D. Astrophysics* 2010 – 2014
  - Advisor: Lawrence Widrow
  - Thesis: Streams and the Milky Way
- **Queen’s University** Kingston, ON  
*M.Sc. Astrophysics* 2007 – 2010
  - Advisor: Lawrence Widrow
  - Thesis: Dynamic Made-To-Measure: A Method of Making Dynamically Self-Consistent Triaxial Halos
- **Saint Mary’s University** Halifax, N.S.  
*B.Sc. Astrophysics* 2003 – 2007
  - Graduated with Honors in Astrophysics and a Minor in Philosophy
  - Graduated with Summa Cum Laude
  - Advisor: Aleksandrs Aleksajevs
  - Thesis: Calculating Asymmetries In Electron-Proton Scattering

## Publications

### Peer-Reviewed Journal Articles

5. Deg, N., Widrow, L., Carignan, C., and Randriamampandry, T. H., GalactICS with Gas, submitted to
4. Randriamampandry, T. H., Deg, N., Carignan, C., and Widrow, L. [Simulating non-axisymmetric flows in disc galaxies](#). Accepted by A&A
3. Randriamampandry, T. H., Deg, N., Carignan, C., Combes, F., and Spekkens, K. [Exploring the GalMer database: bar properties and non-circular motions](#). A&A, 594, A86, 2016
2. Randriamampandry, T. H., Combes, F., Carignan, C., and Deg, N. [Estimating non-circular motions in barred galaxies using numerical N-body simulations](#). MNRAS, 454, 3743, 2015
1. N. Deg and L. Widrow. [Incorporating Streams into Milky Way Models](#). MNRAS, 439, 2678, 2014
0. N. Deg and L. Widrow. [The Sagittarius Stream and halo triaxiality](#). MNRAS, 428, 912, 2013.

## Unpublished Manuscripts

1. A. Aleksejevs, S. Barkanova, P. G. Blunden, and N. Deg. [Electroweak Hard Bremsstrahlung in Electron-Nucleon Scattering](#). arXiv:0707.0657 [nucl-th]

## Conference Presentations

- **GalactICS with Gas**  
*SKA South Africa Bursary Conference 2017 (Cape Town)* 2017
- **GalactICS with Gas: Making Equilibrium Galaxies with Gas**  
*SKA South Africa Bursary Conference 2016 (Cape Town)* 2016
- **Streams Out of Clouds: The Particle Cloud method of modelling stellar streams**  
*South Africa Institute of Physics Annual Conference 2016 (UCT)* 2016
- **Stream Modelling: A Quick Comparison**  
*Stellar Streams Ringberg 2015 (Ringberg Castle)* 2015
- **Stellar Streams: Modelling & Methodology**  
*South Africa Institute of Physics Annual Conference 2015 (Port Elizabeth)* 2015
- **Combining Stellar Streams with other Observational Constraints**  
*Gaia Challenge Workshop (U. of Surrey)* 2013
- **The Milky Way and the Sagittarius Stream**  
*Santa Fe Cosmology Workshop (Santa Fe)* 2012
- **Calculating Asymmetries in Electron-Proton Scattering**  
*Winter Nuclear and Particle Physics Conference (Banff)* 2007
- **Calculating Asymmetries in Electron-Proton Scattering**  
*Canadian Undergraduate Physics Conference (University of New Brunswick)* 2006

## Conference Posters

- **GalactICS with Gas**  
*The Role of Gas in Galaxy Dynamics (Valetta, Malta)* 2017
- **Stellar Streams and the Milky Way**  
*SKA South Africa Bursary Conference 2015 (Stellenbosch)* 2015
- **The Sagittarius Stream, Statistics, and the Shape of the Dark Halo**  
*Statistical Challenges in Modern Astronomy (Penn State)* 2011
- **The Sagittarius Stream, Statistics, and the Shape of the Dark Halo**  
*CASCA 2011 (U. Western Ontario)* 2011
- **Modelling The Milky Way: A Cautionary Tale**  
*CASCA 2010 (Saint Mary's University)* 2010
- **Modelling The Milky Way: A Cautionary Tale**  
*CITA 25 (U. Toronto)* 2010
- **Made To Measure made Simple and Self-Consistent**  
*Unveiling The Mass (Queen's University)* 2009

## Supervision

- **Nadine Hank** 2017-2018
  - Masters student
  - Investigating asymmetries in interacting galaxies with simulations.
  - Co-supervisor with Prof. Sarah Blyth
- **Simon Krüger** 2017-2017
  - Honours student
  - Investigating asymmetries in interacting galaxies with simulations.
  - Co-supervisor with Prof. Claude Carignan and Prof. Sarah Blyth
- **Toky Randriamampandry** 2015-2017
  - Ph.D student
  - Studying non-circular motions induced by galactic bars.
  - Co-supervisor under Prof. Claude Carignan for the final portion of his Ph.D.

## Teaching Experience

- **Galactic and Extragalactic Astronomy** UCT  
*Guest Lecturer* 2018
  - Taught a large portion of the main 3rd year astronomy course.
- **Computational Astrophysics** UCT  
*Lecturer* 2018
  - One of three instructors for the Masters course in computational astrophysics.
  - Developed material for the first quarter of the course.
  - Wrote appropriate assignments covering this material.
- **Masters of Data Science in Astronomy** UCT  
*Lecturer* 2017
  - Developed and delivered material on N-Body simulations for the overall course.
- **Physics For Life Sciences (Phys117)** Queen's University  
*(Senior) T.A.* 2007-2014
  - Run multiple 1.5 hour tutorial sections for students
  - Marked one long answer question on winter and spring exams.
  - Guided first year lab sections

## Awards, Grants & Honours

R. Samuel McLaughlin Fellowship	2013
Queen Elizabeth II Scholarship Science Technology	2010 – 2012
NSERC PGS-M	2007 – 2009
Achievement Scholarships - Saint Mary's University	2005 – 2009

## Public Talks

- **Making Galaxies 101**  
*100 UP program* 2018
- **The Milky Way**  
*SAAO Open House* 2016  
*Queen's Observatory Open House* 2014
- **Radio Astronomy**  
*Queen's Observatory Open House* 2016
- **How Big is the Universe**  
*Queen's Observatory Open House* 2010
- **How do we Know the Invisible Exists: Dark Matter**  
*Queen's Observatory Open House* 2010
- **Space Travel: Past, Present, And (Mostly) Future**  
*Queen's Observatory Open House* 2009

## Technical Skills

- Galaxy scale simulations
- Bayesian statistics and MCMC algorithms
- Comparing simulations to observations
- Programming Languages
  - Fortran, Python, some C and R