

## EDUCATION

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**University of Chicago | Postdoctoral scholar | Chicago, IL** **Present**

**Associate Fellow at the Kavli Institute for Cosmological Physics (KICP)**

- Leader of the simulation group within a small collaboration (~15 people) developing a class-leading next-generation detector for ultra-high energy cosmic rays, the Fluorescence detector Array of Single-pixel Telescopes (FAST).
- Design, development and installation of the detector, as well as analysis of initial R&D data.
- Work closely with both the large-scale anisotropy and atmospheric monitoring task-forces of the Pierre Auger Observatory (Auger — an international collaboration of ~400 scientists).
- Co-supervise graduate and undergraduate students on high-impact analyses within the Auger and FAST collaborations.
- Present results on behalf of both the FAST and Auger collaborations at large international conferences.
- Active member of the Gargoyle Consulting Club.

**University of Adelaide | Adelaide, South Australia** **June 2016**

**Doctor of Philosophy (Ph.D.) in Physics**

- Thesis title: “Systematic Effects in the Measurement of Vertical Aerosol Profiles at the Pierre Auger Observatory.”
- Development of advanced laser-based techniques for determining the vertical distribution of atmospheric aerosols responsible for the attenuation and scattering of fluorescence light from extensive air showers.
- Significantly reduced the systematic uncertainty associated with measurements of the aerosol atmosphere.
- Algorithm now adopted by the collaboration for the reconstruction of all data recorded at Auger.
- Highly active member the atmospheric monitoring taskforce.
- Presentations at collaboration and analysis meetings.

**University of Adelaide | Adelaide, South Australia** **December 2012**

**Master of Philosophy (M.Phil.) in Physics**

- Thesis title: “Studies of Fluorescence Profile Reconstruction Systematics at the Pierre Auger Observatory.”
- Systematic studies of the reconstruction of the Cherenkov light contaminating data measured with the Observatory’s fluorescence detectors.

**University of Adelaide | Adelaide, South Australia** **December 2010**

**B.Sc. (Space Science and Astrophysics)**

- Majored in Physics and Theoretical Physics.
- GPA: 6.4/7 (91%).

**Training:** Modelling and algorithm development, Monte Carlo simulation, analysis pipeline development, statistical analysis of very large datasets, optimisation, supervision and teaching, public speaking and presentations, academic/paper writing.

**Software:** C++, ROOT data analysis framework, Python, MATLAB, PowerPoint, Excel, Microsoft Office suite.

## EXPERIENCE

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**Associate Fellow | University of Chicago | Chicago, IL** **July 2016 – Present**

- Large-scale anisotropy studies with data from the Pierre Auger Observatory, along with extensive work on characterisation of the atmosphere above the array — essential for the accurate reconstruction of air shower data, and by extension the quality of all of the collaboration’s science output.
- Design, installation, and commissioning of the first prototype of the Fluorescence detector Array of Single-pixel Telescopes in Utah, USA.

**Graduate Student | University of Adelaide | Adelaide, South Australia** **January 2011 – June 2016**

- Studied systematic effects in the reconstruction of air shower data with the Pierre Auger Observatory's fluorescence detector.
- Developed a novel algorithm for the reconstruction of the aerosol optical depth above the array, taking into account the complicating effects of multiple-scattered laser light for the first time.

**Research Assistant | Swinburne University | Melbourne, Australia** **January 2010 – March 2011**

- Construction of Tully-Fisher relationships for a sample of ~25,000 galaxies from the Sloan Digital Sky Survey.
- Work published in the Monthly Notices of the Royal Astronomical Society.

**Teaching Assistant | University of Adelaide | Adelaide, South Australia** **January 2011 – June 2016**

- Lead lab instructor for introductory physics, astronomy and engineering courses.
- Tutor for introductory physics and mathematics courses.

**Mathematics and Physics Tutor | Adelaide, South Australia** **2009 – 2016**

- Worked both privately and for various tutoring businesses and schools.
- Developed and provided lessons for students of all ages (~5–60) and education levels on mathematics- and physics-related topics.

**Showroom Coordinator | REPCO | Auckland, New Zealand** **January 2007 – December 2007**

- Coordinated with head office on the layout of the retail showroom.
- Time-critical procurement of parts for trade and retail customers.

## **AWARDS AND SCHOLARSHIPS**

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Dean's Commendation for Doctoral Thesis Excellence	2016
Faculty of Sciences Divisional Scholarship	2013
Australian Postgraduate Award	2011
Centre for Astrophysics & Supercomputing Vacation Scholarship	2011 / 2010
Faculty of Sciences Outstanding Academic Achievement Award	2010 / 2009

## **OUTREACH ACTIVITIES**

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**Life Long Learning Program Coordinator | KICP | University of Chicago**

- Primary contact and organiser of the Kavli Institute for Cosmological Physics' Life Long Learning program.
- Public lecturer as part of KICP's Life Long Learning program, regularly presenting science lectures to older adults across Chicago.

## **SCIENTIFIC COLLABORATIONS AND SOCIETIES**

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American Institute of Physics	2017 – Present
Fluorescence detector Array of Single-pixel Telescopes Collaboration	2014 – Present
Pierre Auger Auger Collaboration	2012 – Present
Astronomical Society of Australia	January 2011 – December 2016
Australian Institute of Physics	January 2011 – December 2016
Institute for Photonics and Advanced Sensing	January 2011 – July 2016