

# Sanjaykumar Patil

## Education

2010–2015 **Integrate BS-MS**, Indian Institute of Technology-Kharagpur (IIT), Kharagpur, CGPA: **8.96/10**.

Master Thesis: Probing Galaxy Cluster mass discrepancy using  $f(R)$  gravity

**Supervisor: Prof. Somnath Bharadwaj**, IIT-Kharagpur, West Bengal, India - 721302

2015-2019 **Ph.D.**, School of Physics, The University of Melbourne, Melbourne.

(expected) Thesis title: Weighing the giants with CMB lensing

**Supervisor: Dr. Christian Reichardt**, The University of Melbourne

## Honors & Awards

2010-2015 Inspire Fellowship, DST, Government of India

2015-2019 Melbourne International Engagement Award, The University of Melbourne

2017 Jean. Laby PhD Travel Bursary, The University of Melbourne

2017-2018 Science Student Ambassador, The University of Melbourne

## Publications

### Refereed Journal Articles

- Measuring galaxy cluster masses with CMB lensing using a Maximum Likelihood estimator: Statistical and systematic error budgets for future experiments

S. Raghunathan, **S. Patil** et al., JCAP, 8, 030. doi: 10.1088/1475-7516/2017/08/030.[arXiv:1705.00411 [astro-ph.CO]]

- Mass Calibration of Optically Selected DES clusters using a Measurement of CMB-Cluster Lensing with SPTpol Data

S. Raghunathan, **S. Patil** et al., [arXiv:1810.10998 [astro-ph.CO]] (submitted to ApJ)

- A Measurement of CMB Cluster Lensing with SPT and DES Year 1 Data

E.J. Baxter et al., MNRAS. doi: 10.1093/mnras/sty305. [arXiv:1708.01360 [astro-ph.CO]]

- Spectroscopic Confirmation of Five Galaxy Clusters at  $z > 1.25$  in the 2500 sq. deg. SPT-SZ Survey

G. Khullar et al., [arXiv:1806.01962 [astro-ph.CO]] (submitted to ApJ)

- Measurement of the Splashback Feature around SZ-selected Galaxy Clusters with DES, SPT and ACT

T. Shin et al., [arXiv:1811.06081 [astro-ph.CO]] (submitted to MNRAS)

- Cluster Cosmology Constraints from the 2500 deg<sup>2</sup> SPT-SZ Survey: Inclusion of Weak Gravitational Lensing Data from Magellan and the Hubble Space Telescope

S. Bocquet et al., [arXiv:1811.06081 [astro-ph.CO]] (submitted to ApJ)

### In preparation

- A robust cluster lensing quadratic estimator to handle the thermal SZ effect in CMB temperature maps

**S. Patil** et al (in collaboration review)

- A measurement of CMB-Cluster lensing using SPTpol Polarization-only MAPS

**S. Patil** et al

## Talks

11/2016 **CosPA 2016**, University of Sydney, Sydney, Australia

"Measuring mass of Galaxy Clusters using CMB lensing"

06/2017 **Annual Scientific Meeting**, ANU, Canberra, Australia

- "Measuring mass of Galaxy Clusters using CMB lensing"  
 08/2017 **University of Pennsylvania**, Pennsylvania, USA  
 "Measuring mass of Galaxy Clusters using CMB lensing"  
 11/2017 **The CMB from A to Z**, Cargese, France  
 "Measuring mass of Galaxy Clusters using CMB lensing"  
 11/2017 **Leiden Observatory**, Leiden, Netherlands  
 "Measuring mass of Galaxy Clusters using CMB lensing"  
 06/2018 **Annual Scientific Meeting**, Swinburne University, Melbourne, Australia  
 "First detection of cluster lensing in CMB polarisation data"  
 07/2018 **Yale University**, connecticut, USA  
 "Weighing the giants with CMB lensing"  
 07/2018 **New York University**, New York, USA  
 "Weighing the giants with CMB lensing"  
 08/2018 **Stony Brook University**, New York, USA  
 "Weighing the giants with CMB lensing"

## Conferences & Workshops

- 04/2016 **SciCoder**, The University of Melbourne, Melbourne, Australia  
 07/2016 **Harley Wood School of Astronomy**, Sydney, Australia.  
 07/2016 **Annual Scientific Meeting**, University Of Sydney, Sydney, Australia  
 11/2016 **CosPA**, University of Sydney, Sydney, Australia  
 07/2017 **Annual Scientific Meeting**, ANU, Canberra, Australia  
 11/2017 **The CMB from A to Z**, Cargese, France  
 06/2018 **Annual Scientific Meeting**, Swinburne University, Melbourne, Australia

## Outreach

- Volunteer Star Gazing Live World Record Attempt  
 Talk Year 10 Work Experience Week  
 "Early Universe"

## Positions held

- 2016-2017 **Lab Demonstrator**, From the Solar System to the Universe, The University of Melbourne  
 2017-2018 **Physics Fundamentals Tutor**, The University of Melbourne  
 2017-2018 **Astro Group Meeting Organiser**, School of Physics, The University of Melbourne  
 2018- **President of Badminton Club**, Graduate Student Association, The University of Melbourne

## Computer skills

- Programming Python, C, Fortran(basic)  
 Languages  
 Softwares Mathematica, MATLAB, CAMB

## References

**Prof. Somnath Bharadwaj**  
 Professor, Department of Physics  
 Indian Institute of Technology-Kharagpur  
 India - 721302  
 ✉ somnath@phy.iitkgp.ernet.in  
 ☎ +91-3222-283806

**Dr Christian Reichardt**  
 Senior Lecturer, School of Physics  
 The University of Melbourne, Melbourne  
 Australia - 3010  
 ✉ christian.reichardt@unimelb.edu.au  
 ☎ +61-3-8344-1436

**Assoc. Prof. Tom Crawford**

Research Associate Professor, Department of Astronomy and Astrophysics

Kavli Institute of Cosmological Physics, University of Chicago

USA - 60637

✉ [tcrawfor@kicp.uchicago.edu](mailto:tcrawfor@kicp.uchicago.edu)

☎ +1-773-702-1564