

LIJU PHILIP

lijuphil@gmail.com | Skype: lju.philip

EDUCATION

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| Ph.D. in Physics
University of KwaZulu-Natal, South Africa | Apr 2019 |
| MSc. in Physics
Rhodes University, South Africa | Jan 2016 |
| B.E. in Instrumentation Engineering
University of Mumbai, India | May 2009 |

PROFESSIONAL EXPERIENCE

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| NASA Jet Propulsion Laboratory
<i>Postdoctoral Researcher</i> | Oct 2020 - present
California, USA |
| <ul style="list-style-type: none">• Working on CO intensity mapping experiment called COMAP• Involved in hardware and software efforts, mainly astronomical instrumentation, calibration, data analysis, and software development• Full-time telescope operator managing observing schedules, system checks, planned maintenance, etc. | |
| University of KwaZulu-Natal
<i>Graduate Student Researcher</i> | Feb 2016 - Apr 2019
Durban, South Africa |
| <ul style="list-style-type: none">• Developed RF electronics for radio telescopes to observe the Universe at lower frequencies• Led efforts in astronomical instrumentation, system integration, signal processing, remote deployments, data analysis and mechanical designing• Undertook three voyages (2016-18) to Marion Island in the sub-Antarctic to deploy radio telescopes• Published first-author paper in a leading astronomical instrumentation journal and presented my work at various national and international conferences• Mentored four undergraduate students in their vacation research projects | |
| Raman Research Institute
<i>Visiting Student</i> | Oct 2011 - Apr 2012
Bangalore, India |
| <ul style="list-style-type: none">• Implemented a server-client networking model using Unix/Linux at Gauribidanur radio observatory• Conducted astronomy events at Gauribidanur radio observatory | |
| Accenture Services Pvt. Ltd.
<i>Software Engineer</i> | Dec 2009 - Apr 2011
Mumbai, India |
| <ul style="list-style-type: none">• Worked on data integration projects (using TIBCO & Gentran) with collaborators from USA and Denmark• Successfully completed Accenture Greenfield Training | |

RESEARCH EXPERIENCE

PRIZM deployment

Instrumentation expert

Apr - May 2016, 2017, 2018
Marion Island, Prince Edwards Islands

- Lead developer of PRIZM RF and electrical instrumentation
- Designed mechanical support structures for the antennas
- RFI characterization of Marion Island
- Data analysis and calibration

CHAMP SCHOLAR

Research Visitor

Jun - Aug 2017
University of California, Berkeley

- Worked on socket programming for testing HERA data packets using Python
- Provided technical support to the HYPERION experiment on test deployments to Owens Valley Radio Observatory
- Developed a quicklook script using Python for faster feedback on data quality during remote deployments

HERA SUMMER COHORT

Research Visitor

Aug 2016
University of California, Berkeley

- Worked on FPGA programming for a wideband spectrometer

RHODES CENTRE FOR RADIO ASTRONOMY TECHNIQUES & TECHNOLOGIES

Postgraduate Student Researcher

Mar 2014 - Jan 2016
Rhodes University, South Africa

- Calibration and image processing using PAPER-32 data
- Played an active role in RATT journal club and seminars

SKILLS

Software and technical tools: Python, HTML, Raspberry pi & Arduino programming, Latex, Git, Excel, PowerPoint, Google Suite, Jupyter notebook, CASA, Matlab, Simulink, Autocad, FreeCAD, Xilinx, Eagle PCB design and schematic software, cocoaNEC

Instrumentation: RF electronics, system integration and automation, FPGA programming, electrical circuit designing, deploying instruments at remote sites

Machine Shop: Electronic circuit designing, soldering, lathes, mills, welding and presses

Amateur astronomy: Optical telescope operation and astrophotography

TALKS (*selected*)

Seminar, JPL, California	Dec, 2019
Seminar, NCRA-TIFR, Pune, India	Dec, 2018
Science at low-frequencies V, Japan	Dec, 2018
MIT Haystack Observatory, Boston	Aug, 2018
Indian Institute of Technology Bombay	Jan, 2018
Tata Institute of Fundamental Research, Mumbai	Jan, 2018
Science at low-frequencies IV, Sydney	Dec, 2017
University of Melbourne	Dec, 2017
Swinburne University, Melbourne	Dec, 2017

The Astronomical Society of Southern Africa, Durban	Sept, 2017
California State Polytechnic University, Pomona	Aug, 2017
University of California, Berkeley	Aug, 2017
Arizona State University, Tempe	Jul, 2017
South African Institute of Physics Conference, Port Elizabeth	Jun, 2015
Rhodes University Postgraduate Conference, Grahamstown	Mar, 2015
Rhodes University Interdisciplinary Postgraduate Conference, Grahamstown	Oct, 2014

PUBLICATIONS

Thomas J. Rennie, Stuart E. Harper, Clive Dickinson, **Liju Philip** et al 2021 "COMAP Early Science: VI. A First Look at the COMAP Galactic Plane Survey"

The Astrophysical Journal

HC Chiang, T Dyson, E Egan,... **L. Philip** et al. 2020 "The Array of Long Baseline Antennas for Taking Radio Observations from the Sub-Antarctic"

Journal of Astronomical Instrumentation <https://www.worldscientific.com/doi/abs/10.1142/S2251171720500191>

L. Philip et al. 2018 "Probing Radio Intensity at high-Z from Marion: 2017 Instrument"

Journal of Astronomical Instrumentation <https://www.worldscientific.com/doi/10.1142/S2251171719500041>

STUDENTS MENTORED

Ms. Annarien Bester

BSc. student, University of KwaZulu-Natal, Westville Campus

Project : Designing a Faraday cage for an autonomous radio receiver (2018)

Mr. Scott Eyono

B-Tech student, University of KwaZulu-Natal, Howard College

Project : Developing a real-time spectrum viewer for PRIZM (2018)

Mr. Moinudeen Mohamed

BSc. student, University of KwaZulu-Natal, Westville Campus

Project : Characterizing the ripples in LMR400 coaxial transmission line (2018)

Ms. Veruschka Simes

BSc. student, University of KwaZulu-Natal, Westville Campus

Projects : A master switch control circuit to operate latching electromechanical switches (2018)

Backend amplification unit for a RFI survey kit (2017)

PUBLIC OUTREACH

- Contributed to student tutoring program in remote villages near Grahamstown, South Africa
- Delivered a public talk (invited) at the Astronomical Society of Southern Africa in Durban, and shared ideas with the general public
- Gave newspaper interviews about the radio telescope I built during my Ph.D. research
- Conducted lab tours for school and college students