Saavidra Perera

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EDUCATION

Durham University **United Kingdom**
Doctor of Philosophy *Oct 2013 - Oct 2017*

PhD Project: "Characterising and Correcting Atmospheric Seeing for Astronomy" - Successfully designed, developed and deployed the Shack-Hartmann Image Motion Monitor, a low-cost portable seeing monitor. The work included simulating the instrument and optical atmospheric propagation, aligning the optics, on-site testing at the La Palma observatory and comparing results with SCIDAR. This work led to a collaboration with Andres Guesalaga from Pontifical Catholic University of Chile, for the combined FASS-SHIMM turbulence profiler instrument. A prototype of the FASS-SHIMM was installed in 2018 at Paranal (see below). *Supervisors: Dr. R. W. Wilson Prof. R. Myers*

Imperial College London **United Kingdom**
MSci Physics *Oct 2008 - Jul 2012*

MSci. Project: "Characterising the Atomic Fluctuations of Ovens used in Ion Traps" - Optimising ovens used in the Imperial College Penning trap to produce calcium ions. Work entailed research into thin film physics, working with rotatory and ion vacuum pumps and handling liquid nitrogen. *Supervisor: Prof. R. Thompson*

EMPLOYMENT

Max Planck Institute for Astronomy, Germany *Jul 2018 - Present*

- Working on P-REx which reconstructs the piston drift caused by the atmosphere for interferometric telescopes, such as LBTI and VLTI.
- Using pseudo open loop CIAO WFS data for P-REx to compare with GRAVITY's fringe tracking data.
- Collaborative work with Steward Observatory to analyse archival fringe tracking and science data from the LBTI nulling mode to characterise data quality with respect to telescope vibrations.
- Supported the SOUL AO observations for the LBTI.
- Collaborative work with Kalyan Radhakrishnan using LINC NIRVANA's MCAO telemetry data to develop a predictive wavefront technique for the partially illuminated high layer conjugated WFS.
- Supervised by Dr. Jörg-Uwe Pott

Durham University, United Kingdom (based in Chile) *Jan - Jul 2018*

- Collaborative work between ESO (Marc Sarazin), PUC (Andrés Guesalaga) and Durham (Richard Wilson), funded to commission the FASS-SHIMM instrument.
- Polar alignment, sky model, autoguiding, data acquisition, installation of the instrument, on-sky testing.
- Analysis of SHIMM data.
- Produced technical documentation, user manual and installation of the instrument and the software.
- Supervised by Prof. Andrés Guesalaga

Oxford University, United Kingdom *Oct 2012 - Apr 2013*

- Six month work placement in the Astrophysics Instrumentation Group at Oxford University.
- Worked with Ansoft's High Frequency Structure Simulator (HFSS) to design and simulate a dual polarisation feed, comprised of a horn and an orthomode transducer, as part of collaboration with M-Microwave.
- Supervised by Prof. Ghassan Yassin

Astronomisch Onderzoek (ASTRON), Netherlands *Jun - Aug 2012*

- Research project titled "Properties of faint sources of the LOFAR-EoR observing windows".
- Work involved comparing radio spectra with images to identify sources and to see if any exhibited unexpected properties.
- Project required the use of LOFAR data reduction and imaging packages and basic MATLab to analyse spectra. In addition, data form FIRST Survey, SDSS and NED were used for comparison.
- Supervised by Dr. Panos Labropoulos

Ernst-Mortiz-Arndt-Universitat , Germany *Jun - Aug 2011*

- Research included investigating how to optimise ion counts, taking measurements in different forms of excitation using axial and radial detection, as well as implementing rotating quadrupolar excitation for the Paul trap.
- Utilised Autodesk Inventor to model traps.
- Supervised by Dr. Steffi Bandelow

European Southern Observatory (ESO) , Germany *Jul - Sep 2010*

- Data analysis of stars belonging to the open cluster NGC 6866.
- Analysis involved data reduction, spectral and luminosity classification, activity comparisons and calculating radial velocities using IDL.
- Supervised by Dr. Gaitee Hussain

TECHNICAL SKILLS

- **Programming Languages:** Proficient in Python, basic programming in C++ and experience in IDL, MATLab and html.
- **Operating Systems:** Use Linux, OSX and Windows.
- **Software Development:** Built software to interface with CCD and EMCCD detectors based on SDK of the providers. Co-developed the autoguiding software for a telescope (VX) Mount. Developed data acquisition and real-time data analysis of the SHIMM.
- **Lab Work:** Experience in optical alignment. Worked with NTM and VX mounts, (EM)CCDs, liquid nitrogen and different vacuum pumps.
- **Observations:** Observed with SOUL AO system for the LBTI on the LBT. Made observations with the SHIMM five times and FASS-SHIMM five times.

KEY SKILLS AND ACHIEVEMENTS

- **Networking:** Co-founder of the Network of Young Researchers in Instrumentation for Astrophysics (NYRIA). Started and maintain the NYRIA blog (https://nyriastronomy.github.io) and have been part of the organisational team for every annual meeting
- **Communication:** Coordinating with different staff members at Paranal during the commissioning of the FASS-SHIMM, especially important since I worked solo at night on the tower.
- **Outreach:** UK STEM Ambassador, conducted planetarium shows, participated in numerous science fairs science festivals, visited secondary schools, organised lab tours and volunteered at the Science Museum in London as a curatorial archiver.
- **Teaching and Supervising:** Supervised PhD student for 4 weeks and demonstrated in undergraduate Python computing labs.
- **Committees:** At Durham University, served as a post-graduate representative for three years, on the Diversity

and Equality Committee for two years and basketball team social secretary for two years.

- **Languages:** Native English speaker and basic Spanish.
- **Sport:** Three years basketball for Ustinov Women's Basketball Team at Durham University and avid gym-goer.

PUBLICATIONS

- *In Prep.* **Perera, Saavidra**. & Pott., Jorg-Uwe. *"P-REx's Turbulent Wind Velocity Measurements from the VLTI's CIAO WFS"*
- *In Prep.* **Perera, Saavidra**., Wilson, Richard W., Osborn, James., Butterley, Timothy. & Farley, Ollie. *"SHIMM: a seeing and turbulence monitor for astronomy"*
- Bécheta, Clémentine., Ayancana, Boris., Badinez, Rodrigo., Guesalaga, Andrés., **Perera, Saavidra**., Osborn, James. & Wilson, Richard W. (2017), *"The Generalized FASS (Full Aperture Seeing Sensor): filling the lower altitudes of the Cn2 profile"*, Adapt. Opt. Extrem. Large Telesc. 5 - Conf. Proc
- **Perera, Saavidra**., Wilson, Richard W., Osborn, James. & Butterley, Timothy. (2016), *"SHIMM: a seeing and turbulence monitor for astronomy"*, Proc. SPIE 9909, Adaptive Optics Systems V, 99093J
- Guesalaga, Andres., **Perera, Saavidra**., Osborn, James., Sarazin, Marc., Neichel, Benoit. & Wilson, Richard W. (2016), *"FASS: the full aperture seeing sensor"*, Proc. SPIE 9909, Adaptive Optics Systems V, 99090H
- Guesalaga, Andres., Osborne, James., Sarazin, Marc., Neichel, Benoit., **Perera, Saavidra**., Wilson, Richard W., et al.(2015). *"An Integrated MASS/DIMM Monitor Based on a Low-Noise CCD Detector"*, Adapt. Opt. Extrem. Large Telesc. 4 - Conf. Proc 1(1).
- Osborn, James., Butterley, Timothy., **Perera, Saavidra**., Fohring, Dora. & Wilson, Richard W. (2015). *"Observations of the dynamic turbulence above La Palma using Stereo-SCIDAR"*, Adapt. Opt. Extrem. Large Telesc. 4 - Conf. Proc 1(1).

REPORTS FOR ESO

- **Perera, Saavidra**. & Wilson, Richard W., *"FASS-SHIMM Technical Document"* (2018)
- **Perera, Saavidra**., Guesalaga, Andres. & Wilson, Richard W. *"FASS-SHIMM Instrument: Commissioning Report and Results"* (2018)
- **Perera, Saavidra**., Wilson, Richard W. & Guesalaga, Andres, *"FASS-SHIMM Instrument: User Manual and Software System Description"* (2018)

PRESENTATIONS AND POSTERS

- **Presentation** NYRIA Workshop, Leiden University, Netherlands 2018: "P-REx: Piston-Reconstruction Experiment"
- **Presentation** NYRIA Workshop, Meudon Observatory, France 2017: "SHIMM: Calculating Tau0"
- **Poster** AO4ELT5, Tenerife, Spain 2017: "Atmospheric coherence time and turbulence altitude information from the SHIMM seeing monitor"
- **Presentation** Durham student Astronomical Instrumentation Meeting, Durham, UK 2016: "FASS-SHIMM: A Turbulence Profiler"
- **Poster** SPIE, Edinburgh, UK 2016: "SHIMM: Seeing and Turbulence Monitor for Astronomy"
- **Poster** UK Exoplanet Meeting, Warwick, UK 2015: "SCIDAR Scintillation Profiling and Exoplanet Transit Observations at Paranal"
- **Presentation** MPIA, Heidelberg, Germany 2015: "Optical Turbulence Profiling"
- **Presentation** Van Mildert, Durham, UK 2015: "Seeing the Stars"
- **Poster** Santander Summer School, Santiago, Chile 2014: "Measuring Seeing with Two DIMM-SHs"