Saavidra Perera

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Education

Durham University *Durham, UK*

PhD in Physics *Oct 2013 - Oct 2017*

"SHIMM: A Low-Cost Portable Seeing Monitor for Astronomical Observing Sites" - 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. **Supervisor** Dr R. Wilson

Imperial College London *London, UK*

MSci in Physics *Oct 2008 - Jul 2012*

"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

Work Experience

University of California, San Diego *San Diego, USA*

Post-doctoral Reseacher *Jan 2021 - Present*

- Leading the build, testing and integration of the new pyramid wavefront sensor for Gemini Planet Imager (GPI 2.0)
- Laboratory work includes optical alignment and detector characterisation, under class 1000 clean-room conditions.
- Write extensive documentation, liaise with vendors, and coordinate within the larger consortium.
- Conduct remote operational tests of the current GPI instrument.
- Using KPIC data to Doppler image magnetically active M dwarfs.
- Co-I for the SHIMM on the 1m Nickel Telescope at Lick Observatory, as part of a collaboration with Maaike von Kooten at UCSC.
- **Supervisor:** Prof. Quinn Konopacky

Max Planck Institute for Astronomy *Heidelberg, Germany*

Post-doctoral Reseacher *Jul 2018 - Oct 2020*

- Worked on the Piston-Reconstruction Experiment (P-REx), which reconstructs the piston drift caused by the atmosphere for interferometric telescopes, such as LBTI and VLTI, using AO telemetry.
- Generated pseudo open loop CIAO WFS data for P-REx to compare with GRAVITY's fringe tracking data.
- Collaborated 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.
- **Supervisor:** Dr Jörg-Uwe Pott

Durham University / Pontificia Universidad de Católica *Santiago, Chile*

Research Scientist *Jan 2018 - Jun 2018*

- Collaborative work between Europen Southern Observatory (Marc Sarazin), Pontificia Universidad de Católica (Andres Guesalaga) and Durham University (Richard Wilson), funded to commission the FASS-SHIMM instrument.
- This included polar alignment, building a sky model, autoguiding, data acquisition, installation of the instrument and on-sky testing.
- Produced technical documentation, user manual and installation of the instrument and the software.
- **Supervisor:** Prof. Andrés Guesalaga

Supervision & Teaching

Daniel Levinstein	Supervised post-bachelor student for 6 months. Continued supervision for an additional year as he became a staff research assistant. Daniel worked on estimating coherence time from AO telemetry (Levinstein et al., 2022).
EXPAND & CAMPARE	Mentoring and supervising several undergraduate students for computational and lab-based research.
Teaching	Demonstrated in undergraduate Python computing labs.

Technical Skills

Programming	Proficient in Python, basic programming in C++ and have experience in IDL, MATLab and html.
Software Development	Built software to interface with CCD and EMCCD detectors based on the 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	Experienced in optical alignment. Worked with (EM)CCDs, liquid nitrogen, vaccum pumps, and worked in cleanroom conditions.
Observations	Facilitated LBTI observations by controlling SOUL AO system on the LBT. Made observations with the SHIMM five times and FASS-SHIMM five times, at La Palma and Paranal Observatory.

Key Skills

Networking	Co-founder of the Network of Young Researchers in Instrumentation for Astrophysics (NYRIA). Started and maintain the NYRIA website (https://nyriastronomy.github.io), and organised international annual workshops and virtual events.
Communication	Coordinated with staff members at Paranal Observatory during the commissioning of the FASS-SHIMM, which was critical for safety as I worked alone on the tower at night.
Outreach	Work with the Postdoctoral Association on science outreach. UK STEM Ambassador, conducted planetarium shows, demonstrated in science fairs science festivals, visited secondary schools, organised lab tours and volunteered at the London Science Museum as a curatorial archiver.
Committees	At Durham University I served as a post-graduate representative for three years, on the Diversity and Equality Committee for two years and basketball team's social secretary for two years.
Languages	Native English speaker and basic Spanish.

Publications & Writing

First & Second Author

- **Perera S.** et al., *"SHIMM - A Versatile Seeing Monitor for Astronomy"*, MNRAS (*Submitted*)
- **Perera S.** et al., *"GPI 2.0: pyramid wavefront sensor status"*, Proc. SPIE 12185, Adaptive Optics VIII (2022) https://doi.org/10.1117/12.2629062
- Levinstein D.M., **Perera S** et al., *"Estimating effective wind speed from Gemini Planet Imager's adaptive optics data using covariance maps"*, Proc. SPIE 12185, Adaptive Optics VIII (2022) https://doi.org/10.1117/12.2629677
- **Perera S.** et al., *"Piston Reconstruction Experiment (P-REx) – II. Off-line performance evaluation with VLTI/GRAVITY"*, MNRAS Volume 511, Issue 4, (2022) https://doi.org/10.1093/mnras/stab3813
- **Perera S.** et al., *"Testing P-REx on VLTI data"*, Proc. SPIE 11446, Optical and Infrared Interferometry and Imaging VII, (2020) https://doi.org/10.1117/12.2560105
- Santhakumari K.M.R., **Perera S.** et al., *"Wind estimates from layer-oriented MCAO telemetry: working towards wavefront prediction"*, Proc. SPIE 11448, Adaptive Optics Systems VII, (2020) https://doi.org/10.1117/12.2561368
- **Perera S.** et al., *"SHIMM: a seeing and turbulence monitor for astronomy"*, Proc. SPIE 9909, Adaptive Optics Systems V, (2016) https://doi.org/10.1117/12.2231680
- Guesalaga A., **Perera S.** et al., *"FASS: the full aperture seeing sensor"*, Proc. SPIE 9909, Adaptive Optics Systems V, (2016) https://doi.org/10.1117/12.2232012

Reports for ESO

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

Presentations

- **Presentation** Atmospheric Turbulence Profiling for Astronomy, University of Notre Dame Astronomy Seminar (2022)
- **Presentation** GPI 2.0: upgrade status of the Gemini Planet Imager, *On Behalf of J. Chilcote* SPIE (2022)
- **Presentation** Upgrading the Gemini Planet Imager to GPI 2.0, Spirit of Lyot (2022)
- **Poster** GPI 2.0: pyramid wavefront sensor status, SPIE (2022)
- **Recorded Presentation** Testing P-REx on VLTI data, SPIE (2020)
- **Presentation** P-REx: Piston Reconstruction Experiment, NYRIA Workshop Leiden University (2018)
- **Presentation** SHIMM: Calculating Tau0, NYRIA Workshop, Meudon Observatory (2017)
- **Poster** Atmospheric coherence time and turbulence altitude information from the SHIMM seeing monitor, AO4ELT5, Tenerife (2017)
- **Presentation** FASS-SHIMM: A Turbulence Profiler, Durham University, UK (2016)
- **Poster** SHIMM: Seeing and Turbulence Monitor for Astronomy, SPIE, UK (2016)
- **Poster** SCIDAR Scintillation Profiling and Exoplanet Transit Observations at Paranal, UK Exoplanet Meeting, UK (2015)
- **Presentation** Optical Turbulence Profiling, Max Planck Institute for Astronomy, Germany (2015)

References available upon request.