Uthpala Herath
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PhD candidate in Computational Condensed Matter Physics at the Department of Physics and Astronomy at West Virginia University.

Education

Doctor of Philosophy (Physics)
Department of Physics and Astronomy
West Virginia University (2015-Present)

Master of Science (Physics)
Department of Physics and Astronomy
West Virginia University (2018)

Bachelor of Science (Special degree in Physics- Honors)
Minor: Pure and Applied Mathematics
University of Peradeniya, Peradeniya, Sri Lanka (08/2010 - 12/2014)

Academic Research Projects

"The study of strongly correlated materials using charge self-consistent DFT+DMFT"
(West Virginia University-Current)

A computational/theoretical approach to study properties of strongly correlated materials using a combination of Density Functional Theory (DFT) and Dynamical Mean Field Theory (DMFT)

"*The effect of magnetic field line curvature scattering on the rapid loss of ring current ions"*
(West Virginia University)

Perform test particle simulations to quantify cumulative FLC scattering of ring current ions. Based on these simulation results, a physical parameterization for the FLC scattering is determined which is incorporated into the RAM-SCB model.

"Identification of Blue Stragglers in the Globular Cluster M53 using CCD Photometry"
(2014- Arthur C. Clarke Institute for Modern Technologies/ University of Peradeniya, Sri Lanka)

Telescopic data of the globular cluster M53 was used to construct a novel Color-Magnitude Diagram (CMD) of the cluster, which was in turn utilized to study its stellar population, mainly focusing on the Blue Straggler Star population.

"Nano Magnets and their Applications"
(2013- University of Peradeniya, Sri Lanka)

The traits, synthesis methods, functionalization and applications of Nano Magnets were investigated.

Grants received

- Development of computational methods for electronic structural characterization of strongly correlated materials from different ab-initio perspectives; funded by the National Science Foundation through XSEDE; start date: 2018-10-01; awarded resources: 3,500,869.0 SU's on Bridges and 74,005 Node Hours on Stampede2
- Eberly College of Arts and Sciences student travel grant- 2018
- Office of the Provost graduate student travel grant- 2018

Publications

- Herath, U., Tavadze, P., He, X., Bousquet, E., Singh, S., Muñoz, F. & Romero, A. **PyProcar: A Python library for electronic structure pre/post-processing.** *Computer Physics Communications* 107080 (2019). doi:10.1016/j.cpc.2019.107080Z

- Singh, V., Herath, U., Wah, B., Liao, X., Romero, A., Park, H., **DMFTwDFT: An open-source code combining Dynamical Mean Field Theory with various Density Functional Theory packages.** *Submitted to Computer Physics Communications* (2020).

- H.M. Ariyarathne[1], H.M.U. Kaushal[2] , **Developing an Expert System for Plant Pest Diagnosis, Annals of the Sri Lanka Department of Agriculture**, *Vol.15:381*

Academic Research Experience

-Studying complex material systems using Density Functional Theory and Dynamical Mean Field Theory under the supervision of Dr. Aldo Romero at the Department of Physics and Astronomy, West Virginia University **(2017-Present)**

-Attended the International Summer workshop on Computational Quantum Materials in Sherbrook, Québec **(2018)**
Presented "Development of computational methods for the characterization of novel strongly correlated materials"

-Attended the 3rd Summer School on Materials Growth and Design: Exotic Magnetic States in Quantum Mechanics at the Johns Hopkins University, Maryland **(2018)**

-Conducted research in the field of Space Physics under Dr. Weichao Tu at the Department of Physics and Astronomy, West Virginia University **(06/2016 - 2017)**

- Our research focused on modeling the trapped radiation environment in near-Earth space

-Attended GEM conference in Portsmouth, Virginia. **(07/2017)**

- A conference on Geospace Environment Modeling

-Attended CISM Space Weather Summer School in Boulder, Colorado. **(07/2016)**
- A two week workshop on solar-terrestrial weather systems

-Undergraduate senior year research project at Space Applications Division-Arthur C. Clarke Institute for Modern Technologies (ACCIMT), Sri Lanka **(06/2014-12/2014)**

- Worked in conjunction with an expert team of scientists.
- Extensive study of globular cluster characteristics using CCD Photometry.
- Aperture Photometry and PSF (Point Spread Function) Fitting Photometry methods were experimented using the IRAF (Image Reduction and Analysis Facility) system.

-Took part in an auxiliary research project conducted in collaboration with the Sri Lanka Department of Agriculture to develop a system for plant disease diagnosis. Assisted in computational aspects of the system. **(2012)**

Work Experience

- Freelance software developer (2010-2012)
- Teaching Assistant- Department of Physics, University of Peradeniya (2015)
- Teaching Assistant- Department of Physics, West Virginia University (2015/2016)
- Research Assistant- Department of Physics, West Virginia University (2016-present)

Computational Skills

- Skilled in High Performance Computing
- Parallelization of programs using OpenMP and MPI
- Sun/Oracle Certified Programmer for the Java SE Platform
- Experienced Linux and Windows user
- Proficient in C, C++, Fortran, Python, Java, Matlab, SQL
- Profound skills in handling the IRAF system

Extra-curricular Activities/ Leadership Roles

- Active Member of Physics and Astronomy Graduate Student Organization (PAGSO)- West Virginia University
- President, Astronomy Society, University of Peradeniya (2013-2014), Assistant Secretary (2012-2013), Member (2011-2012)
- Junior Editor, Physical Society, University of Peradeniya (2012-2013), Committee Member (2011-2012)
- Faculty Representative (Faculty of Science), Ceylon Drama Society, University of Peradeniya (2011-2012)
- Member, International Interaction Club, University of Peradeniya (2013-2014)

Additional Experience/Activities

- Participated in outreach programs to enlighten the public on science around Morgantown, WV.
- Organized "Water Rocket Challenge 2014"; the first-ever water rocket competition held at University of Peradeniya
- Conducted regular astronomy lectures, planetary & deep sky observation sessions and workshops in the university as well as in local schools aiming to promote astronomy among students and the general public
- Volunteered for United Nations World Space Week- Sri Lanka (2014)
- Compiled academic articles for the "Echo" magazine; the annual scientific journal issued by the Physical Society of University of Peradeniya
- Organized "Let Them Smile"; a charity project focused on uplifting the educational standards of students living in rural areas across the country

References

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