

## Curriculum Vitae

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### Education

- 1/85: Ph.D. in Physics, Cornell University, Ithaca, NY 14853, USA.
- 5/82: M.S. in Physics, Cornell University, Ithaca, NY 14853, USA.
- 8/78: B.S. in Mathematics (first class honors) University of Colombo, Sri Lanka.

### Work Experience

- 9/91-present: Faculty Member of Physics, Univ. of Connecticut, Storrs, CT 06269, USA.
- 10/87-8/91: Associate and Assistant Scientist in the Physics Department at Brookhaven National Laboratory, Upton, NY 11973, USA.
- 10/86-9/87: Research Associate in the Condensed Matter Theory Group at Brookhaven National Laboratory, Upton, NY 11973, USA.
- 10/84-9/86: Post Doctoral Research Associate with Prof. B. R. Cooper, Dept. of Physics, West Virginia University, Morgantown, WV 26506, USA.
- 6/81-9/84: Graduate Research Assistant with Prof. John W. Wilkins at LASSP, Physics Dept., Cornell University, Ithaca, NY 14853, USA.

### Summary of Research Activities

- Worked on a wide variety of problems in theoretical condensed matter, developing accurate theoretical and computational techniques and applying them to examine bulk and surface electronic structure, chemisorption, stability of crystal structures, elastic properties, cohesion, alloy phase diagrams, point defects in alloys, spectroscopic and magnetic properties of transition metal systems, self diffusion in simple liquid metals, and spintronics in heterojunctions.

- Currently working on floquet systems, organic materials, perovskites and double-perovskites. Previous work on exact many body calculations of Hubbard nanoclusters has uncovered numerous exotic properties of strongly correlated clusters that have not been seen before. Combining exact diagonalization with statistical mechanics has paved the way to a better understanding of phase diagrams, pseudogaps, magnetism and condensation (among other things) of some of the inhomogeneous materials such as the high temperature superconductors and materials exhibiting colossal magnetoresistance.
- Have authored several computer codes for first principles electronic structure and molecular dynamics, Monte Carlo, as well as Embedded Atom Method based studies.

### **Professional Honors and Other Activities**

- Associate Editor, *Frontiers in Physics*
- Editorial Board, *Advances in Condensed Matter Physics*
- Published a book on “Metallic Multilayers and their Applications” (publisher: Elsevier 2008)
- Visiting Professor, Nordita, Stockholm, Sweden (July 2019)
- Visiting Professor, Beijing Computational Science and Research Center (Sep.-Oct. 2018)
- Starting work on a book (to be published by World Scientific) related to time dependent phenomena in condensed matter.
- A co-author of nearly 100 publications in refereed journals. Also a co-author of about a hundred abstracts and presentations at the March Meeting of the American Physical Society (APS), Materials Research Society meeting, Conference on Physical Electronics, American Vacuum Society meeting. Have also given invited talks at several work shops on recent developments in electronic structure and supervised several Ph.D. thesis projects.

## Recent Publications

1. A Brief Review of Electronic and Magnetic Structure of  $\text{TiF}_3$ , 2440072 <https://doi.org/10.1142/S012915642440072X> July 2024, International Journal of High Speed Electronics and Systems, Gayanath W. Fernando, Donal Sheets, Jason Hancock, Arthur Ernst, R. Matthias Geilhufe International Journal of High Speed Electronics and Systems 2024 33:02n03
2. Mott insulating negative thermal expansion perovskite  $\text{TiF}_3$ , Donal Sheets, Kaitlin Lyszak, Menka Jain, **Gayanath W. Fernando**, Ilya Sochnikov, Jacob Franklin, R. Matthias Geilhufe, Jason N. Hancock, arXiv:2311.08382 and Physical Review B 108, 235140 (2023).
3. Correlation Driven Magnetic Frustration and Insulating Behavior of  $\text{TiF}_3$ , **Gayanath W. Fernando**, Donal Sheets, Jason Hancock, Arthur Ernst, and R. Matthias Geilhufe, arXiv:2310.1264v1 (2023) and Physica Status Solidi (Rapid Research Letters), 2300330 (2023).
4. The Quantumness in Detecting Electromagnetic Waves is Determined by the Interaction Properties of the Detector, C. Roychoudhuri, N. Prasad and **G. Fernando**, Fundamental Research and Application of Physical Science Vol. 3, B P International, Print ISBN: 978-81-19217-29-8, eBook ISBN: 978-81-19217-05-2 (2023),
5. Structural and electronic properties of rare-earth chromites: A computational and experimental study, Jianhang Shi, **Gayanath W. Fernando**, Yanliu Dang, Steven L. Suib and Menka Jain (Phys. Rev. B106, 165117, 2022).
6. Understanding physical processes behind the photoelectric current pulse (PCP) statistics and designing better sources, C. Roychoudhuri, **G. Fernando**, and N. Prasad, Proc. SPIE 12243, Photonics for Quantum 2022, 1224303 (19 July 2022).
7. Driven emergent phases in small interacting condensed-matter systems, **Gayanath W. Fernando**, R. Matthias Geilhufe, Adil-Gerai Kussow and W. Wasanthi P. De Silva, European Physics Letters, Volume 134, 37004 (2021).
8. Multi-hole bands and quasitwo-dimensionality in  $\text{Cr}_2\text{Ge}_2\text{Te}_6$  studied by angle-resolved photoemission spectroscopy, Turgut Yilmaz, Matthias Geilhufe, I. Pletikovic, **G. W. Fernando** et al. European Physics Letters, Volume 133, 27002 (2021).
9. Contrasting quantum sensing light source properties, which generate different photocurrent pulse-statistics, Chandra Roychoudhury, **G. W. Fer-**

- nando** et al. Proc. of SPIE, Quantum sensing, nano-electronics and photonics XVII, 11288-15 (2020), DOI: 10.1117/12.2551090
10. Chemical-Strain Induced Tilted Dirac Nodes in(BEDT-TTF)<sub>2</sub>X<sub>3</sub>(X = I, Cl, Br, F) Based Charge-Transfer Salts, R. M. Geilhufe, B. Commeau, and **G. W. Fernando**, Physica Status Solidi (Rapid Research Letters), 1800081 (2018). (DOI: 10.1002/pssr.201800081).
  11. Structural and electronic properties of  $\alpha$ -(BEDT-TTF)<sub>2</sub>I<sub>3</sub>,  $\beta$ -(BEDT-TTF)<sub>2</sub>I<sub>3</sub> and  $\kappa$ -(BEDT-TTF)<sub>2</sub>X<sub>3</sub> (X=I,F,Br,Cl) organic charge transfer salts, B. Commeau, R. M. Geilhufe, **G. W. Fernando**, A. V. Balatsky, Physical Review B **96**, 125135 (2017).
  12. From a  $\mathcal{Z}_2$  topological insulator to a square ribbon: Tuning quantum spin Hall states and conductivity, Zhiwei Zhang, Yiteng Tang, and **Gayanath Fernando**, Journal of Applied Physics, **121**, Issue 20, 204302 (2017).