

Curriculum Vitae

TAMIRU TESHOME MAMO

Department of Physics

Addis Ababa Science and Technology University (AASTU)

Addis Ababa, Ethiopia



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Current Position

April 2015 - 2019	PhD TWAS Scholar at Indian Association for the Cultivation of Science (IACS), Kolkata, India
Present Status	Assistant Professor in department of physics at Addis Ababa Science and Technology University, Addis Ababa, Ethiopia
Supervisor	Prof. Ayan Datta
Thesis Title	First Principles Studies of Electronic Structures in Two Dimensional Materials and Topological Insulator Induced by Tensile Strain

Publications

1. Tamiru Teshome and Ayan Datta, Effect of Doping in Controlling the Structure, Reactivity, and Electronic Properties of Pristine and Ca(II)-Intercalated Layered Silicene *J. Phys. Chem. C*, **2017**, *121*, 15169-15180.
2. Tamiru Teshome and Ayan Datta, Two-Dimensional Graphene-Gold Interfaces Serve as Robust Templates for Dielectric Capacitors. *ACS Appl. Mater. Interfaces*, **2017**, *9*, 34213-34220.

3. Tamiru Teshome and Ayan Datta, Topological Insulator in Two-Dimensional SiGe Induced by Biaxial Tensile Strain, *ACS Omega*, **2018**, *3(1)*, 1-7
4. Tamiru Teshome and Ayan Datta, Phase Coexistence and Strain-Induced Topological Insulator in Two-Dimensional BiAs, *J. Phys. Chem. C*, **2018**, *122*, 15047-15054
5. Tamiru Teshome and Ayan Datta, Strain-Induced Topological Insulator in Methyl-Decorated SiGe Films *J. Phys. Chem. C*, **2018**, *122*, 25127-25133
6. Topological Phase Transition in Sb_2Mg_3 Assisted by Strain (Under Communication), **2019**
7. Oxides of BiAs nontrivial Phase Transition (Under preparation).

Research Interest

- Computational investigation of Electronic, excitonic and photonic properties of two-dimensional materials.
- Solving physicochemical problems in heterogeneous as van der Waals (vdW) of chemical reactions related to sustainable energy conversion and energy storage materials.
- Computational modelling of 2D and 3D topological insulators based on Density functional theory.
- Investigating topological insulators and superconductivity.
- Computational design of exotic properties in novel 2D materials of plasmon interfaces with exciton namely plexiton and extendable to topological insulators.
- Theoretical and computational modelling of materials for solar cell application specially doping graphene, silicene, germanene, stanene and borophene properties such as enormous mechanical strength, excellent electrical and heat conductivity and strong interaction with light.
- Temperature-pressure induced topological phase transition.

Research Experience

- Theoretical understanding for structural diversity of very important two-dimensional phases of BiAs namely, Alpha, beta, gamma, delta and epsilon. The existence of these phases is due to different coordination system. β -BiAs the most stable structure in both dynamically and thermally at room temperature.

- Possible application of silicene in Ca ion batteries.
- Application of novel 2D material graphene and Gold interfaces for Dielectric Capacitor embaded by number of layers hexagonal boron nitride.
- Silicene/germanene doping, controlling reactivity and optical properties for the application of photovolitic cells. Intercalcted of Ca ion in silicene/germanene have been investigated for multilayers of application in batteries.
- Computational studies of new class of Topological Insulators for 2D SiGe, BiAs and $SiGeCH_3$. For the application purpose those materials growth on hexagonal boron nitride in spintronics device.
- Theoretical investigation 3D Sb_2Mg_3 topological phase transition induced by tesile strain/pressure. We have studied in detail how the phase transition can be occur from trivial phase to nontrivial phase. We extended our studies to topological insulators and superconductivity.
- Computational study of proviskit induced-pressure in 3D topological insulators.

Keywords

Computation Physics, Material Designing, Density Functional Theory, ab initio Molecular Dynamics (AIMD) Simulation, Optical properties, vdW Heterostructure materials, Photovolitic cell, pressure/strain induced topological insulators, Li/Na/Ca Ion Battery, 2D Materials, Plasma frequency, Plasmon-exciton-topology interfaces, topological insulators and superconductivity.

Technical Skills

- Experienced in **DFT, Plane Wave DFT, TDDFT, ab initio Molecular Dynamics Simulation and wannier90.**
- Experienced user of **VASP, Quantum Espresso, GPAW Gaussian, Fortran90/95, Python and MATLAB.**
- Also have used **ADF, AIM, NCIPLLOT, VASPsol, Phonopy, VTST, v-sim, Molpro, USPEX**, when required.
- Visualization of structures and plotting software: **VMD, VESTA, GAUSSVIEW, XCrysDen, Origin, Xmgrace, p4vasp and GNUPLOT.**
- Basic knowledge in **Python** language.
- Use of parallel clusters.

- Experienced in all main Operating Systems **UNIX/LINUX, WINDOWS.**

Conferences/Workshops attended and Poster/Oral Presentations

November, 2017	Poster presentation in International Conference in Physics, 9th IACS-APCTP, Kolkata.
November, 2018	Poster presentation on Young Investigator Meet on quantum Condensed Matter Theory, S. N Bose National center for the Basic Sciences, Kolkata.
Jan, 2018	Poster presentation in 5th Symposium on Advanced Science day IACS, Kolkata.
Oct, 2019	Oral presentation Seminar On Topological Insulators, IACS, Kolkata.
Oct, 2019	Poster presentation in CRSI-RSC joint Symposium in Chemistry 13th CSIR-CLRI and IIT Madras, Chennai.

Award and Education

July, 2009	Top class student in Physics Department, Dire Dawa University, Ethiopia.
September, 2009	Qualified for Assistant Lecturer in 2009 (Joined directly MSc in Mekelle University by scholar award of Ethiopian government).
Jan, 2012	Qualified for the Lecturer at University in Physics.
July, 2017	Recipient of the Senior Research Fellowship (SRF).
July, 2013	Secured great distinction in M.Sc in Physics at University.
June, 2011	First class position in B.Sc in Physics at University.
M. Sc(2009-2012)	Physics (Condensed Matter Physics Specialization), Mekelle University.
B. Sc(2006-2009)	Physics (Honors), Dire Dawa University, Ethiopia

Personal Details

Date of Birth	
Sex	
Languages	English, Amharic, Afaan Oromo(Mother tongue).
Nationality	Ethiopian

Academic References:

1. Professor Ayan Datta
School of Chemical Sciences
Indian Association for the Cultivation of Science
Raja S C Mallick Road, Kolkata-700032, India



2. Professor Swapan K. Pati
New Chemistry Unit and Theoretical Unit
Jawaharlal Nehru Centre for Advanced Scientific Research
Bangalore -560064, India



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3. Professor Pranab Sarkar
Department of Chemistry

