Rajendra Adhikari, PhD
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RESEARCH INTERESTS

First-principles density functional (perturbation) theories and calculations. Electronic band and phonon structures of ferroelectric/photovoltaic nanomaterials. Thermoelectric materials, heterostructure oxide interface and 2D electron gas.

RESEARCH SKILLS

Extensive use of Quantum-Espresso, Abinit, and VASP density functional packages to calculate total energy, structural optimization, band structure, Phonons spectrum using planewave basis sets, and other post processing calculations in serial, parallel and GPU environments. Pseudopotential generation. Large scale MC/MD simulation. Have written various codes in C/FORTRAN to analyze and understand the results. Libraries such as FFT, BLAS and LAPACK.

TEACHING INTERESTS

Condensed Matter Physics and High Performance Computing. Innovative teaching techniques, modernization of classroom and laboratory. Open source **Moodle** based distance teaching (online education).

WORK EXPERIENCE

- **Kathmandu University**, Kathmandu, Nepal (March 2015-present)
  Assistant Professor: topics covered: Introduction to High Performance Computing. Solar Photo-voltaics, Nanomaterials. Solid State Devices.
- **Arkansas State University**, Jonesboro, AR USA (Apr 2014-Nov 2014).
  Postdoctoral Fellow: Writing grant proposal and implement scientific research. Publish results in journals and presentation in conferences.
- **Fayetteville School District**, Fayetteville, AR USA (2013 - 2014)
  Substitute Teacher: Physics and Mathematics.
- **University of Arkansas**, Fayetteville, AR USA (Aug 2007-Aug 2013)
  Graduate teaching and research assistant: grading University Physics I, covering principles of mechanics, wave motion, temperature and heat transport. Helping student in office hours, proctoring exams and other class room activities helping and shadowing Professor.
- **University of Rhode Island**, Kingston, RI USA (Sep 2005-May 2007)
  Graduate teaching assistant: Undergraduates lab sessions for major/non-major in Physics,

engineering Physics and individual helping sessions. Lab sessions include the following key experiments: measurement of acceleration due to gravity, motion of simple pendulum, projectile motion, elastic and inelastic collisions. For Physics-major, error estimations on the results were performed. Other responsibilities include proctoring exams, class room activities, helping and shadowing Professor.

- **Kathmandu Model College**, Kathmandu, Nepal (June 2004-April 2005)
  Lecturer: topics covered: Mechanics, Sound, Electricity & Magnetism, Optics including lab sessions and setups.

- **Birendra Multiple Campus**, Bharatpur, Chitwan, Nepal (June 2001-April 2004)
  Lecturer: topics covered: Analog and Digital Electronics, Advanced Solid State Physics, Quantum Mechanics, Programming in C to Undergraduate students including Lab sessions and setups.

- **Chitwan Science College**, Bharatpur, Chitwan, Nepal (June 2001-April 2004)
  Visiting Lecturer: topics covered: Mechanics, Heat, Sound, Electricity & Magnetism, Optics including lab sessions and setups.

- **Kingdom Star English School**. Lalitpur, Nepal (June 1998-May 2001)
  Teacher: Science, Mathematics and Computer Science.

- **Kalika Boarding High School**, Jyotinagar, Chitwan, Nepal (June 1994-May 1996)
  Teacher: Physics, Mathematics and Chemistry for grade 9th and 10th.

Education

Ph.D. in Physics (Aug 2013), University of Arkansas, Fayetteville, AR, USA.
MS in Physics (May 2007), University of Rhode Island, Kingston, RI, USA.
M. Sc., Physics, (2001), Tribhuvan University, Kathmandu, Nepal.
B. Sc., Physics, Mathematics and Chemistry (1997), Birendra Multiple Campus, Bharatpur, Chitwan, Nepal.

Publications

Effect of calcination environments and plasma treatment on structural, optical and electrical properties of FTO transparent thin films, Madhav Kafle, Ramesh K Kapadi, Leela Pradhan Joshi, Armila Rajbhandari, Deepak P Subedi, Gobinda Gyawali, Soo W Lee, Rajendra Adhikari, Bhim P Kafle, AIP Advances **7 (7)**, 075101 (2017)

Emerging New Pseudobinary and Ternary Halides as Scintillators for Radiation Detection, B Kang, Q Feng, C Summers, CM Fang, R Adhikari, K Biswas IEEE Transactions on Nuclear Science **64** (7), 1817-1824 (2017)

Rajendra Adhikari and H. Fu, *Structural and electronic properties of LaO δ-doped $SrTiO_3$ caused by biaxial strain*, J. Phys. App. **1**16, 123712 (2014).

Rajendra Adhikari, Q. Li, R. Williams, A. Burger, and K. Biswas, *DX-like centers in NaI:Tl upon aliovalent codoping*, Journal of Applied Physics **116**, 223703 (2014).

Q. Li, R. T. Williams, A. Burger, Rajendra Adhikari, and K. Biswas, *Search for improved-performance scintillator candidates among the electronic structures of mixed halides*, Proceedings of SPIE **9213**, 92130M (2014).

Rajendra Adhikari and H. Fu, *Interesting properties of ferroelectric $Pb(Zr_{0.5}Ti_{0.5})O_3$ nanotube array embedded in matrix medium*, J. Appl. Phys. **1**14, 044105 (2013).

R. Adhikari, Y. Cheng, and A. E. Meyerovich, *Quantum size effect and biased diffusion of gravitationally bound neutrons in a rough waveguide*,
Phys. Rev. A **7**5, 063613 (2007).

Presentations

June 20-21, 2017, South Asian High Energy Physics Instrumentation Workshop on Detector Technology and Applications (SAPEPI 2017), Kathmandu University, Nepal:
Co-organizer: Presented the concluding remarks of the workshop.

May 4-5, 2017, Third National Symposium on Nanotechnology and Material Processing (SNMP 2017), Kathmandu University, Nepal:
Co-organizer: Presented the concluding remarks of the Symposium.

April 29-30, 2017, Deerwalk Institute of Technology (US based software company), Kathmandu, Nepal.
Resource person: Rajendra Adhikari, *Workshop on Density Function Theory and Computational Tools*

April 07-08, 2017, Career Point University Hamirpur (H.P.), India: Advances in Basic & Applied Sciences (ABAS-2017).
Oral: Rajendra Adhikari, *Strained Induced Properties on CaTiO3, a LDA+U study*

Sep 22-24, 2015, Government Vivekanand P.G. College, Maihar, Satna (M.P), India: International Conference on Space and Plasma Science (ICSPS-2015).
Poster: Shankar Chimoria and Rajendra Adhikari, *Chaotic motion of Hyperion using dumbbell model*

Jan 29- Feb 1, 2012 Argonne, Illinois: Fundamental Physics of Ferroelectrics and Related Materials.
Poster, Rajendra Adhikari and H. Fu, *Electronic structure of LaO δ-doped $SrTiO_3$.*

March 21-25, 2011 Dallas, Texas: APS March Meeting 2011.
Oral, Rajendra Adhikari and H. Fu, *Ferroelectric polarization of $Pb(Zr_{0.5}Ti_{0.5})O_3$ nanotube array*.

Jan 31- Feb 5, 2010 Aspen, Colorado: Advances in the Fundamental Physics of Ferroelectrics and related materials.
Poster, Rajendra Adhikari and H. Fu, *Ferroelectric properties of modulated PZT nanowires.*

Computing Skills

Languages: C, FORTRAN, Mathematica, Maple, Matlab. Parallel programming in MPI environment. Bash Script, LaTeX, gnuplot, Origin, R, Spss etc.

Hardware and software: Experience in building supercomputer and Linux system administration. Expert in moodle learning platform.

Protocols and IDEs: ssh, sftp, scp, telnet, ftp, git, svn etc. IDEs eclipse, and netbeans.