

MAHENDRA B. THAPA, PhD (Physics)

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Education

PhD, Aug 2016, Physics – University of Cincinnati, OH, USA

M.S, May 2009, Physics – Western Illinois University, Macomb, IL, USA

M.Sc, Nov 1997, Physics – Tribhuvan University, Kathmandu, Nepal

Certificate Program, 2014, Preparing Future Faculty, UC

Professional background

Lecturer, Physics, Aug 2016 – present, California State University, Chico, CA

Graduate Assistant, July 2009 - July 2016, Physics/Genetics Department, University of Cincinnati, OH

Graduate Assistant, Aug 2007 - May 2009, Physics Department, Western Illinois University, Macomb, IL

Lecturer, Aug 1997 – July 2007, Pinnacle Academy H.S.S, Lalitpur, Nepal

Lecturer (Adjunct), Aug 2004 – July 2007, Pinnacle Technical College, Lalitpur, Nepal

Lecturer (Adjunct), Feb 1998 - Feb 2000, Tribhuvan University, Patan Multiple Campus, Nepal

Physics Lecturer, July 1996 - Aug 1997, Kathmandu Women's College (H.S.S), Kathmandu, Nepal

Science Teacher (Adjunct), 1992- 1997, various schools in Nepal

Internal Exam Controller, Aug 1997 - July 2007, Pinnacle Academy H.S.S, Lalitpur, Nepal

Teaching and Research experience

Lecturer, Aug 2016 – present

California State University, Chico, CA

Job descriptions: Teach Calculus-Based Mechanics Lecture and Calculus-Based Mechanics Laboratory

Graduate Assistant, July 2009 - July 2016

Physics / Molecular Genetic Department, University of Cincinnati, OH

Job descriptions: Teach undergrad labs, coach students and help Professors in researches

Graduate Assistant, Aug 2007 - May 2009

Physics Department, Western Illinois University, Macomb, IL

Job descriptions: Teach undergrad labs & coach students

Lecturer, Aug 1997 – July 2007

Pinnacle Academy H.S.S, Lalitpur, Nepal

Job descriptions: Lecture undergrad Physics & labs, grade exam papers, guide students in physics projects, coach students for various medical and engineering competitive exams

Lecturer (Adjunct), Aug 2004 – July 2007

Pinnacle Technical College, Lalitpur, Nepal

Job descriptions: Lecture Physics for Diploma in Pharmacy & conduct labs, grade exam papers, guide students in physics projects

Adjunct Physics Lecturer, Feb 1998 - Feb 2000

Tribhuvan University, Patan Multiple Campus, Kathmandu, Nepal

Job descriptions: Lecture undergrad Physics labs

Physics Lecturer, July 1996 - Aug 1997

Kathmandu Women's College (H.S.S), Kathmandu, Nepal

Job descriptions: Lecture undergrad Physics & labs, grade exams papers, guide students in physics projects

Adjunct Science Teacher, 1992- 1997

Various schools in Nepal

Job descriptions: Teach science and maths for high school students and guide them for science projects

Internal Exam Controller, Aug 1997 - July 2007

Pinnacle Academy H.S.S, Lalitpur, Nepal

Job descriptions: Make arrangement for all exams, prepare report cards & counselling services

Research Area

Physics Education Research

Developing expertise in topics of physics education research (Network analysis, FCI, CSEM & COPUS related and ISLE Teaching Approaches)

Teaching Experiences with a Large Class of Non-major Physics Students (a paper submitted in 'Physics Teacher')

Algebraic issue with a simple pendulum like problems (draft in preparation for 'Physics Teacher')

Biophysics Research

Researches related to Molecular Dynamics Simulation, Bioinformatics techniques, protein purification techniques, Sample preparation for X-ray Crystallography and techniques

Molecular Dynamics Simulation of Calbindin D_{9K}

Rance Lab, Molecular Genetics Department, University of Cincinnati, OH

Study of transcription factors, transcriptional regulation, functional genomics, genome analysis

Weirauch lab, Department of Pediatrics, University of Cincinnati, OH

Study of Norovirus by computational approaches

Jarek Meller lab, Department of Pediatrics, University of Cincinnati, OH

Functional Nuclear Magnetic Resonance (fmri) introduction and related software (SPMCHIPS/IDL)

Imaging Research Center (S. K. Holland Lab), Cincinnati Children's Hospital Medical Center, OH

Condensed Matter Research

Researches related to Atomic/magnetic forces microscopy (AFM/MFM), Raman Spectrometer
Boley Lab, Physics Department, Western Illinois University, Macomb, IL

Computer expertise

PERL, MATHEMATICA, MATLAB, R, Python, FORTRAN, C, Java, AMBER, VMD, CHIMERA,
H++, SPARTA, ORCA, Bowtie2, BLAST, CHARMM, NAMD, Docking software, Linux and Microsoft

Selected poster presentations on Education researches

Difficulties in solving algebraic problems for students taking introductory physics

Mahendra Thapa

Gordon Research Conference on Physics Research and Education, June 10-15, 2018, Bryant University,
Smithfield, RI

The many faces of equity: The system impact of Learning Assistants in physics

B.V. Dusen, J. Nissen, **M. Thapa**, A. Torre, and D. Caravez

13th Annual College of Natural Sciences Poster Session, May 10, 2017, CSU Chico, CA

Comparative Study of Different Teaching Techniques in Introductory Calculus

Mahendra Thapa, Kathleen Koenig

Ohio Project Kaleidoscope 2nd Annual Conference, May 21, 2016, Capital University, Bexley, OH

Flipping Calculus: Impact on Student Learning and Challenges of Effective Implementation

Kathy Koenig, **Mahendra Thapa**

AACU Meeting, Nov 3 to Nov 5, 2016, Boston, MA

Selected oral presentations on Education researches

Assessing the Impact of the Flipped Classroom in Introductory Calculus

Kathleen Koenig, Mahendra Thapa

Ohio Project Kaleidoscope 2nd Annual Conference, May 21, 2016, Capital University, Bexley, OH

Papers on Biophysics

**Lysine side-chain dynamics in the binding site of homeodomain/DNA complexes as observed by
NMR relaxation experiments and molecular dynamics simulation**

(Web): April 17, 2018, Biochemistry (Co-author)

Targeting substrate-site in Jak2 kinase prevents emergence of genetic resistance'

Scientific Reports 5, Article no:14538, Sept 2015, (Co-author)

Manuscripts in preparation for (i) a paper related to 'side-chain dynamics of a protein using NMR and
Molecular Dynamics Simulation' (ii) a paper related to dynamics of c-terminus of Norovirus using
simulation (MD & autoduck) and bioinformatics technique

Submitted a paper in 'Scientific World' related to '**Coarse-grained simulation of Calbindin D_{9k}**'

Computational Prediction of Chemical Shifts of Apo-state of the Protein Calbindin D9k

Mahendra Thapa, Dr. Mark Rance

'Scientific World', Vol. 12, No. 12, July 2014

Selected Oral Presentations in Biophysics

Molecular Dynamics Simulation: A Tool for Physical Properties Prediction in Biomolecule Calbindin D_{9k}

Physics Department Seminar, Feb 3rd, 2017, California State University Chico, CA, USA

Analysis of Domain Movement and Dynamics of Norwalk Virus Capsid by Molecular Dynamics (All-atom and Coarse Grained) Simulations and Normal Mode Analysis

Biophysical Society 59th Annual Meeting 2015, Baltimore, Maryland, Feb, 07/11/2015,

Comparison of Side-chain Motion of Calbindin D_{9k} in its Four Calcium Binding States by Molecular Dynamics Simulation

(i) 3rd Bluegrass Molecular Biophysics Symposium, University of Kentucky, Lexington, KY; 5/12/2014

(ii) APS March Meeting 2014, Colorado Convention Center, Denver, Colorado 80202, Friday, 03/07/2014 (iii) Statewide User's Group (SUG) meeting, Ohio Supercomputer Center, Columbus, OH, Thursday, 12/4/2014

Selected Poster Presentations in Biophysics

Application of statistical procedures based on mutual information in the protein Calbindin D_{9k} for detecting the allosteric pathways, Mahendra Thapa, Mark Rance

Annual Spring Meeting of the Ohio-Region Section, Bulletin of the American Physical Society, Vol 61, Number 5, April 8-9, 2016, Dayton, Ohio

Structure and Dynamics of the Pitx2 Homeodomain Bound to DNA Using Combined NMR/MD Analyses

Jamie Baird-Titus, **Mahendra Thapa**, Thomas Doerdelmann, Mark Rance

58th Annual Meeting of Biophysical Society, Moscone Center, San Francisco, California, 2/2014

Prediction of Crystallographic B-factors for the Backbone Atoms of the Protein Calbindin D_{9k} using Molecular Dynamics Simulations

Mahendra Thapa & Dr. Mark Rance

The 27th Annual Gibbs Conference on Bio-thermodynamics, Southern Illinois University, Carbondale, IL, 9/2013

Prediction of Chemical Shifts of Protein Calbindin D_{9k} derived from Molecular Dynamics (MD) Simulations using Sparta+

Mahendra Thapa & Dr. Mark Rance

(i) Ohio-Region Section of the APS, Ohio University, Athens, OH, 3/2013 (ii) Midwest Graduate Research Symposium, University of Toledo, 4/20/2013

Book Chapters

Co-author of 'A Text Book of Higher Secondary Physics' [total 2 volumes: for Classes XI & XII], Vidyarthi Publications, Kathmandu, Nepal

Co-author of 'Modern Graded Science & Environment-Introductory' [total 7 volumes: A, B, 1, 2, 3, 5], Vidyarthi Publications, Kathmandu, Nepal

Co-author of 'Modern Graded Science' [total 5 volumes: 6,7,8,9 & 10 (part I), 9 & 10 (part II)], Vidyarthi Publications, Kathmandu, Nepal

Author/Co-author /Editor of manual books, practice books and solution books of science for kindergarten to class 12 [about 12 books], Neema Publications, Kathmandu, Nepal

Popular Articles

Many articles published in the Scientific Magazine published by Ministry of Science, Nepal

Member

(i) American Physical Society

(ii) Nepal Physical Society

(iii) Nepal Nuclear Society

(iv) Nepal Red-Cross Society

Award & scholarship

Physics Graduate Scholarship for excellent academic result & involvement in research

Western Illinois University, Macomb, IL

Travel grants and support from Physics Department, GSA and mentors of University of Cincinnati, OH

Research Collaboration

Ray Luo, Ph.D.

Professor of Structural Biology/Biochemistry/Biophysics,
Chemical Physics, Biomedical Engineering, and Chemical Engineering
Department of Molecular Biology and Biochemistry
University of California, Irvine, CA 92697-3900

Mark Rance, Ph.D. Professor

Dept. of Molecular Genetics, Biochemistry and Microbiology
University of Cincinnati College of Medicine
231 Albert Sabin Way
Cincinnati, Ohio 45267

Selected Professional Development /extracurricular activities / Services

One of the **Judges** in (a) 13th Annual College of Natural Sciences Poster Session, May 10, 2017, CSU Chico, CA (b) Annual UC Science and Engineering Expo (UCSEE) 2011, 2014, 2015 University of Cincinnati, Science Fair for 6th grade through 12th grade students from a five county area, (c) 2013 Greater Cincinnati Association for Women in Science, Poster Session (10/25/ 2013, CARE atrium, UC, OH), (d) Science and Engineering Fair of Northern Kentucky (2/ 22/2014)

Resource person and trainer in Physics for school (Middle School and High School) teachers in Nepal

Adviser for students for test preparation of various medical and engineering entrance exams & designer of a website and calendar for an institution

Teacher Training Program in physics, 11-17 June, 1999, Higher Secondary Education Board, Nepal

Actively attending seminars and talks related to teaching and learning and took "Physics Education Seminar" as a credit course in 2012 at University of Cincinnati, OH