Niraj R. Ghimire

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EDUCATION

Ph.D. Physics 2011-2019
Department of Physics, University of Connecticut

- Thesis title: "Density Matrix Renormalization Group Studies of Interacting Dipoles in a Zigzag Chain"
- Thesis advisor: Susanne F. Yelin

Graduate Certificate in College Instruction 2016-2017
Neag School of Education, University of Connecticut

- Gained theoretical and practical understanding of college pedagogy through courses and seminars offered in this program

M.Sc. Physics 2006-2008
Central Department of Physics, Tribhuvan University, Nepal

B.Sc. Physics 2003-2006
Tri-Chandra College, Tribhuvan University, Nepal

EMPLOYMENT

Associate Professor in Residence 2025-Present
Department of Physics, University of Connecticut

Assistant Professor in Residence 2019-2025
Department of Physics, University of Connecticut

Graduate Research Assistant 2013-2019
Department of Physics, University of Connecticut

Graduate Teaching Assistant 2011-2019
Department of Physics, University of Connecticut

AWARD/HONOR/GRANT

Teaching Enhancement Grant 2023
College of Liberal Arts and Sciences, University of Connecticut

Letter from the Provost Commending Excellence in Teaching 2020
Office of the Provost, University of Connecticut

Marshall J. Walker Outstanding Teaching Assistant Award 2017
Department of Physics, University of Connecticut

TEACHING EXPERIENCE

Instructor of Record (Spring 2025)
PHYS 1601Q - Fundamentals of Physics I: Calculus-based mechanics for physics majors (studio format)

Instructor of Record (Fall 2023)
PHYS 3201 - Electricity and Magnetism I: Advanced electromagnetism for physics majors

Instructor of Record (Fall 2019, 2020, 2021, 2022, 2024, 2025; Spring 2020, 2021, 2022, 2023, 2024, 2025)
PHYS 1501Q - Physics for Engineers I: Calculus-based mechanics for engineering majors (studio format)

Instructor of Record (Spring 2022, 2023; Fall 2023)
PHYS 1502Q - Physics for Engineers II: Calculus-based electromagnetism for engineering majors (studio format)

Instructor of Record (Summer 2020, 2021, 2022)
PHYS 1402Q - General Physics with Calculus II: Calculus-based electromagnetism for premeds

Instructor of Record (Summer 2021)
PHYS 1202Q - General Physics II: Algebra-based electromagnetism for life science majors

Instructor of Record (Summer 2016; Fall 2019)
PHYS 1201Q - General Physics I: Algebra-based mechanics for life science majors

Graduate Teaching Assistant/Co-instructor (Spring 2018, 2019)
PHYS 1601Q - Fundamentals of Physics I: Calculus-based mechanics for physics majors (studio format)

- Involved in helping students learn physics concepts through problem-solving and hands-on activities such as interactive simulations and physical demos
- Involved in redesigning and teaching of labs
- Involved in identifying best teaching practices for studio-style instruction

Instructor of Record (Spring 2017)
PHYS 1501Q - Physics for Engineers I: Calculus-based mechanics for engineering majors (large lecture)

- Responsible for all the components of the course
  - Used clickers to engage the students in the lectures
  - Used formative assessment to understand and address students' issues with course materials
- Number of students: 107

Lab Instructor (2012-2015)
PHYS 1501Q - Physics for Engineers I: Calculus-based mechanics for engineering majors
PHYS 1502Q - Physics for Engineers II: Calculus-based electromagnetism for engineering majors
PHYS 1201Q - General Physics: Algebra-based mechanics for life science majors
PHYS 1202Q - General Physics: Algebra-based electromagnetism for life science majors
PHYS 1401Q - General Physics with Calculus: Calculus-based mechanics for premeds

- Responsible for one or more lab sections of the course

Course Assistant (2011-2016)
PHYS 3401 - Introductory Quantum Mechanics for physics majors
PHYS 1201Q - General Physics: Algebra-based mechanics for life science majors
PHYS 1202Q - General Physics: Algebra-based electromagnetism for life science majors

- Responsible for grading of homework and/or exams, office hours and review sessions for exams

Tutor (2013-2014)
Physics Learning Resource Center, Department of Physics, University of Connecticut

TEACHING INTERESTS

- Promote active learning by delivering lectures with hands-on activities and interactive simulations
- Teach problem-solving and critical-thinking skills by encouraging the students to work in cooperative groups

PUBLICATIONS AND PRESENTATIONS (*=presenter)

- Belter Ordaz-Mendoza*, **Niraj R. Ghimire**, James Jaconetta, Kevin Lindstrom, "Active Learning Python-based Interactive Notebooks for Introductory Electricity and Magnetism Concepts", AAPT Summer Meeting 2024, American Association of Physics Teachers, Boston, Massachusetts, July 6 – 10, 2024 (poster)
- **Niraj R. Ghimire**, "Quantum phases of interacting spins in a one-dimensional lattice", University of Massachusetts Dartmouth, November 17, 2023 (invited talk)
- **Niraj R. Ghimire**, "Quantum phases of interacting spins in one dimension", University of Massachusetts Dartmouth, April 1, 2021 (invited talk)
- **Niraj R. Ghimire** and Susanne F. Yelin, Frustrated plane-polarized dipoles in one dimension, Physical Review B **100**, 115110, 2019
- **Niraj R. Ghimire*** and Susanne F. Yelin, "Quantum phases of many-body dipolar system in one dimension", APS March Meeting 2019, American Physical Society, Boston, Massachusetts, March 4 – 8, 2019 (talk)
- Diego Valente, **Niraj R. Ghimire***, Jason Hancock, "Initiating the transition to studio physics in a large public university: A case study", APS March Meeting 2019, American Physical Society, Boston, Massachusetts, March 4 – 8, 2019 (poster)
- **Niraj R. Ghimire*** and Susanne F. Yelin, "Many-body physics of plane-polarized dipoles in quasi-1D zigzag chain", 49^{th} Annual DAMOP Meeting, American Physical Society, Fort Lauderdale, Florida, May 28 – June 1, 2018 (talk)

- **Niraj R. Ghimire*** and Susanne F. Yelin, "Finding frustrations and topological phases in a quasi-1D zig-zag chain of dipoles", 48^{th} Annual DAMOP Meeting, American Physical Society, Sacramento, California, June 5 – 9, 2017 (talk)
- **Niraj R. Ghimire*** and Susanne F. Yelin, "Study of dipolar many-body system in a one-dimensional zig-zag chain", 47^{th} Annual DAMOP Meeting, American Physical Society, Providence, Rhode Island, May 23 – 27, 2016 (poster)

SERVICES

University of Connecticut

- **Faculty At-Large**, University Senate, 2025 - Present
  - Responsible for advancing the work of the University Senate as defined by the By-Laws of the University
  - Attend Senate meetings and share what is being discussed at the meetings with colleagues in the Physics Department
- **Member**, University Budget Committee, 2025 - Present
  - Review the planning and allocation of the University budgets, the process of making budgetary and financial decisions, and the determination of priorities among programs having financial implications.
- **Faculty Advisor**, Nepalese Student Association-Grad, 2019 - Present
  - Meet with organization leaders to discuss goals and offer advice in areas such as organizational mission, program content, and purpose
  - Guide the decision-making process
  - Serve as a source of information to the organization members

Department of Physics, University of Connecticut

- **Faculty Advisor to Physics Majors**, 2020 - Present
  - Discuss with students their progress and coursework for the upcoming semester
- **Chair of the Awards Committee**, 2022 - Present
  - Work closely with the Department Head to identify and nominate members of the Department for various awards
  - Coordinate with the people writing the letters of nomination and support so that the letters highlight important contributions of the nomination candidates and get submitted before the deadline
- **Course Coordinator**
  Physics 1501Q - Physics for Engineers I (Spring 2020, 2021, 2024, 2025; Fall 2020, 2022, 2025)
  Physics 1502Q - Physics for Engineers II (Spring 2022; Fall 2023)
  - Moderate instructor meetings before the start of the semester to discuss the syllabus, course policies, lab policies, course site (Blackboard/HuskyCT), and other course logistics
  - Get the online homework system ready for all the sections before the semester starts
  - Call and moderate instructor meetings to discuss course logistics such as midterm exams
  - Edit or revise the lecture slides and tutorial problems that are common to all sections of the course and make them available to the instructors and TAs
  - Attend the TA meetings as needed to train, mentor, and guide the TAs on important aspects of the course
  - Communicate regularly with the other instructors to resolve issues with the lecture component of the course and with the laboratory technician to resolve issues with the laboratory component of the course
  - Monitor fairness to students across all the sections
  - Send important course or lab-related announcements to the instructors and TAs in all the sections and help clarify their confusion regarding the course or lab policies
  - Work as a mentor to graduate instructors of record and help them throughout the semester so that they can teach their section effectively
- Actively involved in discussions with faculty, staff, and graduate students about the development of studio format physics courses and redesign of undergraduate physics teaching labs, 2017
- **Graduate Student Liaison**, Promotion, Tenure and Reappointment Committee, 2013 and 2017
  - Collected anonymous feedback from graduate students on the faculty members being reviewed for promotion, tenure and/or reappointment and submitted it to the committee
- **Graduate Student Liaison**, Preliminary Exams (PhD Qualifying Exams) Committee, 2016
  - Collected anonymous feedback from the graduate students about the qualifying exams and submitted it to the committee

- Collected anonymous feedback from lab instructors about the undergraduate physics teaching labs and submitted it to the Director of the Teaching Labs, 2017
- **Photographer/Videographer**, Colloquia and Distinguished Lectures, 2016 – 2019
- **Event Organizer**, STEM-fest for High School Students, May 2015
  - Facilitated problem-solving sessions in student competition

RESEARCH EXPERIENCE

- Wrote Mathematica and Python codes from scratch to find the exact solutions for a small quantum mechanical system and gain a fundamental understanding of the system
- Employed the C++ library Intelligent Tensor to simulate large quantum mechanical systems using the numerical approximation method "Density Matrix Renormalization Group"
- Wrote Linux Bash scripts to break massive output data obtained from C++ into many pieces and make plots using the graphing utility Gnuplot
- Studied zero-temperature quantum phases of a many-body dipolar system in a zigzag optical lattice at
  - half-filling where all the dipoles are oriented at the same angle in the plane of the lattice, and
  - unit-filling where the individual dipoles are randomly oriented in lattice sites

COMPUTATIONAL SKILLS

- **Operating System:** MS Windows (all versions), Linux (Fedora, Ubuntu), Mac OS
- **Software:** Mathematica, MS Word, MS Excel, MS PowerPoint, LaTeX, Gnuplot, Audacity, Windows Movie Maker
- **Programming Language:** C++, Python, Linux Bash