Physics Graduate Program

Overview

• Intake ~22 students/year, ~85% retention, diverse student population, ~60% international
• 32 tenured/tenure-track faculty members; major research areas: Condensed matter physics, particle and nuclear Physics, biological physics, statistical non-linear physics, space and planetary physics, seismic physics and radiation physics
• Students receive support as Teaching or Research Assistant

Application Requirements

Basic qualification: A four-year undergraduate degree in Physics or related areas with a grade point average (GPA) in the last 60 hours > 3.0

• Proof for English proficiency (TOEFL ≥ 79, IELTS ≥ 6.5 or Duolingo ≥ 105)
• Copies of transcripts, personal statement and three letters of recommendation
• Recommended: Research exp. and scientific/professional/technical publications
• GRE score is NOT essential for admission
• Application due date: January 15 (screening starts by December end)

Applicants passing the screening are invited for an interview (virtual/in-person)
Contact Information and Relevant Links

Department Chair
  Prof. Kevin Bassler  E-mail: kbassler@Central.UH.EDU

Associate Chair
  Prof. Claudia Ratti  E-mail: cratti@Central.UH.EDU

Graduate Program Chair
  Dr. Oomman K Varghese  E-mail: okvarghese@uh.edu

Graduate Student Advisor (Contact person for program and application submission info)
  Ms. Naomi Haynes  E-mail: nghaynes@Central.UH.EDU

Relevant Links

Application Submission:
  https://www.uh.edu/graduate-school/admissions/how-to-apply/

Physics Graduate Program
  https://www.uh.edu/nsm/physics/graduate/

Faculty Members and Research Areas
  https://www.uh.edu/nsm/physics/people/tenure-track/
Condensed Matter Physics

- High-$T_c$ superconductivity: experiments, theory and applications (Ching Chu, W.-K. Chu, J. Miller; theory: C. Ting, W. Su)
- Thin films & Nanomaterials: fundamental studies and device development (O. Varghese, Z. Ren, S. Curran, D. Stokes)
- Energy conversion & Storage (Z. Ren, S. Curran, O. Varghese, S. Chen)
- Topological Materials (Theory: P. Hosur)
- Thermoelectrics (Z. Ren, S. Chen)
- X-ray and neutron scattering (B. Freelon)
- Ion implantation (W. –K. Chu)
- Sensors (O. Varghese, S. Curran)
- Semiconductors (O. Varghese, Z. Ren, S. Curran, D. Stokes)
Energy Related Physics

- Seismic Physics, Imaging, data generation and inversion (A. Weglein, M. Meier)
- Photovoltaics (S. Curran, Z. Ren, O. Varghese)
- Solar fuels (O. Varghese, Z. Ren)
- Battery (S. Chen)
- Thermoelectrics (Z. Ren, S. Chen)
Nuclear Physics

Experiment (R. Bellwied, L. Pinsky, A. Timmins)
- ALICE@LHC, STAR@RHIC; QCD phases, Quark Gluon Plasma, Critical Point Searches
- Particle Astrophysics, Radiation Simulations

Theory (C. Ordonez, C. Ratti)
- QFT, Quantum Gravity, Conformal QM, Quantum Anomalies, Quantum Computing
- Lattice Gauge Theory, Neutron Star Mergers
Particle Physics

Neutrino Physics (L. Koerner, D. Cherdack, A. Renshaw)
• Neutrino Oscillations, CP-violation (DUNE, NOvA, T2K)
• Neutrino Interactions, Flux (NOvA, T2K, ICARUS, EMPHATIC)
• Sterile Neutrinos, BSM Physics (DUNE, NOvA, ICARUS)

Dark Matter and LNG Detector Development (A. Renshaw)
• Liquid Nobel Gas Detector Development (DUNE, Darkside)
• Dark Matter Search (Darkside)
• Sterile Neutrino Search (HUNTER)

Flavor Violation (E. Hungerford)
• Neutrinoless muon decays (Mu2e)
Biological and Medical Physics

• Imaging Science, Optical and Radiological Imaging
  M. Das

• Single Molecule Biophysics
  G. Morrison, W.-P. Su, J. Miller

• Biological Networks
  K. Bassler, G. Gunaratne, G. Morrison
Statistical/Nonlinear Physics

- Complex Systems, Non-equilibrium Statistical Mechanics (K. Bassler, A. Barato)
- Chaotic Motions, Pattern Formation (G. Gunaratne)
- Networks, Network Control (K. Bassler, G. Morrison, G. Gunaratne)
- Hydrodynamics and Turbulence (G. Gunaratne)
- Stochastic Analysis (K. Bassler, G. Gunaratne)
Space and Planetary Physics

E. Bering, L. Li, L. Pinsky

- Auroral Studies, Magnetic Fields in Ionosphere, VASIMR Rockets
- Planetary Physics (Cassini, Juno)
- Dosimetry
Physics Education & Outreach

L. Wood, R. Forrest, D. Stokes, E. Bering

- New Instructional/pedagogical Techniques
- Discovery Classes
- Summer Projects for Undergraduates, High School Students