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 Production ≥ 105) **+** Duolingo Conversation ≥ 120 (***must have both for Duolingo***), or ACTFL must obtain an AH
- 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)**

Department of Physics
College of Natural Sciences and Mathematics

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/

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College of Natural Sciences and Mathematics

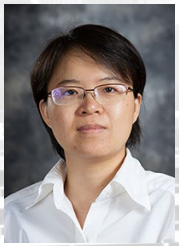
Condensed Matter Physics

- 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**)



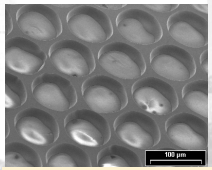


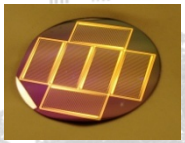
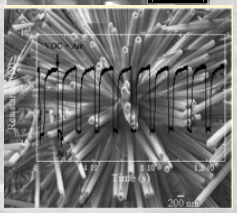


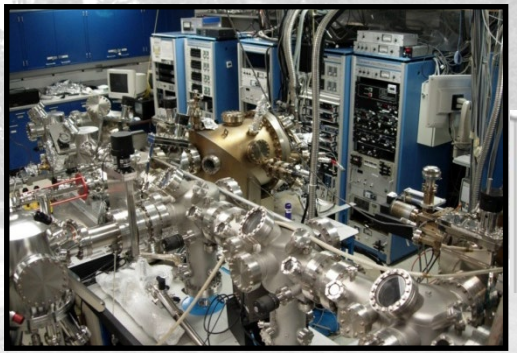








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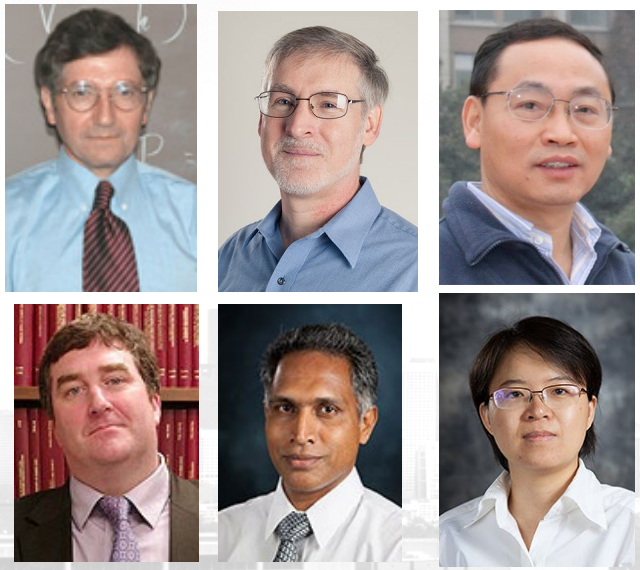
Energy Related Physics

- 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**)



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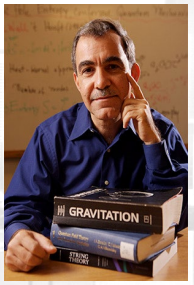
Nuclear Physics





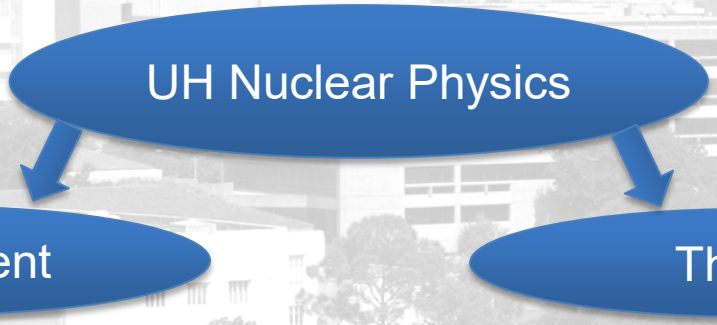


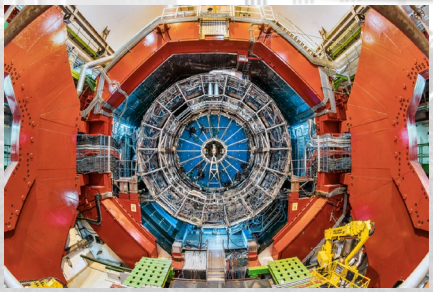
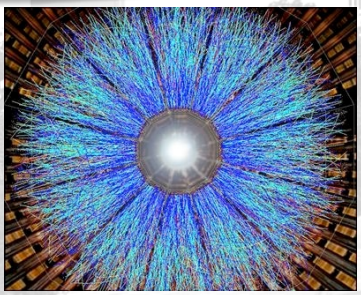
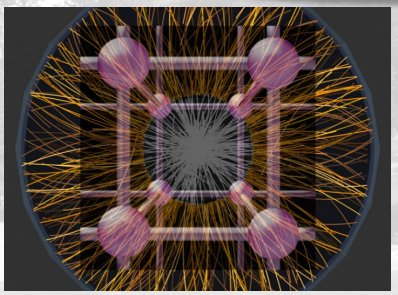
Experiment (R. Bellwied, L. Pinsky, A. Timmins)

- 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

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College of Natural Sciences and Mathematics

Particle Physics

Neutrino Physics (L. Koerner, D. Cherdack, A. Renshaw)

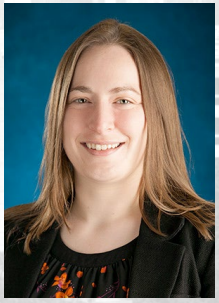
- Neutrino Oscillations, CP-violation (DUNE, NOvA, T2K)
- Neutrino Interactions, Flux (NOvA, T2K, ICARUS, EMPHATIC)
- Sterile Neutrinos, BSM Physics (DUNE, NOvA, ICARUS)

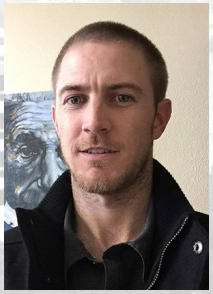
Dark Matter and LNG Detector Development (A. Renshaw)

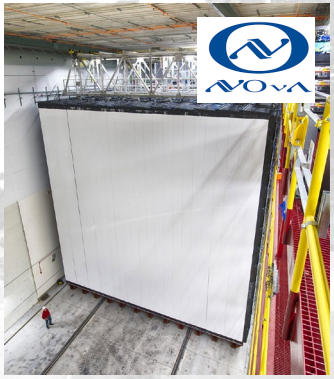
- Liquid Nobel Gas Detector Development (DUNE, Darkside)
- Dark Matter Search (Darkside)
- Sterile Neutrino Search (HUNTER)

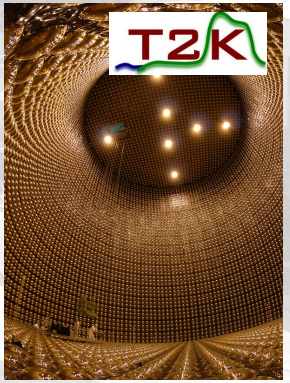
Flavor Violation (E. Hungerford)

- Neutrinoless muon decays (Mu2e)









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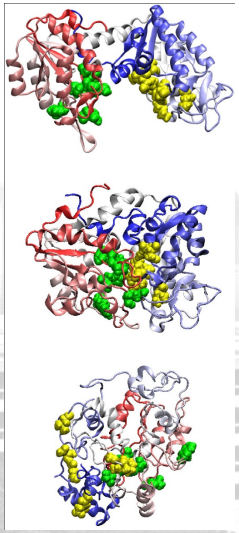
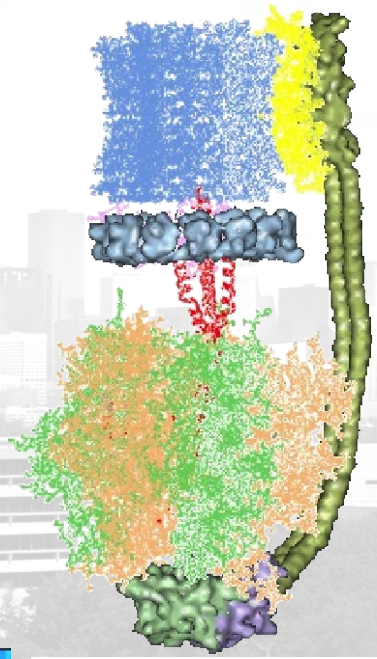
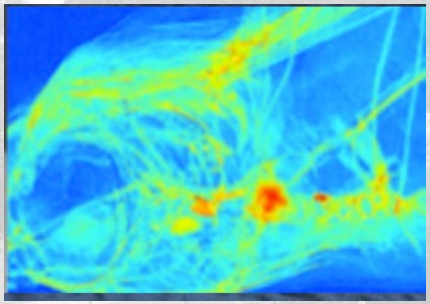
College of Natural Sciences and Mathematics

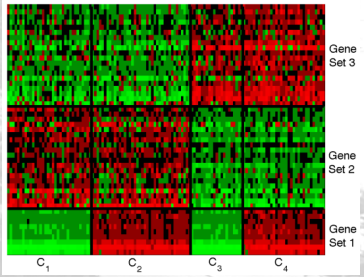
Biological and Medical Physics

- 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









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College of Natural Sciences and Mathematics

Statistical/Nonlinear Physics



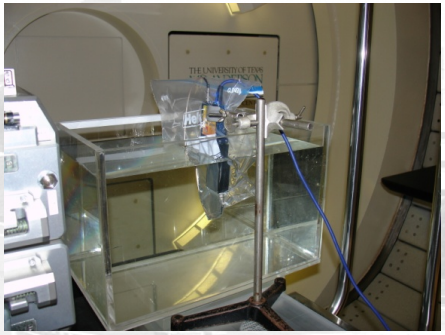

- Complex Systems, Non-equilibrium Statistical Mechanics (**K. Bassler, A. Barato**)
- Chaotic Motions, Pattern Formation (**G. Gunaratne**)
- Networks, Network Control (**K. Bassler, G. Morrison, G. Gunaratne**)
- Hydrodynamics and Turbulence (**G. Gunaratne**)
- Stochastic Analysis (**K. Bassler, G.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

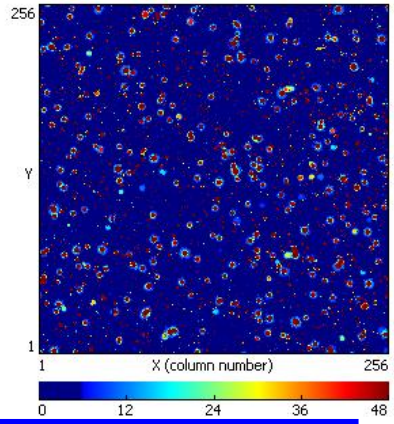
Space and Planetary Physics

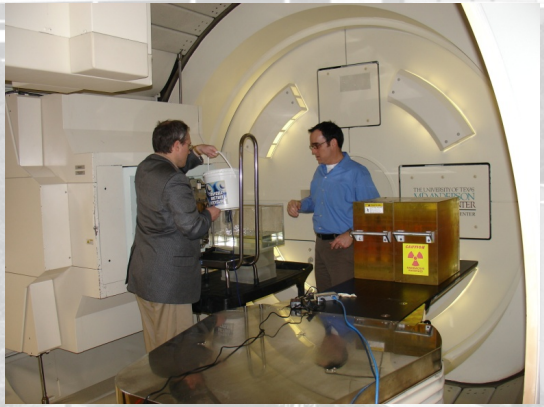
E. Bering, L. Li, L. Pinsky

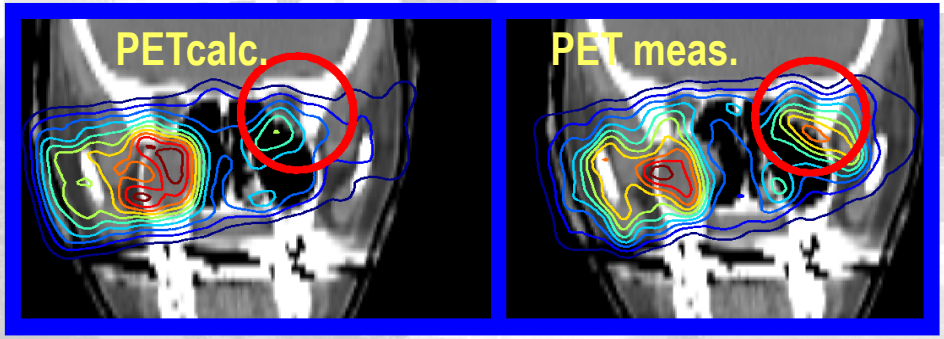


- Auroral Studies, Magnetic Fields in Ionosphere, VASIMR Rockets
- Planetary Physics (Cassini, Juno)
- Dosimetry









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College of Natural Sciences and Mathematics

Physics Education & Outreach




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

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