



Walter C. Pettus

IU Physics Graduate Program Open House

15 December 2022

INDIANA UNIVERSITY

Overview

The IU-Bloomington Department of Physics offers students the opportunity to earn advanced degrees in physics while performing cutting edge research in a variety of fields. Our students select from a variety of programs and interdisciplinary degrees and are integral participants in our labs. Graduate students work with professors whose research takes place on the beautiful IU Bloomington campus and at research centers and national labs throughout the world.

Let us know your interests and what questions you have. We'll point you to someone to talk to further, in a breakout room as needed. Or look at the breakout room and join one that looks relevant to you.

More info on research, graduate program www pages at:
<https://physics.indiana.edu>



Plan for Today

- Overview the department and graduate program
- Chat with research groups
- Answer lingering questions about the application
- Hear from a panel of current graduate students

Learn more at <https://physics.indiana.edu>



Indiana University Bloomington

- Bloomington is the flagship campus of the Indiana University system
 - ~45,000 students (~11,000 graduate and professional)
 - R1 school in the Big Ten conference
 - “Public Ivy”, member of Association of American Universities, etc
- Located in scenic southern Indiana, in a small city of ~80,000 residents
 - ~1 hr drive from Indianapolis (nearest major airport)
 - Indiana really is the “Crossroads of America”
- Important campus details
 - Major basketball school (Hoosiers!)
 - IUB’s Jacobs School of Music is one of top programs
 - Over 1000 performances every year
 - Astronomy is a separate department from physics (but right next door)



Brief Introductions



David Baxter
Department Chair



Radovan Dermisek
Director of Graduate Studies



Nelson Batalon Jr.
Student Services Administrator



Program Timeline and Requirements

Year 1

- Take the recommended 1st-year core courses (QM1/2, EM1/2, class/stat mechanics¹)
- Connect with a research group, join effort in summer after 1st year
- (Likely) teaching assignment
- Prepare for and take the **qualifying exam** in August at end of 1st year

Year 2

- Take courses in major and minor areas of concentration.
 - 2 course for major (eg: subatomic physics, solid state/condensed matter, or biophysics)
 - 3 courses for minor (eg: quantum field theory, computational physics, other non-major course)
 - Ramp up involvement with research

Year 3

- Finish any course requirements in major or minor areas and meet 90 credit hour requirement²
- Meet teaching requirement (if not done in previous years)
- Complete any language requirements
- Complete **candidacy seminar** in 5th semester
 - You are then “nominated for candidacy”

Years >3

- Do advanced research in G901.
- Average time to PhD, IU physics, over last 5yrs \approx 6 yrs.

¹) biophysics tract is somewhat different

²) 90 cr hr requirement met after 3 yrs with 12/12/6 cr hr in Fall/Spring/Summer



Support

- Admissions into program is a statement from the department we:
 - a) Think you will be successful in the program
 - b) Intend to support you for the duration of your PhD
- Almost all admissions are into PhD program
 - Application to masters program carries expectation of self-support
- Admission to PhD program carries guarantee of support
 - For current 1st years, at least 5 years, and stipend of \$2,200/month
- Separate “Bridge” masters track with option to convert to PhD



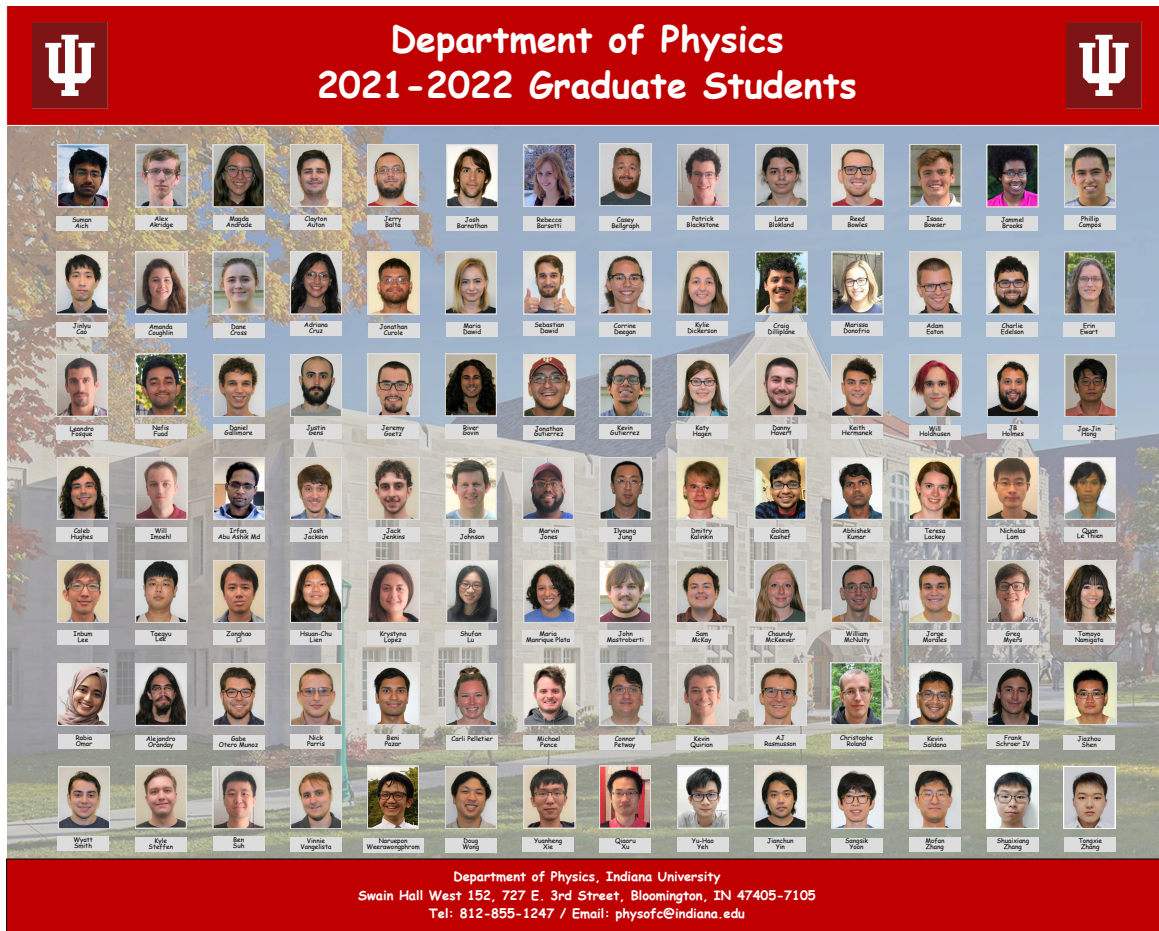
Application Notes

- <https://physics.indiana.edu/graduate/how-to-apply/index.html>
- Application deadline is January 1
 - Make best effort to have all material (including letters, transcripts) submitted by deadline
 - All applications received by deadline will receive full and equal consideration
 - We will continue to collect late applications, but we review applications late applications after the initial set
- GRE scores are optional this year
 - We will review applications with or without scores, with no bias
 - Submit scores if you feel they help, no judgement for omitting scores
 - Only official score reports can be included in application review



Grad Students

- 93-100 students in program
- 19% female
- 28% international
- 17% from under-represented groups
- Average time-to-degree for 2020 grads was 6.1 yrs
- Employment: for 60 PhDs 2014-18
 - 37% career research
 - 10% industry or business
 - 37% post-doc research
 - 7% non-tenure track faculty



Research

- See <https://physics.indiana.edu/research/research-areas/index.html>
 - Nuclear Physics (perennially one of the top ten groups in the country), precision measurements, ...
 - High-Energy Physics: ATLAS, neutrinos, fundamental symmetries, BSM physics, astrophysics, ...
 - Condensed Matter: neutron scattering, correlated electron and topological materials, quantum fluids, soft matter, ...
 - AMO: quantum simulation with ions and cold atoms, QIS, ...
 - Biophysics: neuroscience, systems biology, ...
- *35+ active faculty/researchers*
- *Lots of interdisciplinary, cross-cutting research ...*

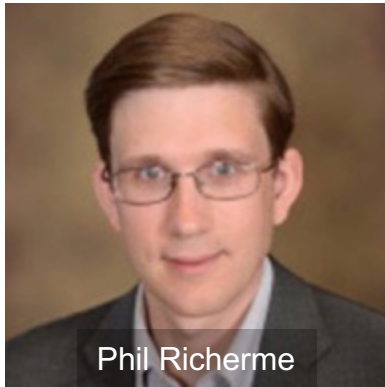


Research Centers

- **Center for Exploration of Energy and Matter (CEEM)**
 - Nuclear Physics
 - Neutrons, neutrinos, spin
 - Major facilities/large work areas facilitates significant participation in important international collaborations.
- **IU Center for Spacetime Symmetries (IUCSS)**
 - World center for precision measurement approaches to studying fundamental symmetries (AMO/nano scale approaches to satellites)
- **Quantum Science and Engineering Center (QSEc)**
 - Exploring the power of quantum entanglement through novel probes and quantum simulation
- *Plus strong connections to several national labs, including ORNL and FNAL*



AMO & Biophysics



Condensed Matter



David Baxter



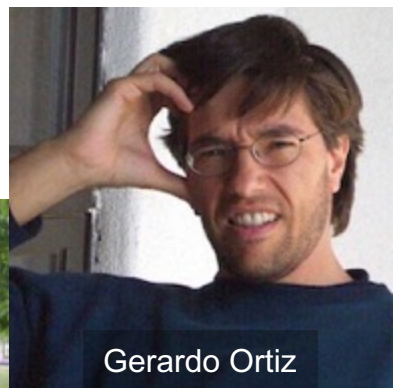
John Carini



Roger Pynn



Herb Fertig



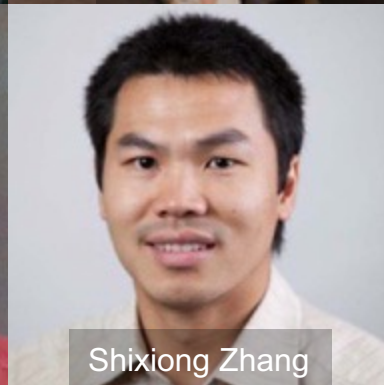
Gerardo Ortiz



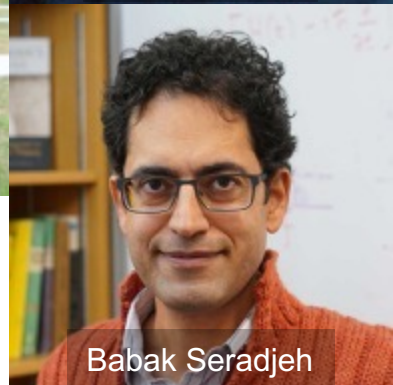
Paul Sokol



Garfield Warren



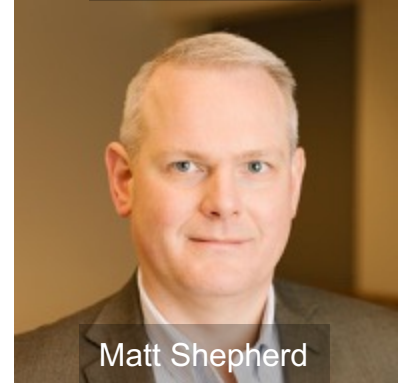
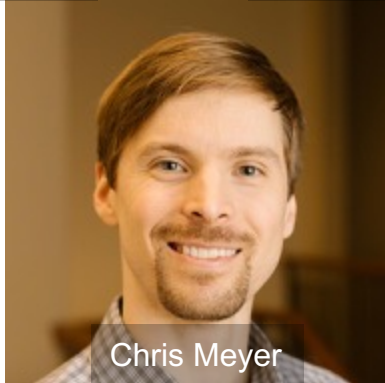
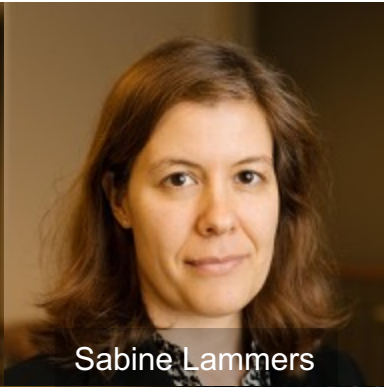
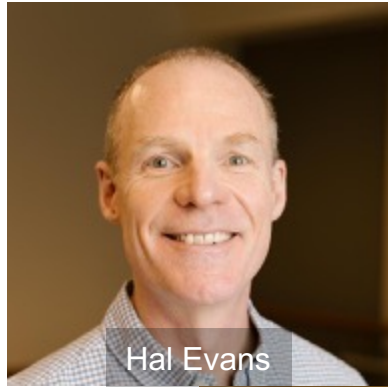
Shixiong Zhang



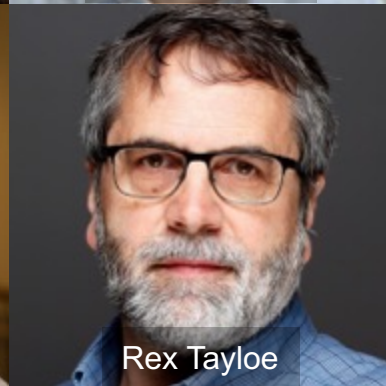
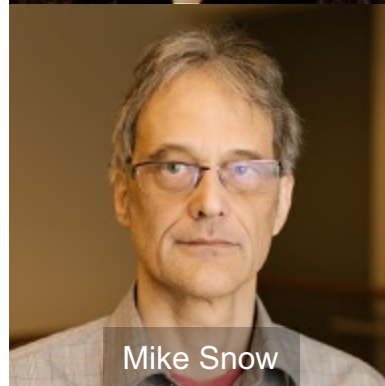
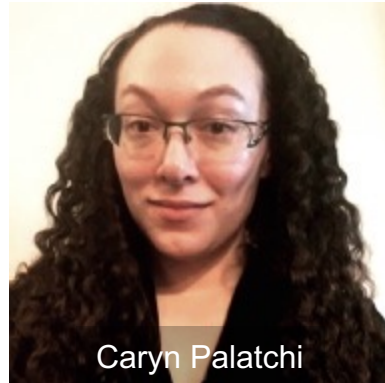
Babak Seradjeh



Experimental High Energy* & Nuclear



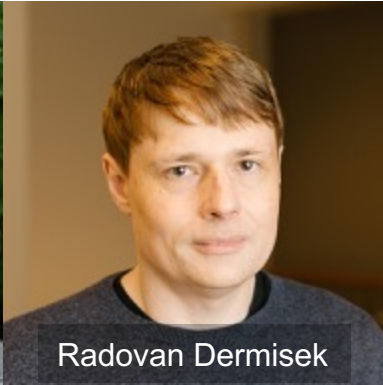
Experimental Nuclear & Neutrinos



Theoretical High Energy & Nuclear



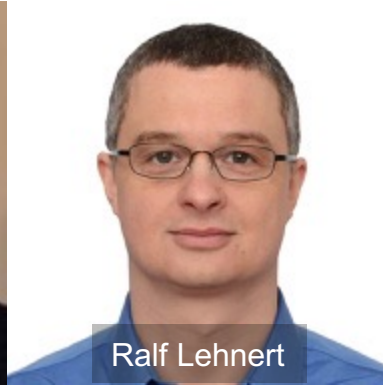
Mike Berger



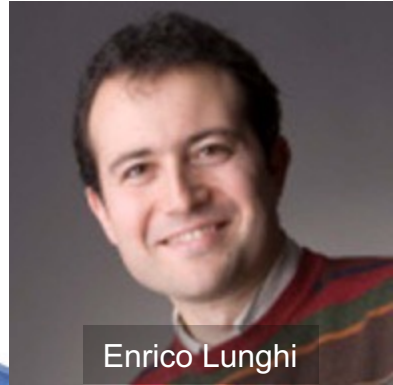
Radovan Dermisek



Alan Kostelecky



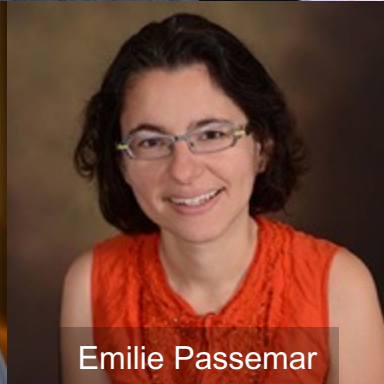
Ralf Lehnert



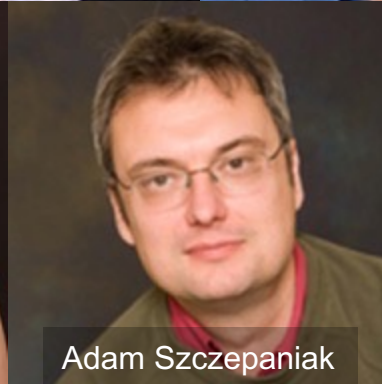
Enrico Lunghi



Jinfeng Liao



Emilie Passemar



Adam Szczepaniak



Chuck Horowitz



Thank You!

- Research breakout rooms now open
- Application questions, find Nelson's breakout room
- Grad student panel starts in ~15 minutes
- E-mail me at pettus@indiana.edu
- E-mail department at gradphys@indiana.edu

