



Walter C. Pettus

# IU Physics Graduate Program Open House

8 December 2023

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>

*Lingering questions?*

- *General questions:* [pettus@Indiana.edu](mailto:pettus@Indiana.edu)
- *Application questions:* [gradphys@Indiana.edu](mailto:gradphys@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



Mark Messier  
*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 mechanics<sup>1</sup>)
- Connect with a research group, join effort in summer after 1<sup>st</sup> year
- (Likely) teaching assignment
- Prepare for and take the **qualifying exam** in August at end of 1<sup>st</sup> 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 requirement<sup>2</sup>
- Meet teaching requirement (if not done in previous years)
- Complete any language requirements
- Complete **candidacy seminar** in 5<sup>th</sup> 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.

<sup>1</sup>) biophysics tract is somewhat different

<sup>2</sup>) 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 1<sup>st</sup> 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






# International Application Notes

- IU imposes more stringent review of international applicants
  - Centralized control of degree equivalency, English proficiency, etc.
- Please reach out to Nelson with specific questions




# Grad Students


- ~90 students in program
- ~20% female
- ~30% international
- ~20% 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



## Department of Physics

### 2023-2024 Graduate Students





Sygen Aich	Alex Akrilige	Magda Andrade	Kwabena Amankwah	Clayton Aulon	Jerry Baliga	Rebecca Barozzi	Casper Blackstone	Patrick Blackstone	Lera Blackland	Brend Bowles	Jamuel Brooks	Wes Burke	Robert Cabral
Elio Cardenas Figueroa	Adri Cruz	Kylie Dickerson	Adam Eaton	Charlie Edson	Elin Ewart	Nafa Foad	Daniel Gallimore	Jeremy Gertz	Brian Goins	Jonathan Gutierrez	Katy Hagler	Daniel Havelit	Lara Helmenstein
Keith Hernandez	Marcus Hernandez Ogilvie	Will Hoffmann	Jae-Jin Hong	Jeonghoon Hong	Caleb Hughes	Josh Jackson	Bo Johnson	Marvin Jones	Youngh Song	Colson Kasper	Nathan Lane	Oguz Le Yilmaz	Gregory Lee
Tengyu Liu	Katherine Li	Huzhou-Chu Liu	Kyrylana Lopat	Santosh M	Maria Manoussos Plata	Abi Marquet	Tiffany McBride	Conner McConnell	Anna McChesnon	Liam McKay	Chowdhury Md. Karim	Bill McHaffty	Fanuel Mendez
Miles	Jorge Morales	Ron Murray	Khalid Omar	Alex Orantsev	Dirke Owen Munoz	Jim Ouellet	Nick Parris	Rami Patel	Michael Percec	Connor Petrosky	Kevin Quinn	AJ Rasmussen	Kevin Roberts
Depesh Sabharwal	Sam Schlicht	Frank Schuster IV	Danesh Selvan	Oliver Shroyer	Kyle Shroyer	Ryan Smith	Ben Sob	Michael Van Meter	Narayanan Venkateshwaran	Srinivas Venk	Mohan Veng	Shuangming Zhang	Jingyi Zhang

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Swain Hall West 152, 727 E. 3rd Street, Bloomington, IN 47405-7105  
Tel: 812-855-1247 / Email: [physofc@indiana.edu](mailto:physofc@indiana.edu)



# 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 ...*

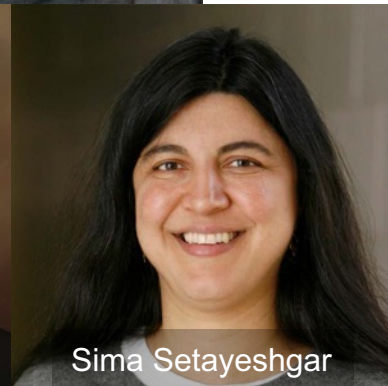
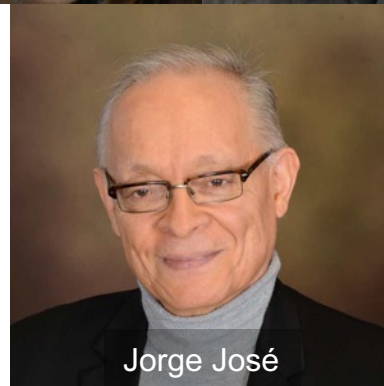
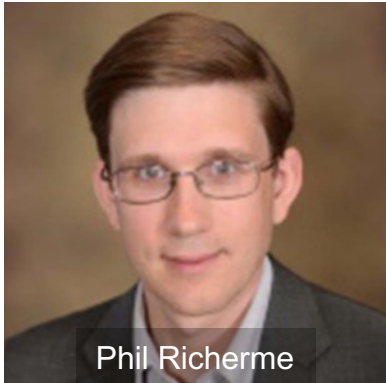


# Research Centers

- **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
- **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



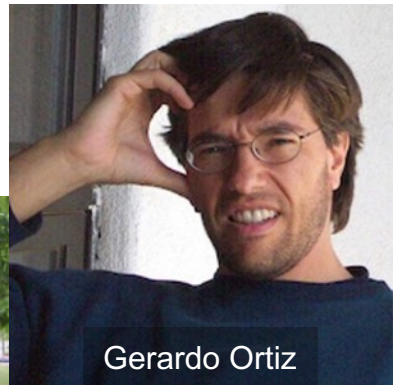
John Carini



Roger Pynn



Herb Fertig



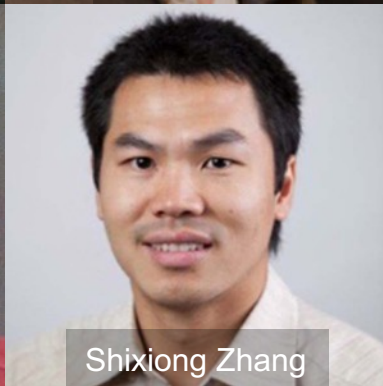
Gerardo Ortiz



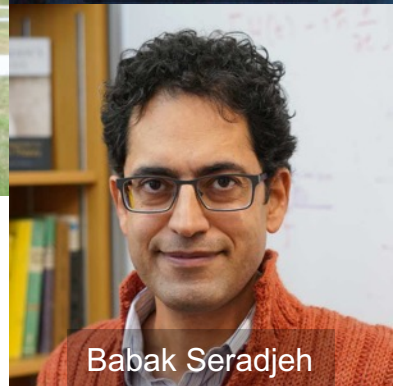
Paul Sokol



Garfield Warren



Shixiong Zhang



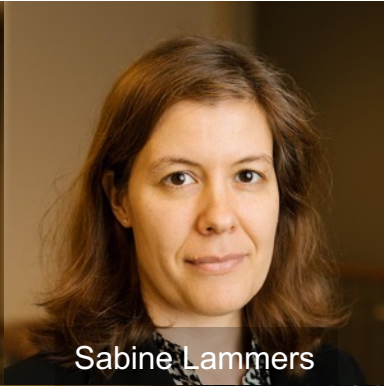
Babak Seradjeh



# Experimental High Energy\* & Nuclear



Hal Evans



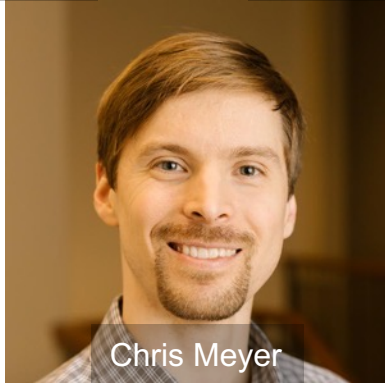
Sabine Lammers



Fred Luehring



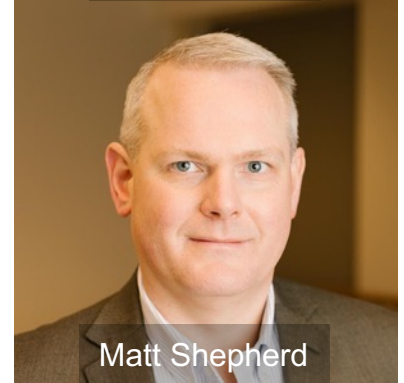
Ryan Mitchell



Chris Meyer



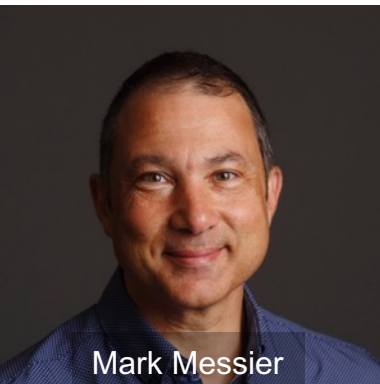
Rick Van Kooten



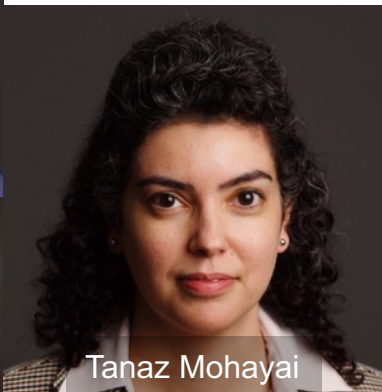
Matt Shepherd



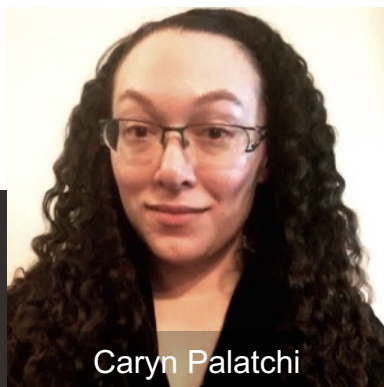
# Experimental Nuclear & Neutrinos



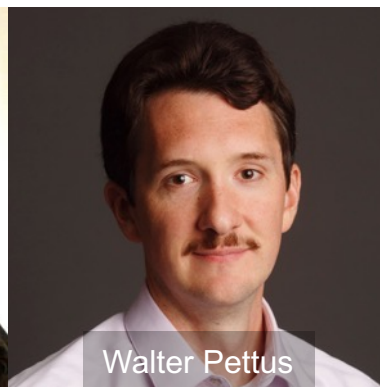
Mark Messier



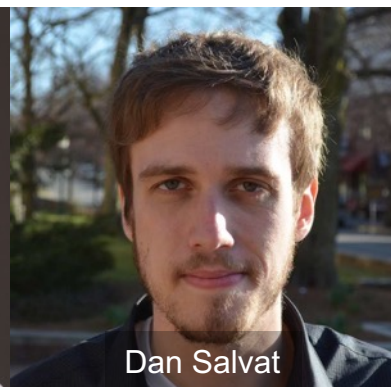
Tanaz Mohayai



Caryn Palatchi



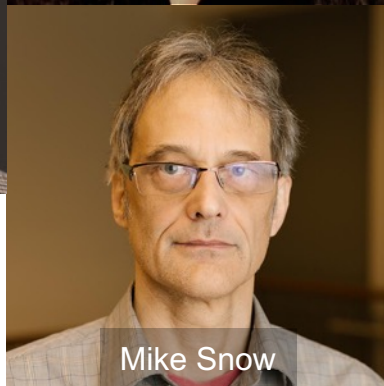
Walter Pettus



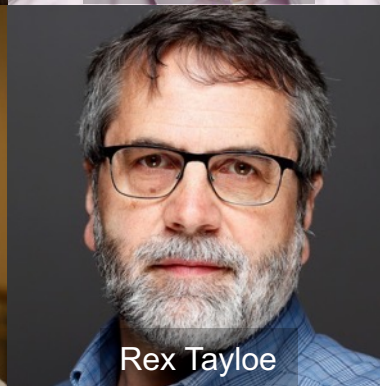
Dan Salvat



Jon Urheim



Mike Snow



Rex Tayloe



Scott Wissink





# Theoretical High Energy & Nuclear



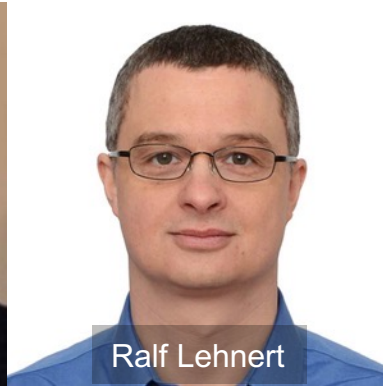
Raymond Co



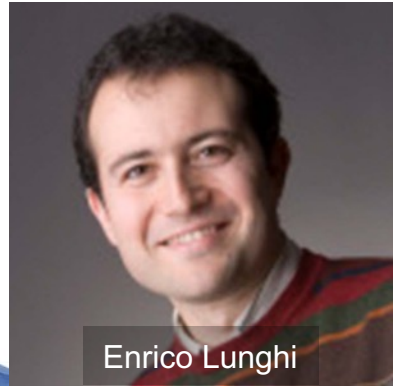
Radovan Dermisek



Alan Kostelecky



Ralf Lehnert



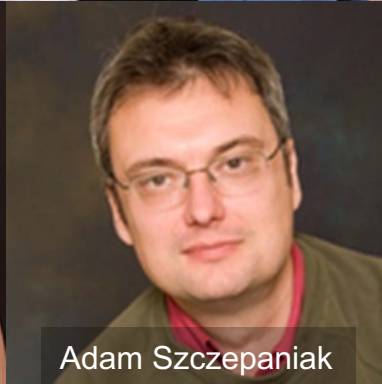
Enrico Lunghi



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 ~40 minutes
- E-mail me at [pettus@indiana.edu](mailto:pettus@indiana.edu)
- E-mail department at [gradphys@indiana.edu](mailto:gradphys@indiana.edu)

