

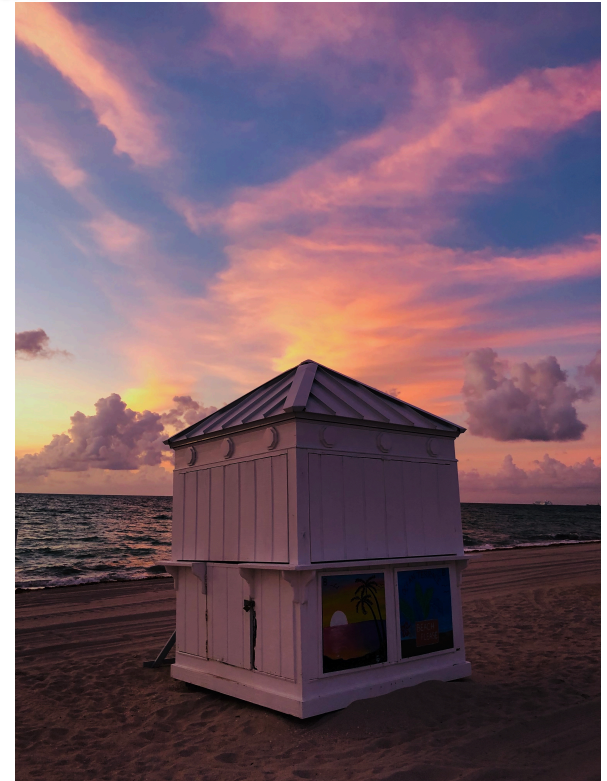
Promoting underrepresented group participation in nuclear physics at FIU

Lei Guo, Florida International University

FIU Overview

- Urban, large, research, community oriented!
- One of eleven State universities in Florida
- One of the 5 largest in the U.S.
with over 52,000 students
- ~77% of undergrad population
Hispanic or Black/African
American.
Reflects demographics of Miami
and southeast Florida.

Makes FIU the largest
producer of Hispanic STEM
majors in the country.



FIU Physics Overview

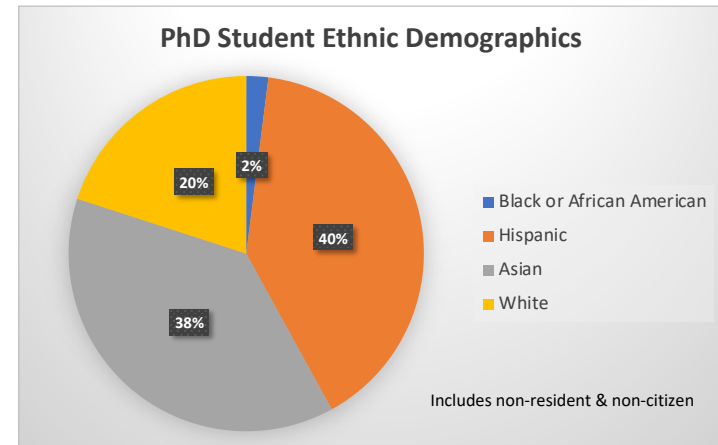
- About 175 undergrad majors
 - 63% Hispanic
 - 11% Black/African American
 - 28% women

Large pool of URM students from which to draw.
Highly sought after by grad schools.

- 50 Graduate students (Ph.D.)
 - 26% women
- 24 Tenure Track Faculty
 - 3 women
 - 7 Asian
 - 1 Hispanic
- 5 Instructors
 - 2 women
 - 1 Asian
 - 1 Hispanic

Research Area:

- Astronomy
- Biophysics
- Condensed Matter
- Neurophysics
- Nuclear/Particle physics
- Quantum Optics
- PER

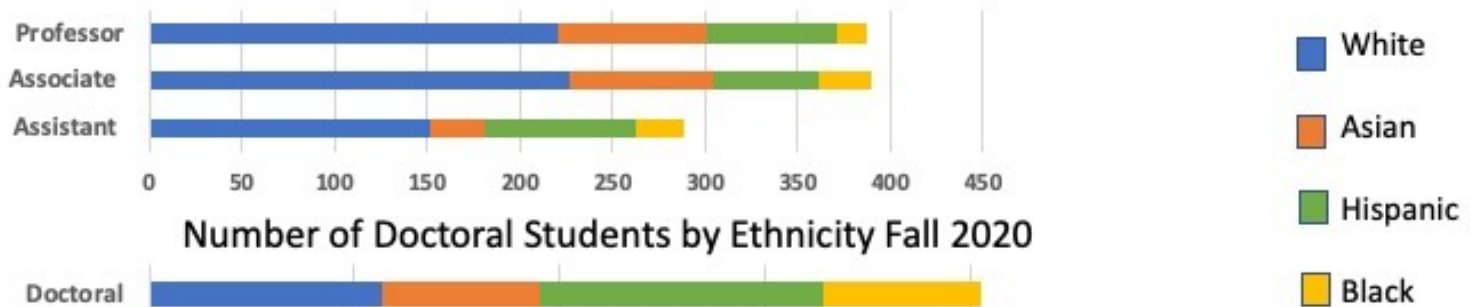


FIU Demographics: Faculty/Students

FIU by Ethnicity 2020

Note: 13.4% of U.S. and 16.4% of Miami-Dade demographics are Black or African American

Number of Faculty at Professor Ranks by Ethnicity Fall 2020



Number of Doctoral Students by Ethnicity Fall 2020



Number of Undergraduate Students by ethnicity



One group looks very different from the others. Can you tell?

FIU: Experimental Nuclear Physics Group

Experimental Faculty Members

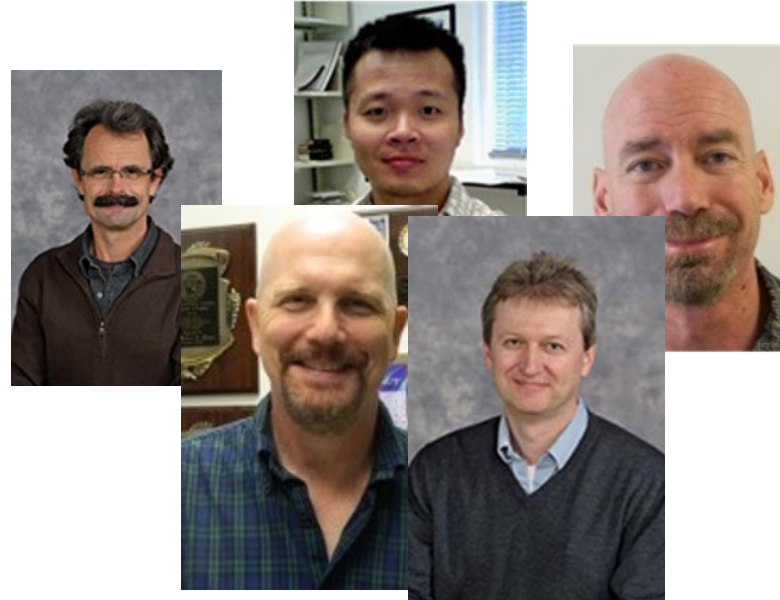
Werner Boeglin: Deuteron structure and exotic meson spectroscopy (Fusion).

Lei Guo: hadron spectroscopy.

Pete Markowitz: Strange-quark physics and hypernuclear spectroscopy.

Brian Raue: Strange particle spectroscopy and proton structure.

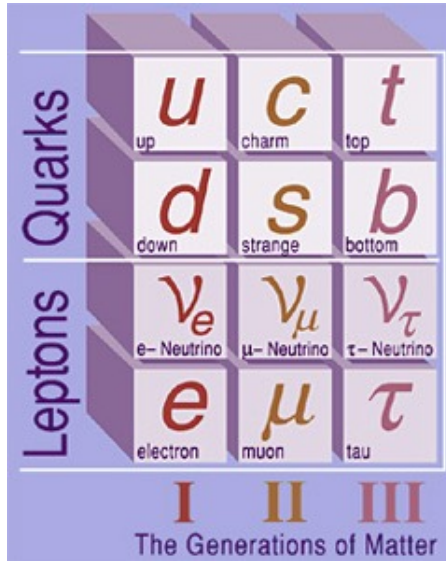
Joerg Reinhold: Hypernuclear spectroscopy and exotic meson spectroscopy



Group started with Jlab Bridge program;
Looking to actively participate in future EIC
Program: part of EEmcal proposal;
Spectroscopy/SRC/nucleon structure....
20+ Ph.D Graduates



FIU Theoretical Nuclear/Particle Physics Group



Dr. Rajamani Narayanan

- Lattice field theory of quantum chromodynamics (QCD)
- Fundamental aspects of lattice field theory



Dr. Misak Sargsian

- High-energy nuclear physics
- Short-range correlations in nuclei
- QCD and nuclei



Dr. Wim Cosyn

- Nuclear short-range correlations
- QCD studies with light ions
- Jlab and EIC



FIU Nuclear/Particle physics: Past success mentoring undergraduate students

- Undergraduate mentoring success (Since 2014-15 AY, prior to trainee program)
 - 20 total undergrads
 - 15 have gone on to grad school with about half going into nuclear/particle physics.
 - 16 Hispanic
 - 1 African American
 - 3 Women

This clearly illustrates our group's ability to recruit and train underrepresented students and contribute significantly to goals of the D.O.E. URM trainee initiative.

Current Ph.D. Students: 14
(3 theory, 11 experiment)

7 Hispanic

3 Asian

4 White

5 Women (3 Hispanic, 1 Asian, 1 White)

Current Faculty: 8

6 white men

2 Asian men

FIU Nuclear Physics D.O.E. Trainees and Projects (2021-2023): Year 1



Manuel Ramirez Garcia
Exp (CCR)
(U Michigan, 2022)



Alan Sosa
Theory/Exp
(FIU 2023 Fall)



Alejandra Granados
Exp (CCR)
Michigan State U,
2023 Fall

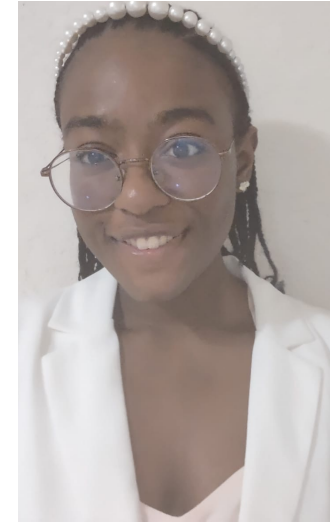


Clare Bennet
Theory
U of Nevada,
Health Physics

- Data analysis and hardware projects along with theoretical studies during the academic year
- Career development (grad school applications, job hunt, writing skills, etc.)
- Summer trips to Jefferson Lab
 - Detector work for group's upcoming experiment in Hall C
 - Moeller polarimeter work in Hall B

FIU Nuclear Physics D.O.E. Trainees and Projects

Year 2: (2022-2023)



Brandon Roldan
Tomei

Soichi Ystokazu
Gomez

Diego Padilla
Monroy

Alejandra
Granados

Nicolas
Cea

Hillary
Beauliere

Theory
(structure
functions)

Theory
(structure
functions)

Theory/Exp
(antiproton
photproduction)

Exp (CCR)

Exp
(antiproton
photproduction)

Exp
(GlueX
detector)

Senior
Math/Phy

Senior
Math/Phy

UCLA
2023

MSU
2023

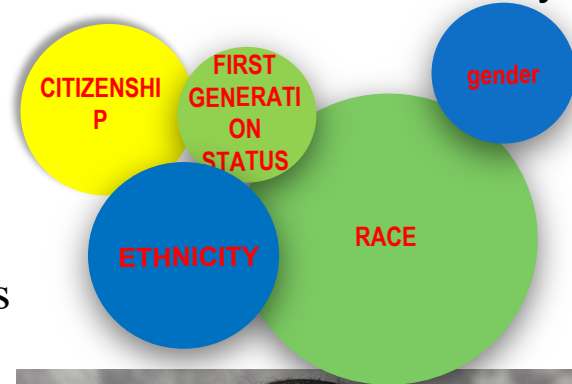
Senior
Math/Phy

Junior

Trainee Program Assessment

- Overall: Do students continue in the field after graduation?
- Digging deeper:
 - Dr. Dionne Stephens from FIU's Department of Psychology does work on identifying cultural meanings that effect mental health of URM populations.
- Interviews with both trainees and faculty early in the program and after trainees have completed program.
 - Effectiveness of mentoring strategies
 - Role and influence of stakeholders and resources
 - Gaps in existing mentoring resources and services
 - Self-identified needs and resources of students

Consider Intersectionality



www.faculty.fiu/~stephens

Anonymous Trainee Interviews

“My mentor - he's really nice and he really wants his students to succeed. So, he's kind of strict so like in some parts he's kind of strict but I feel like that's helpful because he's honest about his opinions . And other mentors in the program they're very nice and very easy to approach. And my other classmates in the program. Whenever we talk about like our projects that's helpful too. ”-- Katara

“Usually there's a lot of like REU, summer things for physics, and research experience for undergrads for physics.. it's very few that are like all year and give a stipend, so I really like that about that. And we are doing real research, not just watching or reading about it.” -- batman

“I think the program does really help you to determine what you want to do in terms of whether you want to be a nuclear physicist or not. Because you really get exposed to it so that's great... and it made me think about who I am. I think there's an organization of nuclear Mexican physicists [in the United States]- I have to look more into that.
” -- Hernandez

FIU Initiative: Improving diversity throughout the academic pipeline.

FIU College of Arts, Sciences, & Education is developing *holistic* graduate admissions processes that we expect to **improve diversity in the graduate student population.**

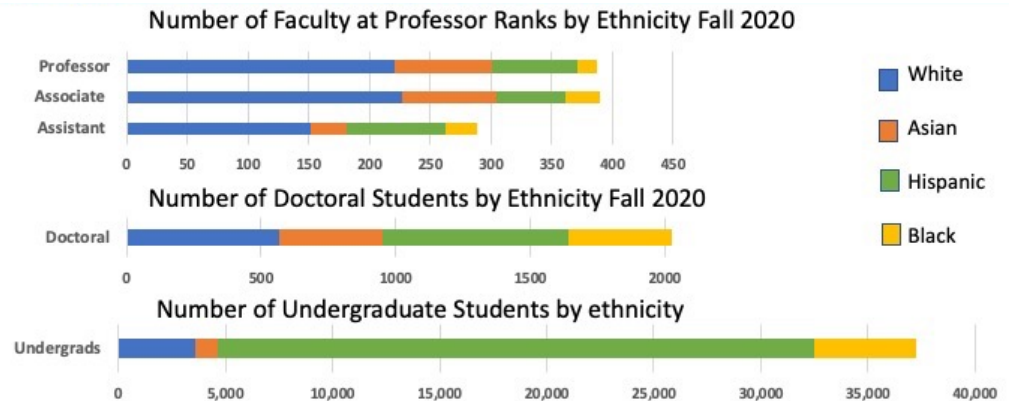
Desirable characteristics

1. Academic preparedness
2. Research experience
3. Leadership and group work
4. Long-term goals and commitment
5. Resilience and adaptability

6. Contributions to a diverse community
7. Self-awareness and self-development
8. Creativity

Eliminate the GRE altogether.

Use Physics as an early testbed.



Other Resources: FIU Bystander Leadership

- FIU Bystander Leadership Program
 - **educational program** for faculty members that is intended to move participants from “insight” to “action” to increase inclusion among faculty as well as to address gender and race bias within faculty interactions in positive and prosocial ways.
 - **Fun/Effective/You get to be actors**
 - **Award Winning**
 - 2020 Council for Advancement and Support of Education (CASE) Platinum Award in the category of Best Practices in Diversity Programming.
 - NIH Prize for Enhancing Faculty Gender Diversity in Biomedical and Behavioral Sciences.
 - **Possible expansion to postdoc scholars/graduate students**

Summary

- FIU Nuclear/particle physics group has a strong track record of promoting diversity
- Much remains to be done
- DOE trainee program has been a big boost
 - We are constantly assessing and learning
- There are various other FIU resources available and FIU is committed to increasing underrepresented group participation in STEM
- Welcome to join us!

