2023 Fall Student-Faculty Medical Physics Meeting

Location: HAMP 2107
Date: August 28, 2023
Time: 5:00-6:30 pm
Agenda

• Welcome!
• MPCP
• What is Medical Physics? (visiting students)
• Important Dates
• CAMPEP News and Program Information
• Faculty Research Labs
New Medical Physics Students
New Students

- Kolawole Adesina (PhD)
- Waleed Almutairi (PhD) (Spring, 2024)
- Maram Alqurashi (PhD) (Spring, 2024)
- MacKenzie Coon (PhD)
- Jubril Ramotallah Dami (PhD)
- Wilson Delmas (MS)
- Phillip Durham (MS)
- Justin Geise (MS)
- Chia-Tien Hsu (MS)
- Tahereh Khanialakbari (PhD) (Spring, 2024)
- Michael Rottier (MS)
- Pegah Shoa (PhD)
- Qi Wang (PhD)
- Jian Zirui (PhD)
2023-2024 Leadership

Mahsa Servati
Co-President

Brian Bozymski
Co-President

Philip Durham
Treasurer
Events: “Journal Club” Meetings

- Brief volunteer report on a recent MP-related publication
  - Group-wide discussion, including MP faculty

- ABR question review
  - Informally prepare for Part 1 exam
Events: Meet Medical Physicists

• Host (in-person or virtually) a professional physicist
  • Purdue Alumni, Residents, Researchers, Clinical, Industry…

• Opportunity to…
  • Hear their journey
  • Learn about their day-to-day
  • Network!

• Always open to your suggestions
Events: Socials and Specials

- Student hangouts and socials
- Get to know your peers outside class
2022-2023 Event Highlights

- Event Series: Non-Clinical MP Careers
- Met Some MPs:
  - Dr. Mychaela Coyne (IU Health, 3D Printing)
  - Liz Jaye (Recent Alum, Resident @ Cleveland)
  - Dr. Eric Cameron (Colorado, Diagnostic Physics)
  - Dr. Daniel McIlrath (U of Oklahoma, Faculty)
- Summer Indianapolis Clinic Visit
2022-2023 Awards ($$$)

- **ONE** $200 award for MP-related travel
- **TWO** $50 awards for annual AAPM membership dues

**How?**

*Earn points for MPCP participation, presentations, etc.*

- Awarded to students with most points at end of academic year
2022-2023 Awards ($$$)

- MPCP Travel Award Recipient
  - Song Yue (PhD Student)

- MPCP AAPM Membership Award Recipients
  - Joe Speth (MS Student)
  - Sidney Schwartz (Undergraduate)

2023-2024 Awards TBD
# Fall 2023 Events

*(Tentative → Check your emails!)*

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
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</thead>
<tbody>
<tr>
<td>September 6th</td>
<td>Callout meeting (<em>RSVP</em>)</td>
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<tr>
<td>September 20th</td>
<td>Meet a Medical Physicist (TBD)</td>
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<tr>
<td>October 4th</td>
<td>Journal Club #1</td>
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<td>October 18th</td>
<td>Meet a MP: <strong>David Campos</strong></td>
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<td>– PhD, DABR (IU Residency Program)</td>
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<td>November 1st</td>
<td>Journal Club #2</td>
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<tr>
<td>Nov. 3rd/4th</td>
<td>AAPM ORVC Fall Meeting</td>
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<tr>
<td>December</td>
<td><strong>SOCIAL EVENT</strong></td>
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We want to hear from you!

Callout – September 6th – 5:00-6:00 PM in FRNY G124

Mahsa Servati
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Brian Bozymski
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RSVP Survey
What is a Medical Physicist?
What is a Medical Physicist?

- Medical Physicist and the Medical Doctor, specifically the Radiation Oncologist/Oncologist and Radiologist, are two sides of the same coin.
- For example,
  - the Radiation Oncologist determines the best cancer treatment for the patient based on their cancer,
  - the Medical Physicist determines the best way to apply the radiation for each individual patient.
Medical Physicist Responsibilities?

- Medical Physicist considers …
  - Apply uniform dose to tumor
  - Minimize dose to normal tissue
  - Avoid dose to critical organs
  - How to reposition and apply this dose every day for 4-6 weeks
  - Type of radiation to use (x-rays, electrons, protons)
  - Adapt the treatment
  - And many other considers
Medical Physicist Expertise?

• Medical Physicist expertise …
  • Understanding advanced radiation producing equipment (accelerators, instrumentation to measure radiation, etc.)
  • Quality assurance and control
  • Advanced software tools (computational methods, AI, etc.)
  • Integrating new technologies into the clinic
  • Research and develop better methods and technologies
  • And many other considers
Medical Physicist Specialize in …

- Radiation Therapy Physics
  - Here, you work with Radiologists, and perform similar activities, specializing in Medical Imaging – X-ray, Tomosynthesis, Fluoroscopy, CT, MRI and US.

- Diagnostic Imaging Physics
  - Instead of external radiation sources, the focus is on radioactive material inserted into the body
  - Therapy component (radioactive isotopes and seeds) and Diagnostic component (PET/SPECT)
Path to Becoming a Medical Physicist?

• To become a Medical Physicist,
  • Physics major or minor
  • Obtain a M.S. or PhD degree from a CAMPEP accredited graduate program (Part I of the ABR exam)
  • Perform a 2-year Residency from a CAMPEP program (Part 2 of the ABR exam)
    • Declare your specialty (Therapy, Imaging, NM)
  • Pass the oral board exam (Part 3 of the ABR exam)
Not all jobs are in the clinic?

- Companies performing MP service
- Industry
  - Radiation Therapy (R&D) - Varian, IBA, Elekta, BrainLab, etc.
  - Medical Imaging (R&D) – Siemens, Philips, Toshiba, Sony, etc.
  - Nuclear Medicine Techniques – Eli Lilly, etc.
  - Numerous other companies
- Government (NRC, etc.)
- Academia and Research Centers
  - Cancer Centers, Universities, etc.
Salaries?

- MS degree, starting salaries
  - 0 – 2  200.7
  - 3 – 4  166.5
  - 5 – 9  194.6
- PhD degree, starting salaries
  - 0 – 2  164.3
  - 3 – 4  175.1
  - 5 – 9  196.2
Important Dates and Events
ABR Exam, Part 1

2024

Feb 1 – March 30

Applications for ABR Exam, Part I (in August)

Within 30 days, you will be notified via email of the status of your application

https://www.theabr.org/medical-physics/initial-certification/part-1-exam/requirements-application#app

Aug 1

Qualifying Exam, Part 1

https://www.theabr.org/medical-physics/calendar#2024

Requirements: https://www.theabr.org/medical-physics/initial-certification/part-1-exam/requirements-application
AAPM Annual Conference

• Local Chapter (Ohio River Valley Conference, OVRC)
  • Fall (clinical): November 4th - Cincinnati, Ohio  (free for students); November 3rd – night out
  • Spring (research/student): TBD

• Annual AAPM Conference
  • July 21 – 25 – Los Angeles, CA
  • Great opportunity to present your research
  • Lots of professional development workshops
  • Networking with people from industry, residency, and academia
  • Purdue Alumni night!

• Annual ASTRO Meeting
  • October 1-4, in San Diego

• RSNA
  • Nov. 26 – Nov. 30th – Chicago Ill

Proffered Submission Deadline: typically, around the beginning of MARCH
CAMPEP News and Program Information
Clinical Internships

Fall, 2023
• HSCI 672 – MRI QA Intern (see Dr. Dydak)

Spring, 2024
• HSCI 674 – Diagnostic Imaging Physics Intern (see Dr. Stantz)  (DXR, Fluoro, CT, US, MRI)

Spring, 2024
 HSCI 690  – Radiation Therapy Physics Clinical Competencies II (see Dr. Oderinde)

Summer, 2024
 HSCI 690  – Radiation Therapy Physics Clinical Competencies II (see Dr. Oderinde)
CAMPEP - New Requirements, New Course

HSCI 590 (2CR) Human Sectional Anatomy

• Plan to start Fall, 2022 (Ongoing)
• This course will be required!
• Lead: Dr. Uzay Emir (taught by all faculty)
• Need: Volunteers to TA course for credit?
Requirements

• Physics Minor, if one does not have a B.S. degree in Physics

Students that have not completed prior coursework in anatomy and physiology upon entry into the program are required to take a 2-semester undergraduate sequence of anatomy and physiology (BIOL 203/204).

Alternative plans are available for students that do not have the equivalent of a B.S. or minor in physics. These students are required to take three upper level physics courses (and prerequisites) from the Physics Department at Purdue University. Of these three courses, two must include the following:

<table>
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<th>Purdue Course</th>
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<tr>
<td>PHYS 340/342</td>
<td>Modern Physics and Lab</td>
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<tr>
<td>PHYS 330</td>
<td>Intermediate Electricity and Magnetism</td>
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One additional course is selected which must be at a 300-level or higher, such as PHYS 360 Quantum Mechanics; PHYS 310 Intermediate Mechanics; PHYS 322 Optics; any honors equivalent or graduate level course, such as PHYS 556 Introductory Nuclear Physics. If Intermediate Electricity and Magnetism is unavailable due to a scheduling conflict or other unforeseen circumstance, students may substitute an alternative upper-level physics course for that course, if approved by the MP Steering Committee. This curriculum follows the plan of study for a Physics minor as defined by the Purdue Physics department (Minors: Department of Physics and Astronomy: Purdue University).

Students with other deficiencies in their undergraduate curriculum may be accepted or conditionally accepted into the program with the approval of the Director of Medical Physics and at the discretion of the Head of the School. Students accepted on a conditional basis may be required to take additional 100, 200, 300 or 400 level classes and a cumulative GPA of 3.0 or better in all these courses. Upon completing the identified deficiencies, the Head of The School, in consultation with the MP Program Director and GC Chair, will re-evaluate the admission status of conditionally accepted students and either accept or deny admission in the MP program. Conditionally accepted students that are ultimately denied admission in the MP program are counseled on possible alternate degree or alternative career paths.
Waiver

• Must be reviewed by the MP Steering Committee and approved by the Director

• We follow CAMPEP protocol
  • Syllabus
  • Textbook
  • Example HW and/or Exams

• Unlikely to waive Graduate Level HSCI courses
  • Will give some consideration if the course was taken within a CAMPEP accredited program
Brief Program Updates

• CAMPEP submission for reaccreditation, being processed
  • Responded to questions
  • Nothing appears to be critically important

• 4+1 program does exist
  • College instituted a new format for all program webpages, working on resolving issues)
Faculty Research Labs
Faculty Highlight

Faculty Research
• FacultyResearchAreas.pdf (purdue.edu)
  or
• https://hhs.purdue.edu/wp-content/uploads/2022/09/FacultyResearchAreas.pdf

Faculty with research opportunities in their labs, for undergraduates:
• Dr. Scarpelli
• Dr. Oderinde
• Dr. Nie
• Dr. Stantz
Conclusion

Questions?

Meet with each other and Faculty!