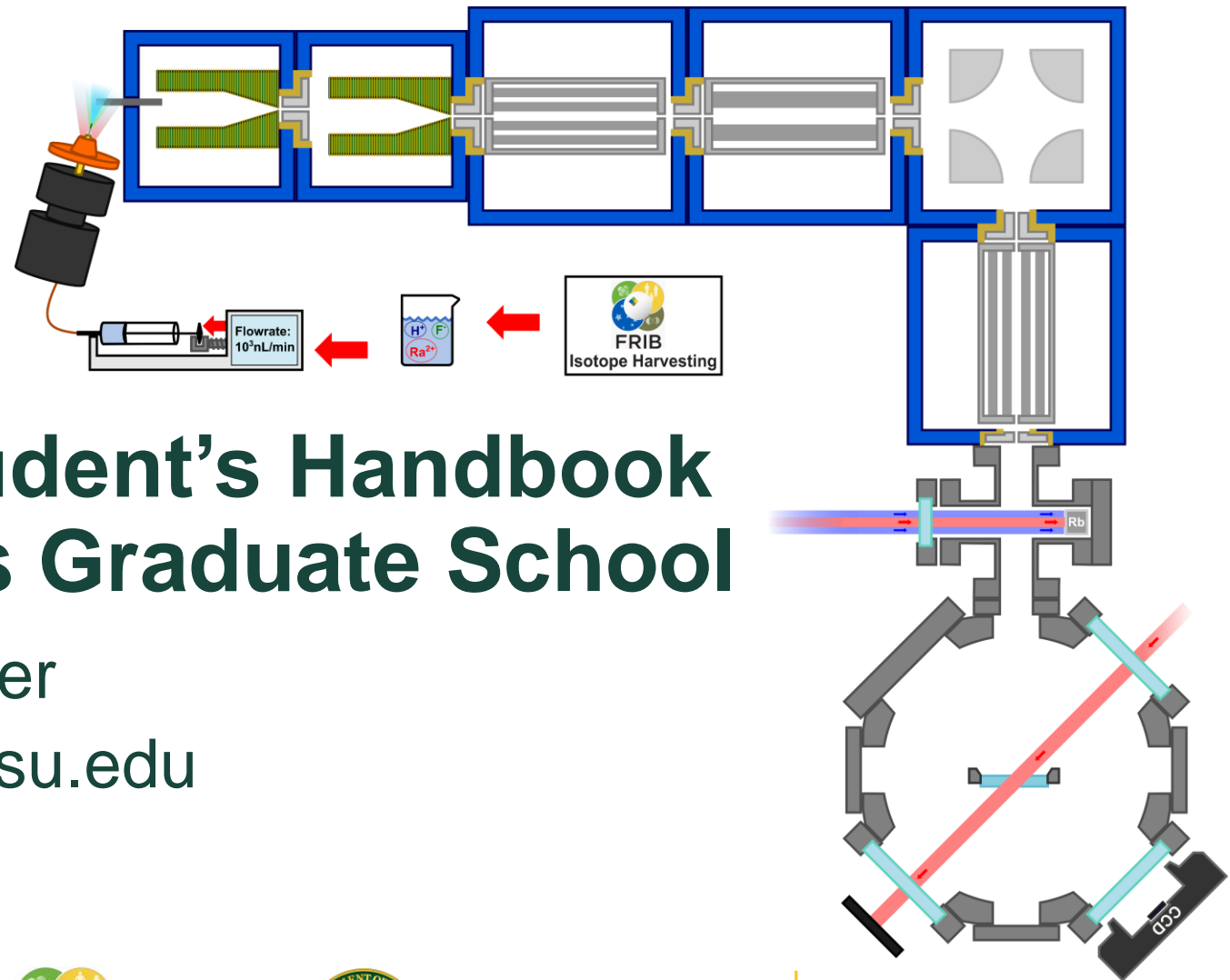


Thursday, March 27, 2025, 12:15 – 13:30
711 Forbes Avenue, Pittsburgh, PA, 15219
Fisher Hall, Room 611



A Physics Graduate Student's Handbook For Applying To Physics Graduate School

Aiden Boyer
boyera@frib.msu.edu



U.S. DEPARTMENT
of ENERGY

Office of
Science

This material is based upon work supported by the U.S. Department of Energy, Office of Science, Office of Nuclear Physics and used resources of the Facility for Rare Isotope Beams (FRIB) Operations, which is a DOE Office of Science User Facility under Award Number DE-SC0023633.

This work is supported by the U.S. Department of Energy, Office of Science, Office of High Energy Physics under Award Number DE-SC0022299

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Outline

1. Who am I?
2. General context about PhD programs and graduate school
3. Preparing to apply
 1. Should you apply to graduate school?
 2. Starting the application process
4. Filling out the application
 1. Academic history
 2. Curriculum Vitae
 3. Letters of recommendation
 4. Personal and Academic statements
5. In-person and virtual visits
6. Advice from my advisor: insight from the admissions committee perspective
7. Links to materials

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 - Born here 2000-01-10
 - Elementary & high school in Dormont
- Duquesne alumnus
 - B.S. Physics, B.S. Mathematics, 2022



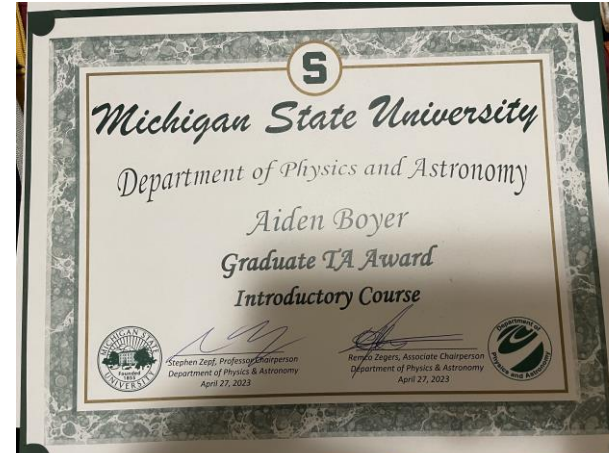
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- Personal interests:
 - Cooking, Baking, Reading, Video games
- Current research: trying to develop a method for efficiently forming radioactive molecules



Context: Comparison Between EU and US Graduate School

- I applied directly to several physics graduate programs: all of these were directly for a PhD in physics
 - European style: 2 – 3 years **Masters program required first** (you pay), then you can do a PhD program (3 – 4 years) More context: <https://www.mastersportal.com/articles/730/can-you-get-a-phd-without-a-masters-yes-but-heres-why-you-shouldnt.html>

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**Physics graduate school is not just more classes:
a very large part of it is doing novel academic research**

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 - Stipend, paid to you usually every two weeks
 - Contractual agreement for TA and RA: on paper you work for 20 hours a week, use another 20 for independent skill development. Realistically, you spend about 60 hours working per week
 - Taxes withheld, at MSU 2025 this amounts to about \$2,200 every two weeks
 - Fellowship students: your pay frequency will depend on the nature of your fellowship. For me (MI HEP Traineeship) I get paid **once** a semester and must budget
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The cost: several years of your life

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 - Me: “I want to go because I like to learn things”
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 - What institutions are they at?
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Grad school Staff

Personal Statement:

- what have I done in the proposed field of study?
- Most important contributions

what I want to do

- suggest a subfield (experiment or theory)

why this school?

- do I have research interests here?

Focus on my most important research contributions

Start off with why I'm passionate but don't waste space on it.

Reference Letters:

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- Dr. Frittelli? Dr. C? Phillip Clarke?

Schools:

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- CMU

- UConn (Analysis)

- William & Mary

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Most important lesson I learned: start earlier!

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If you answered “Yes!” to the above, you should consider graduate school

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- Florida International (Possible Safe School)

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- PSU?

- Michigan State in E... (MSU) ^{Jaideep, ^{Paul} Measuring Dipole moment of neutron}

Their own Particle Detector

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Christine Adella (UMichigan)

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MOLLER Project (krishna kumar)

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Prep: Organizing The Information Is A Key Step!

School	Rank	Acronym	Location	Physics GRE	General GRE	Specialization	Deadline	Website	Recommendations	GPA
Carnegie Mellon	1	CMU	Pittsburgh	Optional	Optional	Neutrino Physics (Diana Parno)	Wednesday, December 15, 2021	https://www.cmu.edu/physics/graduate-program/admission.html	3 (after applying)	N/A
University of Connecticut	2	Uconn	Storrs, Connecticut	Optional	Optional?	Nuclear & Particle Physics (K. Joo)	Saturday, January 15, 2022	https://physics.uconn.edu/academics/graduate-program/applications/	3 (with application)	3.00
William and Mary	1	W&M	Williamsburg, Virginia	Optional	Optional	Nuclear & Particle Physics (David Armstrong, MOLLER)	Saturday, January 15, 2022	https://www.wm.edu/as/physics/grad/admission/index.php	3 (with application)	N/A
University of Virginia	1	UVA	Charlottesville, Virginia	Optional	Optional	Nuclear & Particle Physics (Kent Paschke, others, MOLLER)	Wednesday, December 15, 2021	http://www.phys.virginia.edu/GraduateBrochure/	3?	N/A
Michigan State	2	MSU	East Lansing, Michigan	Optional	Optional	Nuclear Physics (Jaideep Singh)	December 15, 2021 (fellowship), January 1 otherwise	https://pa.msu.edu/academics/graduate-program/prospective-grad-students/	3?	N/A
University of Michigan	2	MICH	Ann Arbor, Michigan	Optional	Optional	Nuclear & Particle Physics (Christine Aidala)	Wednesday, December 15, 2021	https://lsa.umich.edu/physics/graduate-students/application.html	3	N/A
University of Massachusetts	1	Umass	Amherst, Massachusetts	Optional	Optional	Nuclear & Particle Physics (Krishna Kumar, Dave Kawall, MOLLER)	December 15 (Priority), January 15 otherwise	https://www.physics.umass.edu/graduate/PHDprogram	3	N/A
Virginia Tech	3	Vtech	Blacksburg, Virginia	Optional	Optional	Nuclear & Particle Physics (Mark Pitt)	Wednesday, January 05, 2022	https://www.phys.vt.edu/Graduate/ProspectiveGraduateStudents.html	3	N/A
Notre Dame	3	UND	Notre Dame, Indiana	Optional	Optional	Nuclear Physics	December 15, 2021	https://physics.nd.edu/graduate/apply/	3?	N/A
Lehigh	2	LU	Bethlehem, PA	Optional	Required	Nuclear & Particle Physics (Rosi Reed)	Saturday, January 15, 2022	https://physics.cas.lehigh.edu/how-apply-0	3	N/A

- I recommend a spreadsheet with a handful of graduate schools:
 - 2 “safe” schools
 - 2 “reach” schools
 - Other schools you could see yourself at

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Don't apply if you don't think you'd realistically go there

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University of Michigan	2	MICH	Ann Arbor, Michigan	Optional	Optional	Nuclear & Particle Physics (Christine Aidala)	Wednesday, December 15, 2021	https://lsa.umich.edu/physics/graduate-students/application.html	3	N/A
University of Massachusetts	1	Umass	Amherst, Massachusetts	Optional	Optional	Nuclear & Particle Physics (Krishna Kumar, Dave Kawai, MOLLER)	December 15 (Priority), January 15 otherwise	https://www.physics.umass.edu/graduate/PHDprogram	3	N/A
Virginia Tech	3	Vtech	Blacksburg, Virginia	Optional	Optional	Nuclear & Particle Physics (Mark Pitt)	Wednesday, January 05, 2022	https://www.phys.vt.edu/Graduate/ProspectiveGraduateStudents.html	3	N/A
Notre Dame	3	UND	Notre Dame, Indiana	Optional	Optional	Nuclear Physics	Dember 15, 2021	https://physics.nd.edu/graduate/apply/	3?	N/A
Lehigh	2	LU	Bethlehem, PA	Optional	Required	Nuclear & Particle Physics (Rosi Reed)	Saturday, January 15, 2022	https://physics.cas.lehigh.edu/how-apply-0	3	N/A

- I recommend a spreadsheet with a handful of graduate schools:
 - 2 “safe” schools
 - 2 “reach” schools
 - Other schools you could see yourself at

Don't apply if you don't think you'd realistically go there
- Rank schools to prioritize order of applications
 - Subjective: what makes a school a higher rank than another?
 - Research?
 - Living cost?
 - Area?
 - Prioritize by deadlines for general admission or fellowship considerations

Prep: Organizing The Information Is A Key Step!

School	Rank	Acronym	Location	Physics GRE	General GRE	Specialization	Deadline	Website	Recommendations	GPA
Carnegie Mellon	1	CMU	Pittsburgh	Optional	Optional	Neutrino Physics (Diana Parno)	Wednesday, December 15, 2021	https://www.cmu.edu/physics/graduate-program/admission.html	3 (after applying)	N/A
University of Connecticut	2	Uconn	Storrs, Connecticut	Optional	Optional?	Nuclear & Particle Physics (K. Joo)	Saturday, January 15, 2022	https://physics.uconn.edu/academics/graduate-program/applications/	3 (with application)	3.00
William and Mary	1	W&M	Williamsburg, Virginia	Optional	Optional	Nuclear & Particle Physics (David Armstrong, MOLLER)	Saturday, January 15, 2022	https://www.wm.edu/as/physics/grad/admission/index.php	3 (with application)	N/A
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Final Score: 6 out of 9

Carnegie Mellon: Waitlisted, ultimately **rejected**

University of Connecticut: **Accepted**

William & Mary: **Accepted**

University of Virginia: **Accepted**

MSU: **Accepted**

University of Michigan: **Rejected**

University of Massachusetts Amherst: **Accepted**

Virginia Tech: **Accepted**

University of Notre Dame: **Rejected**

Lehigh: Did not apply

Prep: Do Your Homework!

For each institution you're you are considering:

1. Find a faculty member(s) doing work you're interested in

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What I would do differently: more research about possible groups to join, and more chats with prospective groups

Context: Availability of Research Funding Is Decreasing

- In the last year, major research funding agencies like the National Science Foundation (NSF) and the Department of Energy (DOE) have been reducing their capacity at which they can fund research

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In the wake of funding cuts, it is extremely important to craft a very strong application that stands out in an otherwise competitive applicant pool

Filling Out The Application: Biographical Information

- This section includes standard information for filling out any kind of application:
 - Name
 - Age
 - Identity and demographic information
 - Contact info
 - Provide a current address, and a current professional email address

Filling Out The Application: Academic History

- Some applications ask for academic information with different scope:

Filling Out The Application: Academic History

Student No: D01755173

Date Issued: 27-NOV-2021

Subj	No.	Title	Cred	Grade	Pts	R
INSTITUTION CREDIT:						
PHYS	461	Mechanics	4.00	In Prog	Course	
PHYS	470	Electricity & Magnetism	3.00	In Prog	Course	
Spring 2022						
HONR	495	Advanced Honors Symposium	0.00	In Prog	Course	
MATH	302W	Intro Probability & Stat II	3.00	In Prog	Course	
MATH	420	Intro to Complex Variables	3.00	In Prog	Course	
PHYS	405	Gravitational Astrophysics	3.00	In Prog	Course	
PHYS	473	Electrodynamics	3.00	In Prog	Course	
Transcript Totals						
		Earned Hrs	GPA Hrs	Points	GPA	
TOTAL INSTITUTION		101.00	99.00	372.6000	3.7636	
TOTAL TRANSFER		16.00	0.00	0.0000	0.0000	
OVERALL		117.00	99.00	372.6000	3.7636	
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-Spring 2020, PHYS 340, Undergraduate Research, Pass, no textbook

-Spring 2020, PHYS 350, Math Methods in Physics, A, Mathematical Methods in The Physical Sciences, Boas

-Spring 2020, PHYS 374, Modern Physics, A, Modern Physics for Scientists and Engineers, Thornton & Rex

-Fall 2020, PHYS 401, Thermal Physics, A, Concepts in Thermal Physics, Blundell and Blundell

-Fall 2020, PHYS 474, Quantum Mechanics, B+, Quantum Mechanics: A Paradigms Approach, McIntyre

-Spring 2021, PHYS 464, Advanced Lab, A, no textbook

-Spring 2021, Advanced Quantum Mechanics, A, Quantum Mechanics: A Paradigms Approach, McIntyre

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Planned/Progress

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Grade Quality Points Per Credit

A	4.0
A-	3.7
B+	3.3
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C+	2.3
C	2.0
D	1.0
F	0.0

<https://www.duq.edu/academics/university-catalogs/2024-2025-catalog/undergraduate/academic-policies/grades-gpa.php>

2025-04-11

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 - In addition to the transcript, some ask you to enter your GPA into a part of the application
 - Cumulative GPA: take the value reported on your transcript
 - Physics GPA: I calculate this by taking calculating the GPA weighting myself

$$\text{Physics GPA} = \frac{\sum_{\text{physics courses}} \text{GPA Weight from course grade}}{\text{Number of course}}$$

Perspectives From MSU's Fall 2025 Accepted Graduate Students: The Physics GRE Is Not Required For Admission



Aiden Boyer 3/19/2025 6:47 PM

can any [@Prospective Student](#)'s comment on if y'all had to take the GRE for applying to grad schools? I'm prepping a talk that I'm giving to undergrads who are planning to apply for graduate school and I want to know if the GRE is still relevant

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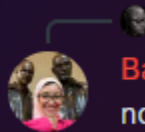
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Daniel Barr 3/19/2025 6:51 PM

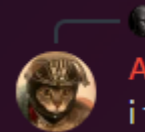
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Basma :) 3/19/2025 6:51 PM

no unless they're applying for scholarships (international students)



[@Aiden Boyer](#) can any [@Prospective Stud](#)

Antonio 3/20/2025 12:36 AM

i took it but didnt use the score



Austin 3/19/2025 6:50 PM

I also did not have to take the GRE for any of the schools applied to. I am a current undergrad at MSU and I will be staying for my PhD and I don't know of many people (I can only think of one off the top of my head) who took the GRE.

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Prottoy Samir 3/19/2025 6:47 PM

I didn't take the GRE



Prottoy Samir 3/19/2025 6:48 PM

And i know that from my school, nobody except for 1 took the Gre and all of them got into grad schools for Physics



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@Aiden Boyer can any **@Prospective Student**'s comm



Brendan Nolan 3/19/2025 8:33 PM

I did not take it, don't know anyone who did



@Aiden Boyer can any **@Prospective Student**'s comment on if y'all had to take the GRE for applying to grad schools? I'm prepping a talk that I'm giving



DJ Liveoak 3/19/2025 6:50 PM

I also didn't, but my current undergrad institution is saying they want to re-instate the requirement so it might be slightly coming back



Jacquelin_Miller 3/19/2025 6:48 PM

I did not, but several schools switched to interviews with content quizzes in place of the GRE



@Aiden Boyer can any **@Prospective Stud**



Antonio 3/20/2025 12:36 AM

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- A curriculum vitae is a summary of all your educational, volunteer, and employment work
 - For these applications: typically 1-2 page length
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 - Awards and achievements: Dean's list, summer internship awards, fellowship awards or offers. Include hyperlinks to uploads or scans if available

Filling Out The Application: Curriculum Vitae

- A curriculum vitae is a summary of all your educational, volunteer, and employment work
 - For these applications: typically 1-2 page length
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Ask your advisor or a professor to see their CV if you need ideas!

Filling Out The Application: My CV

Aiden Boyer | Curriculum Vitae

3109-2D Trappers Cove Trail – Lansing, Michigan – 48910
☎ (+412)-932-6377 • ✉ aboyer0110@gmail.com

Header should include current
Contact address, email, and number

EDUCATION

Keystone Oaks high school Pittsburgh, Pennsylvania
High School Diploma 2014-2018

Duquesne University Pittsburgh, Pennsylvania
B.S Physics, B.S Mathematics 2018-2022
Physics GPA: 3.89, Math GPA: 3.59
Cumulative GPA: 3.77
Graduation Date: May 14, 2022

Michigan State University East Lansing, Michigan
Doctor of Philosophy, Physics August 16 2022 - Present
Specialization: Experimental Nuclear Physics

TECHNICAL SKILLS

Programming Python, MicroPython, C++, Java, LabVIEW
Data Analysis Software Cern ROOT, Maple, MATLAB
Operating System Literacy Linux, MacOS, Windows
Assorted Software LaTeX, Markdown, Adobe Photoshop, Adobe Illustrator, SOLIDWORKS 2020

Formatting error:
make sure your
submitted CV
does not have these!

RESEARCH EXPERIENCE

Duquesne University Undergraduate Research Program, May 2020 - August 2020

- Collaborated remotely with Jefferson Lab in Newport News, Virginia to write C++ scripts with ROOT to analyze performance metrics for photomultiplier tubes (PMTs) utilized in Jefferson Lab's Ring Imaging Cherenkov Detector (RICH) 40 hours per week, advisor: Fatiha Benmokhtar, PhD.

Duquesne University, August 2020 - May 2021

- Data analysis of missing energy spectra from Jefferson Lab's E08009 scattering experiment. Analysis was done using ROOT and C++ programming, generated plots of missing mass, energy, and more kinematic variables applying experimental cuts. Also developed a program to separate and construct RICH PMT data files for implementation into a Jefferson Lab database. 10 hours per week, advisor: Fatiha Benmokhtar, PhD.

Department of Energy SULI Program, Jefferson Lab, May 2021-August 2021

- Collaborated remotely with Jefferson Lab's Hall B collaboration to investigate an issue with event mapping in the RICH offline monitoring suite. Monitoring suite is built in Java, made changes to the programs which display intensity of counts within the RICH during active beam time. 40 hours per week, advisor: Valery Kubarovsky, PhD.

Duquesne University, August 2021-May 2022

- Continued to optimize the event mapping corrections made during the SULI program. Software preparations for the integration of a second RICH detector in Hall B of Jefferson Lab. Assisted in the development of an MAPMT mapping scheme for the second RICH module. 12 hours per week, advisor: Fatiha Benmokhtar, PhD.

Specify your time
commitment
List your advisor for
contact purposes

TEACHING EXPERIENCE

Duquesne University Pittsburgh, Pennsylvania
Teaching Assistant and Tutor, Department of Physics August 2019 - March 2020

- Assisted the professor in grading student quizzes and exams in General Analytical Physics 1 and 2. Accompanied the professor during weekly problem solving sessions to answer student questions as they arise. Concurrently served as a tutor for General Analytical Physics and Physics for life sciences alongside this position. 10 hours per week.

Michigan State University East Lansing, Michigan
Graduate Teaching Assistant, Department of Physics and Astronomy August 2022 - May 2023

- Assisted in the instruction of Studio Physics for Life Scientists I. Prepped weekly for activities that would be done by the students during class time. Activities included traditional pen-and-paper physics problems, short lab activities, and formal lab reports. Would answer student questions during class and provide guided help if needed. Graded lab reports when formal labs would occur. Also served as a help room tutor concurrently for this course.

EMPLOYMENT

Duquesne University Pittsburgh, Pennsylvania
Physics Department Technical Assistant May 2019 - August 2019

- Maintained and developed a literacy for the lab equipment of the Duquesne University Physics Department.
- Prepared daily experiments for the summer curriculum of physics labs. Also graded summer students' lab reports and homework assignments.

PROJECTS AND PUBLICATIONS

RICH 1 and 2 MAPMT Analysis May 2020-August 2020

- Analysis of RICH 1 and RICH 2 MAPMTs. Presented to the Hall B Collaboration, July 10, 2020. Also presented as a part of Duquesne University's URP program, August 2020.
- Click to view presentation
- Click to view LaTeX report

Precision Measurements of A=3 nuclei September 7, 2020

- Proposal with Aiden Boyer listed as a co-author, <https://arxiv.org/abs/2009.03413>

APS/DNP 2020 Presentation October 31st, 2020

- PowerPoint presentation that briefly outlines analysis of E08009 (at the time of presenting)
- Click to view presentation

Software Development for the CLAS12 RICH Detector May 2021 - August 2021

- Poster and paper discussing my work on the CLAS12 RICH monitoring suite.
- Click to view poster
- Click to view report

Short summary
Link to relevant uploads

Filling Out The Application: Letters Of Recommendation

- Ask your research advisor and course instructors if they would be willing to write a recommendation letter well in advance!

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For the perspective of a faculty member, see my graduate advisor's blog post:

<https://spinlab.me/2018/06/06/the-time-consuming-privilege-of-writing-a-thoughtful-letter-of-recommendation-for-a-student-2018-edition/>

Filling Out The Application: Writing Statements

Writing the personal and academic statements is a formulaic process

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 - Add context about the most important research experience(s), give more detail than the CV

Filling Out The Application: My Academic Statements

UConn

Aiden Boyer
Personal Statement

During my time as an undergraduate student, I have fallen in love with nuclear physics. It first began when I attended research presentations at Duquesne University's summer research program. There I was introduced to the work of Dr. Fatiha Benmokhtar and her students and exposed to the intriguing phenomena that exist in the nucleus of the atom. Quarks of different flavors – up, down, and strange– coming together to compose a single particle, either through an identifiable quark triplet or through pairs in the quark sea. The exchanging of gluons to change color, the fact that elementary particles had their own bizarre charge, these concepts all fascinated me. From that day forward I had planned to join Dr. Benmokhtar's research group. I began by educating myself on nuclear and particle physics topics with Coughlan, Dodd, and Gripaos's *The Ideas of Particle Physics*. As I read through the text, I was also working to familiarize myself with CERN's ROOT for data analysis. With my knowledge of these topics growing, I began to question how they manifest in nature, how we could perform measurements on such a small scale, and much more. This ongoing passion has motivated me to pursue a doctorate in nuclear physics. I am primarily interested in experimental research, akin to the kind of research I've been participating in over the last year and a half. That said, I am open to the idea of theoretical nuclear physics research; I've seen some theoretical presentations at the previous fall meetings of the Division of Nuclear Physics, and they were always very interesting. I could see myself pursuing a theoretical path if given the proper guidance, but experimental nuclear physics is my top choice.

I am actively interested in studying strong Quantum Chromodynamics and weak interactions. Most of my research experience pertains to strong QCD interactions, either through the analysis of semi-inclusive deep inelastic scattering processes or with software development for detectors utilized in these scattering processes. In the summer of 2020, I participated in Duquesne University's virtual undergraduate research program (vURP). This was a 10-week program which involved putting in 40 hours of research work per week. At the time, I was working on a collaborative project with the RICH collaboration in Hall B of Jefferson Lab. This collaboration centers around the Ring Imaging Cherenkov (RICH) Detector, a component in the CLAS12 spectrometer that allows for the separation of pions, kaons, and protons in a 3-8 GeV/c momentum range. During these 10 weeks, I worked on developing software to analyze the performance multi-anode photomultiplier tubes (MAPMTs) that are utilized in the RICH. When I completed my analysis, I typed up a LaTeX report of the results, comparing the different available models of MAPMTs that were installed in the RICH detector, and a selection of MAPMTs that are to be installed in a second RICH module. I presented these results to the RICH collaboration, high lighting MAPMTs with high performance and low performance in the sample size. Throughout the program, I also participated in an ethics forum, where I formed a group with other students and reviewed a case of ethical misconduct in research. I found this experience very informative, not only in the context of it being a first research experience, but it served as a good way to familiarize myself with the ethics of the research process.

MSU

Aiden Boyer
Academic Statement of Purpose

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UVA

Aiden Boyer
Statement of Purpose

My interests in pursuing a doctoral program at UVA stem from my passion for nuclear and particle physics. During my time as an undergraduate student, I have fallen in love with nuclear physics. It first began when I attended research presentations at Duquesne University's summer research program. There I was introduced to the work of Dr. Fatiha Benmokhtar and her students and exposed to the intriguing phenomena that exist in the nucleus of the atom. Quarks of different flavors – up, down, and strange– coming together to compose a single particle, either through an identifiable quark triplet or through pairs in the quark sea. The exchanging of gluons to change color, the fact that elementary particles had their own bizarre charge, these concepts all fascinated me. From that day forward I had planned to join Dr. Benmokhtar's research group. I began by educating myself on nuclear and particle physics topics with Coughlan, Dodd, and Gripaos's *The Ideas of Particle Physics*. As I read through the text, I was also working to familiarize myself with CERN's ROOT for data analysis. With my knowledge of these topics growing, I began to question how they manifest in nature, how we could perform measurements on such a small scale.

From this point forward, I began participating in research projects with Dr. Benmokhtar, starting with Jefferson Lab's Ring Imaging Cherenkov (RICH) Detector. I conducted a performance analysis of the RICH's Multi-Anode Photo-Multiplier tube (MAPMT) system, creating programs and running them with ROOT to analyze and compare data for every PMT in the RICH. I presented a summation of my work to the RICH collaboration during one of their meetings and typed a formal report of the analysis results using LaTeX. After finishing this project, I spent some time assisting in data analysis for Jefferson Lab's E08009 experiment. This experiment involved the scattering of an electron beam off a stationary Helium target. My role was to analyze the continuum channel of the missing energy spectrum of the collision. In the year that followed, I worked very closely with the RICH's monitoring programs to correct event mapping issues in the software. In the monitor, certain detection channels were reporting excessive events that would drown out other events on the GUI display. I spent time reviewing the RICH technical design documents and reflecting on the monitoring software, trying to identify the cause of this issue. The problem originated from an incorrect mapping of the RICH detector's construction in the software. I re-wrote the map to reflect the RICH's physical construction to fix this issue. Currently, I'm assisting in the design and construction of a second RICH detector at Jefferson Lab. While the lab staff are building the device, I'm working alongside Dr. Benmokhtar to develop an event map for the detector.

My advice: try to write a statement which you can repurpose for the different institutions you are applying to

Filling Out The Application: My Personal Statements

UMICH

Personal Statement
Aiden Boyer
Physics, Ph.D.
16445060

While I was growing up, my family was not always financially stable. During the later part of my youth, in and around my teenage years, my family fell on difficult financial times. My mother lost her job as a nurse, and our savings began to drain until we ended up losing our house and moving in with our grandparents. For a few years afterwards, we lived a slightly impoverished life, my family struggling to get back on its feet. This left a lasting impression on me - I can remember how I felt about money as I got older, wearing the same few outfits repeatedly because I couldn't afford to get new clothes. I can recall the rare occurrence I would have spending cash, and then feeling reluctant to use it out of fear for needing it for something more essential. To this day, I hesitate to spend money on myself by buying things I need like clothes, because of the impact this period of my life has had on me.

This feeling of financial dread motivated to secure my future – I wanted to be able to push out myself out of this poverty pit and provide for myself and my own family. When I entered high school, I seized that as the moment to make this happen, and I began to spend many days and night in high school working strenuous hours and developing a long-lasting work ethic. Learning, studying, and thinking became a passion for me as I engrossed myself in my studies. I was the first of my siblings to graduate, not necessarily because I am the oldest, but because my brothers before me had dropped out. I knew I wanted to continue my education further, so I enrolled in a bachelor's program in physics at Duquesne University. During my time at Duquesne, I learned about what could be done with a physics degree, and research began to pique my interest. I found the process of research very satisfying; it involves an immense amount of rigor and methodology that I've learned to enjoy in my work ethic. The desire to explore more rigorous experiments and processes is what motivates me to continue my education. I have barely scratched the surface of research, and I would love to further it at the University of Michigan by getting involved with some of the faculty involved in such projects.

MSU

Aiden Boyer
Personal Statement

Throughout my life, I never anticipated I would come as far as I have academically. I was the first of any of my siblings to complete a high school education, and it is not because I am the oldest of them. I lie right in the middle of the age range of my siblings – the eldest is my transgender sister, who dropped out of high school and never attended college, the same goes for my older brother. I came along next, and then my sister, and years later an unexpected little brother. In 2018, I made my family proud by being the first to receive my high school diploma, and I amplified that feeling more so when I committed to Duquesne University for undergraduate studies. This was a first for my family – someone attending college for anything other than an associates degree, as my mother had done. As the first person in my family to pursue a bachelor's degree, I was ready for the challenge, but an underlying issue plagued my excitement: financing this journey.

For most of my early childhood, my family did well financially; we owned our own house and as far as my eight-year-old self was aware, we did not have any money troubles. Around 2008, a lot of things changed. I saw my mom struggling for one of the first times in my life, as my father developed a drug addiction and began using our savings to fund it. It spiraled out of control for him as it lost him his job, and our family income began to steadily decrease with my mom unable to support it and all the expenses by herself. Eventually, we couldn't afford paying off our house, and had to sell it; what made things worse was that my mom got laid off from her job as a nurse. We ended up moving in with our grandparents, crammed into a small Pittsburgh-esque house, struggling to get by. I can remember how I felt about money as I got older, I remember wearing the same few outfits repeatedly because I couldn't afford to have as many as the other kids at school. I can remember the rare occurrence I would have spending cash, and then feel reluctant to use it out of fear for needing it for something more essential. To this day, I hesitate to spend money on myself, buying myself things I need like clothes, because of the lasting impressions this period of my life left on me.

When I entered high school, things began to turn around and my family started to slowly recover. My mom had found a new job, and my youngest sibling had just been born. She managed to save up enough money to move out of our grandparents, renting a house for our family. We were doing okay during this period, but we still struggled, especially as I neared graduation and began to think about my future. I yearned to attend college, I wanted to be able to secure my future and push myself out of this financial situation. I spent many days and nights in high school working strenuous hours, studying for my classes, and giving everything my all. On top of this, I also got myself involved in several activities – I had a passion for marching band, but I cannot play instruments. Instead of joining as an equipment manager, I joined my school's color guard, twirling flags in the marching band. There was a social stigma in my school about being a male in the color guard, which is traditionally considered for females, but I did not care about what people thought. I went to try outs and loved it, and decided I wanted to do more flag twirling no matter what anyone said. I was also an active member in several clubs and volunteered to assist the production of my school's yearly musical. Juggling these activities and

My advice: try to write a statement which you can repurpose for the different institutions you are applying to

Reflecting On The Weakest Links In My Applications

- In my opinion, I think the weakest parts of my application were my writing samples:

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The University of Notre Dame (UND, Indiana) offered some very useful advice for writing statements that I wish I heeded. That document will be available for y'all to reference

Hints On Writing Statements From The University Of Notre Dame in Indiana

Helpful hints for writing your Statement of Intent (SOI)

Students are often unsure of what to include in their statement of intent (SOI). The most important objective of the SOI is to inform the graduate admissions committee of the things that are not directly evident from the other parts of your application. Below we list a number of points that you are encouraged to consider when writing the SOI.

Avoid generalities

Applying to graduate school is very different from applying to college for your undergraduate (UG) degree. In particular, the SOI is *not equivalent* to the UG application essays. By applying to graduate school it is understood that you are interested in physics and passionate about science (otherwise you should not apply), and you *do not* have to state this explicitly. Instead the SOI is your opportunity to let the admissions committee know about specific information concerning the areas listed below.

Research experience

Have you done research as an undergraduate? If so what did you do and what did you learn from the experience? We don't expect groundbreaking original research, but we do look for experience outside a classroom environment. After all there is a distinct difference in the mindset for the two.

Research interest

Are there any particular areas that you would like to pursue in graduate school and why? Are you interested in experiment/observation or theory/modeling? This does *not* have to be the same area that you worked in as an undergraduate. While continuing in the same field is certainly acceptable, we urge you to consider this question a more broadly. After all, maybe you worked in a certain area simply because your UG institution offered research in a limited number of areas or you got accepted to a certain REU project. You should also know that the research area(s) that you discuss in your SOI are not binding, so there is no risk to being honest about your interests.

Why Notre Dame

What caused you to decide to apply to Notre Dame? Maybe you already know a faculty member that you would like to work with. Maybe there is a particular research group that piqued your interest, or other aspects of the physics graduate program that made you think that we would be good fit for you. This can also be for more personal reasons such as location, friends in the program, or a positive REU experience as an undergraduate.

Anything in particular you would like the admissions committee to be aware of

Include anything relevant that was not captured by other parts of the application. For example, this could be certain grades or test scores that you would like to address. You are encouraged to keep this factual and brief.

Addendum 2025-04-11, This is available on the Google Drive folder:

https://drive.google.com/file/d/1MrRhtQuadO3X9_tc2aLZwXMoVS6jzcuF/view?usp=sharing

What Does An Acceptance Look Like?

University of
Massachusetts
Amherst

College of Natural Sciences
Physics

March 1, 2022

Aiden Boyer
1120 Kelton Avenue
Pittsburgh, PA 15216

Dear Aiden,

On behalf of the Department of Physics, I am pleased to inform you that the Graduate Admission Committee has recommended you for admission to the Physics Doctoral Program for the Fall of 2022. Formal admittance is made by the Graduate School and you should expect to receive a letter concerning acceptance from the Graduate School in the near future.

The Physics Program makes every effort to support students financially for the duration of their graduate training. This financial support comes in the form of teaching assistantships, research assistantships, or fellowships. We are pleased to inform you that we can offer you financial support for the 2022-2023 academic year in the form of a Teaching Assistantship. The stipend associated with this assistantship will be at least, \$23,248 (20 hours/week for 38 weeks) and, additionally, carries tuition credit, 95% exemption of the individual health insurance fee costs (95% for the family plan), and excellent dental, vision, wellness and childcare benefits. You will remain responsible for other mandatory fees, the cost of which is approximately \$1,118.35 per semester, plus a one-time only graduate entering fee of approximately \$507.00 which is due the first semester. These fees are estimates at this stage so you should refer to <http://www.umass.edu/oursa/fee-explanation> for updated fees. Please note that continued appointment in assistantship positions beyond the first year is also contingent on satisfactory performance of your job duties and satisfactory academic progress towards your degree. It is possible that you may be considered for a Departmental or College fellowship; if you are selected for one of these we will notify you as soon as possible.

If you would like more information before making a decision about joining the Physics Program at the University of Massachusetts, please feel free to contact the Head of the Physics Program, Dr. Anthony Dinsmore (dinsmore@umass.edu; 413-545-0852). If you have general questions about attending the University of Massachusetts, you also may contact the Physics Department's Graduate Program Director Professor Lori Goldner (lgoldner@physics.umass.edu; 413-545-0594).

We are very pleased to extend this invitation to you, and we hope that you will be joining us in the Fall. As per the ["April 15 Resolution"](#), you have until April 15 to inform us of your final decision. However,



February 25, 2022

Aiden Boyer
1120 Kelton Ave
Pittsburgh, PA 15216-2423
boyer1@duq.edu

Dear Aiden,

It is our great pleasure to offer you admission to the Physics PhD program in the Graduate School of Arts and Sciences at the University of Virginia for the Fall 2022 term. Having carefully examined your work and achievements, the faculty is enthusiastic about the prospect of your joining our intellectual community.

Should you accept our offer of admission, you will receive annual living support in the amount of \$28,000, including \$21,000 during the 2022-2023 academic year and \$7,000 during the summer of 2023. You will also receive full funding of your tuition, enrollment fees, and the health insurance premium for single-person coverage through the University. This award, composed of fellowships and assistantships, is renewable up to a total of five years of support contingent on your satisfactory academic performance, successful fulfillment of assigned duties as a teaching or research assistant, and compliance with all applicable University, School, and departmental policies, including but not limited to those governing student conduct, academics, and the Honor Code. More information about the support available to students in the physics department is provided in our graduate student [handbook](#).

The faculty regards training in teaching as an essential aspect of graduate education. Your duties as a student will include appointments as a Graduate Teaching Assistant in your first year. Support in subsequent years can be in the form of a teaching assistantship, research assistantship or a graduate fellowship. The teaching assistantship typically involves leading laboratory or discussion sections for a total of ten contact hours with students per week, plus additional responsibilities such as material preparation, student evaluation and grading.

Students are encouraged and supported in their efforts to secure external research funding to augment the aid offered upon admission. In addition, the Graduate School has partnered with numerous academic units across the University to develop [opportunities](#) for doctoral students to accelerate their research and develop interdisciplinary collaborations.

Please be sure to visit the web sites for the [Graduate School](#), the University's [Office of Graduate & Postdoctoral Affairs](#) and our [Graduate Guide](#) for information about the distinct benefits of graduate student life in Charlottesville and opportunities for research support, professional development and engagement with the UVA graduate community. Widely noted for its high quality of life, Charlottesville offers graduate students beautiful and historic surroundings, a cosmopolitan atmosphere, and a lower [cost of living](#) than many other locations.

Dear Aiden,

The Physics Department is pleased to recommend to the Dean of Graduate Studies and Research that you be offered admission into our graduate program for the academic year 2022-23. William & Mary is made unique by its friendly size and pleasant surroundings, its connection to the roots of America, its excellent and congenial faculty, and its proximity to major research facilities, including the NASA Langley Research Center and the Thomas Jefferson National Accelerator Facility. Please note: Financial support is contingent upon the availability of funding from the Commonwealth of Virginia. These terms may be adjusted in accordance with changes in university operations and personnel practices in response to the COVID-19 pandemic.



Department of Physics
850 West Campus Drive
Robeson Hall
Blacksburg, Virginia 24061
P: (540) 231-6544 F: (540) 231-7511
<http://www.phys.vt.edu>

February 1, 2022

Dear Aiden,

On behalf of the Department of Physics, I am writing to invite you to join our Graduate Program in Physics. I am delighted to tell you that the graduate committee in the Department of Physics was extremely impressed with your application, and has recommended to our graduate school that you be admitted. As you have seen from our website, a variety of interesting research activities is conducted in our department. I am sure you will find time spent here towards a graduate degree challenging and rewarding.



January 27, 2022

Aiden Boyer

Dear Aiden,

Congratulations! On behalf of the Department of Physics and Astronomy at Michigan State University (MSU), it is my pleasure to inform you of your acceptance into our Physics Ph.D. program starting in Fall 2022. Faculty in our department pursuing research in Nuclear Physics believe that your interests fit well to their endeavors and are excited to work with you. Our offer is not contingent on pursuing research in that field though and we also appreciate students carefully considering their preferred area of research during the first phase of their Ph.D. studies.

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 - I recommend going to visit for one extra day, just to explore possible living options
 - Email current graduate student(s) and get suggestions for apartments or houses to rent or buy

Insights From The Admissions Committee Perspective

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- **Try to make contact** – useful even if the PI does not respond

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Links to Stuff

The following materials were created in the past by my graduate advisor:

- Blog post about Physics Grad School Applications, <https://spinlab.me/2021/09/13/physics-grad-school-application-bootcamp/>
- Powerpoint slides for Physics Grad School Application “Boot Camp”, <https://www.dropbox.com/scl/fi/si8dez5en9nt5u0x3s9yl/2021-09-13-Grad-School-App-Bootcamp-JTS-notes.pdf?rlkey=pqt87cj6rbxrx9rtismeqvhmp&e=1&dl=0>
- Recording of presentation of Physics Grad School Application “Boot Camp”, https://mediaspace.msu.edu/media/t/1_fyo73vuh
- Blog post about the considerations that go into a recommendation letter, from my advisor’s perspective, <https://spinlab.me/2018/06/06/the-time-consuming-privilege-of-writing-a-thoughtful-letter-of-recommendation-for-a-student-2018-edition/>

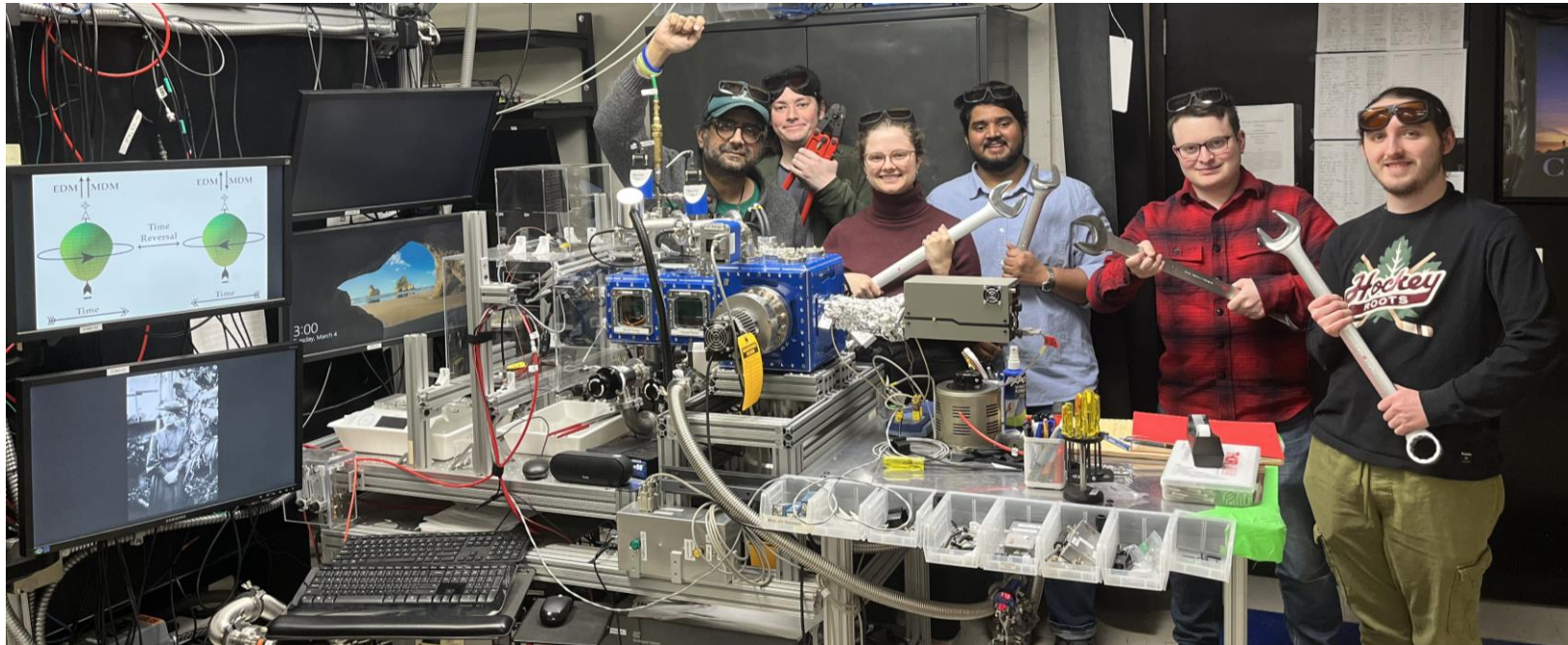
These are materials created or used by me:

- My preferred template for making a CV, <https://www.overleaf.com/articles/montasirs-complete-cv/nrzhncvnktzd>
- Google Drive folder which contains all of my writing sample, my initial planning document, my spreadsheet, and other stuff, <https://drive.google.com/drive/folders/1Bixm6REHZ8wZUYsbuNBCM79CLX5zwWeD?usp=sharing>
- A cost of living calculator is a useful tool to use to estimate how far your graduate stipend will get you economically <https://www.nerdwallet.com/cost-of-living-calculator>

Conclusion

- Graduate school is not just another undergrad degree
 - There's an academic component involving graduate level coursework
 - There's teaching experience expected at some level during your first few years
 - Most of the experience is conducting novel research as a research assistant
 - You don't need a Masters to apply!
- Filling out these applications is a challenging process – try to streamline it as much as possible
 - Create template documents that contain things common to other applications
 - Start planning early and communicate extensively with the professors or recommenders helping you out
- Make it a priority to visit the institutions if you get accepted
 - This is the single biggest factor which led me to make my own decisions on where to go – its an extremely useful metric!

Thank You For Your Attention!



Spinlab @ MSU:

PI: Jaideep Taggart Singh

Graduate Students: Erin White, Gordon Arrowsmith-Kron, Karina Martirosova, Nicholas Nusgart, Aiden Boyer, Yousuf Alishan

Undergraduate Students: Skylar Milne, Lindsey Hickman, Rashawn Carter, Aesen Copeland, Myles Daugherty, Tanusree Makwana, Nick Koester, Graham Malone

Special thanks to:

Jochen Ballof, Sebastian Miki-Silva, Oscar Naviliat-Cuncic, Tom-Erik Haugen, Mia Au, Peyton Lalain, Sebastian Rothe, Ben Arend, Peader Richards, Brandon Ewert, Patrick Glennon, Eric Hessels, Greg Koyanagi, David Leimbach, Ryan Ringle, Stefan Schwarz, Amar Vutha



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Science

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DE-SC0019455 (Ra EDM)
DE-SC0025679 (Ra EDM+EDM3)