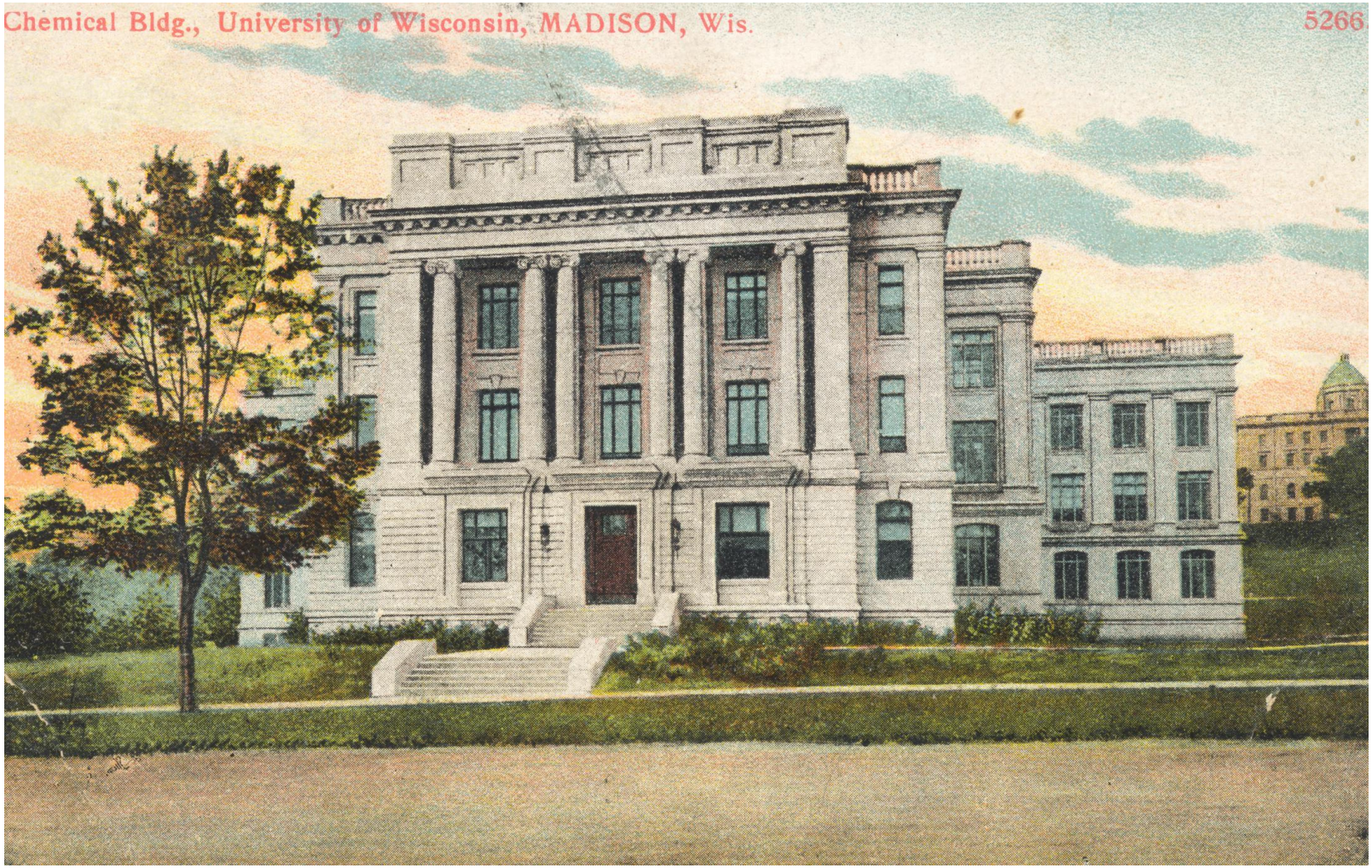
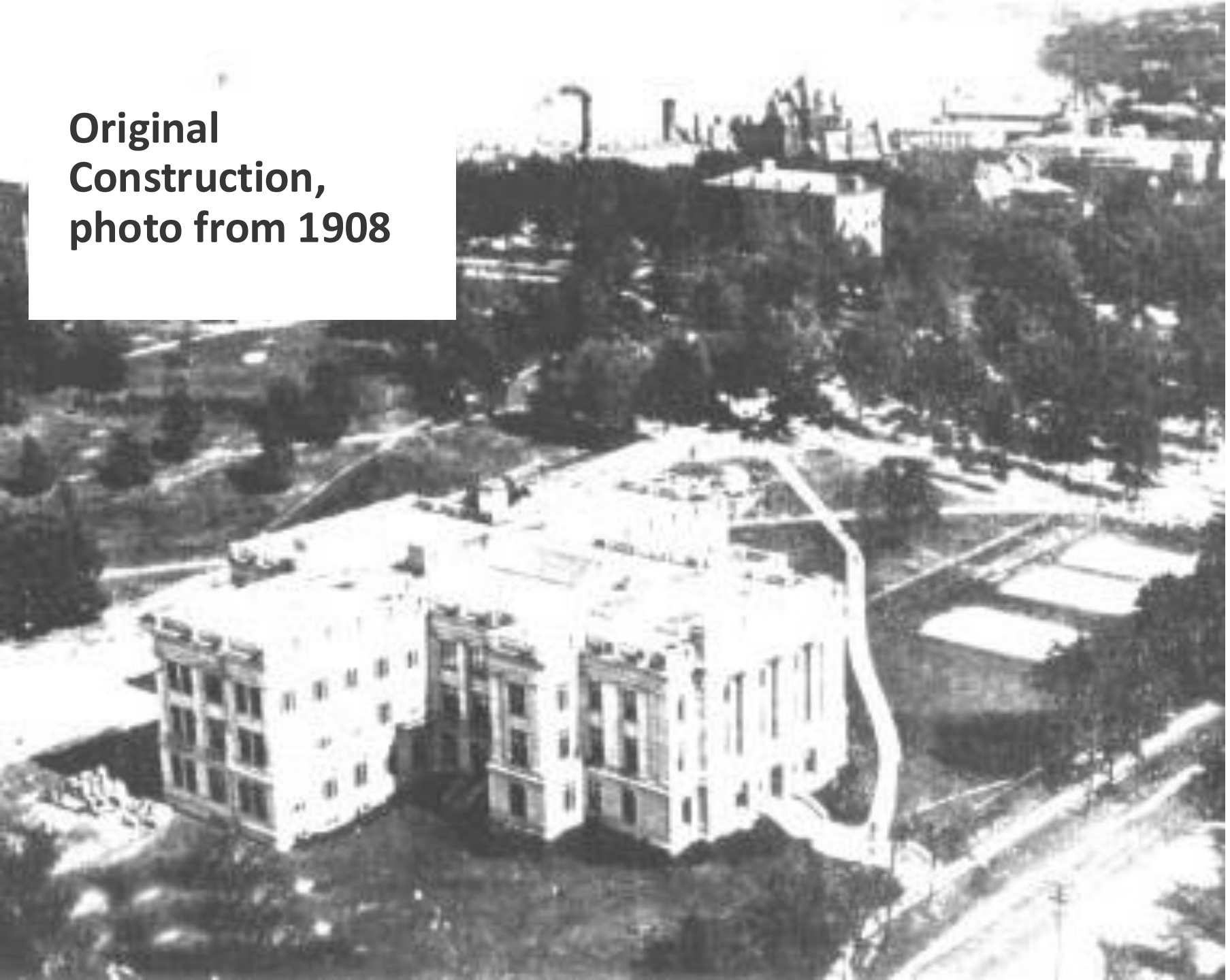
State of the Department





Original Construction, photo from 1908

Outline

Review of the Department

Current Leadership

New Faculty, Staff, and Students

Updates from last year and to this year

UW Madison Physics Today!

- 500+ people today
  - 50+ core faculty
  - 200+ PhD Students
  - 40+ Masters Students
  - 100+ undergrad majors
  - 100+ research, academic, and university staff
- Research covering
  - Astrophysics, Cosmology, Atomic Molecular & Optical, Biophysics, Condensed Matter, High Energy, Machine Learning, Neutrino Astrophysics, Nuclear, Plasma, Quantum, X-rays

Departmental Leadership

Keith Bechtol
Associate
Chair For the
Graduate
Program

Maxim Vavilov
Associate Chair
for
Undergraduate
Program and
Academic Affairs

Associate Chair for
Alumni Relations
& Board of Visitors

New Faculty joining in Fall :
Assistant Professor of Physics
Joshua Foster

- Joining from MIT **Pappalardo** Fellow
- PhD in 2021 from the University of Michigan
- Theoretical particle physics, particle astrophysics and cosmology

New Faculty joining in Fall :
Durand Assistant Professor of Physics
Mariel Pettee

- Joining from LBNL where she has been a postdoc since 2021
- PhD in 2021 from Yale
- Experimental High Energy Physics and Artificial Intelligence
- Cosmology and Collider Physics
- RISE-AI hire

New Faculty joining in Fall :
Anderson Assistant Professor of Physics
Josiah Sinclaire

- Joining from MIT where he has been a postdoc since 2021
- PhD in 2021 from the University of Toronto
- AMO Physics
- Quantum Computing with Neutral Cold Atoms

New Staff Members

Lisa Bek-gran
Curricular Administrative Asst
bekgran@wisc.edu

Alice C. M. Kwok
Graduate Advisor
amain2@wisc.edu

Administrative Regional Teams

ART 3

Physics	Chemistry	AOS	Astronomy	WiCore	Geoscience	Math
Finance Manager						
Steve Walline						
Gifts Manager						
Sherry Adamson						
CCM	CCM	Cost Center Manager			Cost Center Manager	
Emma Nametz	Emily Schjoth	Osman Habib			Moritz Stock	
Initiator	Initiator	Initiator			Initiator	Initiator
Dawn Suchomel	Aaron Kluck	Charlie Tokar			Susan Hyatt	Teresa Fastabend
Harpreet Hunjan	Chad Skemp				Steph Dufek	
	Tammy Comber					
	Nathan Onopa					
HR Manager						
Renata McMillen						
HR Support	HR Support	HR Support			HR Support	HR Support
Rachel Mattingly	Beatriz Bolanos L.	Malcolm Davis (JRP)			Shirley Baxa	Serena Boman
	Marc Willadsen					Char Burke
RA Manager						
Courtney Griese						
RA Support	RA Support	RA Support	RA Support		RA Support	RA Support
Sylvia Kmiec	Hailey Johnson	Carolyn Lipke	Andrew Beck		Cindy Luo	Mark Castillo
Susan Anderson	Carolyn Karls					Nathan Grosse
	Emily Bennin					
	Sabrina Miner					

- L&S has reorganized some of the administrative staffing
  - Human Resources, Research Administrative Support, Gift Management
- Technically : Sylvia, Susan, and Dawn were moved into L&S ART3
  - De facto they still work primarily for physics and sit on the 4th floor
- Emma, Harpreet sit on the 4th floor office
- ART managers are shared with other ART 3 managers

Physics Major Data

- Finished Spring 2025 with 219 majors, our most ever by 50 students.
  - Since Fall 2022, the major has grown by 78%.
- Starting the Fall semester with 181 physics majors.
  - Started Fall 2024 with 141 majors.
- Graduated 54 students in the 2024-25 Academic Year.
- From alumni data, 54% of our graduates go onto graduate school (not necessarily in Physics).

Undergraduate Enrollment

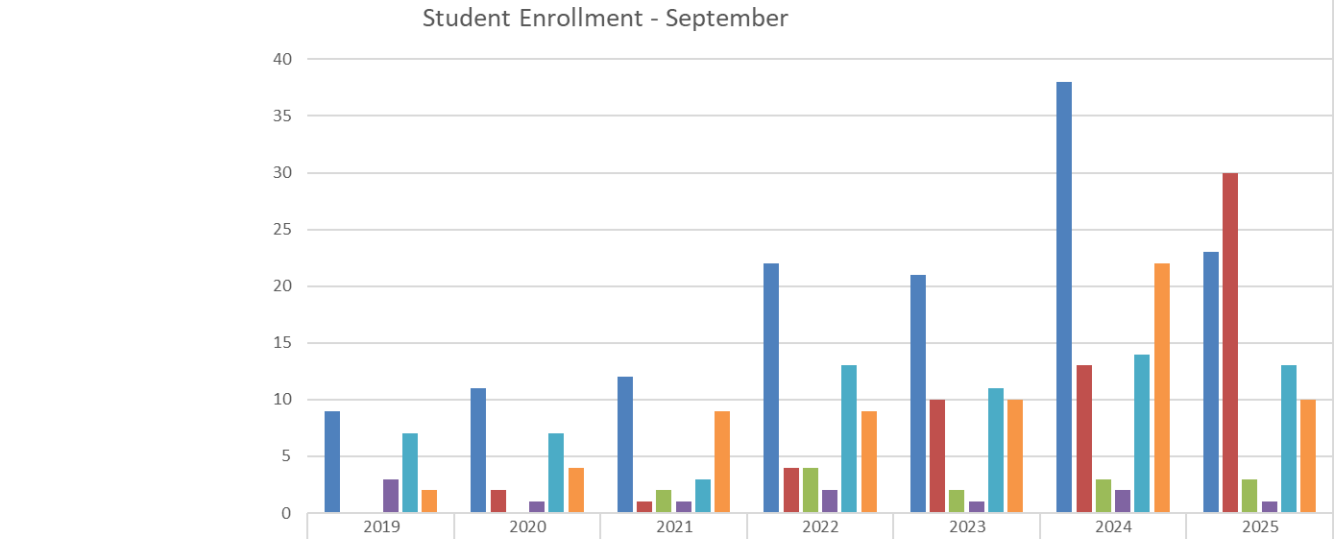
- Undergraduate Course Enrollment is up to 3810 students this Fall.
  - Up from 3591 in Fall 2024 and 3208 in Fall 2023.
- Enrollment in major courses is at 741 students.
  - Up from 721 in Fall 2024 and 554 in Fall 2023.
- Courses with Big Changes in Enrollment:
  - 103/104: Intro Physics w/ Algebra (↑47 combined)
  - 106: Physics of Sports (↑111)
  - 107: Ideas of Modern Physics (↓38)
  - 201/202: Intro Physics for Engineers (↑62 combined)
  - 311: Mechanics (↑12)

New Course for Fall 2025

- Physics 120: Special Topics in Physics
  - Algebra-based physics topics course.

- Being taught this semester by Uwe Bergmann as part of a First-Year Interest Group course (FIG).
  - Created course titled “Exploring the World with X-Ray Vision”
  - Enrollment of 13 students which is great for a FIG!

MSPQC Program – Admissions



	2019	2020	2021	2022	2023	2024	2025
New students enrolled	9	11	12	22	21	38	23
Continuing students	0	2	1	4	10	13	30
Female students enrolled (new)	0	0	2	4	2	3	3
AOF students enrolled (new)	3	1	1	2	1	2	1
Domestic students enrolled (new)	7	7	3	13	11	14	13
International students enrolled (new)	2	4	9	9	10	22	10

Fall 2025 enrollment
- 11 dom. students
- 8 int. students

Spring 2026 exp. enrollment
- 1 dom. students
- 9 int. students

Expected 2025 Graduation:
10 + 16(Dec)

MSPQC Program – Other News

MSPQC → **MSQC**

- Recruiting has started
- 1st Enrolled cohort in Fall 2026
- Current cohort can switch to new degree if desired

3-1-1 agreements in process

- Ajou University completed (South Korea)

New/additional QC-focused courses offered this year

- Physics
- Computer Science
- ECE

MSQC Curriculum Overview

30 credits

Core Courses (14cr) – need all	QM Courses (6cr) – need two	Specialization Courses – need two or three
701 Graduate Seminar - F	**448** Atomic and Quantum Physics	**799** Independent Study (do research with faculty)
707 Quantum Computing Lab – Su/F	**449** Atomic and Quantum Physics	
709 Intro to Quantum Computing - F	**531** Intro to Quantum Mechanics	Specialize in Hardware vs Software
763 Qubit Tune-Up and Programming - F	**545** Intro to Atomic Structure	
779 Advanced Quantum Computing - S	**551** Solid State Physics	
	731 Quantum Mechanics	
	732 Quantum Mechanics	

F = Fall, S = Spring, Su = Summer

Specialization Courses Examples (need two – three courses)

Software

- **765** Quantum Algorithms and Error Correction – required (S)
- **CS 412** Introduction to Numerical Methods (F)
- **CS 759** High Performance Computing for Applications in Engineering (S)
- **CS 319** Data Science Programming I for Research (F or S)
- **CS 506** Software Engineering (F or S)

Hardware (AMO focus)

- **623** Electronic Aids to Measurement – required (S)
- **625** Applied Optics – required (F)
- **ECE 835** Light Interactions with Quantum Materials (S)

Hardware (SS focus)

- **623** Electronic Aids to Measurement – required (S)
- **551** Solid State Physics – required (F or S)
- **ECE 549** Integrated circuits Fabrication Lab (S)

PhD Graduate Students

Currently 217 PhD Students as of today

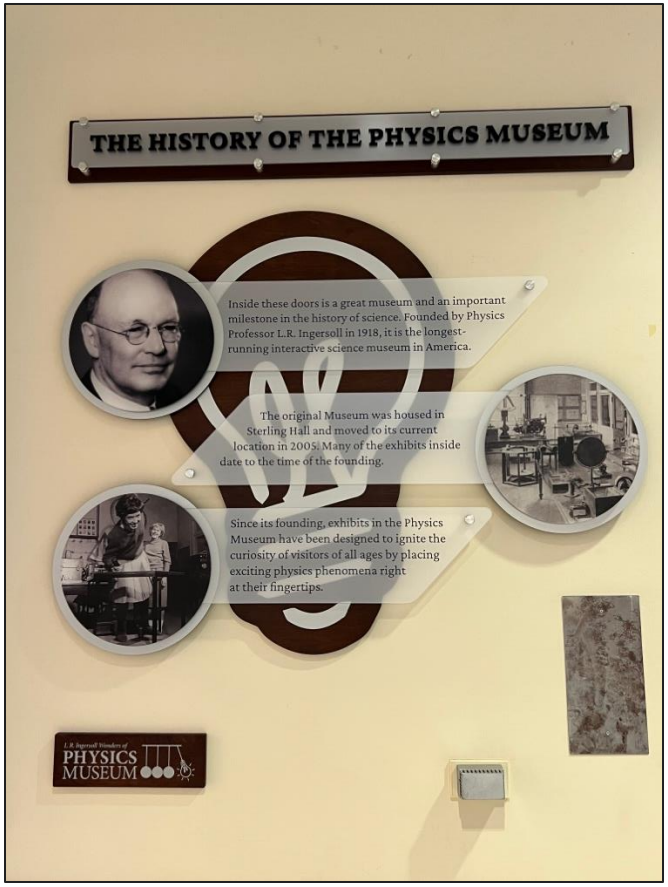
42 students, covering every research area in our department. It's exciting to note that this list includes:

- 23 are domestic, representing 13 states; 19 are international, representing 13 countries
- 9 (22%) are women
- 39 participated either in an in-person (32) or a virtual (7) visit

12 PhDs completed over the summer and 10 new dissertators (passed the prelim since May)

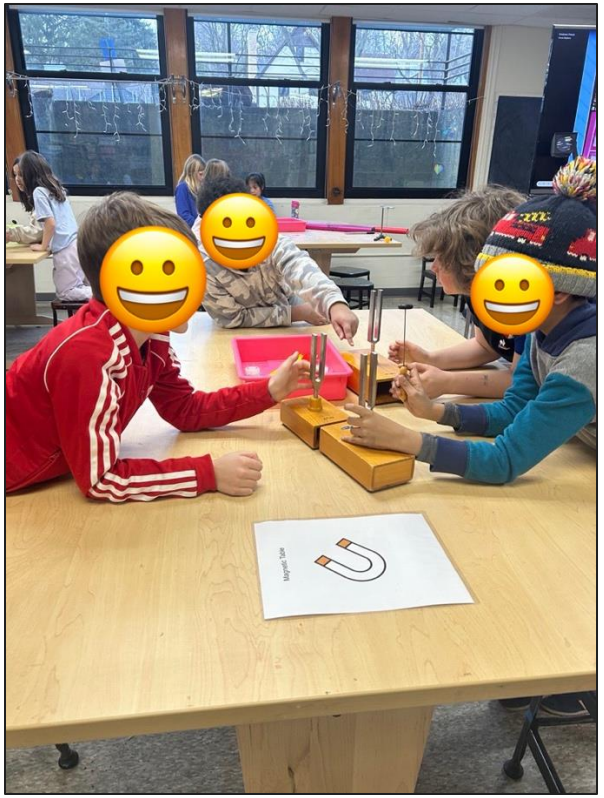
Museum Updates

- Museum officially renamed The L.R. Ingersoll Wonders of Physics Museum
- Now open — with docents! — many Saturdays during the academic year
- New sign showcasing the history was installed this summer



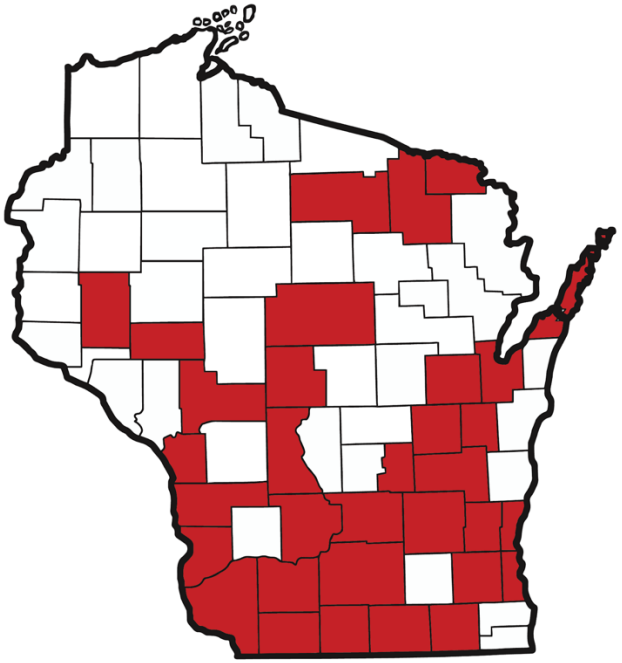
Field trip Updates

- Better coordination across campus with Biotech, Morgridge, etc
- Now offering lab tours to AP Physics classes that visit (thanks to everyone who is participating in those!)
- Piloted an afterschool program and kits to work on with students for more structured field trips



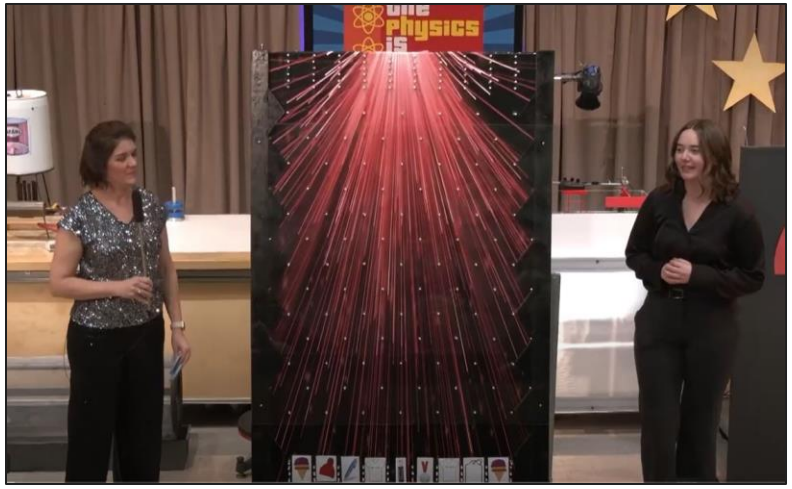
Traveling Show Update

- Visited nine new counties
- Added a staff member, Aubree. She left in August to go graduate school ☹
- Attendance & number of shows up 11% from 2023
- Supplemental *All About Air Pressure* classroom kits distributed to teachers (funded by the MacDonald fund)



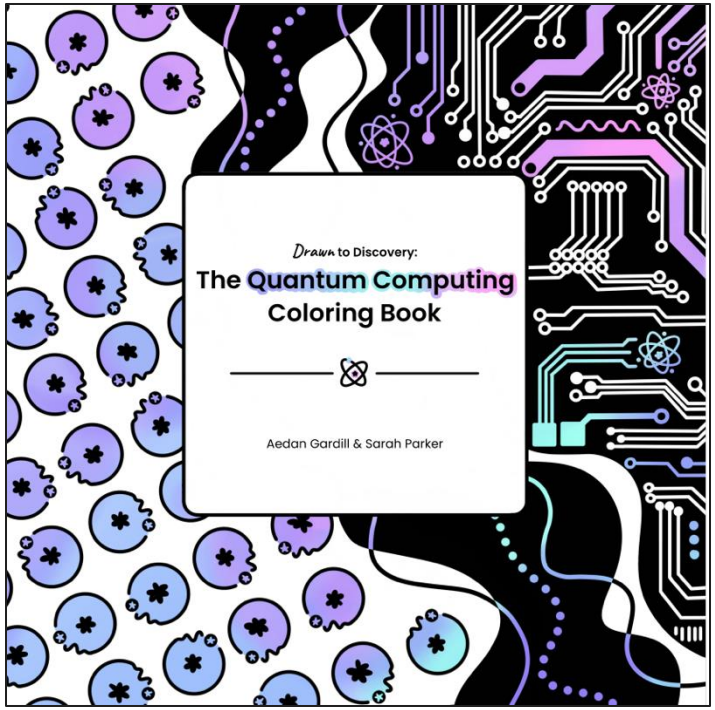
Annual Show Updates

- Quantum themed to celebrate International Year of Quantum
- *So* many grad students involved now. Thanks to all of you!
- Prof. Kuzmin was in the show and built a wave machine with Steve, and Prof. Song's group built a giant Plinko board for Quantum Plinko



Quantum Outreach Updates

- QuanTime provided 675 reusable, curated activity kits to over 6200 WI/IL middle and high school students
- TeachQuantum welcomed a new cohort of WI physical sciences high school teachers, and included a conference this year
- Release of a quantum computing coloring book



Research Communications Updates

- In conjunction with field trip lab tours, we are creating a series of lab tour videos, based on requests from teachers
- Greater emphasis on high-impact, narrative storytelling (e.g. Rubin Observatory) which gives us greater reach across campus and local media
  - Rubin story was covered by Cap Times, WiSJ, MKE Journal-Sentinel, WPR, WORT, and more!

Climate and Diversity

Committee Members


(Chair) Tulika Bose


Ayshea Banes


Uwe Bergmann


Jakob Mills


Katerina Moloni


Sophia Nowak


Sarah Perdue


Brian Rebel


Kunal Sanwalka


Rachel Zizmann

Not pictured: Ishita Kemeny

Academic Year Goals:

Increased Feedback and Transparency

- The Climate and Diversity Committee hosted Physics Department Feedback workspace to address shared concerns and values
- Sarah Perdue developed and launched a shared Google Drive for the Physics Department
- Sarah Perdue and Katerina Moloni developed a comprehensive list of committee work and assignments
- Shared information about completed trainings and developments for staff outside of direct physics work

Supporting Undergraduate Students Pursuing Physics

- The Climate and Diversity Committee partnered with the Space Committee to begin work on creating additional learning and community spaces on the second floor
- Worked with Undergraduate Advisors to develop plans to support undergraduate research involvement

Supporting Underrepresented Groups in Physics

- Supporting the Thaxton Fellowship, supporting undergraduate research
- Applied for and received GAANN, supporting graduate student scholarship
- Supporting student groups including GMaWiP and newly created Black and Brown in Physics (created by Ayshea Banes)

Efforts to Prevent Impostor Syndrome

- The Climate and Diversity Committee hosted professional development for The Climate and Diversity Committee hosted faculty professional development on intentional mentorship
- Programming on impostor syndrome for graduate students
- Professional development on mental health support and interventions

Climate and Diversity

Programs

Community Building Events
- December 2024 Physics Rewind: Reflect and Recharge
- April 2025 End of year Chamberlin Scavenger Hunt

Department Discussions
- Bias processing space
- Moving through performative allyship
- Physics Department Feedback Workspace

Graduate Student Programming
- Impostor Syndrome in graduate school
- First generation student experience
- Personal vulnerability the power of challenging personal comfort in equity work
- Disability and access in graduate school

Fall Series: Current Issues in STEM (Topics)
- Advancing Women of Color in STEM
- GoBig Read: Sitting Pretty
- Unconscious Bias in Recruitment and Selection
- STEM and Intersectionality
- Queer Identities in STEM Workspaces
- Creating inclusive learning spaces
- Supporting Native American scientists
- Personal vulnerability the power of challenging personal comfort in equity work

Spring Series: Diversity Forum Fridays
- Your Brain is Good at Inclusion...Except When It's Not
- The Islamophobia Sniff Test
- Democracy, and the Struggle for an Inclusive and Resilient America
- Fostering Psychological Safety to Enhance Belonging and Community
- Use Plain Language to Build a More Inclusive Workplace Community
- The Math Ain't Mathing: Professionals of Color Working Twice as Hard to Get Half as Far
- Addressing the Mental Health Needs of Underrepresented Collegiate Students

Climate and Diversity featured speakers

Physics Department Discussion: Improving Department Culture

Featuring:

- DeVon Wilson: College of Letters & Science Associate Dean for Diversity, Equity and Inclusion
- Mel Freitag: Assistant Dean of Diversity, Equity and Inclusion Training and Innovation, College of Letters and Science
- Jasmia Hamilton: Sloan Center for Systemic Change Asst Director

Microaggressions in the Workspace

Presented by Triston King
Assistant Director for the Office of Inclusion Education

Suicide Prevention: Recognize, Respond, Refer

Presented by Wendy Ellis, Suicide Prevention & Mental Health Promotion Specialist

Friday, May 2nd

Physics Department Colloquium; 3:30 pm - 4:30 pm; Chamberlin 2241 - https://uwmadison.zoom.us/j/93391800686?pwd=pWoHQcSYNMDdT9DBykttTbTlaDpaRhg.1

Unearthing the history of our disciplines to better science, Erika Marin-Spiotta, University of Wisconsin-Madison

Add this event to your calendar

Challenges

- The University is facing challenges that we have never seen
  - President will ask for drastic reductions in federal research dollars (unclear yet what effects, if any, will directly impact physics)
  - Demands to go to 15% overhead rates (current negotiated rates are 55% on on-campus research, 26% on off-campus research)
  - Demands to control the ideological content of Universities
  - Cancellation of grants based on what the administration's priorities are (none in physics so far)
  - Declaration of DEI being immoral and illegal
  - Cancellation of Visas of foreign students for minor or unclear reasons
  - Declaration of VP that ”Professors are the Enemy”
  - Concerns that we may be entering a self-induced recession

Impact on Physics

- Indirect is research money!
  - Pooled at the campus level and averaged over grants to pay for grant administration, infrastructure, power, cooling, etc of experiments
  - VCR statement – would not be able to pay for infrastructure at the demanded 15% rate
- Even if physics grants are not directly effected, 10% of base funding based on overhead to support basic research administration
- Federal research budgets could be dramatically reduced
- L&S has cut our budget by 7%
- L&S is insisting on a reduction to our TA budget for Fall 2026 going forward
  - Note that normally we hire 15-20 external TA to properly staff courses

Response by Physics

- We have moved to reduce our base budget by moving some staff to other funding mechanisms
- Plan for natural attrition and retirement to gently reduce expenditure for now accepted by the college
- As federal research budgets are uncertain and we have had 3 large incoming PhD cohorts in the last 3 years likely to significantly reduce the incoming class of Fall 2026
- Basic principle is to support teaching , research, and our community during these difficult and uncertain times

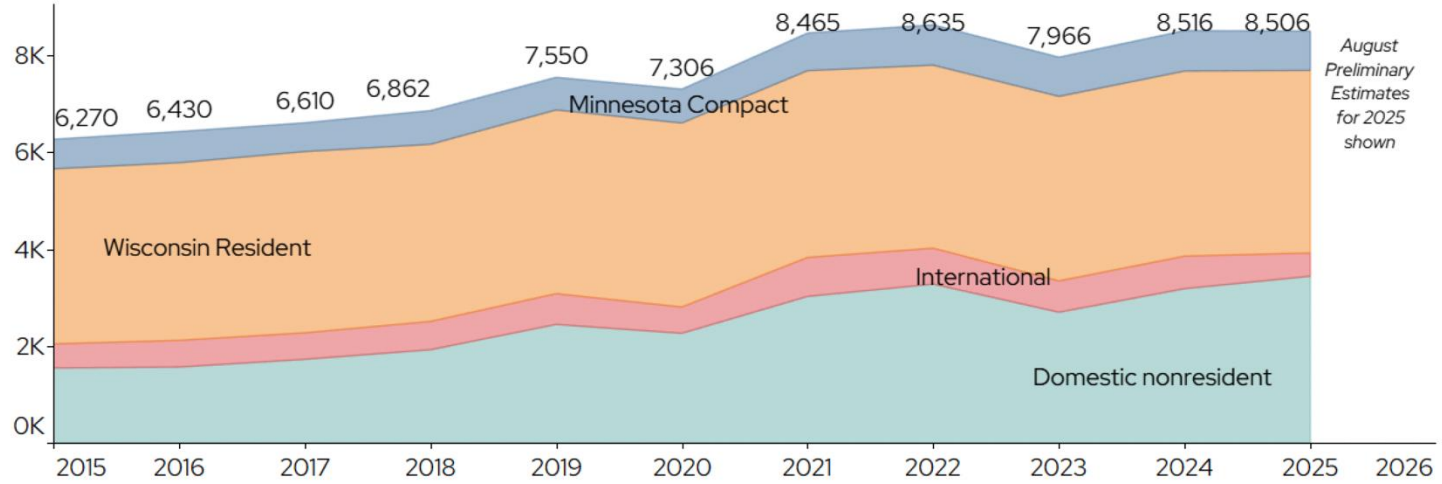
Some good news

- Despite challenges it looks like overall enrollment in the university is stable with respect to fall 2024
- Proposed federal research budgets from congress seem to be much more reasonable and less drastic than administration proposal
- State budget includes moderate increase for UW system for the first time in over a decade and not a significant cut which was on the table
- For now, overhead rates have stabilized but uncertainty on the future remains

UW Madison Enrollement

UNDERGRADUATE ENROLLMENT

Fall FYR Enrollment by Residency 2015-2024 and Est. 2025



	2020	2021	2022	2023	2024	2025 est.
Wisconsin Resident	52.0%	45.6%	43.8%	47.9%	44.9%	44.4%
Minnesota Compact	9.6%	9.2%	9.6%	10.2%	9.8%	9.6%
Domestic nonresident	30.9%	35.7%	38.0%	33.8%	37.4%	40.4%
International	7.4%	9.5%	8.6%	8.1%	7.9%	5.6%

Going forward

- We have both a lot to be proud of but also a lot of challenges to higher education that have not been seen before
- Departmental leadership remains committed to supporting students, staff, and faculty
- We will remain as transparent as we can be with budgets, uncertainties, and shifting sands
- On Wisconsin!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