

Sigma Pi Sigma – ΣΠΣ The Physics Honor Society

Virtual Induction Ceremony

Friday, October 16, 2020

Yale University

Physics Department

SPS & ΣΠΣ– Linked, but Distinct

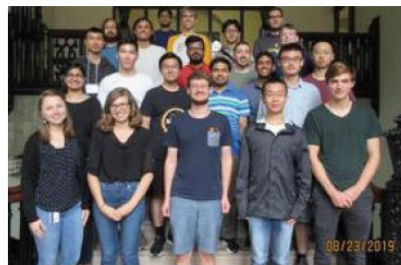
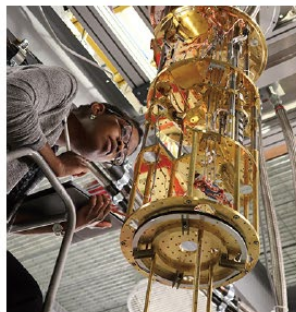
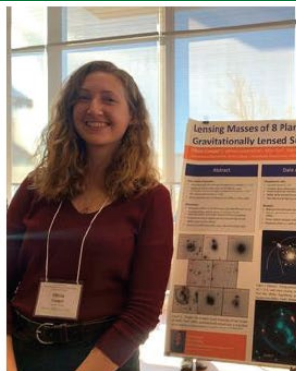


The **Society of Physics Students (SPS)** is open to all who have an interest in physics and astronomy. SPS Chapters are chartered at two-year and four-year colleges and universities. With over 800 chapters, SPS is the professional society of undergrad students and their mentors.



Sigma Pi Sigma (ΣΠΣ) is the physics honor society and is housed within SPS. Sigma Pi Sigma chapters are restricted to colleges and universities of recognized standing that offer a strong physics or astronomy program. With over 100,000 lifelong members, ΣΠΣ fosters opportunities to connect and contribute to the broader physics community.

Yale Physics



Yale Physics

A Distinguished History

First U.S. PhDs were from Yale in 1861, Arthur Wright one of the three

1863: J. Willard Gibbs, PhD in 1863

1878: Edward Bouchet, first African American PhD

1883: First dedicated Physics Lab in America, the original Sloane Lab

1899 First “Physics Club”=Physics Colloquium (Gibbs!)

Seven Nobel Laureates associated with the Department

2016: President Peter Salovey identified science as a top academic priority for Yale.

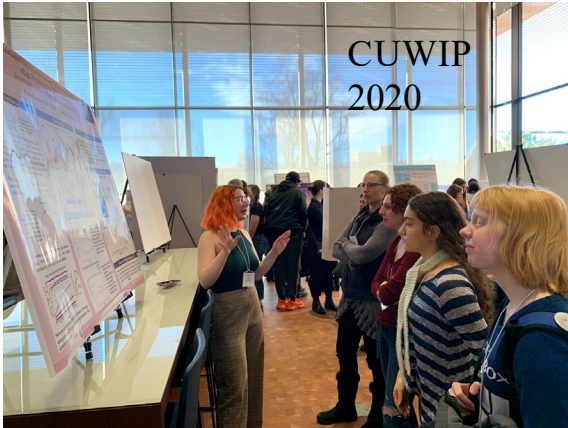
2018: New Yale science initiatives linked to the Physics Department

You are part of a distinguished history in Physics!

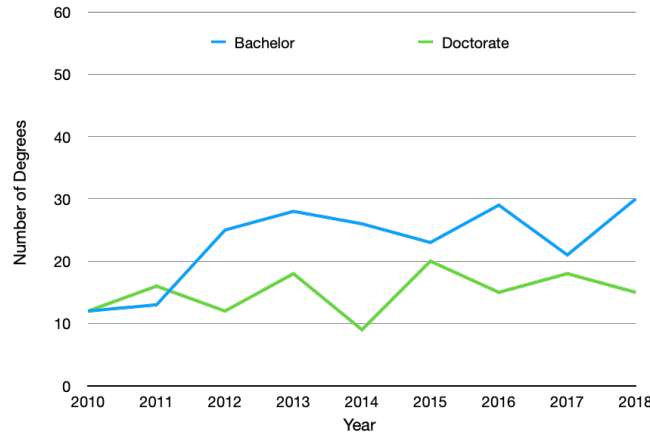
A community of students!

Yale Physics

Hoodie Ceremony 2019



Degrees in Physics



Majors

Physics

Physics & Geosciences

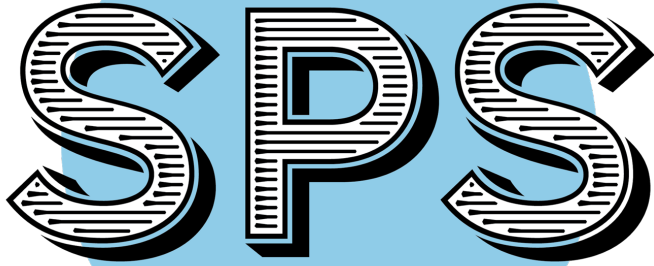
Physics & Philosophy

Astronomy & Physics

A growing community of
Physics majors

Yale Physics and Yale SPS

Yale



society of physics students

...and a special thank you to Prof. Reina Maruyama, for her role in helping SPS grow over the past few years!

A Brief Overview

- Established in 1998, recently revitalized by the 2019 & 2020 executive boards, ~100 national SPS members
- An integral part of the undergraduate Physics experience here at Yale (especially now!)
 - Very active in the research life of the department (attended AAS, APS meetings, coauthors on 5+ papers)
 - Weekly meetings, study sessions, peer tutoring
 - “Bluebooking” events
 - Advice on applying to graduate school
 - Research talks by graduate students
 - Physics outreach (“Physics of Juggling”)
 - Hosts of Schultz & Tinsley (w/ WIP) prize lectures



The Yale Society of Physics Students (SPS) presents

The Second Annual Howard L. Schultz Senior Prize Lecture

F. Duncan M. Haldane

2016 Nobel Laureate in Physics
Princeton University

**“Topological Quantum Matter, Entanglement,
and the Second Quantum Revolution”**


Thursday, April 11th 2019

SPL 57 @ 4:30pm

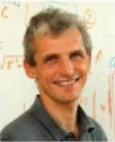
This is a public lecture — all are welcome!

Abstract: While the laws of quantum mechanics have remained unchanged and have passed all tests for the last eighty-five years, new discoveries about the exotic states that they allow, “entanglement”, and ideas from quantum information theory, have greatly changed our perspective, and some believe that a “second quantum revolution” is currently underway. The discovery of unexpected “topological states of matter”, and their possible use for “topologically-protected quantum information processing” is one of the important themes of these developments, and will be described.





 THE SECOND ANNUAL
TINSLEY SENIOR PRIZE LECTURE

DECEMBER 5, 2019
 reception: SPL 3rd floor @ 4:00
 talk: SPL 59 @ 4:30

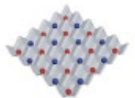


Wolfgang Ketterle
 2001 Nobel Laureate in Physics
 MIT



Ultracold atoms: From superfluid gases to spin transport

The realization of Bose-Einstein condensation in dilute atomic gases has created a unique experimental platform to study superfluidity in Bose and Fermi gases. The low density (a million times lower than air) of the gas allows control over the atoms and their interactions using the tools and precision of atomic physics. For fermions, the crossover from Bose-Einstein condensation of strongly bound fermion pairs to weakly bound Cooper pairs has been explored. After freezing out the motion of atoms, control of the spin degree of freedom has emerged as a new frontier. I will report on recent results on spin transport in optical lattices which highlights the crucial role of the anisotropy in the paradigmatic Heisenberg Hamiltonian. These studies illustrate a new approach to condensed-matter physics where many-body phenomena are realized in dilute atomic gases.

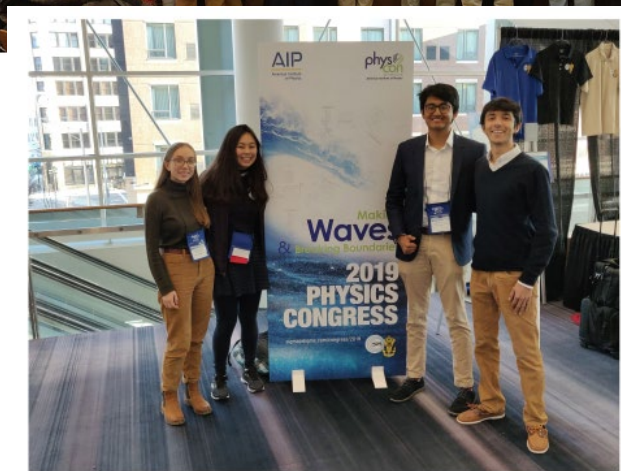




Yale SPS and WiP present:

A CONVERSATION WITH DONNA STRICKLAND

JOIN US FOR A Q&A WITH NOBEL
 LAUREATE AND PHYSICS
 PROFESSOR AT THE UNIVERSITY OF
 WATERLOO



Mission

Sigma Pi Sigma ($\Sigma\Pi\Sigma$) exists to:

- Honor scholarship
- Encourage interest in physics
- Promote service
- Provide fellowship



A brief History of ΣΠΣ

ΣΠΣ was established at Davidson College, NC on December 11, 1921

“I became acquainted with some students at Davidson College, NC...a very high class liberal arts college...[They] came up with ΣΠΣ...I said, ‘Oh boy, that’s what we ought to have here at Penn State.’”

Marsh White, ‘father’ of Sigma Pi Sigma

NO.	NAME	CLASS OR POSITION	RECD.
1	DOUGLASS, JAMES McDOWELL	PROP. PHYSICS	DEC. 11, 1921
2	WOOD, WM. WOODRUFF	" MATH, PHYSICS	"
3	WOODRUFF, ROBERT H.	"	"
3 (A)	DEW, MARCUS CECIL	"	"
4	CURKIE, LANCELOT MACLAIN	INSTR. PHYSICS	"
5	MCCAIN, WILLIAM KENNARD	"	"
6	BRUCE, ROBERT MARION	"	"
7	DOUGLASS, JOHN LEIGHTON	PROP. MATH	"
8	PRICE, JOHN KAUFMAN	"	"
9	(UNRECORDED NAME)	"	"
56	MCGUIR, ROGER MARTIN	"	MAR. 11, 1922
10 (A)	SMITH, HUGH HOLLINGSWORTH	"	"
10 (B)	LAFAR, DAVID ROBERTSON	"	"
10 (C)	JORDAN, SAMUEL REED	"	"
10 (A)	CRAY, HUGH	"	"
11	BOUSHAR, EDWARD ETHEL	"	APR. 27, 1922
12	BROWN, CHAS. VICTOR, JR.	"	"

The beginning...



Marsh White at the Wheaton College
ΣΠΣ Installation Ceremony (1931)

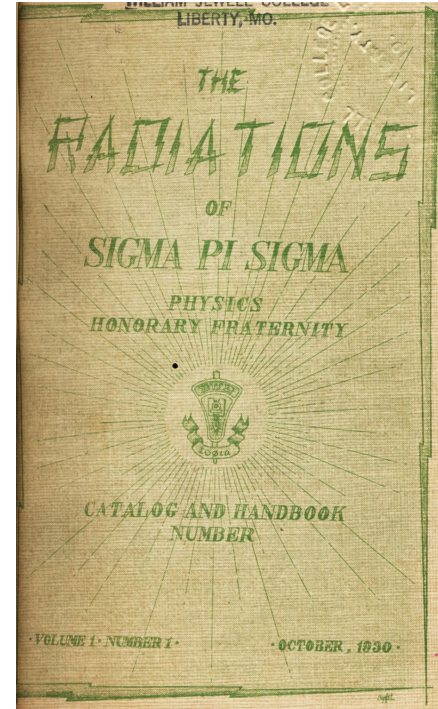
CHRONOLOGICAL LISTING OF SIGMA PI SIGMA CHAPTERS BY THEIR INSTALLATION DATES

1. Davidson College, Davidson, NC -- *December 11, 1921*
2. Duke University, Durham, NC -- *May 14, 1925*
3. Pennsylvania State University, University Park, PA -- *May 17, 1926*
4. Centenary College of Louisiana,
Shreveport, LA (1989-) -- *April 20, 1927*
5. Furman University, Greenville, SC -- *May 16, 1927*
6. William & Mary, College of, Williamsburg, VA -- *June 2, 1927*
7. Tennessee-Chattanooga, University of, Chattanooga, TN -- *May 17, 1929*
8. West Virginia University, Morgantown, WV -- *June 3, 1929*
9. St. Lawrence University, Canton, NY (1929-73) -- *June 7, 1929*
10. Ohio Wesleyan University, Delaware, OH -- *June 5, 1929*
11. Kentucky, University of, Lexington, KY -- *May 15, 1930*
12. Oklahoma, University of, Norman, OK -- *May 17, 1930*
13. Park College, Parkville, MO (1970-79) -- *May 19, 1930*
14. William Jewell College, Liberty, MO -- *May 20, 1930*
49. South Dakota State University, Brookings, SD -- *June 17, 1947*
50. South Dakota, The University of,
Vermillion, SD (1947-59) -- *June 17, 1947*
51. Bucknell University, Lewisburg, PA (1948-74) -- *February 14, 1948*
52. Maryland-College Park, University of,
College Park, MD -- *March 17, 1948*
53. Manchester College, North Manchester, IN -- *April 28, 1948*
54. Colby College, Waterville, ME -- *May 5, 1948*
55. Oregon, University of, Eugene, OR (1948-52) -- *May 10, 1948*
56. Occidental College, Los Angeles, CA -- *May 12, 1948*
57. Arkansas, University of, Fayetteville, AR -- *May 13, 1948*
58. Oklahoma State University, Stillwater, OK -- *May 14, 1948*
59. Emory University, Atlanta, GA -- *May 17, 1948*
60. Utah, University of, Salt Lake City, UT -- *June 8, 1948*
61. Howard University, Washington, DC -- *March 7, 1949*

Supporting Physics and Astronomy

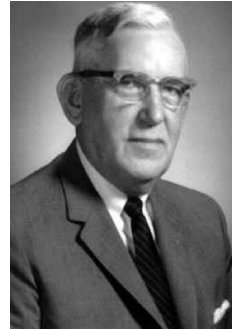
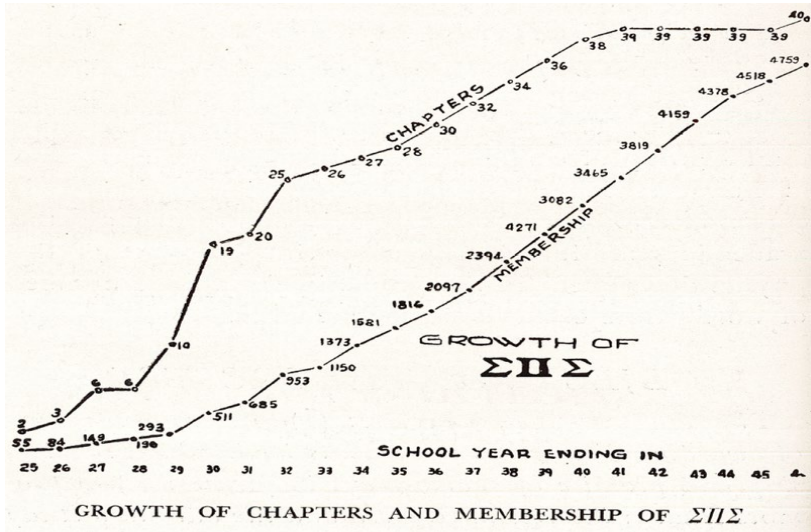
“From such a modest beginning, ... $\Sigma\Pi\Sigma$ has grown. ...The most serious subject for consideration at the first business meeting after organization was a discussion by Price, Brice and Dew [founding members] as to how much voltage could be applied to “Wooly” Grey, [member of the first induction class] without doing him any permanent injury. A moderate voltage was decided upon, and applied at a later date.” – Radiations, December 1931

Since its inception, $\Sigma\Pi\Sigma$ & SPS have supported department goals and been reflections of our community.



First Cover of the Radiations Publication

Marsh W. White



Penn State's first Ph. D. recipient, 1926
Sigma Pi Sigma Executive Sec., 1925-68
Pentagon War Citation, 1946
Presidential Certificate of Merit, 1948
AAPT President, 1954-55
Co-author, "College Technical Physics"
Personally installed 200+ chapters

“..You're supposed to remember them [secret handshakes and such], but I've forgotten. When I'd go to install a chapter I'd teach it all to them. You used to shake hands and ...say certain names or phrases. So, SPS drifted away from being a 'fraternity,'...”

1968 – ΣΠΣ teams up with AIP

In the 1950's, the American Institute of Physics and SPS began hatching a plan to work together on student and education issues. On April 22, 1968, Articles of Agreement between the AIP Student Sections and ΣΠΣ were signed, creating a joined Society of Physics Students (SPS) and ΣΠΣ. Both societies remain supported by AIP to this day.



Members of the Society's Executive Council, including the new officers elected during the convention, are (l. to r. in the rear) Vincent E. Parker, chancellor, Marsh W. White, executive secretary; (l. to r. in the front) Walter French, vice president, L. Worth Seagon-dollar, president, and Stanley S. Ballard, immediate past president.



SPS & ΣΠΣ today

Our societies continue to grow:

- + 825 SPS chapters
- + 575 ΣΠΣ chapters
- + 100,000 lifetime ΣΠΣ members
- +100 Honorary ΣΠΣ Members
- ΣΠΣ Service Awards
- Yearly Regional Meetings
- Regular Physics Congresses



ΣΠΣ Physics Congresses



Recent themes:

2019 - Making Waves & Breaking Boundaries

2016 - Unifying Fields: Science Driving Innovation

2012 - Connecting Worlds through Science and Service

Physics Congresses provide chapters:

- A national voice around issues facing their departments
- A strong connection to the national network of SPS & ΣΠΣ chapters
- Community building initiatives



2021 Physics Congress - 100 Years of Momentum: Honor, Fellowship, & Service

October 6-9, 2022

Downtown Washington, DC

- Two poster sessions
- Centennial Reception
- 5 Plenaries with field luminaries
- Washington DC themed Astronomy scavenger hunt
- SPS Chapter/Club Showcase
- + 20 different workshops
- Tours of regional laboratories
- Visits to local PhD Programs
- 2021 Congress voting/ballot
- ΣΠΣ member lunch



Centennial speakers
including Dame Jocelyn
Bell Burnell



[Click on the picture for a video](#) about the
2021 Congress

Lifelong Service Opportunities

Sigma Pi Sigma members serve the physics community in many ways, for example:

- Supporting local and national SPS programs
- Representing physics to the public
- Providing alumni networks
- Working for sound national science policies
- Offering science outreach opportunities

Symbolism



The Key

Voltmeter with lamp & dynamo



The Insignia

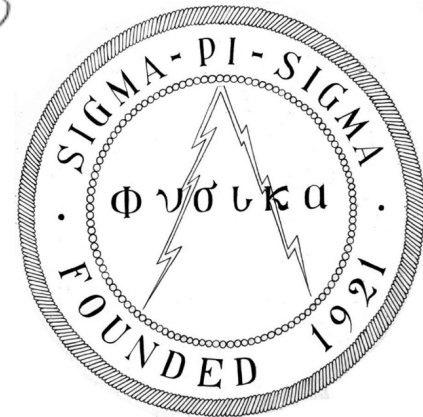
The Seal

The Motto

ΣΚΕΨΙΣ ΠΡΟΣΤΑΤΗΣ ΣΥΝΕΣΕΩΣ

Pronunciation: **S**kép-sis **P**raw-stah-tays **S**oon-ess-eh-occe

Translation: Investigation the Forerunner of Knowledge



Inductee Introduction



Sami Alves



India Bhalla-Ladd



Jack Chapman



Shoumik
Chowdhury



Caleb Clothier



Rebecca Dai



Krish Desai



Sarah Dickson

Inductee Introduction



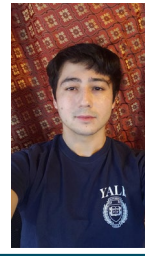
Ryan Flynn



Noah Goodman



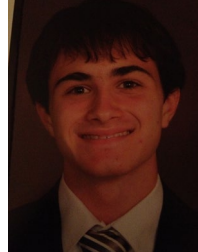
Luke Grossman



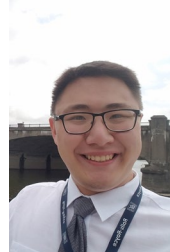
Gabe Hoshino



Shantanu Jha



Matt King



Derek Kuldinow



Alex Lathem

Inductee Introduction



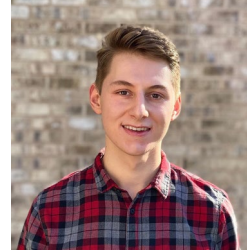
Richard Li



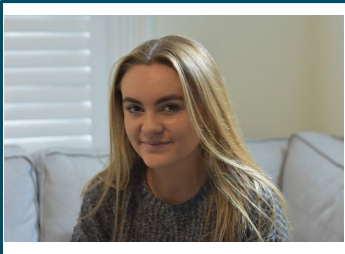
Helena Lyng-Olsen



Charlie Mayhew



Jack McArthur



Lucy McEwan



Georgia Michelman



Eitan Minsky-Fenick



Sajjan Ramanathan

Inductee Introduction



Isabel Sands



Kohsuke Sato



Will Sun



Malcolm Tang



Ben Togni



Grace Zdeblick



Laura Zhou



Benjamin Zolkiewicz

Induction into $\Sigma\Pi\Sigma$

A representative will repeat the following on behalf of all of the inductees:

We agree to uphold the pillars of Sigma Pi Sigma:

- Encourage those seeking knowledge and competence in physics and astronomy;
- Develop and maintain an attitude of service;
- Support colleagues, promote fellowship, and honor excellence in physics and astronomy;
- And, encourage scholarship in physics and astronomy, at all levels.

Charge to New Members

Continue your commitment as physicists and astronomers to honorable scholarship, irrespective of your ultimate career trajectory. Traditional scientists and ‘hidden physicists’ alike are critical to the future of society.



Read more about [Hidden Physicists](#) or [add your story](#) at Sigma Pi Sigma

ΣΠΣ: Experiences, Opportunities, and Connections

ΣΠΣ encourages lifetime service

- Connect to local chapters through mentoring: [Alumni Engagement Program](#)
- Interact with high school students through [Adopt-a-Physicist](#)
- [Sigma Pi Sigma Physics Congresses](#)
- Write for [Radiations](#), the official magazine of Sigma Pi Sigma
- Stay connected with your alma mater, local schools, or national initiatives
- Connect to members through ΣΠΣ [LinkedIn Group](#)



**ΣΠΣ HONOR SOCIETY BENEFITS
AT THE SPEED OF LIGHT!**

An invitation to join ΣΠΣ is an honor that provides a lifetime of benefits and service opportunities for both student and professional members.

 Students	 Professionals	 Service
<ul style="list-style-type: none">• Gain recognition via the honorary distinction for high achievement• Receive a complimentary 1-year membership to the Society of Physics Students• Become eligible to apply for a variety of exclusive SPS internships, fellowships, grants and other awards• Access a broad network of alumni and professionals through your local chapter• Receive a lifetime, biennial subscription to <i>Radiations</i>, the ΣΠΣ magazine• Distinguish your resume for graduate school and job applications	<ul style="list-style-type: none">• Connect with students through alumni engagement programs (www.spsnational.org/connect)• Reengage with your alma mater at PhysCon—the largest undergraduate gathering of physics and astronomy majors• Enter federal service at the GS-7 level• Access professional development and networking opportunities• Share your experience through Physicist Profiles and Alumni News at www.sigmapi.org	<ul style="list-style-type: none">• Promote interest and engagement in science through advocacy and outreach opportunities• Foster internship opportunities at your organization for physics undergraduates• Support the physics community through community service and outreach events• Volunteer for the Adopt-a-Physicist program: www.adoptaphysicist.org

One-time dues of \$54 covers lifetime membership

Sigma Pi Sigma - The National Physics Honor Society - www.sigmapi.org

1 Physics Bldg - College Park, MD 20740 - 301-206-3007 - sigmapisigma@ajp.org



Congratulations!



“I’m very happy to have been here.” [Marsh White on his 100th birthday, April, 1996]

Thanks to...
family, friends, & professor,
teacher, and mentors who
helped our students arrive here.

SPS/ ΣΠΣΣ Leadership:

Brad Conrad, SPS & ΣΠΣ Director

James Borgardt, ΣΠΣ President

Althea Gaffney, Assistant Director

Want to connect?

Sacha Purnell, Member Services

sigmapisigma@aip.org

301-209-3007

www.sigmapisigma.org