

Mentoring for Careers in Physics

A new pilot program at William & Mary

Chris Monahan

Ran Yang

William & Mary

01

A “Public Ivy”

Research-active state institution
known for liberal arts education

02

Chartered in 1693

Campuses in Williamsburg, Richard
Bland College of W&M, VIMS, & in DC

03

Schools

Schools of Arts and Sciences,
Business, Education, & Law

04

Student overview

6543 undergraduates
2974 graduate students



Class of 2026



10%

18997 applications

1801 students enrolled

60%

Virginia residents

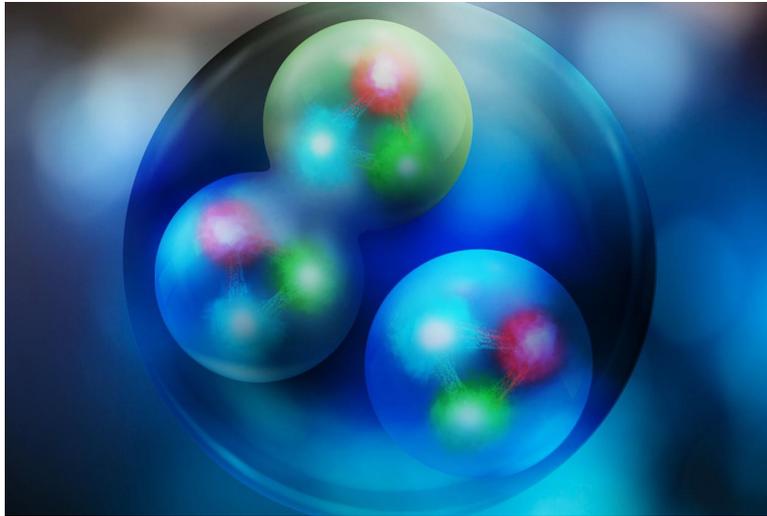
31%

Students of colour

56%

Women

Physics @ William & Mary



Research active

Relatively large department:
24 tenure-line faculty and 2 term faculty
9 research groups

01

Graduate program

58 graduate students
25% women (2019)

02

Undergraduate majors

39 majors graduating (2022)
Including 13 EPAD majors (2022)
36% women (2019)
No African American majors (2019)

03

What do we know about science identity and sense of belonging?

Sense of belonging makes a difference

- Implicit bias and stereotypes put women in STEM at a disadvantage
- Faculty and peer mentorship provides external validation of belonging
- Strong sense of belonging and science identity increase retention in STEM degrees
- Same-gender paired mentoring provides encouragement to pursue STEM degrees

(Bjorkquist, 2019)
(Nehmeh & Kelly, 2021)
(Kricorian et al., 2020)

Professional mentoring and physics majors?

- Does mentoring from women working in physics/engineering careers help inform female undergraduate students' science identity and feelings of belonging?
- What role does external mentoring play in the retention of female undergraduates in STEM majors?
- Does same-gender career mentoring increase the chance that undergraduate female students will pursue a career in STEM?

Mentoring @ William & Mary



Academic advising

Faculty advising for pre-major students and declared majors

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SPS peer-to-peer

Informal peer-to-peer mentoring coordinated by Society of Physics Students

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WM2

One-on-one mentoring for undergraduate women.
Wide range of mentors.

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Mentoring for Careers in Physics (MCP)

MCP provides one-on-one professional mentoring for undergraduate students majoring, or planning to major, in physics, including the Engineering Physics and Applied Design track. Mentors work with students to cultivate a rewarding and educational experience by sharing their professional insights and experiences, providing career guidance and networking opportunities, and helping students identify and plan their future STEM careers. We welcome undergraduate students of all genders that face gender-based discrimination.

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Our team



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Ran Yang

Lecturer of Physics
Co-founder & Co-director

...

Julia Merti

Program Assistant
MCP participant

...

Piero Panariello

Web Developer

...

Carson Stillman

2021-2022
Program Assistant

...

Pamela Eddy

Professor, School of Education
Program Evaluation Coordinator

...

Jenny Carlos

Ph.D. Candidate,
School of Education
Program Evaluation

Our program pilot

One-on-one mentoring

24 mentor-mentee pairs

Our mentors

6 alumnae

17 organisations

2 physics graduates

Our structure

- Launch event December 10, 2021
- Pilot runs Jan to Dec 2022
- Pairs signed a contract outlining expectations and responsibilities
- Pairs meet at least once a month
- Suggested professional and social activities highlighted each month
- Feedback requested each month

Moving beyond the pilot

	2022 Total	2022 Seniors	Returning for 2023	Seeking new pair
Mentors	24	-	22	1
Mentees	24	6	16	1

Program evaluation

Quantitative

Pre- and post-program surveys

- Only 2 students completed both
- Unable to quantitatively evaluate program

Monthly feedback surveys

- Participation fell significantly over the program

Students who responded experienced positive benefits

- "I see myself as a scientist" changed from "disagree to agree"
- "I don't have many friends in my major program" changed from "true" to "false"

Program evaluation by Jenny Carlos
W&M School of Education

Qualitative

"My mentor is wonderful and I'm learning a lot from them :)"

"I have formed a relationship with a woman who encourages me in all facets of my life "

"My mentor is great. She's encouraging and takes interest in me. She gives me useful and targeted advice."

"I've unexpectedly really appreciated the sense of kinship that I've experienced since joining MCP."

01

Professional one-on-one mentoring

Pilot program at William & Mary
24 mentor-mentee pairs

02

Professional mentors

Drawn from 17 organisations, outside academia
Share experience, skills and networking opportunities

03

Build STEM identity

Build community and sense of belonging for female undergraduate students

04

MCP in 2023

Building network of mentors
Integrating mentor training
Improved quantitative evaluation



Want to find out more?



<https://youtu.be/1TmcGkKM3LU>

<https://bit.ly/wmmcp> **W&M NEWS**

Thank you

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The Society of 1918