



ARCS Foundation Metro Washington Chapter *Advancing STEM in Our Nation's Capital* **2024-25**

*ARCS Foundation is a non-profit 501(c)(3) organization.
100% of donations go towards ARCS Scholars.*

e-mail: MWCPresident@arcsfoundation.org
Website: www.metro-washington.arcsfoundation.org



ARCS Foundation Metro Washington Chapter

Achievement Rewards for College Scientists (ARCS) is a national, all volunteer, women's organization that advances science and technology in the United States by providing awards to academically outstanding U.S. citizens studying to complete degrees in science, engineering, and medical research.

The Metro Washington Chapter (MWC) makes annual awards to graduate and undergraduate students attending five area universities. Members of ARCS are all volunteers who donate their time, efforts, and financial support. 100% of every dollar raised for scholar awards goes directly to our scholars. ARCS provides a way for individuals, foundations, corporations, and civic organizations to combine their resources and efforts to support American scholars, helping ensure a better future for all. ARCS scholar awards for scientific education are among the largest of any private membership organization in the United States.

MWC Chapter Highlights



1968

MWC is founded and is the second oldest ARCS chapter



\$8.5 Million

Amount of MWC Scholar funding raised since 1968



\$1 Million

Endowment Fund dedicated to funding scholar awards



5

Local Metropolitan Washington University partners



\$15,000

Amount of MWC Scholar Graduate Scholar Award



\$5,000

Amount of MWC Scholar Undergraduate Scholar Award

ARCS-MWC Partner Universities



JOHNS HOPKINS
UNIVERSITY



UNIVERSITY OF
MARYLAND



UNIVERSITY
OF VIRGINIA

MESSAGE FROM ARCS-MWC CO-PRESIDENTS



We welcome you to this year's events that support the ARCS Metro Washington Chapter's mission to advance science and technology in the United States by providing financial awards to academically outstanding US students.



Through the years, the ARCS MWC's diverse membership has grown and represents the breadth of Americans committed to STEM research - volunteers, educators, scientists, lawyers, business leaders, medical professionals and astronauts to name a few. The supported scholar research areas have also expanded to include: physics, chemistry, computer science, and multiple engineering disciplines as well as biomedical research and more recently cyber security and AI.

We sincerely appreciate the collaboration of our members, donors and university partners. We are grateful for the generous support of our donors and members. Through your contributions, the chapter has raised over \$8.5 M and supported approximately 500 scholars. Your gifts are essential to advancing the ARCS mission in an impactful and sustainable way.

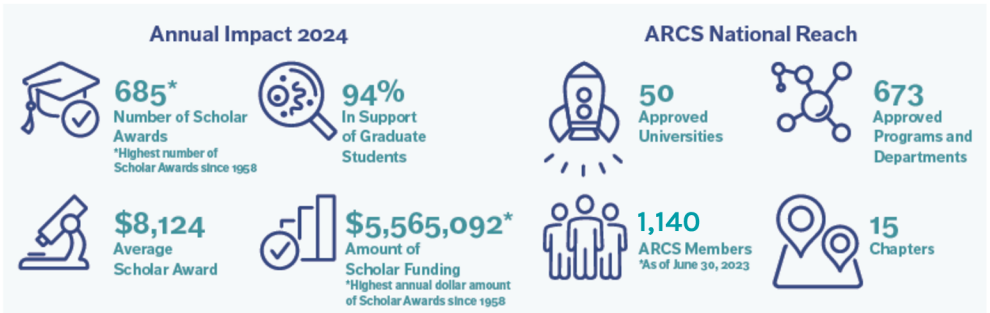
This year ARCS MWC is sponsoring 17 PhD graduate scholars and 4 undergraduate scholars from our five partner universities. In addition to the amazing contributions these scholars are making to the future of science, they are also giving back to their communities through mentoring, peer support and other activities.

Julie Hohl and Patricia Sparrell

Co-Presidents, ARCS MWC
MWCPresident@arcsfoundation.org

ARCS Foundation National – At a Glance

Since its founding in 1958 in Los Angeles, California, ARCS Foundation has grown to a national organization of 15 chapters that has provided scholar awards totaling over \$136 million at 50 leading universities to nearly 12,000 recipients.



ARCS Foundation Mission

ARCS advances science and technology in the United States by providing financial awards to academically outstanding U.S. citizens studying to complete degrees in science, engineering, and medical research.

Opening Doors to Scientific Achievement

ARCS Foundation embraces diversity, equity, and inclusion as core values critical to scientific excellence and innovation. We believe these core values are crucial to creating a welcoming environment within our organization. We open doors to talented individuals who bring different perspectives to scientific research. ARCS Foundation celebrates and supports the efforts of our partner institutions as they eliminate barriers to academic and scientific achievement.



GEORGETOWN UNIVERSITY

2024-2025 Scholar Award Recipients

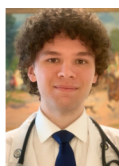


DaVonne J. Henry

Hesse Endowment Scholar

First Year Scholar, Physics

To improve from the current state-of-the-art high-density magnetic data storage, novel solutions are needed to reduce the data storage device size while maintaining data integrity. Single-molecule magnets have the potential to greatly improve data storage density. This research involves electrical measurements and computational models to investigate the fundamental questions related to how these molecules can decrease storage device size.



Alexander A. Lekan

Forster Family Foundation Scholar

First Year Scholar, Tumor Biology

Combining single-molecule magnets (SMMs) with graphene nanodevices can lead to high-density data storage or quantum computing applications. Using nanofabrication techniques, I create highly responsive devices that can be used to perform measurements on SMMs. Electrical measurements and computational models are used to assess the performance of these devices and determine their working principles.



Rachael E. Maynard

JCM Foundation Scholar

First Year Scholar, Tumor Biology

Current therapies are not very successful at reducing pancreatic cancer tumor burden. In my past research, I engineered natural killer (NK) cells that better invade and kill pancreatic cancers, enhancing their usefulness in treating solid tumors. Current research examines the impact of these NK cells on other human immune cells within tumors in a humanized mouse model.



Jonathan D. Riess

Toni & Hans Schierling Undergraduate Scholar

First Year Scholar, Physics and Mathematics

Current superconductors used in quantum computers and particle accelerators must be supercooled to maintain their property resulting in large cooling energy requirements. This research in holographic superconductivity will attempt to understand the nuclear physics which sets the temperature at which a material becomes superconducting and what features of a material one would need to fine tune to create a room temperature superconductor.



Prachi D. Shah

MWC Chapter Scholar

First Year Scholar, Biology

Memory and forgetting are highly regulated biological processes fundamental for animal survival in an ever-changing environment. This project aims to understand the neurobiological basis of retrograde amnesia induced by different insults. This research requires the development of a number of cutting-edge, custom-made tools to explore the molecular, cellular and circuit mechanisms involved in the degradation of memory.



THE GEORGE WASHINGTON UNIVERSITY

2024-2025 Scholar Award Recipients



Emily C. Cheung

MWC Chapter Scholar

First Year Scholar, Biomedical Engineering

Cardiovascular disease is the leading cause of death worldwide. Heart failure with preserved ejection fraction (HFpEF) has a higher prevalence in women. This project will develop a novel therapy that provides targeted activation of specific neuron populations in the brain to mitigate progression of the disease. High-speed optical mapping techniques and electrophysiological properties will determine the treatment efficacy on failing hearts.



Hallie M. Fausey

Michelle & Julian Francis Scholar

Second Year Scholar, Physics

Studying gamma-ray bursts allows us to examine the history of the universe and learn about the environments of the first galaxies and stars. This research involves studying gamma-ray bursts, with observational data from some of the largest telescopes on earth while collaborating with scientists around the world. In addition, this research will support evaluating and optimizing the capabilities of new instrumentation to further their studies in the future.



Sanjori Mukherjee

McNichols Family Foundation Scholar

First Year Scholar, Biomedical Engineering

The clinical presentation of Alzheimer's disease (AD) varies widely across individuals and the neurobiological mechanisms underlying this heterogeneity are largely unknown. Our research goal is to develop image analysis and structural magnetic resonance imaging (MRI) of the brain to improve the understanding of AD pathology. The underlying features of images are examined further to understand whether they represent risk factors of AD or the disease itself.

JOHNS HOPKINS UNIVERSITY

2024-2025 Scholar Award Recipients



Akshaya V. Annapragada

Danaher Foundation Scholar

First Year Scholar, Biomedical Engineering, School of Medicine

There is a great need for accessible and sensitive screening approaches for carcinomas worldwide. This research focuses on novel artificial intelligence approaches to enable new whole genome analyses and enhanced understanding of cancer-related genetic changes. These approaches are enabling the development of non-invasive, affordable, accessible blood tests for early detection of cancers across a range of high-impact clinical settings.



Rebecca J. Baxter

Sparrell Family Undergraduate Scholar

First Year Scholar, Biomedical Engineering

This research involves the development and evaluation of a novel device designed to improve percutaneous drainage procedures in patient care. This innovated device prevents clogging of drainage catheters used to remove unwanted fluids like abscesses, thus decreasing drainage times and reducing the rate of repeat procedures for catheters used in these procedures.



Zachary J. Gold

Danaher Foundation Undergraduate Scholar

First Year Scholar, Biomedical Engineering

This research involves development of novel technologies for those with neurological disorders, including a controls-theory based biomarker for characterizing treatment-resistant schizophrenic patients based on EEG data, and the development of a rectal catheter accessory device for those with neurogenic bowel disorder.



Alexander Lu

Mulford Endowment Scholar

First Year Scholar, Biomedical Engineering, School of Medicine

Surgeons use a variety of imaging systems to guide diagnostics and interventions; patient movement during imaging is often unavoidable and can substantially distort the images. This current research combines machine learning with physics-driven methods to improve the quality of intra-operative imaging technologies with the intent of improving diagnostics and subsequent treatment.

JOHNS HOPKINS UNIVERSITY

2024-2025 Scholar Award Recipients



Sabahat Rahman

Danaher Foundation Undergraduate Scholar
First Year Scholar, Biomedical Engineering

Two cancer research projects will be focusing on personalized care and treatments. The first project will develop a device that measures individual patient melanoma stiffness in situ; with the intent of diagnosing melanomas earlier. The second project will use computational tools to model patient-specific reactions to various immunotherapies such as neo-antigen vaccines. These specialized treatments could prevent the deleterious side effects associate with nonspecific therapies.



Sydney R. Shannon

Virginia Lukasik Memorial Scholar
First Year Scholar, Biomedical Engineering


Gene therapies are transforming treatment approaches for many human diseases; but current approaches can be very costly and not available for all patients. This research focuses on engineering novel biomaterials that incorporate natural immune signals to activate the body's immune cells to treat cancer. The platform has the potential to mediate anti-tumor effects as a more accessible and durable "off-the-shelf" therapeutic and available to more patients.



Ariel V. Slepyan

Willard and Marilynn Sweetser Scholar
First Year Scholar, Electrical & Computer Engineering

Research is focused on developing 'CS-Skin', a next-generation touch sensor mimicking the acuity of human skin. CS-Skin boasts a large area, numerous sensors, and fast response times, replicating human touch. This innovative technology, tested successfully in robotic hands, enhances dexterity and object recognition. CS-Skin has the potential to revolutionize prosthetics, robotics, and everyday surfaces by granting them human-like touch capabilities.





UNIVERSITY OF MARYLAND

2024-2025 Scholar Award Recipients



Patrick R. Banner

MWC 55th Anniversary Scholar
First Year Scholar, Physics

This research spans atomic, optical, and detector physics. The primary research uses strongly interacting atoms to make light and matter interact in ways that can be used for both studies of fundamental few-body physics problems that cannot be solved analytically, as well as emerging quantum technologies—especially quantum networks. The results have application in specialized detector design as well as quantum computer design.



Eman Mirdanmadi

MWC Chapter Scholar
First Year Scholar, Bioengineering

Three dimensional bioprinting technology has gained increased attention in the regenerative medicine and tissue engineering communities over the past decade with their attempts to create functional living tissues and organs. This research specializes in tissue engineering, regenerative medicine and drug delivery and is centered on developing 3D printed bone with gels capable of treating health conditions, particularly related to the eye and brain.



Emily H. Powsner

MWC Chapter Scholar
First Year Scholar, Bioengineering

Rapid healing of chronic wounds continues to be a challenge. This research works towards improving the therapeutic potency and production of extracellular vesicles (EVs) that can be used as lower-risk alternatives to regenerative cell therapies. Novel approaches will be used to manipulate cell morphology and incorporate dynamic cell culture. This work will help improve the biomanufacturing potential and contribute to the goal of clinical translation of EV therapies; chronic wound healing being one area of application.



UNIVERSITY OF VIRGINIA

2024-2025 Scholar Award Recipients



Emma M. Glass

Evelyn Soucek Memorial Scholar
First Year Scholar, Biomedical Engineering

The aim of this research is to develop innovative ways of treating bacterial infection without the use of conventional antibiotics. Specifically, computational metabolic models of bacteria in conjunction with big-data and machine learning techniques will be used to uncover unique functional signatures in groups of pathogens. These unique functions can guide predictions of new antimicrobials, which will be validated with wet-lab experiments.



Tyler G. Horoho

Mars Foundation Scholar
First Year Scholar, Physics

The research goal involves testing next-generation particle detector instrumentation, and using machine learning techniques, along with data from particle accelerators, to probe open questions in cosmology and particle physics such as the nature of dark matter and the matter-antimatter asymmetry of the early universe.



Najwa Labban

Danaher Foundation Scholar
First Year Scholar, Biomedical Engineering

Most breast cancers are treated with surgery, radiation, and hormone therapy, but not all women respond equally to these therapies. This research uses breast cancer cells from patients to engineer tumor "organoids" that more accurately mimic the disease process within the body for testing new and approved therapies and for understanding the origins of therapeutic resistance.

PAST EAGLE AWARD RECIPIENTS

On an annual basis, the Metropolitan Washington Chapter of ARCS is honored to present The Eagle Award to an individual who has demonstrated extraordinary leadership in the advancement of American science, technology, medical research, and/or engineering. The influence of these individuals has led to significant benefits for American competitiveness as evidenced by their business leadership, scientific innovation, and/or public service.

1985-1989

Admiral Bobby R. Inman
Mr. H. Ross Perot
Lt. Gen. James H. Abrahamson
Dr. Gilbert M. Grosvenor
Mr. Hugh Downs

1990-1999

Vice Admiral Richard H. Truly
The Honorable John Sununu
Dr. Lynne V. Cheney
Dr. June Scobee-Rodgers
Dr. Norman Augustine
Dr. John Deutch
Dr. Sheila Widnall
Dr. William Perry
General Colin Powell
Alma Johnson Powell
The Honorable Elizabeth Dole

2000-2009

Dr. Clayton Daniel Mote
The Honorable Daniel S. Goldin
Dr. J. Craig Venter
Dr. Maxine Singer
Dr. Bruce Alberts
The Honorable Samuel W. Bodman
Dr. Vance D. Coffman
The Honorable Ted Stevens
Dr. Ronald Sega
Barbara Radding Morgan
Dr. G. Wayne Clough

2010-2019

Dr. Kristina M. Johnson
Dr. Vinton G. Cerf
Dr. Ralph W. Shrader
Roger A. Krone
Dr. Wanda M. Austin
Dr. Craig Barrett
Barbara Barrett
The Honorable Barbara Comstock
Ms. Marillyn Hewson
Dr. Marcia McNutt
Charles O. Holliday, Jr.
The Honorable Justice Kennedy
Mrs. Mary Kennedy

2020-2024

Dr. Francis S. Collins
Dr. Shirley Ann Jackson
Dr. Jason Providakes
Dr. Renee Wegryzn

MWC DONOR PARTNERS

*We gratefully acknowledge our corporate, foundation, and individual donors who share our vision!**

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\$15,000+

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**Reflects donations from July 1, 2023 - June 30, 2024*



Donate to ARCS-MWC

Support our area's vibrant intellectual and scientific community with a gift to the Metropolitan Washington Chapter of ARCS. ARCS provides a unique vehicle for channeling dollars into STEM (Science, Technology, Engineering, and Math) education without deduction for administrative costs.

Your tax-deductible gift will support the best of our nation's science and engineering students and is an opportunity to impact America's scientific and economic future. Gifts of any size are greatly appreciated

There are special opportunities to fund an ARCS-MWC Named Scholar:

ENDOW A SCHOLAR \$100,000

Funds one named Endowment Scholar once every five year in perpetuity

FUND A GRADUATE SCHOLAR \$15,000

Funds one named Graduate Scholar for one year

FUND AN UNDERGRADUATE SCHOLAR \$5,000

Funds one named Undergraduate Scholar for one year



ARCS Foundation is a non-profit 501(c)(3) organization. TIN 23-7087021

Gifts are tax-deductible as allowed by law and are payable to:

**MWC/ARCS Foundation
PO Box 60868
10221 River Road
Potomac, MD 20859-0868**

e-mail: MWCPresident@arcsfoundation.org

Website: www.metro-washington.arcsfoundation.org