

# Arielle Miller, Ph.D., P.E.

## Curriculum Vitae

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<https://www.youtube.com/@drarielle>

## EDUCATION AND CREDENTIALS

Postgraduate:	Ph.D. in Mechanical Engineering	Howard University, Washington, DC	2021
Postgraduate:	Masters in Nuclear Engineering	North Carolina State University, Raleigh, NC	2014
Undergraduate:	Bachelor of Arts in Physics	Northwestern University, Evanston, IL	2003
License:	Professional Engineering License (Nuclear Engineering)	State of Maryland Board of Professional Engineers and Land Surveyors - 44621 State of Virginia Board of Professional Engineers and Land Surveyors - 0402066601 District of Columbia Board of Professional Engineers and Land Surveyors - PE40001258	

## MILITARY

Highest Rank Held:	Lieutenant Junior Grade, United States Navy, Surface Warfare Officer, Nuclear Separated March 3, 2008
Source of Commission:	Navy Reserve Officer Training Corps, Northwestern University, May 23, 2003
Entered Active Duty:	June 18, 2003
Military Education:	US Navy Nuclear Prototype Training Unit, Ballston Spa, NY (2006) US Navy Nuclear Power School, Charleston, SC (2005) US Navy Surface Warfare Officer School (2004)
Military Awards:	Navy "E" National Defense Service Medal Global War on Terrorism Expeditionary Medal Global War on Terrorism Service Medal Navy Sea Service Ribbon Expert Pistol Shot Medal

## PROFESSIONAL EXPERIENCE

Current Positions: Engineering and STEM Education Consultant ([www.ariellemiller.com](http://www.ariellemiller.com))  
Self-employed: **Dr. Arielle Miller Coaching & Consulting LLC**  
Including:  
External STEM Education Evaluator  
Grant Writing and Grant Program Management  
Engineering Research and Technical Writing  
STEM PhD Dissertation Technical Editing  
STEM Education Research  
STEM Curriculum Development  
Tutoring

As a **consultant** to individuals, corporations, non-profits organizations, and higher education institutions. Guide students to develop research proposals that are rigorous, feasible and relevant to their field of study. Provide PhD guidance and assistance, including technical writing, to Black women pursuing engineering PhDs to promote inclusion and diversity. Assist students in conducting comprehensive and up-to-date literature reviews to identify gaps in the existing research and establish research questions. Deliver consulting services in engineering, research, and diversity, equity, and inclusion (DEI) to clients seeking professional guidance. Provide feedback on drafts of written work, such as proposals, chapters, and articles, to ensure drafts are clear, coherent, and well-structured.

**Individual PhD Coach:** Provide PhD guidance and assistance, including technical writing, to Black women pursuing engineering PhDs.

**Training/Curriculum Development, YouTube:** Develop "how-to" educational videos on **YouTube** Channel (<https://www.youtube.com/@drarielle>) on nuclear computer code software for nuclear engineers and training videos on research methodologies for students in STEM programs.

**Training/Curriculum Development, Teachable:** Developed training videos on research methodologies for students in STEM programs interested in how to conduct research. Training videos are available for purchase on Teachable (<https://ariellemiller.teachable.com/>)

**Training/Curriculum Development, Howard University:** Developed and delivered lectures in "Entering Research - Engineering Undergraduate Research Seminar" aimed to elevate students' self-efficacy and research process understanding for as future researchers.

**Tutor, Wyzant.com:** Physics and Calculus, Technical Editing (LaTeX). Provided tutoring services for high school and college students at undergraduate and graduate level.

Previous Positions: R&D Portfolio Director, Office of Naval Research (2021 – 2023)  
Researcher (Detailed), US Naval Research Laboratory (2021)  
Senior Nuclear Engineering, Defense Nuclear Facilities Safety Board (2015 – 2021)  
Director of Product Strategy and Innovation, AREVA Transnuclear (2014-2015)  
Core Process Engineer, AREVA Enrichment Services (2011-2014)  
Licensing Engineer, AREVA Enrichment Services (2010 – 2011)  
Nuclear Parts LEAN Leader/Six Sigma Black Belt, GE-Hitachi Nuclear Energy (2009 – 2010)  
Advanced Reactor Project Manager, GE-Hitachi Nuclear Energy (2008 – 2009)  
Staff, COMNAVAIRLANT, Norfolk, VA (2007 – 2008)  
Reactor Controls Division Officer, USS ENTERPRISE, US Navy, (2006 – 2007)  
Electronic Warfare Officer, USS NORMANDY, US Navy, (2003 – 2005)

**R&D Portfolio Director at Office of Naval Research:** Led high-level operations at Department of Navy, developed and executed projects for Office of Naval Research (ONR) and NavalX while responding to Navy's requirements. Supervised and developed a diverse team along with encouraging transparent communication on project plans, grants and results across department. Contributed towards building partnerships and networking which facilitated greater collaboration in addressing war fighter needs. Accomplished annual budget of \$35M by leading team of 11 full-time federal employees and managing U.S. Department of the Navy (DoN) Small Business Innovation Research/Small Business Technology Transfer Program (SBIR/STTR) and DoN Technology Transfer Program (T2) with great responsibility. Merged two ONR organizations and launched Navy's innovation cell along with expanding innovation pipeline by involving diverse partners to start businesses. Headed and directed staff in executing NavalX programs with advising and coordinating initiatives across ONR, DoN, and other federal organizations.

**Researcher (Detailed), US Naval Research Laboratory:** Detailed from the Defense Nuclear Facilities Board (DNFSB) to the US Naval Research Laboratory. Enhanced mission-critical algorithms to identify signal changes and refined filtering of noisy signals, improving customer products. Planned experiments to test anomaly detection algorithms using real-world Blue Team and Red Team signals. Headed project to create anomaly detection algorithm and contributed to design team of implementation. Analyzed Blue Team and Red

Team signals for anomaly detection, boosting critical products to clients. Devised and delivered training on nuclear fuel cycle, contributing to success of mission critical products. Ideated and curated series of experiments and research studies focused on innovative additive manufacturing techniques and high-entropy materials for use in ionizing radiation environments.

**Senior Nuclear Engineer, Defense Nuclear Facilities Safety Board:** Spearheaded analysis and reporting of U.S. DOE nuclear criticality safety studies, research reactors, and weapons facilities. Collaborated with professionals from diverse functions, such as engineers, scientists, and health physicists, to ensure that safety protocols and practices are maintained. Scrutinized Safety Analysis Reports ensuring adherence to established standards and regulations. Lead author and researcher of DNFSB Technical Report 42, which addresses flammable gas and criticality hazards associated with Waste Treatment and Immobilization Plant, thus contributing to safe operation. Engineered creation and testing of programmatic review and piloting procedures. Conducted safety inspections and oversaw publication of several technical reports through DNFSB. Assessed nuclear criticality safety risks of US DOE's uranium and plutonium processing sites using Monte Carlo software. Evaluated historical Pacific Northwest National Laboratory nuclear criticality experiments performed in non-water moderators for incorporation into the International Criticality Safety Benchmark Experiments Project (ICSBEP).

**Director of Product Strategy and Innovation, AREVA – Transnuclear:** Supervised team of five (5) engineers and scientists to ensure efficient development of new products, methodologies, and resources that would enhance market placement, day-to-day performance, and on-time delivery to the customer. Governed AREVA Transnuclear College of Experts to transfer knowledge and enhance overall performance across various disciplines. Facilitated student internships, consulting agreements, research contracts, and mutual interest information sharing with universities and laboratories. Coordinated R&D efforts, managed \$5M+ budget, and oversaw existing patents and pending patents applications. Designed and implemented a simplified R&D process, which led to a 50% increase in on-time closure rates and 75% improvement in review approval rates within just six months resulted in a more efficient product development process. Reduced time-to-market by six months, resulting in faster completion of projects and delivery of products to customers. Improved product creation process and facilitated technical reviews, focusing on process improvement.

**Core Process Technical Project Engineer, AREVA – Enrichment Services:** Devised production impact as result of schedule and design modifications. Conducted compliance reviews and managed Requests for Information, ensuring adherence to project schedules and best practices. Validated centrifuge design and uranium enrichment process documents. Managed core design processes according to internal requirements and NRC

license application. Delivered expertise as Subject Matter Expert (SME) on uranium process to Eagle Rock Enrichment Facility and design contractors in core systems of enrichment and post-processing. Fixed critical American Society of Mechanical Engineers (ASME) Section VIII pressure vessel design flaw and uranium station conceptual error by utilizing field research expertise, saving time equivalent to one year. Slashed review period from six months to three weeks by automating workflow for reviewing and approving vendor documents.

**Licensing Engineer, AREVA – Enrichment Services:** Managed license changes, drafted procedures, documents, and reports, and translated regulations. Prepared correspondence for government agencies, revised EREF License (10CFR70) Application, and integrated design changes for NRC. Ideated and executed regulatory reporting process to satisfy 20+ Federal, State, and Local reporting requirements.

**Nuclear Services LEAN Leader/Six Sigma Black Belt, GE-Hitachi Nuclear Energy:** Developed and executed continuous improvement strategies across Nuclear Services with process owners to improve quality, cost, and satisfaction. Led Outage Tooling Lean project, overhauling processes from design to maintenance, using Six Sigma methodology for optimization. Directed best practice sessions and implemented key process improvements and participated in GE Energy Services Lean Council, where contributed expertise and insights to drive further improvements in operational efficiency. Improved camera refurbishment turnaround time, used for reactor vessel inspections, resulting in faster visual inspections.

**Advanced Reactor Project Manager, GE-Hitachi Nuclear Energy:** Spearheaded and coordinated various aspects of nuclear projects, ensuring safety compliance, timely delivery, and optimizing resource allocation. Created Advanced Boiling Water Reactor (ABWR) training manual to aid reviewing ABWR licensing application for improved process efficiency. Supervised project execution and coordinated with national laboratories, universities, and stakeholders to develop licensing and design plans for advanced sodium-cooled fast reactor, Prism, adhering to US DOE Global Nuclear Energy Partnership (GNEP) funding requirements and ensuring timely delivery to DOE. Implemented Institute of Nuclear Power Operations (INPO) Systematic Approach to Training program, meeting guidelines to enhance nuclear power operation. Trained staff on Light Water Reactor design/operation and Reactor Physics domain.

**Surface Warfare Officer (Nuclear), US Navy:** Earlier experience as Surface Warfare Officer (LTJg, O-2) with nuclear subspecialty within the United States Navy on board USS ENTERPRISE (CVN-65) as the Reactor Controls Division Officer and USS NORMANDY (CG-60) as the Reactor Controls Division Officer. Led 30+ Electronic Warfare Specialists and Reactor Controls Specialists. Supervised successful weapons onloading to USS NORMANDY. Planned and supervised successful Reactor Control Rod replacement on board the USS NORMANDY.

Taught naval reactor operators, on board the USS ENTERPRISE, reactor physics and plant operations to enhance their knowledge and skills. Developed interactive eLearning Reactor Operations training for the fleet at COMNAVAIRLANT.

### **Special Training:**

#### ***Radiation/Hazardous Waste:***

US Department of Energy, Radiation Worker Training, Savannah River National Laboratory, 2017

Hazardous Waste Worker (HAZWOPER) Training, March 2016

#### ***Nuclear Criticality Safety:***

SCALE Nuclear Criticality Safety Code Training, Oak Ridge National Laboratory, 2014 and 2017

MCNP Nuclear Criticality Safety Code Training, Los Alamos National Laboratory, April 2017

COG Nuclear Criticality Safety Code Training, Lawrence Livermore National Laboratory, 2017

#### ***Process Improvement:***

LEAN Six Sigma Green Belt Training and Certification, GE-Hitachi Nuclear Energy, 2008

LEAN Six Sigma Black Belt Training, GE-Hitachi Nuclear Energy, 2009

## **ADDITIONAL PROFESSIONAL**

Volunteer: MGAM Scholarship Foundation, Founding Board Member, Vice-President (2020 – 2023)  
American Nuclear Society, Training Development (2018 – 2021)

Contributions: "Stories of Women in STEM" (interviewed) ebook, Smithsonian Science Education Center, 2023  
*Energy!* Guide – Nuclear Energy, Smithsonian Science Education Center, 2023

Speaking: Guest Classroom Speaker – Nuclear Energy at Antilles School US Virgin Islands, EngineerGirl, 2023  
Panel Speaker, 2022 Navy Summit, Potomac Officers Club, 2022  
Keynote Speaker, National Defense Industrial Association, 2022  
Panel Speaker, Doctoral Career Pathways – Startup/Entrepreneur, Howard University, 2023  
Black Doctors Talk Podcast, Black Doctoral Network, 2023  
([www.ariellemiller.com/speaking](http://www.ariellemiller.com/speaking))  
Panel Speaker, Doctoral Career Pathways – Federal Government, Howard University, 2022  
Nuclear Engineering with Dr. Arielle Miller, Naval Horizons – Office of Naval Research, 2022 ([www.ariellemiller.com/speaking](http://www.ariellemiller.com/speaking))

Awards/Honors: Engineer of the Year – Honorable Mention (2011), AREVA  
2010 Young Members Excellence Award, American Nuclear Society

As a founding member of the **MGAM Scholarship Foundation** and Vice-President from 2020 – 2023, I worked as part of a the 3-member Board to develop, implemented, and executed the Building Opportunities for Sistas to Shine (B.O.S.S.) Scholarship. The scholarship supported cis and transgender Black female students in educational pursuits. Offered guidance and scholarships to young Black women graduating high school who were admitted to vocational or 2/4-year programs. The first scholarships were awarded in July 2021. As a member of the Board, we devised and executed scholarship program for Black female students entering college and increased scholarship amount from \$1000 to \$1500 in past three years. Offered students counseling with personal and academic problems, such as stress and anxiety management, motivation, and time organization along with providing scholarships.

Volunteered for the **American Nuclear Society** (ANS) Professional Engineering Exam Committee (PEEC) Study-Guide project and developed eLearning training materials for the Nuclear Professional Engineer Exam Study Guide in "Specification Area 2: Nuclear Fuel Cycle" (<https://www.ans.org/library/item-pemodules/>). Designed, developed, and narrated 9 of the 15 modules in Specification Area curriculum: Nuclear Fuel Cycle – Front End (4); Nuclear Fuel Cycle – Back End (5). This study guide was developed by the ANS PEEC and provided online to prepare Nuclear PE test-takers.

## TEACHING EXPERIENCE

Howard University, Washington, DC

Aug 2020 – Dec 2022

Teaching Assistant (2019 – 2021)

Taught "Computer Aided Design/Computer Aided Manufacturing" and "Introduction to Mechanical Engineering" to undergraduate students.

- **Teaching Assistant – to Professor Emmanuel Glakpe in "Thermodynamics"**- Provided review sessions, monitored testing and conducted exam analysis upon request.
- **Teaching Assistant – to Professor Grant Warner in "Introduction to Engineering" and "Computer Aided Design/Computer Aided Manufacturing" classes** – Taught lessons, proctored exams, graded assigned work, offered review sessions, monitored testing and conducted exam analysis upon request. Developed course content, assisted on Zoom, managed LMS and provided support as teaching assistant.



## ORGANIZATIONS/SOCIETIES

American Nuclear Society (2008 – present)

Executive Committee Member – Nuclear Criticality Safety Division, (2020 – 2023)

Member – Standard 8.1 Committee - Nuclear Criticality Safety in Operations with Fissionable Material Outside Reactors, (2019 – present)

Member – Standard 8.12 Committee - Nuclear Criticality Control and Safety of Plutonium Uranium Fuel Mixtures Outside Reactors, (2019 – present)

Chair – Professional Engineer Exam Committee – Study Guide Subcommittee, (2021 – 2023)

Vice Chair – Planning Committee (2009 – 2011)

Member – ANS-57.11-202x Working Group - Integrated Safety Assessments for Nonreactor Nuclear Facilities (proposed new standard) (2015- 2018)

Member - ANS-53.1-202x Working Group, Nuclear Safety Criteria for the Design of Liquid Metal Reactor Plants (2009 -2012)

American Institute of Chemical Engineering (2013 – present)

American Society of Mechanical Engineering (2013 – present)

National Society of Black Engineers (2016 – 2021)

ASTM International (2017 – 2023)

Veteran of Foreign Wars (life member)

Disabled Veterans of America (life member)

American Association of University Women (2023 – present)

American Society of Engineering Education (2020 – present)

## PUBLICATIONS

1. A. Miller, "[Investigation of Proton Radiation Damage Effects on the Tensile Performance of 3D Printed Acrylonitrile Butadiene Styrene](#)," Dissertation, Howard University (2021)
2. A. Miller, G. Warner, G. Owolabi, "[Mechanical Performance and Mesostructure Analysis of Proton Irradiated Fused Filament Fabrication Acrylonitrile Butadiene Styrene Material](#)," Journal of Materials Engineering and Performance, Vol. 30 (9), (2021).
3. A. Miller, G. Warner, and D. Raghavan, "[Proton radiation effects on the mechanical and structural properties of 3D printed ABS](#)," Transactions for the Annual American Nuclear Society Meeting, Vol. 122, Virtual, (2020).
4. A. Miller, C. Brown, and G. Warner, "[Guidance on the use of existing ASTM polymer testing standards for ABS parts fabricated using FFF](#)," ASTM Journal for Smart Sustainable Manufacturing Systems, Vol. 3 (1), (2019).
5. A. Miller, G. Warner, and D. Raghavan, "[Experimental design to study the mechanical performance of irradiated acrylonitrile butadiene styrene fabricated via fused filament fabrication](#)," Proceedings for the 19th International Conference for Environmental Degradation of Nuclear Systems – Light Water Reactors, ANS, Boston (2019)



6. A. Miller, J. McKamy, "[Criticality characterization of plutonium-iron systems](#)," Transactions of American Nuclear Society Annual Meeting, Vol. 118, ANS, Philadelphia [2018].
7. B. Boser, A. Miller, R. Kazban, S. Seprish, P. Meyer, S. Thangavelu, "[Flammable Gas and Criticality Hazards at the Waste Treatment and Immobilization Plant](#)," Defense Nuclear Facilities Safety Board Technical Report-42, DNFSB, [2017].
8. A. Miller, P. Saha, E. Loewen, C. Bagnal, "[Licensing strategy for PRISM sodium-cooled fast reactors in the United States](#)," Proceedings of the International Congress on Advances in Nuclear Power Plants, ANS [2010].

## LANGUAGE PROFICIENCIES

**English** – native language

**French** – read/write fluently and speak with high proficiency including technical/nuclear French.

### ***Computer Programming Languages:***

Python

HTML

LaTeX

VBA

## VOLUNTEER WORK

EngineerGirl [2021 – present]

MGAM Scholarship Foundation [2020 – present]

Smithsonian Science Education Center [2023 – present]