

MAREENA ROBINSON SNOWDEN, PhD

EDUCATION

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Ph.D. Nuclear Science and Engineering

Dissertation Title: *Nuclear Warhead Monitoring: A Study of Photon Emissions from Fission Neutron Interactions with High Explosives as a tool in Arms Control Verification*
GPA: 4.7/5.0

2011 - 2017
Cambridge, MA

FLORIDA A&M UNIVERSITY

B.S. Physics

Summa Cum Laude, Cumulative GPA: 3.8/4.00 Major GPA: 3.714/4.00

2006 - 2011
Tallahassee, FL

RESEARCH/TECHNICAL EXPERIENCE

JOHNS HOPKINS UNIVERSITY APPLIED PHYSICS LABORATORY

Senior Engineer, National Security Analysis Department

- Conducts analytical research on strategic, operational, and tactical level defense questions
- Current portfolio includes future nuclear weapon systems, nuclear crisis issues, and new technology for surface warfare
- Spearheading pilot project on education technology. Project leadership includes management of \$150K budget and team of 6 analysts

2019- Present
Laurel, MD

CARNEGIE ENDOWMENT FOR INTERNATIONAL PEACE

Stanton Nuclear Security Fellow, Nuclear Policy Program

- Conducted policy relevant research on two topics: (i) how policy makers think about how much verification is enough in the arms control space (ii) the verification needs in the denuclearization of North Korea
- Advised and managed one junior fellow

2018- 2019
Washington, D.C.

NATIONAL NUCLEAR SECURITY ADMINISTRATION

Graduate Fellow, NA-19 Office of Major Modernization Programs

- Provided programmatic support to NA-19 front office and NA-194 Uranium Program (UPM)
- Authored and edited content on strategic materials and life extension programs for the FY19 Stockpile Stewardship and Management Plan
- Organized the 2018 Depleted Uranium Technology Summit - assessed material supply, future mission requirements, and process technology developments
- Served as the Liaison to Development at the Y12 National Security Complex - tracked emerging technologies relevant to the mission of UPM

2017 - 2018
Washington, D.C.

MIT LABORATORY OF NUCLEAR SECURITY AND POLICY

Research Assistant

- Investigated the use of photon emissions from fission neutron interactions with high explosives as a warhead monitoring tool in arms control verification
- Developed MCNP model of open-source warhead design to study radiation interactions and detection for warhead monitoring applications

2012 - 2017
Cambridge, MA

MIT NUCLEAR SCIENCE AND ENGINEERING COMMUNICATION LAB

Communication Coach

- Empowered clients to become confident and effective communicators by offering content-specific support in written, oral, and visual communication

2014 - 2016
Cambridge, MA

LAWRENCE LIVERMORE NATIONAL LABORATORY

Research Intern, Physics and Life Sciences Division

- Investigated the pulse shape discrimination properties of different organic scintillators: Stilbene, Boron-loaded plastic and liquid based scintillators

Summer 2013
Livermore, CA

IDAHO NATIONAL LABORATORY

Research Intern, National and Homeland Security Directorate

- Determined the limits of passive gamma measurements on the detection of shielded HEU for varying shielding material and thicknesses
- Determined efficiency of CVD diamond neutron detectors for neutron energies from thermal to 14.1-MeV

Summer 2012
Idaho Falls, ID

GORE ECOLOGICAL SYSTEMS BIOLOGY LABORATORY, MIT

Research Intern, MIT Summer Research Program (MSRP)

- Traced cooperative evolutionary behaviors in E. Coli with mixed-antibiotic environments

Summer 2010
Cambridge, MA

LABORATORY OF NUCLEAR SCIENCE, MIT

Research Intern, MIT Summer Research Program (MSRP)

- Developed the data acquisition system for a prototype neutron-veto detector, which was used in conjunction with a dark matter detection to eliminate neutron background

Summer 2008
Cambridge, MA

FLORIDA A&M UNIVERSITY LABORATORY OF MODERN FLUID PHYSICS

Undergraduate Research Assistant

- Constructed a plasma glow discharge system and investigated the effects of an axial magnetic field on turbulent plasma

2006 - 2011
Tallahassee, FL

TECHNICAL SKILLS

MCNP
Mathematica
MatLab
Linux
C++
Radiation Detection and Associated Electronics
Oral/Written/Visual Communication

RELEVANT NUCLEAR SECURITY COURSES

- Introduction to Nuclear Physics (22.101- MIT 2011)
- Nuclear Nonproliferation (22.814 - MIT 2011)
- Electromagnetic Interactions (22.105 - MIT 2011)
- Neutron Interactions and Application (22.106 - MIT 2012)
- NSE Laboratory: Radiation Detection and Measurement (22.90 - MIT 2012)
- Nuclear Power Plant Dynamics and Controls (22.921- MIT 2012)
- Quantum Theory of Radiation Interactions (22.51- MIT 2012)
- Nuclear Forces and Missile Defense (STS.435 - MIT 2013)
- Thinking Outside the Black Box: New Insights into North Korea (HAK.M681 - HKS 2014)

RELEVANT PRESENTATIONS + PUBLICATIONS

M. R. Snowden, "One Size Does Not Fit All: Why Diversity and Inclusion Efforts Fail in the Nuclear Community, and What Can Be Done About It", *The Bulletin of Atomic Scientists*, Jan 6, 2021

M. R. Snowden, "Probabilistic Verification: A New Concept for Verifying the Denuclearization of North Korea", *Arms Control Today*. 49. September 2019.

M. R. Snowden. "Responsible Disruption". *NSquare*, February 26, 2019

M. R. Snowden, Probabilistic Verification, Nuclear Firewall Meeting, Beijing, China, Nov 2018.

M. R. Snowden, Verification Sufficiency in the 21st Century, Stanton Nuclear Security Seminar, Stanton Foundation, Washington, D.C., October 2018.

M. R. Snowden, Verifying Warhead Confirmation for Future Dismantlement Treaties, 27th International Summer Symposium on Science and World Affairs, Union of Concerned Scientists, Nagasaki, Japan, July 2015.

M. R. Snowden, An Investigation into the Passive Detection of High Explosives for Warhead Confirmation in Future Warhead Dismantlement Treaties, Seminar, MIT Laboratory for Nuclear Science and Policy, Cambridge, MA, Oct. 2014.

M. Robinson, Development of Verification Technologies for Warhead Counting for Future Nuclear Arms Reduction Agreements, 25th International Summer Symposium on Science and World Affairs, Union of Concerned Scientists, Sengi, Italy, June 2013.

PROFESSIONAL ACTIVITIES

"Racial Injustice in the Nuclear Field", Panel Moderator, Project on Managing the Atom, Harvard University, Virtual, Oct 9, 2020.

"Responsible Disruption: Women's Participation, Perspectives and Power," Panelist, Ploughshares Fund, Virtual, Oct 21, 2020.

"PONI Pathbreakers: Breaking the Nuclear Glass Ceiling", Smart Women Smart Power Podcast, CSIS, Aug 12, 2020.

"White, Male, and Yale: How Women of Color are Changing National Security," The World Unpacked Podcast, Carnegie Endowment for International Peace, June 11, 2019

"Political and technical cooperation on verification amongst NPT Member States: progress, potential, pitfalls", Session chair, The nuclear non-proliferation regime towards the 2020 NPT Review Conference (WP1633), Wilton Park, England, Dec 10-14, 2018.

HONORS + AWARDS

Association For Women in STEM Next Generation Award	2019
FAMU President's Award	2018
BET/Ford Girls Rock! Tech Award	2018
ESSENCE Magazine Young Phenom Feature	2017
MIT Community Excellence Award	2016
MIT Graduate Woman of Excellence	2015
DOE NNSA Stewardship Science Graduate Fellow	2012 - 2016
Ford Foundation Fellowship Honorable Mention	2012
MIT Office of the Dean of Graduate Education Diversity Fellow	2011 - 2012

LEADERSHIP EXPERIENCE + ORGANIZATIONS

2019 CARNEGIE INTERNATIONAL NUCLEAR POLICY CONFERENCE

Young Professionals Track, Chair

- Led planning and execution of young professionals programming aimed at cultivating and sustaining a pipeline of diverse talent, and highlight the work of early and mid-career nuclear policy professionals
- hosted technical plenary, career panel, and breakout sessions on 2018 Nuclear Posture Review, the Nuclear Ban Treaty, and the DPRK nuclear weapons issue
- 105 registered participants

WOMEN OF COLOR ADVANCING PEACE AND SECURITY

2019
Washington, D.C.

2018 - Present
Washington, D.C.