

# Kathryn A. Mummah

PHD STUDENT IN NUCLEAR ENGINEERING & ENGINEERING PHYSICS

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## Education

### University of Wisconsin-Madison

Madison, WI

PHD STUDENT, NUCLEAR ENGINEERING & ENGINEERING PHYSICS

Aug. 2017-PRESENT

M.S. NUCLEAR ENGINEERING AND ENGINEERING PHYSICS

May 2020

- Advisor: Professor Paul P.H. Wilson
- Fellow, NNSA Nuclear Nonproliferation and International Safeguards (NNIS) Graduate Fellowship Program
- Graduate Associate, Consortium for Monitoring, Technology, and Verification (MTV)
- PhD Minor in Science Communication
- Graduate Certificate in Energy Analysis & Policy

### University of Illinois at Urbana-Champaign

Urbana, IL

B.S. NUCLEAR, PLASMA, AND RADIOLOGICAL ENGINEERING, GRADUATED WITH HONORS

May 2017

- Concentration in Power, Safety, and the Environment
- Minor, Atmospheric Sciences

## Research

### Computational Nuclear Engineering Research Group (CNERG), UW-Madison

Madison, WI

GRADUATE RESEARCH ASSISTANT

Sept. 2017 - PRESENT

- Developing software to model the lifecycle of nuclear materials within Cyclus for nuclear nonproliferation applications
- Reviewing public communication efforts in consent-based siting of radioactive waste disposal facilities worldwide
- Designed uranium enrichment cascades in the Cyclus fuel cycle code to model post-JCPOA cascade performance scenarios

### Los Alamos National Laboratory

Los Alamos, NM

GRAD RESEARCH ASSISTANT, NEN-1 SAFEGUARDS SCIENCE & TECHNOLOGY

Jan. 2020 - PRESENT

GRAD RESEARCH ASSISTANT, NEN-2 ADVANCED NUCLEAR TECHNOLOGY & GLENN T. SEABORG SUMMER RESEARCH FELLOW

May 2018 - Aug. 2018

VISITING STUDENT GUEST, NEN-5 SYSTEMS DESIGN & ANALYSIS

May 2017 - Aug. 2017

### Idaho National Laboratory

Idaho Falls, ID

INTERN, FUELS MODELING & SIMULATION

May 2016 - Aug. 2016

### University of Illinois Department of Nuclear, Plasma, and Radiological Engineering

Urbana, IL

UNDERGRAD RESEARCH ASSISTANT, ADVANCED REACTORS AND FUEL CYCLE RESEARCH GROUP (PROFESSOR K. HUFF)

Aug. 2016 - May 2017

UNDERGRAD RESEARCH ASSISTANT, ANALYSIS OF REACTOR TRANSIENTS AND STABILITY RESEARCH GROUP (PROF. T. KOZLOWSKI)

Jan. 2016 - Dec. 2016

UNDERGRAD RESEARCH ASSISTANT, EXPERIMENTAL THERMAL HYDRAULICS RESEARCH GROUP (PROFESSOR C. BROOKS)

Aug. 2015 - Dec. 2015

### Fermi National Accelerator Laboratory

Batavia, IL

QUARKNET HIGH SCHOOL SUMMER INTERN, OPTICAL ASTRONOMY

Jun. 2012 - Aug. 2012

## Honors & Awards

### SCHOLARSHIPS AND FELLOWSHIPS

2021-22	<b>ANS Graduate Scholarship</b>
2020-21	<b>ANS Michael J. Lineberry Memorial Scholarship</b>
2019-20,21	Graduate Fellow, <b>Nuclear Nonproliferation International Safeguards Program (NNIS)</b>
2018	Summer Research Fellow, <b>Glenn T. Seaborg Institute</b>
2017-18,19	Graduate Fellow, <b>Consortium for Verification Technology</b>
2017-18,19	<b>ANS Fuel Cycle and Waste Management Division Randall Scholar</b>
2015-16,17	<b>DOE Nuclear Energy University Program IUP Scholarship Award</b>
2015-16,17	<b>Nuclear Regulatory Commission Scholarship</b>
2015-16,17	<b>American Nuclear Society Decommissioning &amp; Environmental Sciences Scholarship</b>
2016-17	<b>Roy G. Post Foundation Scholarship</b>
2016-27	<b>Dale W. and Wanda L. Weaver Engineering Scholarship</b>
2016-17	<b>Crowe Horwath Scholarship</b>

2016-17	<b>Edith and Harry Darby Leadership Scholarship</b>
2015-16,17	<b>Catherine Pritchard Undergraduate Scholarship</b>
2013-14,15,16,17	<b>Mike Harper Leadership Scholarship</b>
2015-16	<b>Exelon Energy for Education Scholarship Award</b>
2014-15,16	<b>National Academy for Nuclear Training Scholarship</b>
2014-15	<b>ANS Incoming Sophomore Scholarships</b>

## AWARDS

2020	First place, <b>Institute of Nuclear Materials Management J.D. Williams Student Paper Award</b>
2017	<b>University of Illinois Knights of St. Patrick</b>
2016	<b>Alpha Nu Sigma</b>
2016	<b>William R. Schowalter Award</b>
2016	<b>American Nuclear Society Commendation for Service and Leadership</b>
2014	<b>American Nuclear Society UIUC Most Committed Member</b>
2013	<b>University of Illinois James Scholar</b>

## Papers and Presentations

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### JOURNAL ARTICLES

#### It's Time to Reignite U.S.-Russian Cooperation in Space: Nuclear Power May Hold the Key

BULLETIN OF THE ATOMIC SCIENTISTS, VOLUME 77, ISSUE 4

July 2021

S. Buono, J. Hecla, V. Kobezskii, **K. Mummah**, J. de Trouilloud de Lanversin (alphabetical)

### CONFERENCE PRESENTATIONS

#### Integrating Acquisition Pathway Analysis Into The Cyclus Fuel Cycle Simulator

[Virtual](#)

2020 INSTITUTE OF NUCLEAR MATERIALS MANAGEMENT ANNUAL MEETING

July 2020

**K. Mummah**, P. P.H. Wilson

- 1st place, INMM J.D. Williams Student Paper Award

#### Graph representation of a fuel cycle for acquisition pathway analysis

[Virtual](#)

2020 CONSORTIUM FOR MONITORING, TECHNOLOGY, & VERIFICATION (MTV) STUDENT VIRTUAL RESEARCH SYMPOSIUM

June 2020

#### Acquisition Pathway Analysis using Fuel Cycle Simulators

[Palm Desert, CA](#)

2019 INSTITUTE OF NUCLEAR MATERIALS MANAGEMENT ANNUAL MEETING

July 2019

**K. Mummah**, R. Bahran, K. Miller, P. P.H. Wilson

#### Material diversion analysis within a fuel cycle simulator

[Champaign, IL](#)

2019 TECHNICAL WORKSHOP ON FUEL CYCLE SIMULATION

June 2019

**K. Mummah**, P. P.H. Wilson

#### Assessing Material Inventory Uncertainties in Integrated Fuel Cycle Simulations

[Wilmington, NC](#)

ADVANCES IN NUCLEAR NONPROLIFERATION TECHNOLOGY AND POLICY CONFERENCE 2018

September 2018

B. Mougnot, **K. Mummah**, P.P.H. Wilson

#### Modeling Potential JCPOA Diversion Scenarios with Cyclus

[Philadelphia, PA](#)

2018 AMERICAN NUCLEAR SOCIETY ANNUAL MEETING

June 2018

B. Mougnot, **K. Mummah**, P. P.H. Wilson

#### Integrating Nonproliferation and Safeguards Concepts into Reactor Lab Courses

[Los Alamos, NM](#)

LA-UR-17-27198

Aug. 2017

**K. Mummah**, D. Poston, M. Griffin, R. Bahran, C. Verschuren

#### NuWWIS: An Interim Storage Solution for Spent Fuel

[Pittsburgh, PA](#)

2017 AMERICAN NUCLEAR SOCIETY STUDENT CONFERENCE

Apr. 2017

**K. Mummah**, J. Bae, D. OGrady, A. Lopez

#### Public Image in Spent Fuel Disposal: Lessons Learned from Sweden's SKB

[Madison, WI](#)

2016 AMERICAN NUCLEAR SOCIETY STUDENT CONFERENCE

Apr. 2016

**K. Mummah**, C. Kuprianczyk

- 1st place, "Public Image" technical track

## Asymmetry of the Milky Way

FERMILAB-UNIVERSITY OF CHICAGO QUARKNET SUMMER RESEARCH PROGRAM

K. Mummah, B. Yanny

Batavia, IL

Aug. 2012

## POSTERS

### Systems modeling of the nuclear fuel cycle to enhance safeguards implementation

CONSORTIUM FOR MONITORING, TECHNOLOGY, AND VERIFICATION (MTV) VIRTUAL WORKSHOP 2021

K. Mummah, P. P.H. Wilson

Virtual

March 2021

### Good Practices and Clear Communication Gaps in the Effort to Site a Low- and Intermediate-Level Deep Geologic Waste Repository in Ontario

WASTE MANAGEMENT SYMPOSIUM 2021

K. Mummah

Virtual

March 2021

### Off-normal operation in gas centrifuge enrichment cascades

2018 AMERICAN NUCLEAR SOCIETY STUDENT CONFERENCE - POSTER SESSION

K. Mummah, B. Mouginot, P. P.H. Wilson

Gainesville, FL

Apr. 2018

### Investigating the Effects of Fuel Pellet Geometry on Pellet Cladding Mechanical Interaction (PCMI) using BISON

2016 AMERICAN NUCLEAR SOCIETY WINTER MEETING - STUDENT POSTER SESSION

K. Mummah, R. Williamson

Las Vegas, NV

Nov. 2016

### Reactivity Management: More Than Just Reactor Engineers

2015 AMERICAN NUCLEAR SOCIETY WINTER MEETING - STUDENT POSTER SESSION

K. Mummah

Washington, DC

Nov. 2015

## SPONSOR CONFERENCE PRESENTATIONS

### Graph Representation of a fuel cycle from Cyclus input

2020 MTV WORKSHOP, POSTER

Ann Arbor, MI

Mar. 2020

### Can we study material diversion analysis within a fuel cycle simulator?

MTV FUEL CYCLE FACILITY MODELING WORKSHOP

Madison, WI

Oct. 2019

### Extending the Cyclus Fuel Cycle Simulator for International Safeguards

2019 NNSA UNIVERSITY PROGRAM REVIEW

Raleigh, NC

June 2019

### Simulation of the Nuclear Fuel Cycle and its Applications to International Safeguards

2018 CONSORTIUM FOR VERIFICATION TECHNOLOGY (CVT) WORKSHOP

Ann Arbor, MI

Oct 2018

### Progress on Studying Gas Centrifuge Cascade Behavior of Off-Normal Enrichment Scenarios

2018 NNSA UNIVERSITY PROGRAM REVIEW, POSTER

Ann Arbor, MI

June 2018

### Modeling Post-JCPOA Cascade Performance with Cyclus

2017 CVT WORKSHOP, POSTER

Ann Arbor, MI

Nov. 2017

## Work Experience

### University of Wisconsin-Madison Engineering Physics Department

GRADER

- NE405: Nuclear Reactor Theory, Spring 2018

Madison, WI

## University of Illinois

Urbana, IL

### TEACHING ASSISTANT

- Lead Engineering Learning Assistant, ENG 100 for the Nuclear, Plasma, and Radiological Engineering. Fall 2015 & '16
- NPRE 100: Introduction to Nuclear, Plasma, and Radiological Engineering. Fall 2014, '15, & '16
- NPRE 101: Introduction to Energy Sources. Spring 2014 & '15

### GRADER

- ASTR 100: Introduction to Astronomy. Fall 2014

## Oyster Creek Generating Station

Forked River, NJ

### INTERN, REACTOR ENGINEERING

Jun. 2015 - Aug. 2015

## Exelon Generation Cantera Regional Headquarters

Warrenville, IL

### INTERN, SPENT FUEL & DECOMMISSIONING

Jun. 2014 - Aug. 2014

## Service

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### PROFESSIONAL SERVICE

#### American Nuclear Society (ANS)

CHAIR, STUDENT SECTIONS COMMITTEE (SSC)

June 2021 - PRESENT

EXECUTIVE COMMITTEE, FUEL CYCLE AND WASTE MANAGEMENT DIVISION

June 2021 - PRESENT

EXECUTIVE COMMITTEE, YOUNG MEMBERS GROUP

June 2019 - PRESENT

COMMITTEE MEMBER, SSC

June 2016 - PRESENT

CHAIR, RETENTION SUBCOMMITTEE OF THE SSC

Apr. 2021 - PRESENT

VICE CHAIR, STUDENT SECTIONS COMMITTEE (SSC)

June 2019 - June 2021

EXECUTIVE COMMITTEE, NUCLEAR NONPROLIFERATION POLICY DIVISION

June 2018 - June 2021

COMMITTEE MEMBER, DIVERSITY AND INCLUSION COMMITTEE

July 2018 - June 2021

STUDENT DIRECTOR, ANS BOARD OF DIRECTORS

June 2017 - June 2019

CHAIR, COMMENDATIONS SUBCOMMITTEE OF THE SSC

June 2016 - Jan. 2021

COMMITTEE MEMBER, LOCAL SECTIONS COMMITTEE

June 2016 - June 2019

#### American Nuclear Society, University of Wisconsin-Madison Student Section

MEMBER

Aug. 2017-PRESENT

GOVERNOR

May 2018 - Dec 2018

ADVOCACY CO-CHAIR

Jun. 2017 - Nov. 2017

#### Catalysts for Science Policy

MEMBER

June 2019 - PRESENT

#### Wisconsin Baja Racing

MEMBER

Aug. 2018 - May 2020

#### American Nuclear Society, University of Illinois Student Section

MEMBER

Aug. 2013 - May 2017

PRESIDENT

Apr. 2015 - Apr. 2016

INTERNAL VICE PRESIDENT

Apr. 2014 - Apr. 2015

FRESHMAN PRESIDENT

Oct. 2013 - Apr. 2014

#### Women in Nuclear, University of Illinois Student Section

COFOUNDER

Aug. 2015

MEMBER

Aug. 2015 - May 2017

#### Engineering Ambassadors, University of Illinois

RECRUITMENT & PUBLICITY CHAIR

Apr. 2016 - Dec. 2016

AMBASSADOR

Nov. 2015 - May 2017

#### Phi Mu - Delta Beta Chapter

ACADEMIC EXCELLENCE CHAIRMAN

Dec. 2016 - May 2017

MEMBER

Sept. 2016 - May 2017

#### Engineering Council, University of Illinois

STUDENT INTRODUCTION TO ENGINEERING (SITE) RESERVATIONS CHAIR

May 2015 - May 2016

## University of Illinois Student Chapter of the American Meteorological Society

SECRETARY

Apr. 2015 - Apr. 2016

MEMBER

Jan. 2015 - May 2017

## Illinois Space Society

RASC-AL TECHNICAL TEAM MEMBER

Aug. 2014 - Dec. 2014

REPRESENTATIVE TO STUDENTS FOR THE EXPLORATION AND DEVELOPMENT OF SPACE (SEDS)

Sept. 2013 - Sept. 2014

## DEPARTMENTAL SERVICE

### University of Wisconsin-Madison Department of Engineering Physics

CHAIR, STUDENT ADVISORY COMMITTEE

Apr. 2019-PRESENT

DEPARTMENT REPRESENTATIVE TO THE COLLEGE OF ENGINEERING GRADUATE ADVISORY COMMITTEE

Aug. 2018 - PRESENT

### University of Illinois Department of Nuclear, Plasma, and Radiological Engineering

UNDERGRADUATE ADVISORY BOARD REPRESENTATIVE

Apr. 2014 - Dec. 2016

## OTHER SERVICE

### Generation Atomic

ADVISORY BOARD MEMBER, ATOMIC AMBASSADOR

July 2020-PRESENT

### Rethinking Nuclear

SCIENCE ADVISOR

[Madison, WI](#)

2018-PRESENT

### Nuclear Innovation Bootcamp 2020

COMMUNICATIONS TEAM

[Madison, WI](#)

Jan 2020-Apr. 2020

## Short Courses and Other Training

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### Young Professionals Nuclear Forum

STANFORD CENTER FOR INTERNATIONAL SECURITY AND COOPERATION AND THE MOSCOW ENGINEERING PHYSICS INSTITUTE

[Virtual](#)

Dec. 2020 - PRESENT

### Nuclear Facilities Experience

ARGONNE NATIONAL LAB AND TEXAS A&M UNIVERSITY

[Virtual](#)

Aug. 2021

### International Safeguards Policy and Information Analysis-Intensive Summer Course

MIDDLEBURY INSTITUTE OF INTERNATIONAL STUDIES AT MONTEREY AND LAWRENCE LIVERMORE NATIONAL LAB

[Virtual](#)

June 2021

### Nuclear Security: The Nexus Between Policy and Technology

UNIVERSITY OF CALIFORNIA, BERKELEY COURSE NE C285

[Virtual](#)

Jan. 2021 - Apr. 2021

### Verification in Nuclear Arms Control

MIT AND PACIFIC NORTHWEST NATIONAL LAB

[Virtual](#)

Jan. 2021

### ETI Annual Summer School

CONSORTIUM FOR ENABLING TECHNOLOGIES AND INNOVATION

[Virtual](#)

August 2020

### Nonproliferation and International Safeguards Summer Course

PACIFIC NORTHWEST NATIONAL LAB

[Virtual](#)

June 2020

### Nondestructive Assay (NDA) Summer Course

LOS ALAMOS NATIONAL LAB

[Los Alamos, NM](#)

June 2018

### Nuclear Innovation Bootcamp

UNIVERSITY OF CALIFORNIA, BERKELEY

[Berkeley, CA](#)

July 2017

### Dr. G. Robert Keepin Nonproliferation Science Summer School

LOS ALAMOS NATIONAL LAB

[Los Alamos, NM](#)

Jun. - Aug. 2017

## Professional Organizations

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Since 2013	Student Member, <b>American Nuclear Society</b>
Since 2015	Member, <b>Women in Nuclear</b>
Since 2015	Student Member, <b>Society of Women Engineers</b>
Since 2017	Member, <b>Earth Science Women's Network</b>
Since 2018	Student Member, <b>Institute of Nuclear Materials Management</b>
Since 2018	Member, <b>C3E Network for Women's Leadership in Clean Energy</b>
Since 2019	Member, <b>National Science Policy Network</b>

### PRIOR MEMBERSHIP

2019 - 2020	Student Member, <b>Society of Automotive Engineers</b>
2016 - 2017	Student Member, <b>American Society of Mechanical Engineers</b>
2015 - 2016	Student Member, <b>American Meteorological Society</b>