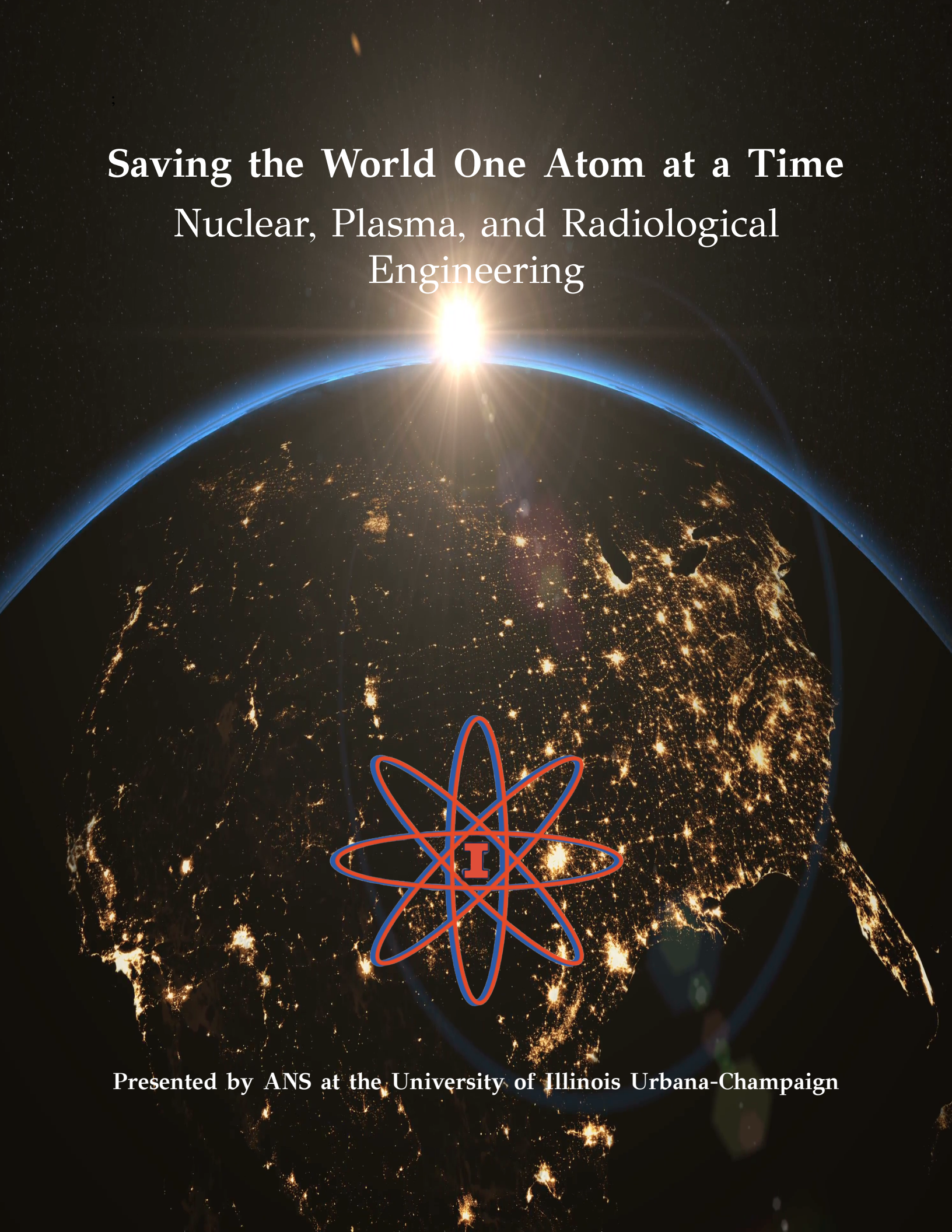
Saving the World One Atom at a Time

Nuclear, Plasma, and Radiological Engineering



Presented by ANS at the University of Illinois Urbana-Champaign

1 Letter from the Chairs

Contents

2 Saving the World One Atom at a Time

The future is nuclear.
There are many challenges facing the world today and some have been designated existential threats to humanity. Young people today will witness the growing toll of anthropogenic climate change. As students, obstacles at the scale of the world climate crisis appear daunting and overwhelming. We believe that many solutions will come from the nuclear sciences. The ANS student conference is an opportunity for students and professionals to come together and share advances in critical technology and research, dedicated to solving these problems. Whether the problem is solving the world's energy needs, developing technology that will take us to the stars, or curing cancer, nuclear, plasma, and radiological engineering will be at the center of those endeavors. Our goal is to inspire and motivate students in nuclear, plasma, and radiological engineering fields to tackle big problems. Saving the world one atom at a time reflects the fact that nuclear science is a powerful force in dealing with grand challenge problems. This theme also honors the individual, atomic, contributions from students, researchers, and professionals, in the field of nuclear engineering, that are essential to progress. This conference is about science and it is about the people that make the science possible. Students will hear from visionary speakers and leaders of the nuclear science community and come away with optimism for the future; knowing that they are saving the world one atom at a time.
The University of Illinois at Urbana-Champaign chapter of ANS would be honored to host the 2021 student conference. We hope to create an atmosphere that will galvanize students and professionals for the exciting future of nuclear engineering.

Goals of the conference

1. Celebrate the people behind the science
2. Inspire young students to take on grand challenge problems
3. Help students and professionals develop a strong network of like-minded people.

3 Urbana-Champaign and UIUC

3.1 About Urbana-Champaign

Champaign-Urbana (CU) is a close-knit community filled with music, culture, and food. While Campustown, the neighborhood immediately surrounding campus, is an important part of the atmosphere, there is plenty to do off campus. Relax in one of the outdoor restaurants downtown or walking through the various gardens and parks around town. The culture in Champaign is very rich as a result of many annual festivals such as the CU Pride Parade, the Ellnora guitar festival, and the Pygmalion festival. The Krannert Center for the Performing Arts is also a world-renowned theater that has hosted groups from all genres like the New York Philharmonic, the Russian National Ballet, and Sonny Rollins.

3.1.1 Accessibility

Myriad festivals and sporting events on campus draw many people to Champaign-Urbana at varying times of the year, which means hotels are not hard to find. A large number of these hotels are located around downtown Champaign and the Eastern side of campus, making transportation easy. There is also a small airport, Willard Airport, just 20 minutes from campus that regularly has flights to and from the Chicago O'Hare and Dallas Ft Worth airports. Finally, there are several reliable bus services that make frequent trips from Champaign-Urbana to O'Hare and the Chicagoland area.

3.1.2 Weather

With an average high temperature of 65° and an average low temperature of 40°, April in Champaign is a gorgeous month of dwindling winter weather as summer begins to round the corner. Holding a conference during this time would be the perfect way to showcase our beautiful city.

3.2 About the University of Illinois

Founded in 1867, the University of Illinois at Urbana-Champaign (UIUC) has cultivated a long history of significant scientific discoveries and contributions. The theory of superconductivity, the invention of the transistor, the discovery of archaea, the fourth domain of life, and the first web browser are just some of the many breakthroughs from UIUC. Established in 1876, the famous Morrow Plots became the first research crop field at a university and is still used today. Attendees will also be familiar with Blue Waters, one of the world's fastest supercomputers. The UIUC Grainger College of Engineering has had sixteen Nobel Laureates in physics. Including John Bardeen, the only scientist to ever win the award twice. It also offers 15 different majors to more than 9,100 undergraduate and 3,400 graduate students. Of its twelve ranked majors, nine are ranked among the top 10 in the nation, and six of which remain ranked among the top 5 in their degree. Overall, the College of Engineering in Urbana-Champaign ranks sixth among the nation's best undergraduate engineering programs. With more than 250 degrees for undergraduates and graduates and a multitude of first-class research facilities and resource, UIUC gives its 45,000 students the ability to succeed.
Today, the University of Illinois at Urbana-Champaign attracts visitors from throughout the state by offering a variety of valuable public attractions. UIUC maintains four public museums: the Spurlock Museum, containing 54,000 cultural artifacts from around the world; the Illinois Natural History Survey, has more than 9.5 million biologic specimens in its collection; the Sousa Archives and Center for American Music, provides shows and education to students and the public; and the Krannert Art Museum, offers fine arts and education. More than 470,000 square feet of recreational space is occupied by other facilities including an ice arena, climbing wall, swimming pools, parks, sports fields, parks, and outdoor adventure venues.

3.3 UIUC ANS Student Chapter (ANS-UIUC)

The ANS-UIUC maintains and develops a cohesive community of students in nuclear engineering. It also engages in education and outreach programs to teach members of the surrounding community about nuclear science. Membership is currently around 70-80 students and has been steadily growing. The chapter works to host events catering to nuclear, plasma, and radiological concentrations. It also makes professional

development a large part of member involvement. ANS-UIUC has historically been one of the best represented institutions at the annual student conference and is a tradition this chapter is eager to uphold.

Figure 1: Members of ANS-UIUC at the 2019 Kick Off Barbeque.

Figure 2: Members of ANS-UIUC at the 2019 Student Conference at VCU.

3.4 Research at UIUC

Faculty in NPRE conduct research in many areas of interest to the nuclear science community. Students are highly encouraged to participate and make their own atomic contributions that will someday save the world.

3.4.1 Nuclear Power

The Department of Nuclear, Plasma, and Radiological Engineering at Illinois is well known for its pioneering research in the area of reactor power engineering. Graduates have gone on to leadership positions in industry, national laboratories, and academia. Research in the Nuclear Power concentration covers all aspects of power generation using nuclear energy on land, underwater (submarine), and in space. It is inherently interdisciplinary and relies on several branches of physics and engineering for design and analysis of

large complex systems. These include aspects of reactor physics, reactor thermal-hydraulics, reactor safety, reliability and risk, instrumentation and control, training and education, human factors engineering, reactor materials, nonproliferation, and more. Safety starndards and maintenance for existing reactors and new reactor designs are also explored by faculty in the department. Cross-cutting areas of research include multi-physics and multi-scale modeling and simulation, high performance computing, reliability and risk, validation and verification, and uncertainty analysis. Recently, the University of Illinois declared a plan to be completely carbon-neutral by 2050. Nuclear power is the perfect candidate to help UIUC attain its energy goals. Together, the University and the NPRE department are saving the world one atom at at time.

3.4.2 Plasma Physics and Fusion Science

The research theme of Fusion and Plasma Physics in the NPRE department has a long history of work in the area of magnetic and inertial nuclear fusion as well as plasma engineering. NPRE is now one of the leading departments in plasma-material interactions with its Center for Plasma-Materials Interactions established by Prof. David Ruzic. Furthermore, in the past few years, three new faculty members have been added to this area including: Prof. Davide Curelli and Prof. Daniel Andruzcyk. There are five research themes that spans the work in fusion and plasma physics: fusion materials, plasma-material interface (PMI) diagnostics, plasma-edge and PMI modeling, plasma nanosynthesis, and plasma sources and processing. The Hybrid Illinois Device for Research and Application (right) marks the newest addition to the team at CPMI. This device finished construction and achieved first plasma during the spring of 2016

3.4.3 Radiological Science

Radiological engineering at UIUC strives to discover novel applications for ionizing radiation in biomedical research, homeland security, and nuclear safeguards. We have developed various gamma-ray, x-ray and neutron detectors, imaging devices, and novel algorithms for analyzing the data from these systems. These algorithms range from the use of so-called "big data" techniques applied to large sensor networks to advanced radiological imaging methods and image processing techniques for biomedical research. We work with physicists, biologist, chemists, material scientists, statisticians, and physicians around the world, to develop advanced diagnostic imaging and radiation-induced therapeutic approaches to address some of the most critical health care-related issues, such as cancer, cardiac diseases, diabetes and neurodegenerative disorders. We also work with organizations like the Departments of Defense, Energy, and Homeland Security and the International Atomic Energy Agency to deploy our research around the world to detect and identify the illicit movement of nuclear and radiological materials.

3.4.4 Reliability and Risk Analysis

Risk analysis represents the pinnacle of interdisciplinary research and education. Following the Three Mile Island disaster in 1979, Probabilistic Risk Assessment (PRA) has become a key pillar of the risk-informed nuclear regulatory framework, and is now a requirement for every nuclear power plant in the United States. Enhancing the prevention of catastrophic technological accidents and the protection of the environment requires advancement in multidisciplinary PRA. It demands the development of a common vocabulary within diverse engineering and social science domains in order to address risks emerging from the interface of social and technical systems.

3.4.5 Materials Science

3.4.6 NPRE Research Groups and Laboratories

- **Advanced Reactors and Fuel Cycles (ARFC)** - *Dr. Katy Huff*
  The ARFC group seeks to advance the safety and sustainability of nuclear energy production through improved reactor designs, fuel cycle strategies, and waste management techniques. In the area of advanced reactors, our work focuses on extending current simulation tools with features essential to advanced reactor multiphysics. In the context of the broader nuclear fuel cycle, the ARFC group emphasizes modeling, simulation, and analysis of the global nuclear fuel cycle, with an emphasis on

sustainability. A crosscutting theme of our research is an emphasis on advancing methods and software for computational nuclear engineering. Accordingly, the Advanced Reactors and Fuel Cycles group is proud to be affiliated with the University of Illinois National Center for Supercomputing Applications and its Blue Waters computing facility.

- **Virtual Education and Research Laboratory (VERL)** - *Dr. Rizwan Uddin*
  The VERL group focuses on the development of innovative numerical methods and their implementation on high performance computing machines. Research efforts center on problems in nuclear engineering, with emphasis on thermal-hydraulics and reactor physics.

- **Analysis of Reactor Transients and Stability (ARTS)** - *Dr. Tomasz Kozlowski*
  The ARTS group performs deterministic safety analysis by developing and validating advanced methods to accurately determine reactor safety margins and reactor behavior. By performing high-fidelity numerical predictions of the reactor behavior in abnormal transient scenarios of safety significance, our work supports the nuclear reactor safety analysis, and increases the fidelity of primary system simulation. This approach is at the heart of nuclear power's excellent safety record { always striving to improve current tools and methods.

- **Center for Plasma-Material Interactions (CPMI)** - *Dr. David Ruzic*
  The primary objective of CPMI is the study of plasma-material interactions relevant to fusion, semiconductor manufacturing, and plasma processing through a combination of experimental and computational means. CPMI has facilities for the study of fusion materials, High Power Impulse Magnetron Sputtering (HiPIMS), liquid metals, Extreme Ultraviolet Lithography (EUVL), laser-material interactions, and more. Projects are supported by both government and commercial partners to further the application and knowledge of plasma physics. The facility recently finished the construction of the HIDRA fusion device, which is a stellarator-tokamak machine hybrid machine used to study plasma-materials interactions. HIDRA is currently run by Dr. Daniel Andruczyk.

- **Materials Science** - *Dr. James F. Stubbins*
  The group investigates a wide variety of topics within the realm of materials research including mechanical properties, microstructural evaluations, plus radiation damage investigations, and modeling. Materials such as copper alloys nickel-based alloys, stainless steels, ferritic steels, and silicon-carbide composites are studied using a variety of analytical techniques electron microscopy and spectroscopy.

- **Non-Equilibrium Matter Laboratory** - *Dr. Yang Zhang*
  This laboratory focuses on the study of non-equilibrium matter, with particular emphasis on liquids and soft matter, using integrated neutron and synchrotron light experimental probes and atomistic modeling and simulation. The structure and dynamics of these systems are either inherently complex or driven away from equilibrium by extreme conditions. In particular, our current interests include a range of fundamental and technical problems involving slow phenomena and rare events, such as: materials far from equilibrium and in extreme environments; extreme properties of liquids; and glassy or jammed soft matters.

- **Radiation Imaging Group** - *Dr. Ling Jian Meng*
  Research is on developing radiation sensor and systems for visualizing the distribution of radioactivity in surrounding objects, patients, and small lab animals etc. Current emphasis includes (a) developing novel radiation sensors for detecting X-ray, gamma rays and neutrons, and (b) developing nuclear techniques for detecting and imaging a tiny amount radiolabeled molecules inside small lab animals.

- **Socio-Technical Risk Analysis (SoTeRiA)** - *Dr. Zahra Mohaghegh*
  The Socio-Technical Risk Analysis (SoTeRiA) Laboratory is evolving Probabilistic Risk Assessment (PRA) by explicitly incorporating the underlying science of accident causation into risk scenarios. SoTeRiA laboratory has pioneered two key areas of theoretical and methodological innovations: (1) spatio-temporal causal modeling of social and physical failure mechanisms in PRA, and (2) the fusion of big data analytics with PRA. The Lab's current projects include: Fire PRA; Location-specific Loss- Of-Coolant Accident (LOCA) Frequency Estimations; Risk-Informed Resolution of Generic Safety Issue 191; Human and Organizational Influences on System Risk; Risk-Informed Regulation; and Risk-Informed Emergency Preparedness, Planning and Response.

- **Laboratory**: **High Temperature Environmental Exposure Lab** - *Dr. Brent Heuser*
  A simultaneous thermal analyzer with combined thermogravimetric and differential scanning calorimetry function is housed in this laboratory. The response of LWR fuel cladding materials in high temperature steam environments for improved accident tolerance is currently of interest.

- **Laboratory**: **Nuclear Materials Fabrication and Studies Lab** - *Dr. Brent Heuser*
  The Radiation Detection and Imaging Lab focuses on developing non-invasive imaging technology for use in preclinical medical research. Many of our current endeavors focus on developing semiconductor Single Photon Emission Computed Tomography (SPECT) and Positron Emission Tomography (PET). These works challenge the current state of the art for spatial resolution and system sensitivity. The use of highly pixelated CdTe detectors has driven our work to break into a spatial resolution on the order of 300 microns for both PET and SPECT. Our work in SPECT has also challenged the limits of aperture sensitivity through the engineering of the compound-eye aperture.

4 Conference Logistics

4.1 Date Selection

Primary date selection
Rationale for date selection
Graphical calendar of date selection and conflicts

4.2 Conference Facilities

Conference facilities

4.3 Conference Contingency Plan

4.4 Hotels and Accomodations

4.5 Travel and Transportation

5 Conference Program

5.1 Potential Speakers

5.1.1 Rachel Slaybaugh, UC Berkeley

Prof. Slaybaugh's research is based in numerical methods for neutron transport with an emphasis on supercomputing. She applies these methods to reactor design, shielding, and nuclear security and nonproliferation. Slaybaugh was a key founder of the nuclear innovation bootcamp, which seeks to train students and professionals in skills essential to innovation in nuclear energy while executing team projects. Finally, Slaybaugh has served as a Program Director at ARPA-E, developing and running their first fission energy programs. Advanced Research Projects Agency-Energy (ARPA-E) invests in research for ways to generate, use, and store energy. These projects have the potential to radically improve economic prosperity in the U.S. and environmental wellbeing. Due to her endeavors in teaching and sharing nuclear innovation, we believe that Slaybaugh's goals are aligned with the goals of this conference and would make her an excellent addition to the program. Slaybaugh has much to offer the conference with her vision and leadership.

5.1.2 Suzanne Hobbs Baker

Talking about nuclear energy, specifically with the general public, is one of Suzanne Hobbs Baker's key goals. Baker has a strong track record as a nuclear science communicator. In 2008 she founded a nonprofit organization aimed at reaching women, minorities, and young people with critical information about climate change and nuclear energy. She currently works as the creative director for Fast Path to Zero Initiatve at the University of Michigan and as a Nuclear security fellow with Third Way Energy. Baker's work in empowering minorities and students to solve the world climate crisis with nuclear energy, as well as her skill in creative science communication, ensures that Baker has a lot to offer the student conference. Celebrating the people behind the science is one of the key goals of this conference and an area in which Baker has a lot of experience.

5.1.3 Todd Allen, UW Madison

His first post-Ph.D. position was as a staff scientist at Argonne National Laboratory. While at Argonne, he joined the leadership team tasked with developing the Generation IV Roadmap, the document that framed the resurgence of the nuclear research programs early in the 21st Century.Following Argonne, he joined the faculty at the University of Wisconsin. While there, he split his time between establishing a premier material science program at the university and supporting the Idaho National Laboratory. At INL, he led the transition of the Advanced Test Reactor into a national user facility. He also ran a six-institution Energy Frontier Research Center focused on answering fundamental questions about heat transfer in nuclear fuel. From 2013-2016, he helped lead the Idaho National Laboratory as the Deputy Laboratory Director for Science & Technology, including being an important contributor to the development of the Gateway for Accelerated Innovation in Nuclear (GAIN) initiative announced at the White House in November 2015. Since 2016 he has been a Visiting Senior Fellow with Clean Energy Program at Third Way, a Washington, DC based think tank. His role in formulating the roadmap for Generation IV reactors and his leadership indicate that he would make a great speaker at the conference.

5.1.4 Rita Baranwal, DOE Nuclear Energy

Dr. Rita Baranwal serves as the Assistant Secretary for the Office of Nuclear Energy in the U.S. Department of Energy (DOE). Dr. Baranwal leads the office's efforts to promote research and development (R&D) on existing and advanced nuclear technologies that sustain the existing U.S. fleet of nuclear reactors, enable the deployment of advanced nuclear energy systems, and enhance the U.S.A.'s global commercial nuclear energy competitiveness. Prior to her current role, Dr. Baranwal directed the Gateway for Accelerated Innovation in Nuclear (GAIN) initiative at Idaho National Laboratory. She was responsible for providing the nuclear industry and other stakeholders access to DOE's state-of-the-art R&D expertise, capabilities, and infrastructure to achieve faster and cost-effective development, demonstration, and ultimate deployment of innovative nuclear energy technologies. Under her leadership, GAIN positively impacted over 120 companies.

Baranwal is a clear choice of speaker to discuss the ways to improve nuclear legislation and how companies can rapidly develop new nuclear technology.

5.1.5 Jim Conca, Forbes

Jim Conca has been a scientist in the field of the earth and environmental sciences for 33 years, specializing in geologic disposal of nuclear waste, energy-related research, planetary surface processes, radiobiology and shielding for space colonies, subsurface transport and environmental clean-up of heavy metals. He is a Trustee of the Herbert M. Parker Foundation, Adjunct at WSU, an Affiliate Scientist at LANL and consult on strategic planning for the DOE, EPA/State environmental agencies, and industry including companies that own nuclear, hydro, wind farms, large solar arrays, coal and gas plants. He also writes for Forbes magazine about nuclear issues, energy, and the environment. Conca has a strong vision for the future and is not shy about coming up with ideas to solve grand challenge problems. In addition to his experience and ambition, he is an excellent science communicator to scientists and non-scientists alike. Together, these factors make him an ideal speaker at the conference.

5.1.6 Fatima Ebrahimi, Princeton

Fatima Ebrahimi is a Research Physicist at the PPPL Theory Department and an Affiliated Research Scholar at the Department of Astrophysical Sciences, Princeton University. She has many years of experience in theoretical and global computational extended magnetohydrodynamics (MHD) with wide applications to laboratory fusion and astrophysical plasmas. Her main research interests are MHD stability in fusion plasmas, momentum transport, dynamos, and magnetic reconnection in laboratory fusion and astrophysical plasmas. She has written many papers over a wide range of topics and peer-reviewed journals. She is an elected executive committee member of the APS Topical Group in Plasma Astrophysics (GPAP), 2018-2021, and program committee member for U.S. Magnetic Fusion Research (MFR) Strategic Directions, 2017-2018. Dr. Ebrahimi is a great choice to have as a speaker on the future of fusion energy.

5.1.7 Brian Jurczyk, CEO Starfire Industries

Brian holds a dual PhD/MBA degree with background in aerospace, nuclear, plasma and radiological engineering and technology commercialization. As CEO, Brian works to find creative win-win solutions with commercial and industrial partners for particularly challenging applications - at all stages of value creation from basic IP development through early-stage manufacturing. In 2012-13, Brian received the Innovation Celebration "Entrepreneurial Excellence in Management Award," was named to Central Illinois Business' "40-under-40" and has served as Chairperson of the Champaign-Urbana CEO Roundtable. As a professional leader in plasma and radiological engineering, Jurczyk would be a great speaker to have at the conference on topics related to the future of plasma engineering and professional development.

5.2 Saving the World Panel Series

Technical and non-technical panels encourage interaction between students and professionals at the conference. Each panel is designed to address one or more of the stated goals for the conference. They also serve as a way for students and professionals to learn more about relevant issues, find inspiration for their next project, and feel encouraged for the future of the nuclear field.

Technical Panels

5.2.1 Critical Conversations: Microreactors

This panel explores the benefits of microreactors in general. It will also explore the idea of universities as potential markets for microreactors. Microreactors are exactly what they sound like,

5.2.2 Applications for Fusion and Plasma

5.2.3 Nuclear Policy and Legislation

Nuclear energy is one of the most heavily regulated fields in the United States. This panel aims to enlighten attendees about how legislation is written and how non-scientist government officials might better understand the potential of nuclear energy. This panel will allow attendees to learn who is working in this area and develop a network of people devoted to issues of nuclear policy. Rita Baranwal would be an excellent speaker on this panel because of her work for the DOE.

Non-Technical Panels

5.2.4 Science is People: Conducting Inclusive Research

Research and technology that will help us solve the grand challenge problems of the world must also reflect the diverse needs of the people that live in it. Everyone comes to nuclear engineering from a variety of backgrounds, identities, abilities, and experiences. Saving the World One Atom at a Time means making atomic contributions. Finding ways to encourage and include even one more person in the endeavor of nuclear science is an important kind of atomic contribution. This panel works toward the goal of celebrating the people behind the science. It also serves to inspire students and

5.2.5 Talking To Non-Scientists

It has been shown that when members of the general public are given more scientific evidence they are less likely to shift their beliefs. While this finding is surprising to members of the scientific community, people who value data and evidence, it can be difficult to find ways to effectively communicate your research to the public. Attendees will learn how other scientists effectively communicate their results. No longer discouraged by potential resistance from the public, students will steel their resolve for working on ambitious projects that can save the world. Suzanne Hobbs Baker would be a great choice for this panel, as well as members of The Story Collider; a non-profit organization devoted to helping scientists tell stories that

5.2.6 How to Host a Conference

This panel is devoted to sharing the experience of this conference's planning committee with students from other schools that may want to host their own student conference. This panel is for students by students. We will discuss our process from writing a successful proposal to executing a successful conference.

5.3 Workshops

5.3.1 Scientific Storytelling

Science is people. The Story Collider is a non-profit organization whose mission is to honor the people and stories behind the science and teach scientists to use these stories to their advantage. From their website:

> We know that storytelling is not typically taught during scientific training, and is sometimes explicitly discouraged. There are many reasons why. But like it or not, stories are how people understand the world, and they weave together fact and emotion. Compared to other forms of communication, these narratives can be more successful in:
>
> - generating interest and engagement with a topic,
> - improving comprehension, and
> - influencing real-world beliefs, even among skeptical audiences.

5.3.2 Building Your Network

The AAAS conducts workshops that teach early career scientists and students how to develop a professional network that will benefit them in the future. They hold regular workshops about strategic networking, making new contacts, and getting the most out of a conference. We will invite them to conduct a workshop where attendees can come away with skills to maximize their experience at the ANS Student Conference.

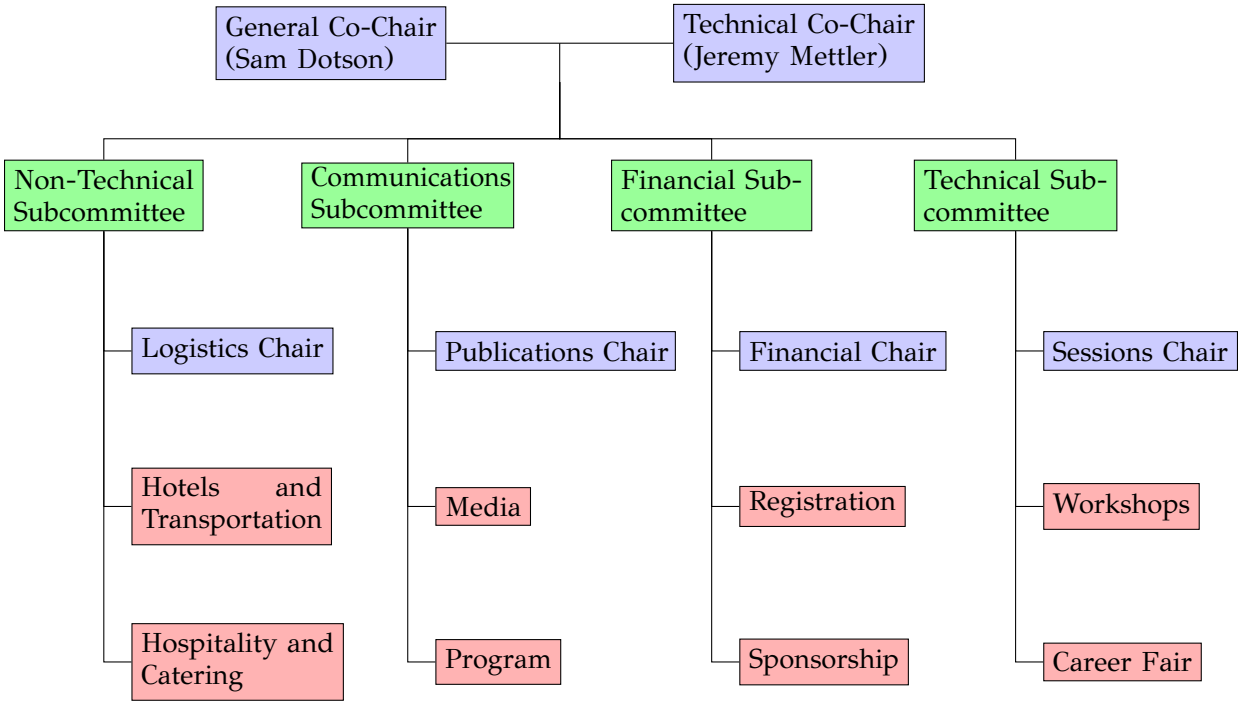
5.3.3 MOOSE Workshop

The Multiphysics Object Oriented Simulation Environment is an open source framework for finite element modeling, developed and maintained by Idaho National Laboratory. MOOSE is a powerful framework that enables users to couple several different physics codes together under a single API. Many research groups at UIUC use this framework for simulating reactors and materials. The Idaho National Laboratory MOOSE team gives many workshops a year to train future user-developers of the framework. We will invite this team to give a half-day MOOSE workshop at the conference. The workshop will take place in NCSA room 1030.

5.3.4 PyNE and PyRK Workshop

Python for Nuclear Engineering (PyNE) and Python for Reactor Kinetics (PyRK) are two open source packages with computational tools for nuclear science and engineering. The PyNE toolkit provides both a Python and a C++ API for common computational pre- and post-processing tasks in nuclear engineering. PyRK offers point kinetics implementation for nuclear reactors. This workshop will provide a hands-on tutorial for attendees to begin using PyNE and make use of its capabilities for their curriculum and research work. The Advanced Reactors and Fuel Cycles (ARFC) research group at UIUC and its collaborators will provide instructors. This workshop, alpha-tested at the University of Wisconsin will be aimed at students who can provid their own laptops and have a desire to improve their nuclear computational skills. The workshop will be approximately two hours of instruction at NCSA room 1030.

6 Conference Management



6.1 Position Responsibilities

The general and technical chairs are responsible for setting up major milestones and ensuring that those milestones are met. Together they oversee all four subcommittees but are each primarily in charge of two. They will serve as the primary contacts between subcommittee chairs and the faculty as well as professionals. The two co-chairs have the final word on all conference decisions.

- ***General Co-Chair***
  In addition to the responsibilities outlined above, the General Co-Chair primarily oversees the Non-technical and Publications Subcommittees. Works with the Technical Co-Chair to plan full committee meetings and completes any remaining tasks to ensure that milestones are met.
- ***Technical Co-Chair***
  In addition to the responsibilities outlined above, the Technical Co-Chair primarily oversees the Technical and Financial Subcommittees. Works with the General Co-Chair to plan full committee meetings and completes any remaining tasks to ensure that milestones are met.
- **Non-Technical Subcommittee**
  The Non-Technical Subcommittee oversees, arranges, and executes all actions related to hospitality, transportation, special events, and non-technical workshops and panels. This committee keeps the theme of the conference in mind when organizing all events. They ensure that the conference runs smoothly.
  - **Logistics Chair (Gavin Davis?)**
    The Logistics Chair is in charge of planning all tours and non-technical workshops and panels. Organizes speakers during dinners Also responsible for keeping track of subcommittee and reporting to the General and Technical Co-Chairs.
  - **Hotels and Transportation Coordinator**
    Coordinates with ANS National to negotiate room rates and room blocks for hotels. Reserves busses for the necessary times and events. Works with the Hospitality and Catering Coordinator and the Logistics Chair.

- **Hospitality and Catering Coordinator**
  Responsible for planning and organizing all catered meals for the conference. that includes contacting the catering services, reserving the venues where meals are held, and making sure the venues are staffed.

- **Financial Subcommittee**
  The Financial Subcommittee oversees, arranges, and executes all actions related to banking, sponsorship, registration, reimbursement, budgeting, and monetary exchanges. This committee works closely with the General and Technical Co-Chairs.

  - **Financial Chair**
    Sets the budget for the whole committee and ensures that the committee does not exceed the budget. Manages the ANS Student Committee account and collects receipts. Updates and maintains the budget as required. Keeps track of subcommittee progress and reports to the General and Technical Co-Chairs.
  - **Registration Coordinator (Jasmine Dinari?)** Handles the registration for professional and student attendees. Communicates the number of attendees to the Program Coordinator.
  - **Sponsorship Coordinator**
    Assists the Financial Chair with matters involving sponsorship as well as working closely with the registration coordinator and the General and Technical Co-Chairs.

- **Technical Subcommittee**
  The Technical Subcommittee works with the Technical Co-Chair to process student abstracts and set up technical workshops, panels and sessions.

  - **Sessions Chair (Gwen Chee?)**
    Responsible for organizing presentation, poster sessions, and technical panels. Also responsible for ensuring that judges understand the judging criteria, and organizes the award ceremony. Keeps track of subcommittee progress and reports to the General and Technical Co-chairs.
  - **Workshops Coordinator (Zach Jeckell?)**
    Organizes workshops locations, times, staffing, costs, supplies, student enrollment and any other tasks required to have successful workshops. Also assists the Sessions Chair when needed.
  - **Career Fair Coordinator (Rierson Johnson?)**
    Oversees staffing and support for the career fair as well as working with the Sponsorship Coordinator to ensure a successful career fair. Also assists the Sessions Chair when needed.

- **Communications Subcommittee** The Communications Subcommittee is in charge of public relations and communicating status updates with attendees.

  - **Publications Chair (Nate Reid?)**
    The Publications Chair is primarily responsible for publishing and organizing the student abstracts, as well as helping the media coordinator maintain a social media presence.
  - **Media Coordinator (Nathan Ryan?)**
    The Media Coordinator is reponsible for designing the conference website, constantly updating social media presence, and obtains information from other members of the planning committee for the website.
  - **Program Coordinator (Brady Moran?)**
    The Program Coordinator is in charge of setting the program for the conference, minimizing event overlap, and coordinating with the Publications Chair and Media Coordinator.

6.2 Planning Committee Biographies

[All committee members must plan on attending the upcoming student conference!]

6.3 Conflict Resolution

Committee members should hold professionalism at the forefront of their composure in order to avoid and resolve issues amicably without the involvement of higher powers. As such, members are encouraged to settle conflicts without invoking this protocol. If an issue arises that immediately presents itself as overwhelming, the scope of the issue exceeds an individual's ability to handle it, or the issue imposes certain implications that jeopardizes the mission of the planning committee, members should not hesitate to refer to this section. In the event of a conflict between members of the planning committee, a document for decision-making and conflict resolution has been drafted and approved by the general committee. All General Committee members are expected to abide by the resolution. Key points of the resolution are as follows:

1. Subcommittees are encouraged to operate as autonomous and democratic as possible; however, the General Co-Chairs reserve the rights to make all final decisions. If the Co-Chairs cannot agree, the faculty advisor will be involved.

2. Conflicts between committee members are to be resolved outside of the committee. Should this begin to affect the work of these members, the General Co-Chairs may intervene.

3. Any cases of misconduct or negligence will be handled by the General Co-Chairs as necessary.

4. For extreme cases of misconduct or negligence, separate steps for the removal and replacement of a member are outlined for general members, Subcommittee Chairs, and General Co-Chairs. These include a discussion with the offending member, consultation of the Faculty Advisor, and a hearing with the General Committee to decide if removal is necessary.

6.4 Staffing Requirements

6.5 Milestones

Deadline	Task	Responsibility
	November	
	December	
12/14/19	Some task needs to be done	General Co-Chair
	2020	
	January	
	February	
	March	
	April	
	May	
	June	
	July	
	August	
	September	
	October	
	November	
	December	
	2021	
	January	
	February	
	March	
	April	

7 Budget