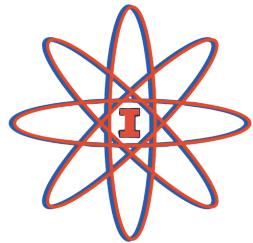


# Saving the World One Atom at a Time



Presented by ANS at the University of Illinois Urbana-Champaign



September 30, 2019

Dear members of the American Nuclear Society Student Sections Committee:

The American Nuclear Society, University of Illinois at Urbana-Champaign Student Section (ANS-UIUC) is pleased to submit its proposal to host the 2021 ANS Student Conference. Our student section continues to grow and find new avenues for professional development, outreach, and research. This year we have many new faces and each of them brought an invigorating energy for nuclear engineering. ANS-UIUC is qualified and prepared to host a student conference that will motivate students to take on big challenges and engage with the nuclear science community in new ways.

Our theme is: Saving the World One Atom at a Time. This theme reflects the important role the nuclear sciences will play in solving many of the world's grand challenges. It also recognizes the atomic contributions we all make every day. Together, these contributions form the foundations of solutions to these grand challenges. It celebrates the people that make science possible by acknowledging that we come to this conference from an infinitude of backgrounds and experiences. It encourages us to widen our circles and include scientists and engineers with a diversity of thoughts. Finally, it inspires us to be active participants in the solutions to the world's problems.

This year we have added a Diversity Co-Chair to our leadership. We are devoted to making this conference as diverse and accessible as possible. This is a novel role for the ANS Student Conference and one we believe will become a staple in future conference proposals.

ANS-UIUC is ready and excited to take on the challenges of hosting a student conference. Thank you for considering our proposal to host the 2021 ANS Student Conference. We hope the message behind our theme resonates with the Student Sections Committee as strongly as it resonated with the students and faculty that made this proposal possible.

Thank you,

Sam Dotson  
General Co-Chair

Jeremy Mettler  
Technical Co-Chair

Nathan Reid  
Diversity Co-Chair



## THE GRAINGER COLLEGE OF ENGINEERING

Department of Nuclear, Plasma, & Radiological Engineering  
216 Talbot Laboratory, MC-234  
104 S. Wright St.  
Urbana, IL 61801

September 30, 2019

To the ANS Student Conference Selection Committee,

As their faculty advisor, I enthusiastically support the University of Illinois ANS student section bid to host the 2021 ANS Student Conference.

The Illinois ANS Student Section is the most vibrant and active student section I have encountered and I have complete confidence in their capability to organize and execute an exceptional and successful student conference. Notably, this student chapter has an extraordinary membership which devotes enormous time and effort to nuclear advocacy and national involvement. The vibrance and drive of this student section has accordingly been consistently recognized with the Glasstone Award in 2016 (Best Section), 2017 (Honorable Mention), 2018 (Honorable Mention), and 2019 (3rd Place). Also, this student section enjoys strong departmental support from the Department of Nuclear, Plasma, and Radiological Engineering which will certainly help to ensure the success of this conference.

Additionally, this chapter has demonstrated their enthusiasm for the student conference through their attendance and performance at those hosted elsewhere. In recent years, 30-40 Illinois students typically attend the ANS student conferences where these Illinois attendees present research and receive awards accordingly.

Finally, 2020 will be an exciting time for students from around the country to be introduced to the Nuclear, Plasma, and Radiological Engineering Department at the University of Illinois. The department has undergone a period of exceptional growth, and now boasts a youthful, vibrant faculty. The resulting expansion of our research efforts and experimental facilities will provide a fresh take on nuclear, plasma, and radiological engineering today.

It is with high hopes that I write this letter of support for the UIUC student section proposal to host the student conference. I hope you will not hesitate to ask if you have any questions regarding my support.

Sincere regards,

A handwritten signature in black ink that reads "Kathryn Huff".

Kathryn Huff  
Assistant Professor  
Nuclear, Plasma, & Radiological Eng.  
U. Illinois at Urbana-Champaign



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## 1 Saving the World One Atom at a Time

The future is nuclear. There are many grand 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. Nuclear, plasma, and radiological engineering will be central to many endeavors, whether the goal is solving the world's energy needs, developing technology that will take us to the stars, or curing cancer. By hosting this conference, we hope to inspire and motivate students in these 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 that are essential to progress. This conference is about science and engineering and it is about the people that make science and engineering 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.

There are three main goals of our theme and each of these goals will be the focus of a different day of the student conference.

1. Celebrate the people behind the science and engineering.

Everyone that does science has a unique background, skillset, and experiences. People are what make science possible. Encouraging diversity and inclusivity in these areas, and others, improve creativity, productivity, and insights. We showcase this aspect of the conference with panels like *Science is People: How to Conduct Inclusive Research* and *Scientific Storytelling*.

2. Connect students and professionals to develop strong networks.

This is the networking and professional-development-focused section of the conference. Beyond the mere job-seeking aspect, these networks enable the spread of ideas. Additionally, this evening builds on top of the previous night as we remember that our networks also consist of people. More diverse networks are better networks. This aspect of the conference is captured by workshops like *Developing Your Network*.

3. Inspire the next generation of nuclear engineers to take on grand challenge problems

The final day is the culmination of the conference and underpins the single unifying ideal. For many students, this conference might be the first time they are presenting research to their peers, mentors, and future employers. Everything about this conference should encourage students to take on challenges that seem bigger than they are in order to improve the world around them.

These goals and our theme motivated every decision in our conference proposal. 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.



## 2 Welcome to Illinois



### 2.1 Champaign-Urbana in a Nutshell

Champaign-Urbana (CU), colloquially known as Chambana, is home to the state's flagship school, the University of Illinois at Urbana-Champaign (UIUC). Since its founding in the mid 19th century CU has grown into the flourishing cultural hub of the midwest it is today. CU houses many landmarks and districts and showcases both local and national events annually. It is home to the Historic Virginia Theater that hosts Ebertfest in honor of the late film critic and UIUC alumnus Roger Ebert. The Krannert Center for the Performing Arts is located on U of I campus, which is known for its four first-class venues, including the Foellinger Great Hall - one of the most acoustically perfect performance spaces in the world, attracting world famous artists and ensembles to perform there every year. Other notable events that attract many people to the twin cities are the Pygmalion Music Festival, the Urbana Sweetcorn Festival, and the Illini Marathon.

CU is an industrial base to several major companies including Abbott Laboratories, Archer Daniels Midland (ADM), Caterpillar, John Deere, The Dow Chemical Company (TDCC), IBM, and State Farm. Other top employers in CU include Kraft Heinz, Carle Foundation Hospital, and Wolfram Research. Carle has notably been affiliated with the creation of the first college in CU in over 60 years, the Carle Illinois College of Medicine - "the world's first engineering-based college of medicine". Research Park at the University of Illinois serves as a technology hub for several research and development ventures, where there are more than 120 companies employing 2,100 students and professionals in high-technology careers.

The state of Illinois relies heavily on nuclear power to supply its energy needs with 52% of electricity generated by nuclear plants. The first human controlled nuclear reaction, Chicago Pile One, happened in Illinois. UIUC also bears a long tradition of nuclear power research and was home to the TRIGA nuclear reactor for almost 40 years. During this time researchers at UIUC contributed to the knowledge store of nuclear reactor kinetics, isotope production, fission fragment physics, and much more. Now, UIUC is exploring ways to use nuclear power to accelerate its decarbonization efforts. This exploratory effort has the potential to position UIUC as the world leader in advanced carbon-free technologies. We hope to continue our excellent nuclear tradition by hosting the ANS Student Conference in 2021.



Figure 1: Downtown Champaign



### 2.1.1 Accessibility and Accommodation

A large number of hotels are located around downtown Champaign and the Eastern side of campus, making transportation easy. Champaign-Urbana Mass Transit (CU-MTD) is a reliable public transportation service that sees millions of riders every year. CU-MTD charges an affordable rate of \$1 per ride. All CU-MTD busses are wheelchair accessible. Rental bikes and rideshare services are also plentiful. There is a small airport, Willard Airport, just 20 minutes from campus that has regular flights to and from Chicago O'Hare and Dallas Fort Worth airports. Finally, Peoria Charter is a popular bus service with several daily trips between the UIUC campus and the Chicagoland area.

### 2.1.2 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 and spring coming into bloom. Holding a conference during this time would be the perfect way to showcase our beautiful city.

## 2.2 University of Illinois at Urbana-Champaign: Learning & Labor

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 that came out of UIUC. The famous Morrow Plots, established in 1876, became the first research crop field at a university and is still used today. Attendees might 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 almost 6000 undergraduate and 2500 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 Grainger 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 resources, UIUC gives its nearly 45,000 students the ability to succeed.



Figure 2: Alma Mater accompanied by Learning and Labor

## 2.3 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. One of our most popular outreach programs is Engineering Open House (EOH), during which ANS-UIUC repeatedly earns awards for best presentation of a society. EOH is an annual event where members of the local community, from young children to senior adults, visit the engineering campus to learn more about STEM research. 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. Professional development plays a crucial role in student development, and it is the biggest part of member involvement at UIUC. Events range from tours of various facilities to pizza with campus visitors. Some of the past tours have included Clinton Power Station, Oak Ridge National Laboratory, Analysis System (ANSYS) Inc, and Argonne National Laboratory. 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 3: Mouse Trap Chain Reaction at EOH 2019



(a) ANS Barbeque 2019



(b) ANS Student Conference 2019 at VCU

## 2.4 Research at UIUC

Faculty and students in NPREG conduct research in many areas of interest to the nuclear science community. Both graduate and undergraduate students actively participate and make their own atomic contributions that will someday save the world. Research programs in Nuclear, Plasma, and Radiological Engineering at the University of Illinois at Urbana-Champaign can be broadly classified into five areas:

- **Nuclear Power** (reactor physics, thermalhydraulics, fuel cycle, radiation transport, I&C)
- **Plasma and Fusion** (modeling, plasma-material interactions)
- **Radiological Sciences** (detectors, imaging, health physics, medical applications)
- **Material Science** (nuclear fuels, structural materials)
- **Risk and Policy** (PRA, safety, energy, arms controls, disarmament, security)

These research areas are supported by a stellar faculty and world-class facilities, which will be briefly described below.



#### 2.4.1 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 standards and maintenance for existing reactors and new reactor designs are also explored by faculty in the department. Crosscutting 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 carbon reduction and energy goals. Together, the University and the NPRE department are saving the world one atom at a time.

#### 2.4.2 Plasma Physics and Fusion Science

The Fusion and Plasma Physics research theme 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 (HIDRA) marks the newest addition to the team at CPMI. This device finished construction and achieved first plasma during the spring of 2016.

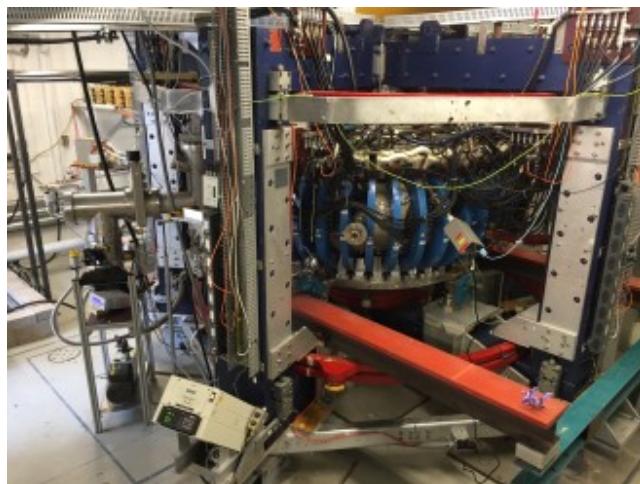


Figure 5: The Hybrid Illinois Device for Research and Application (HIDRA)

#### 2.4.3 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, biologists, 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.



#### 2.4.4 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.

#### 2.4.5 Materials Science

Materials science research includes investigations of the mechanical properties of cladding and other structural components, and heat exchanger materials. Advanced microanalysis techniques are often employed to perform nano-scale interrogation of deformation, precipitation, and chemical segregation studies, for example. Ion beam bombardment of materials often runs concurrent with these techniques to simulate fast neutron displacement cascade damage. Fuel performance modeling, molecular dynamics, and kinetic Monte Carlo simulations complement these experimental activities. The Department also has strong efforts related to the study of nuclear fuel such as urania, including mass transport and mechanical property studies. The Department also studies hydrogen in metals, including hydride phase formation and solute dislocation pipe diffusion.

#### 2.4.6 NPRE Research Groups and Laboratories

The faculty, pictured in Figure 6 support the above areas of expertise in the collaborations and facilities discussed below.

- **Advanced Reactors and Fuel Cycles (ARFC) - Dr. Kathryn 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,



### Professors



Brent Heuser



Ling-Jian Meng



David Ruzic



Jim Stubbins



Rizwan Uddin

### Associate Professors



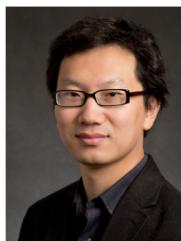
Davide Curreli



Tomasz Kozlowski



Magdi Ragheb



Yang Zhang

### Assistant Professors



Caleb Brooks



Angela Di Fulvio



Kathryn Huff



Zahra Mobagbegh



Daniel Andruszyk



Seyed Reibani

### Research Faculty/Scientist



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 (SoTeRa) - Dr. Zahra Mohaghegh**

The Socio-Technical Risk Analysis (SoTeRa) Laboratory is evolving Probabilistic Risk Assessment (PRA) by explicitly incorporating the underlying science of accident causation into risk scenarios. SoTeRa 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.

- **Laboratory: Multiphase Thermo-fluid Dynamics Lab - Dr. Caleb Brooks**

This group performs experiments related to thermal hydraulics and multiphase flow. Phenomena studied include boiling, condensation, critical heat flux, natural circulation, two-phase flow instabilities, bubble dynamics, and two-phase transport. Utilizing advanced instrumentation, data from these experiments are used in model development and validation of computational tools.

- **Laboratory: Nuclear Measurements Laboratory - Dr. Angela DiFulvio**

The lab is equipped with a Cf-252 source and a D-T neutron generator with an emission rate of 1E7 and 1E8 neutrons/s, respectively. The neutron flux density is well-characterized in energy and intensity employing various instruments, including multisphere spectrometers, ionization chambers, long counters, and scintillators, calibrated to primary reference standards, which enable the detection of neutrons via scattering of protons or via fission of uranium nuclei.

### 3 Conference Logistics

#### 3.1 Date Selection

We propose the conference be held on either of the following dates:

1. Thursday, April 8<sup>th</sup> - Sunday, April 11<sup>th</sup>
2. Thursday, April 15<sup>th</sup> - Sunday, April 18<sup>th</sup>

We believe either of these dates would serve as an appropriate first choice because they avoid major conflict dates like finals and spring break for most schools. Additionally, mid-April offers pleasant, mild, weather in Champaign. The reason for proposing two weekends to host the conference is due to the UIUC tradition of hosting Mom's Weekend on or near the first weekend in April. The Illinois Mom's Association has not yet announced their 2021 dates but, to avoid potential conflict, we suggest two dates. In the event that both of these dates are unavailable our backup date is

- Thursday, April 1<sup>st</sup> - Sunday, April 4<sup>th</sup>.

This is a backup date because Easter falls on that Sunday. In general, this should be avoided. In this case we found that holding the conference at the end of April would conflict with finals for students and holding it earlier in March would conflict with several spring breaks as well as having potentially poorer weather. A detailed conflict schedule is listed in Appendix A on page 57.

#### 3.2 Conference Facilities

##### The Illini Union



Figure 7: Illini Student Union

The Illini Union is capable of hosting the entire technical program of the ANS Student Conference. This keeps the conference contained in one convenient location while being within easy access of the rest of the campus. Technical sessions will be held in a combination of rooms on the second, third, and fourth floors of The Union. Each of these rooms have at least enough capacity for 42 people, lecture style, and A/V capability. There will also be rooms available to have panels and workshops during the course of the technical program. The Illini Rooms A and B will be a combined space for the career fair while Illini Room C and the south lounge will host the poster sessions. We will keep the space open to allow the poster sessions and career fair to share attendance and encourage networking. A detailed list of room capacities and floor plans are located in Appendix D: Building Layout on page 59.



### 3.3 Banquet Space

#### 3.3.1 Garden Hotel in Urbana

The opening ceremony dinner on Thursday night will be hosted at the Garden Hotel in Urbana. It has a seating capacity of 600 people in rounds and offer in house catering as well as AV capabilities. This location was chosen for its convenience, as it would be the primary hotel for the conference.



Figure 8: The Garden Hotel Banquet Hall with capacity for 600 people in rounds.

#### 3.3.2 I Hotel

Dinner on Friday night will be hosted at the I Hotel. The I Hotel is undergoing an expansion that will increase the capacity of their banquet space to 690 people in rounds. Catering is provided by University Catering which avoids a 20% gratuity charge because of its association with the University of Illinois. This expansion is set to be completed by Fall 2020. We will be hosting a social at the 77 Club in Memorial Stadium, just up the street. Information about the I Hotel expansion is included in Appendix D.



Figure 9: The current 400-person banquet space at the IHotel.



### 3.3.3 Illini Union

After the career fair is taken down on Saturday the final dinner will be set up in the combined Illini Rooms, which has a seating capacity of 496 people in rounds. Catering will be provided by University Catering which allows us to avoid the 20% gratuity for services. A floorplan for the Illini Rooms in rounds is available in Appendix D.



Figure 10: The combined Illini rooms with capacity for 496 in rounds.

### 3.4 Conference Contingency Plan

In the event that the Union has reduced availability during the conference we have the ability to host technical sessions and workshops at a combination of buildings: The National Center for Supercomputing Applications (NCSA) and Beckman Institute. Rooms in Beckman Institute range from 20 - 60 classroom capacity. Most rooms have A/V capabilities. NCSA has rooms that can hold 13 - 50 people in lecture style. As these buildings are UIUC property, the cost of renting them are significantly reduced compared to a private facility. Additionally, these two buildings are adjacent to one another and are at most a 10 minute walk from the Union. We could also host all technical sessions at the I Hotel. Hosting at the I Hotel is more expensive than hosting in University buildings and would also require additional transportation options. We would need to reevaluate some parts of our budget in order to host the technical program at this venue. See Appendix E on page 65 for a map marking the locations of the proposed conference facilities.

#### National Center for Supercomputing Applications (NCSA)

NCSA is a hub of transdisciplinary research and digital scholarship where University of Illinois faculty, staff, and students, and collaborators from around the globe, unite to address research grand challenges for the benefit of science and society.



Figure 11: NCSA



### Beckman Institute

The Beckman Institute for Advanced Science and Technology at the University of Illinois is an interdisciplinary research institute devoted to leading-edge research in the physical sciences, computation, engineering, biology, behavior, cognition, and neuroscience.



Figure 12: Beckman Institute

### The I Hotel and Conference Center

The IHotel offers a unique, flexible, meeting space and a variety of small touches that make any meeting, social gathering or event in Champaign-Urbana a flawless and memorable experience.



Figure 13: I Hotel



### 3.5 Hotels and Accommodations

#### The Garden Hotel Urbana

When selecting the primary hotel to accommodate students we considered the ability to host all students under one roof over proximity to the conference activities. The Garden Hotel Urbana (soon to be the Radisson) will be the primary hotel for all attendees. This will also be the location of the opening ceremony dinner. Since this hotel is just beyond walking distance from the main conference activities, we will hire four Peoria Charter busses to shuttle attendees to and from the Union every 10 minutes. Additionally, there is a CU-MTD bus stop adjacent to the hotel that travels directly to the Union and runs every 10 minutes from 8am to 6pm.



(a) King Suite



(b) Queen Double

Figure 14: Garden Urbana Hotel rooms

#### Illini Union

This is the primary hotel for invited speakers and panelists. Commuting to the conference will be as easy as taking the elevator downstairs because the Illini Union is where the primary conference activities will be held. The Union is also a five-minute walk from Green Street, the campus hub of dining and social activities. Guests have access to Wi-Fi and, upon request, guest passes to the university recreational facilities. Breakfast is provided in the form vouchers for any of the hotel restaurant options inside the Union. Hosting technical sessions, workshops, and plenaries in the Union will help us negotiate a lower room rate.

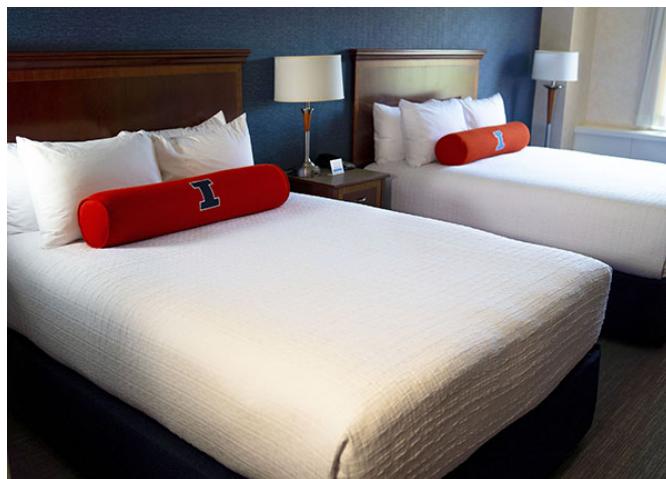


Figure 15: Queen Double



Table 1: Cost of Hotels

Hotel	Distance from the Union (mi)	Dates	Number of Rooms	Rates*	Per Person**
Garden Urbana	2.2	4/8-4/11	198	119	\$29.75
Illini Union	0.0	4/8-4/11	35	134	\$33.5
Marriott TowneSuites	0.25	4/8-4/11	95	189	\$47.50

\*Price for a queen double \*\*Assumes 4 people per room

### Marriott TowneSuites

In the event that attendance exceeds 600 people, we will have overflow rooms in the Marriott TowneSuites. Rooms at the Marriott resemble a studio apartment with an open floor plan, refrigerator, stove, microwave, dishes, and dining area. Many rooms are equipped with pull-out couches, allowing 5 students to share a queen double room if desired. The hotel offers internet access for a maximum of 3 devices per room. The hotel is located on Green Street and the Illini Union a mere five-minute walk away. For \$7 a day, guests may park in a parking garage with 8ft clearance.



Figure 16: Marriott Rooms: Left, a queen double. Right, a king single

UIUC is one of most well represented schools at past student conferences. Students from UIUC will be able to stay in their respective dorms and apartments to maximize the number of hotel rooms available to out of town guests.

## 3.6 Dining

### 3.6.1 Breakfast

Our primary hotel, the Garden Hotel in Urbana, soon to be the Radisson Hotel, serves complimentary breakfast every morning. Due to this, we will not be catering breakfast at the Illini Union during the conference. Guests staying at the Illini Union Hotel are provided with vouchers for breakfast at the food court in the basement of the Union. The food court offers Einstein Brothers, Starbucks, Garbanzo Mediterranean, and more.

### 3.6.2 Lunch

Conference attendees are encouraged to explore the University's campus and surroundings, including getting lunch on the main street of campus, Green street. Due to this, lunch will not be provided for the conference. However, box lunches will be provided for the Student Sections Committee meeting from 11:30pm to 1:30pm on Friday as well as any lunch and learns hosted by sponsors on Friday and Saturday. The Illini Union's catering service, University Catering, will be used. Sponsors can also choose to sponsor and host a lunch in one of the technical session rooms on Friday or Saturday. If more rooms are required, there are

available rooms on the first and second floor of the Union. Sponsors will be able to use University Catering, or cater from one of the food vendors in the Illini Union.

### 3.6.3 Dinner

#### Thursday Night

Communicating the science of nuclear energy remains one of the chief challenges of our field. The opening dinner of this conference will focus on science communication and the people behind the science. Science communication requires more than the recitation of raw data to be effective. By telling our own, diverse backstories, we become more effective science communicators. Speakers will be asked to speak to their own backstory as a nuclear advocate and how their story makes them a more effective communicator.

#### Friday Night

The second dinner will be themed around networking and professional-development and how these critical tools have value beyond finding jobs. Communities like ANS thrive on the exchange of ideas and knowledge. The student conference serves plays an essential role by connecting the burgeoning minds of the next generation with the wisdom of established professionals. This dinner will consist of tables organized by company/national lab to allow students and professionals to mingle, promoting the exchange of ideas.

#### Saturday Night

The closing dinner of the conference will be a call to action for student attendees. Ours is a generation faced with challenges on a scale never witnessed by humanity, and we will only successfully address these challenges through the engagement of as many bright young minds as possible. The speakers for this night will be asked to address ways we all can take individual responsibility for the grand challenges of our age by using our own unique skills to tackle problems like climate change and energy poverty from every angle imaginable.

## 3.7 Travel and Transportation

### 3.7.1 Getting to Champaign

The University of Illinois is a 2.5 hour drive from one of the largest airports in the world, O'Hare International Airport. There is also a small airport located just 20 minutes outside of campus. Additionally, there is a reliable bus service, Peoria Charter, that runs between O'Hare and the UIUC campus several times per day. Table 3 shows the round-trip, non-stop, airfare costs for the first weekend of April. Peoria Charter fare from O'Hare to UIUC is currently \$61 round-trip. Due to the central location of UIUC, driving might be a good option for some schools and individuals. Table 2 shows the approximate driving times and costs from several universities.

Table 2: Estimated Costs of Ground Travel

School	Estimated Mileage (mi)	Driving Time (hrs)	Fuel Cost*	Per Person**
Purdue University	90	1h 40m	\$21.86	\$5.47
University of Cincinnati	233	3h 40m	\$56.60	\$14.15
Air Force Tech	250	3h 58m	\$60.73	\$15.18
University of Wisconsin	253	4h	\$61.46	\$15.36
Missouri University S & T	279	4h 21m	\$67.77	\$16.94
U. Missouri - Columbia	291	4h 28m	\$70.69	\$17.67
Ohio State University	302	4h 47m	\$73.36	\$18.34
University of Michigan	345	5h 17m	\$83.81	\$20.95
Vanderbilt University	373	5h 33m	\$90.61	\$22.65
Iowa State University	378	5h 44m	\$91.82	\$22.96
Average	279	4h 22m	\$67.87	\$16.97

\*Estimated assuming an average 23 MPG

\*\*Assumes four people in a car



### 3.7.2 Getting to the Conference

The primary hotel, Garden Hotel Urbana, is approximately two miles from the Union and outside of reasonable walking distance. Thus we have budgeted to include transportation provided by Peoria Charter. We intend to have busses shuttling continuously between the Union and the Garden Hotel Urbana. For those who desire more flexibility and freedom, there is CU-MTD bus stop adjacent to the hotel that has a bus every 10 minutes. This bus route, the 22 Illini, can take attendees directly to the Union from the hotel. It is also one of the main campus bus routes and can take travelers almost anywhere on or around campus. Lyft and Uber are available as well for attendees that choose to use those services. A map of the bus route is in Appendix E: Campus Map of Locations on page 65.

Table 3: Airfare to Chicago/Champaign

School	Departure City	O'Hare (ORD)*	Willard (CMI)
University of California - Berkeley	San Francisco (SFO)	\$338	\$436
University of California - Irvine	Orange County (SNA)	\$394	\$436
Colorado School of Mines	Denver (DEN)	\$222	\$328
Three Rivers Community College	Hartford (BDL)	\$468	\$327
University of Florida	Gainesville (GNV)	\$377	\$416
Georgia Institute of Technology	Atlanta (ATL)	\$199	\$291
Southern Polytechnic State University	Atlanta (ATL)	\$199	\$291
Idaho State University	Idaho Falls (IDA)	\$501	NA
Kansas State University	Manhattan (MHK)	\$336	\$406
Louisiana State University	Baton Rouge (BTR)	\$380	\$329
United States Naval Academy	Hanover (BWI)	\$210	\$321
University of Maryland	Hanover (BWI)	\$210	\$321
Massachusetts Institute of Technology	Boston (BOS)	\$191	\$325
University of Massachusetts - Lowell	Boston (BOS)	\$191	\$325
University of Nevada - Las Vegas	Las Vegas (LAS)	\$262	\$358
University of New Mexico	Albuquerque (ABQ)	\$439	\$358
City College of New York	\$New York (JFK)	\$245	\$325
Excelsior College	Albany (ALB)	\$444	\$327
Rensselaer Polytechnic Institute	Albany (ALB)	\$444	\$327
United States Military Academy at West Point	New Windsor (SWF)	\$273	\$357
North Carolina State University	Morrisville (RDU)	\$180	\$321
Oregon State University	Portland (PDX)	\$314	\$436
Pennsylvania State University	Harrisburg (MDT)	\$397	\$323
University of Pittsburgh	Pittsburgh (PIT)	\$282	\$293
Clemson University	Greenville (GSP)	\$356	\$287
South Carolina State University	Columbia (CAE)	\$407	\$564
University of South Carolina	Columbia (CAE)	\$407	\$564
Chattanooga State Community College	Chattanooga (CHA)	\$334	\$316
University of Tennessee	Knoxville (TYS)	\$340	\$291
Texas A&M University	College Station (CLL)	\$367	\$243
University of Texas - Arlington	Dallas (DFW)	\$197	\$303
University of Texas - Austin	Austin (AUS)	\$298	\$358
University of Texas - Permian Basin	Midland (MAF)	\$434	\$333
Utah State University	Salt Lake City (SLC)	\$298	\$358
University of Utah	Salt Lake City (SLC)	\$298	\$358
Virginia Commonwealth University	Richmond (RIC)	\$279	\$321
University of Washington	Seattle (SEA)	\$253	\$436
Average Lowest Cost for Air Travel**		\$293	

\*A \$61 round-trip bus ticket through Peoria Charter was added to the cost.

\*\*The average of the lowest price between O'Hare and Willard.

## 4 Conference Program

### 4.1 Potential Speakers

#### 4.1.1 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. We would ask her to give a call to action for students on the final night of the conference.

#### 4.1.2 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.

#### 4.1.3 William Magwood



Mr. Magwood served seven years as the Director of Nuclear Energy with the U.S. Department of Energy (DOE), where he was the senior nuclear technology official in the United States Government. He oversaw the restoration of the Federal nuclear technology program and led the creation of "Nuclear Power 2010," "Generation IV," and other innovative initiatives including successful efforts that helped reverse the decline in American nuclear technology education. Since joining the NRC, he has continued his advocacy for both U.S. science and technology education and strong international cooperation. He has also sought to assure transparency and improve the agency's openness to public participation. As an NRC Commissioner, Mr. Magwood has been a strong defender of the NRC's regulatory independence and adherence to the principle that regulations should be based firmly on scientific and technical facts. From his nomination as a Commissioner, Mr. Magwood has remained committed to his promise to carry out his responsibilities "in a manner that earns the public's trust, and always doing the right thing even when the right thing isn't easy."



#### 4.1.4 Phi Nguyen, Former Vice President and Director of Engineering at Intel



Phi Nguyen, is a UIUC alumni from the NPRE department and went on to a major leadership role at the Intel corporation. Smartphones, computers, and other technology that most Americans take for granted everyday would not be possible without innovations from companies like Intel. Plasma processing plays a significant role in the production of key components of these devices. As the former Director of Engineering at Intel, Phi Nguyen is the perfect person to talk about how this important research helps solve big problems.

#### 4.1.5 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 Initiative 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. Thus she would be a great speaker on the opening night.

#### 4.1.6 Cathy McCarthy, Canadian Nuclear Laboratories



Dr. Kathy McCarthy joined CNL as the Vice-President of Research and Development in 2017. Kathy has also held the position of Director of the US Department of Energy Light Water Reactor Sustainability Program Technical Integration Office. Her team, made up of scientists and engineers from across the US, conducted and guided important research that enabled power companies to be able to make informed decisions regarding long-term operation broadly, and second licence renewal specifically, for their operating nuclear units. Her expertise, leadership and contributions to the nuclear science and technology community are globally recognized, having received the American Nuclear Society Presidential Citation (2015, 2007), and the Partnership for Science & Technology Nuclear Energy Advocate of the Year Award (2011), among many others. Her many contributions to the nuclear industry indicate that she would make a great speaker at this conference.



#### 4.1.7 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. His diverse background makes him an ideal speaker to discuss the importance of developing a diverse network on the second night of the conference.

#### 4.1.8 Greg Piefer, CEO SHINE



Dr. Piefer is the founder and CEO of SHINE Medical Technologies. The mission of SHINE is to lead the world in safe, clean, and affordable production of medical tracers and treatment elements. He holds a PhD in nuclear engineering, and BS degrees in physics and electrical and computer engineering from the University of Wisconsin-Madison. Greg has received numerous awards and honors including the prestigious UW-Madison Early Career award, is the primary inventor on multiple patents and author or co-author of numerous publications, and serves on the boards of several profit and non-profit entities. His passion is the growth of technology companies that take scientific advancement to commercialization, providing the opportunity to serve and better humanity. Piefer's goals are perfectly attuned to the goals of this conference and he would be an excellent speaker on the powerful applications of radiological engineering.

### 4.2 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

##### 4.2.1 Critical Conversations: Microreactors

Microreactors are a growing area of nuclear research and the first installations have been projected for some time in the mid 2020s. They are capable of generating 1-50 MWth, which can be used directly or converted to electricity. These relatively portable reactors are capable of powering remote areas and towns with little infrastructure. UIUC has stated that it aims to be carbon neutral by 2050. The University is exploring the possibility of constructing a microreactor on campus for research and power generation, a first of its kind, in pursuit of its decarbonization goals. This panel will discuss the benefits and applications for microreactors around the world and also talk specifically about the potential market for microreactors on universities. We have several groups on campus researching, simulating, and modelling microreactors. Faculty leading these groups such as Dr. Caleb Brooks and Dr. Kathryn Huff would be excellent speakers on this panel.



#### 4.2.2 Plasma Processing in Your Pocket

Plasma processing has become a staple in many fields of advanced manufacturing. Without plasma, modern conveniences such as smartphones and powerful computer technology would not be possible. In this panel, representatives from companies at the cutting-edge of plasma processing research will discuss how plasmas continue to revolutionize contemporary industry. Potential panelists include Brian Jurczyk, CEO of Starfire Industries, and David Ruzic, Professor of NPRE and Principle Investigator of CPMI.

#### 4.2.3 Fusion: Materials for the Future

Nuclear fusion has the potential to serve as the ultimate clean energy source, capable of supplying the world's energy needs for millennia. Harnessing this immensely powerful energy resource requires further innovation in a variety of scientific disciplines. One of the largest remaining obstacles to fusion energy is the unprecedented strain placed on the materials from which fusion reactors are built. This panel will focus on the latest advancements in plasma facing components research and could feature panelists such as Professor Dan Andruszyk, director of the UIUC Center for Plasma-Material Interactions, and Dr. Lauren Garrison, Weinberg Fellow at ORNL.

#### 4.2.4 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. Leadership of the GAIN program would make excellent panelists to discuss policy.

#### 4.2.5 Radiological Technology for a Healthier and Safer Future

From the production of medical isotopes to nuclear verification, radiological engineering will play an important role in the future of health, security, and more. This panel will illuminate some of those applications and show attendees what could be possible with radiological technology. Speakers may include Ross Radel from Phoenix and Professor DiFulvio from UIUC.

### Non-Technical Panels

#### 4.2.6 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 professionals to consider how diversity plays a role in their research.

#### 4.2.7 Effective and Unorthodox Science Communication

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. Professor Paul Kwiat of the Physics Department at UIUC has taken science communication in an entirely new direction. He owns and operates Lab Escape, a popular escape room in Urbana. Kwiat along with members of the Story Collider, non-profit organization devoted to helping scientists tell stories that will resonate with their audiences, would make an excellent panel on unusual methods of science communication.



#### 4.2.8 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. Students from other schools will be able to ask questions and gain insights for their own conference hosting process.

### 4.3 Workshops

#### 4.3.1 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.

#### 4.3.2 Building Your Network

The American Association for the Advancement of Science (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.

#### 4.3.3 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.

#### 4.3.4 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, tested at the University of Wisconsin will be aimed at students who can provide 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.

### 4.4 Technical Sessions

Technical sessions are an integral part of every student conference. This is where students can share their research experiences, new ideas, exchange knowledge, and *atomic contributions* to the big problems of the world. There are 6 technical sessions held concurrently each day. Each room will be equipped with



a projectors, computers, podiums, and other necessary equipment. Each presenter is given 15 minutes to present and 5 minutes to answer questions from the audience. Presenters will be judged on significance, originality, and overall presentation (Podium Presentation Judging Form can be found in Appendix B). The divisions of the technical sessions include, but are not limited to

- Accelerator Applications
- Aerospace Nuclear Science & Technology
- Computational Medical Physics
- Decommissioning & Environmental Sciences
- Education, Training & Workforce Development
- Fuel Cycle & Waste Management
- Fusion Energy
- Human Factors, Instrumentation & Control
- Isotopes & Radiation
- Materials Science & Technology
- Mathematics & Computation for Nuclear Engineering
- Next Generation Reactors & Advanced Reactors
- Nuclear Criticality Safety
- Nuclear Energy Applied to Biology & Medicine
- Nuclear Installations Safety
- Nuclear Nonproliferation
- Probabilistic Risk Analysis
- Operations & Power
- Radiation Protection & Shielding
- Reactor Physics
- Robotics & Remote Systems
- Thermal Hydraulics

Practice rooms will be made available every day of the conference. We expect a total of 48 technical sessions each with 4-5 presenters. Where possible, students will be awarded with funds donated by the technical divisions of ANS.

## 4.5 Poster Session

There will be a poster session on Saturday in Illini Room C and the South Lounge. This offers nearly 1600 square feet of space and allows students an opportunity to share their research in an open environment. The poster session will be immediately adjacent to the career fair. This encourages students and professionals, that might otherwise go to one or neither, to attend both. There will be an award for best graduate and undergraduate poster. A layout of the rooms are available in Appendix D: Building Layout.

### 4.5.1 Highschool Poster Session

We believe that attracting younger students to the field of nuclear engineering will help us grow the nuclear community. To that end we will invite high school students to present a poster on a topic of interest in the nuclear sciences. This will also add to the diversity of the conference.



## 4.6 Career Fair

The career will be held all day on Friday, from 8am to 5pm, and on Saturday from 8am to noon. It will be held in Illini Rooms A & B, a large space capable of holding 600 people. This space will be immediately adjacent to the poster sessions on saturday to encourage students and professionals to attend both. Together, the Illini Rooms can hold up to 900 people. Recruiters can mail bulkier items prior to their arrival in Champaign. All companies that sponsor the conference will be given a table at the career fair. Location will be decided in order of sponsorship amount and when the agreement was made. Universities may freely request a table at the career fair, while space is available. There will be rooms available at the Illini Union for companies to interview potential candidates.

## 4.7 Tours

### 4.7.1 Technical Tours

Out of the 61 commercially operating nuclear power plants and 99 nuclear reactors in the U.S., Illinois is home to six nuclear power stations and eleven active reactors. Being located in a state with numerous power plants, as well as being surrounded by locations of interest to a variety of nuclear-related disciplines, the touring opportunities at the University of Illinois mirror the diversity of UIUC's Nuclear Plasma and Radiological Engineering program.

#### National Petascale Computing Facility (NPCF)

Also located on campus is NCSA, which houses Blue Waters, one of the most powerful supercomputers in the world. The NCSA is within walking distance from all conference hotels. During the tour, attendees will tour the machine room and witness some of the beautiful results it produces. Supercomputers like Blue Waters are important for solving computationally challenging problems and creating robust simulations for a variety of phenomena.



Figure 17: Blue Waters Supercomputer

#### Starfire Industries LLC

Starfire Industries is located at the south end of campus and works with federal organizations such as DARPA, Homeland Security, NASA, and others. They offer services in areas like neutron radiography, fabrication, and prototyping. Students will be able to get to the site by using the MTD busses that run continuously throughout the day and will be free to all conference attendees. Here, students will be able to learn more about Starfire products such as the IMPULSE pulsed power module, plasma sources, thin film systems, nGen neutron generators, neutron detectors, and the PICTORIS neutron radiography system. Starfire's collaboration with government agencies and propensity for solving big problems related to plasma engineering make them a great place to learn about plasma processing applications.



### Argonne National Laboratory

Located in Lemont, Illinois, Argonne works closely with universities, industry, and other national labs to help make an impact on the atomic, human, and global scale. With 14 research divisions, five national scientific user facilities, and hundreds of research partners, attendees of this tour will be exposed to the diverse areas of research in nuclear science. Argonne is two-and-a-half-hour drive away. Bus transportation will be provided. On the tour, students will be guided around the site's scientific and engineering facilities.



Figure 18: Argonne National Laboratory



Figure 19: Clinton Powerplant on Clinton Lake

### Clinton Nuclear Power Plant

Located about 35 miles away from Champaign, the Clinton Power Station is an Exelon owned nuclear power plant that started operating at full power on September 15th, 1987. They currently serve over one million customers and operate 94.9% of the time. The tour will be held on Thursday morning and bus transportation will be provided. Attendees will be guided by a Clinton employee. The tour will include the control-room simulator that operator trainees use, and a chance to learn more about the site's innovative safety, operation, and engineering practices.

#### 4.7.2 Non-Technical Tours

Brewery tours are staple social event and tour at the ANS Student Conference. Champaign-Urbana has several popular local breweries that give tours and tastings at their facilities. Due to this, we will be able to expand the number of attendees that can go on these tours over previous conferences. These will require sign up before the conference and we expect spots to fill up quickly.

### Riggs Brewery Tour

For 21+ attendees, two tours of a local brewery will be included in our tours list Thursday afternoon from 3-5pm. Find out how Riggs makes their beer and taste test it along the way. Each tour will last approximately one hour and accommodates up to 20 people per tour. Riggs is located in east Urbana. Transportation to and from the brewery will be provided.



Figure 20: Riggs Brewery



Figure 21: Triptych Brewery Vessels – Not RPVs

### Triptych Brewery Tour

For 21+ attendees, Triptych offers two tours that run around 1.5 hours for roughly 30 people each that includes several beer tastings throughout. Tours will be from 2-5pm on Thursday afternoon. Triptych is located in Savoy, IL, just 15 minutes from campus. Transportation to and from the brewery will be provided.



Figure 22: Engineering Hall on the Beautiful Engineering Quad

## 4.8 Socials

### 4.8.1 Illini Union Rec Room Lockout

The Illini Union Rec Room is located in the basement of the Union building. A Rec Room lockout gives ANS exclusive access to 14 bowling lanes, 12 billiard tables, and coin-operated arcade games following dinner at the Krannert Center for Performing Arts, only a short walk away through the University of Illinois main quad! This space can accompany up to 150 people, with extra tables outside of the Rec Room for socializing, playing board games, or having a late night snack or coffee with professionals or students from other universities.

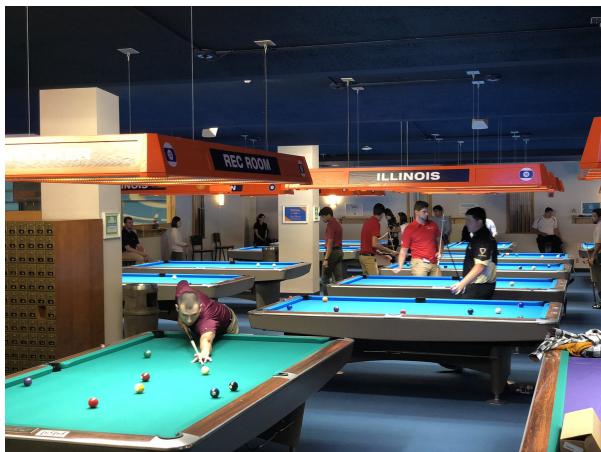


Figure 23: Illini Union Rec Room



#### 4.8.2 77 Club at Memorial Stadium

Memorial Stadium is not only home to the Fighting Illini football team, but also to exquisite event space overlooking Zuppke Field. The sixth level of Memorial Stadium is home of the magnificent 77 Club, which honors Illini great, the “Galloping Ghost” Red Grange. This 5,020 square foot space is located midfield and features an outdoor patio area overlooking the city of Champaign, for a combined total space of 9,740 square feet. This event will take place following dinner at I Hotel Conference Center, and is just a short and scenic walk away past the State Farm Center (formerly the historic Assembly Hall). Tables will be set up around a stage featuring live music and a dance floor and drinks will be served. This is the perfect event to incorporate a little bit of Illinois history with music, dancing, and socializing!



Figure 24: 77 Club at Memorial Stadium

#### 4.8.3 Pour Bros. Taproom in Downtown Champaign

Welcome to Illinois' first pour-your-own taprooms. Pour Bros. Taproom is located in the heart of the historic downtown Champaign area and features 28 pour-your-own taps: beers, ciders, meads and wine... all poured by you, one ounce at a time. Socialize over the vintage games Pour Bros has to offer: skeeball, bubble hockey, steel tip darts, DAGZ and more! If you are feeling more on the leisurely side, Pour Bros features live music in a spacious and comfortable seating area for you to get your networking on.



Figure 25: Pour Brothers Taproom



#### 4.8.4 Barn Dance: A Proud Midwestern Tradition

Barn dances are a staple event at UIUC. Socialize in a unique environment with games of corn-hole and other midwestern fun. Various barns are used for dancing and mingling by many of the student organizations on UIUC campus, such as Farm Lake barn which hosts dozens of barn dances annually. Other barns may be best suited for the student conference social events, such as Hudson Farm, which offers a corporate event or professional social events option which can accommodate up to 300 guests with an alcohol service available and friendly, helpful service. Like socials in the past student conferences, the barn may be used and a third party service can be hired to bring the square dance, swing dance, two step and cowboy boogie to the barn dance floor!



Figure 26: Hudson Farm Barn.



Figure 27: Farm Lake Barn

#### 4.8.5 Under 21 Social: University of Illinois Ice Arena

For students under the drinking age that cannot attend the Pour Bros. Taproom social event, the University of Illinois Ice Arena is another option that is only a brief walking distance from the Union. It was built in 1931 and offers a unique option for skating get-togethers from broomball and hockey to group skating parties. The Ice Arena is a 55,000 square foot facility and is the only one in Champaign-Urbana. The dimensions of the rink are 192' by 115' with a 1,200 seat arena surrounding. There are four public locker rooms, four party areas, and two Zambonis in the facility. The Center Ice Cafe offers hot chocolate, coffee, smoothies, fountain drinks, and more to quench your thirst. Snacks and concession items are also available.

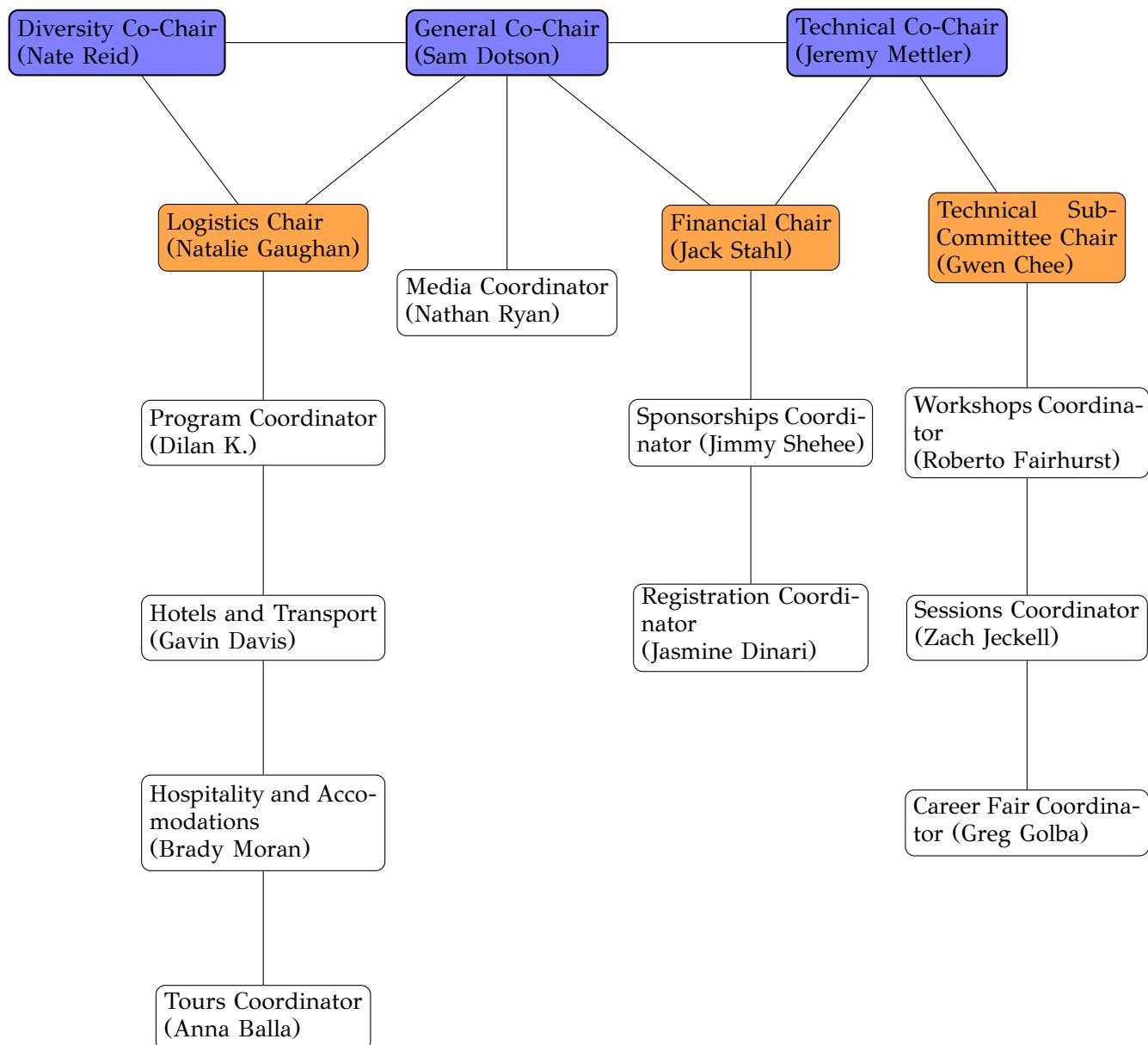


Figure 28: The UIUC Ice Arena



## 5 Conference Management

The Conference Planning Committee is separated into three categories: Co-Chairs, Directors, Coordinators. The three co-chairs are responsible for setting up major milestones and ensuring that those milestones are met. Together they oversee all three subcommittees. They will serve as the primary contacts between subcommittee chairs and the faculty as well as professionals. The co-chairs have the final word on all conference decisions. They serve as the faces of the conference. In this proposal we have decided to add a novel Co-Chair position: Diversity Co-Chair. This addition reflects our goal of celebrating the people behind the science and make this conference experience accessible to as many people as possible. The Directors are in charge of specialized subcommittees and are responsible for making decisions in those areas. They must communicate with their subcommittees and with other directors to make sure there are no conflicting decisions. The coordinators work in an even more specialized area and help the directors by handling a single task.





## 5.1 Position Responsibilities

- **General Co-Chair**

In addition to the responsibilities outlined above, the General Co-Chair oversees the Non-technical Subcommittee, the Media Coordinator, and the Financial Subcommittee. He works with the Technical Co-Chair in talking to sponsors, companies, and planning full committee meetings.

- **Technical Co-Chair**

In addition to the responsibilities outlined above, the Technical Co-Chair primarily oversees the Technical Subcommittee. Works with the General Co-Chair to plan full committee meetings and completes any remaining tasks to ensure that milestones are met.

- **Diversity Co-Chair**

In addition to the responsibilities outlined above, the Diversity Co-Chair is responsible for making sure the conference is as inclusive, diverse, and accessible as possible. This includes: contacting minority serving institutions to encourage their students to attend the conference, ensuring socials and dinners are accessible, verifies that the final list of speakers has adequate representation, and more. We believe the example set by UIUC will make this role a staple of future conferences.

- **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**

The Logistics Chair is in charge of planning all tours and non-technical workshops and panels. Organizes speakers during dinners. Recruits student volunteers to staff events and sessions during the conference. Also responsible for keeping track of the subcommittee and reporting to the 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.

- **Tours Coordinator**

The tours coordinator organizes tours and works with the transportation coordinator to ensure that transportation is available during the conference for these tours.

- **Program Coordinator**

The program coordinator creates programs for the conference, sets the conference schedule to minimize overlap between events and increase student involvement. Communicates with other coordinators and subcommittees about the schedule of events. Designs and purchases T-shirts for attendees. Arranges gift bags for attendees. Works with sponsorship coordinator to create gift bags.

- **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**

Manages the ANS Planning Committee account with Busey Bank and ANS National. The account coordinator is also responsible for keeping track of receipts, setting a budget for the committee, keeps track of all transactions,



- **Registration Coordinator** Handles the registration for professional and student attendees. Communicates the number of attendees to the Program Coordinator.
- **Sponsorship Coordinator**  
Assists the Financial Co-Chair with matters involving sponsorship as well as working closely with the Registration and Account Coordinators and the General and Technical Co-Chairs. Works with the Program Coordinator on gift bag items and works with the Career Fair Coordinator.
- **Technical Subcommittee**  
The Technical Subcommittee works with the Technical Co-Chair to process student abstracts and set up technical workshops, panels and sessions.
  - **Technical Subcommittee Chair**  
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.
  - **Sessions Coordinator**  
Responsible for organizing presentation, poster sessions, and technical panels. Makes sure that all rooms are properly set up with equipment to ensure smooth technical sessions.
  - **Workshops Coordinator**  
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**  
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.
- **Media Coordinator**  
The Media Coordinator is responsible for designing the conference website, constantly updating social media presence, and obtains information from other members of the planning committee for the website.



## 5.2 Planning Committee Biographies



### General Co-Chair - Sam Dotson

Sam graduated with a B.S. in Physics from UIUC in 2019. He attended his first ANS student conference in April 2019 and was so inspired by his experience that he decided to pursue graduate work in nuclear engineering rather than physics. Now he does research on machine learning applications and computational reactor physics with Dr. Kathryn Huff in the ARFC group. Hosting a student conference that will inspire others the way he was inspired is one of his top priorities this year. He has experience planning activities for student organizations such as Guidance for Physics Students (GPS) and has experience fundraising for the College of Lake County (CLC). He helped set a record amount of donations at the 2016 CLC Foundation Gala, where he was an invited speaker and volunteer. He will be attending the ANS National conference in November 2019, as well as the ANS Student Conference 2020 at North Carolina State University.



### Technical Co-Chair - Jeremy Mettler

Jeremy graduated with a B.S. in Nuclear, Plasma, and Radiological Engineering from UIUC in 2018, and is now attending as a 2nd-year graduate student studying plasma science under Dr. David Ruzic. He has been heavily involved in the UIUC student chapter of ANS since his freshman year, serving on the executive board for three years as External Vice President and President. Jeremy has attended the past five ANS Student Conferences, which serve as an inspiration for his involvement in this proposal process. He is dedicated to making sure that future generations of students are able to have the same amazing experiences through ANS as he had, especially at the ANS Student Conference. Outside of ANS, he has held a summer internship at Oak Ridge National Lab, and is currently focusing his research towards combined laser-plasma systems for materials processing.



### Diversity Co-Chair - Nathan Reid

Nate graduated with a B.S. in Nuclear, Plasma, and Radiological Engineering from UIUC in 2016. He is a 4th-year Ph.D. student in the field of fusion and plasma science and engineering under Prof. Jean Paul Allain. Nate is currently conducting his thesis research at Oak Ridge National Laboratory, where he has spent the last three summers working in the nuclear structural materials group under the mentorship of Dr. Lauren Garrison. He will return the UIUC in December 2019. Nate has attended four of the last five ANS Student Conferences and was a student paper competition finalist at the TOFE embedded topical of the 2018 ANS Winter Meeting. Nate has been recognized by the ANS-UIUC for his outstanding graduate service in the last year, and served as the Women in Nuclear UIUC chapter Vice President. He was part of the executive team that received the national student chapter excellence award at the 2019 Women in Nuclear national conference, of which he was awarded a student sponsorship to attend. Nate is ecstatic about working alongside his ANS student section as Diversity Co-Chair and setting goals to bring inclusion to the conference.



#### Technical Subcommittee Chair - Gwen Chee

Gwen is a third year graduate student studying fuel cycles for advanced reactor designs with Dr. Kathryn Huff in the ARFC group. Last summer she had an internship at Argonne National Laboratory where she worked on sensitivity analysis of the nuclear fuel complex. She also serves as the president of the UIUC chapter of Women In Nuclear (WIN). Under her leadership, WIN-UIUC was honored with the Best Student Chapter award at the WIN National Meeting in 2019. She has also been involved with ANS and attended the 2018 ANS Student Conference in Florida and will be attending the upcoming ANS Student Conference at NC State in 2020.



#### Logistics Chair - Natalie Gaughan

Natalie earned her B.S. in Nuclear Engineering from the University of Wisconsin-Madison in 2017. She has completed two summer internships at Argonne National Laboratory where she worked with various neutronics codes. Natalie then spent a year in Vienna as an intern at the International Atomic Energy Agency, where she helped organize and evaluate nuclear data for medical isotope production. She is now a graduate student at UIUC intending to research radiological science and nuclear medicine. As an undergraduate, Natalie attended two ANS student conferences which played a huge role in obtaining internships and inspired her decision to attend graduate school. Natalie knows firsthand how the ANS student conferences can be influential in students' education and career development, and would love to help younger students experience the same benefits. She will also be attending the upcoming ANS student conference in 2020 at NC State.



#### Financial Chair - Jack Stahl

Jack graduated with a B.S. in Nuclear, Plasma, and Radiological Engineering from UIUC in 2019, and is now a first-year graduate student studying plasma engineering under Dr. David Ruzic. He has been involved in the UIUC student chapter of ANS since his sophomore year and has attended two student conferences. Previously, Jack has spent a summer as an intern at ASML. Jack hopes to help host a student conference that will bolster younger student involvement in ANS.



## Financial Subcommittee



### Sponsorship Coordinator - James Shehee

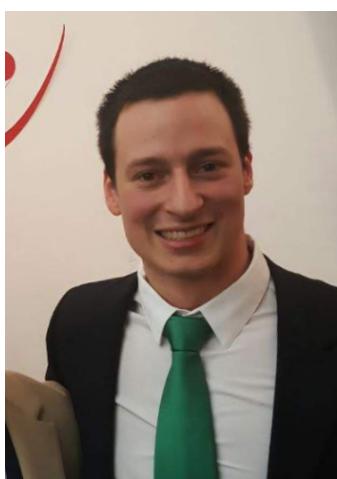
Jimmy is a junior undergraduate student in UIUC's Nuclear, Plasma, and Radiological Engineering department, with a concentration in power, safety, and the environment. Jimmy has been an active member of the University's ANS student chapter since his freshman year, has held the positions of Secretary and External Vice President, and was chosen to receive the chapter's Undergraduate Outstanding Service Award in the spring of 2019. Jimmy was first introduced to the nuclear industry through the Nuclear Science Merit Badge in Boy Scouts, and he is excited about any opportunity to create similar experiences for students and the public. Outside of ANS, Jimmy is also the President of the Illini Venturing Crew. In the summer of 2019, Jimmy interned at Exelon's Quad Cities Generating Station, and will be returning for another summer in 2020. He is excited to attend his first ANS Student Conference in March 2020 at North Carolina State University.



### Registration Coordinator - Jasmine Dinari

Jasmine is a freshman studying Nuclear, Plasma, and Radiological Engineering at UIUC, as well as minors in French and Physics. She is starting research with Dr. Andruczyk, who is currently at the head of the HIDRA project. Powering the world through nuclear is one of her main interests, and she later hopes to participate in nuclear fusion research. The ANS Student Conference is an amazing opportunity to share her interests in nuclear science. She gained organizational and leadership experience through various extracurriculars in high school and currently serves as the Professional Development Chair for the UIUC student chapter of Women in Nuclear. She plans on attending the 2020 ANS Student Conference at NC State.

## Technical Subcommittee



### Workshops Coordinator - Roberto Fairhurst

Roberto graduated with a B.S. in Nuclear Engineering from Instituto Balseiro (Argentina) April 2018. He is now a 2nd-year graduate student at UIUC. He does research on computational multi-physics solvers applied to advanced reactors as part of the Advanced Reactors and Fuel Cycle group under the supervision of Dr. Kathryn Huff. He got experience in the organization of conferences during the planning and development of a technical workshop (TWOFC19) that took place at UIUC in June 2019. His motivation for hosting a student conference is his passion for Nuclear Energy and his desire to transmit this passion to other students. He believes hosting the student conference at UIUC will help the field grow and thrive. This is also an opportunity to meet other people working in the field, share life experiences, and develop a stronger network.



#### Sessions Coordinator - Zachary Jeckell

Zachary graduated with a B.S. in Nuclear, Plasma, and Radiological Engineering from UIUC in 2018 and is now a second year graduate student studying plasma engineering under Dr. David Ruzic. He has presented his research at two previous student conferences and realized that he wanted to help bring this prestigious event to the University of Illinois. He strongly believes that the group of students at UIUC are capable of such a feat and that the University would make an excellent location for the conference because of its stellar program and wonderful faculty. He plans to attend the next ANS student conference at NC State to present research on chemical vapor deposition using atmospheric pressure plasma.



#### Career Fair Coordinator - Grzegorz Golba

Grzegorz Golba is a sophomore pursuing a B.S. in Nuclear Engineering with a physics minor in the plasma and fusion science concentration. He is now studying material interactions with plasma under Dr. Daniel Andruczyk. Grzegorz attended the 2019 ANS Student Conference in Virginia, reaffirmed his desire to study of nuclear science. He seeks new opportunities to engage with the nuclear science community and is excited for the possibilities of hosting a student conference at UIUC.

### Non-Technical Subcommittee



#### Program Coordinator - Dilan Kurukulasuriya

Dilan Kurukulasuriay is a sophomore pursuing a B.S. in Nuclear, Plasma, and Radiological Engineering, along with a minor in Physics and Mathematics. He has been active in ANS at UIUC since the start of his freshman year, and he currently serves as the Outreach Chair on the Executive Board. Dilan has worked at the Center for Plasma-Material Interactions lab since the start of his freshman year on HIDRA, and he stayed on campus over the summer to continue to do so. Dilan attended the 2019 ANS Student Conference and it was the highlight of his freshman year of college. He is interested in fusion science research, specifically the materials interaction aspect. He also plans on attending the upcoming student conference at NC State in 2020.

**Hotels and Transportation Coordinator - Gavin Davis**

Gavin is currently pursuing a B.S. in Nuclear, Plasma, and Radiological Engineering from UIUC and plans to graduate in 2022. He has been involved with the ANS-UIUC since his freshman year and has dedicated his time to outreach events and increasing public awareness of nuclear science and nuclear energy. He has accomplished this through events such as UIUC's Engineering Open House. It was an event he enjoyed as a kid and hopes to help other children develop an interest in nuclear sciences. He also returns to his high school to talk about his experience at UIUC. He looks forward to learning more about nuclear fission technology and to make advancements in nuclear science and in the nuclear energy sector as a whole. He looks forward to attending the student conference at NC State in 2020.

**Hospitality and Catering Coordinator - Brady Moran**

Brady a freshman in the Nuclear, Plasma, and Radiological Engineering program in the Plasma concentration. He is looking forward to putting his time and efforts toward ANS events throughout his years at UIUC. Last year, Brady planned a large tasting event, the Taste of Sauk Valley, which boasted 550 attendees, \$15,000 in revenue, and required him to coordinate 12 restaurants and various subcommittees. He is confident that this experience will help him make the Student Conference a great success. He will be attending the 2020 conference at NC State.

**Tours Coordinator - Anna Balla**

Anna is a junior in NPRE with a planned concentration in the power, safety, and the environment. She became interested in nuclear engineering after taking a general education class with an NPRE professor and learning about how effective nuclear power is at reducing carbon emissions. Anna is a teaching assistant for two classes in the NPRE department and is also very involved with the Women in Nuclear chapter at Illinois. In her spare time, she enjoys going to concerts, playing volleyball, and wishing she knew how to juggle.



#### Media Coordinator - Nathan Ryan

Nathan is pursuing a B.S. in Physics from UIUC. He graduated in the top five of his high school class, while holding down a part time managerial position and running a research project at Argonne National Laboratory concurrent with his Sophomore through Senior years of Secondary Education. His first experience with Nuclear Physics was at the National Superconducting Cyclotron Laboratory where he worked with grad students on rare Cadmium isotopes. He has experience with building appealing website pages, as well as social media communications. He believes that an online presence for this event will supplement the success of an already great set of programs and individuals involved. He is excited to attend the upcoming ANS Student Conference at NC State in 2020.

### 5.3 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 resolve conflicts internally and as democratically as possible. If an independent resolution cannot be reached, the Co-Chairs should be involved. The Co-Chairs have the final word on all decisions. If the Co-Chairs are unable to agree on a solution, the faculty advisor will be involved.
2. Conflicts between individual committee members are to be resolved outside of the committee. Should such a conflict jeopardize the mission of the conference the Co-Chairs will be involved.
3. Any cases of misconduct or negligence will be handled appropriately by the Co-Chairs.
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 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.

### 5.4 Staffing Requirements

Staffing for room breakdowns and setups, registration, socials, workshops, tours, etc. will be supplied by either UIUC ANS members or students of the NPSE department. While it is likely that members of our student chapter will voluntarily fill all the staffing requirements of conference hosted events. If not, we will rely on other student organizations for support including, but not limited to: Arms Control and Domestic and International Security (ACDIS) and Women in Engineering (WIE). Participating in conference events on a staff level is a beneficial experience for any undergraduate who wants to become more familiar with ANS or support their ANS Chapter. Throughout the conference, interacting with registering students, driving groups to tour a scientific facility, and turning rooms for technical sessions provide plentiful opportunities for volunteers to interact with myriad members on a number of levels. Thus, it will be an overall positive experience for the volunteers. Quantitative needs are outlined in Appendix G on page 67.



## 5.5 Milestones

Deadline	Task	Responsible Committee
<b>November</b>		
11/21/19	Announcement of 2021 Conference	
11/21/19	Update milestones with lessons learned	
11/21/19	Notify department of selection	Co-Chairs
11/22/19	Confirm Conference Committee	Co-Chairs
11/29/19	Finalize Conference Date	Co-Chairs
<b>December</b>		
12/1/19	Contact ANS National for support with hotel negotiations	Co-Chairs and Non-Technical
12/1/19	Set up banking through Busey Bank and ANS National	Financial
12/3/19	Confirm Conference Reservations	Non-Technical
12/3/19	Finalize Facilities Reservations	Non-Technical
12/20/19	Finalize Logo Design	Media
12/20/19	Begin Designing Website and Social Media	Media
<b>2020</b>		
<b>January</b>		
1/13/20	Finalize meeting schedule	Co-Chairs
<b>February</b>		
2/3/20	Launch social media plan	Media
2/17/20	Finalize list of potential speakers	Non-Technical
2/17/20	Finalize technical topics	Technical
<b>March</b>		
3/9/20	Contact Speakers and Presenters	Non-Technical and Technical
3/26-28/20	Attend Student Conference at NC State	All
3/28/20	Request lessons learned from NC State	Co-Chairs
<b>April</b>		
4/6/20	Create sponsor letters and contact	General Co-Chair
4/13/20	Prepare tour opportunities	Non-Technical
<b>May</b>		
5/4/20	Confirm tours and costs	Non-Technical
5/18/20	Submit Progress Report to SSC	Co-Chairs
5/18/20	Create a Call for Papers	Technical and Media
<b>June</b>		
6/7-11/20	Send Delegates to Annual Meeting in Arizona	Co-Chairs, All
<b>July</b>		
7/6/20	Confirm with all speakers and presenters	Technical
7/20/20	Report on sponsorship	Financial
7/27/20	Reassess budget	Financial
<b>August</b>		
8/10/20	Update with sponsors	Financial
8/24/20	Submit second progress to SSC	Co-Chairs
<b>September</b>		
9/14/20	Updates on conference deadlines	Financial
9/21/20	Finalize gift bag order	Non-Technical
<b>October</b>		
10/12/20	Confirm hotel blocks and contracts	Non-Technical
10/26/20	Registration Opens	Financial
10/26/20	Create and test online paper submission	Technical



November		
11/15-19/20	Attend Winter Conference 2020 in Chicago	Co-Chairs, All
11/24/20	Finalize marketing material	Media
11/24/20	Report from winter conference	Co-Chairs
December		
12/4/20	Reassess Budget	Financial
12/4/20	Update website	Media
12/18/20	Third progress report to SSC	Co-Chairs
12/18/20	Send out call for papers	Media
2021		
January		
1/4/20	Confirm all judges, panelists, and speakers	Technical
1/18/20	First paper deadline – send to reviewers	Technical
1/22/20	Recruit student volunteers	All
1/29/21	Finalize tours	Non-Technical
1/29/21	Finalize conference transportation	Non-Technical
February		
2/1/21	Finalize program	Media
2/1/21	Order gift bag items	Financial and Non-Technical
2/5/21	Final Paper Deadline	Technical
2/9/21	Extended Paper Deadline	
2/15/21	Finalize Website	Media
2/19/21	Finalize budget	Financial
March		
3/22/21	Print Programs	Media
3/26/21	Finalize Awards	Technical
3/26/21	Finalize Staff Schedule	Non-Technical
3/29/21	Final progress report to SSC	Co-Chairs
April		
4/1/21	Prepare gift bags, print tags, and banners	Non-Technical
4/8-11/21	Host ANS Student Conference 2021	
4/22/21	Return seed money	Financial
4/29/21	Process Student Reimbursements	Financial
4/29/21	Finalize financial report	Financial
4/29/21	Submit conference report	Co-Chairs



## 6 Website and Social Media

### 6.1 Website

Shortly after the host is announced, ANS-UIUC will purchase a domain name and create a website in conjunction with ANS National. The website will be hosted using GitHub pages, a free hosting service for static websites. Since there is no cost, the website can be hosted indefinitely. This webhost was selected because several members of the chapter possess knowledge and experience in using it for serving collaborative, Jekyll-based, and static HTML websites. The domain name can be purchased for as little as one dollar for the first year, and a little less than \$20 to maintain annually. If we need to cut costs or decide that a domain name ending in ".github.io" is fine we can drop the purchased domain name. The website will include important dates, costs, calendars, schedules, maps, emergency contact information, as well as a direct link to the paper submission site for the conference. The mobile web app will store downloaded maps, emergency contact information, and calendars for offline use while providing access to all features of the website as well.

### 6.2 Social Media

Two accounts will be used to monitor and promote social media at the event. The first will be a Twitter account, created specifically for the conference. This account will send out schedules and updates, as well as neat facts about events at the conference. The second account will be a Facebook page which will serve a similar function to the Twitter account. The Facebook page has the added benefit of being able to create events. This ability would be used to provide another source of schedule information to conference attendees.

## 7 Budget

### 7.1 Projected Attendance

We project to have 450 student attendees and 150 professional attendees. We have based these projections on the attendance from previous years and on our central midwestern location. Additionally, this estimate allows us to create the most conservative budget possible and be prepared in the event that attendance is unusually high. A summary of the previous attendance is shown in Table 5.

Table 5: Summary of Previous Attendance

Host	VCU	UF	UPitt	UWM	T. A&M	Penn	MIT	UNLV	GIT	Mean ( $\mu$ )	Margin ( $\frac{\sigma}{\sqrt{N}}$ )
Students	450	430	500	438	375	388	536	400	425	438	$\approx 16$
Professionals	100	120	75	130	137	134	101	200	150	127	$\approx 11$

### 7.2 Revenue

We have compared the predicted and actual revenues from previous reports and used these to estimate our expected revenue. To maintain reasonable accuracy in the budget, we were financially conservative in our estimates to account for fluctuating economy and attendance numbers. Should our bid be selected, these conservative estimates will result in a smoother planning and execution process. We have also accounted for an estimated number of waived professional registration based on previous conferences. This correlates to the number of waived fees given in our expected tier sponsorship figures and also factors in discounts to speakers, panelists, and workshop instructors.



### Attendance Revenue

Item	Quantity	Cost	Subtotal
Student	450	\$40	\$18,000
Professional	150	\$250	\$37,500
Waived	60	-\$250	-\$15,000
<b>Attendance Total:</b>			<b>\$40,500</b>

### Sponsorship Revenue

Package	Quantity	Cost	Subtotal
World Savior	1	\$30,000	\$30,000
National Hero	3	\$15,000	\$45,000
Local Prodigy	5	\$10,000	\$50,000
Lifesaver	6	\$5,000	\$30,000
Exhibitor+	3	\$3,500	\$10,500
Exhibitor	5	\$2,500	\$12,500
Good Samaritan	10	\$1,500	\$15,000
Contributor	8	\$1,000	\$8,000
<b>Sponsors Total:</b>			<b>\$201,000</b>

**Total Revenue: \$241,500**

## 7.3 Expenses

A conservative breakdown of conference expenses is outlined in Table 6 on page 47. All rooms hosted in the Union are provided to registered student organizations (such as ANS-UIUC) free of charge. This allows us to save significantly on event space. Meals catered through the University catering service reflect a 6.25% sales tax in the total cost which is not represented in the unit cost. Gratuity is neglected because it is forbidden under the catering service's policies, allowing us to save 20% gratuity on meals. Under our most conservative estimates for budget and revenue, the spending margin is found to be 6.8%. While this margin is tight, we feel this is justified as several costs in the expenses, such as reimbursements, are left significantly inflated as compared with previous years. Adopting previous years' estimates of \$60,000 for travel reimbursements leaves a spending margin of 21.6%, matching that of the most austere contingency plans provided in previous years. Assuming maximum expenses and an attendance of 450 students, the total cost per student is estimated at \$501.63. This number also includes the travel reimbursement, which was intentionally set to be considerably more generous than previous years to make the budget more conservative. Assuming every student traveled here with the average cost of flights from Table 3, our current travel reimbursement package would cover 76.8% of the accumulated costs. Neglecting the cost of travel reimbursements, the average cost per student falls to \$276.63, at or below that estimated for previous years. In Appendix G on page 68 we included quotes where possible.



Table 6: Budget Expenses

	Item	Priority	Cost Per Unit	Thursday	Friday	Saturday	General	Total Cost
Facilities	Technical Session AV	I	\$ 13.80	1	6	6	-	\$179.40
	Technical Session Rooms	I	\$ 0.00	-	-	-	1	\$0.00
	Panel AV	I	\$ 17.80	-	2	2	-	\$71.20
	Panel Rooms	I	\$ 0.00	-	-	-	1	\$0.00
	Workshop AV	I	\$ 17.80	2	-	-	-	\$35.60
	Workshop Rooms	I	\$ 0.00	-	-	-	1	\$0.00
	Dinner Room (Ihotel)	I	\$ 4,000.00	-	-	1	-	\$4,000.00
	Dinner AV (Ihotel)	I	\$ 0.00	-	-	1	-	\$0.00
	Dinner Room (Garden Hotel)	I	\$ 4,000.00	1	1	-	-	\$8,000.00
	Dinner AV (Garden Hotel)	I	\$ 0.00	1	1	-	-	\$0.00
Facilities Subtotal:								\$12,286.20
Transport	Shuttles From Hotel	I	\$ 1,000.00	4	4	4	-	\$12,000.00
	Ihotel Dinner	I	\$ 875.00	-	-	4	-	\$3,500.00
	Brewery/Starfire Tours	II	\$ 875.00	1	-	-	-	\$875.00
	Clinton Tour	II	\$ 875.00	1	-	-	-	\$875.00
	Argonne Tour	II	\$ 875.00	1	-	-	-	\$875.00
Transport Subtotal:								\$18,125.00
Food	Coffee/Tea	III	\$ 1.95	-	600	600	-	\$2,486.25
	Garden Hotel Dinners*	II	\$ 36.50	600	600	-	-	\$46,537.50
	Ihotel Dinner	II	\$ 27.50	-	-	600	-	\$17,531.25
	Dinner Cash Bars	III	\$ 336.00	1	1	1	-	\$1,071.00
	SSC Lunches	II	\$ 16.50	-	-	150	-	\$2,629.69
Food Subtotal:								\$70,255.69
Socials	Ice Skating	III	\$ 240.00	2	-	-	-	\$480.00
	Illini Rec Room	III	\$ 490.00	-	2	-	-	\$982.00
	Memorial Stadium Club 77	III	\$ 2,000.00	-	-	1	-	\$2,000.00
	Club 77 Tab	IV	\$ 3,000.00	-	-	1	-	\$3,000.00
	Guido's Tab	IV	\$ 3,000.00	-	1	-	-	\$3,000.00
Socials Subtotal:								\$9,462.00
Miscellaneous	Conference Programs	I	\$ 2,133.90	-	-	-	1	\$2,133.90
	Lanyards	I	\$ 2.54	-	-	-	600	\$1,524.00
	Award Certificates	III	\$ 2.50	-	-	50	-	\$125.00
	Poster Session Prizes	III	\$ 100.00	-	-	3	-	\$300.00
	Swag	IV	\$ 10,000.00	-	-	-	1	\$10,000.00
	Brewery Tour	IV	\$ 5.00	45	-	-	-	\$275.00
	Travel Reimbursements	I	\$ 225.00	-	-	-	450	\$101,250.00
Miscellaneous Subtotal:								\$126,857.90
Grand Total:								\$225,734.79

## 7.4 Financial Contingency

Table 7: Budget Cuts

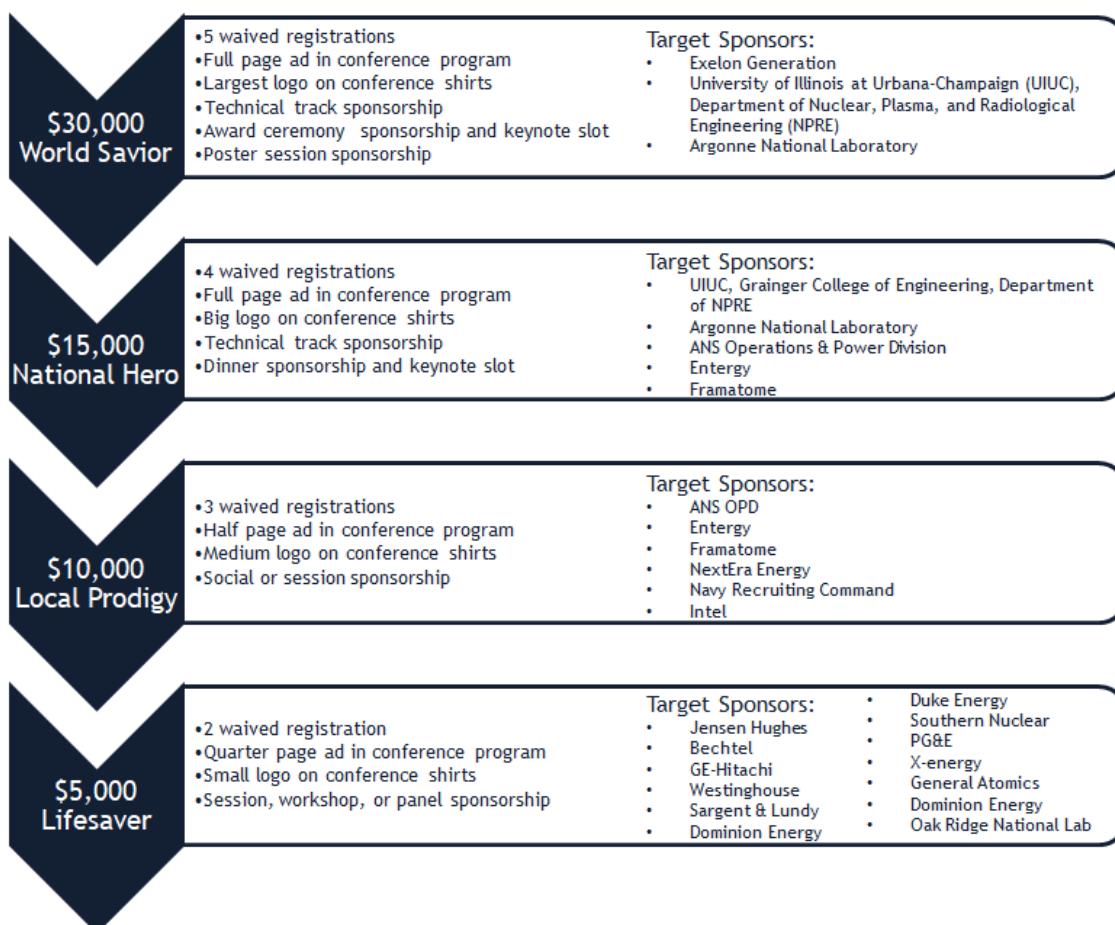
Level of Cuts Made	Amount Saved	Grand Total	% of Max Revenue
Priority IV Cuts Made	\$9,346.00	\$216,388.79	10.4%
III and IV Cuts Made	\$22,987.25	\$198,747.54	17.4%
II, III, and IV Cuts Made	\$49,053.19	\$176,681.60	26.56%

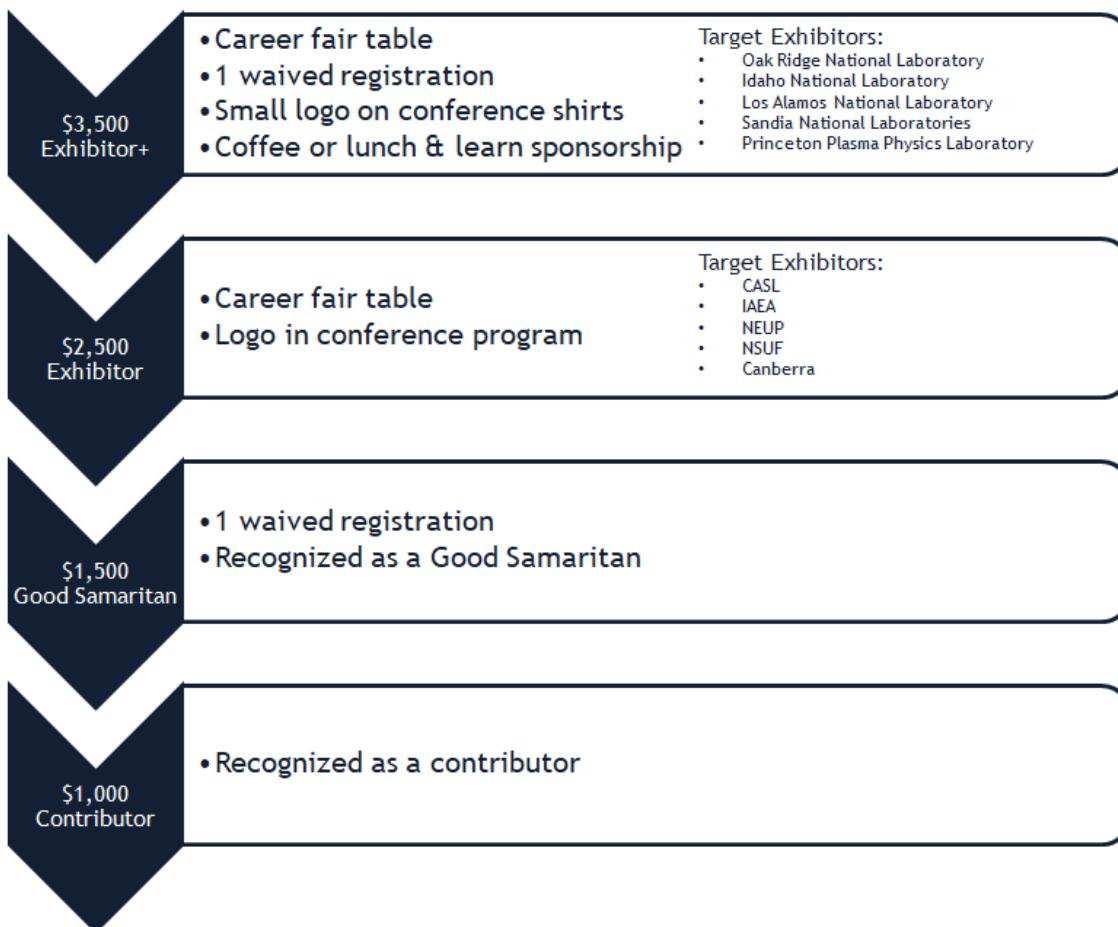


The budget is structured with priority levels outlining the order of cuts, should they be necessary. Priority I expenses are not subject to cuts under any circumstances as they are considered necessities for hosting the conference. Cuts will be made first to reduce most priority IV expenses by half, preserving events while still saving money. Priority III cuts mean eliminating all priority IV expenses and either elimination of, or reduction of the duration of social events by half. Priority II cuts entail complete elimination of social event expenses, along with elimination of tour expenses and reduction of dinner costs through cheaper buffet options and desserts. The expenditure savings from these cuts are outlined in Table 7. While this contingency plan does not consider cuts to the reimbursement funds, this could be reconsidered if necessary, since reimbursements were set aside at a level nearly double that of previous conferences.

## 7.5 Sponsorship and Fundraising

The sponsorship breakdown for our conference pulls from averages of sponsorship packages in the last several conferences, with four main tiers that tie into the conference theme for the largest representation in the conference and visibility in the career fair, socials, sessions, technical, and meals as well as in conference shirts and attendee bags. Using two tiers for an exhibitor package allows for a platform for DOE national laboratories to participate, with the higher tier having logo representation on shirts as well as the opportunity to sponsor a coffee break or lunch & learn session. Lastly, two packages are left to benefactors who are recognized in the conference program and represent the anticipated support from ANS divisions or local industry or University of Illinois contributors (or some generous contributions from out-of-state companies!).





## 7.6 Banking

In order to properly handle all of the conference expenses, two accounts will be used. One account will be with the national ANS headquarters, and the second will be a local checking account through Busey Bank. Our student section currently holds a checking account with Busey Bank and has developed a working relationship with them. Similar to previous conferences, the national ANS account will be the primary account due to their previous experience in handling conference funds and their 501(c)(3) tax exemption status. Although an account with the national ANS organization is currently not maintained by the UIUC local chapter, should this bid be selected, the opening of an account would happen almost immediately. An established local checking account with Busey Bank allows for convenience when using them as a secondary account. The student section account has been maintained for a number of years, allowing for adequate knowledge of Busey's policies and a stable relationship to be established with the local branch. A new account would be opened, such that the student chapter funds and the conference funds are completely separate and require different oversight. This account will be used for small expenses that can occur during the conference. Although the ANS-managed account could be used for such purposes, the presence of a local branch allows for more flexibility if a purchase becomes time sensitive. Should the additional Busey Bank account be unobtainable, an account would be established with Chase instead. If ANS National desires to manage all funds, accommodations will be made to consolidate the funds.

### 7.6.1 Financial Oversight

Financial integrity must be maintained when providing a conference of this size. To do so, diligent oversight will be practiced for all transactions related to the conference. Expense requests will be required for all transactions. These requests must carefully outline the reason for the purchase and the total cost. If the purchase is reoccurring, automation will be required at the time of request. These requests will require the approval of both conference chairs in addition to the financial director. Only the conference chairs



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and the financial director will have authority, assuming the previously mentioned permission, to complete transactions on the Busey Bank account. To ensure transparency, the financial director will update a public record containing all transactions.

## 7.7 Cost of Attendance and Student Reimbursement

The cost of attending the student conference, per student, varies among schools and is highly dependent on distance from UIUC and the preferred mode of travel. We will assume that minimizing cost is a priority for schools, thus number of persons per hotel room is assumed to be double the number of beds. The University of Illinois is a 2.5 hour drive from one of the largest airports in the world, O'Hare International Airport. There is also a small airport located just 20 minutes outside of campus. While some students may wish to make use of the convenience of the local airport, in general the most economic method of arriving in Champaign is by first flying to O'Hare and then busing. The average cost of this trip comes out to be \$293 as shown in Table 3. Adding this to the registration and lodging costs (see Table 1) for four nights (as students often arrive Wednesday evening) and assuming four students per room, the total cost of attendance for each student comes out to an average of \$447. The travel reimbursement is meant to help mitigate some or most of the costs for students coming to this conference to encourage future attendance at other conferences.

## 7.8 Student Travel Reimbursement Procedure

The procedure for student travel reimbursement will require each section send via email all acquired expenses in their travels and lodging for this conference. Each chapter will be required to send us:

1. The number of students that attended.
2. The number of hotel rooms reserved.
3. The location of the hotel rooms.
4. Modes of transportation
5. Parking costs (excluding airport reserved parking).
6. Receipts for all purchases will be required for all submitted purchases.

A form will be emailed to each of the chapter presidents for their section to fill out and attach the appropriate receipts. We will require that the form along with the necessary receipts be submitted via email to the Finance Director in one PDF, two weeks after the Sunday following the conference. The Finance Chair will review all of the submitted documents for any corrections that need to be made. Any section that needs to make corrections to their reimbursement form will be emailed the following Tuesday. The reimbursement form must be re-submitted to us by that Friday. Once all the sections have their forms submitted to us we will turn in our master list to ANS National for reimbursement distributions. Checks will be mailed to each of the chapter presidents or a selected representative for the chapter.

# 8 Liability

In the process of hosting a conference, especially a student conference, great care must be placed in assuring the protection of all involved parties, particularly ANS National and the hosting university, should a concern for liability arise. The following sections outline such cases.

## 8.1 Hotels

The Illini Union and the Garden Hotel in Urbana (soon to be the Radisson) are not responsible for lost, stolen, or damaged items. Damages to their premise will be charged to those responsible. These terms are to be agreed upon contractually on a guest by guest basis as rooms become occupied. Hotels are covered through their own insurance policies. A map of the campus hotel locations is available in Appendix E: Campus Map of Locations on page 65.



## 8.2 Transportation

### 8.2.1 Peoria Charter

Peoria Charter is registered with the United Motorcoach Association, International Motorcoach Group, US Department of Transportation, the cities of Champaign-Urbana, and is fully insured in the State of Illinois. They also hold a certificate of registration from the University of Illinois board. Peoria Charter assumes responsibility for the safety of their passengers.

### 8.2.2 UIUC Carpool

While using UIUC rental shuttles, employees of the University with valid driver's license will be drivers. The State of Illinois Self-Insured Motor Vehicle Liability Plan provides liability coverage to full-time, part-time, and student employees or student trustees operating a University motor vehicle in the course of their employment and in accordance with State of Illinois and University policies and procedures. The State of Illinois may accept liability to others harmed by a University employee's negligence, but occupants of University motor vehicles are not provided any medical payments. Any personal property belonging to drivers and/or occupants is the responsibility of those individuals. Neither the University nor the State of Illinois provides any insurance coverage for personal property.

### 8.2.3 CU-MTD

Though CU-MTD is the recommended mode of transportation while on campus, they are not affiliated with the conference. They are, however, liable for the safety of their passengers.

## 8.3 Dining

University Catering and the Garden Hotel in Urbana (soon to be the Radisson) assume all liability regarding foodborne illness derived from their respective events.

## 8.4 Bank Account and Expenses

ANS claims liability for unpaid expenses with primary banking orchestrated through ANS National. All receipts will be managed by the Financial Chair. It is thus imperative to save expenditure receipts and review all contracts involving the exchange of money carefully as to avoid unexpected expenses.

## 8.5 Release of Information

Since personal information - such as credit card numbers, addresses, and contact information - is necessarily gathered during registration, it is imperative that any and all leaks be avoided. ANS claims liability for leaks of secure information. Such information provided by attendees to secondary services do not fall under the liability of the conference.

## 8.6 Disabilities

UIUC is proudly a fully ADA compliant university. As such, all events hosted on campus will be compliant with ADA regulations. There can be no guarantee regarding the compliance of off-campus establishments.

## 8.7 Alcohol

During conference hosted or sponsored events at which alcohol is being served, only those at or above the age of 21 years who can produce a valid ID will be served. Establishments licensed to serve alcohol are liable for ensuring the age of their customers. Catering services reserve the right to deny service to those who cannot produce a valid form of ID regarding the sale of alcohol. Special care will be taken at events serving alcohol to ensure safe consumption and avoid cases of illness due to over-consumption, and to ensure individuals deemed too drunk will no longer be served and can return to their rooms safely. Patrons of Champaign-Urbana bars must be 19 years old to enter. It is the responsibility of those establishments



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to verify the age of their customers before serving alcohol. ANS does not assume liability for underage consumption of alcohol.



## A Appendix: Conflict Calendar

March 2021

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6
			Spring Break (Michigan)			
7	8	9	10	11	12	13
Spring Break (University of Florida, Kansas State, Virginia Commonwealth University, Rensselaer Polytechnic Institute)						
14	15	16	17	18	19	20
Spring Break (University of Illinois Urbana-Champaign, University of Tennessee Knoxville, University of Texas, Ohio State, Purdue)						
21	22	23	24	25	26	27
Spring Break (North Carolina State*, South Carolina State, Penn State, Texas A&M, Idaho State University, MIT, MS&T, University of California Berkeley, Oregon State, New Mexico State University)					Engineering Open House	
28	29	30	31	1	2	3
Spring Break (Wisconsin)				Proposed Conference Date 2		

Figure 29: Potential Date Conflicts in March 2021



## April 2021

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
28	29	30	31	1	2	3
	Spring Break (Wisconsin)			Proposed Conference Date 2		
4	5	6	7	8	9	10
				Proposed Conference Date 1		
11	12	13	14	15	16	17
				Proposed Conference Date 1		
18	19	20	21	22	23	24
						UIUC Marathon
25	26	27	28	29	30	

Figure 30: Potential Date Conflicts in April 2021

(a) Two primary (Date 1) conference dates are provided to avoid conflict with the annual UIUC Mom's Weekend



## B Appendix: Judging Forms

### Podium Presentation Rubric

Presentation Title: \_\_\_\_\_

Presenter(s): \_\_\_\_\_

University: \_\_\_\_\_

Undergraduate     Graduate

Track: \_\_\_\_\_

Date: \_\_\_\_\_

Start Time: \_\_\_\_\_

End Time: \_\_\_\_\_

#### Content (40)

\_\_\_\_ / 5 Introduction/Hypothesis

\_\_\_\_ / 5 Methods/Analysis

\_\_\_\_ / 5 Data

\_\_\_\_ / 10 Interpretation of Results

\_\_\_\_ / 10 Significance/Conclusions

\_\_\_\_ / 5 Citations/References

#### Presentation Delivery (20)

\_\_\_\_ / 5 Annunciation and Volume

\_\_\_\_ / 5 Preparedness

\_\_\_\_ / 5 Professional Attire

\_\_\_\_ / 5 Timing

#### Visual Appeal (20)

\_\_\_\_ / 5 Slide Legibility

\_\_\_\_ / 5 Slide Organization

\_\_\_\_ / 5 Use of Figures/Tables

\_\_\_\_ / 5 Logical Order/Progression

#### Audience Engagement (20)

\_\_\_\_ / 5 Body Language

\_\_\_\_ / 5 Eye Contact

\_\_\_\_ / 5 Dynamic Voice

\_\_\_\_ / 5 Ability to Answer Questions

**Total Points:** \_\_\_\_ / 100

#### Comments/Notes:

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Judge's Name: \_\_\_\_\_

Judge's Affiliation: \_\_\_\_\_



### Poster Presentation Rubric

Poster Title: \_\_\_\_\_

Poster Number: \_\_\_\_\_

Presenter(s): \_\_\_\_\_

Date: \_\_\_\_\_

University: \_\_\_\_\_

Undergraduate     Graduate

Track: \_\_\_\_\_

#### Content (40)

\_\_\_\_ / 5 Introduction/Hypothesis

\_\_\_\_ / 5 Methods/Analysis

\_\_\_\_ / 5 Data

\_\_\_\_ / 10 Interpretation of Results

\_\_\_\_ / 10 Significance/Conclusions

\_\_\_\_ / 5 Citations/References

#### Presentation Delivery (15)

\_\_\_\_ / 5 Ammunition and Volume

\_\_\_\_ / 5 Preparedness

\_\_\_\_ / 5 Professional Attire

#### Visual Appeal (25)

\_\_\_\_ / 5 Overall Appearance

\_\_\_\_ / 5 Poster Legibility

\_\_\_\_ / 5 Logical Order/Progression

\_\_\_\_ / 5 Use of Figures/Tables

\_\_\_\_ / 5 Use of White Space

#### Audience Engagement (20)

\_\_\_\_ / 5 Body Language/Use of Poster

\_\_\_\_ / 5 Eye Contact

\_\_\_\_ / 5 Dynamic Voice

\_\_\_\_ / 5 Ability to Answer Questions

Total Points: \_\_\_\_ / 100

#### Comments/Notes:

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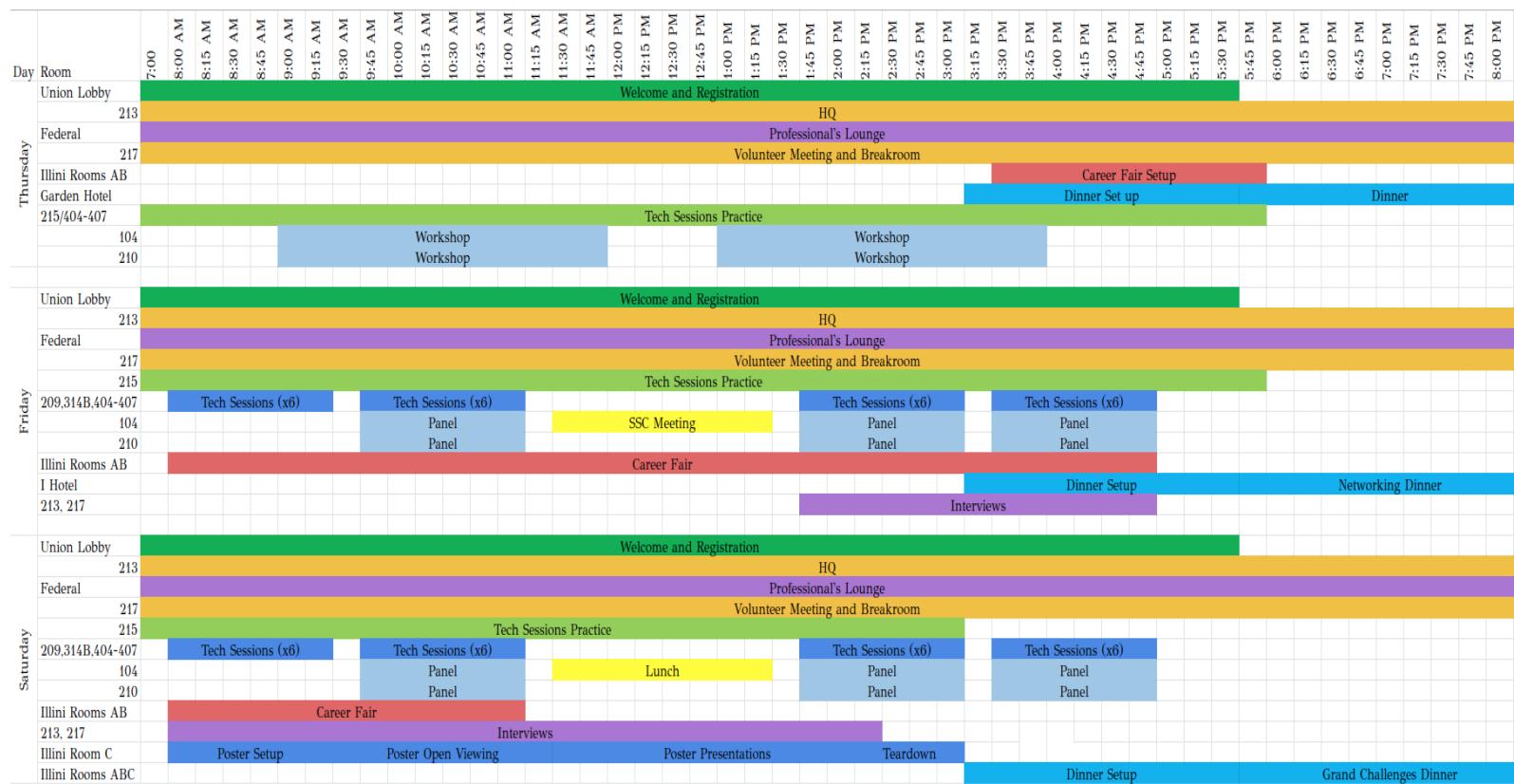
Judge's Name: \_\_\_\_\_

Judge's Affiliation: \_\_\_\_\_



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## C Appendix: Graphical Schedule





## D Appendix: Building Layout

**Rooms and Capacities: Illini Union**

Floor	Room	University Fee	Theater		Classroom		Rounds			Conference		Chairs Around Perimeter	Dimensions		
Lower Level	Federal Room	\$30							20				32' x 18'		
1st	Illini Room A	1 Room = \$75	300	600	135	270	405	112	296	60	60	105	39'x72'		
	Illini Room B	2 Rooms = \$150	300	900	135			136		60	60	117	41'x72'		
	Illini Room C	3 Rooms = \$225	300		135			136	312	60		112	41'x72'		
	104	\$160	110		42		80			36		75	45.5'x53.6'		
	Colonial Room	\$95							Special for 75				50'x33.7"		
2nd	209	\$30	42										27'x19'		
	210	\$50	88		42		56			42		66	59'x22'		
	211	\$30							16				27'x15'		
	213	\$30							18 - Solid						
	215	\$30	27										22'x16'		
	217	\$30							18 - Solid				27'x15'		
	Ballroom	\$235	430		210		274			60		156	112'x52'		
3rd	317	\$30							10 - Solid				23'x16'		
	319	\$30							10 - Solid				22'x12'		
	314A	\$50	135		63		80		54		50		29'x48'		
	314B	\$50	108		45		80		45		50		25'x48'		
	314	\$100	270				160				100		60'x48'		
4th	402	\$30							10 - Solid				15'8"x24"		
	403	\$30				12					12 - Solid		16'6"x24'4"		
	404	\$45	58		24					21 - U-Shape		46	24'x30'5"		
	405	\$45	61		24					21 - U-Shape		32	21'4"x30'5"		
	406	\$45	48		21					21 - U-Shape		42	24'x29'1"		
	407	\$45	92		36		48		30 - U-Shape		63		26'5"x45'3"		
	408	\$30							10 - Solid				13'2"x24'		
	409	\$30							10 - Solid				12'8"x21'4"		



### Floor Plans by Level: Illini Union

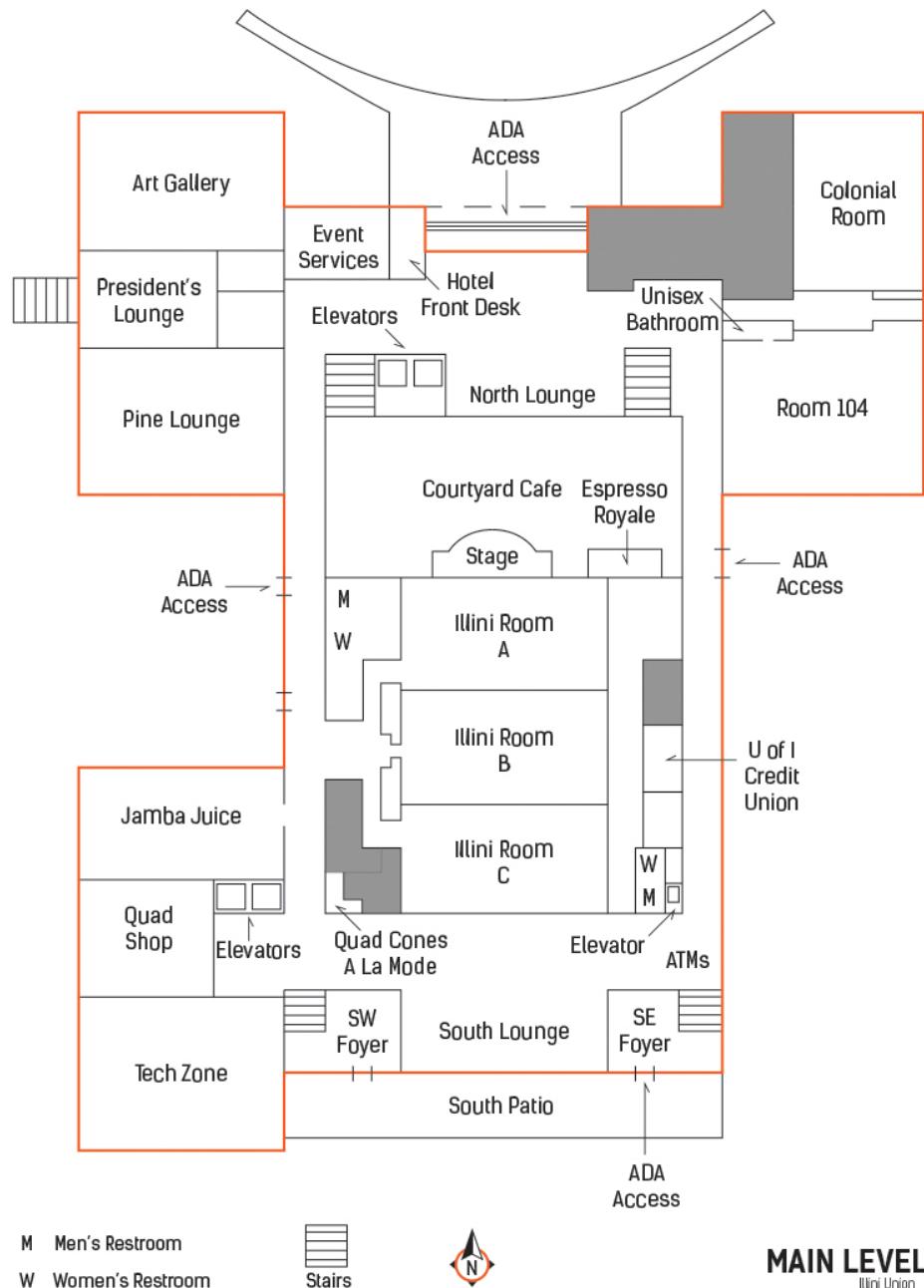


Figure 33: First Floor

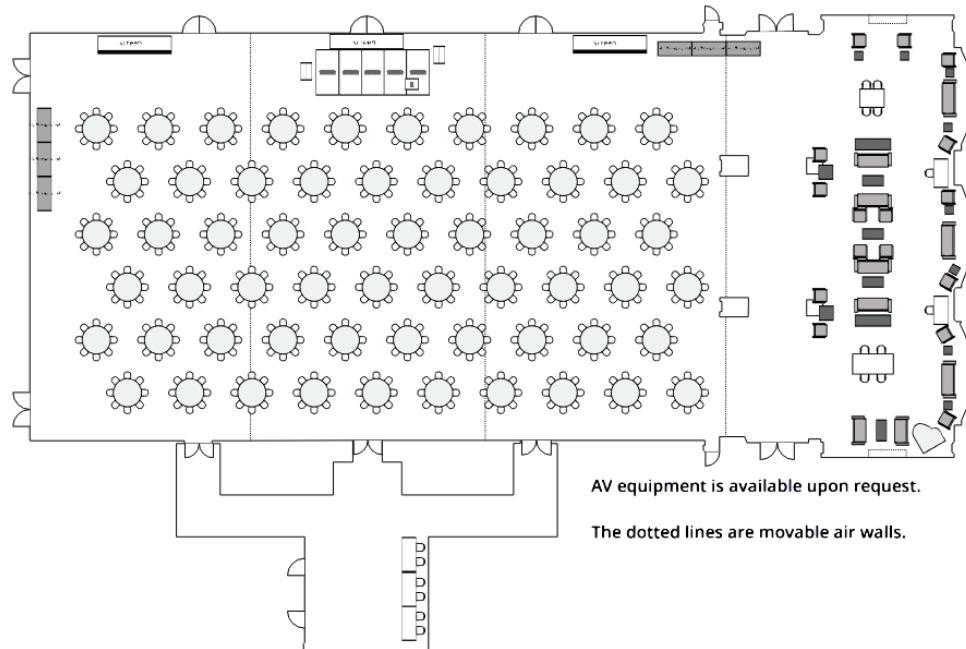
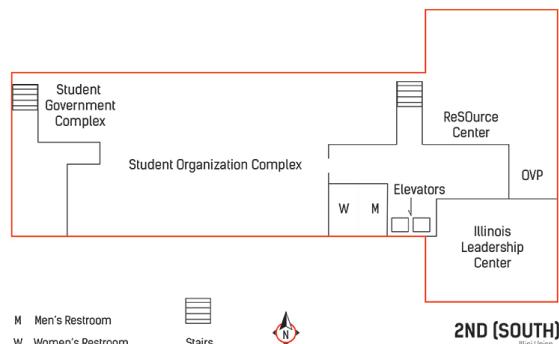
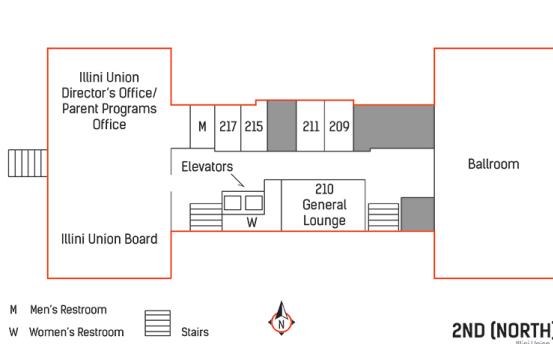
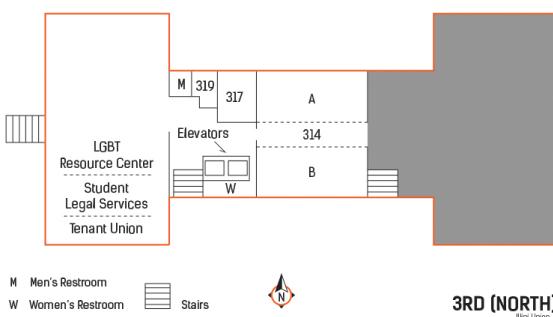


Figure 35: Illini Rooms Banquet Space



(a) Second Floor - North Side

(b) Second Floor - South Side



(c) Third Floor



(d) Fourth Floor



Room	Room Arrangement	Cost	Equipment	Dimensions
1003	10 Solid Conference Style, 12 Solid Conference Style no/av	\$50	Screen, no projector	--
1005	110 theater style, 60 herringbone/classroom, 36 U-shape conference style, 80 rounds for dining, 125 stand-up reception	\$300	Screen & projector, Audio & sound	30x60 feet
1025 Audit.	230 theater style, <b>No food or beverages allowed</b>	\$400/2hr min., \$125 ea addl hr	Screen & projector, Audio & sound	64x84 feet
1227 Video	20 Herringbone style seating, <b>No food or beverages allowed</b>	\$50/hr	2 Screens & projector	25x27 feet
2269	60 theater style only	\$150	Screen & projector	38x38 feet
3269	42 herringbone/classroom only	\$150	Screen & projector	38x38 feet
4269	24 U-shape w/wings - +12	\$150	Screen & projector	38x38 feet
5269	60 theater style, 42 herringbone/classroom style, 24 square shape, 21 half-octagon U-shape, 48 rounds for dining, 75 stand-up reception	\$350	no screen or projector	30x30 feet (octagon-shaped room)
5602	100 theater style, 60 herringbone/classroom, 36 U-shape conference style, 72 rounds for dining	\$350	Screen & projector, Audio & sound	30x55 feet
Atrium	200 stand-up reception, 16 rounds for dining, 100 theater-style	\$500	no screen or projector	--

Figure 36: Information about the room capacities of Beckman Institute



## I Hotel Floor Plan

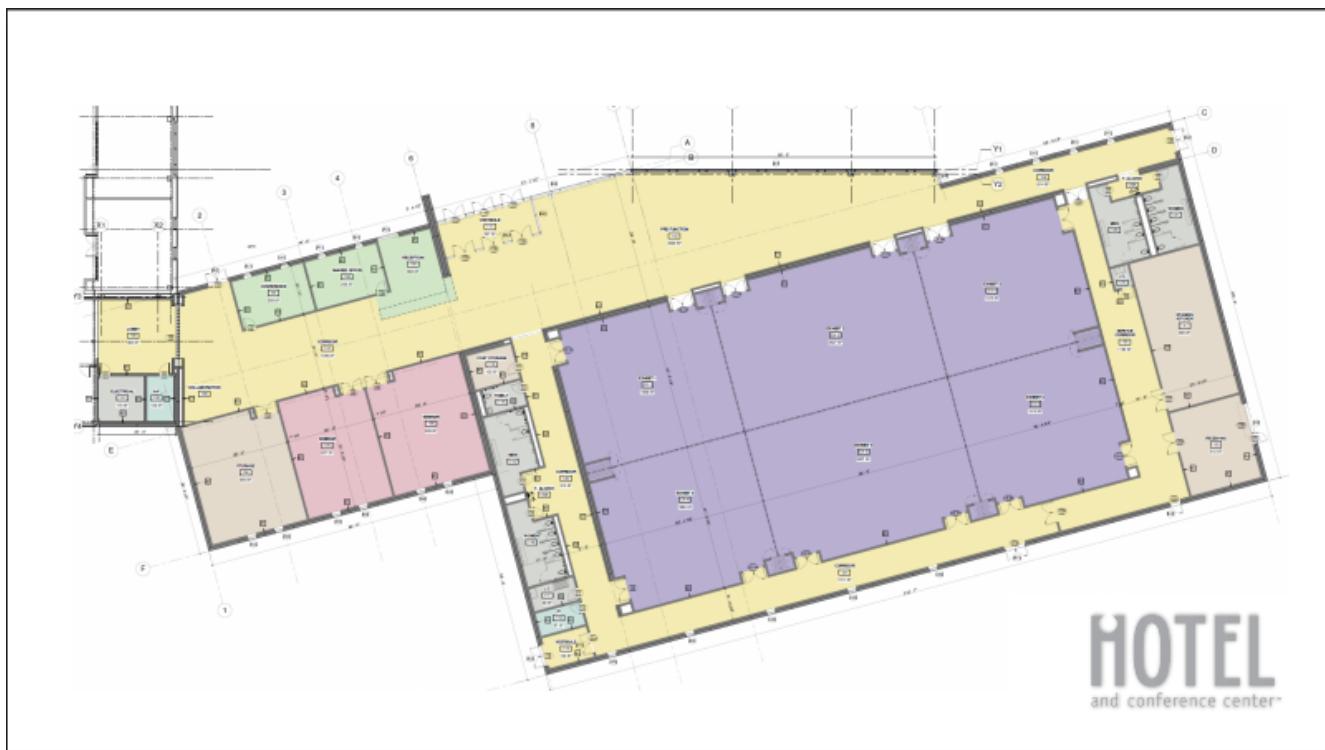
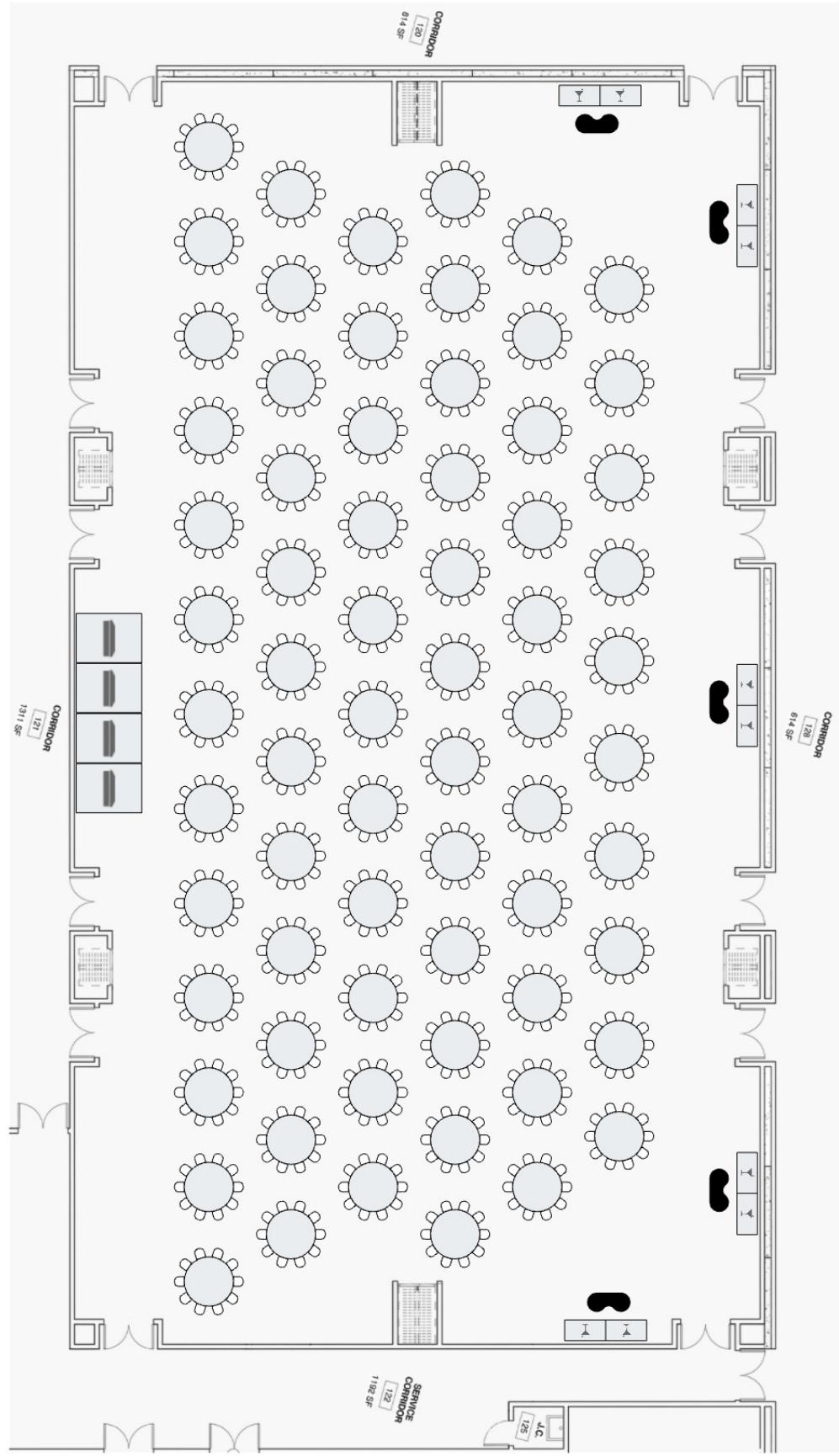


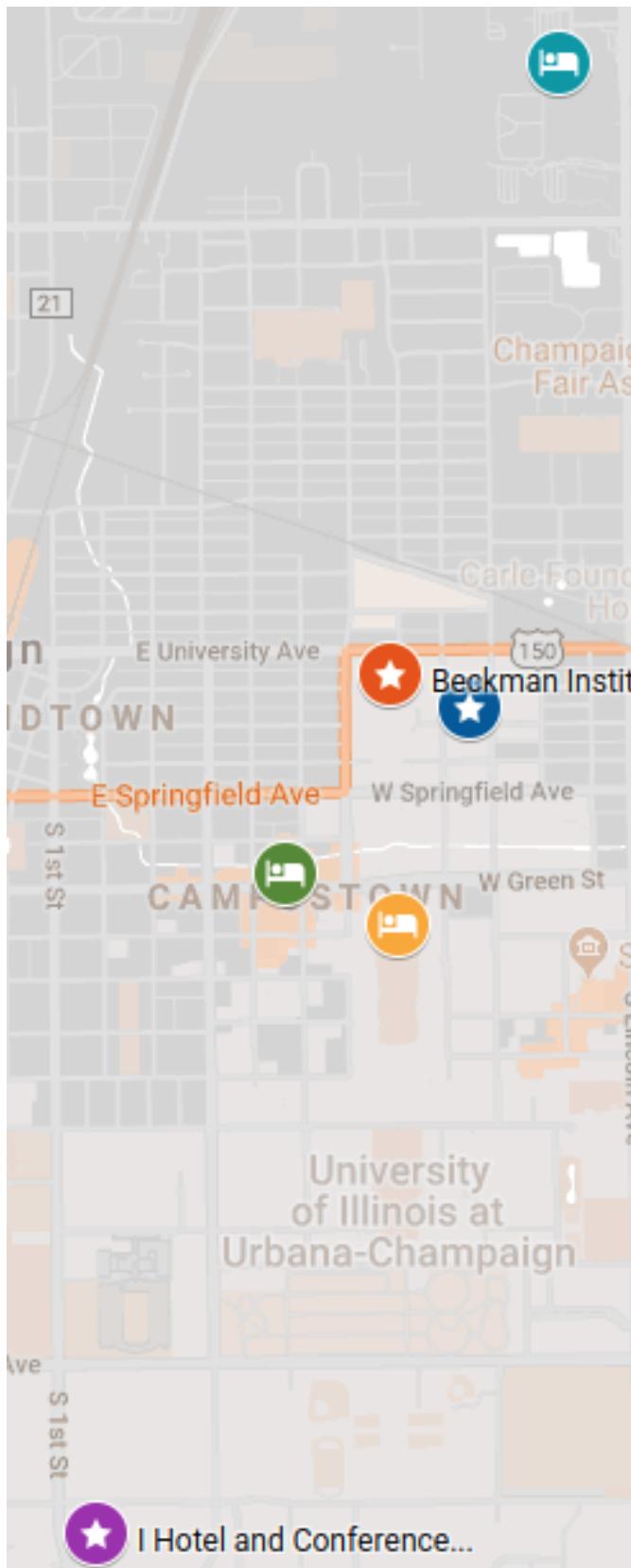
Figure 37: Conference space for the expanded I Hotel.



10 Feet



## E Appendix: Campus Map of Locations



- Garden Hotel Urbana
- TownePlace Suites
- Illini Union Hotel
- I Hotel and Conference Center
- Beckman Institute
- NCSA

Left: Points of Interest

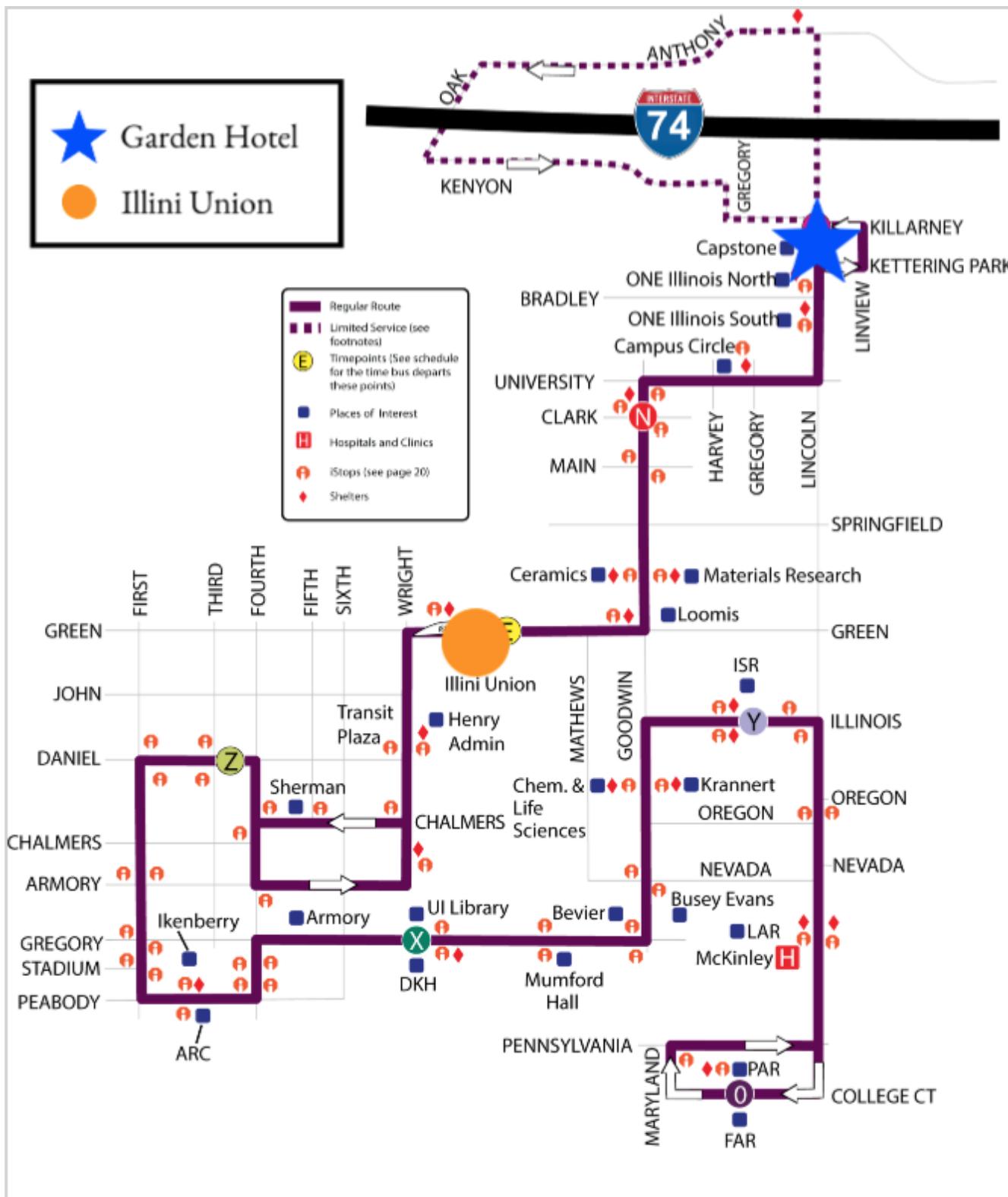


Figure 38: The 22 Illini Bus Route



## F Appendix: Staffing Requirements

Table 8: Staffing Requirements by Day

Event	Description	Volunteers
<b>Thursday</b>		
Registration	3/shift, 5 2-hr shifts	15
Student HQ	2/shift, 5 2-hr shifts	10
Professional's Lounge	1/shift, 5 2-hr shifts	5
Workshops	1/workshop for technical assistance	4
Bussed Tours	1/tour for logistic assistance	4
Campus Tours	4 tour groups, 2 per group	8
Dinner	4 all purpose	4
Social	2 all purpose	2
Career Fair Setup	2 to assist recruiters	2
Total		54
<b>Friday</b>		
Registration	2/shift, 5 2-hr shifts	10
Student HQ	2/shift, 5 2-hr shifts	10
Professional's Lounge	1/shift, 5 2-hr shifts	5
Technical Sessions	Session MCs	24
Panels	1/panel for technical assistance	4
Dinner	4 all purpose	4
Social	2 all purpose	2
Total		59
<b>Saturday</b>		
Registration	2/shift, 5 2-hr shifts	10
Student HQ	2/shift, 5 2-hr shifts	10
Professional's Lounge	1/shift, 5 2-hr shifts	5
Technical Sessions	Session MCs	24
Panels	1/panel for technical assistance	4
Poster Session	2 all purpose	2
Dinner	4 all purpose	4
Social	2 all purpose	2
Total		61



## G Appendix: Quotes



**Jake Winkler**

to me ▾

Samuel,

Mon, Sep 23, 10:43 AM (6 days ago)



With the UIUC contracted rate, the price is \$100/hour or \$875 minimum for our 55 passenger coach. It sounds like you would need the buses for 8 hours or less so that rate would be \$875.

Let me know if you have any questions.

In order to book I would need to know exactly how many buses you would want each day.

**Jake Winkler** Charter Sales Manager



**Peoria Charter Coach**

**Office:** 800.448.0572 Ext. 127

**Fax:** 309.688.9520

**Email:** jwinkler@peoriacharter.com

**Website:** www.PeoriaCharter.com

**Address:** 2600 NE Adams St | Peoria, IL 61603



Find me on facebook



Follow on Twitter



Let's connect!

...



Jeremy Mettler <jmettle2@illinois.edu>

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## RSO Sponsored Conference Proposal

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**Illini Union Event Services** <iueventservices@illinois.edu>  
To: "Mettler, Jeremy Jacob Harry" <jmettle2@illinois.edu>

Wed, Sep 25, 2019 at 1:21 PM

Hi Jeremy,

Rooms are rented at no charge to RSOs. You will also receive a discount on any multimedia you request.

To reserve a screen and AV cart, it will cost \$13.80 per room. The Illini Union Event Services rents out projectors and HDMI cords for 24 hours at a time to RSOs at no cost. You will simply need to reserve the amount of projectors you require in advance.

A microphone will vary in cost depending on whether you would like it to be wireless or handheld. A wired microphone is cheaper, and will likely cost around \$4 per room.

I hope this clears up some confusion. Please let us know if you need anything else.

Best,  
Rachel Melancon

### ILLINI UNION EVENT SERVICES

Student Affairs | University of Illinois at Urbana-Champaign  
1401 W Green | Urbana, IL 61801  
217-333-0691 | [iueventservices@illinois.edu](mailto:iueventservices@illinois.edu)  
[union.illinois.edu/spacerequestform](http://union.illinois.edu/spacerequestform)



*Under the Illinois Freedom of Information Act any written communication to or from university employees regarding university business is a public record and may be subject to public disclosure.*

---

**From:** Jeremy Mettler <jmettle2@illinois.edu>  
**Sent:** Wednesday, September 25, 2019 11:12:40 AM  
**To:** Illini Union Event Services <iueventservices@illinois.edu>  
**Subject:** Re: RSO Sponsored Conference Proposal

[Quoted text hidden]



Jeremy Mettler <jmettle2@illinois.edu>

---

## I Hotel and Conference Center; 600 Person Dinner--2021

1 message

Kelsey Clapp <kclapp@stayatthei.com>  
To: "jmettle2@illinois.edu" <jmettle2@illinois.edu>

Tue, Sep 24, 2019 at 1:22 PM

Hi Jeremy,

Thank you for reaching out! We would love to be the host of the spring 2021 dinner you are planning! I have attached here a mockup of the outside of the facility, along with two floor plans that I believe will fit your needs! The facility will rent for \$4000 for the day and has a \$15,000 catering minimum on Saturday nights only. Our staff will do the full set up and tear down of the room and provide tables, chairs, risers for a stage and a variety of audio visual. Attached is our included AV menu that will be available with the space. I have also attached our catering brochure through University Catering. We exclusively use University Catering as our conference center dining option. Since it is run through the University which is a state entity, they do not charge an additional 18-20% gratuity that other facilities charge. Table linens and floral are also provided through the University. White floor length table linens and black or white cloth napkins can be provided, as well as a simple bud floral base for each individual table.

Please let me know if you have any questions at all or if you would like me to place any tentative holds for you!

Best,

Kelsey



**Kelsey Clapp | Sales Coordinator**

**p** 217.819.5003 | **f** 217.819.5010  
I Hotel and Conference Center  
1900 South First Street  
Champaign, Illinois 61820  
[www.stayatthei.com](http://www.stayatthei.com)

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### 5 attachments

- Expansion Sales materials.pdf**  
4110K
- Expansion 690 Rounds with 5 Bars.pdf**  
339K
- Expansion 660 Rounds with 6 Buffets.pdf**



## H Appendix: Letters of Support

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## THE GRAINGER COLLEGE OF ENGINEERING

Department of Nuclear, Plasma, & Radiological Engineering  
216 Talbot Laboratory, MC-234  
104 S. Wright St.  
Urbana, IL 61801

September 24, 2019

To the ANS Student Conference Selection Committee:

I am pleased to write to you in support of the University of Illinois at Urbana-Champaign American Nuclear Society (ANS) student section proposal to host the 2021 ANS Student Conference. I am confident that our students are united, motivated, and ready to engineer an excellent student conference in 2021. As Department Head, I can also confirm that the students will be supported by the Department of Nuclear, Plasma, and Radiological Engineering (NPRE) and its faculty if their proposal is selected.

The University of Illinois at Urbana-Champaign ANS student section has performed exceptionally for many years. NPRE and The Grainger College of Engineering have matched their fantastic efforts by dedicating significant resources to the growth and sustainability of the section. Thus, the ANS-UIUC section is the healthy, robust cultural core of the department. The work they have already done to plan this conference proposal is evidence of their strong intent to showcase our university, department, and student section.

Their motivation is well-placed, as this is a very exciting time to invite students and professionals to visit NPRE at Illinois. The department has grown tremendously in the past five years, with many new hires doubling our faculty population. This remarkable growth is coupled with increased depth and breadth of our research and course offerings. Additionally, student experiences are enriched by new facilities such as the HIDRA stellarator-tokamak, a world-class plasma fusion device. Our faculty recognizes that the ANS Student Conference is a unique opportunity for our students to share the department's renewed strength with the national ANS student population. We are accordingly thrilled to support their bid for the 2021 ANS Student Conference.

Sincere regards,

A handwritten signature in black ink, appearing to read "Rizwan Uddin".

Rizwan Uddin  
Professor and Department Head



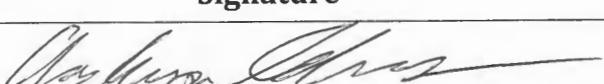
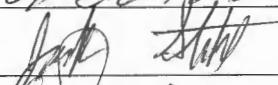
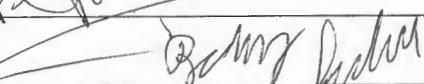
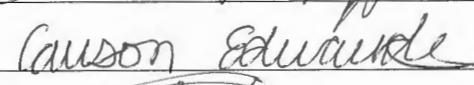
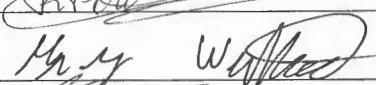
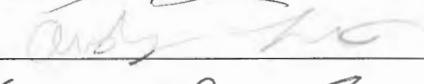
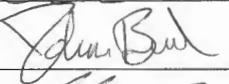
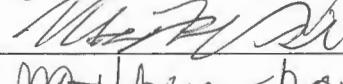
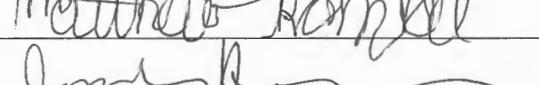
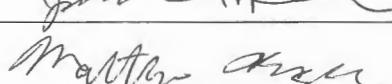
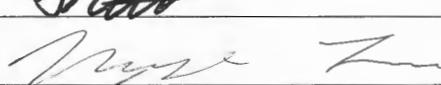
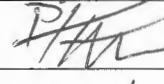
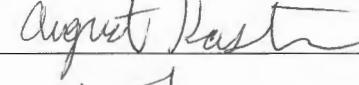
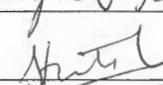
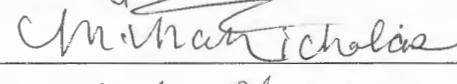
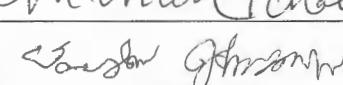
## I Appendix: Student and Faculty Support

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I pledge my support to the student section of the American Nuclear Society at the University of Illinois at Urbana-Champaign in hosting the 2021 ANS Student Conference

Name	Signature
Sam Dotson	Sam Dotson
Jeremy Mettler	Jeremy Mettler
Dario Panici	Dario Panici
KELSEY LUC	Kelsey Luc
Erik Medhurst	Erik Medhurst
Dilan Kurukulasuriya	Dilan Kurukulasuriya
Franklin McDonnell	Franklin McDonnell
Stephen Armstrong	Stephen Armstrong
James Shehee	James Shehee
David Leonhardt	David Leonhardt
Anish Tallam	Anish Tallam
Nathan Rya	Nathan Rya
Brierson Johnson	Brierson Johnson
Joshua Hoffman	Joshua Hoffman
Kathryn Huff	Kathryn Huff
Matt Kabelitz	Matt Kabelitz
Kavita Desai	Kavita Desai
Cody Moynihan	Cody Moynihan
Aveek Kapat	Aveek Kapat
Steven Stemmley	Steven Stemmley
Dominic Piedmont	Dominic Piedmont
Joe Bottini	Joe Bottini
Natalie Gaughan	Natalie Gaughan
Dan O'Dea	Dan O'Dea
Christram Williams	Christram Williams

I pledge my support to the student section of the American Nuclear Society at the University of Illinois at Urbana-Champaign in hosting the 2021 ANS Student Conference

Name	Signature
Andrew Shone	
Jack Stahl	
Dhruval Patel	
Zachary Ocholl	
Carson Edwards	
ROBERTO FAIRHURST	
Greg Westphal	
Jon Dobny	
Stephanie Oti-Mansivais	
Caleb Brooks	
Fady Elw	
Connor O'Donnell	
John Beal	
Matthew Wens	
Matthew Kozicil	
Jordan Heidrick	
Matthew Kozak	
Andrew Fine	
Muzammil Siddiqui	
Nayeli Lvara	
Phillip Tanton	
August Kasten	
Shuti Sweani	
Meagan McNicholas	
Taylor Johnson	

I pledge my support to the student section of the American Nuclear Society at the University of Illinois at Urbana-Champaign in hosting the 2021 ANS Student Conference

Name	Signature
Andrew Santedo	Andrew Santedo
Kaitlyn Butler	Kaitlyn Butler
Alp Akutun	Alp Akutun
PATRICK BRAND	PATRICK BRAND
Isabella Iaccino	Isabella Iaccino
Alexandra Fanning	Alexandra Fanning
Ibrahim Jarrar	Ibrahim Jarrar
Anna Balla	Anna Balla
Elias Kotleinis	Elias Kotleinis
Katangra Borowiec	Katangra Borowiec
WEN-CHI CHENG	WEN-CHI CHENG
Hla Bri	Hla Bri
NOAH BUCKWICK	NOAH BUCKWICK
Jiaqi Chen	Jiaqi Chen
Taiyong Zhang	Taiyong Zhang
Longxiang Zhu	Longxiang Zhu
Muhammad Abdelghany	Muhammad Abdelghany
Teja Jeleniakas	Teja Jeleniakas
Moutaz Elias	Moutaz Elias
Sani Alkhatib	Sani Alkhatib
Jaemin Yang	Jaemin Yang
Travis Mui	Travis Mui
Zhihua Liu	Zhihua Liu
Jiajin Zhang	Jiajin Zhang
Xingchen Nie	Xingchen Nie

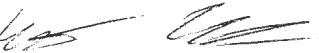
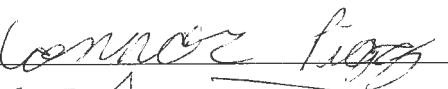
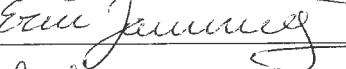
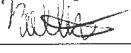
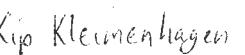
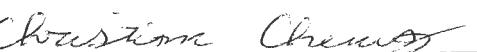
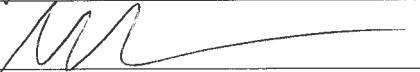
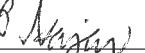
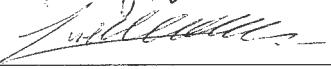
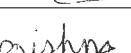
I pledge my support to the student section of the American Nuclear Society at the University of Illinois at Urbana-Champaign in hosting the 2021 ANS Student Conference

Name	Signature
Yunlai Chen	yunlai chen
Eric Lang	Eric J. Lang
Hamza Khan	Hamza Khan
Anshuman Chawbe	Anshuman Chawbe
Anthony Ruzzo	Anthony Ruzzo
Alim Lee	Alim Lee
Xin Zhi Tan	Xin Zhi Tan
Md Fazlul Huq	Md Fazlul Huq
Carlo Doramillo	Carlo Doramillo
Alvaro Pizurro	Alvaro Pizurro
Shane Keniley	Shane Keniley
Tianxin Zhou	Tianxin Zhou
Lyon Derrini	Lyon Derrini
Tay Choi	Tay Choi
Mohammad Mustafa	Mohammad Mustafa
Erik Medhurst	Erik Medhurst
Aric Tate	Aric Tate
Zoe Richter	Zoe Richter
Greg Romanchek	Greg Romanchek
Mikayla Molnar	Mikayla Molnar
Sonata Valaitis	Sonata Valaitis
Natalie Gaughan	Natalie Gaughan
Carly Rennies	Carly Rennies
Daniel Arizaga	Daniel Arizaga
Michael A. Lively	Michael A. Lively

I pledge my support to the student section of the American Nuclear Society at the University of Illinois at Urbana-Champaign in hosting the 2021 ANS Student Conference

Name	Signature
Thomas C. Brautigam	Thomas Brautigam
Brady J. Moran	Brady Moran
Arthur Marroco	Arthur Marroco
John Butler	John Butler
Oliver Johnson	Oliver Johnson
Joe Solar	Joseph Solar
Tony Kajic	Tony Kajic
Jasmine Dihani	Jasmine Dihani
Rosendo Martinez	Rosendo Martinez
Shunko Cha	Shunko Cha
Andrew Ernst	Andrew Ernst
Andrew Lin	Andrew Lin
Emily Susey	Emily Susey
Cassandra Soto	Cassandra Soto
Armando Lopez	Armando Lopez
Anthony Evans	Anthony Evans
Antonio Santa Ana	Antonio Santa Ana
Elias Kotekinis	Elias Kotekinis
Michael Hysick	Michael Hysick
Amber Hunter	Amber Hunter
Andreas Oehler	Andreas Oehler
Tobin Blizzard	Tobin Blizzard
Branden Bodner	Branden Bodner

I pledge my support to the student section of the American Nuclear Society at the University of Illinois at Urbana-Champaign in hosting the 2021 ANS Student Conference

Name	Signature
Erik Smith	
Connor Pigg	
Erin Fanning	
Nathan Bartholomew	
Andy Christensen	
Kip Klementhen	
Christian Cheng	
Anish Tallam	
Alexandria Nolan	
Rauf Najam	
LUCAS HAZPER	
David Atwater	
Junior George	
Krishna Chaitanya	
Skil Kumar	

Can Yang

Jin, Yifei

Heather Sandefur

Mikhail Finko

Day Mao

SUNDA & NAM AIA

B. Ja. Meh

Can Yang

Jin, Yifei



N. Sudan