American Nuclear Society Student Section at The Ohio State University

March Newsletter

This Month's ANS Events:

Academic Tour to Perry Nuclear Power Plant

Join us on **March 2nd** for a full day event where we travel to the Perry Nuclear Power Plant! Stay tuned for more information on schedules and other details. Registration for the event is required and has closed, but we can't wait to see you all there.

ANS OpenMC Workshop

Come learn more about OpenMC with Jacob Stonehill, OSU PhD Student, on **March 25th** from 6-8 PM in Scott Lab Room E100!

Speaker from Academia with Dr. Dean Wang

Join us for an event where Dr. Dean Wang will be speaking on all things academia and nuclear on **March 31st** from 5-6:30 PM in Scott Lab Room E525!

For more information about our upcoming events take a look at our website!

Stay Connected with the "Nuclear World" at OSU!

Nuclear Engineering Minor Classes

Are you starting to plan classes for Fall 2026? Well take a look at the classes the Nuclear Engineering Minor has to offer on their webiste!

Nuclear Seminar

Check out a seminar from Dr. Ayman Hawari, a visiting professor from Texas A&M University, about "Neutron Thermalization: Manipulating the DNA of Thermal Nuclear Reactors" on March 11th from 11:10 AM to 12 PM in Scott Lab E141. To learn more about the speaker visit the College of Engineering website!

ANS Announcements:

ANS Annual Conference

Register for the 2026 ANS Annual Conference if you are interested in sharing your research and learning more about current research in the nuclear field. Visit the ANS website for more information on the conference in Denver, Colorado!

2026 MeV Summer School

The Modeling, Experimentation, and Validation (MeV) Summer School is an intensive two-week on-site program for early-career researchers and scientists. The school is to be held July 20 - 31, 2026 and hosted by Idaho National Laboratory (INL) located in Idaho Falls, ID. It will focus on the topic of "Ushering in a New Era in Nuclear Power: The Convergence of Advanced Reactors, Artificial Intelligence, and Regulatory Modernization" If you're interested in attending visit our website for more information!

OpenMC Event Interest Form

If you are interested in attending our OpenMC event on **March 25th** please fill out this interest form and look at our website for more information on the event!

ANS GroupMe

For more information about all things ANS and a platform to connect with ANS members, join our new GroupMe platform!

Faculty Spotlight

Dr. Richard Vasques



Dr. Vasques is an Assistant Professor in the Nuclear Engineering Graduate Program within the Department of Mechanical and Aerospace Engineering. His expertise includes neutron transport and diffusion, fission reactor physics, transport in stochastic mixtures, nonclassical transport theory, advanced modeling and simulations, radiative transfer in atmospheric clouds, volume rendering for computer graphics, and homogenization techniques. To learn more about Dr. Vasques and his work visit his page on the Department of Mechanical and Aerospace Engineering website.

What are some projects that you are currently working on that you are most excited about, and what can you tell us about them?

I'm working on a few projects that all focus on improving how we model particle transport when real materials and geometries break the usual assumptions. One major area is nonclassical transport theory, where we account for spatial correlations and memory effects that standard models average away. This has direct implications for reactor physics and for how we interpret particle transport in heterogeneous systems.

In parallel, I'm working on generalized quasidiffusion methods, where the goal is to retain the correct physics through consistent Eddington factors while making the equations cheaper and more robust to solve, especially for coupled multiphysics problems. "Huh… what?" I can almost hear you ask. Technical mumbo jumbo aside, this is about getting answers that are very close to what the hardest, most expensive models give you, but in a way that is much faster, more stable, and actually usable in practice.

Separately, I also work on neutron spectrum unfolding and diagnostic tools, which are much more data driven. These projects focus on extracting reliable physical information from measurements, often in close collaboration with national labs, and increasingly make use of machine learning to improve accuracy and robustness while staying grounded in the underlying physics.

What inspired you to pursue a career in nuclear science?

I liked math a lot, but I was always drawn to equations that were trying to describe something real and imperfect, not just something elegant on paper. Nuclear science showed up as a field where applied mathematics is absolutely central, and where small mathematical assumptions can lead to very different physical predictions. That combination grabbed me early.

What hooked me was particle transport in particular. It is mathematically rich, but it is also very tangible. Those equations are describing real particles moving through real materials, and people actually rely on the answers. That combination of rigorous math, physical intuition, and real consequences made it feel like the right long-term home for me.

I sometimes wish I had a more cinematic origin story about wanting to save the world or solve the energy crisis, but if I'm honest, it mostly started with curiosity and a lot of nerdiness. The bigger-picture motivation came later.

How does your work connect to real-word applications or industry needs?

A lot of my work sits right at the interface between theory and use. The questions I care about usually come from places where existing tools are being pushed hard, like reactor analysis, neutron diagnostics, or radiation measurements, and people start running into the limits of standard models. That is where better math and better physics actually matter.

On the transport side, improving models and reduced-order methods helps make simulations more reliable and more practical for real systems, especially when you are dealing with complex materials or coupled physics. Those are exactly the situations industry and national labs care about, because they are the ones that show up in real designs, not idealized examples.

On the diagnostics side, the work on spectrum unfolding and data interpretation is directly motivated by measurement problems. The goal is to turn messy experimental data into information you can trust, without treating the analysis as a black box. In both cases, the connection to applications is pretty direct. If the math is wrong or too fragile, the decisions based on it will be too.

And there is also another whole fun side to this research. I actively work on transport problems in atmospheric sciences, including cloud radiative transfer, where the same equations help us understand how light and radiation move through the atmosphere. I also collaborate on problems connected to computer graphics and animation, where transport theory is used to render light, fog, and scattering in a physically realistic way. It is genuinely satisfying to see the same mathematical ideas show up in contexts ranging from reactors to weather models to CGI.

What is one piece of advice you would give to someone pursuing a career in the nuclear field?

Know your math. Seriously.

You do not need to be a prodigy, but you do need to be comfortable with equations, approximations, and asking what assumptions are hiding under the hood. In nuclear engineering, the physics, the codes, and the data all sit on top of math, and if you understand that layer, everything else becomes much easier to learn and much harder to fool you.

And as a bonus, good math gives you flexibility. It lets you move between subfields, pick up new tools faster, and have real confidence in your work instead of just trusting a black box.

What is an example of a nuclear advancement that you hope to see in the next ten years?

So glad you asked.

Honestly, the advancement I most hope to see has less to do with a specific technology and more to do with culture. I would love to see the nuclear field become more humane and more intentional about how it trains and treats people, especially graduate students. We do a great job teaching equations and codes, but we are not always great at remembering that the people learning them are future colleagues, not raw material to be processed.

I hope we move toward programs where graduate students are trained to think and act as peers in the profession. That means being invited into real technical discussions, being taught how to ask good questions, how to disagree constructively, and how to develop their own scientific voice. It also means moving away from models where exhaustion is treated as a badge of honor and where students feel like they have to suffer to belong.

If we can build environments where students are respected as developing professionals, supported as people, and challenged in healthy ways, I think the field will be better for it. You end up with researchers who are more confident, more creative, and more willing to stay in the field long term. That kind of advancement may not make headlines, but it would make a real difference.

Do you have a favorite element or isotope?

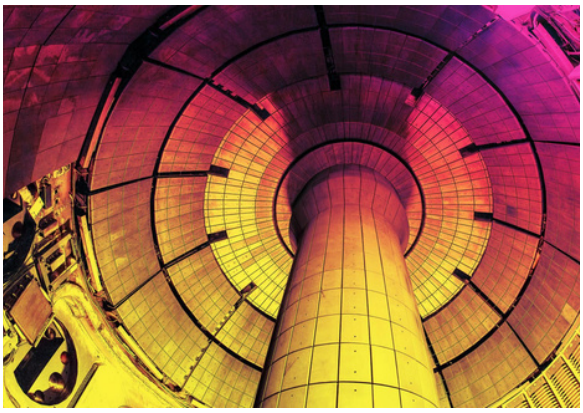
I don't have an official favorite, but if pressed I'd probably say neutrons… which I realize is not technically an element or an isotope, but that feels very on brand.

If I'm forced to play by the rules, then something like U-238 wins by sheer personality. It is patient, slightly stubborn, not immediately useful on its own, but central to how nuclear systems actually work. It does not demand attention, it quietly shapes everything around it, and it makes you do real math instead of letting you wave your hands. I respect that.

So yes, my favorite "element" is either a particle that is not an element, or an isotope that refuses to cooperate unless you treat it properly. Aaaand having written this just now I realize it probably says more about me than the answer itself…

What's New with Nuclear?

PPPL's Fusion Research Advancement



Princeton Plasma Physics Laboratory (PPPL) has began using AI technology to accelerate the development of fusion energy research through the use of computer simulations. Simulation, Technology, and Experimental Leveraging Learning-Accelerated Research enabled by AI (STELLAR-AI) was developed as a part of the Department of Energy's Genesis Mission, created because of last year's presidential executive order to speed up AI applications in scientific research. Using this AI platform will supposedly reduce the time required to run fusion-related simulations and develop AI programs that can design ideal fusion systems.

This platform "connects computing resources directly to experimental devices" like PPPL's National Spherical Torus Experiment-Upgrade (NSTX-U), "allowing researchers to analyze data as experiments are being conducted". Some projects that STELLAR-AI is being used for include the creation of a digital twin of the NSTX-U, designing stellarators, and more. To learn more about STELLAR-AI and PPPL's new initiative, visit the article from NuclearNewswire!

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