

Department of

PHYSICS

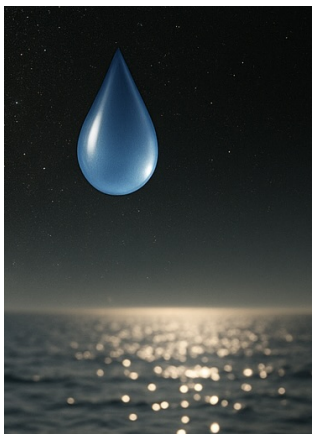
alumni
newsletter

www.ndsu.edu/physics

NDSU NORTH DAKOTA
STATE UNIVERSITY

DECEMBER 15, 2025

Greetings Alumni and Friends



"If every star in the observable universe turned into a drop of water and fell as rain on our Earth, how much would the sea level rise?" The answer is less than one meter. Doesn't that seem disappointingly little in view of the billions of galaxies that each contain billions of stars? The answer puts the unimaginable into a different perspective. If it happened (hypothetically, of course), it would be challenging for us humans, but we could deal with it.

Different perspectives can also help us grasp the many challenges we currently face in our society. For me as a physicist, the deliberate ignorance of even basic scientific knowledge and the funding cuts for many science fields are most concerning. Severe cutbacks to agencies like the NSF and NIH threaten to undermine our nation's leadership in science and technology. This is happening at a time when we should be advancing collaboration on a global scale to address worldwide challenges (including sea level rise). Yet human development throughout history has been non-homogeneous, resembling stick-slip motion with friction or dynamic instabilities when microtubules grow inside a cell. Patterns reappear across scales: the golden ratio appears in the helix of DNA and also in the shape of a spiral galaxy. That persistence instills me with hope that things will improve at some point. It just depends on perspective.

It took a while to produce a newsletter again, but here it is. As always, quite a bit has happened. We are now in a different college, Arts and Sciences instead of Science and Mathematics, as a result of the 2023 Transform NDSU process. The new college is much larger and more diverse, and we have benefited from these changes, especially through an increased number of Teaching Assistants. Our faculty and students re-

main devoted to their many activities. Some highlights are the recognition of our Society of Physics Students chapter as Outstanding in 2022-23 and Distinguished in 2023-24, Mila Kryjevskaja's 64th Faculty Lectureship Award, and Yongki Choi's drone workshops, which he has offered on many occasions.

As always, I hope that you, dear reader, are doing well, staying healthy, and supporting your loved ones. Please don't hesitate to share your thoughts with us.

Sylvio May,
Department Chair

Faculty Lectureship Award

Our faculty member Dr. Mila Kryjevskaja is the recipient of NDSU's 64th Faculty Lectureship Award for the 2024-2025 academic year. Mila's research in physics education focuses on improving learning and teaching through evidence-based instructional innovations. She plays a national leadership role in advancing research-based teaching and currently serves as representative of the Topical Group on Physics Education Research in the Committee on Education of the American Physical Society. The Faculty Lectureship is one of NDSU's most prestigious honors, recognizing excellence in teaching, scholarship, and service.

NDSU NORTH DAKOTA
STATE UNIVERSITY
FACULTY LECTURESHIP NO 64

MILA KRYJEVSKAIA
PROFESSOR,
GRADUATE PROGRAM COORDINATOR
Department of Physics

April 23, 2025 | 3-4 p.m.
Memorial Union, Anishinaabe Theatre
also offered via Zoom
Reception will follow



UNRAVELING
**INTUITION
IN PHYSICS**

When to Trust It and When to Think Twice



From MicroLEDs to Data Science: An NDSU Alumnus at Bobcat

By MATTHEW SEMLER

Hi, my name is Matt Semler. I received my bachelor's and PhD degrees in Physics from NDSU back in 2011 and 2016, respectively. After graduating, I spent five years at Uniqarta as a research scientist. At Uniqarta, we refined a laser-transfer technology used to rapidly place microLEDs with high precision to enable next-generation displays. Uniqarta was acquired in 2021 by Kulicke and Soffa and relocated to the East coast.



Matthew Semler

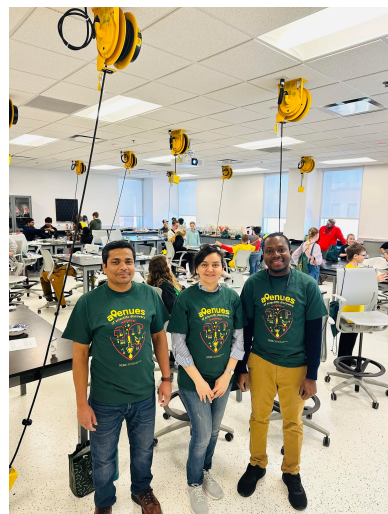
I decided to stay in Fargo, so I started the job hunt. With a referral from a friend, I ended up at Bobcat as a data scientist. I've been there for about three and a half years now. Without formal data science training there's been a lot to learn, and some of my techniques are a bit unorthodox. Early on, I was asked to look into customer purchasing frequency. I immediately thought of using Fourier transforms. I got some strange looks when I explained my methodology, but in the end the results were the same as "more traditional" data science techniques. Until this year, everything we were working on was your typical data science - machine learning, complex problem solving, and optimization problems - but when ChatGPT came out, my team basically went all in on LLMs (Large Language Models). It's been exciting learning how to apply this new technology with new tools and applications coming out almost every month. Based on what we've worked on and what we have planned, it'll be an interesting next few years as this technology's applications get fleshed out.

Avenues of Scientific Discovery

Grad Phi, NDSU's graduate physics club, hosted two hands-on workshops at this year's *Avenues of Scientific Discovery* conference for regional students in grades 5–12. In the ever-popular *Physics of Slime* session, participants explored the behavior of non-Newtonian fluids and mixed their own slime to take home. Two sessions were offered, each drawing 20–30 enthusiastic students.



The second workshop, *Say Watt*, introduced the fundamentals of electric circuits. Students built simple, functional circuits and left with their own kits to continue exploring at home. Three sessions were held, each with 9–11 students, and the interest and energy remained high throughout. We extend our sincere thanks to the Grad Phi volunteers who made these workshops possible: Oreoluwa Alade, Faruk Hossain, Masomeh Nazem Salimi, Kurt VanDonselaar, Idris Malik, Hadassah Grifin, Safana Ismael, and Eric Roeschlein. Thanks to their efforts, both workshops were lively, well attended, and memorable experiences for the students.



SPS wins National Recognition

NDSU's chapter of the Society of Physics Students (SPS) has received an Outstanding Chapter Award from the SPS National Office. This first-time recognition honors the chapter as a top-tier student-led physics organization,



The SPS group in 2024

a distinction awarded to fewer than 10 percent of SPS chapters nationwide and internationally. "This award is such an honor for all of us at our SPS chapter. It's been wonderful to engage with our peers and mentors at student meetings and conferences. The most rewarding aspect is being able to share my interest in physics with others, and SPS has helped me do that," said chapter President Sigurd Saude. The NDSU SPS chapter was recognized in 2024 as outstanding for hosting a Zone 11 meeting with participants from five states, supported by the SPS National Office, featuring lab and CCAST tours, an astronomy talk, student poster presentations, and an egg-drop competition. NDSU students were also honored for attending PhysCon 2022 in Washington, D.C., and for their extensive outreach efforts, including Science Fun Night, the ND State Science Olympiad, and a campus Drone Discovery Day.

Advancing Materials Theory at the National Science Foundation

By SYLVIO MAY



During 2022 and 2023, I was on leave from NDSU while serving as a Program Director at the National Science Foundation. The NSF regularly appoints temporary Program Directors to bring fresh perspectives and disciplinary expertise into the grant review process and to help identify emerging research directions. Together with two permanent Program Directors, I managed the Condensed Matter and Materials Theory program within the Division of Materials Research.

Gaining first-hand insight into theoretical materials research at the national level and working with the exceptionally dedicated staff at NSF was a unique and highly rewarding experience. It was also the most intense two years of my professional life, marked by frequent meetings, events, some travel, and many late nights. I developed a deep appreciation for how complex, multilayered, and rigorous the NSF proposal review process is, all carefully designed to ensure fair evaluation and to support the most promising research. I am proud to have given back to the scientific community through this service. Since returning to NDSU, I have greatly enjoyed sharing these experiences with our faculty and students.

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Reaching Out with Outreach Events



Physics students and faculty continue to enjoy engaging in community outreach by organizing and facilitating several events at NDSU and beyond. With help from our amazing students, Science Fun Night at Longfellow Elementary School has become a spring tradition. The mix of demonstrations and hands-on activities — including liquid nitrogen, homemade slime, giant bubbles, and crackling sparks — regularly attracts

around 100 curious kids and their parents/guardians.

Our awesome graduate student organization (Grad Phi) annually puts on workshops (making slime, soapy science, electric circuits) for middle schoolers at NDSU's Avenues of Scientific Discovery and spooky demonstrations for trick-or-treaters at

Boo!@NDSU. Faculty and students also hosted on-campus visits for Physics students from Fargo South, Fargo North, and Davies High Schools. Motivated by their inspiring teachers, Michelle Strand, Michael Dobberstein, and Shawn Carney, students engaged in several hands-on activity stations and learned to fly drones using programming and mind control. The drone activity grew out of a new outreach initiative, masterminded by Dr. Yongki Choi, which invites students to explore the science and technology behind unmanned aerial vehicles.

After a successful pilot program, where 80 students from Liberty Middle School learned to assemble drone kits and use Arduino programming to fly them, Drone Discovery Camp has become a very popular event. The activities now include wearing a headset with electrodes that empower the pilot to control the drone just by thinking!



Drone Discovery Camp

Reflections on Six Decades of Change in NDSU Physics

By ORV SWENSON

Many changes have occurred over the past 59 years since I arrived as an NDSU freshman, most of them positive. The campus is hardly recognizable with all the construction and remodeling. However, the physics building remains much the same, constructed in 1907. The name, South Engineering, also remains the same, causing confusion for new students and visitors. The old lecture room is long gone, and large classes are taught in the new state-of-the-art A. Glenn Hill Center.



Orv Swenson

Of course, much has changed in the student experience. When I was a student, calculations were done with a slide rule and log tables. Curve fitting was done by hand. Manuscripts and thesis were written and edited in cursive before typing. This is all very unfamiliar to today's students. On the first day of calculus-based physics, the instructor announced that 50% of students would fail, which turned out to be quite accurate. Homework and exams for larger courses are no longer graded by TAs but with an online course management system. Following the national trend, grade inflation has continued with the average grade assigned no longer a C but somewhere between A and B. Since returning to NDSU after a career in the Air

Force in 1993, I have observed that physics student math skills have continuously decreased with a corresponding increase in IT skills. Reflecting a national shift from an education-focused model to a business-oriented one, universities increasingly base course offerings not on academic rigor but on enrollment numbers.

The Physics Department has a far more dynamic research program than 59 years ago. Much of the research utilizes computer modeling which didn't exist with NDSU's card punch main frame computer of 59 years ago. A very positive development has been the addition of physics education research. Our researchers are doing experimental research on undergraduate students' approaches and misconceptions while solving physics problems. I find this to be very promising for the future of physics education and hopefully it can be incorporated with AI to provide individualized instruction for our future students.

Physics Graduate Showcases Research at APS Conference



Wathsala Jayawardana, who graduated in May 2024, successfully presented a poster at the APS 2025 Conference for Graduate Women and Gender Minorities, held September 25–26 in Washington, D.C., representing NDSU one last time. Her poster was based on the final chapter of her thesis, and a corresponding publication has been accepted in *Advanced Engineering Materials*. In September 2025, she also began a position as a Postdoctoral Research Associate in Materials Science–Thermosetting Polymers at Georgia Southern University.

Awards, Graduates, Donors

Student Awards 2024/25:

Physics Achievement Award: Sigurd Saude, Jessica Tsao

Physics Scholarship: Jesse McKay, Sigurd Saude, Carter Erickson, Jack Huovinen

Horvik Award: Ryan Hlucny, Ayden Schmidt, Trayton Hinderer, Bella Amiot

Sinha Scholarship: Jessica Tsao, Eric Bender

Darrell and Carol Strobel Awards:

– *Graduate Research:* Kurt VanDonselaar

– *Graduate Excellence:* Hadassah Griffin

– *Undergraduate Student Travel:* Sigurd Saude, William Tupa

Student Awards 2025/26:

Physics Scholarship: Carter Erickson, Bergen Eklund, Mone Sasakura

Horvik Award: Emma Briggs, Alexander Bourget

Sinha Scholarship: Joseph Degen, Terrence Andre San Gabriel

Graduates 2024 and 2025:

Shawn Aljoe, Matthew Hansen, Jacob Hubbard (BS Physics, Spring 2024), Ibrahim Bukhari, William Tupa (BS Physics & Mathematics, Spring 2024), August Amb (BS Physics & Mathematics, Summer 2024), Benjamin Ockert, Andrea Strange (BS-Physics & Computer Science, Spring 2024), Seth Herner (BSMCE Mechanical Engineering & Physics, Spring 2024), John Schleisman (BS Physics Education, Spring 2024), Nekeisha Johnson, Hadassah Griffin, Mahesh Aryal (MS Physics, Spring 2024), Wathsala Jayawardana (PhD Physics, Spring 2024), Alistair McInerny (PhD Physics & Discipline-Based Education Research, Spring 2024), Jessica Tsao (BS Physics, Spring 2025), Corby Svihovec (BSME Mechanical Engineering & Physics, Spring 2025), Lily Leong (BSMCE Mechanical Engineering & Physics, Spring 2025), Oreoluwa Alade, Eric Roeschlein, Sakurako Tani (MS Physics, Spring 2025)

Donors: Darrell Strobel, Ping He, Dan Chen, Scott Fricke, Ravi Sinha, Harold and Anne Korb, Yongli Ning, Paul Flasch, Gordon Kepner, John Loucks, Ardell Krabbenhoft

The Department of Physics wishes to thank all donors who have contributed to our scholarship programs. You are making a significant difference in the lives of our students.



Physics Congress (PhysCon) in Denver 2025 with SPS students from NDSU: Boden Engebretson, Benjamin Hornaday, Jack Huovinen, Carter Erickson, Jacob Meyer, Alayna Kraft, Ahmad Itani, Sophie Hagemeier (from left).

Travel was supported by Darrell and Carol Strobel Undergraduate Student Travel awards.

Your continued financial support is requested to keep the scholarship and awards programs growing.

Donations can also be made at <https://ndsufoundation.com/explore-giving-opportunities>. Please select "Arts and Sciences" and the Designation drop-down box "Physics Department Fund".

Physics Development Fund

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- ☐ Sinha Family scholarship
- ☐ Physics Achievement Award
- ☐ General Purpose Donation
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Thank you!

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We are eager to hear from our alumni. Please send an email or note to update us on what's happening in your world.

Email updates to:
Paul.Omernik@ndsu.edu

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