



Education has always been an important aspect of life to Isaac Reiter. He says he has his mother to thank for his success in his own education. As a college professor, she would often incorporate concepts from her classes in her home school lessons with Isaac, something he says was invaluable to his success. "It's one of those things that I'm never going to be able to repay her for."

When the time came for Isaac to start college, he found his place in Kutztown University's mathematics department. Along with a minor in computer science, he specializes in pure mathematics. "Pure math isn't necessarily math that doesn't have an application," he says. "It's researching math for its own sake, laying the groundwork for someone else to discover an application."

The theoretical structure of pure math is something that excites Isaac, as this allows for in-depth research into the subject. When the time came to plan for his Honors Program capstone project, he knew he wanted to research a unique concept in pure math that there wasn't much research about yet. "My one professor saw that I really loved playing cards. He said, 'Isaac, I have the perfect research project for you. What if we could take playing cards and use them for cryptography?'" Cryptography is defined as the art of writing and solving codes. He and his faculty advisor, Dr. Landquist, created computer programs to test various encryption methods that use playing cards. After a year-round process of researching, coding, and writing, they worked tirelessly to revise the paper to near-perfection. Toward the end of the process, Isaac presented their findings at several conferences. After all their work was

done, they were both proud of their final product and grateful for the experience of working with one another.

Isaac's Honors capstone project was not the only time he had collaborated with a professor on research. Isaac has co-authored several papers that have been published in academic journals. Reflecting on his first published work, a paper on graph theory that he worked on with Dr. Zhou, another mathematics professor, Isaac says it was one of the best feelings in the world. "Getting [a paper] published is an incredibly validating experience" he says, "because you spend hours not just researching the topics but hours coming up with the fifth, sixth, seventh, twenty-fifth version of the paper to make sure it's exactly what you want. To have that validated and [to be told] that it's accepted...is really amazing."

**"If you have interests,
Kutztown is a great place to
explore them."**

After publishing the paper on graph theory, Dr. Zhou approached Isaac again regarding a paper of hers that she wanted him to help finish. Together, they researched the rest of what Dr. Zhou had started and eventually refined the paper. They hope to submit it for publication soon.

Isaac is currently working toward publishing more research with both Dr. Landquist and Dr. Zhou. He's presented his published research at conferences and has had his research funded by the FPDC grant, a program that supports student faculty research. He says the experience has helped him contribute to his field of study and that it's greatly prepared him for graduate school.

Isaac advises students who are interested in conducting their own research to take advantage of school breaks. "That's a great time to do



Isaac Reiter | Mathematics Student Highlight

research," he says. "You're not distracted with campus, whether it be class or social life." He also recommends finding a faculty member who will work year-round on the research, which Isaac says is the best way to go about it.

Despite having achieved so much success throughout his undergraduate career as a result of his self-proclaimed "restlessness," Isaac stresses the importance of balancing one's academic endeavors with time away from research. "You have to make sure you find time to just have fun with people," he says. "It breaks up the monotony and gives you a chance to unplug." For him, being the President of Math Club has granted him a close social circle that not only allows him to share his love of math, but also to connect with others. In addition, Isaac enjoys using magic to take his mind away from his constant research. "Magic has really given me a lot of great opportunities," he says. "Especially with going to events and [connecting with] people." He also has a love for mathematical card tricks, which allow him to rely on the principles he learns from his academics to enhance his magic.

Aside from advising prospective students to join clubs they're interested in, Isaac also says that it's okay for one to not know what they want to do right when they start college. "If you have interests, Kutztown is a great place to explore them," he says. "Ask questions. Kutztown has a lot of great professors who love their subject, who love students and will work with you and give you an idea of what you want to do." After that, Isaac says, the opportunities that arise from KU are endless.





Dr. Adrienne Oakley | Marine Science and Geology Faculty Highlight

Before she became a professor of marine science and geology at Kutztown University, Dr. Adrienne Oakley had immersed herself in deep ocean processes. “My research was out in the Western Pacific, the Mariana Trench,” she says. “I was looking at really big picture Earth processes, specifically things like subduction where one plate slides beneath another. That’s where you get earthquakes and volcanos and tsunamis.” At KU, she’s now able to share her love of marine field work with her students in a practical setting, which is an invaluable experience for students. “I think that there’s no substitution for field work of any kind, [even if] it is small-scale, getting out and doing something.”

Luckily, the Chincoteague Bay Field Station of PASSHE’s Marine Science Consortium in Virginia provides students with the opportunity to conduct hands-on marine science research, take classes with expert faculty from KU and other partnering universities, and gain experience using high-end research equipment rarely available to undergraduates. The station hosts three-

week-long summer courses that are open to all students from any college. During alternating summers, Dr. Oakley teaches her marine geology class there. “We spend probably 70% of our time out actually doing things, taking data, bringing it back to the lab, and incorporating research.” Even when teaching classes on campus, Dr. Oakley takes her students on 2- to 3-day field trips to the station to gain hands-on experience regarding their coursework. In addition, she organizes longer research expeditions to the station. Most of the research is conducted on Wallops Island and Assateague Island, barrier islands on the Southern Delmarva Peninsula.

All of Dr. Oakley’s class-imbedded research at Chincoteague Bay is a part of a large, continuous research project conducted on behalf of KU and other PASSHE schools. The study focuses on the effects of rising sea level and environmental change along the barrier islands and salt marshes of the Southern Delmarva Peninsula. As sea levels continue to rise due to climate change, many islands are disappearing at a rapid rate. Dr. Oakley and her students observe this process on Wallops Island, home of NASA’s Wallops Flight Facility, where shifting sands erode the island by meters each year and threaten over a billion dollars in infrastructure. Sea level along this portion of the Atlantic coast is rising at a rate twice as fast as the global average. This is one real-time effect of climate change that Dr. Oakley says shows the relevance of marine science research in everyone’s lives.

In speaking of why she thinks non-science majors can benefit from taking introductory oceanography and geology courses, Dr. Oakley says, “They’re an introduction to how our planet works.” Such courses allow us to ask important questions like, “What are reasonable expectations for alternative energy? What can you do in terms of helping the oceans

and the life that’s in them, in terms of climate change but also, how do you become a more educated voter?”

Relating marine geology research to the general public is at the heart of why Dr. Oakley stresses the importance of science communication. “When I was an undergrad,” she says, “my roommate was a non-science major. When I would do marine geology, she would just tell people I looked at wet rocks... Now I try to frame everything like: how would I explain this to my college roommate? How would I explain it in a way that would make her care about it?”

Science communication is at the core of what Dr. Oakley believes will bring change regarding environmental issues. “Making sure we’re part of the conversation” is the first step. Representing the voice of scientific research is crucial to making policy-makers care about environmental issues. Not only that, but also acknowledging that everyone can do little things to make a difference in protecting the environment. One important yet easy action for individuals to take is reducing their use of plastics. “Trying to pressure states and municipalities to reduce the plastic,” she says, “and skip the plastic straws because so much of that plastic ends up in the ocean.” In 2016, the World Economic Forum estimated that about 8 million metric tons of plastic ends up in the oceans each year.

Understanding the connection between individual actions and the bigger picture will help reverse some of the damage caused to the environment. Through putting pressure on industries that harm the environment and better communicating research findings to the public, a unified front is key to helping the planet. “There are problems that can be solved,” she says. “You just can’t pretend they’re not there.”

DEAN’S CORNER DR. DAVID BEOUGHIER

From 70 degrees to snow and from masked to not always so, March has arrived. Our world faces a time of great challenge and change. We are part of that larger world, and the education and experience at Kutztown is designed to help in understanding that very world and why things matter. As the pressures of the semester build and merge with the happenings of the world, I find the civil and respectful conversation on our campus that much more impressive. Our community is passionate and engaged and compassionate. As we continue to explore, engage, and seek answers to difficult and complex questions, I ask us all to continue to challenge ourselves and each other to be, and do, our best. Thank you for all that you do to make Kutztown such a remarkable place.

