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NewsCheck

Washington-Lee Teacher to Embark on Polar Research Experience

The average temperature of the South Pole fluctuates between -18° F in the summer and -76° F in the winter. That will not stop Washington-Lee physics teacher **Kate Miller** from living her lifelong dream of joining Jim Madsen and the Ice Cube Neutrino Observatory team at the South Pole to research high-energy neutrinos.

"Each day, my students and I engage in what we think to be the scientific process - we hypothesize, design experiments, collect data, analyze the data, and discuss improvements to our experiments," said Miller. "But we are often limited by space, time, equipment or safety constraints when conducting labs in the classroom. I wanted to participate in a program where teachers observe and engage with real, cutting-edge research so I could truly understand what the authentic scientific process looks like. PolarTREC offered me this opportunity. I hope that from this experience, I am able to better emulate the true scientific process in my classroom."

In Winter 2016, Miller will participate as a research team member in an authentic scientific expedition in Antarctica, joining other K-12 teachers who will be working in research locations from the Arctic Ocean to Antarctica, as part of a program that allows teachers to experience first-hand what it is like to conduct scientific research in some of the most remote locations on earth.

Asked what she will be most looking forward to, Miller emphatically stated, "The science! I'll be working on the Ice Cube Neutrino Observatory project at the Amundson-Scott South Pole Station."

It's there that scientists are trying to detect high-energy neutrinos. Neutrinos are invisible, nearly massless subatomic particles that travel close to the speed of light. In fact, around 65 billion neutrinos are traveling through your thumbnail every second.

"The Ice Cube Observatory is particularly interested in high-energy neutrinos as these come from some of the most violent and least understood events in the universe, like supernovas and black holes. The observatory consists of a giant cube of detectors spanning one cubic kilometer which sits deep in the ice. I'm so excited to be on site, standing above the detectors themselves," said Miller.

Miller is one many teachers selected through a nationwide search to participate in PolarTREC, an educational research experience in which K-12 teachers participate in polar research, working closely with scientists as a pathway to improving science education. Through PolarTREC, selected teachers will have the rare opportunity to spend two to six weeks working with a research team in the Arctic or Antarctic.

While on field expeditions, teachers and researchers will share their experiences with scientists, educators, communities, and students of all ages through the use of Internet tools such as online teacher and researcher journals, message boards, photo albums, podcasts, PolarConnect real-time presentations from the field, and online learning resources. After the field experience, teachers and researchers will continue to share their experiences with the public and create instructional activities to transfer scientific data, methodologies, and technology to classrooms.



Miller believes it will not only help her as a teacher but will also benefit students. "I hope to model for my students that learning is a life-long endeavor," said Miller. "Too often are students caught up in the pressures of succeeding on an upcoming test or earning an 'A' in a class. Sometimes we forget that learning for the sake of learning can be a really fun, fulfilling, and meaningful process. I want my students to walk away with a sense of curiosity and wonder for the world around them."

While in the field, Miller will be posting journals on a daily basis (internet connection permitting). Her journals and accompanying pictures will teach readers about the science of Ice Cube; describe what it's like to be a field researcher; and paint a picture of what the day-to-day life in Antarctica entails. To follow Miller's journey, visit <https://www.polartrec.com/expeditions/ice-cube-neutrino-observatory-2016>.

"I will also be holding a PolarConnect event: a live presentation from the field during which I will answer questions from classrooms via video," said Miller.

PolarTREC is managed by the Arctic Research Consortium of the U.S. (ARCUS) and funded by the National Science Foundation and additional partnerships.

For more information, to participate, and to view teacher journals, visit the [PolarTREC website](https://www.polartrec.com).



Miller is shown in the photo above in the extreme cold weather gear she will be wearing while in the South Pole.

