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BIRMINGHAM

Groves alumna joins Antarctic expedition

By Brendan Losinski

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BIRMINGHAM — For Birmingham native Kate Miller, science is part of her life. It interested her in school, she now teaches it to students of her own, and in January it will take her on a journey all the way to the South Pole.

Miller is joining an expedition organized through the Arctic Research Consortium of the U.S. and funded by the National Science Foundation. This expedition will have Miller and several other researchers traveling to the South Pole, staying for three weeks to perform physics experiments to better understand the state of the universe.

Miller was born in Royal Oak and attended Birmingham Public Schools. She graduated from Birmingham Groves High School in 2007 and went on to study at the University of Michigan before getting her master’s degree in education from the University of Pennsylvania. Since then, she has taught physics in Arlington Public Schools, near Washington, D.C.

Miller is taking part in the expedition through an organization called PolarTREC, which matches teachers and researchers together to participate in scientific programs that operate at the North and South poles. Miller is one of seven teachers taking part this year, and the only one going to the South Pole.

“I’ll be working on a project called ‘IceCube,’ which uses large neutrino detectors, which are used to find small particles called neutrinos,” explained Miller. “We’re specifically looking for high-energy neutrinos, which could have come to Earth after large celestial events.”

The reason the team is traveling to the ends of the Earth for these experiments is a simple one: They need lots of ice.

“We need a clear medium to detect the neutrinos,” said Miller. “Some researchers use large vats of water, but that is very expensive, so we use ice instead. We will drill holes down into the ice and lower our detectors in.”

While on these polar projects, 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, real-time presentations from the site, and online learning resources. Miller said it also gives educators such as herself fantastic experiences they get to bring back to their classrooms.

“They particularly look for teachers to join these expeditions because we can get experience doing real research in the field,” said Miller. “It’s important for me to get this experience of seeing science being done and taking part so I can pass that knowledge along to my students.”

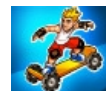
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“The primary goal of IceCube is to observe the cosmos from deep within the South Pole ice by detecting high-energy neutrinos,” explained IceCube researcher Megan Madsen. “These neutrinos will allow us to explore the origin and nature of cosmic rays. Neutrinos act as messengers so that scientists can learn about violent astrophysical sources. As IceCube gives us new ways to study the mysteries of our universe, it is likely to uncover or lead to the discovery of things we couldn’t have anticipated.”

The conditions at the expedition site will be harsh outside, but Madsen said the facility is well-established and comfortable.

“Generally, the temperature in the summer is about (20 degrees below zero, Fahrenheit), and the sun will be shining 24 hours per day,” said Madsen. “It can get quite windy, with the average wind speed about 12 mph. The South Pole is situated at more than 9,000 feet above sea level, so those working have to watch out for signs of altitude sickness in addition to preparations for the cold. The South Pole Station, which opened in 2008, is quite nice and includes everything that the scientists, contractors and support staff need while they are staying at the South Pole. There is a cafeteria, gym, labs, offices, dorms, recreation rooms, greenhouses and more.”

Besides being able to better educate her own students, Miller hopes expeditions like this one will inspire others to take an interest in science.

“I’m hoping to reignite people’s curiosity,” remarked Miller. “I think a lot of people just think of physics as that hard class you didn’t do well at in high school. I want people to know physics is something anyone can take an interest in, and science and scientific research is very much something happening in our world every day.”

Those interested in following Miller’s progress can do so on her blog, polartrec.com/expeditions/ice-cube-neutrino-observatory-2016.



ABOUT THE AUTHOR

Staff Writer *Brendan Losinski* covers Harper Woods and Northeast Detroit as well as Franklin, Bingham Farms and Beverly Hills; Birmingham Public Schools and Bloomfield Hills Schools. Brendan has worked for C & G Newspapers since 2016 and graduated from Oakland University.

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