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Inspiring Teachers: Q&A with D. J. Kast BS '11, MS '11, MAT '14

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USC Rossier alumna headed to the Arctic Circle

D. J. Kast is the STEM program manager for the USC Joint Educational Project, which encompasses the USC Young Scientists Program (YSP) and the USC Wonderkids program. She is also the STEM coordinator for the USC Neighborhood Academic Initiative. In November, she was among the 15 teachers accepted into the PolarTREC program from a pool of 180 applicants. The program will take place next summer.



D. J. Kast sporting a USC Fight On sign in front of the Svínafellsjökull Glacier in Iceland. Photo by Roeë Fung.

What is the PolarTrec program?

[PolarTREC](#) (Teachers and Researchers Exploring and Collaborating) is a program funded by the

National Science Foundation and administered by the Arctic Research Consortium of the United States (ARCUS), a nonprofit in Fairbanks, Alaska. It sends teachers to work with scientists in the Arctic and Antarctica. Teachers are matched up with a team of scientists and spend three to six weeks participating in hands-on field research experiences. By bringing teachers and polar scientists together, the PolarTREC program hopes to increase the teachers' understanding of polar science and the scientific process for use in their classroom.

What kinds of projects will you be working on?

I will be working with Dr. George Kling from the Department of Ecology and Evolutionary Biology at the University of Michigan, Dr. Byron Crump (Oregon State University), Dr. Rose Cory (University of Michigan) and Jason Dobkowski (Lab Manager for Kling's lab and lab technician at Toolik Research Station). I will be working with them in the Arctic at the Toolik Research Station, located north of the Arctic Circle in Alaska. Our research will focus on microbial ecology of the Arctic Tundra.

This research encourages a greater understanding of the polar regions by addressing the impact of microbial ecology on the Arctic tundra and specifically the permafrost. Permafrost is permanently frozen soil or rock that remains frozen (0°C) for at least two years. We will be looking at the relevance of climate change and warming and its impact on the ecology of the arctic tundra.

How will you bring this back to your classroom?

I love polar science! As a PolarTREC teacher, I will also be creating lessons to transfer scientific data, methodologies and technology into my classroom. I'm excited about this opportunity because it is important for my students. Not only do they need to know about the cutting-edge science but also about important issues and how what happens in the polar regions impacts them.

Once I'm done with this experience, I'll continue sharing what I have learned both in and out of my classroom. I plan on sharing this experience with the USC Wonderkids Program, USC NAI program and the USC Young Scientist Program. I will write a polar curriculum to share with other teachers including USC Rossier STEM teachers. Polar science lessons will help meet the NGSS standard on humans required for YSP curricula, and will reach 1,400 low-income and underrepresented students in science in 4th and 5th grade through this program. Wonderkids focuses on different fields of science, and I plan on covering polar science. I will hold four polar scientist speaking engagements either virtually or in-person and will invite participation by scientists and other PolarTREC teachers.



Pondering the Northern Lights, which Kast describes as “the result of collisions between gaseous particles in the Earth’s atmosphere with charged particles released from the Sun’s atmosphere.” Photo by Roe Fung.

How do programs like this reinforce the approach to teaching that you learned at USC Rossier?

This PolarTREC program epitomizes the science-teaching approach from USC Rossier's 502a and 502b classes. Hands-on inquiry-based science is the motto, and what better way for a teacher to teach about climate change, polar regions and other current science topics than being on the front

lines with scientists and translating their science for K-12 students.

D. J. Kast is a regular contributor to USC Rossier's news pages. See also her [recent post](#) about a hands-on STEM activity that she conducted for her students.

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