

FOCUSING ON

AMANDA GERSOFF

FROST
RESEARCH
FELLOW

MICHAEL MULROY

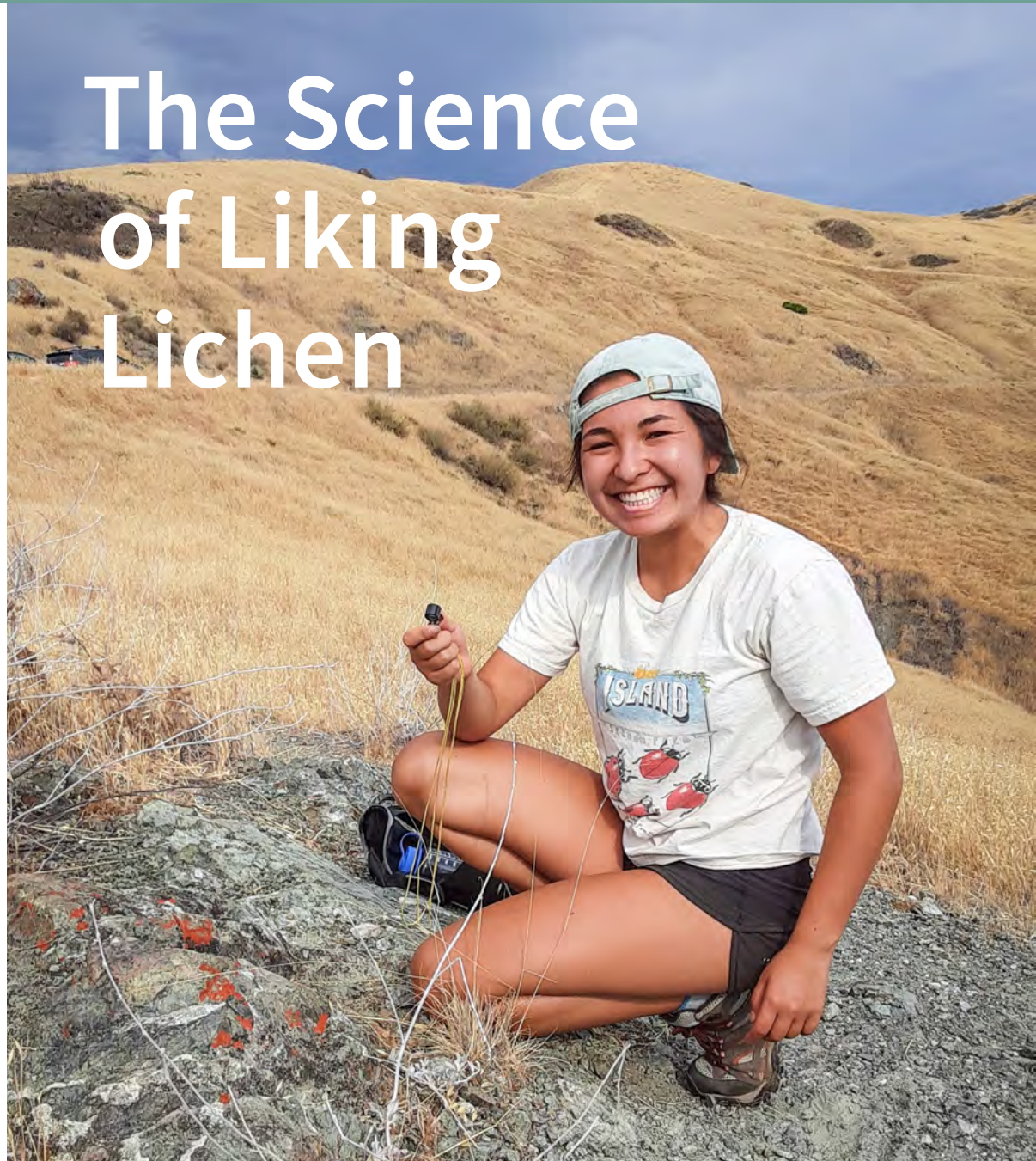
GRADUATE
STUDENT

To the untrained eye, a lichen is a lichen, but approximately 3,600 known lichen species call North America home. Senior environmental management and protection major Amanda Gersoff may now know better than anyone the details of a subset of these species that grow on California's state rock, serpentinite.

Serpentinities hold extremely high concentrations of heavy metals, such as nickel. This creates a toxic environment for most plant and other life forms, and species that are found on these rocks must be highly specialized to survive.

Gersoff is working with biology Professor Nishi Rajakaruna and biology graduate student Michael Mulroy to create a comprehensive database of

The Science of Liking Lichen



lichens that grow on serpentinite in North America. The database that Gersoff created serves as the foundation for a first-of-its-kind survey of these extraordinary fungi.

“Given that only five studies have been published to date on ultramafic lichens in North America, there is still a general lack of knowledge about the topic, and creating a database that synthesizes information from published studies in one place can reveal patterns and suggest research directions that would not otherwise be apparent from reviewing individual studies,” Gersoff said.

Gersoff and Mulroy are collaborating with international lichenologists who have created similar surveys in Italy and Russia. Their work, important in its own right, also provides multiple entry points into the international scientific community. The research team will submit a paper for peer-review early in 2021 on which Gersoff will be a co-author. She's also looking forward to the opportunity to attend the International Conference on Serpentine Ecology in Russia in 2021.

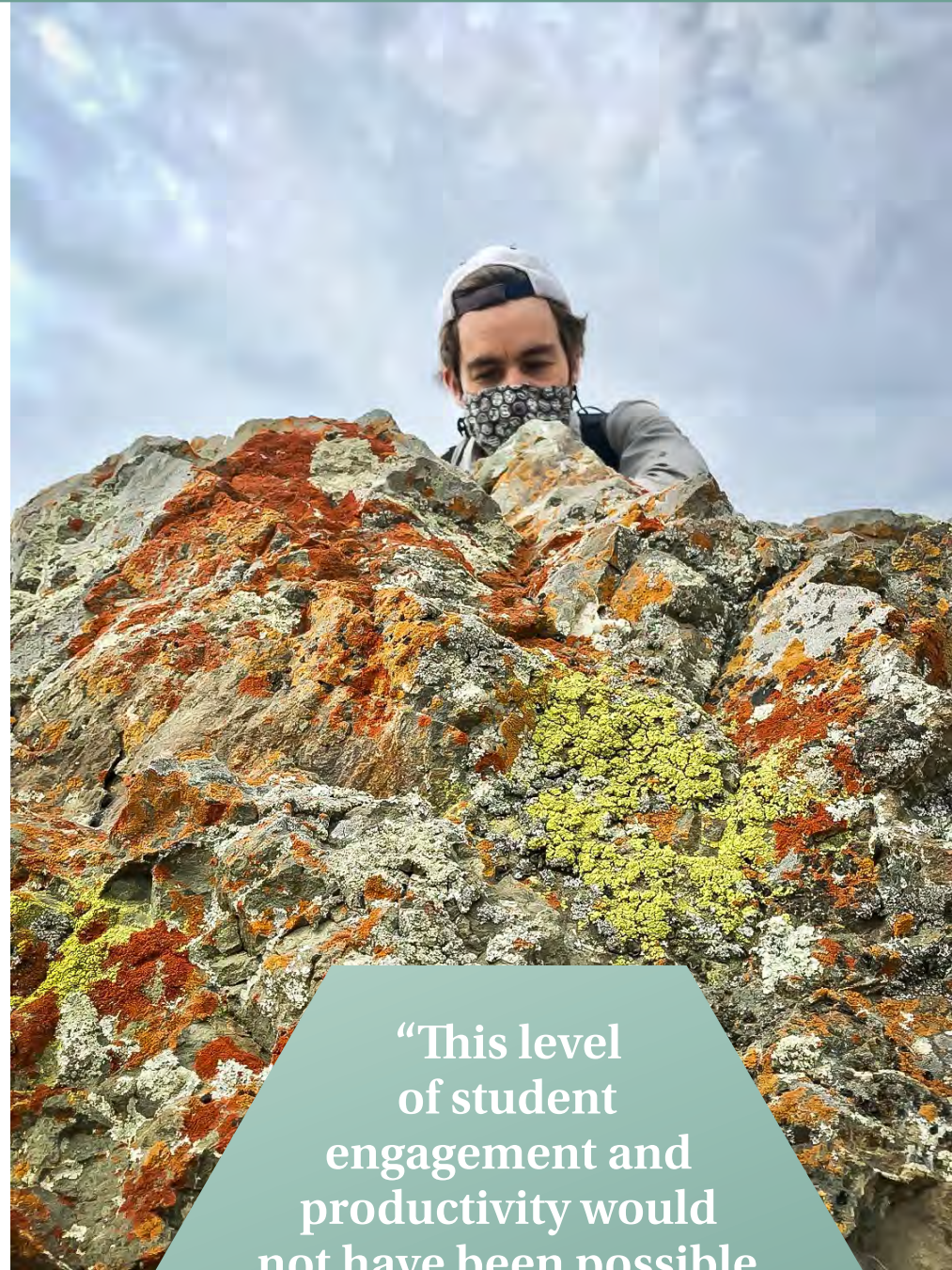
“I am incredibly grateful for all of the opportunities that this research project has brought forth,” Gersoff said. “From getting to learn from a team of accomplished researchers, lichenologists and botanists, to advancing my research and writing techniques, this project has prepared me for future endeavors including grad school and hopefully working as an ecologist after that.”

There’s a possibility of a new-to-science lichen species in Gersoff’s future. She’s also assisting Mulroy with an ecological analysis for another study on the differences between lichens that grow on serpentinite and those that grow on neighboring sandstone. If the pandemic eases and students can safely work together again, Gersoff may join Mulroy in the field.

Together, they may discover a lichen no one has looked at closely enough before to know that this lichen is different from all the others. That’s the kind of Learn by Doing experience only research provides.

“Over the past three summers, eight of my undergraduate research students have greatly benefited from participating in the Frost Summer Undergraduate Research Program,” Rajakaruna said. “The work they conducted has led to three peer-reviewed publications and two additional manuscripts soon to be submitted for publication.

“This level of student engagement and productivity would not have been possible without funding from the Frost Program. I am so grateful for the generous support we have received from Mr. and Mrs. Frost, enabling me to work with undergraduate students full-time during the summer, involving them in all stages of doing science.”



“This level of student engagement and productivity would not have been possible without funding from the Frost Program.”

Nishanta Rajakaruna,
Biological sciences professor and
Frost Research faculty advisor



OPPOSITE LEFT: Close up of *Polycauliona ignea*, a type of lichen found by Gersoff and Mulroy at Figueroa Mountain. OPPOSITE RIGHT: Gersoff holds hand lens to inspect lichen specimens found in serpentinite outcrops at Figueroa Mountain. ABOVE: Mulroy examines lichen specimens on serpentinite outcrop at Figueroa Mountain. LEFT: An interdisciplinary group of lichenologists, geologists and ecologists on a field visit to Jade Cove. (From left are Dena Paolilli, Michael Mulroy, Dr. Nishanta Rajakaruna, Jason Dart, Dr. Scott Johnston, Dr. Rikke Naesborg and Dr. Cameron Williams.)

RESEARCH:

Rajakaruna research students created a comprehensive database of lichen communities of ultramafic substrates in North America. Field location shown in photos is a serpentine outcrop near Figueroa Mountain.

RESEARCH FACULTY:

Nishanta Rajakaruna

RESEARCH STUDENTS:

Amanda Gersoff

Michael Mulroy

