uOttawa doctoral students researching exciting aspects of geological science

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The lines of tiny translucent zircon crystals affixed to the thin epoxy wafer are barely visible to the naked eye, yet when viewed under a microscope the grains of zirconium silicate sparkle like treasure in Aladdin's cave.

These crystals might not have the same allure as true gemstones, but they originated in a hot magma chamber of a volcano, which infused them with a wealth of information regarding the nature of the Earth's molten interior.

For University of Ottawa geochemist Seungmin Leo Lee, a grad student conducting doctoral research into the conditions that existed deep inside Mount Pinatubo's magma chamber over millions of years, the zircon crystals he collected from the volcano's lava slopes are valuable geochemical proxies for the temperatures that were present when the crystals formed deep underground.

"Zircons are a hot commodity in the geosciences because they are an important mineral for interpreting the past," Lee said from the graduate student offices at the university's Advanced Research Complex. "It's crazy to think we can get this information from a rock, but that's what I love about geology."

Lee wasn't always this hooked on the science of rocks. He was charting an academic path in biochemistry until an undergraduate geology elective changed his outlook. Today, he is happily pursuing his research under the supervision of Dr. Keiko Hattori, a professor of geochemistry and mineral deposits in the Department of Earth and Environmental Sciences.

One of the things Lee said he likes best about the university's graduate science programs is the opportunity to develop as a diversified scientist with interdisciplinary skills. He still has two years to go to graduation with his PhD, but has already come to the attention of professionals as a top student presenter at conferences. And he's not alone. Just a few steps down the hall, another of Hattori's PhD geology candidates has been enjoying some outstanding success of her own.

Lilianne Pagé is a vibrant championship rower with the Ottawa Rowing Club, and close to completing her doctoral geoscience research into how water and water-soluble elements are transported from Earth's surface to deep inside its molten mantle 400 kilometres or more underground.

"The question is, how do we have practically an ocean's worth of water in the crystal structure of minerals that are stable at the high pressures and temperatures in the transition zone between the upper and lower mantles?" Pagé said. "I'm looking at rock samples from all over the world to try to paint a global picture of which minerals are important for transporting water and these other elements."

The water is in the form of hydroxyls, not whole water molecules, Pagé explained, so the minerals are not actually 'wet' inside their crystal lattice.

The three scientific papers that comprise Pagé's thesis research have already been published in internationally well-respected journals — which speaks to the excellence of her work.

"It helps that we have some of the top geological researchers in the world who can open up opportunities for us," Pagé said. "It is also vital that we have strong mentors like Professor Hattori to guide us and support us in our academic and non-academic pursuits. I don't think I would have achieved the success I've had in my academics without my rowing. It gives me discipline, and gives me something else to focus on when I'm trying to figure out a problem."

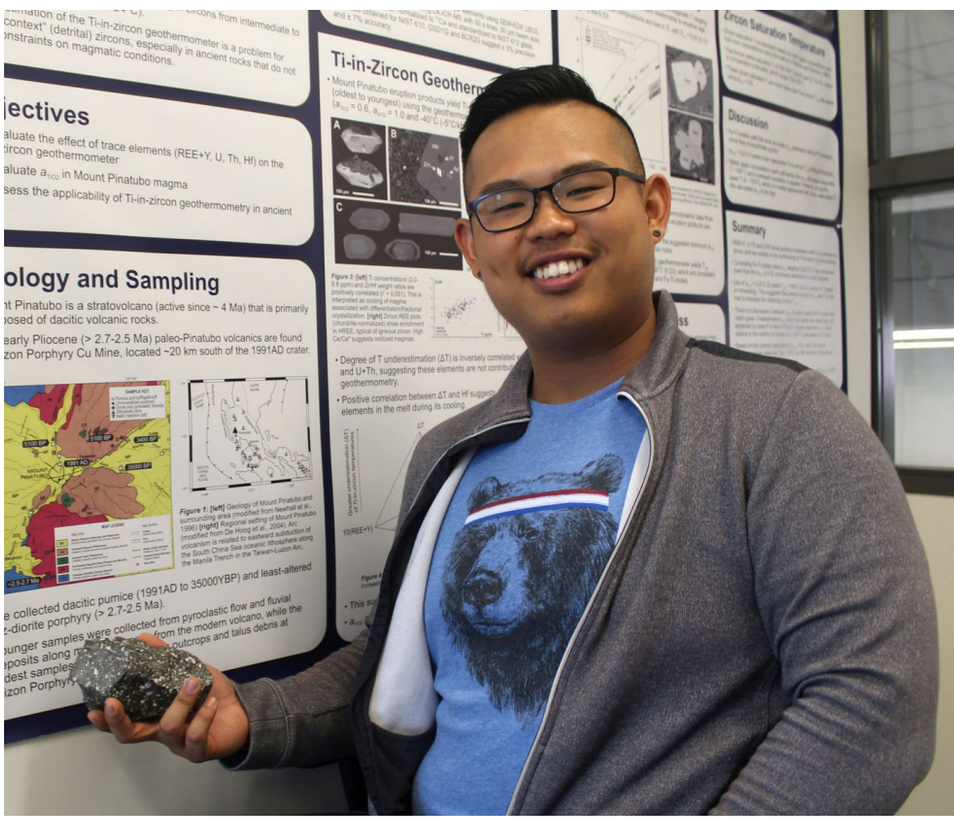
Lee said he finds his recreational balance through Olympic-style weightlifting, an activity he said gives him a "clean reset" every day.

With 6,500 students enrolled in the Masters, Doctorate and Graduate Diploma programs, the uOttawa understands only too well how important proper student support is to the success of its world-class graduate programs. Both Pagé and Lee had nothing but praise for their supervisor and other professors.

"I like the dynamic energy of the school environment," Lee said. "This program has given me the freedom to think creatively about scientific problems."

"You should come and meet the people you'll be working with," Pagé suggested. "It's the connections you make that will get you through grad school. Come and meet the professors and the other grad students. We have a coffee hour every week."

For more information on graduate and postdoctoral studies at uOttawa, visit *http://www.uottawa.ca/graduate-studies*.



uOttawa doctoral candidate Seungmin Leo Lee says one of the things he likes best about the university's graduate science programs is the opportunity to develop as a diversified scientist with interdisciplinary skills. *BRIAN MCCULLOUGH PHOTOS*

Doctoral supervisor Professor Keiko Hattori (right) from uOttawa's Department of Earth and Environmental Sciences supports PhD candidates like Lilianne Pagé.