GERMANY

RESEARCH THIS!

Glacial modeling in the Alps, a rock concert that doubles as a Covid-19 experiment in Leipzig ... Groundbreaking science is underway in the German-speaking world

BY CHRISTIAN HEINRICH AND DEBORAH STEINBORN

ICE AND CLIMATE UNIT
INNSBRUCK

Hike up an Austrian mountain slope to do your climate research

Research climate change on an Alpine mountaintop in Austria. You have super computers and advanced mathematical modeling to help you, but you still have to take the classic route to the top: by hiking up a tall, icy mountain with a heavy backpack on your shoulders and a pickax in hand.

That's how researchers approach science at Ice and Climate, as it's called – one of the world's leading climate research groups. It is housed within the Department of Atmospheric and Cryospheric Sciences at Austria's University of Innsbruck. Since Innsbruck is situated in the glacial Ötztal region, the glaciers are just a hike away.

In recent years, climate research has gained more and more public attention due to global warming. The university has a long tradition of glaciological and climate research in the Alps, the Polar regions, the Himalayas, and the tropics.

Back in 1952, the ice and climate unit began to record annual mass balance of two large glaciers in the Ötztal Alps, Hintereisferner and Kesselwandferner. Today, these are among the most extensive full glacier mass balance records in the world. Researcher Lindsey Nicholson leads the 18-person-strong team. The Scottish national came to the Alps via, of all places, the Himalayas.

While researching in the Asian mountain range, Nicholson heard about the groundbreaking research underway in Innsbruck. She was intrigued by the opportunity "to do the research right on your doorstep," she says. She arrived in 2009.

The Kesselwandferner and Hintereisferner glaciers are a stone's throw from the city's center. This is where Nicholson's team does the bulk of its field research. "Mountain glaciers are changing very fast and contributing to sea-level rise as a result of changes in climate," she explains. "It's so important to understand how the climate operates over these very complex terrains."

Ongoing projects include measuring and modeling snow-cover dynamics on glaciers, modeling glacier length changes in the Alps, and more. The University of Innsbruck and the Tyrolean Hydrological Service sponsor the institute's long-term glacier monitoring. – *D.S.*

Photos: Elias Holzknecht

STUDYING HUMANITY

LEIPZIG

Where do we come from? Who are we? What makes each of us unique? These are three big questions about the meaning of life. Researchers at Leipzig's Max Planck Institute for Evolutionary Anthropology (MPI EVA) want to answer them in a way that reflects all regions of the world.

Studying humanity's origins isn't just about finding and analyzing ancient remains with molecular methods. Understanding present-day human behavior is crucial, too. So psychological studies very much belong to the institute's tool kit.

Daniel Haun, director of comparative cultural psychology at MPI EVA, recently wrote in the magazine "Science" about the limitations of psychological research. Studies tend to be conducted in a very small number of countries, which fall under the acronym WEIRD: Western, Educated, Industrialized, Rich, and Democratic. This means that over 95 percent of participants live in countries that harbor 10 percent of the world's population. Such a biased sampling produces equally biased results. And that, in layperson's terms, is simply not fair. So MPI EVA is committed to studying humans globally, from northern Namibia to Vanuatu in the southern Pacific. The approach could well revolutionize psychology. – *C.H.*

Exploring the origins of humankind and what makes each and every one of us unique

Photos: Marzena Skubatz, Robert Koch Institute

THE CAPITAL OF NOBEL RESEARCH

GÖTTINGEN

Göttingen's connection to the Nobel Prize goes back to 1905, the year microbiologist Robert Koch received the Nobel Prize in Medicine for his trailblazing research on tuberculosis. Koch had retired from Berlin to the town of his alma mater, where as a young man he had discovered his passion for medicine.

Since then, the coveted award has been given to 44 other academics affiliated with the university town, either because they grew up, studied, or worked there. Göttingen, population 120,000, justifiably savors its reputation as the city of Nobel Prize winners. In a way, it's no surprise. Research and academic teaching have played a major role here for centuries. Today, 30 percent of the overall population consists of students. Georg August Universität of Göttingen is one of Germany's larger universities. And its six big research institutes employ a combined staff of 2,500.

A population of just 120,000 but 45 Nobel laureates since 1905

Scientists at the Max Planck Institute for Biophysical Chemistry, for one, recently announced that using nanoscopy, they can optically dissect individually marked proteins in cells at higher resolutions than ever before. Physicist Stefan W. Hell, head of that research team, is Göttingen's most recent Nobel laureate. He was awarded the Nobel Prize for Chemistry in 2014. – *C.H.*

CONCERTS FOR CORONA
HALLE

Restart-19 aims to learn more about the risks of catching Covid-19 at large events

When did you last enjoy a live concert, tapping your feet to the tunes of your favorite musicians? In Leipzig, 4,000 volunteers did so in the service of science one day in August 2020.

The performance by singer-songwriter Tim Bendzko was part of an elaborate study organized by the Martin-Luther-Universität Halle-Wittenberg. Called Restart-19, it aims to see how Covid-19 can spread during large indoor events.

The pandemic has hit live music and events hard. In Saxony, local scientist Stefan Moritz was enlisted for help. "There was a lot of literature on how large events cause the virus to spread rapidly, but no research on why that's the case," explains Moritz, who is head of the clinical infectious diseases department at the university in Halle. Event planners, business leaders, and politicians quickly agreed to the concert idea, and the states of Saxony-Anhalt and Saxony signed off on funding soon thereafter.

At the concert, each visitor's temperature was taken upon arrival, every move was tracked, and detailed data was collected. To minimize infection risk, volunteers were tested for Covid-19 in advance. "The arena probably was one of the safest places in the world that day," laughs Moritz.

The findings of the 10-person team are expected by the autumn of 2020, and Moritz can't wait. "We need to learn how to live with the pandemic," he says. "This is one big step toward doing so."

Word of the project has caught on. Moritz says he's been contacted by researchers in Australia, Belgium, Denmark, and the Netherlands who want to pursue similar studies. But the best finding so far, according to Moritz, is that at the concert, people were able to have fun again. – *D.S.*

ALLIED IN RESEARCH
BERLIN

Glue for your bones? Well-funded universities work together to make this scientific leap

This glue is sticky! So sticky in fact that it can reconnect broken bones. If research continues apace, it may soon replace complex, invasive procedures requiring metal rods, screws, and plates to repair everything from a skier's broken leg to a dancer's torn heel.

Not only is this super adhesive biodegradable, it's also able to withstand damp surroundings. And it's just one of several impressive research outcomes of the new Berlin University Alliance, which brings together Freie Universität Berlin (FU), Humboldt-Universität zu Berlin (HU), Technical University of Berlin, and the medical school Charité Universitätsmedizin.

The consortium has already achieved breakthrough research like the super bone glue, which is now in a test phase. "Each of the individual institutions involved has an enormous capacity for research on its own," says Günter Ziegler, who is both president of the FU and spokesperson for the Berlin University Alliance. "Now that we have started collaborating more closely, we have an interdisciplinary and creative power unlike almost any other," he adds.

The numbers back him up: with a pool of 1,700 professors, 100,000 students, and a special annual budget of over 23 million euros mainly from the German state, the alliance is likely to produce even more groundbreaking scientific and scholarly developments soon.

That budget stems from the German Universities Excellence Initiative, a push to promote cutting-edge research and teaching opportunities for young scholars. When the consortium won "excellence status" in 2019, academics all over Berlin were jubilant. The money will go toward fostering cross-disciplinary research environments. – *C.H.* ●

Photos: picture alliance/Hendrik Schmidt/dpa-Zentralbild, Peter Dazeley/getty images