



With almost 190,000 students, Vienna is the city with the biggest student population in the German-speaking world, surpassing Berlin and Munich.

*“Funding for research, especially fundamental research, is still inadequate.”*

Helga Nowotny, former President of the European Research Council

such as Karl Popper and Ludwig Wittgenstein, left Vienna to blossom abroad. The Vienna Circle of philosophers and scientists, active from 1924 to 1936, ended in tragedy when its founder, Moritz Schlick, was murdered by a fascist student.

The Academy of Sciences began to see itself as a German institution; after the Anschluss in 1938, management positions were filled by Nazi loyalists and even Nobel laureates were forced out. Similarly, Vienna's excellent medical tradition, culminating in four Nobel Prizes, was wiped out. In those darkest of years, Viennese scientists sought refuge in the free world in droves and very few ever returned again.

It takes generations to build a research system and scientific culture of world standing. The brain drain of the 1930s and half-hearted denazification after World War II produced stagnation. Indeed, “the paradoxical result was that many former professors in the humanities who had been strongly involved with the regime were re-installed early on. Some of them continued to dominate their respective field in the humanities until retirement,” Helga Nowotny, former President of the European Research Council, Chair of the Board of Trustees of IWM in Vienna, told *Metropole*.

It has taken several decades for medical research to crawl out of the mire. But its efforts have paid off; in 2014, MedUni Vienna joined the world's top 50 of medical

schools, ranking 14th in Europe. Recently the Academy of Sciences embarked on a new approach, founding basic research centers as limited liability companies under Austrian law, such as the Gregor Mendel Institute (GMI), the Research Center for Molecular Medicine (CeMM) and the Institute of Molecular Biotechnology (IMBA).

Yet the revitalization of the research base is “still in progress,” Jakob Eder, from the Academy of Sciences, told *Metropole*. “Major events were definitely the fall of the Iron Curtain” in 1989 “and integration in the European Union” in 1995, Eder continued. Crucially, Nowotny pointed out, “Austrian universities were granted autonomy only recently” and since the turn of the millennium, “general improvements, including the internationalization of Austrian universities, are among the more recent and positive developments.” But she added: “Funding for research, especially fundamental research, is still inadequate.” The Austrian Science Fund (FWF), she added, “is definitely underfinanced with an annual budget of less than €200 million.” In fact, industrial and applied research fare a lot better in Austria, a country with a strong engineering tradition. The FWF's annual report 2015 regretted that “organisations funding basic research in those leading nations in the science sector can currently access between two to three times more per capita funding than the FWF.”

The University of Vienna, dubbed *Hauptuni* by the Viennese, is the oldest and biggest institution of its kind in the German-speaking world with more than 93,000 students and 9,700 employees.

SCIENCE

# A Magnet for Keen Minds

Vienna brought forth Wittgenstein, Freud and Schrödinger. Today, the city is again a hotbed of ideas.

BY ROXANNE POWELL

**W**hen refugee scientists Paul F. Lazarsfeld (sociologist at Columbia University) and Oskar Morgenstern (economist at Princeton) returned to Vienna in the late 1950s, they were appalled by the lack of intellectual potential. “No brain, no initiative, no collaboration,” Lazarsfeld noted in a letter. Armed with a generous grant from the Ford Foundation, they set up the Institute for Advanced Studies (IAS) in 1962 – it would go on to train a new generation of social scientists in cutting-edge economics, political science and sociology.

Yet Vienna is one of the oldest university cities in

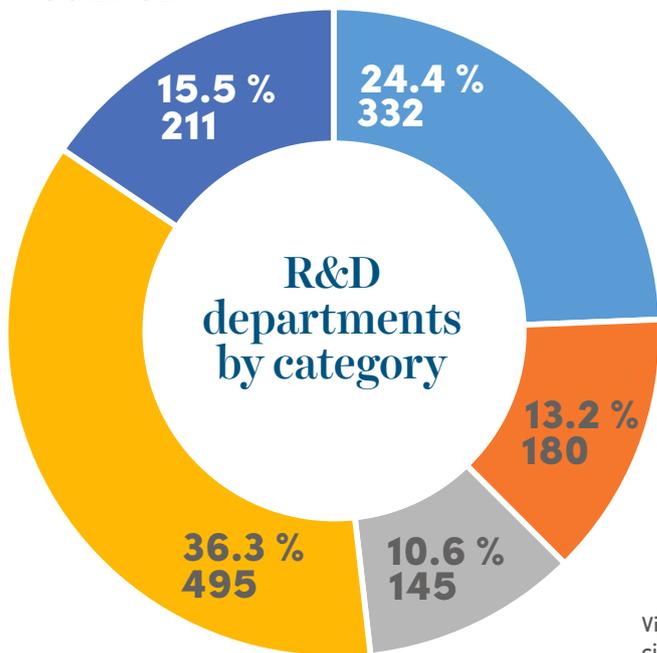
Europe, it has more students than Berlin or Munich, boasts a proud history of discovery, and a respectable number of Nobel laureates. On the eve of World War I, the Austrian Academy of Sciences in Vienna had reportedly become the world's leading research center. Vienna was also a hotspot for the nascent social sciences.

**FROM GREATNESS TO INFAMY**

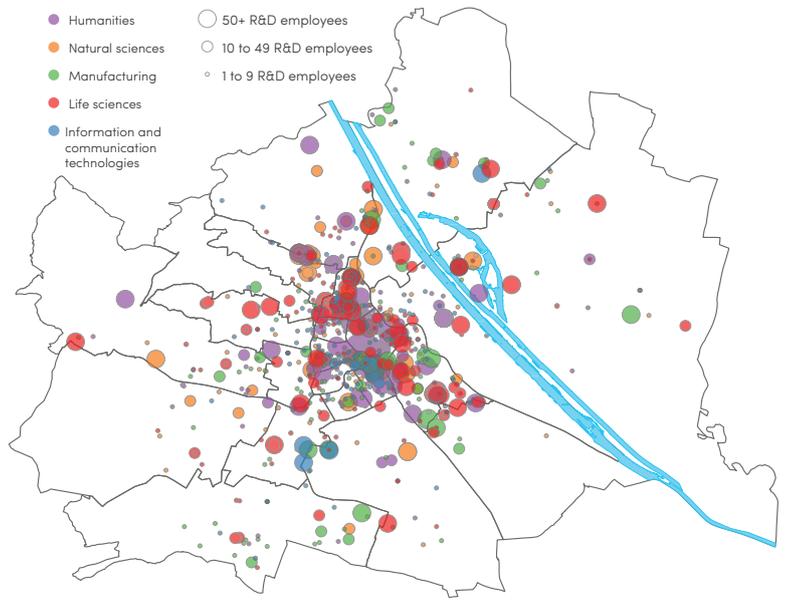
Following the Austro-Hungarian monarchy's collapse in 1918, Vienna gradually lost its edge in science. By the early 1930s, the pall of authoritarian politics had smothered curiosity and creativity. Towering philosophers of science and the mind,

PHOTOS: UNIVERSITY OF VIENNA / BARBARA MAIR





- Life Sciences
- Information and communication technology
- Manufacturing
- Humanities
- Natural sciences



Vienna's research facilities are scattered all throughout the city, with specialized centers clustered around universities.

Source: Open Data Vienna

It's also tough in the social sciences, as Alice Vadrot, a young Franco-Austrian political scientist and Schrödinger Fellow based at the University of Cambridge, explained. "When I received my PhD from the University of Vienna in June 2013, leaving Austria was the only chance I saw to continue my research and pursue an academic career," she said. "In Austria, the situation could be much better, if we take into account that it is one of the wealthiest countries in the world."

Another challenge, Robert Musil from the Academy of Sciences argues, is the transition between a German-speaking scientific culture and an English-speaking one, which is moreover dominated by hard sciences; here, "Vienna is some years behind," Musil says. But there's much more to science in Vienna than universities and the academy. Nearly 1,500 research organizations of all shapes and sizes, half of which are businesses, are thriving – from the diminutive Sir Peter Ustinov Institute for Prejudice Research and Prevention to the hundreds-strong IASA.

The latest addition opened in 2009 on the outskirts of Vienna. Remarkably, the Institute of Science and Technology Austria (IST Austria) has already managed to make a name for itself. "More than half of its faculty are recipients of ERC grants, which makes it one of the most successful research institutions in Europe," said Nowotny.

**THE MAN WHO GREW A BRAIN**

It's hard to single out the next winner, but the Vienna Center for Quantum Science and Technology (VCQ) and its Innsbruck counterpart may be in the running for a Nobel prize in physics. Uniquely, VCQ mixes fundamental research with new technologies, such as quantum computing.

Last March, its Zeilinger Group reached a new milestone in quantum physics by creating a three-photon "en-

tanglement state." Anton Zeilinger, physicist and President of the Academy of Sciences, rejoiced: "The experiment opens the door for a future quantum internet with more than two partners and it allows them to communicate more than one bit per photon."

The life sciences cluster in Vienna is also "widely regarded as being among the top" in its field, Nowotny added. In a recent (world) breakthrough, Jürgen Knoblich's group at IMBA was able to grow cerebral organoids (small developing human brains) from human stem cells. This may well lead to new treatments for neurological disorders.

The ICT cluster, brand named *DigitalCity.Wien*, has flourished around the Vienna University of Technology (TU) in the 4th district. In another branch of technology, Johannes Homa started with 3D printing of ceramic components at the TU in 2006. A breakthrough in 2010 led to a spinoff, Lithoz GmbH; this quickly became a world leader, printing implant materials for biomedical use, for example tailor-made bone replacement.

In addition to classical funding tasks, The Vienna Science and Technology Fund (WWTF) seeks to ease the path of bright young minds into science. One WWTF-funded Vienna Research Group for Young Investigators is looking into "good" bacteria. "The world's leading specialists in laboratory methods for the study of microbes in their environment are in Vienna. This is why the Division of Microbial Ecology is exciting for me," Jillian Petersen, group leader, says.

The latest newcomer on the research scene is the Vienna Humanities Festival, debuting in September 2016. Vienna has come a long way towards regaining its place as a crucible for discovery and invention. It's a good place to be doing science, Musil explained, because research facilities are not on some distant greenfield campus but right in the city center – close to music, the arts and all that Vienna has to offer. **M**

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