eurac
research

ACTIVITY REPORT

EN

2022-23

In the terraXcube, research teams and volunteers carry out a study to test whether exposure to hypoxia (oxygen deprivation) can protect people from the risk of heart attack. The tests were conducted on individuals who despite having coronary artery disease, still wish to practice sports in the mountains. The project is funded by the Autonomous Province of Bolzano (Law 14).

A year of adapting, data and experiences...

A treasure trove of data

Physicist Claudia Notarnicola, the head of our Institute for Earth Observation, recently used her own work to illustrate an impressive development: for her dissertation in the mid-1990s, she had just three satellite images at her disposal, however, for her most recent study on global snow cover, she analyzed more than 7,000. Across the board, we have experienced a similar explosion of data in our fields of research. Data is highly valuable, but it needs to be recovered and sorted – like treasure. That means not just evaluating, sharing and exchanging it to make it comparable but, also being able to store and file it properly.

Last year, we contributed to turning as much data as possible into as much knowledge as possible through a variety of projects and initiatives. The data from the CHRIS study, our large population study in collaboration with the South Tyrolean Health Service, has been used in a wide variety of research on topics such as chronic pain, the relationship between genetic variants and body size, and resistance to hypertension therapies. For the Alpine Drought Observatory, which provides a freely accessible overview of drought in the Alpine region in the form of maps and graphics, data from all Alpine countries has been harmonized and an enormous amount of data is continuously flowing into this monitoring portal. And to ensure that the flood of satellite data is used as efficiently as possible by as many researchers as possible for their analyses, we are developing a Massive Open Online Course on Cloud Computing and Open Data Science – on behalf of ESA.

Roberta Bottarin, vice director of Eurac Research

Research for a changing world

In a survey we conducted in November 2022 together with the Provincial Institute for Statistics, an overwhelming majority of respondents called for putting climate protection ahead of economic interests. From the responses, there was both a general concern, and a desire for social justice. It is clear to people that we are living in a rapidly changing world, which in turn will demand profound changes from our society. But effective action requires understanding – and that requires research. With regard to climate change, we are constantly expanding this understanding for South Tyrol and using continuously updated, freely accessible indicators that show not only how the climate is changing and with what consequences, but also the extent to which we are making progress in climate protection and adaptation. In a technical study commissioned by the Autonomous Province of Bolzano, we quantified how many emissions could actually be saved with the climate protection measures adopted (not enough, according to the result), and calculated the impact of additional, recommended measures. However in other areas, positive changes are occurring – the fact that more and more languages are being spoken in South Tyrol's schools can, if used consciously, be an advantage for everyone. By managing increasing diversity in the workplace, the innovative strength of companies can also improve and we are working on both of these topics. It's important to remember that demonstrating the potential of change is also the task of scientific research.

Stephan Ortner, director of Eurac Research

Are we on the right track?

This is a legitimate question thirty years after the founding of Eurac Research, during which time we have grown to be eleven institutes and six centers, with over 600 employees. Today, we participate in major European and international projects – in many cases as a lead partner, and for years have maintained a balance between basic funding from the local government and competitively acquired third-party funding. Eurac Research has managed a total of over 100 million euros for research and industrial partners in each of the past three years. Our researchers are currently working in 90 EU projects and supervising nearly 70 PhD students from more than 25 universities worldwide. We conduct recognized research in areas such as energy, biomedicine, federalism, to name just three, and are one of the main pillars of the NOI Techpark. And while these figures are important indicators, at a research institute like ours, the focus is on the big questions of the future. How do we solve our energy problems? Safeguard biodiversity? Avoid wars and armed conflicts? Keep people healthy for as long as possible? And how do we achieve peaceful coexistence between old and new minorities under the influence of migration and the risk of poverty? Such questions of global significance are inextricably linked to the challenges that our country will have to overcome by 2030, 2040 and at the latest 2050. Driving this transformation forward with local and international partners from research, industry, trade, services, administration and NGOs will remain our goal in the coming years.

Roland Psenner, president of Eurac Research

Contents summary

Navigating the data jungle

Increasing computational capabilities and artificial intelligence have opened the door to unimaginable research horizons. But how sustainable is this immensity of data? In addition to the expense and environmental impact, we also need to assess our ability to focus on specific goals and not get lost in a jungle of data.

Distant disciplines, converging reflections

Claudia Notarnicola, physicist, and Giacomo Strapazzon, emergency physician, discuss the potential and limitations of big data and artificial intelligence.

Can you discuss environmental sustainability and your projects?
Claudia Notarnicola: It is the new frontier of research. So far there has been a race for data, and this has allowed us to make great strides: for example, artificial intelligence methods began their development in the 1980s and 1990s, but have only seen their full use in recent years precisely because of the big data boom. Today we have come to realize that data is not cost-free, so increasingly we have to ask ourselves which data we really need. In fact, before we launch a satellite, we think hard about what images we really need it to send.

How do you navigate this flow of information?
Giacomo Strapazzon: You have to stay focused on the main research question and not get lost in the rivulets of secondary data. In international clinical trials, there is a tendency to set a minimum amount of indispensable data: that's the only way to be sure that everyone collects it in full. The broader the request, the greater the risk of inaccuracy.

Is there any human element that artificial intelligence can never replace?
Notarnicola: Creativity in devising a study and interpreting the results, even by making interdisciplinary connections.
Strapazzon: The same is true in emergency medicine. Collaboration and deep interpretation of data are essential and are values at risk if we don't pass them on to those who start in our professions now and who may rely more casually on automatic interpretation. Let me give you an example: for years, my team has been working closely with a very good statistician to study avalanche victims; over time, and just by reasoning together, we have discovered that some even very statistically significant data is almost irrelevant from a clinical point of view. So that we don't get blindsided, we constantly stop and review the numbers together.
Notarnicola: Maybe in a few years we will be proven wrong, but for now this is a system of intelligence that has not been equaled. And I have doubts that it ever will be...

Roberto Monsorno, an electronics engineer, has been leading a pioneering team of engineers and developers skilled in programming sensors and meeting a wide variety of requests from research groups and companies since 2019.

Apart from privacy, what other risks are involved in a highly technologized society?
Roberto Monsorno: I would say that smaller entities such as research centers like ours but not only, are very shrewd and have all the tools to protect data effectively, encrypting them properly. Rather, the risks lie with the bigger players who make their own rules... Personally, I see other challenges for us.

Which?
Monsorno: The problem, which is also the biggest challenge I see, is the overabundance of technology and information. Among so many inputs we risk losing coherency in data analysis, over-complicating things and not solving the actual problems.

A NEW LABORATORY FOR BIOMEDICAL RESEARCH

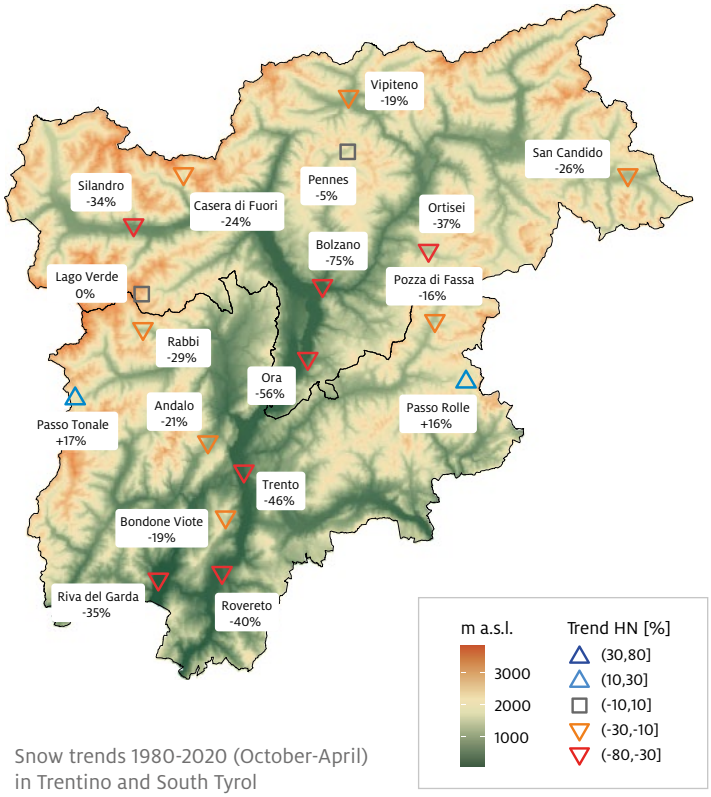
Around 80 people work in the new 900m² laboratory. Using cell and molecular biology experiments the biomedical research team expands knowledge about health and disease.

From left: Peter Pramstaller, head of the Institute of Biomedicine, Alessandra Rossini, biologist and head of the cardiovascular disease research group, Roland Psenner, president of Eurac Research, Ulrich Stofner, director of NOI Techpark, and Stephan Ortner, director of Eurac Research.

Power plants and aquatic ecology: a unique long-term study

In rural regions worldwide, small-scale power plants are considered a good solution for climate-friendly energy generation but there are hardly any detailed long-term studies of their effects on water ecology. However, a team from Eurac Research was able to conduct such a study on the Saldur stream in the Matscher Valley: when a power plant was built on the mountain stream in 2015, the glacier-fed, fast-flowing stream where it was situated had already been sampled for years beforehand to study the effects of climate change. This provided the unique opportunity for a before-and-after comparison. Macroinvertebrates such as insect larvae and worms that provide useful information about the ecological condition of a watercourse, were studied. The data from five years of investigation showed no particular effect of the power plant on these organisms, while the consequences of snow and glacier melt clearly influenced the composition of these communities.

However, this result should by no means be interpreted as a green light for small power plants, emphasizes Roberta Bottarin, a limnologist involved in the study. She highlights the special conditions of the Saldur stream: “It is very important to note that no fish live in the section of the stream that was studied. In addition, the size of the power plant is modest, and snow and glacier melt are the dominant influencing factors of this glacial stream.” In general, there is a great danger that a power plant will disturb the sensitive ecological balance of high mountain streams and each case requires careful, individual consideration.



Snow trends 1980-2020 (October-April) in Trentino and South Tyrol

Snow 101

For years we have been collecting and analyzing information about snow in the Alps to support those who must administer water resources. We do this with different tools, from field measurement campaigns to satellite images, and in collaboration with various partners. Sometimes we also find support from the citizens, as in the case of the latest study on snowfall in South Tyrol and Trentino between 1980 and 2020. The study was carried out in collaboration with the University of Trento, using data made available by the Autonomous Provinces and the South Tyrol and Trentino's Weather Association.
Beyond the climatic aspects and impacts on water resources, the consequences of the lack of snow on small tourist destinations are the focus of the BeyondSnow study, which has just started. A collection of popular articles with key findings can be found in our online magazine:
www.eurac.edu/en/tags/snow

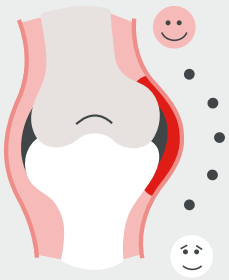
Open Data Science in Earth Observation. An Online Course for the ESA

Today, the Earth is being observed from space more precisely than ever before, with satellites scanning its surface from all angles with a variety of techniques. As a result, there is an uninterrupted flood of data that can no longer be handled by individual computers. This is where cloud computing comes in: it allows huge amounts of satellite data to be stored and processed in a fraction of the time it used to take. And, this data can now be shared via appropriate cloud platforms. Researchers can select the area and time period to study, say, the development of snow cover. Once the process is complete, the results are available online. To help researchers make the most of this, ESA is offering a Massive Open Online Course on Earth Observation Open Data Science – developed by our own Earth observation experts.

Fertile Data

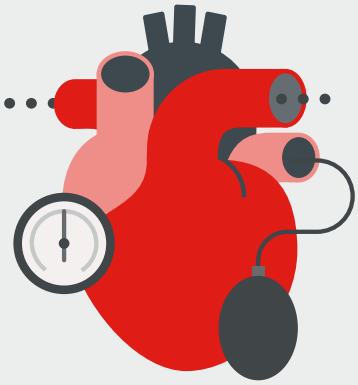
The CHRIS study is the large population investigation we carry out in collaboration with South Tyrol's Health Service. The data and biological samples we collect form the basis for numerous research projects.

Our recent study results and ongoing research has been made possible thanks to more than 13,000 people who have over the years given their time and their consent to participate in the CHRIS study.

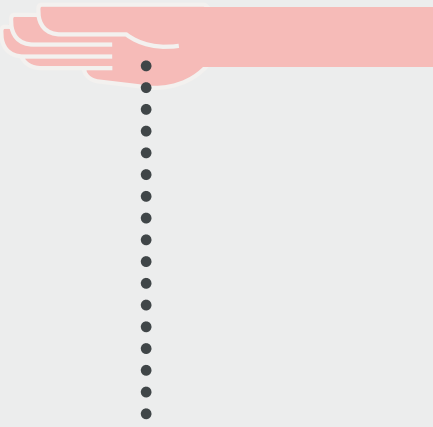


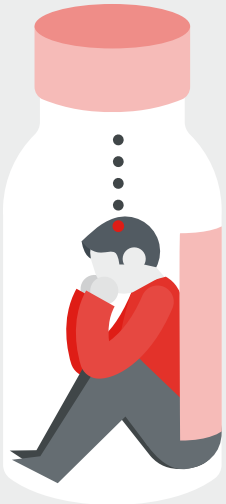
Pain perception and temperament
Do optimistic people actually tolerate pain better? Yes, they do. There is a correlation between pain sensitivity and certain innate personality traits; and thanks to the CHRIS study and the epidemiological analysis that was carried out on a general population sample who did not manifest any health problems, our team was able to better understand these mechanisms. The study was undertaken in collaboration with the Brixen/Bressanone Center for Mental Health.
(Ettore Favaretto)

High blood pressure
Why are some people resistant to hypertension therapies? We are using biomarkers to measure the effectiveness of some drugs on one of the biological processes that regulates blood pressure. The project is being undertaken in collaboration with Schlanders/Silandro Hospital (Stefano Barolo), the University of Glasgow and the Inserm Research Institute and has been financed under Law 14 of the Autonomous Province of Bolzano.



Great heights
We are part of the largest international study to date in this field, which identified more than 12,000 gene variants that influence height by analyzing data from nearly 5.5 million people. The study was undertaken in collaboration with the GIANT consortium.





Chronic pain
Data from the CHRIS study revealed the KCND3 gene presents potential risk for chronic pain. We are now studying its mutations to understand whether people who have these genes are more sensitive to pain. The study findings could then go on to aid pharmaceutical research.
Link to the in-depth dossier:
www.eurac.edu/it/dossiers/dolore-cronico#id-104386494

Social variables in the management of water resources

Mathematical models are making increasingly important predictions in scenarios where climate change will cause more frequent and prolonged periods of drought. But despite increasingly accurate technological tools, conflicts over water management exist and though everything is calculated, it doesn't always work. Why? "My interpretation," comments Environmental Engineer Stefano Terzi, "is that there is definitely a need to bring the social component: the human factor, so to speak, into risk management models, because if you leave this important variable out, our analyses may not work." Decisions and policies affecting water management are in fact influenced by a number of factors that are difficult to quantify, such as social, cultural and political variables.

The Nexogenesis project sees Eurac Research bringing all the "consumers" of the Adige River's water to various discussion tables: from upstream to downstream, hydroelectric power plant operators in Trentino and South Tyrol to farmers in Veneto, via fishermen and municipal governments.

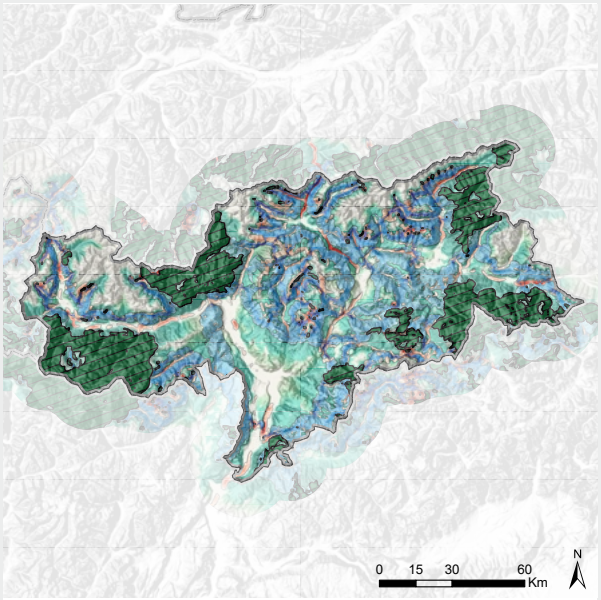
The need to consider the so-called "human factor" becomes even more evident in scenarios where data is less abundant. In collaboration with the United Nations, and thanks to a grant from the Autonomous Province of Bolzano, the AquaMount project is supporting water governance in the Maloti-Drakensberg mountain region which stretches between the states of Lesotho and the Republic of South Africa. "In alpine areas we have excellent data from weather stations and extremely accurate maps, but this is not the case in South Africa. For this reason we used a mixed approach by combining quantitative data, when available, with information gathered by talking to people on the ground," Terzi explains. "The more we listened, the more we were able to outline a coherent story."

71
The number of consultation requests we received from administrations and institutions last year.

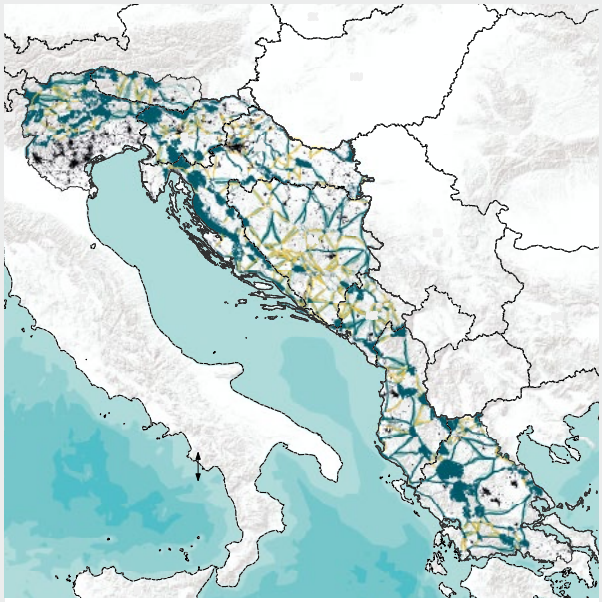
The Namahadi River in the Maloti-Drakensberg mountain region of South Africa.

Ecological connectivity and well-being

Maps are an effective means of seeing at a glance where animals are free to move without barriers. These “green corridors” preserve biodiversity and reduce the risk of road accidents. Smaller green infrastructures such as field bars which are portions of land adjacent to cultivated fields where a small forest or hedge is, are also important because they not only allow birds and other wildlife to move through more territory, they also provide other important services such as soil consolidation and an initial filtration of the water used in agriculture. We have been making maps for different geographical areas for years. Here are two recent examples.



South Tyrol
This map shows protected natural environments in dark green and the most important ecological corridors which connect different natural areas in blue. The red parts represent barriers which are often highly built-up areas or areas used for agriculture, such as valley floors. The map was produced as part of the Interreg LUIGI project.



The Dinaric mountain range
The map shows the most important ecological conservation areas and green corridors. The shorter ones, shown in yellow, have a higher biological value, the longer ones, in blue, are of less importance in the final assessment. Longer corridors mean a longer journey times and therefore involve a greater risk of interaction with human society. Since corridors are travel areas and not core areas for resting, reproduction or nutrition, the shorter the time taken to travel them, the higher the ecological value. This map was created as part of the DINALP-CONNECT project.

Drones for science

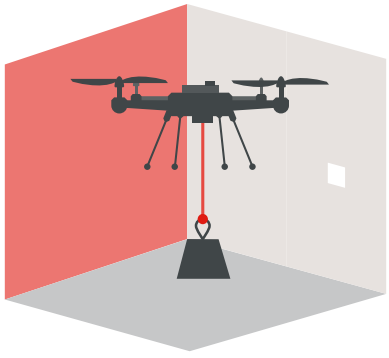
How remotely piloted aircraft are changing scientific research.

Mountain Rescue
Together with the South Tyrol Mountain Rescue Service, we tested whether drones can facilitate the localization and initial treatment of casualties during rescue operations in areas that are difficult to access. The tests were undertaken in the Bletterbach Gorge as part of the START project.

Landslide monitoring
In Corvara, we have been studying the evolution of a slowly but steadily moving landslide for more than a decade. As part of the Blueslemon project, we have been testing the use of drones equipped with an optical reader to detect the location of very small beacons on the ground that send a low-emission signal. As an alternative to the beacons, corner reflectors – small reflective objects that can be detected by a camera on the drone, are also being used.

Permafrost monitoring
We have also been using drones to monitor the movement of the Lazaun rock glacier. Normally, these debris masses move just a few meters per year, but with the thawing of the permafrost, this could change.

Tests at altitude
At terraXcube, we tested two large drones carrying up to 4kg each, at a simulated altitude of 9,000 m.a.s.l. The drones, designed by the Mavtech company, have been built to perform in the Alpine environment.



At the beginning of 2023, a laboratory was opened to measure formaldehyde and gaseous pollutants. These VOCs (volatile organic compounds) are compounds that can be emitted by furnishings and prefabricated components as well as floor coverings, insulating materials, paints, wallpaper, adhesives and textiles. The laboratory also determines the extent to which innovative building materials can act as air purifiers by absorbing pollutants, and is also used to test and calibrate measuring devices and sensors for the indoor climate.

Saving energy, maintaining comfort

The Façade System Interactions Lab was built primarily to test the correlations between façades and indoor environments in real conditions."Measurements on the thermal performance of building façades are often carried out using two climatic chambers: one simulates outdoor environmental conditions, the other indoor ones, and the façade sits in between. This makes the test repeatable but does not fully capture the real conditions of use," explains Francesco Babich, engineer at Eurac Research. "In our Façade System Interactions Lab, on the other hand, on one side you have the real world – made up of variable atmospheric events, temperature, humidity and brightness – and on the other you have a controlled chamber that simulates a realistic indoor environment." The entire laboratory also rests on a mobile base that rotates 360°, so as to simulate a building's different exposures. "Saving energy is essential, but it's not enough," explains Eurac Research's Roberto Lollini, engineer and head of the Energy Efficient Building research group. "You have to feel good in your home, and for some time now, our research has been about combining these two dimensions."

15
The total number of laboratories at Eurac Research. There are also nine other facilities.

Data in Action

Changes are often confusing, and one can get lost in the flood of data. We present relevant information with graphics and maps to provide clear pictures of development.

CLIMATE CHANGE MONITORING SOUTH TYROL

Looking at average yearly temperature, precipitation and lightning, the number of tropical nights and days of frost are a good way to measure how the climate is changing. Other indicators result in measurable impacts such as snow cover, drought, the start of the pollen season or show the extent to which we are making progress in combating the causes, i.e. reducing emissions.
Based on measurements from provincial offices, Eurac Research monitors these indicators and presents their development as well as their meaning on a continuously updated website: **www.eurac.edu/de/data-in-action/klimawandel-monitoring**

+1.4°C
is how much water temperature has risen in Lake Kaltern/Caldaro since 2008.

-6.5%
The percentage snow cover below 1,000 m.a.s.l has dropped by in South Tyrol since 2002.

DROUGHT IN THE ALPINE REGION

The last two winters were very low in precipitation, the summer in between was hotter than average – but was this exceptional? Were there similar years in the past? Or was there a time when was it wetter than average? The Alpine Drought Observatory provides answers to these questions and more. Freely accessible and continuously updated, the online tool uses maps and graphics to provide an overview of drought in the Alpine region over the past 40 years. The data which includes precipitation, evapotranspiration, and snow cover, comes from 11 research partners. Eurac Research developed and maintains the website. **ado.eurac.edu**

Constantly adapting to constant change

Climate change *is forcing* us to change. Societal change is an opportunity to transform. But whether it's language diversity in the classroom, extreme weather events, or choosing the right grape varietal, those who understand the mechanisms of change and are able to adapt, can reduce risks and exploit potential.

Diversity management: South Tyrol's world of work

How do companies deal with diversity? Three researchers investigate.

More than 13% of employees in South Tyrol are of foreign origin and although this is only one dimension of diversity in the South Tyrolean working world, it is the one that is still the most difficult for companies to manage at the moment. Political scientist Marzia Bona explains: "Dimensions such as gender or a disability are recognized and regulated by law; there are no precise standards with regard to migration background." Together with her research colleagues Verena Wisthaler and Johanna Mitterhofer, Bona has examined how diversity is perceived and what strategies, practices and measures exist for dealing with it within the South Tyrolean economic system. General conclusion: the potential of diversity is not recognized. It is not seen as an added value, but as a complication to be accepted, especially in times of staff shortages; it is "managed" mainly to avoid conflicts without realizing that the uniqueness of each person, if appreciated, also benefits the company.

None of the companies surveyed had a structured diversity management plan, but some have an interesting range of concrete measures, from mentoring programs to time bank systems for accumulating days for extended home leave. What the companies lack are opportunities to share experiences, as well as educational opportunities in the area of diversity management.

The researchers also emphasize the importance of the topic beyond companies. If diversity is recognized as positive in the workplace, this message is transferred to society; exclusion and structural inequalities are reduced, and cohesion becomes stronger.

In a second phase, a quantitative survey was conducted together with the South Tyrolean Employment Promotion Institute to ascertain employee views. While 70% of respondents see diversity in the workplace as having positive impacts on creativity and efficiency, the very same percentage believe that it can also lead to conflicts. In South Tyrol, 10% of respondents with a migration background have already been discriminated against in their working lives – the EU average is only 7%.

DIVERSITY: EURAC RESEARCH

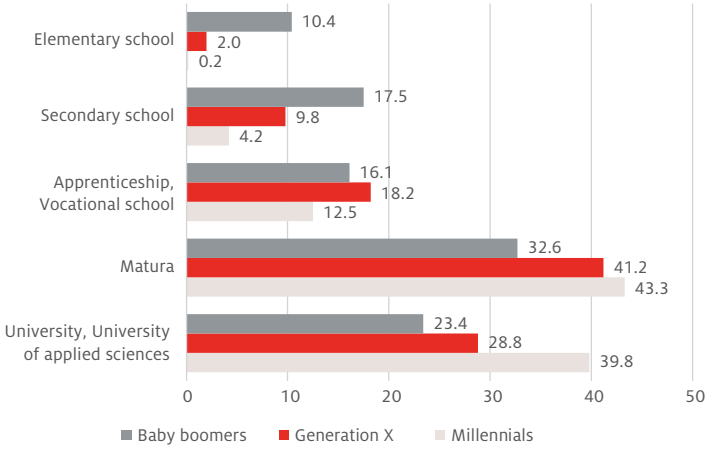
52.2% (318)
women

47.8% (291)
men

This data was taken from identity documents at the time of hiring.

Staff by nation
473 Italy
89 EU
47 Non-EU
22.3% from abroad

47
The number of nationalities at Eurac Research. Between us, we speak more than 30 different languages.



Respondents by generation and education level (%); n = 1,505

Social mobility in South Tyrol

How has the social situation for people in South Tyrol changed in recent decades? And, to what extent do individual opportunities for advancement depend on family background? For the first time, a study conducted jointly by Eurac Research and the South Tyrolean Employment Promotion Institute paints a comprehensive picture of this. At first glance, the picture is positive: for many of those surveyed, their situation has improved compared that of their parents in terms of education, careers and income. However, individual opportunities to reach certain social positions are still unequally distributed and determined to a large extent by social background. Children of executives, for example, have almost six times the chance of becoming executives themselves compared with children from other social backgrounds. The study surveyed 1,505 people from three generations: baby boomers (born between 1948 and 1965), Generation X (1966-1979) and millennials (1980-1997).

Climate protection first

"Climate change and sustainability" were the topics of a population survey undertaken in cooperation with ASTAT – the Provincial Institute for Statistics. On the basis of a random sample, the results show concern. "More than 96% of respondents perceive climate change as a serious problem for the entire world, which also has a very concrete impact on life in South Tyrol, mostly with negative consequences," summarizes Socio-economist Felix Windegger. Almost two-thirds of those surveyed believe that more should be done for climate protection in South Tyrol, and over 70% think that politicians should put climate protection before economic interests. Around 84% believe that South Tyrol should reduce its energy and resource consumption for the benefit of the climate, and 82% think that faster progress should also be made in climate adaptation.

About 1,300 people

responded to the climate change and sustainability survey conducted for the first time as part of the "So Thinks South Tyrol" ASTAT study. This survey is the result of a new collaboration with ASTAT – the Provincial Institute for Statistics.

Linguistic diversity in schools

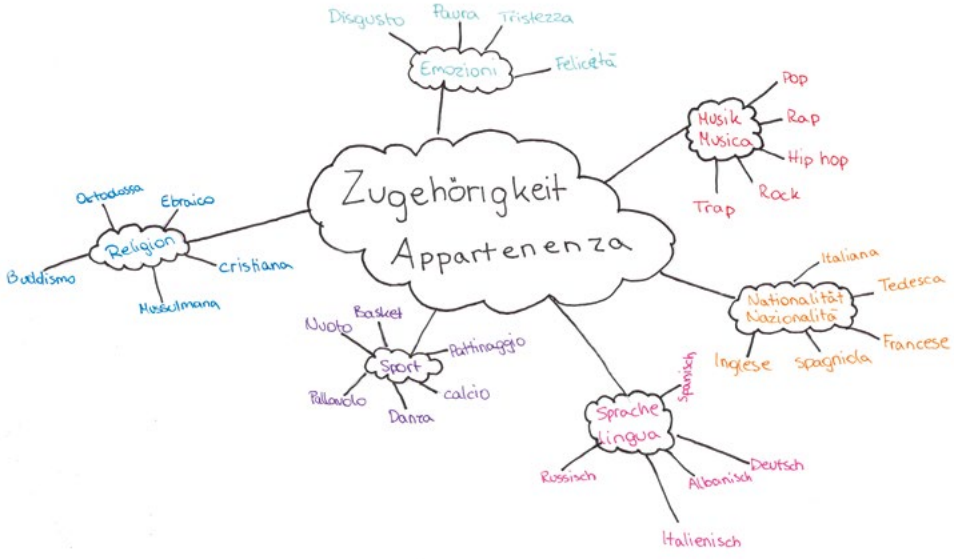
THE QUESTIONNAIRE

A large proportion of the 614 teachers in South Tyrol who participated in an exploratory study on multilingual didactics are asking for more skills and more concrete examples of activities to carry out in their classrooms.
"This is confirmation of the needs that we have also observed in our workshop activities on multilingualism," explains linguist Sabrina Colombo. "The requests from schools for these elements are increasing. It is a sign that the phenomenon of migration, but not only that, has ignited new attention to multilingualism. Ten years ago it would have been hard to imagine." This is also reflected in the questionnaire in which teachers from different parts of the region participated.
However, the activities proposed by the study participants are already very varied. "Beyond the more formalized experiences of co-presence or of CLIL: Content and Language Integrated Learning, a methodology that involves teaching content in a second or foreign language, teachers are often driven by personal initiatives and creativity, and even if they do not classify their activities with official definitions, they do in fact use different multilingual didactic approaches." points out linguist Marta Guarda.
sms-project.eurac.edu/report-didattica-plurilingue

CITIZEN SCIENCE IN ACTION

Created to raise awareness of scientific methods, the citizen science project held in Bolzano at the Italian-speaking Fermi and German-speaking Egger-Lienz middle schools has proven to be an excellent opportunity for collaboration. 40 male and female students were divided into nine small groups that combined students from both schools. Over the course of six two-hour meetings, each group set up and carried out research starting with an open-ended question to be answered. They presented the results publicly to peers, classmates, teachers and professional researchers. The takeaway: a sense of belonging.

The first step in setting the research question: a mind map compiled by a bilingual working group



75%
of respondents asked for new skills in multilingual education.

80%
of respondents would like to exchange ideas and materials.

Which grape variety for which climate?

Geo-ecologist Lukas Egarter Vigl and his team are compiling the first varietal site catalog for South Tyrol.

What is this catalog all about?
Lukas Egarter Vigl: My colleague Simon Tscholl and I are characterizing the winegrowing region of South Tyrol from a climatic perspective for the first time. South Tyrol is a region with complex topography and very different climatic conditions and this requires small-scale analyses. Fortunately, the vineyard register of the Province of Bolzano provides very detailed information on varieties and sites.
So, not only do we have detailed information on this, but also accurate temperature time series. This allows us to link varietal and climatic information to a specific site and create a varietal/site catalog for the most common grape varieties.

What are the advantages of the catalog?
Egarter Vigl: First, we get a clear picture of the current situation. Second, we can use climate scenarios to make forecasts such as which varieties will still find the optimal conditions at which locations in 20, 30,or even 50 years from now.

Can it help today's winegrowers decide on a particular vine?
Egarter Vigl: Yes, the wine maker can precisely correlate climate with variety. For example, if someone is currently growing a variety in a marginal location that is actually too warm or too cold, then they can choose another variety better suited to the site for the next planting. This is important because vines are perennial plants, and decisions made today have an impact for decades to come. You can't just try out whether a variety works, because that involves costs and risks.

What does climate change mean for tomorrow's viticulture?
Egarter Vigl: On the one hand, there will be a change in the ratio of varieties currently grown in South Tyrol and the varieties themselves will also gradually shift; on the other hand, vines will be able to be cultivated as a permanent crop at higher altitudes.

How likely is it that more mountain farmers will attempt wine growing in the future?
Egarter Vigl: The temptation is certainly there for some. The yield for one hectare of grassland is low, and for vines it is currently five times that. Here, science can provide farmers and the country with important empirical arguments for and against conversion or expansion.

Becoming climate neutral: scenarios for South Tyrol

Transport, buildings, energy, industry and agriculture are all sectors in which emissions must be significantly reduced if South Tyrol is to achieve the Paris climate targets. How this can be achieved with the help of technical measures, and what legal room for maneuver does the Province have thanks to its autonomy? These questions and more were examined by an interdisciplinary research team in a comprehensive study commissioned by the Province. With detailed data and analyses, the 180-page, freely accessible document provides a basis for discussion on climate policy decisions. The study has quantified emission reductions for both current and future measures – for the first time. The conclusion: previously calculated reductions aren't going to be enough if we continue on the same path. The results also highlight the effects of additional, recommended measures which include making electric vehicles more attractive for everyone, investing in zero-emission buses for public transport, meeting the energy requirements of newly constructed buildings exclusively with renewable sources, and not installing any new boilers that are exclusively run on fossil fuels.

An alliance for sustainability

Several South Tyrolean research institutions joined forces in the summer of 2022 to form the "Alliance for Sustainability" in order to coordinate research activities, share knowledge, initiate discussions and identify solutions. First initiative: a series of public lectures on sustainability. Our president Roland Psenner and several researchers discussed a wide range of topics from the changes in high mountain lakes due to climate change to the role of artificial intelligence, pathways to decarbonization, the coexistence of humans and wildlife, the potential of municipalities, and whether we are heading for climate catastrophe. In June, researchers will discuss how migration and diversity can be drivers of sustainable societal development.

200
The number of emission-free buses needed by 2030 (out of a total of 750) to produce 22% less CO_2 emissions than now.

60%
The percentage of emissions caused by the South Tyrolean wine industry's bottles. If this is addressed there is huge potential for greenhouse gas reduction.

85%
The percentage of the emissions from agriculture that are caused by rearing livestock.

Return: Italy's biggest ever project on risks and climate change

In Italy's most extensive research project on climate risk to date, 25 partners coordinated by the Federico II University of Naples, three years of work and more than 100 million euros in funding have made up the Return project. Funded by the PNRR (National Plan for Recovery and Resilience), the consortium will focus on improving risk prediction and methodologies for the prevention, adaptation and mitigation of climate change. This will be done by testing new monitoring technologies and promoting a more efficient and sustainable use of the data that relates to extreme events. It is a project that aims to create a bridge between research activity and the final use of the research results with the goal of providing civil protection and more appropriate tools to define risk management policies in all sectors.

Calculating our emissions

Renewable energy specialists are working with the Mission Sustainability project team to determine exactly how many greenhouse gases Eurac Research produces by heating our premises and through other activities. This is one of several initiatives aimed at reducing our impact on the environment and becoming more sustainable. We have also introduced an app that calculates the emissions of business trips for each means of transport: we hope with the numbers in mind, we'll be more likely to make climate-friendly choices.

SOLAR-POWERED BIKE CHARGERS

In five South Tyrolean mountain huts, “green loaders” have been installed that can recharge four bikes at the same time and up to 50 bikes in a day, all thanks to energy produced by a single photovoltaic module. Implemented by Leitner Energy, these are pilot installations that fall within the framework of the European MOBSTER project.

Better e-Governance

MyCIVIS, the portal for the online services of public administration in South Tyrol is becoming more user-friendly. Who better to provide suggestions than the people who use it? On behalf of the Autonomous Province of Bozen/Bolzano, our public management experts have developed an online questionnaire that will be used to survey the satisfaction of the population over the course of six months. The results will then be combined with statistical data on the use of the system in order to make suggestions for improvement. The questionnaire can be accessed via the myCIVIS portal homepage until the end of June.

80
The number of companies that have commissioned assignments from us in the past year. Almost half (37) are local.

Crisis-proofing democracy

Under the pressure of the Corona pandemic, fundamental rights were restricted, parliaments did not meet, and decrees replaced the struggle for consensus. What did all this mean for democratic legitimacy? And what lessons for future crises can be drawn from these experiences? Furthermore, how can our democratic processes and institutions become more resilient in order to function well under stresses such as these? To answer these questions, 11 research institutions are analyzing the crisis responses of 31 European countries in a research project funded by the European Union's Horizon Program. The focus is on the democratic legitimacy of decisions, which is assessed using a variety of indicators such as the participation rights of the general population and those affected, involvement of minorities, economic sustainability, trust in institutions and other related concerns. The aim is to develop a model of legitimate crisis management. Currently the climate crisis is paramount: "Because there, too, it will be a matter of weighing fundamental rights against each other," explains Constitutional Law Expert Francesco Palermo who is coordinating the project with his Eurac Research team of experts. "How does one proceed, if there are no procedures already in place? These are practically the same problems we saw during the pandemic. However, we should be better prepared, and juridically equipped."
legitimult.eu

Blogs: a key to interpreting current events

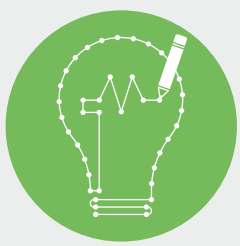
"Putin's war against Ukraine began long before February 24, 2022, when the Russian military launched its large-scale invasion. More often than not, commentaries by pundits, journalists and politicians before and after the invasion fail to take into account the rather complex context of the conflict. For example, many demographic analyses and ethno-linguistic maps of Ukraine are based on 20-year-old statistics and assumptions that may be at least misleading, if not downright wrong. The last Ukrainian census took place in 2001. A new census was originally scheduled for 2011, but has been postponed several times: first to 2012, then to 2013, 2014, 2016, 2020, and finally to 2023. Most likely, the census planned for 2023 will be postponed again because of the ongoing war. However, there are good reasons to take a closer look at the 2001 census results…" As our jurist Sergiu Constantin, blog piece "Ethnic and Linguistic Identity in Ukraine? It's complicated," posted on March 21, 2022 begins. If academic channels and our online magazine delve into the topics of our research, explaining their processes and results, blogs are the places where our researchers can express more personal reflections. And, as in this case, showcase their analytical skills and familiarity with reading technical sources to understand current events critically.

Nearly 10,000
people viewed the blog-post "Ethnic and Linguistic Identity in Ukraine? It's complicated,". It's our most-read piece to date.

84
The number of blog pieces we published over the past year. In total they received 105,000 views.

NEW ARRIVALS: THE BLOG FAMILY EXPANDS

2022 saw three newcomers to the blog family. Let's give a warm welcome to "Imagining Futures", "Connecting the Dots", and our "Ask a linguist" column.

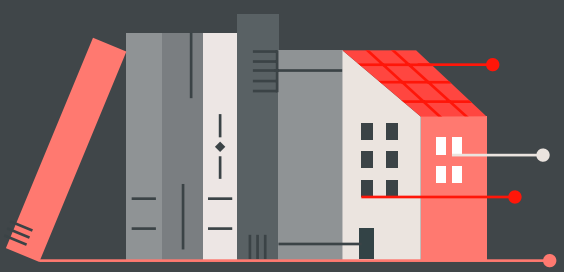


Extreme rescue

South Tyrol Mountain Service conducted their first ever fully simulated exercise inside the terraXcube. The trial saw 12 mountain rescue members performing a complicated rescue at an altitude of 3,500 m.a.s.l during a severe thunderstorm and in temperatures well below freezing. The exercise was monitored by our mountain emergency medicine experts who, at the end of the operation, assessed the physical and psychological stress levels of the rescue teams. The teams were quickly taken to altitude in the simulator's anti-chamber where the sound of a helicopter rotor rumbled. Upon entering the Large Cube, terraXcube's largest chamber, they found very realistic conditions: darkness, a temperature of about -10°C, and strong winds. The last 300m of the ascent on foot was simulated using an obstacle course that the mountain rescue team had to undergo repeatedly for about 20 minutes.

Old knowledge, new insight

Studying the past and passing on valuable knowledge improves the quality of life in the present and future. It applies to the energy rehabilitation of historic buildings, the enhancement of traditional land management techniques and the recovery of ancient crafts.



New life for old walls

A former elementary school, the home of an old sacristan, a traditional farm that housed mine workers and another typical house for tobacco farmers: these buildings in the rural Alpine region are empty and in danger of falling into disrepair. However, they belong to the community and above all form an important part of the respective local history and cultural landscape. There are many such buildings in the rural Alpine surroundings, built heritage whose disappearance would mean a great loss, but whose preservation also poses challenges to the communities. In case studies on the previous examples, our experts in energetic retrofitting of historic buildings demonstrated pathways to a new and sustainable life for these buildings as part of the Interreg project SHELTER. Step one: find a purpose for the building that actually meets local needs by involving the communities themselves. Step two: develop a renovation concept that minimizes energy needs and is in line with historic preservation. Step three: determine how the remaining energy needs can be met by renewable sources. **interreg-shelter.eu**

Former house of tobacco farmers in Valbrenta in the province of Vicenza. This building is one of four historic buildings that will undergo energetic refurbishment and sustainable renovations as part of the Interreg project SHELTER.

Citizen Science: a digitization project

Historical newspapers are a rich source for research in various disciplines, but they can only really be used if they are available online. As part of the Zeit.shift project, Eurac Research, the Landesbibliothek Dr. Friedrich Teßmann and the University and Provincial Library of Tyrol are working together to digitize 41 Tyrolean daily newspapers which were published in a script called 'Fraktur' between 1850 and 1950. Optical Character Recognition (OCR) is the technology used to convert a text image into machine-readable text and although it is constantly improving, the poor quality of the historical newspapers can often compromise accuracy and thus the searchability of the digitized text. However, a linguistic research team is now testing how regular users can help improve and annotate digitized text while learning something in the process. Ötzit!, a web game, is designed to collect OCR corrections from players as they learn to read Fraktur; in another task, participants annotate historical advertisements, gaining a deeper understanding of the cultural values and public discourses of the past. The project will soon make around 450,000 digitized pages available through a freely accessible web portal.
all4ling.eurac.edu/de/projekte/zeitshift

Traditional orchards

In South Tyrolean dialect "Baumgart", "Anger", or "Pangerter" are words for meadows or pastures where tall fruit trees grow. We monitored five of them closely and concluded that in no other habitat in South Tyrol, have so many bird species been recorded. This also includes some endangered species. The results on wild bees are also particularly impressive: on average, nearly 23 species have been found in traditional orchards, while intensive apple orchards have little more than nine.
Comparing traditional orchards with intensively planted apple orchards clearly shows how the increasing concentration of agriculture affects species diversity. Grasshoppers, for example, were found only in exceptional cases in apple orchards, while in the traditional orchards surveyed, nine species including one endangered species – the striped cricket, were recorded. This demonstrates traditional orchards, along with extensive meadows and pastures, are the richest habitats for grasshopper species in the province.


Mummies.
Unwrapping
the past
MM
IES

Mummies: unwrapping the past

"Mummies. Unwrapping the Past," a temporary exhibition at the NOI Techpark that took place between Sept. 2 and Oct. 24, 2022, showcased two Egyptian mummies that had been returned to the scientific community and the public thanks to a collaboration between the Museo Civico Archeologico di Bologna and Eurac Research. An interdisciplinary study was conducted on the mummies and both were subjected to a conservation treatment involving several institutions with specific expertise.
The older of the two mummies is that of a woman who lived in Roman-era Egypt, between the 1st and 2nd century AD. The highly unique painted shroud with which she was prepared for burial still envelops the body. This woman, about 153 centimeters tall, may have been about 35-45 years old at the time of death. However, the analysis did not point to a single cause of death: the woman had dento-alveolar diseases, such as abscesses, as well as degenerative diseases, such as arthrosis in both her spine and knee joints. The woman's body is in a supine position, with her arms stretched along her sides and her legs straight.
www.eurac.edu/en/exhibition/mummies-unwrapping-the-past

Guardians of diversity

A project which documents living cultural heritage in Vinschgau/Venosta, Lower Engadin and Müstair has resulted in an impressive exhibition and a book. Project manager Ricarda Schmidt explains the importance of safeguarding this huge body of knowledge.

Why is investigating old cultural techniques such as willow weaving, orchard cultivation and rural seed production so important?
Ricarda Schmidt: First of all, to create an awareness of them. These practices are often part of people's everyday lives and are not perceived as living cultural heritage, the preservation of which is in everyone's interest. Moreover, living cultural heritage can be seen as a model for sustainable living: the generations before us have left us a treasure chest of sustainability – a huge trove of knowledge and experience regarding cultural techniques, some of which have been working for millennia.

So are you arguing for the protection of these farming traditions?
Schmidt: The term protection is more suitable for material heritage such as architectural monuments. With living cultural heritage, constant dynamic change is important: how we want to preserve or revive it? Some traditions are still very vital and are just in line with the trend of the times, while for others there is a need for action.

For example?
Schmidt: Well, the traditional pear variety "Vinschger Palabirne" comes to mind. In 2007, the municipality of Glurns/Glorenza surveyed a stock of 142 of these trees, and about 20 have been lost since then. Our project not only tries to preserve the Palabirne trees, but also the knowledge about the cultivation and processing of their ancient fruit. For this we worked together with two passionately motivated partners, the "Palabirnkomitee" and the local citizen' cooperative. In particular, I would like to mention the ongoing, inspiring and encouraging support of Armin Bernhard – a pioneer in the concrete implementation of socio-ecological transformation who unfortunately passed away much too early last winter. A first result was the foundation of a tree nursery, where 100 Palabirne seedlings are being grown. These trees will then be given to interested grandparents and their grandchildren to follow the old tradition of planting a Palabirne tree when a child is born: it is an incredible part of cultural identity, especially for the Upper Vinschgau/Venosta.

So it is also a matter of coming to terms with one's own identity...
Schmidt: The identity-forming effect of living cultural heritage can not be overestimated. It shapes people's everyday lives and creates a sense of community and belonging.
www.eurac.edu/hueter-custodi

Facts and figures

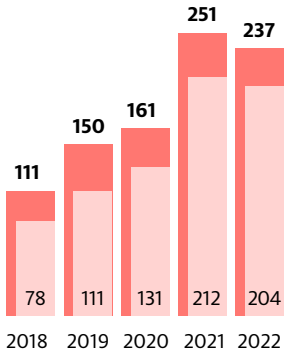
Publications, projects and partners

Publications and Open Science

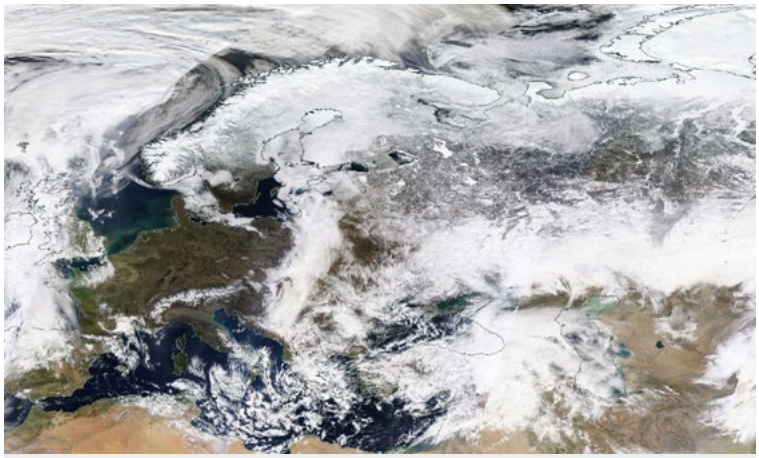
More than 600 scientific publications were published by Eurac Research in 2022. These include articles in journals, books, contributions to conference proceedings and scientific reports.

43.7% of the scientific publications were articles in journals, almost all of them (**94.5%**) *peer reviewed*.

(Source: Eurac Research internal database)



Open access publications
The graph shows the number of open access publications in recent years, as well as the proportion of gold open access publications in each case (approx. 86% in 2022) – these can be accessed directly via the journals' websites.
Source: Scopus



SNOW ON THE SUMMIT
According to Altmetric data, an index that evaluates the impact of research by taking into account alternative metrics to citations, such as web reach, the scientific article with one of the highest scores last year bore the sole signature of Claudia Notarnicola. The piece was published in Open Access mode by "Scientific Reports", and is about snowfall trends in mountain areas around the world. According to the study, on average, snow remains for two weeks less than it used to in 1982.

Overall negative trends for snow cover extent and duration in global mountain regions over 1982–2020 Claudia Notarnicola, Scientific Reports volume 12, Article number: 13731 (2022)
www.nature.com/articles/s41598-022-16743-w

71.6%
The percentage of scientific articles we published in 2022 in Open Access mode.

86%
of them in Gold Open Access mode.

BIA
So far this year, the number of Eurac Research publications in the online archive BIA (Bolzano/Bolzano Institutional Archive) have exceeded **8,000** and have received over **17,000 downloads/file views**. All bibliographic data is available on the platform (**bia.unibz.it**) and many publications are also available in their full-text versions.

Sharing research data
Data sets and data products are an important part of the research cycle. Preparing and preserving them in such a way that they are permanently retrievable and reusable is a central feature of Open Science.
In 2021, Eurac Research became a member of DataCite, an international consortium which enables scientific institutions to assign Digital Object Identifiers (DOIs) to research data and make the information more accessible, reusable and citable.

To enable Eurac Research data products to be found and reused, Eurac Research maintains data portals and repositories. These include the Eurac Research CLARIN Centre (**clarin.eurac.edu**), the Environmental Data Portal (**https://edp-portal.eurac.edu/home**), and the LTSER Matsch/Mazia Data Browser (**browser.lter.eurac.edu**).

20
The number of data sets to which, by the end of 2022, Eurac Research had assigned a Digital Object Identifier (DOI).

27
The number of Eurac Research's data sets and software that was shared in 2022 in the ZENODO open access digital archive.

Patents

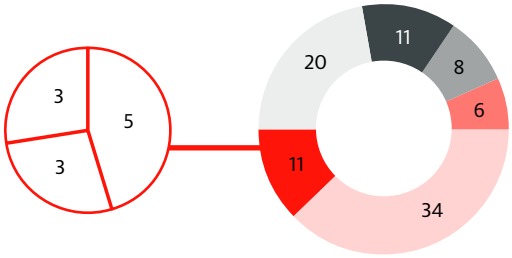
It looks like a headset for listening to music, uses sensors placed in the external ear canal and has been tested in the terraXcube, in temperatures between -10 and 20°C. The space-saving, noninvasive and easy-to-use instrument not only measures core temperature, but also oxygen saturation and heart rate. Eurac Research patented it in collaboration with companies Minnova Med and Kerr Srl. The innovative device performs best in emergency medical interventions, but could also be used in other hospital settings.

4+5
The number of our active and pending patents last year.

EU projects

During 2022, almost all the funding for the European Commission's seven-year programs was allocated and 108 proposals were submitted. 36 new projects started, more than double that of the previous year. Last year, funding per individual project averaged about €253,000. The acceptance rate is currently at 29%. 28 projects are still under evaluation.

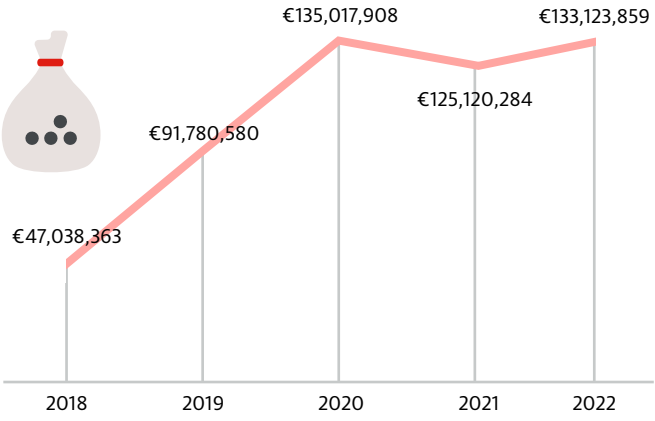
The projects are part of **several funding programs.**



- Horizon 2020
- Horizon Europe
- Life+
- European Territorial Cooperation (3 Interreg Italy-Switzerland, 5 Alpine Space, 3 Central Europe)
- Other programs (Joint Programming Initiative, European Civil Protection and Humanitarian Aid Operations, Adriatic-Ionian, Cost Action, COSME)
- Erasmus+

90
The number of ongoing projects we had by December 2022. We completed 31 projects last year and have started 36 new ones.

Nearly 40%
of 2022's new projects are lead by women. Of the projects in which we are lead partners, 50% are lead by a woman.



Over 100 million euros

Our cumulative budget adds up to €133,123,859. This is the sum we managed in 2022 for all ongoing EU projects – more than 21% of this figure was retained by Eurac Research whilst the rest was distributed to project partners. Around nine million euros was received for EU projects that began in 2022.

PNRR: 3 MAJOR RESEARCH PARTNERSHIPS

In 2022, we entered into three major research partnerships under the National Recovery and Resilience Plan (Piano Nazionale di Ripresa e Resilienza – PNRR). Each of these strategic research programs brings together dozens of partners and has received more than 100 million euros in funding.

In addition to the **RETURN project** (p. 25), we are also involved in:

- **NEST** (Network 4 Energy Sustainable Transition) – Energy Scenarios of the Future; Lead Partner: Polytechnic of Bari – ENEA/CNR; Contribution for Eurac Research €944,333.
- **iNEST** (Interconnected North-East Innovation Ecosystem) – Innovation Ecosystem; Lead Partner: University of Padua, contribution for Eurac Research €861,655.

NOT ONLY EU

In addition to European funding, we are also financed by the Autonomous Province of Bozen/Bolzano. This year we have 26 projects funded by the Province compared with 19 in 2021. Of the proposals submitted to the Province, half were approved and one is still under evaluation.

Awards and nominations

David Moser is the new vice president of the European Technology & Innovation Platform for Photovoltaics and he is also currently involved in the agri-photovoltaic sector.

What should a farm consider before choosing an agri-voltaic system?
David Moser: Choosing to install a photovoltaic system over an agricultural area should not only have electricity production as the primary goal. Agri-voltaic systems should also be functional for the crops themselves. For example, reducing the amount of solar radiation could be advantageous for some crops. Systems could also integrate different types of environmental sensors or other functionalities such as anti-hail systems or rainwater harvesting. That said, it is clear that the possibility of producing electricity is a major benefit for farms, especially in view of covering the consumption resulting from the electrification of processes and means of transport in the agronomic supply chain.

What are the challenges and how is research contributing?
Moser: The systems themselves must be designed to create a symbiosis in which photovoltaics and agriculture can have a mutually beneficial rapport. First and foremost, they must be cost-effective. We need standardized solutions that include PV modules, mounting structures, and simple operation and maintenance systems that can be adapted to the needs of various crops in different climates and landscapes. For this reason precisely, we launched a large European project in mid-January called Symbiosyst. The project will last four years and bring together international companies and research centers. In the project we will develop innovative solutions and test them in the field in four agricultural scenarios that differ in location, climate, size and type of crop in South Tyrol, Spain and the Netherlands. In South Tyrol, together with colleagues from the Laimburg Research Centre, we will install two pilot systems, one will be integrated on a newly planted apple orchard and the other on an existing, productive apple orchard. Working with the South Tyrolean Farmers' Association we aim to understand what the needs of specific farms are and what support they'll need to consider investing in agri-voltaics.

Andrea Abel, has been at Eurac Research's Institute of Applied Linguistics since 1997 and its head since 2016. She has also been Professor of German Linguistics at the Faculty of Education at the Free University of Bozen/Bolzano since 2022.

Katharina Crepaz, a political and health scientist, received the Technical University of Munich's Habilitation Award for her work on the influence of social participation on health.

The 2022 Wilderness Medical Society research award was given to **Giacomo Strapazzon**, head of the Institute for Mountain Emergency Medicine. The award paid tribute to Strapazzon's career in emergency medicine in remote environments. Founded in the early 1980s in the United States, the Wilderness Medical Society is the world's largest society of researchers, physicians and practitioners in the field of medicine in remote areas.

Clear the stage for science

Biotechnologist Giacomo Antonello, won the first evening of Bolzano's first Science Slam with an entertaining presentation in which he used Lego to explain the microorganisms that live in and on us and how they influence our health and our minds. All the slams were packed, with people and with laughter. There was a full house at each of the three events hosted at the Eurac Research HQ, NOI Techpark and unibz.

Science hits the stage, again: seven of our researchers joined five actors for the play "Anthropos, Tyrant (Oedipus)" on the stage of the VBB theatre in March/April 2022, in Bozen/Bolzano. The theme was climate change and the ancient myth of Oedipus. More than 1,200 spectators attended the show's 12 performances.

473
The number of events we organized in 2022.

11,079
The number of people who participated in them.

380 events took place in person, 93 were hybrid or virtual.

Our network

Our network of collaborations has continued to expand and our partners range from research organizations, universities, museums, institutions, companies and can be found from Luxembourg to Papua New Guinea.
In 2022, the web of networks spread especially wide for our Institute for Mummy Studies thanks to "Mummies. The Past Revealed" an exhibition held in collaboration with the Museo Civico Archeologico di Bologna as well as the 10th World Congress held in September in Bolzano, and to a cooperation agreement for research and preservation of pre-Columbian heritage signed with the Bolivian Ministry for Cultures, Decolonization and Depatriarcalization.

Video Bolivia

We collaborate with

1,034 partners in research projects

725

205

104

151 companies and other bodies that have commissioned us for research topics.

48

41

62

179 institutions we have collaboration contracts with

51

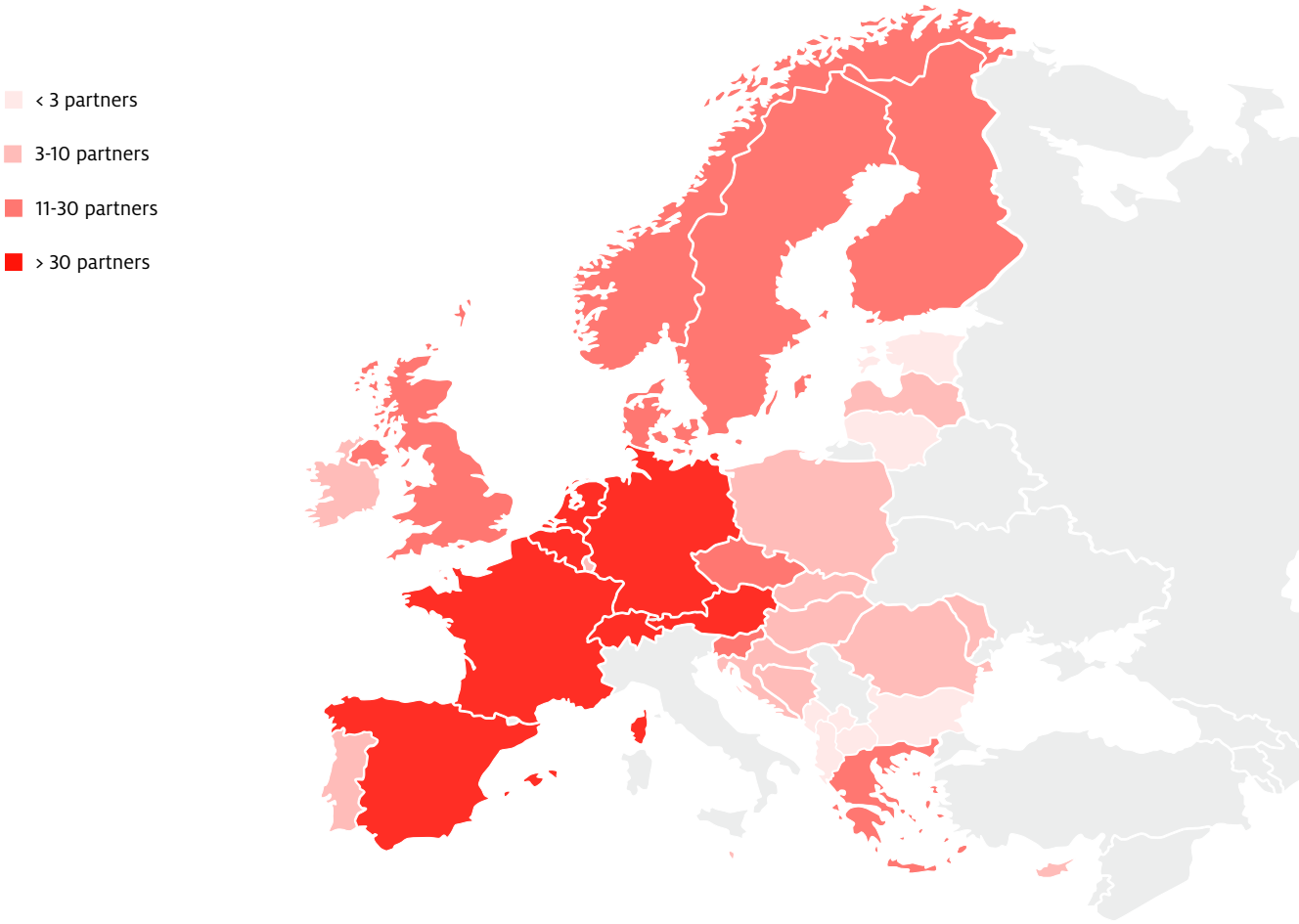
76

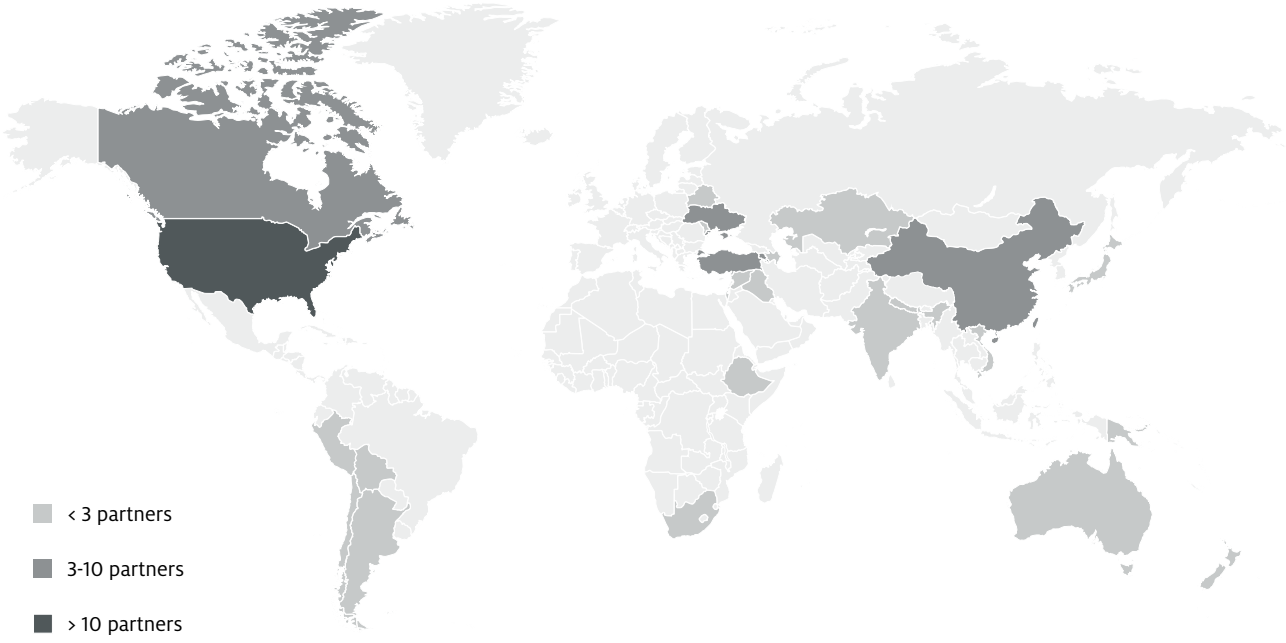
52

international

national

local


< 3 partners
3-10 partners
11-30 partners
> 30 partners


< 3 partners
3-10 partners
> 10 partners

This is us

In 2022, there were 83 new hires – over 15% from countries outside the EU, more than 53% of whom were women. 73 employees have left Eurac to continue their careers elsewhere. So compared to the previous year, we have 10 more staff.

EMPLOYEES

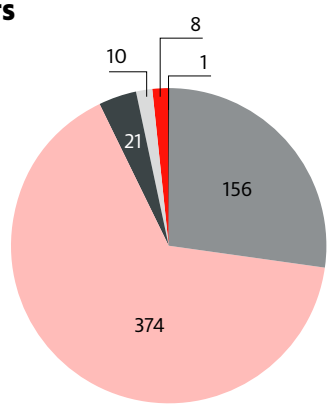
609 of us work at Eurac Research

15 of us have a Habilitation

208 of us have a PhD

69 of us are PhD students (36 are employees and 40 are in the Grant Program)

CONTRACTS



- Contractual employees
- Permanent employees
- Continuous and coordinated collaboration (CoCoCo)
- Apprenticeships
- Visiting (2 professors, 8 scientists)
- Other contract types

In addition, there are 33 scholarships and 6 research grants

AVERAGE AGE AND PERSONNEL BY AGE

39

<35: 216, **35.47%**

35-45: 233, **38.26%**

>45: 160, **26.27%**

WORK ORGANIZATION

70.4%

Full time

29.6%

Part-time

In addition, 87.1% have a Smart Working contract and 0.2% have a Home Working contract.
(Figures refer to employees on fixed-term and permanent contracts, as well as apprenticeship contracts).

Data as of 31.12.2022
Source: internal database

HOW WE ATTRACT TALENT

Each year, winners of the EU-funded Marie Skłodowska-Curie Fellowships join Eurac Research. Among those who score very well but do not receive funding, the Autonomous Province of Bolzano selects the best profiles and awards them with a Seal of Excellence grant. In addition, the individual institutes, in collaboration with various sponsors, coordinate targeted funding such as the Fusion Grant, the Global Fellowships supported by the Sparkassenstiftung and the Unesco Chair Fellowships.

CHANGES AT THE TOP

In March 2023, **Marc Zebisch** became the head of the new Center for Climate Change and Transformation and **Elisa Ravazzoli** the vice head. **Claudia Notarnicola** now fills his old position as head of the Institute for Earth Observation and **Alexander Jakob** is now the vice head there.

17
The number of different types of part-time contract we have. Our part-time staff distribute their working hours in 118 different ways over the course of a week.

25
New members of the future generation have joined us over the past year. On average, that's almost one new child every two weeks.

More than 10
The number of different mobility programs we have in place to attract talent.

11.4
The number of in-house training hours undertaken per person in 2022. Our staff received a total of 370 hours of career development and orientation support from the Career Center.

Finance

Basic financing
from the Autonomous Province of Bolzano/Bozen

48%

€28,978,330

Third party funding

52%

€31,196,829

Partner funding	€893,483
Project partner funding (Budget administrated by Eurac Research)*	€29,379,711
Courses	€364,498
Meeting management	€261,708
Sponsorships	€56,000
Other revenues	€241,429

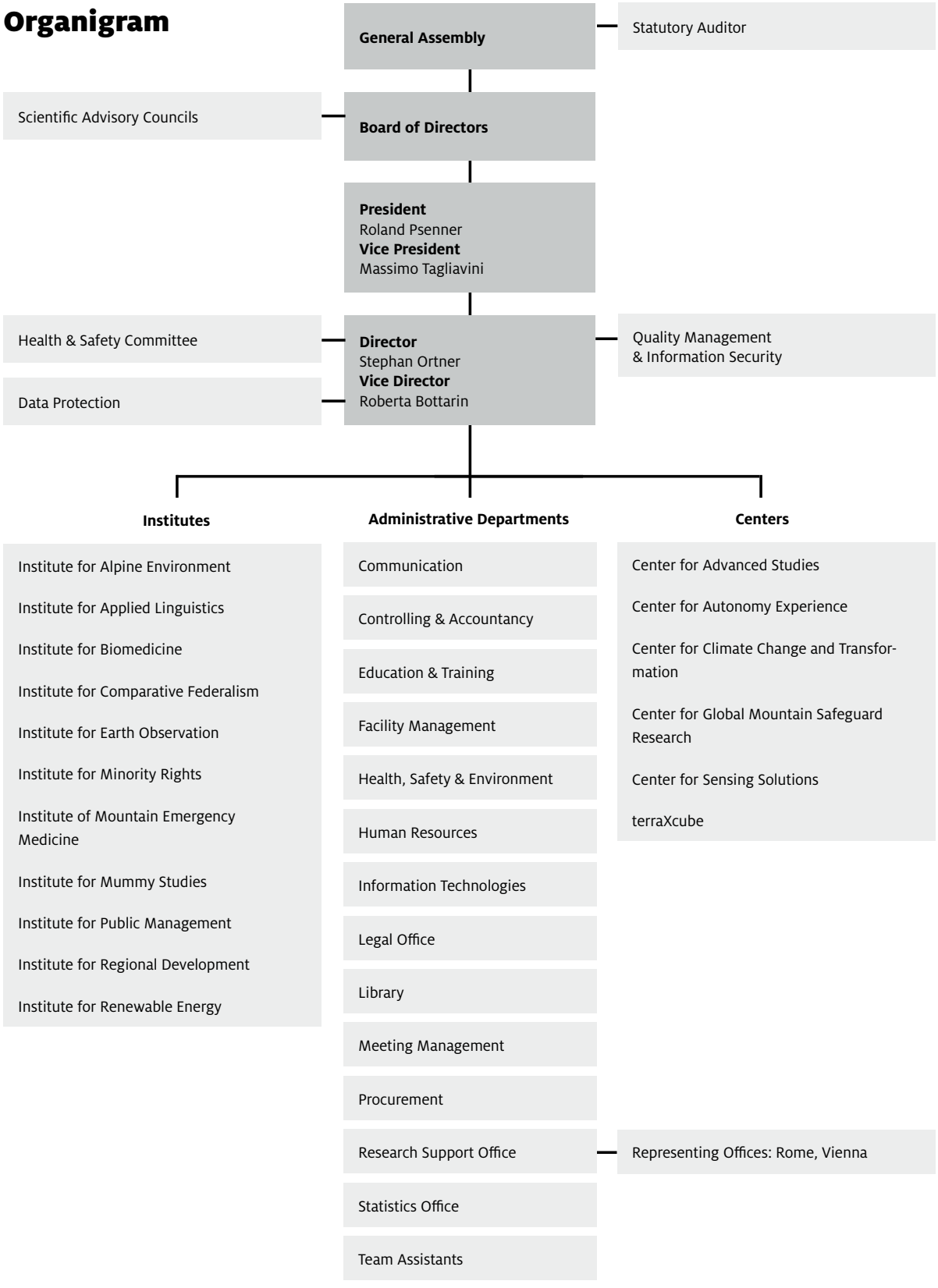
Total

100%

€60,175,159

*
Of the budget administered in the financial year 2022 by Eurac Research (29.4 million euros) 23.5 million euros comes from EU funding. Eurac Research manages 16.4 million euros of these EU funds on behalf of EU project partners. The total budget also includes 3.2 million, which Eurac Research acquired primarily within the framework of the "Research Offensive" of the Autonomous Province of Bolzano/Bozen.

Organigram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Institute for Minority Rights
Institute of Mountain Emergency Medicine
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Human Resources
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Legal Office
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Procurement
Research Support Office
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Center for Autonomy Experience
Center for Climate Change and Transformation
Center for Global Mountain Safeguard Research
Center for Sensing Solutions
terraXcube
Representing Offices: Rome, Vienna

Committees

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Autonomous Region of Trentino-Alto Adige/Südtirol
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Brennercom AG
Free University of Bolzano-Bozen
Gemeinde Bozen/Comune di Bolzano
Gemeinde Brixen/Comune di Bressanone
Gemeinde Meran/Comune di Merano
Handels-, Industrie-, Handwerks- und Landwirtschaftskammer Bozen/Camera di Commercio, Industria, Artigianato e Agricoltura di Bolzano
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Messe Bozen/Fiera Bolzano
Raiffeisenverband Südtirol/Federazione Cooperative Raiffeisen
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STATUTORY AUDITOR (2020-2024)

Sara Pitscheider
Auditor and tax consultant

Institutes and centers

LEGEND

STAFF*

Staff members

with a PhD degree

PhD students (employee contracts only)

SCIENTIFIC OUTPUTS

Books

Contributions in edited books

Journal publications

Contributions in conference proceedings

Presentations at scientific conferences

Contributions to thematic blogs

ONGOING PROJECTS AND ASSIGNMENTS

Research projects

with international partners

Assignments (services and consultancies)

with international agencies

LABORATORIES AND FACILITIES

Laboratories and facilities

* employee contract and CoCoCo only

Source: internal databases. Personnel data as of 31.12.2022; other data refers to the period between 01.01.-31.12.2022 (exported 01.2023).
Note: some people work in more than one institute or center; some research outputs are also collaborative.

INSTITUTE FOR ALPINE ENVIRONMENT

since 1993

Head of Institute
Ulrike Tappeiner

Vice Head of Institute
Roberta Bottarin

Staff

38 15 4

Projects and assignments

25 18

Laboratories and facilities*

2

Scientific outputs

4 **8** **45** **2** **94** **1**

**Eco-Lab, Open air laboratory Matsch-Mazia*

INSTITUTE FOR APPLIED LINGUISTICS

since 1992

Head of Institute
Andrea Abel

Staff

23 15 1

Projects and assignments

28 3 **4**

Scientific outputs

6 **9** **7** **6** **59** **12**

INSTITUTE FOR BIOMEDICINE

since 2001

Head of Institute
Peter P. Pramstaller

Vice Head of Institute
Andrew A. Hicks

Coordinator
Vera Amon

Research Group Leaders
Christian Fuchsberger, Francisco Manuel Lopes da Silva Domingues, Deborah Mascalzoni, Cristian Pattaro, Alessandra Rossini

Technical Group Leaders
Alessandro De Grandi, Clemens Egger

Staff

77 39 2

Projects and assignments

46 28

Laboratories and facilities*

3

Scientific outputs

3 **56** **8** **36** **6**

**Biomedicine laboratory, Biobank, CHRIS Center*

INSTITUTE FOR COMPARATIVE FEDERALISM

since 1994

Head of Institute
Francesco Palermo

Coordinator
Carolin Zwilling

Research Group Leaders
Elisabeth Alber, Karl Kössler, Alice Valdesalici

Staff

19 10 2

Projects and assignments

36 21 **36** 32

Scientific outputs

8 **35** **15** **80** **20**

INSTITUTE FOR EARTH OBSERVATION

since 2006

Head of Institute
Marc Zebisch

Vice Head of Institute
Claudia Notarnicola*

Research Group Leaders
Alexander Jacob, Claudia Notarnicola, Massimiliano Pittore

Staff

 **38**

 14

Projects and assignments

 **54**

 25

Scientific outputs

 **6**

 **25**

 **11**

 **55**

* Co-Head of the Institute from September 2022

INSTITUTE FOR MINORITY RIGHTS

since 1994

Head of Institute
Günther Rautz

Research Group Leaders
Alice Engl, Roberta Medda-Windischer, Verena Wisthaler

Staff

 **16**

 9

 3

Projects and assignments

 **29**

 8

Scientific outputs

 **1**

 **25**

 **7**

 **21**

 **96**

 **18**

INSTITUTE OF MOUNTAIN EMERGENCY MEDICINE

since 2009

Head of Institute
Giacomo Strapazzon

Vice Heads of Institute
Herman Brugger, Hannes Gatterer

Staff

18 10 2

Projects and assignments

25 21

Scientific outputs

44 **72**

INSTITUTE FOR MUMMY STUDIES

since 2007

Head of Institute
Albert Zink

Coordinator
Frank Maixner

Staff

13 8 5

Projects and assignments

10 9 **2** 2

Laboratories and facilities*

4

Scientific outputs

1 **5** **15** **41**

**Ancient DNA Lab, Modern DNA Lab, Anthropology Lab, Conservation Lab*

INSTITUTE FOR PUBLIC MANAGEMENT

since 1998

Head of Institute
Kurt Promberger

Vice Head of Institute
Josef Johann Bernhart

Staff

 **12**
 2
 2

Projects and assignments

 **7**
 4
 **9**

Scientific outputs

 **3**
 **1**
 **2**
 **2**
 **8**

INSTITUTE FOR REGIONAL DEVELOPMENT

since 2009

Head of Institute
Thomas Philipp Streifeneder

Research Group Leaders
Filippo Favilli, Christian Hoffmann, Elisa Ravazzoli

Staff

 **22**
 6
 4

Projects and assignments

 **59**
 16
 **7**
 1

Scientific outputs

 **2**
 **4**
 **11**
 **1**
 **21**
 **31**

INSTITUTE FOR RENEWABLE ENERGY

since 2005

Head of Institute
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Technical Group Leader
Giorgio Belluardo

Staff

 **131**

 40

 8

Projects and assignments

 **89**

 48

 **74**

 10

Laboratories and facilities*

 **11**

Scientific outputs

 **5**

 **13**

 **55**

 **33**

 **30**

 **24**

**Accelerated Life Testing Lab, G-value Lab, Multifunctional Façade Lab, Volatile Organic Compounds Lab, PV Integration Lab, Energy Exchange Lab, Façade System Interactions Lab, Photovoltaic Test Field;*
Solare PV Lab, Heat Pumps Lab, Hygrothermal Testing Lab: 1785L, accredited according to ISO 17025:2018 by Accredia

CENTER FOR ADVANCED STUDIES

since 2017

Head of Center
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Staff

 **18**

 7

 3

Projects and assignments

 **9**

 7

 **1**

Scientific outputs

 **8**

 **9**

 **19**

 **2**

 **25**

 **18**

CENTER FOR AUTONOMY EXPERIENCE

since 2020

Head of Center
Marc Emanuel Röggla

Staff

5

Projects and assignments

5 3 **1** 1

Scientific outputs

3 **6** **1** **20**

CENTER FOR GLOBAL MOUNTAIN SAFEGUARD RESEARCH

since 2019

Head of Center
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Global Mountain Safeguard Research (GLOMOS) is a collaborative programme and scientific alliance, which was initiated in July 2019, between Eurac Research and the United Nations University Institute for Environment and Human Security (UNU-EHS) based in Bonn.

*The team is made up of employees from both institutions.

Staff*

1 (+4) 1

Projects and assignments

11 9 **2** 2

Scientific outputs

2 **9** **1** **29** **1**

CENTER FOR SENSING SOLUTIONS

since 2019

Head of Center
Roberto Monsorno

Staff

10 3

Projects and assignments

18 9 **7** 2

Laboratories and facilities*

3

Scientific outputs

1 **5**

**Sensor System Technologies Lab, Satellite Receiving Station, Environmental Data Platform*

TERRAXCUBE

since 2018

Head of Center
Christian Steurer

Staff

7 1

Projects and assignments

22 10 **13** 2

Laboratories and facilities*

1

Scientific outputs

1 **2** **2**

**Extreme Environmental Simulator terraXcube (1785L, accredited according to ISO 17025:2018 by Accredia)*

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(2021-2024)

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