



Activity Report

2021/22



30 years: a time-lapse review

Scattered throughout this report are facts, figures, and pictures that reflect 30 years of Eurac Research's history. A glimpse back through the mirror of time to showcase our accomplishments without ranking, temporal or institutional framework. It is rather the sum of all the small and large achievements that forms the concrete foundation of our research.

If these memories from the vaults are not enough, we've prepared a section on our website with interactive graphs that show how the growth of a research center can be traced back to a series of significant and pivotal events, decisions, and circumstances.

www.eurac.edu/activity-report

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research



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30 years...

Stephan Ortner, Roberta Bottarin
and Roland Psenner look back.

Research intentions: new dimensions, same spirit

It is impossible to summarize the development of 30 years in a few words, but perhaps one example helps: currently, several of our institutes and centers conduct joint and interdisciplinary research on major topics such as “migration and diversity” and “climate change and transformation”. This not only shows how big we have become but also how big today’s challenges are. It is only because of the experience we have accumulated over the years that we can deal with these topics so broadly, seeking answers to the new and complex questions our society faces. The enthusiasm with which we do this and the constant effort to contribute to a better future with our research has not changed in the last 30 years. Something of this spirit emerges from the facts, figures and images of our activities that we present scattered throughout the pages of this report: an insight into our work, without chronological order or rankings of importance. It is the combination of both small and large concrete achievements accomplished over the years that have cemented the foundations of our research for thirty years.

Stephan Ortner, Director

Research quality: open science is better science

One important development of which we are a part and which we are doing our utmost to promote is Open science. This signifies a real cultural change that affects many areas – publications, research data management, citizen science projects... Change is still underway, but it is becoming increasingly natural not only to publish the results of research, but also to disclose the data, methods and processes involved as well as to make them available to others for further use. This makes research even more traceable and verifiable and moves science forward more quickly overall. For example, we make processed language data from our projects available for other studies via a European research infrastructure, or publish long-term, complete data series from our surveys in the Matscher/Mazia Valley as a resource for worldwide ecological research, to name just two examples. Because we are convinced that openness, transparency, and exchange serve the quality and credibility of science, we launched the Open Research Award last year: an award for all those who actively contribute to moving us forward on this path.

Roberta Bottarin, Vice Director

Research community: more diverse and networked

When a research center grows as fast as Eurac Research, there is a danger that we will not just evolve, but also diverge.

Research has become more differentiated, more focused and – viewed from the outside – more confusing. At the same time, however, international collaborations have multiplied, as evidenced, for example, by more than 80 PhD positions created with two dozen universities, or ground-breaking publications and world-spanning projects with international partners. From the realization that new things often emerge at the edges of the discipline and in exchange with others, the contact between the disciplines has become closer. These “others” are not only different disciplines or international institutions such as the United Nations University, but also questions and suggestions from the population, from companies (especially the South Tyrolean Health Authority) and from politics. We live in a time when multiple crises overlap, and cooperation between countries is essential in addressing them – something science has always taken for granted. However, when an economic boycott calls scientific cooperation into question, time to overcome the larger crisis of climate change becomes increasingly scarce. This makes South Tyrol’s far-sighted, internationally oriented research policy, in which a small country networked with the big players can play a decisive role, all the more important in the future.

Roland Psenner, President



173

The number of lawns nominated in the first edition of the “Who has the most beautiful lawn in South Tyrol?” competition in 2010. The researchers awarded prizes on the basis of 20 different criteria such as biodiversity, yield, composition, distance from farms, and landscape aspects.



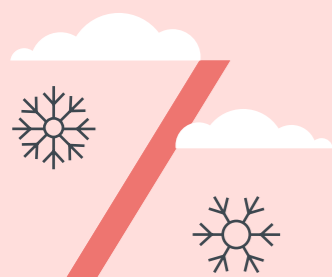
588

The number of lecturers who so far have participated in the **Summer School** on Human Rights, Minorities and Diversity Governance and the **Winter School** on Federalism and Governance. The Summer School has been in existence since 1999, the Winter School since 2010 and over 1,100 hours of classes have been taught since then.



78%

The percentage of **global mountain regions that recorded declining amounts of snow between 2000 and 2018**. A study by Eurac Research mapped global snow cover for the first time and analysed satellite images, ground measurements and simulation models for this purpose.



35

Border regions in Central and Eastern European OSCE states in which minorities live were studied by a team of experts from Eurac Research on behalf of the OSCE. The study concluded **minorities form important bridges** because they drive cultural and economic exchange with neighboring regions. As part of the study experts also identified the legal and policy instruments for cross-border cooperation.

XIII

The century when the Waaghaus/Casa della Pesa was constructed. **The historic building in the center of Bolzano/Bozen has now been renovated in terms of energy efficiency**, thanks in part to the consulting services of Eurac Research and solutions developed in the Institute of Renewable Energy’s laboratory, such as a super-insulating window specially adapted to the building’s aesthetic characteristics.

30



Landmark sights in Bolzano were described in the digital **video city guide in Italian sign language**, which was created in 2011 by the Institute for Applied Linguistics. Unique in Europe at the time, it was a milestone for inclusive tourism.

40%

The percentage of energy savings calculated for **the Coop shopping center in Modena Canaletto** after the conclusion of renovation work carried out by the CommONEnergy project in 2017. As part of the same project solutions to reduce consumption and increase comfort were also tested in in Spain and Norway.



5,888

The municipalities of the Alpine arc examined in **Mapping the Alps**, a publication by Eurac Research and the University of Innsbruck published by Spektrum in 2008 that describes, with the support of 100 maps, the social, economic, and environmental situation of the Alpine region.

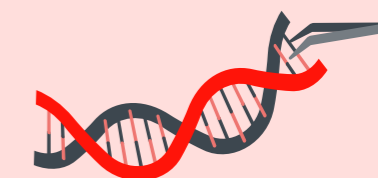
30 to 120 minutes

How long before his death that Ötzi had eaten. His last meal included ibex meat and apples: Albert Zink and his team concluded the timeframe as well as the food from the analysis of the Iceman’s **stomach samples** taken in the summer of 2010. The fact that Ötzi was able to eat a balanced meal indicates that he was not on the run as was previously thought.



100

How many times the cost of **sequencing the human genome** can be reduced by using software developed by Eurac Research and the Medical University of Innsbruck. The new tech allows the entire genome to be reconstructed by sequencing only a part of it. Today this tool plays a leading role in global genetic research.



1,300

Participants were involved in the MICROS population study which was initiated in 2002 in the Vinschgau / Venosta Valley. The aim was to investigate **the link between gene variants and complex diseases**. MICROS then evolved into the CHRIS study which now has more than 10 times the number of participants.



2513

The date the **role-playing game “Space Migrants 2513”** is set. Designed by Eurac Research to enable high school students to experience what it means to be discriminated against and to show what opportunities diversity represent. Since then, our experts have created another interactive game: “The House of Common Values”, which allows you to explore the shared values of the European Union.

People are our most important resource

How we were and how we are. An infographic of the early 1990s when it all began, and where we are today.



At the beginning there were less than a dozen of us dedicated to only 3 areas of research.



Now there are 599 of us working across 11 institutes and 5 centers.



1 contract was valid for everyone.



Today, there are 8 different contracts and 19 part-time variants.



We were multilingual and between us spoke five languages.



Nowadays we can speak 34 languages.



Italian and German were the only passports we had.



We now hold passports from 46 different countries.



We were young, 26 was our average age.



We've aged/grown up. matured, our average age is now 39.



We used to work in the office most of the time.



Now we work in the office, 18 labs, and also from home.



We had contacts with partners in four or five countries.



We have more than 1,300 partners spread across all continents.



We all worked in one location in Bolzano – a 250 m² office in the via Weggenstein.



And how we've grown, with several locations in Bolzano, Rome, and Vienna and over 14,000 m² of office and lab space.



Our servers used to live in the basement, with an archive of 5 MB.



Our storage is now in the cloud, with a capacity of 1,5 petabytes.



30 years of Eurac Research – in a book

April 8, 1992: The European Academy is founded. It soon has a staff of just under a dozen and is dedicated to three research areas. 30 years later, Eurac Research is an internationally networked and prestigious research center with around 600 employees working in 16 institutes and centers. To mark the anniversary, a brand-new book showcases over a dozen authors who describe the journey and its developments. Over the course of 200 pages, they shed light on what makes Eurac Research unique and describe the role the institution has played in shaping the regional knowledge landscape as well as the challenges and successes that define it today. Interviews look to the future and delve into research perspectives for the coming decades. Hannes Obermair and Harald Pechlaner edited the publication which will be presented in September 2022.

Mission: monitoring sustainability

Sustainability has three dimensions: Ecological, social and economic. Development must not come at the expense of future generations. To find solutions that also benefit the people who come after us, continuous monitoring before and after scientific involvement is essential.

Biodiversity Monitoring South Tyrol – a behind the scenes photostory

Together with the South Tyrol Museum of Natural History, the Department for Nature, Landscape and Spatial development and the Department for Agriculture of the Autonomous Province of Bolzano/Bozen, our team of researchers have spent the past three years collecting and sharing data on South Tyrol's biodiversity. Here's a behind the scenes peek at how it works.

<https://biodiversity.eurac.edu/it>

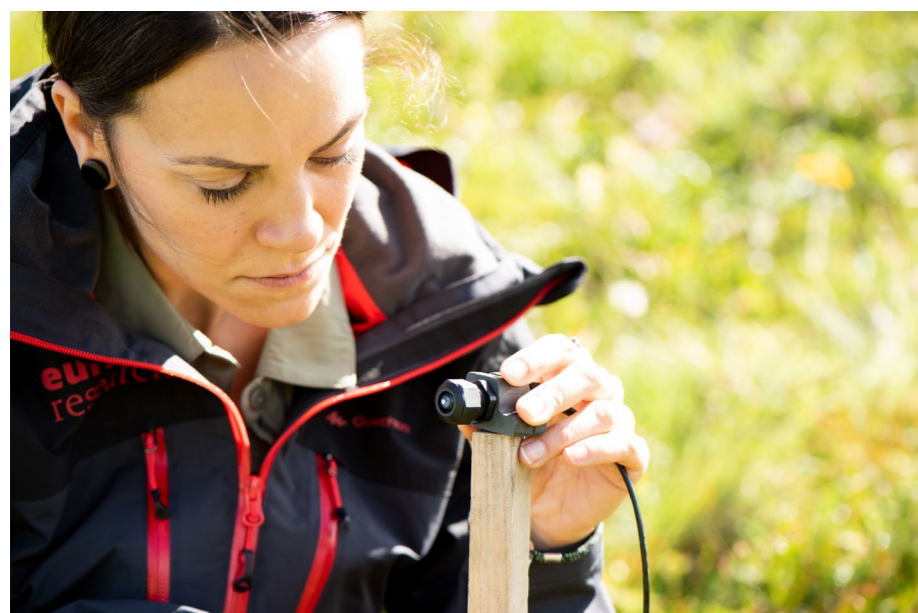


A classic entomological net is used to monitor **butterflies**. Researcher Elia Guariento slowly walks a "transect" – a straight line of 50 meters where he captures, identifies and immediately releases the butterflies back into the wild.



Waking up before dawn and setting off for the sampling site, ornithologist Matteo Anderle detects all the **birds** he sees and hears within 100 meters. Through the different birdsong he can not only distinguish species but also whether males are defending a territory, attracting a female for breeding or if they have been frightened by something.

Botanist Simon Stifter monitors different habitats to catalogue **vascular plants** from trees to the smallest blade of grass. Monitoring areas vary in size and can reach up to 1,000 m² for forests.



The batlogger is a special device that records sounds inaudible to humans, such as the sounds of **bats**. The computer then makes them perceptible to the human ear and translates them into waves, so that the different bat species can be identified. In the Biodiversity Monitoring South Tyrol project, bat loggers are deployed for three consecutive nights at each site.

Grasshopper sampling occurs annually in late summer. Again, an entomological net is used with which to investigate the area around a straight line of about 15 meters. Species are identified based on morphological characteristics and their song.



THE FIRST ARTICLE

What can be done to conserve bird diversity in the Alps and other European mountain areas? A first paper published thanks to data from the Biodiversity Monitoring South Tyrol, has revealed the need for better planning and management practices to protect and promote small-scale agriculture, as well as the need for the rotation of land use and increased preservation practices to ensure the continuity of forests. The full article was published in the journal "Oecologia".

<https://doi.org/10.1007/s00442-022-05134-7>

Climate change and transformation: combining expertise across institutes

Natural science and technology alone cannot meet the greatest challenge of our time, explains Geoecologist Marc Zebisch.



How can a topic so vast be researched?

Marc Zebisch: In dealing with climate change, two strategies must be pursued with equal vigor: Climate adaptation and climate mitigation. So, on the one hand, we must understand the impacts and their extent, the likely development and the risks in order to then identify vulnerabilities and make the system more resilient. Many climate impacts can no longer be avoided, but by adapting, we can limit their harmful effects. Secondly, we have to do everything we can to minimize the impact, which means achieving climate neutrality as quickly as possible. But if you look at the big picture, you can see this crisis is so complex that overcoming it requires a profound transformation of social systems. Hence 'transformation'. It combines the two strategies and affects every area of our existence: energy production, housing, consumption, and mobility behavior.

So, collaboration between different research areas is vital?

Zebisch: Up to now, the topic of climate change has mainly been dealt with by natural science. However, if we want to achieve the socio-ecological transformation that the EU is also calling for, we must also consider the social and economic impacts, regulatory aspects, innovative business models and production forms, issues of social justice and social acceptance, etc. This is why we have spread our research across 10 of our institutes, we have amassed such comprehensive expertise on these topics at Eurac Research that we can actually work out concrete answers to the question of "How to achieve a climate-neutral, sustainable South Tyrol in which people's quality of life is also improved?".

What is the first project the group will undertake collectively?

Zebisch: A study on how South Tyrol can become climate neutral by 2045. We plan to analyze the measures which ensure that climate neutrality can be achieved for all greenhouse gas emitters – transport, industry, the building and energy sector, agriculture. South Tyrol is lucky not to have any heavy industry, no lignite-fired power generation; if you disregard the high volume of traffic, we have a pretty good starting position. But a lot has to happen now, and fast. South Tyrol is not on the path to climate neutrality yet.



DATA MONITORING

A web page with 17 climate indicators updated annually: from the number of tropical nights to the amount of heavy rainfall, lake water temperature and days of frost. For each indicator, a brief description, graph, and a commentary on trends with possible future scenarios are also estimated for some of the parameters. Processing and representation of the data is carried out by Eurac Research, as well as in part by the Autonomous Province of Bolzano/Bozen and the Laimburg Research Centre. The number of indicators may increase in the future. The service is part of Data Monitoring, a larger project to make data available in an easily usable way. In addition to the aforementioned climate indicators, our researchers are working on a page dedicated specifically to drought.



The Climate Report – South Tyrol leads the way

How will Apennine habitats react to increased temperatures? How will the fish stocks of the Adriatic Sea change in the future? Will coast tourism lose attractiveness? How much water will be available for agriculture and cities? The fact that the climate is changing, all over the world, cannot be denied or stopped. Each region is witness to it and impacted differently. Even in the Marche Region, average temperatures have increased and extreme events such as flooding, tornadoes and prolonged droughts have intensified. Citizens, administrations, and entire economic sectors are already coming to terms with the impacts of climate change and are implementing their own and mostly informal adaptation strategies. However, adapting to climate change, requires informed, shared, and data-driven strategies. Work

must be done to make resilient societies from the bottom up. For this reason, the Marche Region has entrusted the realization of an adaptation plan to a team of climatologists, risk experts, hydrologists, ecologists and marine biologists from the Università Politecnica delle Marche, Eurac Research and CIMA Foundation (International Centre for Environmental Monitoring). Researchers from the three institutions are working together with a steering committee composed of local administrations and experts and will be in close dialogue with representatives of the region and its businesses and citizens. In addition to various technical documents, the team will produce *Climate Change Adaptation Plan – Marche* that will draw on *Climate Reports – South Tyrol* from both 2011 and 2018.

Monitoring sustainability

A joint undertaking between the Provincial Agency for Environment, Eurac Research, and the Chamber of Commerce of Bolzano's Institute for Economic Research, to measure sustainability was recognized as one of the best European projects in the field of mountain area management. Euromontana, the European association for co-operation and development of mountain territories recently awarded the collaborative initiative for its sustainability monitoring project. www.sustainability.bz.it

74

Indicators describe the environment, society, and economy in the 116 municipalities of South Tyrol since 2000.

170

The number of enactment decrees for the Autonomy Statute adopted for the Region of Trentino-Alto Adige/Südtirol from 1948 until today. However, the number of enactment decrees for Sicily was only 48. The enactment decrees are a detail from the book “Le variabili della specialità”, in which Eurac Research’s federalism experts examine the topic of **special autonomies from a comparative perspective**. This is just one of numerous publications within the framework of the long-term analysis of the development of the Italian regional state.



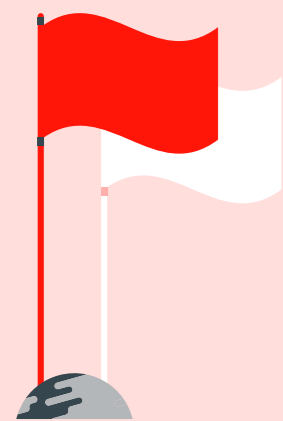
70

Invertebrate species and **genera have been identified in 15 high-elevation streams**. Research has shown that regardless of elevation, diversity is greatest in streams located in meadows frequented by grazing animals. Abandoning these activities could lead to ecological depletion of streams.



140

International mummy researchers world met in 2009 at Eurac Research for Bolzano’s **first international Mummy Congress**.



245,000

This number of environmental variables that the 24 meteorological stations of the **open-air laboratory in the Matscher/Mazia Valley** emit each day. Located between 1,000 and 2,700 m.a.s.l, each station has up to 50 sensors for a total of nearly 500 environmental variables are measured every 15 minutes.



8%

The total percentage of overnight stays in South Tyrol that are accounted for by **agritourism** or “farm holidays”. This equates to 2.5 million annual visitors, the figure comes from 2018, when Eurac Research organized the World Congress on Agritourism in Bolzano for the first time. One hundred experts from 42 countries took part in the three-day congress.

68

So far, this is the number of countries which the 357 participants in the **Winter School on Federalism and Governance** come from. Eurac Research and the University of Innsbruck’s joint training, 2022’s 13th edition included participants from Chile and Tunisia for the first time.

13

The number of positions in the human genome – called loci – that can be associated with severe Covid19 infection. This was the finding of **one of the world’s largest genetic studies** in which an international research consortium studied the genome of nearly 50,000 people infected with Covid19 and compared the results with two million uninfected people. Data for the study came in part from studies conducted by Eurac Research in the Vinschgau/Venosta Valley.



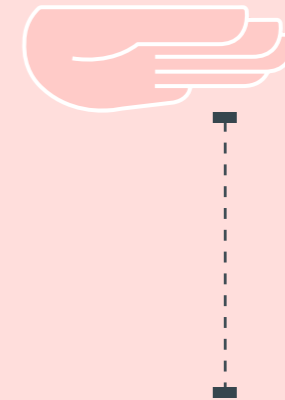
>84,000

This is roughly how many **grazing animals** are driven up to **alpine pastures** in South Tyrol every year. How to effectively protect them from predators is the subject of the “LIFEStock Protect” project which involves livestock farmers from Bavaria, Austria, and South Tyrol.



160 cm

The approximate length of the **Egyptian male mummy** that Eurac Research restored in collaboration with the Archaeological Museum of Bologna. Thanks to special software, the research team was able to virtually “unwrap” the mummy and view its body in detail.



26

Minority language newspapers joined the Midas network in 2001, when it was founded. They represent the minority language communities scattered throughout Europe that have come together in the cooperative network promoted by Eurac Research. Today the Midas group represents 27 newspapers in 10 different languages, with a readership of over three million in 12 countries.

18 minutes

Is the timeframe in which rescue must occur for the **chances of survival of those buried by an avalanche** to be 90 percent, beyond that they decrease rapidly. The calculation was made by a research team between Bruneck/ Brunico (South Tyrol) and Switzerland and verified in Canada.



500

Voluntary contributions were made to the **“Ideas 2015”** project, which was initiated in 2005 within the framework of the Strategic Plan of the Municipality of Bolzano. The initiative scientifically accompanied by Eurac Research, won, among others, the “Award of Excellence” of the Forum PA and involved both individuals and associations.

STUDYING DROUGHT STRESS

These 40 cm in diameter steel containers are called lysimeters. Standard lysimeters are usually buried in open fields with the help of a digger. But these are mobile prototypes, equipped with power and network cables and combined with a scale.

In summer 2021, they were debuted in the terraXcube where they housed 24 Sauvignon Blanc vines. The CLEVAS project, under the aegis of the University of Innsbruck, the Free University of Bozen-Bolzano and the Laimburg Research Centre studies the impact of drought on grape varieties.

<https://terraxcube.eurac.edu>



NOI Techpark activities

We are currently conducting research and testing in 15 laboratories as well as extreme climate simulator terraXcube. The running costs of such facilities are generally high due to the need for specialized staff, rent, maintenance, electricity, etc. Due to the general rise in prices in 2021, outgoings were particularly high.

The income from project funding and commissions of the institutes and centres involved however, corresponded to 57 per cent of their costs.

A patented prototype

Every year, craftsmen, professionals, and businesses – particularly those engaged in construction or on-site operations – lose valuable equipment such as measuring equipment, work lights, drills and other hand tools. Causes range from distraction to theft, in each case causing economic damage to the company and problems in operations.

Committed to finding a streamlined and effective solution, researchers at the Center for Sensing Solutions have prototyped a “silent” technology that, via Bluetooth and without worker intervention, emits an alert if tools are not returned to the van or warehouse. In addition, the technology also provides useful information to locate these missing items. Small wireless antennas are placed in key locations such as the company’s warehouse, transportation van, or the shed at the construction site. If a tool is not detected in one of these checkpoints, antennas will send an alert to a display. So, if a clamp is not replaced in the van once the work is completed on a house, the worker is notified immediately. Once this has happened, it is possible to trace tool’s previous path by way of different checkpoints and ascertain where it was lost. The technology was patented by elektro a.haller, a South Tyrolean company long-renowned for the installation and maintenance of electrical systems. In the coming months, the project partners will decide how exactly to market the product.

3+3

The number of active and pending patents for the past year.

What kind of tourism do we want?

IMPACTS OF THE PANDEMIC

In its third annual report, the Sustainable Tourism Observatory of South Tyrol (STOST) questioned what lessons the pandemic can teach us about making tourism better, more resilient, and more climate friendly.

Tourism in South Tyrol, like everywhere else in the world, suffered a serious setback in 2020: after more than 50 years of growth, arrivals dropped by 40 percent. The decline extends further to the number of employees in the industry, which decreased by 22.3 percent. However, a team from Eurac Research concluded that from an environmental perspective, the negative impacts of tourism have also decreased. Accommodation facilities reduced their energy consumption and produced less waste. At the same time, the number of sustainability certifications increased, and more regional and organic products were used. “As difficult as they were, the pandemic years represent a void in which destinations were able to rethink their development, while not having to deal with their day-to-day business”, explains Harald Pechlaner, director of the Center for Advanced Studies at Eurac Research.


The results were revealed through various databases and surveys.

REGIONAL TOURISM DEVELOPMENT IN SOUTH TYROL 2030+


“Ambition Lebensraum Südtirol. Auf dem Weg zu einer neuen Tourismuskultur”, is the collaborative project of an interdisciplinary research team from Eurac Research to develop the scientific basis for a regional tourism development concept for South Tyrol. The study outlines an overview of tourism in South Tyrol up until 2019. It also offers an outlook and a target scenario for a desirable development and provides recommendations for action in tourism policy. The concept is closely intertwined with spatial planning and pays particular attention to the acceptance of tourism by the local population. Project activities range from the categorization of all South Tyrolean municipalities according to their degree of tourism exposure to the conceptualization of a “sensitivity traffic light” as a specially developed instrument to monitor the local population’s attitude to tourism. Consequently, a standardized and evidence-based prototypic model was created to measure, monitor, and control future tourism development.

50 years of autonomy


In January 2022, the second Autonomy Statute celebrated its 50th birthday. The anniversary is marked by a year of looking back, forward and into the world whilst debating autonomy practices and encouraging dialogue on the subject. This ongoing discourse has been cemented with numerous publications. Naturally, all those researching questions of minority rights and federalism in general as well as South Tyrol’s autonomy in particular, have much to contribute. The extensive program of conferences, webinars and lectures, a film series and a review of the philosophical week can be found here <https://www.eurac.edu/en/autonomy50>




Past and present: South Tyrol’s Autonomy, explained: Wir. Noi. Nos.



Over 20 surveys that Eurac Research conducted in 2021 on various topics, from risk perception to tourism, via renewables.



December 11 marks International Mountain Day and last year’s edition focused on sustainable tourism in mountain areas. To mark the occasion, the (Sustainable Tourism Observatory of South Tyrol) Observatory, in collaboration with GLOMOS (Global Mountain Safeguard Research), published a short video with last year’s most important facts and figures on sustainability.




Another anniversary

30 years of research on autonomy, federalism, and minorities, has made Eurac Research one of the most important centers of competence in this field in Europe. A publication is now available which presents an overview of the topic’s most important themes and milestones at a glance.

www.autonomyexperience.org

Going green(er)

Raising our sustainability stakes is an ongoing, all-around process that involves not only the environmental sphere, but also economic management and social implications. Ours is a multi-step approach: we

collect data, take action, reverify the data, and then make the necessary adjustments. All strategic plans need medium- and long-term goals, here are the first steps we've taken since last year.

408 questionnaires on mobility were completed in Eurac Research's first internal survey on the subject

We now have two new water fountains and a new compost bin at our headquarters in Viale Druso

We only use electricity from certified green providers

The calculation of CO₂ emissions for service trips will soon be integrated in our management system

GRI (Global Reporting Initiative) standards are due for the first-time next spring

In 23 weeks we had 3,626 vegan meals delivered to our Kiosk in Viale Druso and 328 meals were delivered to in Via Galvani over nine weeks

Sustainability requirements must be met by all respondents to the call for tender for The Lab – Eurac Research's new cafeteria



COOL RUNNINGS – A PHOTOSTORY
Experiments in the terraXcube always arouse the interest of the media. Last year the extreme climate simulator ended up on the pages of Wired.UK, thanks to the Manuela Schirra and Fabrizio Giraldi's images of a test subject running in the heat.

400

The number of hours the new generation charging stations made by the South Tyrolean company alpitronic were tested for. The charging stations were subjected to **accelerated aging and environmental stress tests in Eurac Research's renewable energy laboratories.**



49



Questions were included in a Public Management **happiness questionnaire** in 2011. The Institute's researchers used the results to analyze the quality of life in Graubünden and South Tyrol, taking into account physical, mental, and social health as well as family and work, environmental factors, politics, education, culture, and consumer attitudes.

10°C

As opposed to the 70°C of a **traditional network**, this is the minimum temperature at which a **new generation district heating system can work.** The low temperatures make it possible to use excess heat from supermarkets, data centers and industry to heat entire neighborhoods. The Energy Exchange Lab was created in 2017 to test these innovative solutions.

2 years

Is the period over which a research team in a specially equipped laboratory in Cairo used state-of-the-art methods and techniques to examine the **DNA** of 16 mummies and identify **Tutankhamun's parents.** The analysis took place between 2007 and 2009.



10,000

Until now, the number of hours of workshops in which linguists from Eurac Research have taught South Tyrol's schools how to better exploit the **potential of multilingualism** in the classroom. In fact, in addition to German, Italian and Ladin, up to 20 languages and language variants are used by students in South Tyrol.

4th

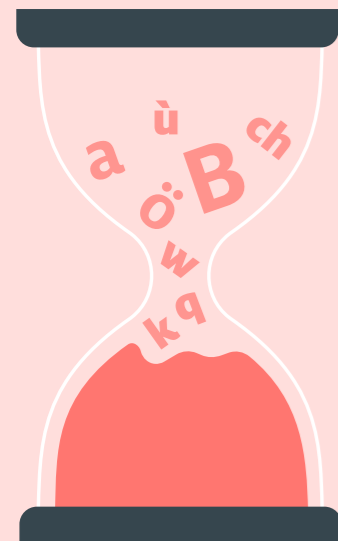
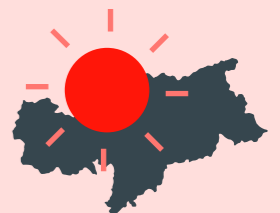
Marks the chromosomal region linked to the onset of **restless legs syndrome.** This was discovered by analyzing genetic material collected in the villages of Stilfs/Stelvio, Langtaufers/Vallelunga and Martell/Martello (South Tyrol). The results of the research have been published in the American Journal of Human Genetics.

0-4

These are the values on an indicator scale assigned to financing of regions. The indicators are part of a system developed by Eurac Research to **assess financial autonomy.**

1,300 kWh

The average amount of solar radiation per square meter that South Tyrol receives annually. However there are large variations within the region. Using climate and satellite data, a research team was able to develop an **algorithm to calculate solar radiation** and use it to work out a detailed solar potential map for the entire area.



10-20%

This is how much the **volume of blood plasma** decreases when our bodies acclimatize to 3,500 m.a.s.l. Research teams at Eurac Research are studying this physiological process to better protect the health of people who live, work or practice sports in the mountains.



161

Since 2004 this is the number of the initiatives carried out by more than **100 municipalities involved in GemNova**, a network that promotes municipal innovation in the regions of Tyrol and South Tyrol: 38 projects, 41 publications, 33 public events, 49 training courses equals a grand total of 161!

65%

The percentage of South Tyrolean young people aged between 14 and 19 who write their Facebook posts in South Tyrolean dialect; among the over-60s, the figure is around eight percent. This was the result of a study on language use in social networks, for which a research team analyzed the **Facebook entries** of 109 German-speaking South Tyroleans for an entire year in 2015.

40%

The percentage by which the **risk of heart disease** in people with rare mutations in the APOC gene is reduced. In fact, these mutations cause blood levels of triglycerides to be much lower than average. Eurac Research's genetic studies are revealing more and more links between genes and blood lipid levels.



Centers and peripheries

Brain drain and gain. Quiet valleys rediscovering themselves at the center of unique international studies. Remote villages exploring and implementing new technologies to feel less isolated. And less populated provinces leveraging themselves and their products. Center–periphery relationships are evolving and the inequalities that exist in different geographical spaces are being examined and overturned.

Calling all bright minds

Well-educated, creative people make regions more competitive and innovative, improving their growth prospects. However, such talents are highly mobile; in an effort to retain or attract them, regions are competing with each other. In 2017, according to a study by WIFO, more than 1,000 people with university degrees left South Tyrol. In a dossier on “Brain Gain - Brain Drain”, experts from Eurac Research analyze how South Tyrol is performing in the competition for highly qualified workers and how the Province can be made more attractive in this regard. The major social developments influencing the labor market were found to be digitalization, demographic change, migration and the changing role of women. In addition, South Tyrol has a highly specific profile reinforced by the region’s multilingualism. So, what are strengths and where is there a need to catch up? “Especially in the areas of research and innovation, South Tyrol has some catching up to do compared to Trentino and Tyrol,” explains Ingrid Kofler, co-author of the dossier. According to Eurostat, in 2019, funding for innovation in South Tyrol was 0.75 percent of the Province’s GDP, compared to 1.6 percent in Trentino and 2.8 percent in Tyrol. Neighboring regions are also ahead in terms of tertiary education. Other issues of concern are work-life balance, accessibility, and the cost of living.

<https://www.eurac.edu/en/dossiers>

THE FUTURE OF WORK

The dossier summarizes the key findings of a study conducted in collaboration with IER (Institute for Economic Research) of the Chamber of Commerce of Bolzano and the Department for Labor and Economics of the Autonomous Province of Bolzano/Bozen, and is based on an initiative of IDM South Tyrol: “The Future of High Skilled Workers: Regional Problems and Global Challenges” (by Ingrid Kofler, Elisa Innerhofer, Anja Marcher, Mirjam Gruber, and Harald Pechlaner, in collaboration with Valeria Ferraretto; published by Palgrave Macmillan).

Nagoya to Bolzano – an epidemiologist’s journey

Ryosuke Fujii, from Japan, holds a PhD in Health Sciences from Nagoya University. He joined Eurac Research last autumn to share his expertise on the study of genetic epidemiology in relation to kidney function.

How did you come to know about Eurac Research?

Ryosuke Fujii: In February 2020, I was mailed an application by a former colleague who was in touch with Cristian Pattaro - Eurac Research’s Biostatistics & Epidemiology -group leader through the CKDGen (Chronic Kidney Disease Genetics) Consortium. The original application was for a Marie Curie Fellowship and less than two years later, albeit without the fellowship but thanks to the Seal(s) of Excellence fund/award from the Provincia Autonoma di Bolzano, here I am.

What were you doing before you came to Bolzano?

Fujii: I was assistant professor at the Fujita Health University, Toyoake, and I lived in Nagoya. My fields of interest are Genetic and Molecular epidemiology. This is my first experience abroad. Initially, I moved by here myself and after a few months, my wife and baby joined me.

How are you enjoying life here?

Fujii: The work environment is open minded and inspires many research ideas. Outside the office I still struggle a bit with the languages because not everyone speaks English, and my German and Italian are still basic. However, that gives me a good motivation and I can already cope with daily issues though gestures and some phrases like “Prendo questo, per favore”. (he smiles).



12
New hires
from non-EU
countries.

34
New hires
from EU
countries.



“Nothing ever happens in Montagne!”

It may seem that life in the mountains is less engaging than in the city. But that’s just a first impression. For years, our regional development team has been supporting projects in which communities take the lead in revitalizing their areas..

The most recent study: the history of Montagne

The Trentino municipality of Tre Ville is made up of the villages Montagne, Preore and Ragoli. Recently, the entire area has been involved in rethinking its future in a shared and ecologically sustainable way with the aim of defining a medium-long term vision and by starting its first concrete projects. One of these projects aims to create a widespread network for the hospitality sector not only for tourist accommodation, but also intended as a lever to develop other ideas that could regenerate the area and improve the quality of life of its inhabitants.

“The development of an area does not start with real estate. Renovating buildings without a perspective wastes time, money and opportunities. What is needed is an analysis of the context, a future vision, a business model and an evaluation of the effects on the region,” explains Federica Maino, project manager for Eurac Research.

“Thanks to the support and experience of the research team, we realized that it was necessary to work on motivations and to start with a small group of people who have a strong link to the local reality and then to proceed to an increasingly broader involvement of the population,” one of the participants shared.



Watch the
Montagne
experience



The golden rules

From a regeneration project for the valley of Seren del Grappa in Trentino to the creation of the Rural Commons Festival, an itinerant exhibition that deals with the theme of collective practices of land care. Here are our eight golden rules for the bottom-up development of a mountain community.

1. Tiptoe, listen and do not impose solutions.
2. Dissolve the tension between tradition and innovation by embracing complexity.
3. Mountains are fragile but not weak. Make local communities aware of their potential.
4. Begin with what’s there. The people who live there and their attitudes.
5. Foster the importance of long-term vision.
6. Make room for young people and encourage inter-generational exchange.
7. Take an ecosystemic approach to problems and projects.
8. Lay the groundwork for the emergence of collective projects. Land development is a team effort.

28°C

In cases of hypothermia, if the body stays above this temperature, cardiac massage can only be interrupted for short periods so that the patient can be transported without life threatening effects. **In the case of severe hypothermia, the body can actually tolerate more prolonged interruptions to cardiac massage.** The result of this study has since changed the guidelines for rescues.



2,000 or so

Is how many technical terms the Italian-German **Terminological Dictionary of the Brenner Base Tunnel (BBT)** contains. From A for Abbruch (demolition) to Z for Zwischenlokomotive (intermediate locomotive). The reference work, published in 2011 by Eurac Research and the Galleria di Base del Brennero – Brenner Basistunnel BBT SE company, is intended to facilitate technical cooperation on this and other similar construction projects.

19

The number of editions of the **Master in Innovation and Management in Public Administration (Mimap)** at the Rome University Tor Vergata that Eurac Research has collaborated on. Since 2004 a module has been taking place in Bolzano/Bozen and about 250 people have been trained so far.

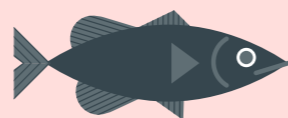


40,000

The number of municipalities that data has been collected from. Eurac Research experts have prepared maps of **demographic development in the Alps** and neighboring countries. They provide a detailed overview of where the population has increased and decreased over a period of more than ten years for 13 countries.

30,000 €

The amount a 10kg - grouper is worth per year if it can be observed in its natural habitat. At the fish monger, the same fish could fetch just 150 €. **Sustainable tourism strategies (not just fishy ones)** were the topic of “**Destination Greenitaly**” an international conference organized by Eurac Research in 2016.



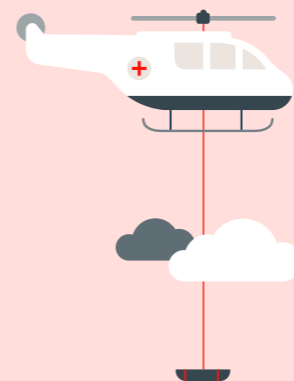
3,119

Butterfly species have been documented in South Tyrol where the existence of one in seven diurnal butterflies is severely threatened. Thanks to Science & Society projects co-organized by Eurac Research involving schools and interested individuals, monitoring butterflies and other elements of biodiversity has become a collaborative effort with richer results.



349

The number of accidents which occurred in inaccessible areas that have been recorded in the Alpine Trauma Registry since 2011. Inaccessible areas are ones where wheeled rescue vehicles can't make it to the scene of an accident. The **Alpine Trauma Registry** records the data for medical and statistical studies on accident dynamics in order to improve rescue operations.



300

Families now live in social housing buildings renovated thanks to SINFONIA, the first large-scale project that has transformed some of Bolzano's neighbourhoods with smart solutions. These buildings use 50 percent less energy than they did prior to renovation and life inside is more comfortable too.

21:00

On February 6, 2004, the first episode of the **minority magazine MINET** was broadcast at this time. The program, a Rai Südtirol and Eurac Research collaboration, discusses minority issues in South Tyrol and Europe. 18 years later, the show's still going strong.

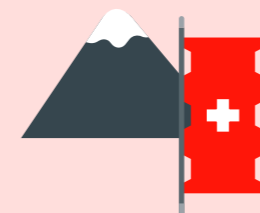
44%

The percentage of the water that flows through the Vent hydrometric monitoring station (Tyrol) over a summer which comes from snowmelt; 35 percent comes from the Ötztal glaciers. A **hydrological model** developed by Eurac Research together with the Universities of Innsbruck and Trento makes it possible to work this out this so precisely.



10

How many years Eurac Research and other South Tyrolean associations active in mountain rescue **trained medical and technical staff** in Nepal for.



65

Young people with an immigrant background told Eurac Research about their path to the world of work. The survey, which focused on **second-generation youth** in South Tyrol, revealed challenges such as discrimination, lack of information, and of a solid social network.

10 years of CHRIS: How a local study is making a global impact

It began with the village of Schlanders/Silandro (South Tyrol) and gradually incorporated more communities within the Vinschgau/Venosta Valley until finally reaching Graun/Curon: In 2011, Eurac Research and the South Tyrolean Health Authority launched a large population study to investigate the most common diseases in South Tyrol and their environmental and genetic causes. The CHRIS study is unique in its kind in Italy.

Firstly, the group studied (“cohort”) is representative of the general population whereas other such studies usually investigate a disease, so their cohorts only comprise people with health problems. The CHRIS cohort also includes many families who are permanent residents in the valley and because of this, it is possible to reconstruct genealogical information and at the same time observe the health of several generations in one family. The close involvement of the population also makes CHRIS special: almost half of the adults in the Vinschgau/Venosta Valley took part in the first study phase. Now the second phase has begun and all examinations and analyses from the original will be repeated. CHRIS has become a prospective study that tracks the development of health status over time.

Combined with genetic information, this will provide valuable insights into the interactions between genetics, environment, lifestyle, and their impact on health. CHRIS has already proven to be a significant resource for research and its data has been incorporated into large international studies that have identified hundreds of gene variants associated with kidney and thyroid function, heart health, obesity, glucose metabolism and diabetes. Which goes to show that local and international research are not separate worlds, but closely linked, as Head of the Institute for Biomedicine Peter Pramstaller emphasizes: “The results of these extensive studies come back to us as new findings.” At the national level, an important collaboration with the Human Technopole Research Institute in Milan is now underway, making the CHRIS study an even more valuable research resource thanks to the new access to state-of-the-art technologies for data and biospecimen analysis that the collaboration enabled. Human Technopole also wants to help pass on the experience gained in ten years of CHRIS to other regional research centers and in doing so allow many more studies in peripheral areas to make future scientific contributions to global research.

More than **13,000** people were examined in the first phase of the study and have now been invited to participate in the second. The genotype of all the participants was determined, and the exons (the coding sections of the DNA) of **3,600** people were sequenced. Metabolomic analyses were performed in **7,000** people. **One million** biological samples are stored in the CHRIS biobank and more than **100** biomarkers from blood and urine tests are collected from all participants.



Biochemist Guido Valverde at work in La Paz, Bolivia

Rediscovering Bolivia's mummies

THE MUMMIES

Bolivia's museums house a wealth of mummies, and human remains, yet bioarchaeological research in Bolivia is currently not as well-developed as its classical archaeological counterpart. At present, predominant focus lies on traditional artifacts, such as pottery, lithics and metalwork. In La Paz's National Archaeology Museum, a substantial piece of Bolivia's bioarchaeological record has for the past 50 years, been awaiting investigation: nearly 40 complete mummified bodies, plus more than 500 human skulls. The naturally mummified remains belong to the archaeological period called Late Intermediate period (1110 – 1400 AD) that predates the Inca Empire in Bolivia. Most of the mummies were recovered from the so called “Chullpas” of funerary towers spread across the Bolivian highlands. This newly rediscovered collection represents uncharted terrain and the first ever in-depth bioarchaeological exploration of mummified individuals in Bolivia. A new collaboration between the museum in La Paz and the Eurac Research Institute for Mummy Studies, funded by the Province of Bolzano – Seal of Excellence grant and in collaboration with Bolivia's Ministry of Culture, will review the immense trove of bioarchaeological information through Computer Tomography analysis to gain insights into the lifestyles and ancient

DNA of these remains not only to explore their genetic diversity but also to develop conservation strategies to preserve such cultural heritage for future generations.

THE MAN

Guido Valverde, from La Paz, Bolivia, is a biochemist currently working at the Eurac Research Institute for Mummy Studies. His academic path led him to the Bolivian High-Altitude Institute where he studied high-altitude adaptation of Andean populations. With a research stay in Berlin in 2006, Valverde continued working on the physiology of high-altitude adaptation in Bolivian populations. That led to a scholarship at the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany where he focused on the genetics of the phenomena. Genetics brought him back to La Paz where he went on to join The Genographic Project, funded by the National Geographic where he was tasked with collecting DNA samples from indigenous populations from Bolivia. The Genographic Project had two main components, modern and ancient genetics. A PhD program in Adelaide at the Australian Center for Ancient DNA, one of the world's chief laboratories in the field of analyzing ancient material followed. It was here that Guido began exploring the ancient genetic diversity of South American human populations.



A drone delivering first aid to within 10 m of the accident site, a small parachute slows the drop of the load.

79

Companies commissioned us last year. Around half of them were local. In addition, many companies were involved in our research projects as partners.

Drones in rescue operations

Locating an injured person in the Bletterbach Gorge in South Tyrol can be difficult. The terrain is inaccessible to wheeled vehicles such as ambulances and there's no mobile phone reception: The narrow gorge near Aldein/Aldino was therefore the ideal location to test how drones can support rescue operations. Why drones? Casualties can be located more quickly and, through the use of telemedicine, could also be treated more quickly. The drone not only carries a camera, but also a package with a radio, thermal blanket and medication, which is dropped close to the accident site. Guided emergency service instructions on the radio, the victim's companions can initiate first aid

quickly and prevent dangerous hypothermia. Over the course of several months, 24 rescue missions were simulated by research teams from the fields of emergency medicine, mountain rescue, drone, and electrical engineering at various locations in the gorge. Analysis of the data sets is nearly complete, and results will be published soon. The test series took place within the framework of the Interreg project START (Smart Test for Alpine Rescue Technology), with the participation of Eurac Research, Mountain Rescue South Tyrol, Geopark Bletterbachschlucht, NOI Techpark and the company MAVtech.

Come together: uniting administration and citizens

Demographic changes due to the depopulation of rural areas and increasing urbanization pose several challenges related to the provision of services, the political weight of local authorities and the economic resources available. Eurac Research leads an international research team that analyzes concrete experiences the world over and makes them available to local administrations.

The basketball hoop hangs crookedly from its backboard. Trash and cans roll around the court. No one uses the court anymore and over time its conditions have worsened, until some parents and teachers at the neighborhood school decide to intervene. A group was born. By requesting support from the local basketball club and contacting the municipality for permission to manage this space as a common good available to all, the court was brought back to life. This is just one of the many pacts of collaboration between people and municipalities that are spreading throughout Italy, in both small villages and large cities. The theme of sharing the administration of common goods in this way has been analyzed as part an international research project called Local Government and the Changing Urban-Rural Interplay (LoGov).

The project involves 18 partners from six continents and is funded by the European Union's Horizon 2020 program. The project aim is to create a network that provides municipalities and communities with evidence-based practices for managing the effects of demographic change. "The issues that need to be addressed concern the effects of two related trends: urbanization and the emergence of metropolitan areas on the one hand, and the abandonment of rural areas on the other. According to the World Bank, from 1960 to 2017 the rural population fell from 67 to 45 percent worldwide," explains Karl Kössler, a legal scholar and political scientist at Eurac Research and coordinator of the project. This diversity presents major social and political challenges: how are public services funded? How can the disparity between local authorities in terms of political clout and economic resources be managed? Does the merger of small local governments really bring greater efficiency? Each partner in the research team has analyzed concrete experiences in their country. The 174 examples collected in 16 countries are available online and will be compared in order to foster the application of effective practices by local administrations.



THE TOOLS

Citizen participation in political life is at the center of various research projects followed by the Institute for Comparative Federalism. Our researchers collaborate with local administrations to encourage the involvement of the youngest members of the population. As part of the GaYA project ("Governance and Youth in the Alps"), The Institute has provided public administrations with a "toolbox" containing recommendations which have been presented to the municipalities of Salurn/Salorno (South Tyrol) and Pergine (Trentino), to increase the involvement of young people in the political discourse of the region.

86

The number of consultations our experts provided to governments, associations, and organizations in 2021.

GREEN SOLUTIONS

The bee roof at FieraMesse BolzanoBozen exhibition center is just one example of how green roofs enable cities to become more climate-friendly and liveable with the help of nature. Through shading and evaporation, they provide cooling, and because they store rainwater and release it over time, they prevent flooding. They are habitats for animals and plants and as such promote biodiversity. On top of that, plants on green roofs bind pollutants and thus provide better air. Green roofs can become places of relaxation or for the cultivation of vegetable gardens. “Nature-based solutions” such as green roofs will be implemented in seven European cities over the next five years as part of an EU project called **JUSTNature**. Coordinated by Eurac Research, the project’s aim is not only to create more ecological space, but also more equitable access to it.

www.justnatureproject.eu

Future mobility

AUTONOMOUS VEHICLES

Getting to work, school, the doctor, the movies, shopping may be a trivial issue for those who live in the city but for mountain dwellers and other citizens of rural areas, limited public transport offers and dependence on private cars can directly impact quality of life. Could autonomous vehicles improve the situation? A new project from the regional development team called “RAAV: Rural Accessibility & Automated Vehicles,” assesses different options for introducing both electric and self-driving vehicles, mainly for public transport,

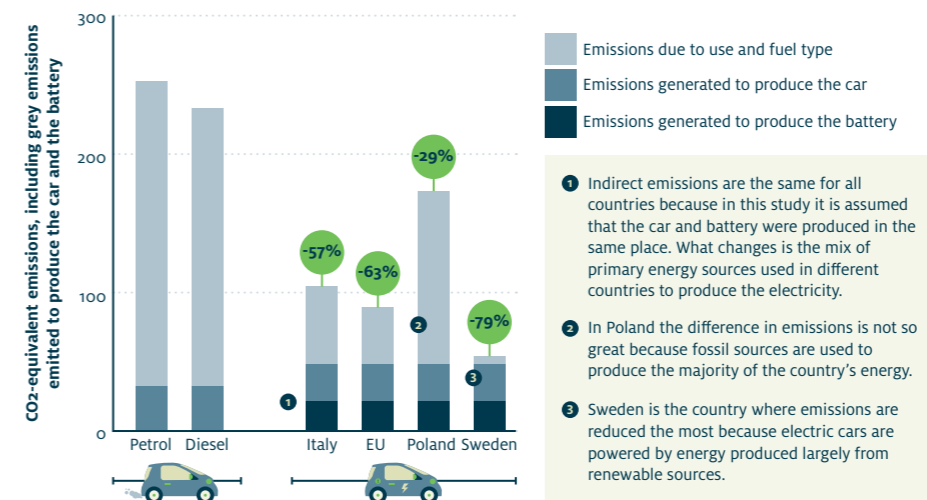
in study areas in Lower Austria and South Tyrol. “Thanks to indicators of individual and collective accessibility we will evaluate the differences between the current state and the possible new scenario, looking at how things could change for various categories of people, from the elderly to young people without a driver’s license, to those who have to commute to large cities and for parents with several children” announces Architect and PhD student Alberto Dianin.

ELECTRIC VEHICLES

Public transport is the most sustainable solution, but when you opt for a car, studies leave no doubt: electric ones are better. In fact, electric mobility figures have soared in recent years. In 2021 published an informative dossier that takes stock of the situation. In 2021 a team from Eurac Research published an informative dossier that takes stock of the situation and its developments with a special focus on South Tyrol. One finding relates to a review of public transport in South Tyrol. The region’s 235 active routes were carefully mapped, and it was revealed that both electric and hydrogen zero-emission buses could

guarantee most routes even in the worst conditions. Major projects currently examining electric mobility include Mobster, an EU-funded project which addresses electric mobility and tourism in a large area between Italy and Switzerland; EVA, an EU-funded project which addresses the optimization of regional infrastructure for the transition to electric vehicles and connected and autonomous vehicles; and Stardust, an EU-funded project examining the transformation of several cities, including Trento, into smart cities.

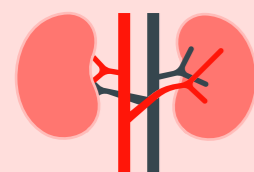
<https://www.eurac.edu/it/dossiers>



A graph showing the differences in emissions between electric, diesel and petrol cars. On average, in Europe, electric vehicles produce about three times less of the emissions than petrol and diesel ones.

22-34 days

Is how many days the snow season has decreased on average in the Alps. The results reflect the changes below 2,000 meters over the past five years. A study coordinated by Eurac Research collected data from over 2,000 measuring stations and evaluated the findings using a uniform method for the first time ever.



500,000

The number of subjects whose data is available to the **Chronic Kidney Genetics consortium (CDKGen)**. The consortium is coordinated by the University of Freiburg and Eurac Research who joined in 2010.

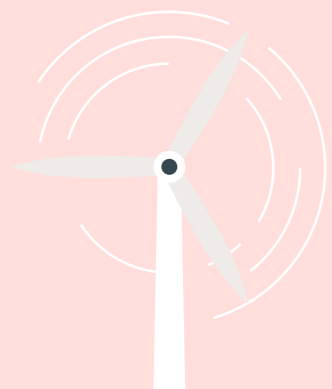
25,000

Different **energy scenarios for South Tyrol in 2050** were simulated by a model developed by Eurac Research. The goal was to identify which energy systems were the most sustainable, economical and allowed more reinvestment in the area.



620

People flocked to meet the **14th Dalai Lama** during his second visit to Eurac Research in 2005. The first was in 1997, the third in 2009, and the fourth and final in 2013. The relationship between South Tyrol and Tibet has grown thanks to a constructive discussion on the topic of autonomy and minority rights.



3 Tons

The approximate weight of the **parabolic antenna of the satellite station** and its dome-shaped protective cover, the radome situated on the **Rittner/Renon Horn**. The antenna receives data from three Nasa satellites, which are used to monitor snow cover, vegetation development and air quality, among other things.

17

Articles are contained within the 2011 Provincial Law on Integration. To ensure that the law remains a tool that can keep pace with changes in society, a research team has developed a series of recommendations which include the establishment of a **symbolic civic citizenship ceremony** that fosters a sense of belonging for old and new inhabitants.

3

The number of years it took to investigate how **learning progresses in German, Italian and English** for 170 students at German and Italian-speaking middle schools in South Tyrol. Amongst other results, the explorative linguistic study found no correlation between the learning progress of the class and the proportion of children with native languages other than German and Italian.

29

Languages make up the **repertoire** of students in German, Italian and Ladin-speaking middle and high schools. Over the course of a three-year language science research project in which 240 pupils were surveyed, it was discovered that 45 percent had proficiency in four standard languages, 30 percent in three; of the remaining 25 percent, most spoke five to six languages, some as many as seven or eight.



500

People sent in suggestions for the first competition of the **South Tyrolean Words of the Year** in 2005. The jury was composed of experts from the South Tyrol Cultural Institute, Free University of Bozen-Bolzano and Eurac Research.

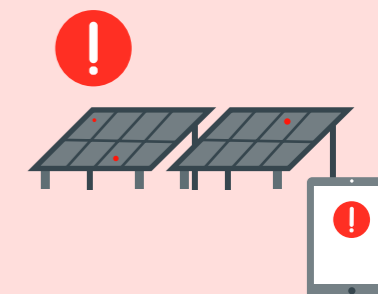
41

The sites identified between 1994 and the early 2000s as suitable for inclusion in the **Natura 2000 Network** thanks to the research and selection work of Eurac Research together with the provincial administration. Today, the number of areas has risen slightly and covers just over 20 percent of the provincial area.



114

The number of mummies aged between 2,000 and 6,000 years which were examined by an international research team. Using state-of-the-art computed tomography, the researchers studied the remains in a truck parked directly in front of the main entrance to the **Egyptian Museum in Turin**. A team of scientists from Eurac Research is leading the large-scale study; in the coming years, the human remains will be precisely dated and studied using microbiological and anthropological methods.



140

Types of errors and **unforeseen events can affect PV panels** in large and medium-sized parks, leading to additional costs and loss of productivity. A tool developed within the Solar Bankability project minimizes these risks by reducing the economic magnitude of the damage by 80 percent.

Open up

At Eurac Research we are dedicated to making research more open, transparent and accessible so that others can contribute to, understand, review and reuse our work and so that knowledge is shared and can reach society faster. With publications and projects, events, and awards, 2021 was the year that we really opened up...

Open Access

Since 2019, Eurac Research has implemented an Open Access (OA) policy. This means that our scientific articles are freely accessible to everyone, anywhere. Looking back over the past three years, here's how things have progressed.

The growth of Open Access publications was accentuated in 2021, by an increase of about ten percent compared with the previous year. In addition, more than four out of five of these publications are classified as "Gold Open Access," meaning they can be accessed directly from the journals' websites. This method of publication is also supported by the Department for Innovation, Research and University of the Autonomous Province of Bolzano/Bozen.



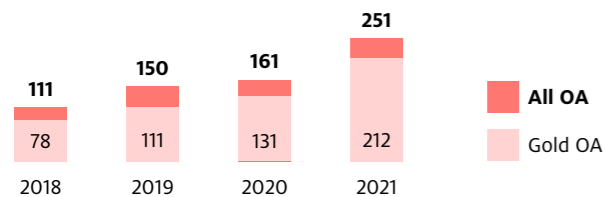
More than 4 out of 5 articles published in 2021 are Gold Open Access

In 2021, over 550 contributions were published, including books, articles, conference proceedings. More than 85 percent of them (over 350) were peer reviewed.

The complete list of scientific publications is available online in the Bolzano/Bozen Institutional Archive (BIA). Set the "Open Access" filter to find all the contributions that can be read in full.

<https://bia.unibz.it>

In 2021, Eurac Research publications were downloaded from the BIA 12,350 times. With 586 downloads, 2021's most downloaded book - signed by our very own anthropologist Fabio Carnelli, was: *The climate crisis in Mediterranean Europe: cross-border and multidisciplinary issues on climate change* (Cantero, J. G., Martínez, C. M., Gómez, J. L., & Carnelli, F.).



OA articles in peer-reviewed journals
Source: Scopus

78%
Of our peer reviewed articles were published as Open Access compared with 67 percent in 2020.

+13%
Peer-reviewed publications increased by this percentage compared to the previous year.

AND THE WINNER IS ...

1,722 points in the Altmetric Attention Score: making "Hallstatt miners consumed blue cheese and beer during the Iron Age and retained a non-Westernized gut microbiome until the Baroque period" 2021 the most mentioned and shared article from Eurac Research. By analyzing fossilized faeces in the Hallstatt salt mine, the study reconstructs the diet and intestinal colonization of Iron and Bronze Age miners. Lead author of the article published in Current Biology is microbiologist Frank Maixner. 1,000 newspapers and online portals have reported on the study, from The Guardian to the Australian Herald, from the Nigeria Sun to the North Korea Times. This article was also published as Open Access.



Small wooden boxes like this one, found in an Iron Age mine, were probably used to store cheese

Awards and appointments

19
The number of awards we received from scientific associations and administrations worldwide over the past year.

189
Eurac Research employees serve on scientific committees or boards of directors of research consortia, institutions, organisations and trade associations.



Simon Rauch – winner of the Autonomous Province of Bolzano/Bozen's Junior Research Award 2021. "For his excellent curriculum in the field of mountain emergency medicine, an area of vital importance to everyone, but particularly in South Tyrol".



The Center for Advanced Studies is the new seat of the UNESCO Chair for "Interdisciplinary Anticipation and Global-Local Transformation". And our very own **Roland Benedikter is the current holder of the position.**

Open Science

The Open Research Awards were presented in 2021 for the first time. The accolade recognizes scientific work that actively engages with the tools and practices that make research more collaborative and which enhance the sharing and dissemination of these findings.



MAIN AWARD 1 Making language data accessible to all

A research infrastructure to permanently archive, disseminate and reuse language data lies at the core of the European initiative CLARIN (Common Language Resources and Technology Infrastructure). The research group “Language Technologies (LT)” has been making an important contribution to this infrastructure for years. Egon Stemle tells us how.

How exactly is your research group involved in CLARIN?

Egon Stemle: Our institute is home to a so-called repository. We store language data - from our own research projects and from others - on non-standard language texts, with our main focus on texts originating from language learners or from social media.

What type of projects does this data come from?

Stemle: I'll give you an example, we had school classes write essays on a certain topic, then typed them up and annotated certain phenomena. By making these data available to the scientific community, they can be used to answer many other research questions. In another project, we analyzed how differently digital natives and digital immigrants deal with the medium on the basis of FB posts of users who grew up in South Tyrol.

How has CLARIN data been used so far?

Stemle: In Ljubljana, some researchers have been investigating language use on Twitter in a similar project and thanks to CLARIN, we have an extended - and continuously extendable - data set with which interesting language comparisons can be made. On the other hand, our learner-generated data flows into a tool for the grammar correction of digitally entered texts.



“Certainly, there is still a need for Open-Source literacy, and it is a generational issue, but even those who are less familiar with these tools should have the vision and be able to understand their potential.”

Giulio Genova



MAIN AWARD 2 Software development among like-minded people

As a bioinformatician at Eurac Research, Johannes Rainer heads the Computational Metabolomics research group, where he works with software that analyzes metabolic data. Five years ago, he faced the problem that the Open-Source software most used for such analyses was not suitable for analyzing the huge datasets of the CHRIS study. Together with the developers, he improved the software and today, it can be used to calculate even huge data sets on conventional computers.

“Open Science also includes Open Data, which is extremely important. Because only when I also have access to the data, does science become comprehensible and thus transparent.”

Johannes Rainer



AWARD FOR EARLY CAREER 1 Collaboration can multiply the impact of research

Limnologist Alberto Scotti studies microorganisms in freshwaters to gain insights into the ecological state of different bodies of water and using Open Science makes his extensive data collections available to the research community.

“Sharing data often results in important collaborations and publications. For research in a small region, this is particularly important: even though we are doing the same work, it has a much greater impact and as a result, potential.”

Alberto Scotti



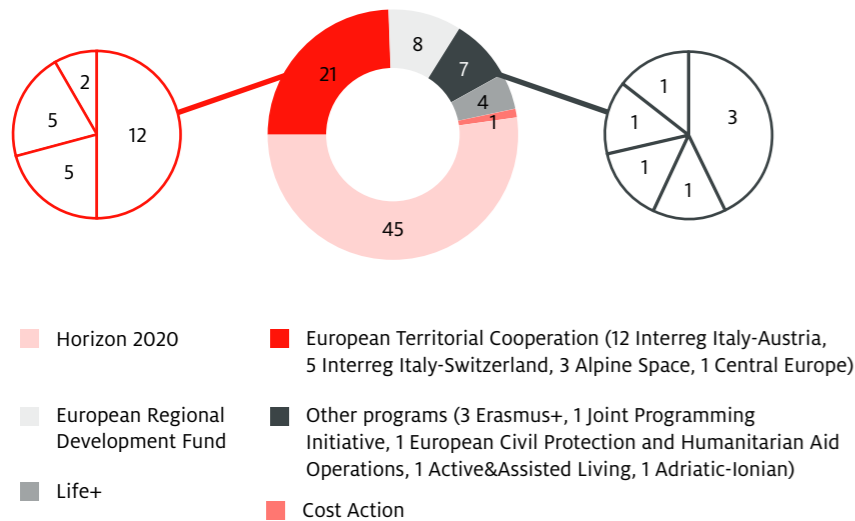
AWARD FOR EARLY CAREER 2 The normalization of innovation

Giulio Genova and Mattia Rossi collaborated to develop Open-Source tools that allow people with minimal programming skills to access and analyze weather and environmental data.

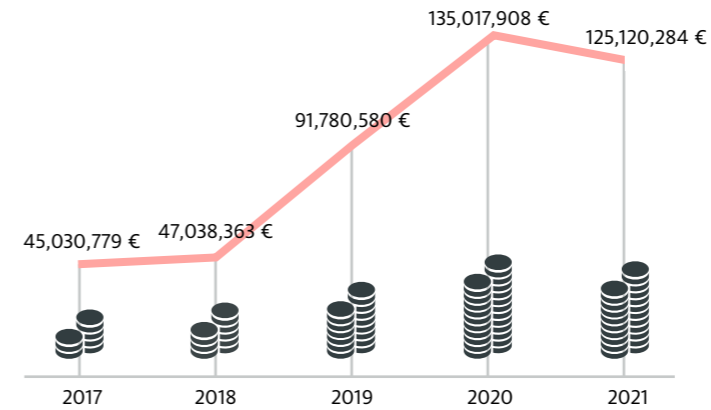
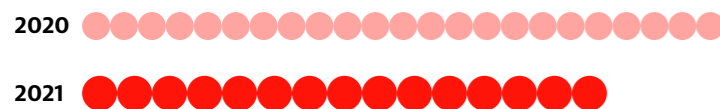
EU projects: fewer but better funded

Although the number of ongoing projects remained roughly the same as last year, fewer new projects were initiated (15) and fewer project proposals were submitted (59 in total). However, the EU Commission also published fewer calls for proposals in 2020/2021, of which the Interreg and ERDF programs were two examples. Acceptance rate is currently 31 percent, with three projects still under evaluation.

The ongoing projects are part of several funding programmes.



On average, EU projects have a larger budget than in the previous year, and we coordinate a larger share of projects as lead partner: 40 percent versus 35 percent.



100+ million

The cumulative budget comes in at 125,120,284 euros this year, exceeding 100 million yet again. This is the total budget that we administered in 2021 for all ongoing EU projects, i.e. the budget that remained in part with Eurac Research (this year more than 22 percent) as well as the part which Eurac Research redistributed as coordinators to other partners. From the EU projects that started in 2021 alone, we received about 5.7 million euros worth of funding for Eurac Research.

NEW EU PROJECTS: GOOD THINGS COME IN THREES



With a budget of 898,440 euros the JUSTNature project, coordinated by Eurac Research, has received the **highest EU contribution** (the total project budget exceeds 10 million). Featuring more than 20 international partners, the project aims to enable nature-based solutions (see page 36) and is part of the Horizon 2020 program.



The **highest total budget** among 2021's projects which is that of Impetus with 16,224,768 euros, of which 748,875 will go to Eurac Research. It is also part of the Horizon 2020 program and deals with adaptation to climate change.



The first project coordinated by Eurac Research and funded by the **new Horizon Europe funding program** is called MODERATE (Marketable Open Data Solutions for Optimized Building-related Energy Services).

86

The number of ongoing EU projects we had by December 2021. We completed 26 over the course of the year and have also started 15 new ones.

+17.5%

The increase in the average contribution of each EU project compared to 2020: from 326,000 to 380,000 euros each.

NOT ONLY EU

We submitted 19 project proposals for the Autonomous Province of Bolzano/Bozen funding programs. More than half of the projects were approved (63 percent), two are still under evaluation.

Our ever-growing network

Rome, Milan, Venice, Pisa, Düsseldorf, Antwerp, Lisbon, Cordoba...: These are just a few of the universities we collaborated with in 2021 – in total, we signed 33 new agreements for scientific and strategic collaborations.

We collaborate with:

957 partners in research projects



169 companies and organizations that commissioned assignments

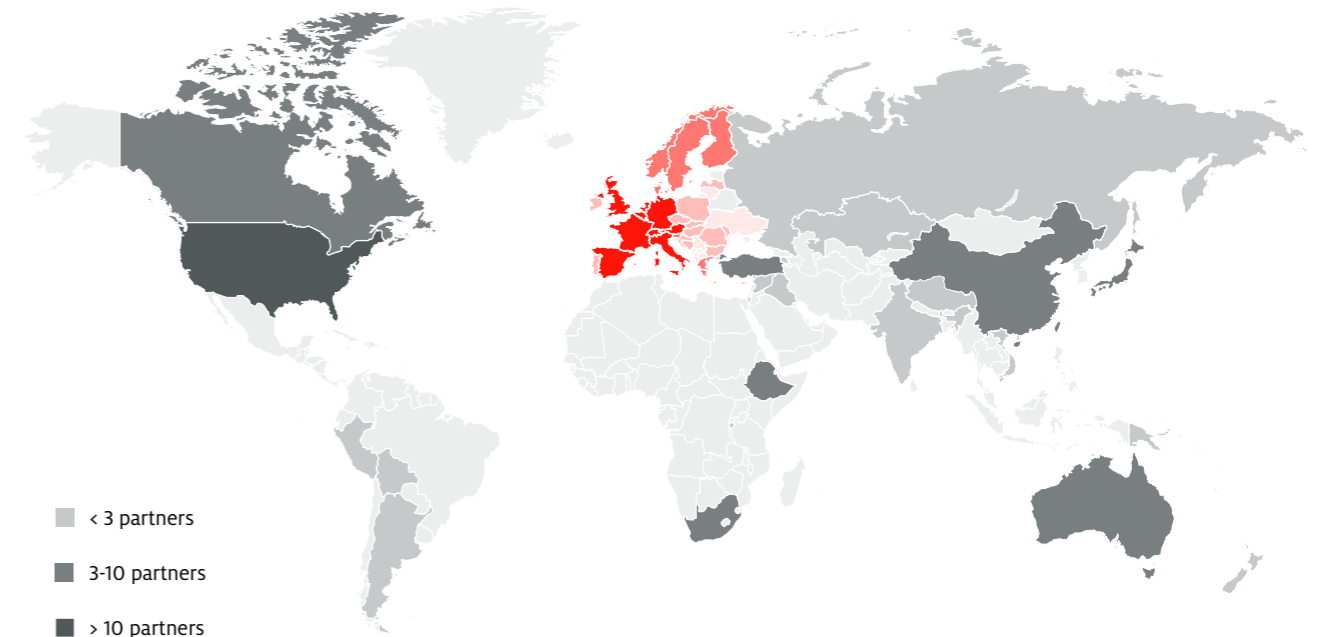
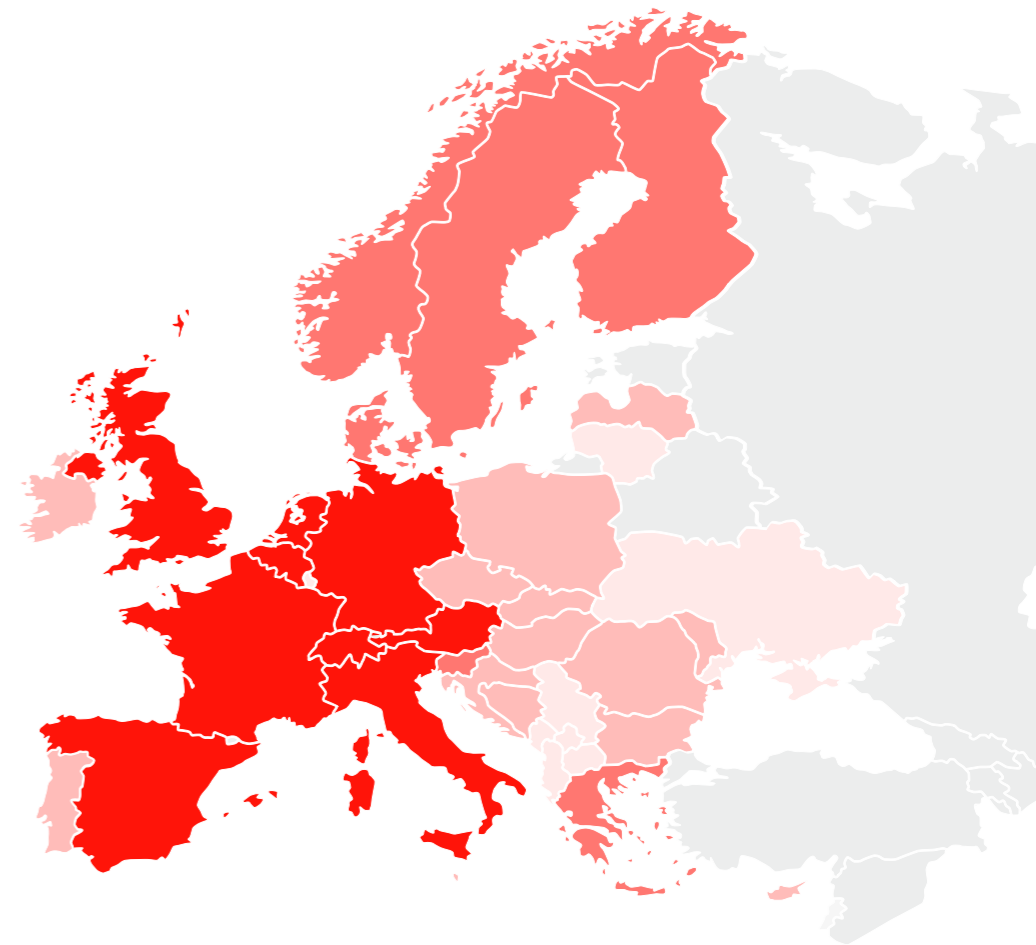


185 institutions with diverse collaboration contracts



-  International
-  Italian
-  South Tyrolean

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



Personnel

Who we are and how we work

PERSONNEL

599 staff members make up Eurac Research

In addition, there are

+8.9%
The percentage our staff increased by compared to the previous year. Last year's upward trend (+6.4 percent) was strengthened significantly yet again.

16 with a habilitation

17 visiting scientists (professors and post doc profiles)

194 with a PhD degree

78 are PhD students (38 employees, 40 in the Grant Programme)

GENDER RATIO
(According to information on identity cards at the time of recruitment)



F: 317 **52.9%** M: 282 **47.1%**

AVERAGE AGE AND PERSONNEL BY AGE



39

>45: 131, **21.9%**
35-45: 210, **35%**
<35: 258, **43.1%**



FIELD EXPERIENCE

Month after month, students from Europe's leading universities have been coming to Bolzano/Bozen to support the ambitious long-term Biodiversity Monitoring South Tyrol project. Amid natural environments and in all seasons and weather conditions, undergraduates and recent graduates were able to put their university knowledge into practice – often for the first time – in what can be described as “valuable field experience”. Students learned the subtle – and often forgotten – art of animal and plant species identification, followed by in-depth mentoring by Eurac Research.



As of January 1, 2022 **Giacomo Strapazzon** has taken his position as the new director of the Institute for Mountain Emergency Medicine. He succeeds Hermann Brugger, the physician and researcher who founded the institute in 2009.

PERSONNEL BY NATIONALITY



European Union
110

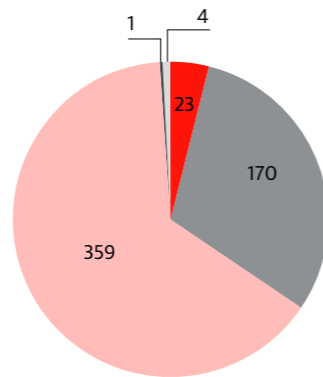


Non EU countries
43

CONTRACTS

- Contractual employees
- Permanent employees
- Apprenticeships
- Continuous and coordinated collaboration (CoCoCo)
- Other contract types

In addition, there are 38 scholarships and 4 research grants



FLEXIBLE WORKING TIME

Apart from the fact that all employees currently have the option of Smart Working,



work full time



work with part-time contracts

(This information concerns those working under fixed-term, open-ended and apprenticeship contracts)

All data from 31.12.2021

Diversity blogstyle

The family of Eurac Research blogs has expanded. Since October, “Mobile People & Diverse Societies” has been sharing insights into the phenomena changing the world from a “bottom-up” perspective. Examining issues such as what happens to societies with migration? What role do local conditions play? And how people arriving and people living in the countries of arrival affect each other?



To date, the contributions have dealt with topics such as state and regional citizenship, the self-perception of the younger generation with an immigrant background who live within the Euregio, and integration in South Tyrolean schools. So far, the most-read post is an interview with Professor Tariq Modood of the University of Bristol on the relationships between religion, politics, and identity. This blog, along with a series of webinars and the Migration Report South Tyrol 2020, is one of the activities of the interdisciplinary group Migrations & Diversities, which has long studied the diversity of languages, cultures, lifestyles, traditions, and religious beliefs as an integral element of everyday life.

<https://www.eurac.edu/en/blogs>

About 500

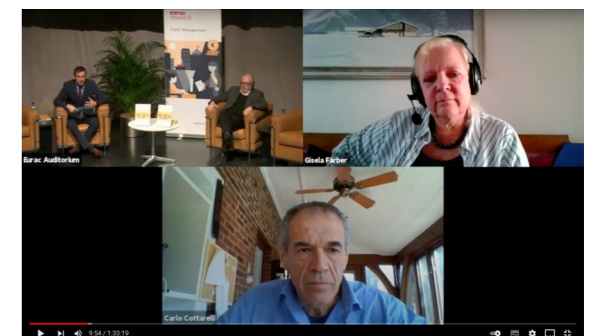
Pieces have been published so far on Eurac Research’s five blogs. Those which cover the pandemic are still the most widely read.

Back on site, still on Zoom

It has long been the norm for events to provide insight not only into scientific facts and research, but also into the living or working rooms of experts. Carlo Cottarelli, Italian Special Commissioner for the Spending Review 2013-14, was on from Washington, D.C., and Professor Gisela Färber was on from Speyer to discuss the problems of public budgets in times of crisis with Kurt Promberger, Head of the Institute for Public Management. „Leere Kassen nach Corona – Spendere bene per ripartire meglio“ (Empty coffers after Covid – Spend well to restart better) was the title of the conference followed by 240 people from eight countries. Great reach without the great time and environmental and financial costs of long traveling: good reasons why hybrid and virtual events will survive the virus.

376

The total number of events that were held by Eurac Research and for which a total of 14,218 participants were present.



Finance

Basic financing

from the Autonomous Province of Bolzano/Bozen

47%

26,133,930 €

Third party funding

53%

29,126,066 €

Partner funding	895,692 €
Project partner funding (Budget administrated by Eurac Research)*	27,395,427 €
Courses	195,990 €
Meeting management	255,303 €
Sponsorships	139,862 €
Other revenues	243,792 €

Total

100%




55,259,996 €

* Of the budget administered in the financial year 2022 by Eurac Research (27.4 million euros) 22 million euros comes from EU funding. Eurac Research manages 14.9 million euros of these EU funds on behalf of EU project partners. The total budget also includes 2.5 million, which Eurac Research acquired primarily within the framework of the "Research Offensive" of the Autonomous Province of Bolzano/Bozen.





Institutes and centers

LEGEND


STAFF

-  Staff members
-  with a PhD degree
-  PhD students

PROJECTS AND ASSIGNMENTS

-  Research projects
-  with international partners
-  Assignments
(services and consultancies)
-  with international agencies

LABORATORIES AND FACILITIES

-  Laboratories and facilities
(*accredited)

OUTPUTS

-  Books
-  Contributions in edited books
-  Journal publications
-  Contributions in conference proceedings
-  Presentations at scientific conferences
-  Contributions to thematic blogs

INSTITUTE FOR ALPINE ENVIRONMENT

since 1993

Head of Institute
Ulrike Tappeiner

Vice Head of Institute
Roberta Bottarin

Staff



Projects and assignments



Laboratories and facilities*



Outputs



*Eco-Lab, Open air laboratory Matsch-Mazia

INSTITUTE FOR APPLIED LINGUISTICS

since 1992

Head of Institute
Andrea Abel

Staff



Projects and assignments



Outputs



INSTITUTE FOR BIOMEDICINE

since 2001

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Projects and assignments



Laboratories and facilities*



Outputs



*Biomedicine laboratory, Biobank, CHRIS Center

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Projects and assignments



Outputs



INSTITUTE FOR EARTH OBSERVATION

since 2006

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Projects and assignments



Outputs



INSTITUTE FOR MINORITY RIGHTS

since 1994

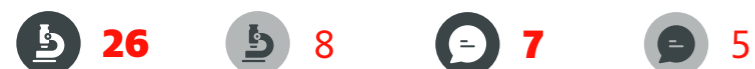
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Projects and assignments



Outputs



INSTITUTE OF MOUNTAIN EMERGENCY MEDICINE

since 2009

Head of Institute
Giacomo Strapazzon

Vice Heads of Institute
Hermann Brugger, Hannes Gatterer

Staff



Projects and assignments



Outputs



INSTITUTE FOR MUMMY STUDIES

since 2007

Head of Institute
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Coordinator
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Staff



Projects and assignments



Laboratories and facilities*



Outputs



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

INSTITUTE FOR PUBLIC MANAGEMENT

since 1998

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Vice Head of Institute
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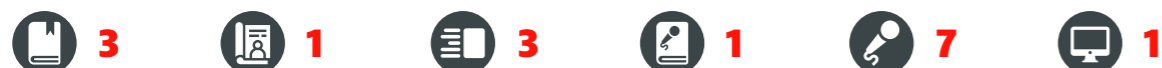
Staff



Projects and assignments



Outputs



INSTITUTE FOR REGIONAL DEVELOPMENT

since 2009

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Staff



Projects and assignments



Outputs



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since 2005

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Projects and assignments



Laboratories and facilities*



Outputs



*Solare PV Lab ([^]1785L, accredited according to ISO 17025:2018 by Accredia), Accelerated Life Testing Lab, G-value Lab, Multifunctional Facade Lab, Heatpumps Lab, Hygrothermal Testing Lab, PV Integration Lab, Energy Exchange Lab, Facade System, Interaction Lab, Photovoltaic Test Field

CENTER FOR ADVANCED STUDIES

since 2017

Head of Center
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Projects and assignments



Outputs



CENTER FOR AUTONOMY EXPERIENCE

since 2020

Head of Center
Marc Emanuel Röggl

The Center for Autonomy Experience has the goal of bringing South Tyrol's model of autonomy and the protection of minorities to the world stage in order to share experiences, to pass on knowledge, and build a strong international and local network.

Staff



Projects and assignments



Outputs



CENTER FOR GLOBAL MOUNTAIN SAFEGUARD RESEARCH

since 2019

Head of Center
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(Eurac Research)

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(UNU)

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 *



Projects and assignments



Outputs



CENTER FOR SENSING SOLUTIONS

since 2019

Head of Center
Roberto Monsorno

Staff



Projects and assignments



Outputs



Laboratories and facilities*

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

TERRAXCUBE

since 2018

Head of Center
Christian Steurer

Staff



Projects and assignments



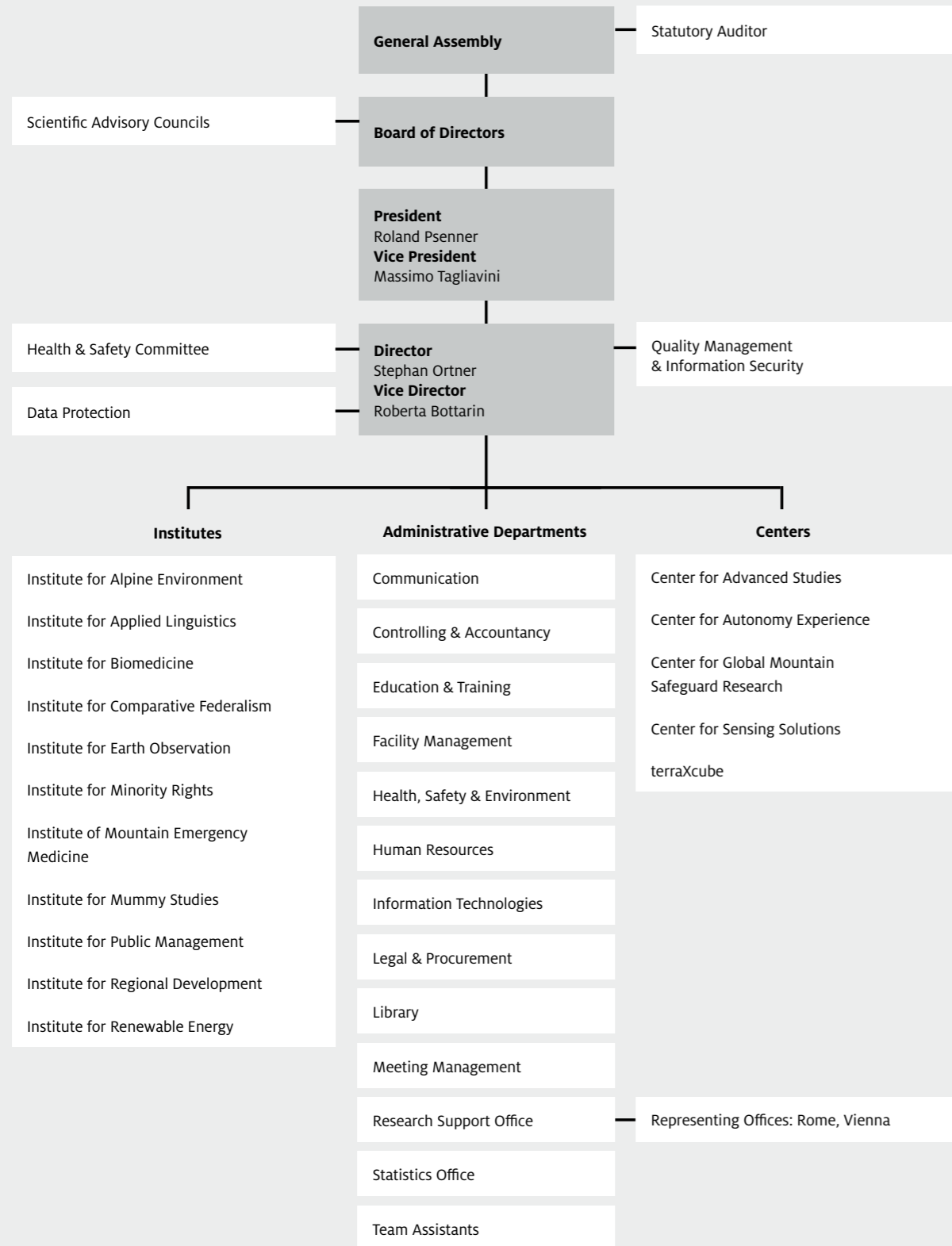
Outputs



Laboratories and facilities*

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

Organigram



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- Autonomous Province of Bolzano/ Bozen
- Autonomous Region of Trentino-Alto Adige/Südtirol
- Bezirksgemeinschaft Burggrafenamt/ Consorzio Comprensoriale del Burgraviato
- Brennercom AG
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- Südtiroler Bauernbund/Unione Agricoltori e Coltivatori Diretti Sudirolesi
- Südtiroler Kulturinstitut
- Universität zu Lübeck
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