

# Research Report 2021



Freie Universität Bozen  
Libera Università di Bolzano  
Università Lìedia de Bulsan



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# Preface

Nach 2020 war auch das Jahr 2021 von der Corona-Pandemie geprägt mit neuen Herausforderungen für die Gesellschaft insgesamt, aber auch für die Universitäten. Die Lehre musste großteils im Online-Unterricht abgehalten werden, genauso wie die wissenschaftlichen Konferenzen zum Austausch unter den Forschenden. Gewiss haben uns diese Einschränkungen gezeigt, dass bestimmte Aufgaben im Online-Modus genauso gut, vielleicht sogar effizienter erledigt werden können. Wir haben aber auch die andere Seite dieser Einschränkungen erfahren. Wissenschaftler\*innen in der experimentellen Forschung waren sehr eingeschränkt in ihren Aktivitäten. Genauso wurde jeder von uns darin bestätigt, dass der persönliche Austausch zwischen Forschenden und innerhalb der Forschungsgemeinschaft extrem wichtig sind und im Online-Modus nicht im selben Maße funktioniert.



President — Prof. Ulrike Tappeiner

Neben der Pandemie stand an der unibz ein weiteres Thema ganz oben auf der Agenda: die Ausarbeitung eines Gender Equality Plan (GEP). Der GEP ist ein strategisches Instrument mit dem Ziel, die Gleichstellung der Geschlechter bzw. Chancengleichheit zwischen Mann und Frau zu erreichen, entsprechend den Werten der Europäischen Union und der nationalen Gesetzgebung. Die Freie Universität Bozen ist diesen Werten verpflichtet. Beim akademischen Personal haben wir eine Frauenquote von 34%, und es gibt keinen „pay gap“. Dennoch liegt noch ein gutes Stück Weg vor uns. Mit Freude stellen wir in diesem Zusammenhang fest, dass: im Jahre 2021 zwei der drei Preisträger\*innen des Forschungspreises der Stiftung Südtiroler Sparkasse Frauen sind, ein neues Kompetenzzentrum von einer Frau geleitet wird und eine Dekanin die Leitung einer Fakultät übernommen hat. Das kann Hoffnung sein, dass zunehmend auch Frauen in wichtigen Positionen der akademischen Verwaltung Berücksichtigung finden.

Anche se la pandemia ha reso più difficile l'organizzazione della ricerca, i ricercatori e i professori di unibz nelle cinque facoltà e nei cinque centri di competenza

hanno continuato la loro ricerca con grande intensità e ad un alto livello di qualità. La qualità della ricerca è testimoniata da numerose pubblicazioni in riviste e conferenze internazionali di altissimo livello, ma anche nei tanti riconoscimenti scientifici ottenuti da professori e ricercatori nella loro community.



Rector — Prof. Paolo Lugli

La qualità della ricerca ha avuto un notevole impatto anche sui ranking delle università: nel 2021 unibz per la quinta volta consecutiva si classifica al primo posto tra le piccole università italiane non statali nel ranking di CENSIS, ed è tra le prime 500 università nel mondo nel ranking internazionale del Times Higher Education.

Un aspetto sempre più importante per le università è l'acquisizione di fondi terzi per sostenere la ricerca. Negli ultimi anni l'importo di fondi terzi è aumentato

ed ha raggiunto ca. 7 milioni di euro. Nel 2021 abbiamo rilevato un aumento significativo di Joint Projects – progetti di ricerca bilaterali che prevedono la partecipazione di un partner altoatesino e di un partner dell’Austria, Germania, Svizzera o Lussemburgo. Si ringrazia la Provincia Autonoma di Bolzano per aver lanciato questa iniziativa nel 2019 con le rispettive agenzie di ricerca FWF, DFG, SNF e FNR. I Joint Projects si sono dimostrati come strumento molto utile e flessibile per promuovere la ricerca e fare rete con questi paesi strategici per unibz. Nel contesto del PNRR unibz ha partecipato in varie proposte di progetto, i cui risultati saranno noti solo nel 2022.

To intensify the connection to the territory and foster excellence in research in areas that are particularly relevant for the territory, unibz runs 13 state-of-the-art research laboratories at the South Tyrol Science and Technology Park. Four of these labs have been opened in 2021: Agroforestry Innovations Lab, Field Robotics South Tyrol Lab, Thermo Fluid Dynamics Lab, Bioenergy & Biofuels Lab. The research labs are embedded in a stimulating and vibrant environment in close contact with companies, start-ups and

other research institutes, thereby providing a significant contribution to the transfer of knowledge to the industry and society.



Vice Rector for Research — Prof. Johann Gamper

Two special highlights in 2021 were the second patent and the second spin-off of unibz. These two milestones not only emphasize a high quality of our research, but also demonstrate that our research generates an impact to the territory.

In a similar vein, the mission of the five Competence Centres of unibz is to strengthen application-oriented research in selected fields. This is done in close collaboration with local stakeholders and with a focus on challenges that emerge from the region. In 2021, the new Competence Centre for Social Work, Social Pedagogy and Social Policy has been founded.

All results described in this report have been reached thanks to the effort and dedicated work of our professors and researchers, and with the support of a competent administration. We would like to express our sincere gratitude to the entire unibz community.

We hope you enjoy reading the Research Report 2021.

Ulrike Tappeiner, President  
Paolo Lugli, Rector  
Johann Gamper, Vice-Rector

# Highlights 2021

## 1.

### unibz in rankings

In national rankings, the Free University of Bozen-Bolzano reaches top positions every year: in the 2021 Times Higher Education World University Rankings it was to be found in the 401–500 range among almost 1,600 institutions worldwide.

ties and being evaluated among the top 150 for “International Faculty ratio”. Furthermore, for the fifth time in a row, unibz placed first among the small non-state universities in the Censis Ranking, also reaching the highest average score among all Italian state and non-state universities: 101.0 points.



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The strongest pillars of unibz were “Citations” (with a score of 77.9 among the top 260) and “International outlook” (with a score of 76.7 among the top 250). In Italy we are on the 16th position out of 53 ranked universities. For the second time unibz has entered the QS World University Rankings 2022 with a rank position in the 651–700 range among 5,000 surveyed universi-

## 2.

### „Research Award Südtirol 2020“ geht an Prof. Ulrike Tappeiner

Die Jahre der Pandemie rüttelten auch die Forschungswelt ordentlich durcheinander. So konnte der „Research Award Südtirol 2020“ des Landes Südtirol erst im September 2021 vergeben werden,

und zwar an die Professorin für Ökosystem- und Landschaftsökologie sowie Präsidentin der Freien Universität Bozen, Prof. Ulrike Tappeiner. Laudator Prof. Roland Psenner, Präsident der Eurac Research, hob ihre langjährige Expertise bei den lokalen Auswirkungen globaler Entwicklungen hervor. Viele Bereiche, vor allem jene der Ökosystemleistungen, denen sich Prof. Tappeiner schon seit langem widme, seien nun als Nachhaltigkeitsziele für ein breites Publikum von Interesse. „Wir möchten mit diesem Preis zeigen, welche herausragende Forscher\*innen wir in diesem Land haben“, so Landeshauptmann Arno Kompatscher.

1 ← Piazzetta-Charles-Darwin-Platz at unibz  
Campus © Nicolò Degiorgis  
2 ↑ Prof. Ulrike Tappeiner

# 3.

## La Facoltà di Scienze della Formazione si distingue per la ricerca

Quattro ricercatori e ricercatrici della Facoltà di Scienze della Formazione a Bressanone sono stati premiati dalla S.I.PED., la Società Italiana di Pedagogia, per i loro contributi scientifici nel

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triennio 2017–2020. I ricercatori e le ricercatrici di unibz che hanno ricevuto riconoscimenti per le monografie nel settore *Pedagogia generale e sociale* sono Monica Parricchi con *Vivere il mondo. Sentieri di educazione alla cittadinanza, dalla partecipazione all'educazione economica* (Franco-

Angeli 2019) e Michele Cagol con *Emozioni, ragione, etica in educazione. Per una pedagogia dei comportamenti complessi* (Franco-Angeli 2020). Nel settore *Storia della pedagogia*, è stata premiata Maria Teresa Trisciuzzi per il volume *Ritratti di famiglia. Immagini e rappresentazioni nella storia della letteratura per l'infanzia* (ETS 2018). Infine, nel settore *Pedagogia sperimentale*, si è distinto Daniele Morselli con *The Change Laboratory for Teacher Training in Entrepreneurship Education: A new Skills Agenda for Europe* (Springer 2019).

# 4.

## Forschungspreis der Stiftung Südtiroler Sparkasse

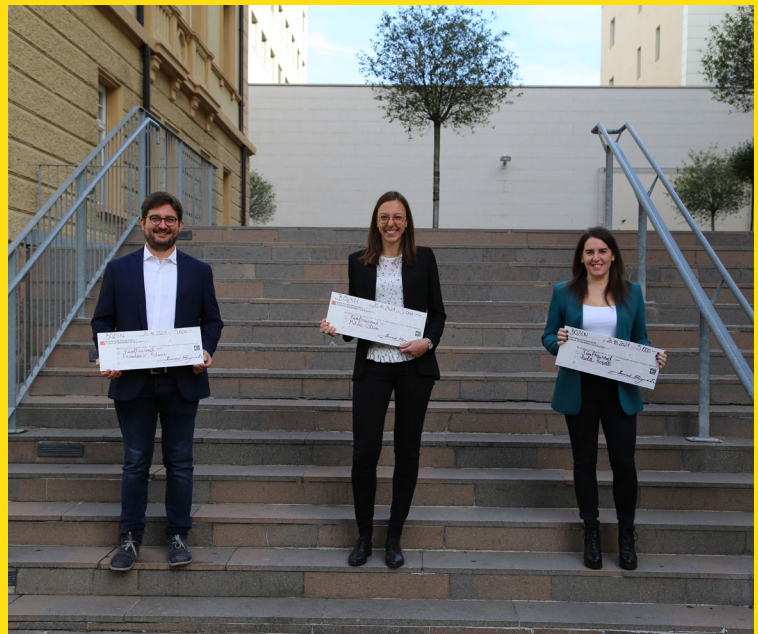
Forschungsleistungen von Nachwuchsforscher\*innen der Freien

Universität Bozen fördern und sichtbar machen: das ermöglicht seit 2019 der Forschungspreis der Stiftung Südtiroler Sparkasse.

Ausgezeichnet wurden im vergangenen Jahr Francesco Patuzzi (Fakultät für Naturwissenschaften und Technik) für seine Forschung im Bereich von Biogasanlagen mit Fokus auf die Südtiroler Realität, Milvia Cottini (Fakultät für Bildungswissenschaften) für ihre Arbeit im Bereich der kognitiven Entwicklung von Kindern sowie Paola Rovelli (Fakultät für Wirtschaftswissenschaften) für ihre wissenschaftlichen Analysen zum Top Management von kleinen und mittleren Betrieben.

3 ← Campus Brixen-Bressanone © Nicolò Degiorgis

4 ↓ Award-winning researchers. Left to right: Francesco Patuzzi, Milvia Cottini and Paola Rovelli

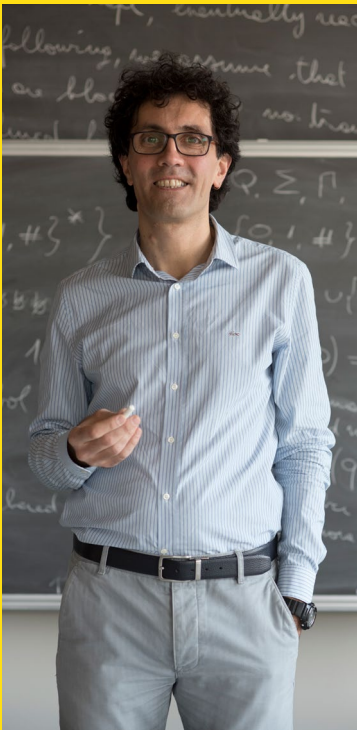


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# 5.

## Premio al paper più influente degli ultimi 15 anni

Un team di ricerca tutto italiano è stato insignito con il Classic Paper Award alla conferenza AAAI 2021, evento di punta a livello mondiale per la ricerca nel campo dell'intelligenza artificiale.



Nel corso della 35a edizione, il comitato organizzatore ha deciso infatti di premiare Diego Calvanese, professore della Facoltà di Scienze e Tecnologie informatiche di unibz, e i colleghi Giuseppe De Giacomo, Domenico Lembo, Maurizio Lenzerini e Riccardo Rosati del Dipartimento di Ingegneria informatica, auto-

matica e gestionale dell'Università La Sapienza di Roma, per il paper *DL-Lite: Tractable Description Logics for Ontologies*, che era stato presentato alla 20a edizione dell'evento, nel 2005, e che ha avviato un filone di ricerca che ha permesso di innovare il modo in cui vengono cercate e trovate le informazioni sul web e nelle grandi banche dati.

# 6.

## „Fuorisalone“: Die Fakultät für Design und Künste ist Teil des Rahmenprogramm des „Salone del Mobile“

In Mailand herrschte Aufbruchstimmung beim „Fuorisalone“ mit einer Reihe von Ausstellungen, Talks und Installationen: mittendrin die Fakultät für Design und Künste, die mit

zwei Projekten mitwirkte. In der Ausstellung *The Lost Graduation Show* durften Absolvent\*innen von Designfakultäten und Akademien ihre Werke ausstellen und den wichtigen Dialog über die Zukunft des Designs wieder aufnehmen, was ihnen im Pandemiejahr 2020 völlig verwehrt geblieben ist. Fünf Abschlussprojekte der unibz wurden für die Ausstellung ausgewählt und waren Teil von 170 studentischen Projekten aus 48 Designschulen in 22 Ländern. Die Gesamtauswahl erfolgte aus über 300 Schulen aus 59 Ländern in aller Welt.

5 ← Prof. Diego Calvanese  
6 ↓ Exhibition "The Lost Graduation Show"





# 7.

## Un brevetto dagli scarti delle microplastiche per l'edilizia "green"

Un biopolimero ricavato dalla lavorazione delle alghe rosse permette di sfruttare materiali plastici o inerti di altro genere per realizzare una schiuma adatta all'isolamento acustico e termico delle abitazioni, evitandone la dispersione nell'ambiente marino. L'invenzione del ricercatore Marco Caniato, della Facoltà di Scienze e Tecnologie, rappresenta un importante contributo alla lotta contro le microplastiche. Il prodotto brevettato si è rivelato estremamente promettente nella battaglia contro la dispersione delle microplastiche nell'ambiente. Caniato ha utilizzato un biopolimero che si è dimostrato efficace come isolante termico e acustico per applicazioni industriali, civili e marittime. L'articolo scientifico *Acoustic and thermal characterization of a novel sustainable material incorporating recycled microplastic waste* è stato pubblicato sulla rivista Sustainable Materials and Technologies.

# 8.

**Second unibz spin-off: AIAQUA for innovative management of water pipes**  
AIAQUA, the second spin-off of the Free University of Bozen-Bolzano was presented in July 2021 and focuses on efficient as well as

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sustainable management of water resources based on the latest scientific findings. Efficient water management is all the more important because it inevitably affects the amount of available drinking water; in fact, according to estimates 40% of water resources are currently lost throughout Italy due to outdated water pipes alone. The company AIAQUA was founded by the engineers Andrea Menapace and Ariele Zanfei, Prof. Maurizio Righetti (all members of the Faculty of Science and Technology), Prof. Francesco Ravazzolo (Faculty of Economics and Management) and Alberto De Luca (freelance).

7 ← Dr. Marco Caniato  
8 ↓ Left to right: Prof. Francesco Ravazzolo, Dr. Ariele Zanfei and Dr. Andrea Menapace



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# 9.

## The new research glasshouse: Plant research under ideal conditions in 9 temperature- controlled sub-areas

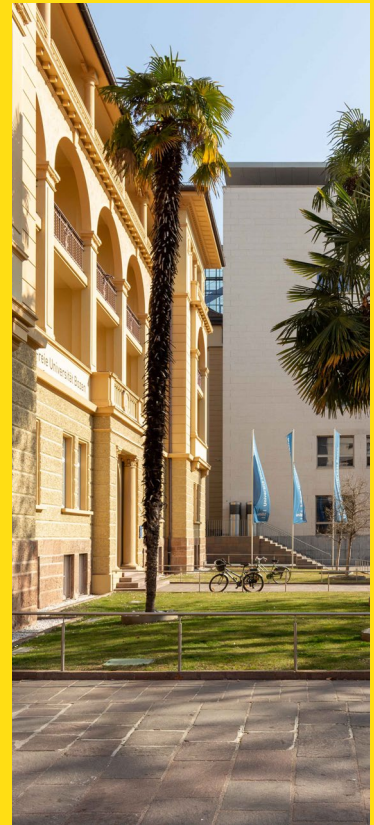
In 2021, the Faculty of Science and Technology has unveiled its new research glasshouse on the grounds of the Laimburg Experimental Centre. In addition to the various laboratories at unibz, it now offers the possibility to conduct phytopathological experiments under defined environmental conditions – such as temperature, light and humidity. The new 200-square-meter glass house provides the research teams with nine separate cells. In each of these cells, different experimental protocols can be established for the most important environmental and

cultivation parameters (such as temperature, humidity, radiation intensity, photoperiod, irrigation and plant nutrition).

# 10.

## Neue Stiftungsprofessuren

Im vergangenen Jahr hat die unibz drei Stiftungsprofessuren auf den Weg gebracht: Prof. Oswald Lanz wurde als Stiftungsprofessor an die Fakultät für Informatik berufen, der Historiker Oswald Überegger, der das Kompetenzzentrum für Regionalgeschichte am Campus Brixen aufgebaut hat und diesem seit 2013 als Direktor vorsteht, wurde als Euregio-Stiftungsprofessor berufen, und es wurde das Berufungsverfahren für eine Stiftungsprofessur im Fachbereich Deutsche Sprache, Literatur und



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Kultur an der Fakultät für Bildungswissenschaften eingeleitet. Letztere wird gemeinsam mit Eurac Research für das Forschungsprojekt Mehrsprachigkeit in Südtirol eingerichtet.

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9 ← unibz Green House at Research Centre Laimburg

10 ↑ Administration Building at unibz Campus

# 11.

## Neues Kompetenzzentrum für Soziale Arbeit und Sozialpolitik

Seit mehr als 20 Jahren wird an der Fakultät für Bildungswissenschaften im Bereich Soziale Arbeit geforscht und gelehrt. Mit einem neuen Kompetenzzentrum wird dieser Erfahrungsschatz nun in Richtung mittel- bis langfristige Forschung und Weiterbildungsprojekte ausgebaut. Das Kompetenzzentrum hat drei Forschungsschwerpunkte: Kinder- und Jugendhilfe; Altern, Care, Diversität, Gender und Migration sowie Sozialpolitik, Innovation im Sozialwesen, soziale Sicherung und Teilhabe. Besonderen Fokus will das Führungstrio, bestehend aus Direktorin Prof. Ulrike Loch, Prof. Dorothy Zinn und Prof. Giulia Cavrini, auf einen partizipativen Ansatz der Forschung legen.

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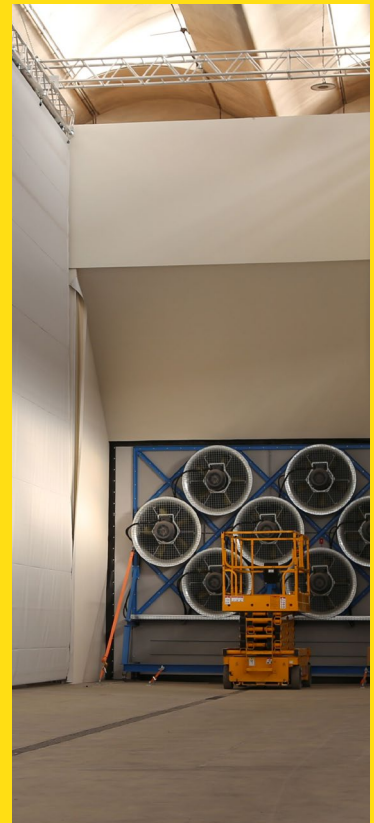
research in the fields of technological and green innovation in agriculture, automation and robotics, industrial fluid dynamics, energy production from sustainable and renewable sources, territorial protection and protection from hydrogeological risks linked to climate change.

# 12.

## New laboratories presented at the NOI Techpark

In December, the new laboratories of the Free University of Bozen-Bolzano at the NOI Techpark, all located in the B5 building and funded by the European Regional Development Fund and the Autonomous Province of Bozen-Bolzano, were presented to the press, key stakeholders and partners. This is an important step forward for the Faculty of Science and Technology's

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11 ↑ Team of the Competence Centre. Left to right: Dr. Federica Viganò, Prof. Giulia Cavrini, Prof. Ulrike Loch, Dr. Elisa Cisotto, Nadia Paone, Emily Giacomuzzi and Prof. Paul Videsott  
12 → Wind tunnel at the B5 Building at NOI Techpark

# Faculty of Computer Science



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## KEY DATA

### PEOPLE

355 Students  
49 PhD Students  
21 Tenured Prof.  
62 Researchers  
29 Contract Prof.  
11 Technical and Administrative Staff

## BACHELOR

+ Computer Science  
+ Informatics and Management of Digital Business

## MASTER

+ Computational Data Science  
+ Software Engineering for Information Systems

## PHD

+ Computer Science



## Research Areas



Dean — Prof. Claus Pahl

The Faculty of Computer Science is one of the most excellent computer science departments worldwide. It is ranked among the 151–175 best ones on an international level and in 2021 it was sixth in the Times Higher Education ranking list of the Italian universities.

The Faculty has an outstanding scientific reputation nationally and abroad in different scientific fields of computer science both in basic and in applied research, ranging from knowledge representation to human-computer interaction, artificial intelligence, and edge/cloud computing. The research activities are carried out in synergy with small and medium enterprises in South Tyrol as well as in cooperation with large research centres (e.g., Fondazione Bruno Kessler) and companies globally operating in basic and applied research.

In the last three years the Faculty could count on good financial support for its research activities, with a total amount of € 3.3 million in external funding. The keywords of the projects mainly

point to big data, intelligent systems, virtualization, and knowledge representation. In 2021 specifically, five new third-party funded research projects and seven new research contracts with small and medium-sized enterprises for a total of € 450,000 were started and further funding of € 700,000 for four new research projects was secured.

In 2021 the Faculty started to broaden the scope of its activities including two new applications areas: Health and Transportation.

This choice was driven by the relevance of the above fields to the territory, where public as well as private organizations are active. Transportation is investigated by a number of researchers, covering smart-city and automotive applications, and Health is also more and more actively supported by publications, projects including a collaboration with hospitals, and the organisation of events.

During 2021 the Faculty activated the 37<sup>th</sup> cycle of its doctoral course in Computer Science. The four-year doctoral programme enables high scientific standards and improves the competitiveness of the doctoral students on an international level by covering topics such as artificial intelligence and data science, software engineering and human-centric technologies focusing on the development of intelligent solutions for a higher usability of technology.

In 2021 the Faculty's research activities expanded more and more, and also the number of publications increased as compared to 2020: there were 158 new publications, including 82 conference proceedings articles and 69 journal articles.

Members of the Faculty chaired 15 scientific events (conferences and workshops), of which three as general chair, and were invited to be part of 19 scientific committees on an international level.



Vice Dean for Research — Prof. Barbara Russo

The Faculty's research activities focus on the following three major areas.

### **IDSE – Information and Database Systems Engineering** **Coordinator:** Markus Zanker

The research activities in this research area cover five topics: Computational Mathematics, Computer Vision and Image Processing, Database Systems, Decision Support, Personalisation and Recommender Systems, and Human Centred Computing.

### **KRDB – Knowledge and Data** **Coordinator:** Enrico Franconi

This research area focuses on four topics: Conceptual and Cognitive Modelling, Foundations of Database Technologies, Intelligent Integration and Access to Data, and Process-aware Information Systems Management.

### **SwSE – Software and Systems Engineering** **Coordinator:** Romain Robbes

Research activities cover here four topics: Dynamic Architecture and Systems – Edge and Cloud,

Software and Systems verification and reliability, Continuous Agile and Lean Process Innovation and Software Engineering Training and Education.

Moreover, in 2021 new professors joined the Faculty and opened new research branches and activities:

#### **Media Interaction Lab**

**Coordinator:** Michael Haller

The Lab integrates research with education, providing students with a project-based learning environment. Its activities focus on large interactive surfaces, creative environments, next-generation interfaces, and smart textiles with recent applications to hardware-related domains, such as sensing technologies and hardware design with automotive companies to develop and investigate next-generation interfaces for vehicles.

#### **Covision Lab**

**Coordinator:** Oswald Lanz

The Lab is a consortium backed by seven multinational technology companies headquartered in South Tyrol. Its mission is to pool know-how, technologies, and resources in order to achieve collaborative competitive advantages in computer vision and AI and solve challenges relevant to industries, such as anomaly detection in images and activity recognition and forecasting in video (e.g., for assisting workers with assembly tasks and collaborative robots in tomorrow's shop floor).

#### **Machine Learning and Data Science**

**Coordinator:** Giuseppe Di Fatta

Research focuses here on Machine Learning and Data Science algorithms, tools and applications with a particular interest in scalability aspects of distributed and parallel computing, such as distributed consensus problem and fully decentralised systems for communication and computation and applications in scientific and industrial domains, such as neuroscience, chemoinformatics, bioinformatics, digital marketing.



### HIVE – Integration heterogener Daten in virtuelle Wissensgraphen

Die heutige Gesellschaft stützt sich zunehmend auf „Big Data“, die durch menschliche Aktivitäten erzeugt werden. Diese Daten sind oft komplex und verstreut auf heterogenen Datenquellen, welche sich in Format und Zugangsmechanismen unterscheiden. Die Technologie der virtuellen Wissensgraphen (VKG), bei deren Entwicklung Bozen mit unibz und dem Spin-off-Unternehmen Ontopic eine Vorreiterrolle einnimmt, geht auf diese Probleme ein, indem sie den Zugang zu Daten in Form von kohärenten Wissensgraphen ermöglicht, die leicht abzufragen und „virtuell“ sind, da die Daten in ihren Quellen erhalten bleiben.

Das Projekt zielt darauf ab, die VKG-Technologie auf zwei weit verbreitete nicht-relationale Arten von Datenquellen zu erweitern: Web-APIs und Textdaten. Die gewonnenen Ergebnisse

tragen bei zu weiteren Fortschritten in der Forschung zu virtuellen Wissensgraphen, einer gesteigerten Wettbewerbsfähigkeit der Südtiroler Akteure, die VKGs anwenden sowie einer verbesserten Fähigkeit, die Datenbestände von Unternehmen und Institutionen zu nutzen, die datengestützte Entscheidungen benötigen, um Herausforderungen wie die ökologische Nachhaltigkeit anzugehen.

Für zwei nachhaltigkeitsbezogene Projekte ergab sich diesbezüglich bereits eine konkrete Anwendung: ein Projekt in Zusammenarbeit mit R3GIS und Alperia für die Integration von Gebäude- und Energieverbrauchsdaten (IDEE) sowie ein Projekt in Zusammenarbeit mit Campfire Solutions für die Integration von Fernwärmedaten zur Förderung einer nachhaltigeren Energienutzung.

FUNDING TYPE  
Stiftung Fondazione Südtiroler Sparkasse

DURATION  
04/2021 – 04/2022

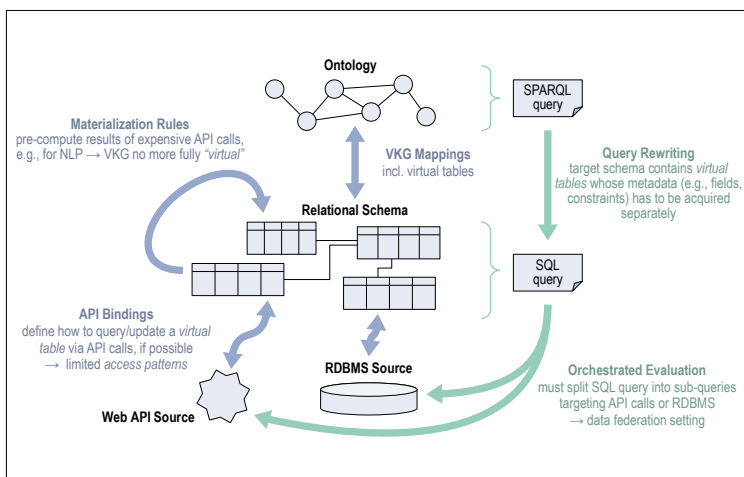
RESEARCH AREA  
Knowledge and Data

PRINCIPAL INVESTIGATOR  
Prof. Diego Calvanese

PROJECT PARTNER  
Ontopic s.r.l.

WEBSITE  
hive.inf.unibz.it

SELECTED PUBLICATIONS  
+ Xiao, G. & Corman, J. (2021). Ontology-mediated SPARQL query answering over knowledge graphs. *Big Data Research*, 23, p.100177



← Approach Hive © HIVE Project



### reCOVeraID – Applica- zione di telemonitoraggio intelligente per pazienti sintomatici, asintomatici e pre-sintomatici affetti da coronavirus

Il progetto reCOVeraID sviluppa un'applicazione web finalizzata al monitoraggio a distanza dei pazienti potenzialmente o attualmente infettati da COVID-19, o che ne sono guariti. In particolare, i ricercatori hanno sviluppato un prototipo di implementazione che consente ai pazienti e ai medici di interagire efficacemente tra loro.

In sintesi, l'applicazione reCOVeraID dovrebbe aiutare a raggiungere obiettivi cruciali come il monitoraggio di persone con possibili crisi respiratorie; il monitoraggio di persone che non sono state sottoposte al test per il COVID-19 ma che potrebbero essere potenzialmente positive; la misurazione in tempo reale dei parametri vitali in modo che i medici possano reagire prontamente alle crisi respiratorie; la

possibilità per i medici di evitare di entrare a contatto diretto con un gran numero di pazienti.

Il progetto è stato coperto dai media locali e nazionali, suscitando notevole attenzione e interesse: 33 articoli in riviste nazionali di rilievo hanno parlato di reCOVeraID, tra cui Vanity Fair e Protezione Civile Nazionale, e l'informazione è stata ripresa anche da RAI News.

I risultati ottenuti dal team di ricerca riguardano l'efficacia delle regole basate sulla conoscenza per modellare e rilevare tempestivamente allarmi a breve e lungo termine, utilizzando i dati di pazienti reali infettati da COVID-19, sia quelli ricoverati presso l'Ospedale Pineta Grande di Caserta sia quelli in telemonitoraggio domiciliare. Gli elevati valori di accuratezza raggiunti dimostrano che l'uso costante del framework reCOVeraID da parte di pazienti infetti o potenzialmente tali può aiutare in modo significativo a identificare tempestivamente eventuali tendenze negative dei loro parametri vitali, consentendo così un'ospedalizzazione precoce che può salvare loro la vita.

Il lavoro futuro esplorerà come reCOVeraID possa essere trasferito ad altri campi di applicazione non strettamente legati all'emergenza COVID, come il monitoraggio di pazienti affetti da diabete o ipertensione, ampliando così il suo potenziale e rafforzando ulteriormente la sua accettazione da parte dei medici.

FUNDING TYPE  
Ministerial Funding (MUR)

DURATION  
06/2021 — 11/2021

RESEARCH AREA  
Information and Database Systems  
Engineering

PRINCIPAL INVESTIGATOR  
Dr. Daniela D'Auria

PROJECT PARTNER  
Scuola Superiore Sant'Anna di Studi  
Universitari e di Perfezionamento

#### SELECTED PUBLICATIONS

- + D'Auria, D., Russo, R., Fedele, A., Addabbo, F. & Calvanese, D. *An intelligent telemonitoring application for symptomatic, asymptomatic and pre-symptomatic coronavirus patients: reCOVeraID*, submitted to the IEEE Access Journal.
- + Barr, J. R., D'Auria, D. & Persia, F. (2020). *Telemedicine, Homecare in the Era of COVID-19 & beyond* Third IEEE International Conference on Artificial Intelligence for Industries (AI4I), 48–51.
- + D'Auria, D. & Persia, F. (2021). *Robots against the Coronavirus: the need for a new generation of robots to help global society*, IEEE 15<sup>th</sup> International Conference on Semantic Computing (ICSC), 421–424.
- + Persia, F., Costantini, S., Ferri, C., De Lauretis, L. & D'Auria, D. (2021). *A smart framework for automatically analyzing electrocardiograms*, Third IEEE International Conference on Transdisciplinary AI (TransAI), 64–67.







### HiTech Manufacturing – Simulations in additive manufacturing using finite element method

Additive manufacturing (AM), sometimes called 3D printing, offers many advantages including its almost unlimited design freedom, and allows for unprecedented levels of functional integration, as well as the capability to locally produce personalised parts with an efficient use of the materials. This has brought about a true revolution in manufacturing and a rapid growth of the AM sector. Selective laser melting (SLM) is an AM technique that uses a high-power laser source to melt metal powder layer by layer to create objects that are defined by three-dimensional model data. As new layers of material are deposited, heat is conducted away from the recently solidified metal, through radiation and conduction in previously deposited layers, inducing thermal cycling in the part as it is built up.

These thermal cycles can activate a variety of metallurgical phenomena including phase transformation, modification of crystallographic texture and residual stress which influences physical properties.

Since the thermal history of the material in the deposited part will differ from point to point and depends on the deposition parameters and melting strategy, the finished object may present complex distributions of microstructure and properties. The deposition process must therefore be optimised in order to achieve optimal combination of physical and mechanical properties. Considering the process complexity, this optimisation can only be effectively done using a numerical approach.

The project aims to develop a fully validated self-consistent finite element model that considers phase transformation effects and residual stresses that develop during the SLM process.

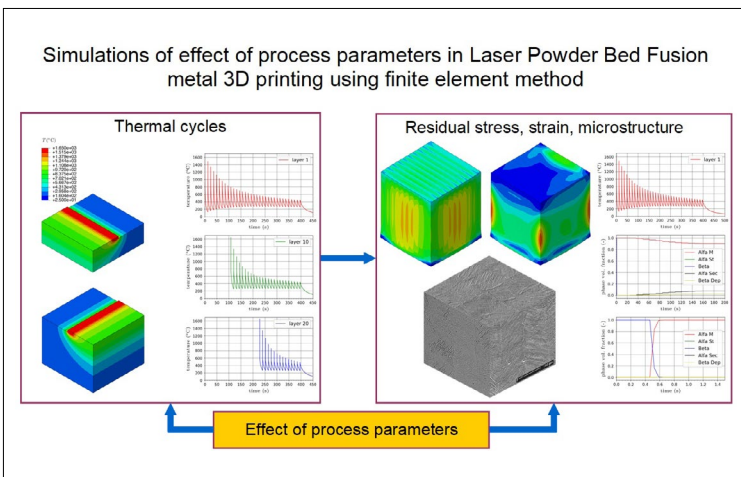
FUNDING TYPE  
Autonomous Province of Bozen-Bolzano

DURATION  
01/2021 – 12/2022

RESEARCH AREA  
Information and Database Systems Engineering

PRINCIPAL INVESTIGATOR  
Prof. Bruno Carpentieri

The model will be applied for the optimisation of process parameters leading to a most favourable combination of mechanical properties, level of residual stress and distortion.



← © HiTech Project



## Cooperation and Internationality

La Facoltà collabora con organizzazioni di ricerca nazionali e internazionali, tramite progetti o accordi finanziati congiuntamente e nell'ambito del programma di dottorato in informatica.

Gli accordi e i progetti del 2021 hanno visto importanti partecipazioni, quali ad esempio l'Università Tecnica di Vienna, le Università di Oxford e Manchester, l'Università di Innsbruck, l'Università di Stoccarda, l'Università di Cambridge, l'Università di Brisbane, l'Università di Regensburg, il College of Charleston, US, ma anche istituti di ricerca come il Max-Planck, il Fraunhofer Institute Kaiserslautern, la Fondazione Bruno Kessler, il Centro Nazionale Francese per la Ricerca Scientifica e università come il Politecnico di Milano, l'Università del Sannio, l'Università La Sapienza di Roma, oltre a partner industriali di livello internazionale, come Telecom Italia, BMW e Deutsche Telekom, e locale come Datatellers, Mircotec, GKN, Würth Phoenix, R3 GIS, DATEF, Raiffeisen, Systems srl, e naturalmente il NOI Techpark e IDM.

Queste cooperazioni esistono nell'ambito di vari programmi di finanziamento a livello regionale, nazionale e internazionale; la cooperazione è stata inoltre rafforzata a tutti i livelli nel 2021 grazie alle seguenti nuove attività:

Dense and Deep Geographic Virtual Knowledge Graphs for Visual Analysis, in cooperazione con Technische Universität München (TUM);

Performance Management Through Skill and Activity-Based Shop Floor Management, in cooperazione con GKN Sinter Metals SpA, SMACT ScpA (SMACT);

AI Algorithms for RAI Public Service, in cooperazione con RAI 3;

Heterogeneous Data Integration into Virtual Knowledge Graphs, in cooperazione con Ontopic srl.

Nel 2021 sono stati inoltre avviati due nuovi progetti di ricerca finanziati dal MUR, che hanno avviato collaborazioni destinate a svilupparsi nel corso degli anni a venire: Community oriented wearable computing systems (COMMON-WEARS) e Expand more information panel exPlainable kNowledge-aware PrOcess INTelligence (PINPOINT).

È inoltre proseguito l'accordo con la Fondazione Bruno Kessler (FBK) di Trento per un programma di dottorato organizzato congiuntamente. A partire dal 35° ciclo e per tre cicli consecutivi di dottorato, per ogni ciclo FBK sponsorizza tre borse di studio quadriennali su temi di ricerca di comune interesse per la Facoltà e la Fondazione.

Inoltre, come già nel 2019 e nel 2020, la Südtiroler Informatik AG (SIAG) ha finanziato nel 2021 una borsa di studio quadriennale per il 37° ciclo su temi di comune interesse.



## Research Events

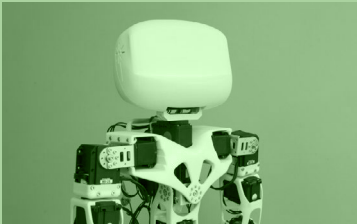
A number of national and international academic conferences have been held at unibz.

25–29 January 2021

**SOFSEM** – (SOFTware SEMinar) annual international winter conference devoted to the theory and practice of computer science.

11–13 July 2021

**CHItaly** – Biannual Conference of the Italian SIGCHI Chapter.



September 2021

**BOSK** – Bolzano Summer of Knowledge hosting a range of knowledge and data centric conferences and workshops.

The conference events are complemented by PhD schools in High Performance Computing, Software Engineering and other topics that target a more focused audience.

In addition, over the recent years single Faculty members have been organizing a number of relevant technology transfer events for the local industry.

13 September 2021

**South Tyrolean StartUp Night** – Information and networking event for startups and students, where entrepreneurs also act as mentors for young startups.

20–24 September 2021

**EC-TEL** – European Conference on Technology Enhanced Learning.

28–29 September 2021

**ISE** the 7<sup>th</sup> International School on Software Engineering on global software engineering. [seschool-series.github.io/2021](https://seschool-series.github.io/2021)

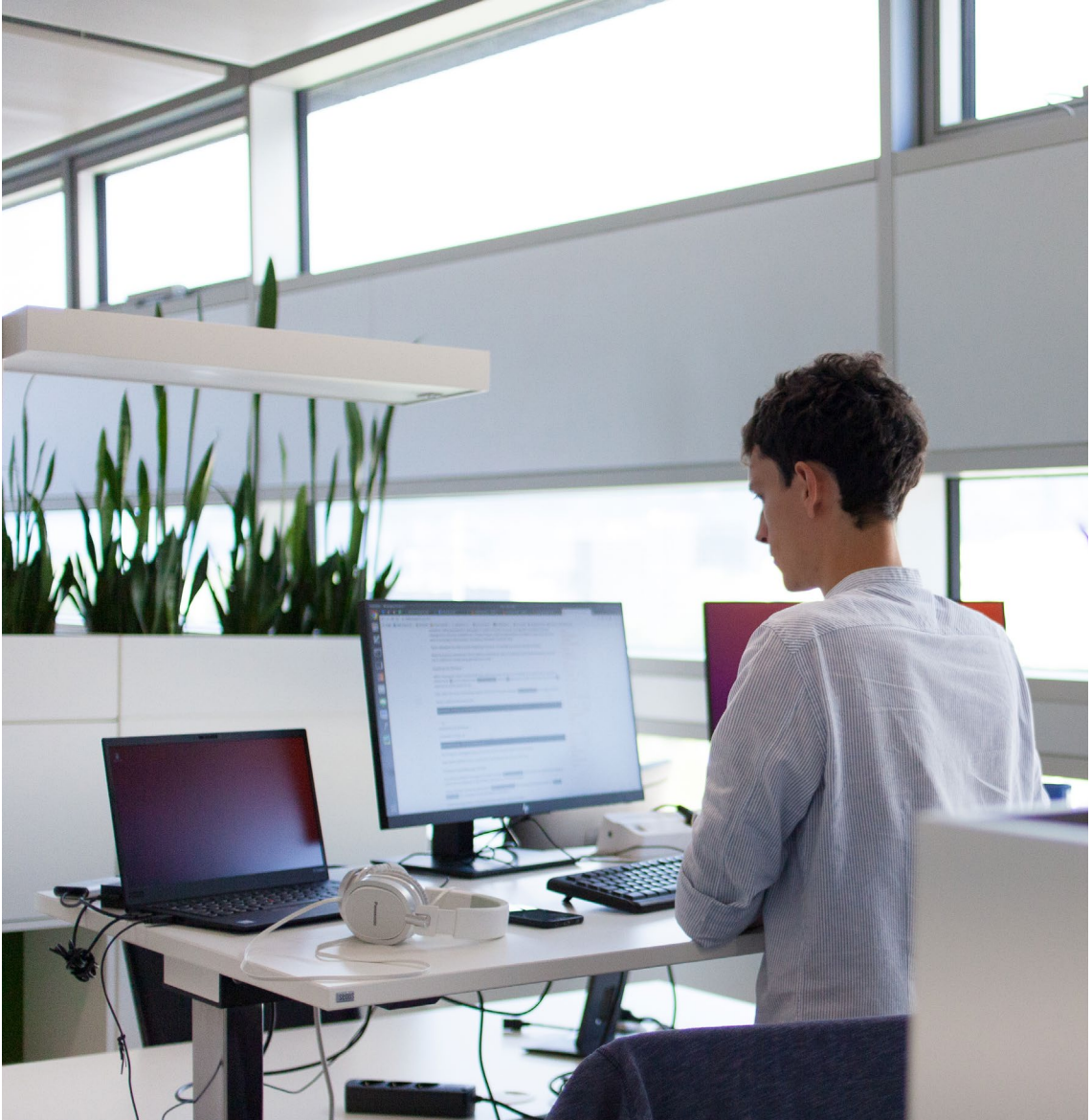
November 2021

+ **ASQT** – Developer conference for the local software development context focussing on quality, test and innovation around software;

+ **TASTE** – An ESF-support training program that provides agile software development skills to local companies. Round the year.

Furthermore, the Faculty continues to support the NOI-organised SFSc on free and open-source software event, which in 2021 was held on November 12–13.

# Faculty of Economics and Management



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## KEY DATA

### PEOPLE

1230 Students  
24 PhD Students  
36 Tenured Prof.  
29 Researchers  
86 Contract Prof.  
17 Technical and Administrative Staff

## BACHELOR

+ Economics and Management  
+ Economics and Social Sciences

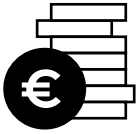
+ Informatics and Management of Digital Business  
+ Tourism, Sport and Event Management

## MASTER

+ Accounting and Finance  
+ Entrepreneurship and Innovation  
+ Public Policies and Administration

## PHD

+ Economics and Finance



## Research Areas



Dean — Prof. Marjaana Gunkel

2021 marked the launch of the Faculty's second Ph.D. programme. Next to the Ph.D. programme in Management and Economics, we now also offer a Ph.D. programme in Economics and Finance. Our Ph.D. programmes attract both local and international students and our newly minted Ph.D.'s continue to obtain research positions in prestigious institutions and companies all over the world.

The overall research performance of the Faculty sustained its momentum in 2021 surpassing the previous record year of 2020. A total of 186 research outputs including books, journal articles, book chapters, and conference proceeding articles were published in 2021. This amounts to more than three outputs per researcher in the year, which is an extraordinary result from both a national and international perspective.

In addition to the published output, the Faculty disseminated its research results through participation in a large number of important international confer-

ences, seminars, and workshops. In addition, the researchers were present in various national and international newspapers and blog posts. Finally, several third-mission activities have contributed to the Faculty's excellent research performance in 2021.

Seven externally funded research projects were completed, and eight new externally funded research projects were started during the year. These projects include the highly competitive and prestigious Marie Skłodowska-Curie Individual Fellowship funded by the European Research Council.



Vice Dean for Research — Prof. Linus Siming

In spite of the persisting pandemic, in 2021 the activities within the five research clusters have spurred internal cohesion and collaboration, which has resulted in output at the highest international level.

### **Entrepreneurship, Innovation and Management** **Coordinator:** Alfredo De Massis

This research cluster's research activities primarily deal with management and internationalisation within small- and medium-sized enterprises, institutional innovation, and cross-country differences in human resources management. Special attention is paid to both old and newly

established family businesses, which are investigated from several angles, e.g., innovation and growth processes, generational change and succession, management, corporate entrepreneurship, business models and decision-making.

### **Tourism, Marketing and Regional Development**

**Coordinator:** Federico Boffa

Tourism is a key sector in South Tyrol's economy since it accounts for about 12% of the local economy's total added value. The research activities of this cluster revolve around tourism economics, managerial and innovative aspects of tourism-related businesses, environmental and energy studies, regional development and sustainable economic growth. The analytical methods used herein merge managerial, economic, social and legal perspectives.

### **Financial Markets and Regulation** **Coordinator:** Massimiliano Bonacchi

This research cluster combines theoretical and empirical methods into a thorough analysis of finance, accounting, and applied information systems. Its research agenda encompasses projects in the fields of corporate finance, banking, financial markets and institutions, trading and market microstructure, and accounting and capital market information quality.

### **Law, Economics and Institutions** **Coordinator:** Roberto Farneti

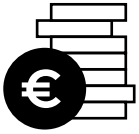
Research in this cluster deals with both the comparative analysis of law and economics in the private and public sectors and the study of legal, ethical, and political systems. A wide range of issues

are covered: corporate law and financial market contracting; European private law; democracy and citizenship; governance and policies in multilingual societies; human rights; political, philosophical and aesthetical models of economics.

### **Quantitative Methods and Economic Modelling**

**Coordinator:** Steven Stillman

This research cluster's agenda addresses issues at the core of the current scientific debate on society, individuals, institutions, and markets, thereby involving both experts in methodology and applied scientists. Its activities centre on the theoretical foundation and the methodological aspects relevant for the empirical study of the economy. Activities cover a wide range of domains such as labour economics, industrial organization and energy economics, decision theory, risk analysis, optimisation, statistical methods, and the evaluation of public policies.



## AGRICOMPET – Governing the Agri-Food Supply Chain: How to Improve Small-holders' Competitiveness

The overall objective of the AGRICOMPET project is to create a menu of governance solutions to help small producers and processors improve their competitiveness. More specifically, the operational objectives are first, to identify organisational and management solutions that have been adopted to successfully address the pressing challenges faced by producers and other food value chain stakeholders in different Mediterranean countries and agri-food sectors. Here, the key is to identify producers and processors, as well as their organisations, that have succeeded in a systems-aware addressing of the root causes of challenges in their relevant countries and sectors. Secondly, researchers intended to rationalise these successful cases, showing their context-dependent



organisational roots and how they can be adapted to different contexts. Here, the focus is to identify the key institutional, organisational and management factors on which success is based by comparing solutions across firms, sectors, and countries.

The researchers' third goal is to cooperate with food supply chain stakeholders in the creation of solutions adapted to specific contexts and to the pressing challenges emerging therein. Finally, the solutions thus identified will be shared with supply chain stakeholders and policymakers with the aim of encouraging their adoption. The key objective here is to inform supply chain stakeholders about the benefits of adopting context-adjusted practices to improve their competitiveness.

For AGRICOMPET to become a feasible and realistic project, efforts will have to be directed towards improving smallholders' competitiveness and strengthening their position in the value chain. To do so, co-operation among small producers should be facilitated, to pool resources and encourage collective action so as to improve their efficiency and bargaining power. The researchers' interest in this area focuses on cooperatives and producers' organisations as well as on geographical indications (GIs) as fundamental tools for achieving co-operation and integration in agri-food chains (specifically in the wine, cheese, and meat sector).

FUNDING TYPE  
PRIMA Programme – Section 2 call 2020

DURATION  
09/2021 – 08/2024

RESEARCH AREA  
Tourism, Marketing and Regional Development

UNIBZ RESEARCH TEAM  
Prof. Günter Schamel (Principal Investigator), Dr. Isabel Schäufele-Elbers, Giulia Gastaldello

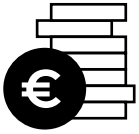
PROJECT PARTNERS  
University of Oviedo (Lead Partner), University of La Rioja, National Research Institute for Agriculture, Food and Environment France, Università degli Studi di Verona, Agricultural Economics Research Institute Athens, Boğaziçi University Istanbul

WEBSITE  
[www.unioviedo.es/AGRICOMPET](http://www.unioviedo.es/AGRICOMPET)

- SELECTED PUBLICATIONS
- + Schamel, G. (2019). Structure, Organization and a Vision: Reasons for the Success of Wine Cooperatives? *Bio Web of Conferences* 12, 03018. [doi.org/10.1051/bioconf/20191203018](https://doi.org/10.1051/bioconf/20191203018)
  - + Santos-Arteaga, F. J., & Schamel, G. (2018). Firm Organizational and Payoff Imbalances: An Aggrievement Model with Cooperatives and Private Firms. *Journal of Wine Economics*, 13(3), 263–281. [doi.org/10.1017/jwe.2018.32](https://doi.org/10.1017/jwe.2018.32)

Equally important for small-holders (and their associations) is the access to new market opportunities provided by technology (e.g., e-commerce) and regulation (e.g., public procurement).

← © Photo by Claudio Poggio on Unsplash



### SIAA – Social Entrepreneurship for the Alps Adriatic Region

Der demografische Wandel, die Veränderungen der Lebens- und Arbeitsweisen sowie die langfristige Sicherung der (Gesundheits-)Versorgung und Mobilität, insbesondere im ländlichen Raum, sind einige der gesellschaftlichen Herausforderungen, die nicht mehr allein durch Staat und öffentliche Verwaltung gelöst werden können. Vielmehr bedarf es der Entwicklung neuer sozialer Praktiken und Initiativen durch die relevanten Stakeholder, zu denen auch die Zivilgesellschaft und das soziale Unternehmertum (*social entrepreneurship*) zählen.

Soziale Innovation als Treiber eines Kulturwandels ist oft Reaktion auf eine allzu technologieorientierte und männlich geprägte Innovationspolitik. Soziale Innovation ist im Vergleich dazu unter anderem durch stärkere Prozessorientierung und Kontextabhängigkeit sowie eine höhere Beteiligung von Frauen gekennzeichnet.

Das Projekt SIAA ging mittels eines Open Innovation Ansatzes der Frage nach, wie im Grenzraum zwischen Italien und Österreich auf obgenannte Herausforderungen reagiert wird, welchen Beitrag Social Entrepreneurs in enger Abstimmung und Zusammenarbeit mit der öffentlichen Verwaltung der beteiligten Regionen zu deren Überwindung leisten (können) und wie diese

Kooperationen im Interesse eines effizienten und effektiven Einsatzes öffentlicher Mittel unterstützt werden können.

Im Rahmen des Projektes wurden folgende Zielsetzungen erörtert:

- + *Social Innovation* als gleichwertige Säule neben technischen Innovationen im Alpen-Adria-Raum zu etablieren;
- + Support- und Entlastungspotentiale für die öffentliche Verwaltung durch soziale Unternehmer\*innen sichtbar und nutzbar zu machen;
- + Methoden und Instrumente zur kooperativer Entwicklung und Umsetzung sozialer Innovationen durch öffentliche Verwaltung und Sozialunternehmen zu entwickeln;
- + Mitarbeiter\*innen der Verwaltung wie auch Soziale Entrepreneure in diesen Methoden zu trainieren.



**FUNDING TYPE**  
Interreg V-A Italia-Österreich  
2014–2020 – ITAT3010

**DURATION**  
01/2018 — 04/2021

**RESEARCH AREA**  
Entrepreneurship, Innovation, and  
Management

**UNIBZ RESEARCH TEAM**  
Prof. Alessandro Narduzzo (Principal Investigator), Prof. Christian Manfred Lechner, Dr. Valeria Cavotta, Chiara Menini, Benedikt Ungar

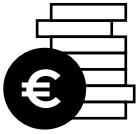
**PROJECT PARTNERS**  
Universität Klagenfurt (Lead Partner), Fachhochschule Kärnten, Università degli Studi di Udine, t2i – trasferimento tecnologico e innovazione, build! Gründerzentrum Kärnten, Friuli Innovazione

**WEBSITE**  
[www.siaa-project.eu](http://www.siaa-project.eu)

- SELECTED PUBLICATIONS**
- + SIAA Projekt-Konsortium (2019): Social Entrepreneurship for the Alps Adriatic Region, *Handbuch Teil 1*, (Klagenfurt).
  - + SIAA Projekt-Konsortium (2021): Social Entrepreneurship for the Alps Adriatic Region, *Handbuch Teil 2*, (Klagenfurt).
  - + Cavotta, V., & Menini, C. Advancing the conversation on social issues' understanding in social entrepreneurship education. Working paper.

← © Photo by Social Impact Lab





## CAB – Incidenti Stradali: Cause Comportamentali e Politiche di Prevenzione

Gli incidenti stradali sono una delle maggiori cause di morte, soprattutto tra i giovani. Basandosi su diversi studi che hanno attratto grande interesse da parte degli organi di stampa locali, nazionali e internazionali (ad. es., Auto Bild, La Repubblica), il progetto di ricerca CAB esplora alcune delle cause di incidente e l'efficacia delle politiche adottate per contrastare il fenomeno.

Uno dei lavori analizzati usa dati americani per mostrare come un andamento borsistico negativo porti a un aumento degli incidenti letali nelle ore successive all'apertura dei mercati, soprattutto tra guidatori che hanno una maggiore probabilità di avere investito in borsa e in periodi in cui le famiglie entrano per la prima volta con i loro risparmi nel mercato azionario. L'ansietà dovuta alle fluttuazioni borsistiche può indurre ad una guida più distratta o aggressiva, con conseguenze a volte fatali.

Un secondo studio usa dati italiani per comparare quanto la patente a punti e l'introduzione del reato di omicidio stradale siano efficaci in termini di riduzione del numero di vittime della strada. L'analisi mostra come il primo provvedimento induca una maggiore riduzione nel numero di morti e feriti, suggerendo che sanzioni modeste ma frequenti (la decurtazione di punti) rappresentano un deterrente maggiore



rispetto a sanzioni draconiane applicate raramente (la carcerazione).

Un terzo studio si focalizza sulla pirateria stradale. Usando dati italiani e considerando la variazione nella luminosità che avviene in corrispondenza del passaggio tra ora solare e ora legale, si dimostra come la propensione ad abbandonare la scena di un incidente aumenti in maniera significativa con il buio, quando l'identificazione risulta più difficile.

Un quarto studio, infine, usando dati sulle contee statunitensi indica che aree caratterizzate da un maggiore capitale sociale, ovvero con un'elevata tendenza a cooperare all'interno delle comunità, presentano una minore incidenza di fughe dopo un incidente.

Gli studi citati permettono di comprendere meglio il fenomeno degli incidenti stradali e di disegnare politiche efficaci a contrastarli.

FUNDING TYPE  
Internal Funding

DURATION  
11/2017 — 10/2021

RESEARCH AREA  
Quantitative Methods and Economic Modeling

UNIBZ RESEARCH TEAM  
Prof. Mirco Tonin (Principal Investigator),  
Dr. Stefano Castriota

PROJECT PARTNERS  
University of Southampton, Istituto  
Nazionale di Statistica

- SELECTED PUBLICATIONS
- + Castriota, S., & Tonin, M. (2022). Stay or Flee? Hit-and-Run Accidents, Darkness and Probability of Punishment. *Mimeo*.
  - + Bruzzone, S., Castriota, S., & Tonin, M. (2021). Points or prison? The Effects of Different Sanctions on Driving Behavior. *Contemporary Economic Policy*, 39, 126–140. [doi.org/10.1111/coep.12500](https://doi.org/10.1111/coep.12500)
  - + Giulietti, C., Tonin, M., & Vlassopoulos, M. (2020). When the market drives you crazy: Stock market returns and fatal car accidents. *Journal of Health Economics*, 70, 102245

↑ On Ridge Route in Los Angeles County. Guard rails sometimes save careless drivers

© Photo by Wikimedia Commons



## Cooperation and Internationality

The Faculty is characterised by extensive collaborations not only with universities and research institutes but also with public institutions and private companies. This is an added value for the quality of research and impacts positively on the student training thanks to the many exchange agreements and internships.

A number of new collaborations were started during 2021, such as:

Collaboration with the Raiffeisenverband Südtirol on the strategic assessment of cooperative banks in Italy.

Collaboration with the University of Szeged, Management Center Innsbruck, University of Vienna, Univations GmbH and Agentur Fundus within the Erasmus+ project “Ulysses Contest – Digital Student Competition on Family Business”.

Cooperation with the Italian Union of Journalists and the Professional Association of Journalists regarding issues which straddle the boundary between economics and journalism.

The research project “Spatial Inequalities in African Political Economy” is funded by the UK Economic and Social Research Council and led by London School of Economics with unibz as affiliate.

Research and teaching activities cooperation on energy markets with Alperia and European Energy Exchange.

Cooperation with Sunway University Malaysia, Edith Cowan University Australia, and ZPID – Leibniz Institute for Psychology in executing the Consumer Behavior in Tourism Symposium as a global event.

Cooperation with Fachhochschule Kärnten and UMIT Tirol with the goal of favouring networking between entrepreneurs, founders and managers in the southern alpine space.

Also, previous collaborations were kept up and are still ongoing:

Collaboration with University of Perugia within the research project “Gender Equality through Data Intelligence” and with Bonfiglioli Consulting Srl on a project on growth innovation in family firms.

Partnership with Pensplan in research and teaching activities on Financial Literacy in the Autonomous Provinces of Bozen-Bolzano and Trento.

Cooperation with Südtiroler Volksbank – Banca Popolare dell’Alto Adige on Bank Sustainability.

Cooperation with Kammer der Wirtschaftsprüfer der Provinz Bozen – Ordine dei Dottori Commercialisti della Provincia di Bolzano and Scuola di Alta Formazione Triveneta on the international certification of Certified Management Accountants.

Partner of the “Alexander Langer’s Legacy Euregio Summer School on Sustainable Development”, supported by the EUREGIO Mobility Fund, together with the Universities of Trento and Innsbruck.

Cooperation with the Chamber of Commerce Bozen-Bolzano, NOI Techpark, and Autonomous Province of Bozen-Bolzano on projects on succession, innovation, family business and SMEs.

Research and teaching cooperation with Baruch College and NYU Stern.

Partner in the Alliance for Wine and Hospitality Management (ARWH) with Cornell University (USA), Kedge Business School Bordeaux (F), EHL Lausanne (CH) and Hong Kong Polytechnic University (HK).

Cooperation with the Universities of Innsbruck and Trento, as well as Akademie Meran – Accademia di Merano, in the framework of the Euregio Platform on Human Dignity and Human Rights (EUPHUR).



## Research Events

Die Fakultät führt ein reichhaltiges Programm an Aktivitäten, darunter Konferenzen, Workshops, Forschungsseminare, Präsentationen und Rundtischgespräche, die dazu beitragen, den wissenschaftlichen Ruf der Fakultät für Wirtschaftswissenschaften und der unibz zu stärken.

Genau wie 2020, war auch 2021 ein besonders herausforderndes Jahr für Veranstaltungen. Es ist dennoch gelungen, einen Teil der geplanten Aktivitäten in Präsenz durchzuführen. Unter anderem organisierte die Fakultät folgende Veranstaltungen:

20. September 2021

### **Climate Risk and Sustainability: A conference with Robert F. Engle Nobel Prize for Economics.**

Konferenz zu Klimarisiken und Nachhaltigkeit mit hochkarätigen Teilnehmer\*innen aus Landesverwaltung, Universitäten und Wirtschaft sowie einer Keynote-Rede des Nobelpreisträgers Prof. Robert Engle (New York University).

[www.unibz.it/it/events/138633-climate-risk-and-sustainability](http://www.unibz.it/it/events/138633-climate-risk-and-sustainability)

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12.–13. Oktober 2021

Die Zoomkonferenz **Differentiated Governance in the Post-Crises European Union** wurde von der Dublin Central University in Zusammenarbeit mit unibz, der Universität Kopenhagen und der Central European University veranstaltet.

[bridgenetwork.eu/event/differentiated-governance-post-crisis-eu](http://bridgenetwork.eu/event/differentiated-governance-post-crisis-eu)

26.–27. November 2021

**Der 5<sup>th</sup> Workshop on Political Economy** brachte mehrere internationale Forscher am Campus Bruneck zu verschiedenen Themen der politischen Ökonomie zusammen. Keynotes wurden von Prof. Shanker Satyanath (New York University) und Prof. Em. Elsa Fornero (University of Torino) gehalten.

[wspoleco.events.unibz.it](http://wspoleco.events.unibz.it)

3.–4. Dezember 2021

**How future-fit is our Economic Growth Model?** Konferenz zu Ökonomischer Nachhaltigkeit mit hochkarätigen Teilnehmer\*innen aus Landesverwaltung, Wirtschaft und einer Keynote-Rede des Club of Rome-Mitglieds Prof. Em. Franz Josef Radermacher (Universität Ulm).

[futuregrowth.events.unibz.it](http://futuregrowth.events.unibz.it)

13.–15. Dezember 2021

**Imagining Tourism Futures Beyond Covid-19.** Virtuelle Konferenz mit Teilnehmer\*innen aus drei Kontinenten und Keynotes von Prof. Dimitrios Buhalis (Bournemouth University Business School und Hong Kong Polytechnic University), Prof. Marianna Sigala (University of South Australia und University of Piraeus) und Prof. Lawrence Fong (University of Macao).

[conference-service.com/CBTS2021](http://conference-service.com/CBTS2021)

16.–18. Dezember 2021

Der **First Joint Workshop of Applied Macro- and Micro-economic** brachte Spitzenwissenschaftler des gesamten Alpenraums zusammen, die auf dem Gebiet der angewandten Makro- und Mikroökonomie tätig sind. Insgesamt gab es siebzehn Vorträge, darunter eine Gastrede von Prof. Helmut Rainer (Ludwig-Maximilians-Universität München).

[guide.unibz.it/en/events/139287](http://guide.unibz.it/en/events/139287)

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1 ← Gustave Courbet, Le bord de mer à Palavas

© Bridgemanart Library

2 ← Prof. Robert Engle

# Faculty of Science and Technology



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## KEY DATA

### PEOPLE

602 Students  
 154 PhD Students  
 37 Tenured Prof.  
 104 Researchers  
 96 Contract Prof.  
 32 Technical and Administrative Staff

## BACHELOR

- + Agricultural, Food and Mountain Environmental Sciences
- + Industrial and Mechanical Engineering
- + Wood Engineering

## MASTER

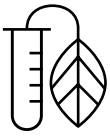
- Energy Engineering
- + Environmental Management of Mountain Areas
- + Food Sciences for Innovation and Authenticity
- + Horticultural Science
- + Industrial Mechanical Engineering
- + Viticulture, Enology and Wine Marketing

## 2ND CYCLE MASTER

- + Sustainable Management of Hydro-Geological Risk in Mountain environments

## PHD

- + Advanced-Systems Engineering
- + Food Engineering and Biotechnology
- + Mountain Environment and Agriculture
- + Sustainable Energy and Technologies



## Research Areas



Dean — Prof. Marco Gobbetti

Teaching and research activities at the Faculty of Science and Technology mainly deal with agricultural sciences, environmental management, food sciences, mechanical and industrial engineering, energy and logistics, automation, and basic sciences.

Sustainability and interdisciplinarity mark out the approach of the Faculty's work. Innovation for industrial processes and products and an intense technology transfer are other distinguishing features, together with a focus on the mountain region.

With an outstanding number of scientific publications, the Faculty was ranked among the top 200 to 250 Universities in the 2021 Times Higher Education (THE) Engineering and Technology subject ranking.

Under normal circumstances, students can rely on an ideal study context thanks to a direct and constant interaction with lecturers and to the excellent facilities. Even in 2021, during the continuing difficult COVID-19 pandemic situation, the use of

modern digital technologies allowed to maintain a high-quality level in teaching exploiting both remote and hybrid lecturing modes. However, the pandemic still meant very limited (if any) opportunities to physically take part in exchange and international cooperation programmes with universities abroad, which usually offer an ideal environment to pursue professional and educational goals in academia. In 2021, such programmes were mostly limited to digital activities.



Vice Dean for Research — Prof. Matthias Gauly

### Agricultural Sciences

**Coordinator:** Massimo Tagliavini

Research aims here at facing the challenge of producing healthy and sustainable food under climate change, decreasing natural resources, and growing pressure from new pests and pathogens. Studies mainly deal with the complexity of biological systems, the exchange of material and energy between the soil-plant systems and atmosphere, precision farming, livestock performance and welfare, the effects of climate change and economic system evaluations.

### Food Sciences

**Coordinator:** Marco Gobbetti

Food Sciences sensory, shelf life, functional and nutritional attributes of foods and beverages are the focus of this research area. The research activity aims at a multidisciplinary approach based on food processing, biotechnology, microbiology, and omics technologies; these are the most suitable tools to guarantee high quality standards for foods and beverages as well as the bio recycling of food wastes according to the current concept of circular economy.

### Management and Technologies for Mountain Environments

**Coordinator:** Francesco Comiti

This research area aims to understand the local and global effects of natural and anthropogenic disturbances on the functioning of terrestrial and aquatic mountain ecosystems, in order to provide tools for a sustainable ecological management of the latter.

### Industrial Engineering and Automation (IEA)

**Coordinator:** Dominik Matt

IEA deals with product development, manufacturing and assembly processes, design and management of production systems, operations, and supply chain management as well as mechanical and mechatronic design and robotics, automation, and digitisation techniques in the context of Industry 4.0, with a focus on the specific requirements of small and medium manufacturing, construction and agricultural businesses. The IEA team consists of more than 30 international professors, researchers and research fellows conducting their research in four research laboratories.

### **Energy Resources and Energy Efficiency**

**Coordinator:** Marco Baratieri

This research area aims at broadening the existing research spectrum in the fields of energy generation and energy efficiency; here again, a multidisciplinary approach is fostered in covering topics such as Energy Efficiency in Buildings and Production Processes, High Efficiency Electrical Conversion and Management of Renewable Resources.

### **Smart Systems Technologies and Engineering**

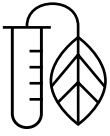
**Coordinator:** Niko Münzenrieder

The focus lies here on the development of innovative solutions for a digital society by bridging over the gap between humans, environment, and technology. The main goal is the realisation of sustainable systems with bespoke mechanical, electrical, and biological properties based on biocompatible, recycled, and organic materials, as well as their equipment with embodied artificial intelligence. The resulting systems are individually optimised for application in production processes on the fields of healthcare, agriculture, construction, environmental monitoring, or Industry 4.0.

### **Fundamental Sciences for Innovative Applications**

**Coordinator:** Maria Letizia Bertotti

In this area, research is carried out with the methods of the fundamental sciences: mathematics, physics, chemistry, and statistics. Specifically, novel general frameworks for mathematical models of complex systems are formulated and dynamics and diffusion on complex networks are investigated, as are also other specific problems falling within applied areas such as engineering and welfare economics. Other issues under study concern bioorganic chemistry and protein crystallography.



## E-EDU 4.0 – Engineering Education 4.0

During the last years public and private investments have been made in support of research and of the development infrastructure for modern production technologies (e.g., fab labs, smart production labs, robotic labs, etc.). The said infrastructure, though, is mainly available to limited target groups and often only to members of the relevant owner organisation, or for specific project-driven purposes.

Due to the lack of usage concepts, educational programmes, and training programmes this situation results in limited usage and accessibility of the infrastructure itself, and this is common to educational organisations and training institutions both in Austria and in Italy.

The Engineering Education 4.0 project aims at the development of comparable and specialised qualification programmes and

offers, leading to a better exploitation of the afore mentioned infrastructure and focusing on topics such as design for manufacturing with respect to generative production techniques (e.g., 3D-printing), application of robotics in manufacturing cells, application of innovative ICT-technology in production (e.g., augmented reality and virtual reality), as well as data management and information management. The qualification network thus established sets up a shared educational format for students as well as a separate extra-occupational training programme. Moreover, knowledge on how the setup of such formats and programmes is carried out on a sustainable basis is transferred throughout the project.

Thus, the project will enable students, talents, start-ups, and SMEs to better face the challenges of smart production and of the digitalisation of society.

**FUNDING TYPE**  
INTERREG V-A Italia-Österreich  
2014-2020 – ITAT 3018

**DURATION**  
05/2018 — 04/2021

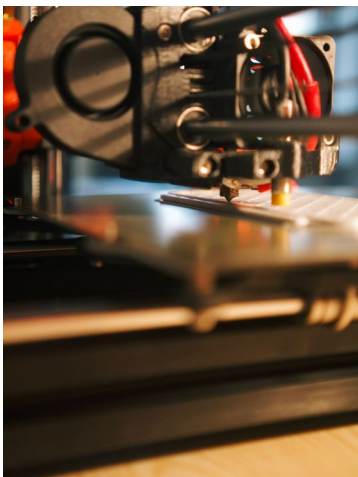
**RESEARCH AREA**  
Industrial Engineering and Automation

**UNIBZ RESEARCH TEAM**  
Prof. Dominik Matt (Principal Investigator),  
Dr. Erwin Rauch, Prof. Renato Vidoni.

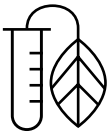
**PROJECT PARTNERS**  
Camera di Commercio di Treviso e Belluno (Lead Partner), FH Fachhochschule Kärnten, Höhere Technische Bundeslehranstalt Wolfsberg, Friuli Innovazione Centro di ricerca e di trasferimento tecnologico, t2i – trasferimento tecnologico e innovazione

**WEBSITE**  
[www.eedu40.eu](http://www.eedu40.eu)

- SELECTED PUBLICATIONS**
- + Morandell, F., Mark, B. G., Rauch, E., & Matt, D. T. (2019). Engineering Education 4.0: Herausforderungen und Empfehlungen für eine zukunftsorientierte Gestaltung der Ausbildung von Fachkräften und Ingenieuren. In Spath, D. & Spanner-Ulmer, B. (Ed.), *Digitale Transformation – Gutes Arbeiten und Qualifizierung aktiv gestalten* (pp. 273–298). Berlin: GITO Verlag. doi.org/10.30844/wgab\_2019
  - + Rauch, E., Morandell, F., & Matt, D. T. (2019). AD Design Guidelines for Implementing I4.0 Learning Factories. *Procedia Manufacturing*, 31, 239-244. doi.org/10.1016/j.promfg.2019.03.038
  - + Gualtieri, L., Rojas, R., Carabin, G., Palomba, I., Rauch, E., Vidoni, R., & Matt D.T. (2019). *Advanced Automation for SMEs in the I4.0 Revolution: Engineering Education and Employees Training in the Smart Mini Factory Laboratory*. Proceedings of the 2018 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM), Bangkok, Thailand, 16–19 December 2018. doi.org/10.1109/IEEM.2018.8607719



← © Photo by Kadir Celep on Unsplash



## HERBAL – Kräuter und Gebirgspflanzen als alternative Arzneimittel für Anthelminthika-Behandlungen bei Nutztieren

Magen-Darm-Strongyliden (MDS) sind weit verbreitete Parasiten in der Tierhaltung. Infektionen sind unvermeidlich, wenn Tiere in Freiland- und/oder Einstreusystemen gehalten werden. Infizierte Tiere werden in der Regel mit synthetischen Anthelminthika (Wurmmittel) behandelt, bei denen immer die Gefahr einer Resistenzentwicklung besteht. Entsprechend zielt das HERBAL-Projekt darauf ab, das Potenzial ethnologischer Veterinärkräuter zu untersuchen, um ihre anthelmintischen (AH) Eigenschaften zu erforschen.



Die Chancen auf die Entdeckung neuer AH-aktiver Substanzen und neuer Klassen AH-aktiver Sekundärmetaboliten (sekundärer Stoffwechselprodukte) sind hoch. Die verschiedenen Wirkstoffe von Kräuterextrakten in

Verbindung mit dem Multi-Target-Charakter von Sekundärmetaboliten kann der potenziellen Resistenzentwicklung entgegenwirken.

Aus zehn Kräutern, die auf der Grundlage des Wissens der Viehbauern sowie der verfügbaren Literatur ausgewählt wurden, wurden Extrakte hergestellt, die in vitro gegen MDS bei Geflügel getestet und mit synthetischen AH-Medikamenten verglichen wurden. Die drei besten Extrakte werden anschließend in vivo an Legehennen getestet, um ihre Wirksamkeit gegen MDS zu bewerten. Weiterhin werden die Effekte auf die Produktionsmerkmale – zum Beispiel die Anzahl der von den Legehennen gelegten Eier – erfasst und bewertet.

Für die Zukunft ist die Züchtung und der Anbau spezifisch AH-aktiver Kräutersorten geplant. Um die molekularen Grundlagen der Aktivität zu ergründen, setzen die Forscher\*innen Methoden ein, mit denen der Wirkmechanismus eingehend analysiert werden kann. Anliegen des Projektes ist es, langfristige Lösungen für die Kontrolle von MDS zu entwickeln, die für alle Nutztierarten anwendbar sind.

FUNDING TYPE  
Euregio Science Fund

DURATION  
06/2019 – 12/2022

RESEARCH AREA  
Agricultural Sciences

UNIBZ RESEARCH TEAM  
Prof. Matthias Gauly (Principal Investigator), Dr. Ioanna Pouloupoulou

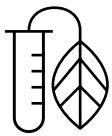
PROJECT PARTNERS  
Fondazione Edmund Mach (Lead Partner), Universität Innsbruck

### SELECTED PUBLICATIONS

- + Horgan, M. J., Pouloupoulou, I., Sigg, I., Siewert, B., Palmieri, L., Martinidou, E., Martens, S., Fusani, P., Temml, V., Albertini, E., Gauly, M., Jansen-Dürr, P., & Stuppner, H. (2021). Alpine Sow-Thistle Against Nematodes: A Dual Approach to Anthelmintic Discovery. *Planta Medica*, 87(15), 1260. doi.org/10.1055/s-0041-1736816
- + Pouloupoulou, I., Horgan, M. J., Sigg, I., Siewert, B., Palmieri, L., Martinidou, E., Martens, S., Fusani, P., Temml, V., Stuppner H., & Gauly, M. (2021). In vitro evaluation of the anthelmintic potential of plant extracts against *Ascaridia galli*. *Book of Abstracts of the 72nd Annual Meeting of the European Federation of Animal Science (EAAP)*, 501. *Magazin für Forschung und Entwicklung (Magazine for Research and Development)*, RAI Südtirol. (2021). www.tagesschau.rai.it/de/index.php?media=Ttv1593727800

← Tanacetum vulgare plants in the field cultivated at CREA in Trento © Dr. Pietro Fusani (CREA, Trento)





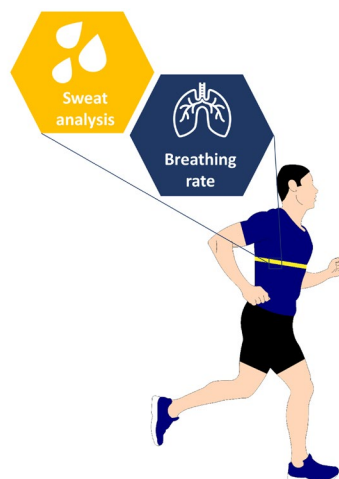
### STEX – Smart Textile per il monitoraggio dell'attività muscolare

Il crescente interesse per il monitoraggio in tempo reale dei segnali fisiologici e degli indicatori di performance durante l'attività fisica nasce dal desiderio di ottenere misurazioni quantitative affidabili tramite l'utilizzo di strumenti indossabili, confortevoli e poco ingombranti. Questo sta diventando possibile grazie alla ricerca indirizzata a soluzioni di consumo, che permettono di realizzare sensori indossabili integrati nei tessuti che risultano confortevoli e non invasivi. La richiesta di tali dispositivi innovativi, in un'ottica di miglioramento delle prestazioni sportive e della rieducazione motoria, ha stimolato la ricerca nei settori degli smart textiles e del wearable per sviluppare soluzioni in grado di fornire biofeedback e valutazioni della performance fisica.

In questo contesto, il progetto STEX ha l'obiettivo di monitorare le prestazioni dell'attività muscolare nell'allenamento ciclistico, utilizzando sensori non invasivi e non intrusivi accoppiati a connettività di tipo Internet-of-Things per l'acquisizione, l'elaborazione e l'archiviazione dei dati. Gli obiettivi del progetto si basano sullo sviluppo e l'impiego di sensori indossabili in grado di percepire diversi parametri dell'attività muscolare correlabili all'intensità dell'esercizio: la frequenza respiratoria, rilevata da sensori di deformazione indossabili posizionati intorno al petto, e la concentrazione di

ammoniaca del sudore, misurata utilizzando sia biosensori basati su transistor a effetto campo elettrolitico (EG-FET), sia sensori di gas a contatto con la pelle. Le attività che il Sensing Technologies Laboratory di unibz sta portando avanti all'interno del progetto STEX sono principalmente legate alla progettazione e realizzazione dei sensori di deformazione stampati indossabili in grado di monitorare la frequenza respiratoria, nonché dei transistor EG-FET e dei sensori di gas per la rilevazione dell'ammoniaca sia in fase liquida che gassosa.

STEX è un progetto interdisciplinare caratterizzato da una stretta collaborazione tra i partner, quali Microgate Srl, la Libera Università di Bolzano, l'Università di Verona e altre industrie altoatesine (Pro Motus, TexMarket Srl, Micron Photon Device), che si propone di promuovere l'innovazione nel campo della sanità, dello sport e dell'Internet of Things (IoT).



**FUNDING TYPE**  
European Regional Development Fund (EFRE-FESR) 2014-2020

**DURATION**  
01/2019 — 09/2022

**RESEARCH AREA**  
Smart Systems Technologies and Engineering

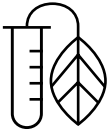
**UNIBZ RESEARCH TEAM**  
Prof. Paolo Lugli (Principal Investigator), Prof. Luisa Petti, Dr. Martina Aurora Costa Angeli

**PROJECT PARTNER**  
Microgate Srl (Lead Partner)

**WEBSITE**  
stex.microgate.it

- SELECTED PUBLICATIONS**
- + Shkodra, B., Petrelli, M., Costa Angeli, M. A., Garoli, D., Lugli, P., & Petti, L. (2021). Electrolyte-gated carbon nanotube field-effect transistor-based biosensors: principles and applications. Invited paper. *Applied Physics Review*, 8, 041325. doi.org/10.1063/5.0058591
  - + Costa Angeli, M. A., Madagalam, M., Petrelli, M., Pogliaghi, S., Scarton, A., Ibba, P., Avancini, E., Gori, F., Biasi, R., Petti, L., & Lugli, P. (2021). Assessing the role of textiles in the performance of wearable screen-printed strain sensors for respiratory rate monitoring. *2021 IEEE Sensors Conference*. doi.org/10.1109/SENSOR47087.2021.9639701

← Smart textile for real-time monitoring of the physical activity through the continuous detection of sweat ammonia and breathing rate  
© Image by Costa Angeli Martina Aurora



## ONEforest – Multi-Criteria Planning System for a Common Forest Management: Strengthen Forest Resilience, Harmonising Stakeholders' Interests and Ensuring Sustainable Wood Material Flows

The unprecedented heatwaves, droughts, storm events and pests seen in recent years have affected the forests in all the biogeographical regions of Europe, showing the limitation of monocultural coniferous forests. Thus, to face the challenges of climate change it is necessary to start a transformation of the current forest management systems towards more resilient forest ecosystems. Although the resilience of mixed forest stands is well known, "classical" silvicultural approaches based on monospecific stands is still a common technique in large areas of Europe.

The overarching objective of ONEforest is to increase forest



productivity taking into account the necessary transitions driven by climate change, at the same time harmonizing the stakeholders' needs. ONEforest will establish model forests within each EU biogeographical region and will optimize wood-based value chains by identifying material flows, costs and emissions. An App and a website dedicated to forest management will be created to assist municipalities and stakeholders in the decision-making process. unibz will evaluate the effects of different forest management strategies on the microbiological services, paying special attention to fertilisation, soil stability and organic carbon dynamics, in relation to management intensity and in comparison with pristine (unmanaged) conditions.

Researchers will evaluate and optimise the effects on soil microbes brought about by the soil amendments derived from the wood industry that are used to protect seedlings in forest nurseries. Also, the development of wood fibre hydro-biocomposite derived from the wood industry will be assessed in the context of a circular economy.

### FUNDING TYPE

Horizon 2020 – RUR 2018-2020 – Grant Agreement 101000406

### DURATION

06/2021 – 05/2024

### RESEARCH AREA

Management and Technologies for Mountain Environments

### PRINCIPAL INVESTIGATOR

Prof. Lorenzo Brusetti

### PROJECT PARTNERS

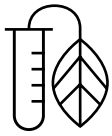
15 partners from Italy, Slovenia, Austria, Germany, Estonia, Spain, and Sweden, with Rosenheim Technical University of Applied Sciences as Lead Partner

### WEBSITE

[www.oneforest.eu](http://www.oneforest.eu)

### SELECTED PUBLICATIONS

- + Pioli, S., Sarneel, J., Thomas, H. J. D., Domene, X., Andrés, P., Hefting, M., Reitz, T., Laudon, H., Sandén, T., Piscová, V., Aurela, M., & Brusetti, L. (2020). Linking plant litter microbial diversity to microhabitat conditions, environmental gradients and litter mass loss: Insights from a European study using standard litter bags. *Soil Biology and Biochemistry*, 144, 107778. [doi.org/10.1016/j.soilbio.2020.107778](https://doi.org/10.1016/j.soilbio.2020.107778)
- + Bani, A., Borruso, L., Matthews Nicholass, K. J., Bardelli, T., Polo, A., Pioli, S., Gómez-Brandón, M., Insam, H., Dumbrell, A. J., & Brusetti, L. (2019). Site-specific microbial decomposer communities do not imply faster decomposition: Results from a litter transplantation experiment. *Microorganisms*, 7, 349. [doi.org/10.3390/microorganisms7090349](https://doi.org/10.3390/microorganisms7090349)
- + Bani, A., Pioli, S., Ventura, M., Panzacchi, P., Borruso, L., Tognetti, R., Tonon, G., Brusetti, L. (2018). The role of microbial community in the decomposition of leaf litter and deadwood. *Applied Soil Ecology*, 126, 75–84. [doi.org/10.1016/j.apsoil.2018.02.017](https://doi.org/10.1016/j.apsoil.2018.02.017)



## SupERA – Siderophore mediated iron uptake in *Erwinia amylovora* and *Aspergillus fumigatus*. Towards new strategies in plant and human health

Aim of this project is to characterise the siderophore pathways of a plant and human pathogen and use this information to develop therapies. *E. amylovora*, a Gram-negative bacterium agent of fire blight in Rosaceae (e.g., apple), is among the top ten bacterial plant pathogens. *A. fumigatus*, a ubiquitous saprophytic fungus that causes a systemic infection called aspergillosis in immune-compromised patients, is the most common airborne fungal pathogen of humans. Both pathogens depend on the secretion of molecules called siderophores to sequester iron and to transport the iron back into the cell.

The project envisages the investigation of how siderophores are synthesised and taken up by *E. amylovora* and *A. fumigatus* and, subsequently, the development of molecules apt to combat infections of humans and plants and the characterisation of the structure, activity and substrate specificity of the siderophore biosynthesis enzymes. The knowledge of the system is tested by reconstituting the pathways in vitro and in vivo. These reconstituted systems are to be used as a platform from which unnatural siderophores can be generated, either by chemically post-translationally modifying the siderophores or by using muta-

genized biosynthesis enzymes. Metal substitution can also be explored for the development of contrast agents for medical imaging applications. An innovative interdisciplinary approach joins together competences in three work packages:

- + Structural and functional characterization of proteins and enzymes (unibz);
- + Reconstitution and biochemical characterization in vitro and in vivo of siderophore synthesis pathway (University of Trento);
- + Characterization and biological activity of siderophores derivatives (Medical University Innsbruck).

The project aims at attaining:

- + a better understanding of the biosynthesis of siderophores from *E. amylovora* and *A. fumigatus* as well as of biotechnologies for the production of siderophores;
- + the development of molecules and strategies for the imaging



FUNDING TYPE  
Euregio Science Fund

DURATION  
06/2019 — 05/2023

RESEARCH AREA  
Fundamental Sciences for Innovative Applications

UNIBZ RESEARCH TEAM  
Prof. Stefano Benini (Principal Investigator), Thanalai Poonsiri

PROJECT PARTNERS  
Medical University of Innsbruck, Università degli Studi di Trento

- SELECTED PUBLICATIONS
- + Caliendo, R., Polsinelli, I., Demitri, N., Musiani, F., Martens, S., & Benini, S.\* [2021]. The structural and functional characterization of Malus domestica double bond reductase MdDBR provides insights towards the identification of its substrates. *International Journal of Biological Macromolecules*, 171, 89–99. doi.org/10.1016/j.ijbiomac.2020.12.190
  - + Benini, S.\* [2020]. Structural and functional characterization of proteins from the fire blight pathogen *Erwinia amylovora*. A review on the state of the art. *Journal of Plant Pathology*, 103, 51–63. doi.org/10.1007/s42161-020-00682-4
  - + Benini, S.\* [2020]. Carbohydrate-active enzymes: Structure, activity, and reaction products. *Int. J. Mol. Sci.*, 21(8), 2727. doi.org/10.3390/ijms21082727

- as well as for the inhibition of bacterial or fungal pathogens;
- + the creation of a research network involving Tyrol, South Tyrol and Trentino.

← *Erwinia amylovora* (bacterial burn of apple buds) © Photo by Mironmax Studio



## Cooperation and Internationality

Nel 2021, la Facoltà ha visto una serie di rilevanti cooperazioni di ricerca a livello nazionale e internazionale. La selezione ne presenta le principali, suddivise per area di ricerca.

L'area di ricerca **Agricultural Sciences** prosegue con successo una collaborazione con importanti investitori istituzionali locali, come la Fiera di Bolzano-Messe Bozen e l'Unione Agricoltori e Coltivatori Diretti Südtirolesi – Südtiroler Bauernbund, così come con Bioland Südtirol, il Centro di Sperimentazione di Laimburg e il Konsortium Südtiroler Wein – Consorzio Vini Alto Adige, oltre che con istituti di ricerca e università internazionali nel Regno Unito, in Austria e in Francia.

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L'area di ricerca **Management and Technologies for Mountain Environments** collabora con diversi attori regionali pubblici e privati, come il Dipartimento Forestale, l'Agenzia di Protezione Civile e l'Agenzia di Protezione Ambientale della Provincia Autonoma di Bolzano, l'Autorità di Bacino delle Alpi Orientali, Eurac Research e Eco-Research. A livello internazionale sono in essere svariate cooperazioni con università e centri di ricerca, ad esempio con gli USA (Colorado State University), la Germania

(Istituto statale bavarese di silvicoltura), la Spagna (Università di Valladolid, Lleida, Oviedo), l'Austria (Accademia austriaca delle scienze, Università di Innsbruck), la Norvegia (Centro per la biosicurezza di Tromsø).

Nell'ambito del dottorato in "Food Engineering and Biotechnology" (FEB), l'area di ricerca **Food Sciences** collabora attivamente con molti gruppi internazionali, come l'Helsinki Institute of Sustainability Science (FI) e il Conycat Technology Park di Merida (MEX), nonché con l'University College of Cork (IE) e l'organizzazione intergovernativa CIHEAM (FR). La collaborazione è intensa anche con molti partner industriali del settore enologico, come Wineleven e Maselli Misure, e con aziende locali, nazionali e internazionali quali Evonik, Puratos, Cerelia, Dr. Schär, Locker, Lavazza, Federazione Latterie Alto-Adige, Mila, Ferrero, Barilla, Bonomelli, Nestlé, Zuegg. Una delle aziende sopra citate ha finanziato una posizione di RTD senior per 3 anni.



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L'area di ricerca **Industrial Engineering and Automation** valorizza la collaborazione con investitori istituzionali locali come Ivh-apa, Fraunhofer Italia e Eurac Research, nonché con diverse industrie locali (Durst Phototechnik, Alupress) e internazionali (Schaeffler Group, Elvez), nonché con istituti di ricerca e università internazionali del Regno Unito (University of Sussex), Malta (University Malta), e Thailandia (Chiang Mai University).



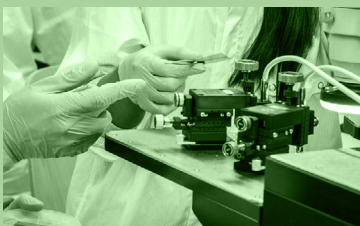
L'area di ricerca **Energy Resources and Energy Efficiency** promuove cooperazioni con l'Università tecnica di Vienna (AT) e con la Purdue University (USA), la Brno University of Technology (CZ), l'Université de Mons (FR), il BEST Competence Centre Graz (AT), la Technical University of Denmark e la Hiroshima University (JPN). Tra i suoi stakeholder ci sono proHolz Tirol (AT), Röchling Automotive, Troyer AG, Agenzia Casaclima, Gemeinde Bozen – Comune di Bolzano Alperia e CISMA.



4 ←

La collaborazione con istituti di ricerca e università internazionali nell'ambito dell'area di ricerca **Smart Systems Technologies and Engineering** è risultata in numerose pubblicazioni scientifiche e notevoli finanziamenti esterni alla ricerca. Esempi dei risultati ottenuti sono un ulteriore "joint project" con la Svizzera e il finanziamento di attività di ricerca per la fabbricazione di circuiti a film sottile per il progetto "WISDOM II" da parte di DFG (DE). Le collaborazioni in corso vedono coinvolti il Politecnico Federale di Zurigo (CH), il centro Helmholtz di Dresden-Rossendorf (DE), l'Istituto Italiano di Tecnologia (IT), il Politecnico di Torino (IT), le Università di Granada (ES), Oslo (NO), Surrey (UK), Nottingham Trent (UK) e Innsbruck (AT), oltre ad aziende quali Microgate Srl, Texmarket Srl, Microtec Srl, e Kerr Italia. Per la realizzazione di dispositivi a film sottile sono stati istituiti contratti di collaborazione con i laboratori FIRST (Frontiers in Research: Space and Time) e BRNC (Binnig and Rohrer Nanotechnology Center) presso l'ETH di Zurigo (CH).

5  
→



L'area di ricerca **Fundamental Sciences for Innovative Applications** annovera tra le sue collaborazioni quella con Doppelmayr Italia a Lana: i ricercatori hanno studiato modelli matematici per la dinamica degli impianti a fune, effettuando misure di parametri fisici rilevanti in un impianto reale. Tra le altre collaborazioni, quella con Integrated Bioprocess Development and Biochemical Engineering dell'Università tecnica di Vienna (AT): la collaborazione è iniziata nel 2019 e ha portato alla riconferma del finanziamento nell'ambito dell'accordo tra Austria e Provincia di Bolzano.

6  
←



- 1 ← © Markus Spiske on Unsplash
- 2 ← Food Technology Lab © Ivo Corrà
- 4 ← Bioenergy and Biofuel Labs © Ivo Corrà
- 5 ← Sensing Technologies Lab © Ivo Corrà
- 6 ← Cable transport © Markus Spiske on Unsplash



## Research Events

01 March 2021

### **1<sup>st</sup> Workshop on the use of Numerical Analysis in Engineering**

Online workshop focussing on the use of the numerical analysis in Engineering. Sessions were held on fluid mechanics, optimization problems, epidemic, and fluid and solid mechanics. The event was organised by unibz and aimed at presenting the work performed by unibz researchers, thus encouraging new research collaborations in multi-disciplinary areas.

01 July 2021

### **FiRST-Field Robotics South-Tyrol lab: workshop and open lab**

The workshop was a forum for discussion on Field Robotics, where experts shared and discussed their latest results, current trends and novel ideas in the area of robotics for Field Activities. The contributions emphasised the interdisciplinary aspects of robotics and its applications in outdoor scenarios with special attention for the South Tyrolean context. The technologies and research fields presented during the event were also linked to the newly established FiRST – Field Robotics South-Tyrol Laboratory of unibz at the NOI Techpark, funded by the European Regional Development Fund.

1 →

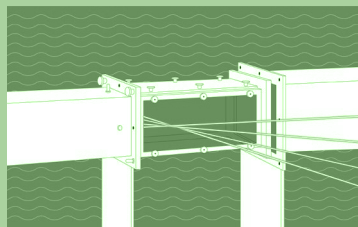


05–09 July 2021

### **W.A.T.E.R. – Workshop on Advanced measurement Techniques and Experimental Research**

Advanced measurement Techniques and Experimental Research is a Summer School started in 2016 by the Vrije Universiteit Brussel and the IAHR Experimental Methods and Instrumentation Committee (EMI) and whose 5<sup>th</sup> edition was held at the Laboratory of Thermo-Fluid Dynamics (LTFD) of the unibz Faculty of Science and Technology.

2 →



23 August 2021

### **Series of Lectures: Computational Acoustic Wavefront Manipulation for Designing Novel User-interfaces**

Prof. Sriram Subramanian from the University College London held this innovative seminar on how to deliver novel multi-sensory experiences to users without instrumenting them with wearable or head-mounted displays. The presentation focused on 3D displays realised by trapping tiny objects in an ultrasonic field. This is done by computing acoustic phase holograms that are created by ultrasonic speakers and acoustic metamaterials to shape the wavefront.

17 September 2021

### **COOL-CAR project: Solutions for a sustainable mobility**

On the basis of a project funded by the European Regional Development Fund (ERDF), the workshop was organized with the aim of presenting a perspective on the future of electric cars and on the novel solutions for the sustainable mobility. The COOL-CAR project was developed thanks to the collaboration between unibz and Röchling Automotive and it represents a step forward on the automotive scene. The purpose of the project was to develop a prototype of a battery module for electric vehicles with reduced weight, thermal management and cooling/heating flows so as to maximize the lifetime and performance of the sustainable electro-mobility.

3 ←



22–24 September 2021

### **21<sup>st</sup> ETRIA World Conference “TRIZ Future 2021”**

The “TRIZ Future 2021” Conference was centred on “Creative Solutions for a Sustainable Development” and was organized by the European TRIZ Association (ETRIA), with the International Federation for Information Processing (IFIP) as the main partner and 6 sponsor companies. 60 participants from all continents and more than 50 peer-reviewed papers on

TRIZ and systematic innovation concurred to the success of the event, that was preceded by a three-language workshop day on innovation and sustainability issues and opportunities in South Tyrol and the Alpine region.  
29 October 2021



**Potential for inclusion of people with disabilities through the use of assistance systems**

How can technical and production assistance systems contribute to promoting the integration of people with disabilities in local industrial and craft enterprises? Within the ASSIST4WORK project, a research group of unibz worked on this topic and organised this workshop, which presented practical solutions for a more socially sustainable production. The aim was to create a meeting place between public administration, social cooperatives and companies in order to foster the integration of people with disabilities in the local economy. Local and international experts talked about the possibilities for job integration in South Tyrol and about assistance systems that support diversity and presented their first practical experiences with these technical aids.

11 November 2021  
**Bilateral Workshop on Smart and Sustainable Engineering Technologies**

The workshop took place at the Smart Mini Factory, where researchers from unibz were able to exchange ideas with colleagues from Chiang Mai University in Thailand.

November, Dezember 2021  
**Lecture series – Man and animal: an ambivalent relationship**

The Series of Lectures was organised by unibz and the Philosophical-Theological University of Bressanone-Brixen. The programme included lectures on current challenges and the reasons behind the ambivalent relationship between humans and animals. The lectures were held by Garry R. Franchione, world-famous American law professor and author, whose radical theses on animal rights are renowned, and Michael Marahrens from the Friedrich Loeffler Institute in Braunschweig, the German Federal Research Institute for Animal Health. The topic was “Animal transports, animal suffering – no end to it?”. In conclusion, Wolfgang Platter, former director of the Stilfserjoch National Park, outlined the legal regulations in the field of environmental protection.



- 1 ← FIRST-Field Robotics lab
- 2 ← “W.A.T.E.R.” Event Illustration
- 3 ← © Photo by Röchling
- 4 ← “TRIZ” Event Illustration
- 5 ← “Man and animal” Event Illustration

# Faculty of Education



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## KEY DATA

### PEOPLE

1757 Students  
39 PhD Students  
47 Tenured Prof.  
74 Researchers  
305 Contract Prof.  
18 Technical and  
Administrative Staff

## BACHELOR

- + Communication Sciences and Culture
- + Social Education
- + Social Work

## MASTER

- + Primary Education
- + Applied Linguistics
- + Innovation and Research for Social Work and Social Education
- + Musicology

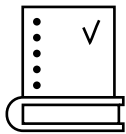
## PHD

- + General Pedagogy, Social Pedagogy, General Didactics and Disciplinary Didactics
- + Linguistics

## TRAINING COURSE 24 CFU

- + For Middle- and High-school Teachers





## Research Areas



Dean — Prof. Paul Videsott

The Faculty of Education of the Free University of Bozen-Bolzano has taken up a unique role in academic teaching and research in various fields connected to education and social sciences on a national level. This is partly due to the specific historical, linguistic, and cultural reality of the Trentino-South Tyrol region, which helps frame the current state of research at the Faculty and to plan future developments.

2021 was a demanding year for everyone. Facts and results of the Faculty of Education show that it has risen to the challenges.

In spite of the continued restrictions due to COVID-19 pandemic, which had a huge impact on research activities worldwide, the Faculty managed to start as many as 36 new projects, with a total budget of 1,8 million €. For the second year in a row, it was possible to clearly exceed the threshold of 1 million euro of acquired third-party funds. This result owes much to 17 new research projects (in the stricter sense of the word) and 8 ESF and Erasmus+ KA2-3 projects.

It is especially in this latter area that the Faculty has gained expertise in recent years, regularly raising between 20–30% of its research budget from these types of calls.

A special achievement was the activation of a second PhD-Programme at the Faculty, offered in collaboration with the University of Verona. All three places available, one of which was funded by an external grant, were awarded to highly qualified candidates, who will undoubtedly contribute to a further increase in language research.

The new PhD programme comes in addition to the long-established doctorate in General Pedagogy, Social Pedagogy, Special and Disciplinary Didactics, which has been awarded 6 additional grants thanks to the national PNRR. Thus, 13 PhD students could be recruited in the 37<sup>th</sup> cycle. In addition, the Faculty was able to secure two RTD posts funded by the national PNRR programme and to recruit its first RTD whose post could be fully financed by externally acquired research funds within the Joint Projects South Tyrol – Switzerland initiative.

The Faculty also offers advanced training courses for teachers (lifelong learning), such as a specialisation course for the teaching of children with special educational needs and ANROPOLAD, a Further-Education Course in Ladin Language and in Culture and Alpine Anthropology.

Research carried out at the Faculty of Education focuses on seven main areas:



Vice Dean for Research — Prof. Giulia Cavrini

### **Permanent Education – Processes and Projects of Education and Development with a Focus on South Tyrol**

**Coordinator:** Iris Nentwig Gesemann

This research area deals with the issues of training for the whole course of life (Lifelong Learning) starting at an early age. The research work considers the different contexts of training and experience (Lifewide Learning), in a deep sense, as regards affective-emotional and cognitive anchors and values that belong in an intergenerational and cultural meaning (Lifedee Learning).

### **IN-IN Education: INnovative and INclusive Education**

**Coordinator:** Simone Seitz

This research area focuses on developing meaningful, evidence-based and original approaches to teaching/learning skills and practices in all educational institutions, in keeping with the global framework of values and policies of inclusive education. Specific research activities address educational spaces, teaching materials, inclusive teaching and learning practices for heterogeneous groups and students with Special Educational Needs.

**Psychology and wellbeing promotion in educational contexts****Coordinator:** Demis Basso

This research area focuses on the study of behaviour, the main psychological functions, and psychological processes related to education and counselling, extending over the whole life course. The research work includes the observation of developmental levels and the early detection of typical and atypical developmental markers, aiming to identify risk and protection factors.

**Languages and multilingualism in South Tyrol****Coordinator:** Silvia Dal Negro

The research activities in this area focus on the study of languages and multilingualism in South Tyrol following three main lines of inquiry: investigation in the evolution of languages over time; description and documentation of language usage in different communicative and social contexts; analysis of the linguistic and educational policies with special attention for the processes of language acquisition and for the teaching of languages in schools.

**Aesthetic experiences and communication****Coordinator:** Attilio Carraro

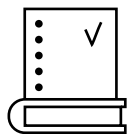
Researchers investigate how and to what extent different forms of aesthetic expression (music, movement, visual art, etc.) appear in social, cultural and educational contexts, with a particular focus on the multi-cultural realities of South Tyrol. More specifically, research focuses on musical heritages and cultures handed down from different historical and social contexts; graphic and visual expression and communication from early childhood to adulthood; contemporary practices and innovative teaching methods for physical exercise and sport in primary schools and kindergartens.

**Educational contexts, disciplines and their teaching in the nursery and primary school****Coordinator:** Giorgio Bolondi

This research area gathers contributions from sciences such as school disciplines and didactics to investigate into the development of skills in children at nursery and primary school. Emphasis is placed on education at the pre-primary level and on disciplinary subjects in primary school.

**Socio-cultural worlds: institutions, welfare, social professions, environment and population****Coordinator:** Kolis Summerer

This research area merges perspectives and expertise from different disciplines such as sociology, social statistics, social anthropology, law, social policy, social pedagogy and social work. Researchers work on a variety of projects contributing to theoretical development, fundamental and applied research in scientific domains regarding the social world, diversity, population, institutions, values, environment and space, as well as cultural studies, cultural identities and memories, and cultural heritage.



## Research Projects

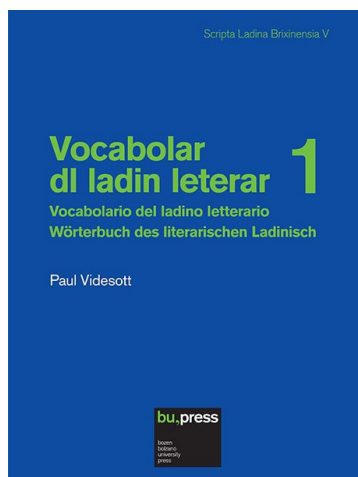
### VLL III (1946-1975) – Vocabolar dl ladin leterar / Vocabolario del ladino letterario / Wörterbuch des literarischen Ladinisch.

An der Ladinischen Abteilung der Fakultät für Bildungswissenschaften wird seit 2013 am Vocabolar dl ladin leterar/ Vocabolario del ladino letterario/ Wörterbuch des literarischen Ladinisch gearbeitet. Es handelt sich dabei um ein Grundlagenprojekt, das die ladinische Lexikographie methodisch tiefgreifend erneuern und für das Dolomitenladinische einen umfassenden Thesaurus der literarischen Sprache bereitstellen möchte. Zu den besonderen Charakteristika des Vocabolar dl ladin leterar gehört seine vollkommene Textbasiertheit (was die Gewähr einer effektiven Verwendung eines bestimmten Wortes bietet), die Berücksichtigung der Literatursprache als prestigereiches Sprachregister, seine gesamtheitliche Ausrichtung unter Einschluss aller 15 ladinischen Varietäten sowie seine digitale Erstellung und damit sofortige Verfügbarkeit auf der Projekthomepage. Einmalig für die ladinische Lexikographie ist insbesondere die Dokumentation jeder Wortbedeutung mit Originalzitate aus der ladinischen Literatur der letzten zwei Jahrhunderte (in der originalen sowie aktuellen Schulorthographie).

Das Vocabolar hat sowohl wissenschaftliche Zielsetzungen als auch sprachkonservatorische und ist gerade im Falle des

Ladinischen ein konkreter Beitrag zum Minderheitenschutz. Es richtet sich sowohl an akademische Fachnutzer\*innen als auch an die ladinische Öffentlichkeit. Wörterbücher sind für Sprachminderheiten in einem noch größeren Ausmaß als für die etablierten Schriftsprachen nicht nur Nachschlagewerk, sondern ein überaus effizientes Mittel, um diese Minderheitensprachen zu dokumentieren und somit zu konservieren. Als Lexikon erleichtern sie den korrekten schriftlichen (und mündlichen) Gebrauch der Minderheitensprache und bereichern die Schriftproduktion der sie nutzenden Personen, indem sie diesen auch wenig bekannte Wörter und Wendungen zur Verfügung stellen, die bei Mehrheitssprachen in der Regel über andere Kanäle (Massenmedien, Studium) vermittelt werden.

Spezifisches Ziel des vorliegenden Projektes ist es, das Vocabolar mit Wörtern und Belegen aus der ladinischen Literatur zwischen 1946 und 1975 zu erweitern.



## Info Box

FUNDING TYPE  
Autonomous Province of Bozen-Bolzano

DURATION  
10/2020 — 12/2022

RESEARCH AREA  
Languages and multilingualism in South Tyrol

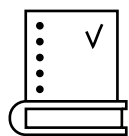
UNIBZ RESEARCH TEAM  
Prof. Paul Videsott (Principal Investigator), Bernardino Chiochetti, Nadia Chiochetti

PROJECT PARTNERS  
Universität des Saarlandes, ATILF Nancy, Università di Udine, Institut dal Dicziunari Rumantsch Grischun, Universität zu Köln, Universität Eichstätt, Istitut Cultural Ladin "Majon di Fascegn" Istitut Cultural Ladin "Cesa de Jan", Union di Ladis de Anpezo

WEBSITE  
vll.smallcodes.com

- SELECTED PUBLICATIONS
- + Videsott, P., et al. (2020). *Vocabolar dl ladin leterar / Vocabolario del ladino letterario / Wörterbuch des literarischen Ladinischen. Vol. 1: Lessich documenté fin al 1879 / Lessico documentato fino al 1879 / Bis 1879 belegter Wortschatz.* (2020). Bozen-Bolzano University Press.
  - + Goebel, H., & Videsott P. (2020). Atlanti linguistici, corpora, bibliografie. In: Videsott, P., Videsott, R. & Casalicchio, J. (eds.): *Manuale di linguistica ladina* (539–574). Berlin: De Gruyter, [Manuals of Romance Linguistics, 26].
  - + Videsott, P. (2021). Un nuovo dizionario ladino: il Vocabolar dl ladin leterar. Esperienze, risultati, prospettive. In: Vicario, F. (ed.): *Jacopo Pirone e la lessicografia friulana / Jacum Pirone e la lessicografie furlane*. Udine: Società Filologica Friulana 197–209 [Biblioteca di studi linguistici e filologici, 24].

← Vocabulary cover © bu, press



### **BECOM-IN – Diventare un insegnante con disabilità o disturbi specifici dell'apprendimento**

Il progetto di ricerca “BECOM-IN” aveva l’obiettivo di analizzare sia l’inclusione di studenti con disabilità/DSA che frequentano percorsi universitari per diventare insegnanti, sia l’inclusione di insegnanti con disabilità/DSA già in servizio, approfondendo quali siano gli elementi facilitatori, anche in termini di strategie individuali di coping attivate, e le eventuali barriere incontrate da studenti e docenti con disabilità/DSA nell’iter di formazione e in quello professionale.

I ricercatori hanno esplorato il “dilemma della competenza professionale” che caratterizza i percorsi accademici abilitanti e, nel caso specifico, la formazione degli insegnanti. Le università, infatti, da un lato hanno la responsabilità sociale di formare insegnanti competenti, il che spesso si basa su un profilo standard di competenze e, dall’altro, devono rispondere al diritto degli studenti con disabilità/DSA di ricevere accomodamenti ragionevoli.

Il progetto di ricerca non solo ha condotto a risultati rilevanti sotto l’aspetto scientifico, ma ha anche evidenziato una serie di implicazioni di policy, riguardanti il sistema in generale, le università e le scuole. Tra le implicazioni generali di sistema, è emersa la necessità di sviluppare politiche che permettano di aumentare in modo sensibile la percentua-

le di studenti/studentesse e di insegnanti con disabilità/DSA e di contrastare gradualmente l’evidente sottorappresentazione di queste persone nei corsi di studio e nei luoghi di lavoro.



A livello di università, dovrebbero essere posti obiettivi quali l’elaborazione di iniziative sistematiche di sviluppo professionale continuo e diffuso sui temi cardine della didattica inclusiva; iniziative di supporto al metodo di studio, rivolte alle studentesse/studenti con disabilità/DSA; lo sviluppo di iniziative di supporto ai processi di consapevolezza e disclosure, rivolte alle studentesse/studenti; la creazione di un presidio attento delle esperienze di tirocinio diretto e indiretto e una formazione specifica dei supervisori di tirocinio e dei tutor nelle scuole.

Infine, a livello scolastico è necessario rendere disponibili le tecnologie compensative necessarie o utili, sostenere iniziative di co-teaching, realizzare un’or-

FUNDING TYPE  
Internal Funding

DURATION  
04/2018 — 09/2021

RESEARCH AREA  
Inclusive Education

UNIBZ RESEARCH TEAM  
Prof. Dario Ianes (Principal Investigator),  
Prof. Heidrun Demo, Dr. Rosa Bellacicco

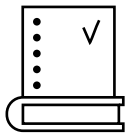
PROJECT PARTNER  
Università di Torino

#### SELECTED PUBLICATIONS

- + Bellacicco, R., & Ianes, D. (Eds.) (2022). Teachers with disabilities and specific learning disorders: dilemmas, challenges, and opportunities. Milano: FrancoAngeli. (curatela in inglese)
- + Bellacicco, R., & Demo, H. (2019). Becoming a teacher with a disability: a systematic review, *Fomr@re*, 19(3), pp. 186–206.
- + Bellacicco, R. (2022). Diventare/essere un insegnante con disabilità e DSA: la ricerca, i dati e i temi emergenti nel contesto italiano, alla luce del panorama internazionale. *Orientamenti Pedagogici*, 69 1), pp. 71–88.

ganizzazione maggiormente flessibile, realizzare accomodamenti ragionevoli anche negli ambiti operativi dei docenti e monitorare gli atteggiamenti dei colleghi in relazione ad eventuali forme di discriminazione.

↑ Book cover © FrancoAngeli



## GRAPHA-SLD – Graphonomic Measures Of Handwriting In Children With Specific Learning Disabilities And Their Perception Of Wellbeing

Learning to write is a difficult task for all children at the beginning of literacy, but also for those who, later on, cannot achieve a sufficient degree of fluency and readability in the production of a text. A consistent, growing body of research investigating the acquisition of handwriting skills has shown that children with specific learning disability (SLD) are slower in producing written text as compared to normally developing children. Difficulties in written expression are namely one of the criteria accounting for a diagnosis for this neurodevelopmental disorder. The act of writing can be described as a complex process involving different cognitive, kinesthetic, motor and perceptual components and requiring the coordination of visual-perceptual skills, motor

planning, and manual and digital dexterity. Studies on writing have mainly focused on the evaluation of short text productions, examining their graphic quality with reference to various parameters. Recently, several studies analysed the writing process by means of computerized digital tools capable of detecting the properties of the graphic traces during their execution, in order to better understand the writing process as a psycho-motor action.

The project GRAPHA SLD aimed at investigating the writing process in SLD children during a copy-text task: by means of a digitizer, researchers recorded data on the writing movements such as time of execution, frequency of writing, speed, pressure exerted on the sheet, in order to understand how and to what extent this clinical population differs from children with a typical development. Specifically, an unrecognized lack of automaticity in the handwriting skills that interferes with the high-order processes involved in text composition could be related to the difficulties that SLD children encounter in written expression. Furthermore, SLD children have been reported to show impaired HRQoL, which can affect their personal self-perceived well-being at school and in the family context.

A second goal of this research was to explore how HRQoL in SLD children and in matched peers of the general population differs. The results of the study can be applied in choosing the most

FUNDING TYPE  
Internal Funding

DURATION  
09/2018 — 02/2021

UNIBZ RESEARCH TEAM  
Dr. Livia Taverna (Principal Investigator), Prof. Renata Zanin Scaratti, Prof. Giulia Cavrini

PROJECT PARTNERS  
Südtiroler Sanitätsbetrieb – Azienda Sanitaria dell'Alto Adige, Krankenhaus Bozen – Ospedale di Bolzano

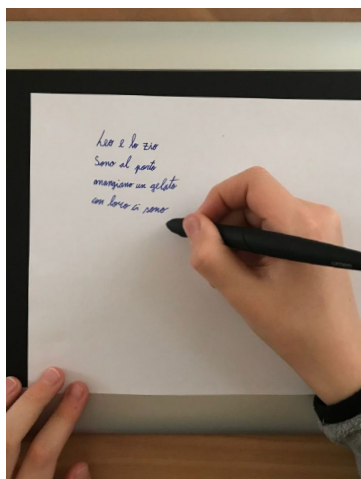
SELECTED PUBLICATIONS  
+ Taverna, L., Tremolada, M., Dozza, L., Zanin Scaratti, R., Domahs, U., Lallo, C., & Tosetto, B. (2020). Who Benefits from An Intervention Program on Foundational Skills for Handwriting Addressed to Kindergarten Children and First Graders? *International Journal of Environmental Research and Public Health*, 17(6), 2166. doi: 10.3390/ijerph17062166

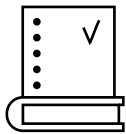
+ Taverna, L., Tremolada, M., Tosetto, B., Dozza, L., & Zanin Scaratti, R. (2020). Impact of psycho-educational activities on visual-motor integration, fine motor skills and name writing among first graders: a kinematic pilot study. *Children*, 7(4), 27. doi:10.3390/children7040027

+ Tremolada, M., Taverna, L., Chiavetta, I. T., Bonichini, S., Putti, M.C., & Biffi, A. (2020). Psychological wellbeing in adolescents with leukaemia: A comparative study with typical development peers. *International Journal of Environmental Research and Public Health*, 17(2), 567. doi:10.3390/ijerph17020567

appropriate psycho-educational interventions to improve the writing skills of children with SLD and the most suitable tools to monitor changes in the automation of the writing process, as well as interventions to support the perception of well-being in the school context.

← © Livia Taverna





## Research Projects

### **FARm – Filiera dell'Agri- coltura Responsabile. Verantwortungsvolle Arbeitsbedingungen in der Landwirtschaft**

Ziel des Projekts FARm ist es, Ausbeutung und illegale Vermittlung von Arbeitskräften (caporalato) in der Landwirtschaft zu verhindern und ein wirksames Netzwerk für sozial verantwortungsvolle Arbeits- und Lebensbedingungen in den Regionen Venetien und Lombardei sowie den autonomen Provinzen Trient und Bozen zu schaffen. Das von der Europäischen Union, dem italienischen Innenministerium und dem Ministerium für Arbeit und Sozialpolitik finanzierte Projekt wird von der Fakultät für Rechtswissenschaften der Universität Verona geleitet. Die Freie Universität Bozen zeichnet hierbei für die Erforschung des Phänomens und den Aufbau des Präventionsnetzes verantwortlich. Die bisher durchgeführte Forschung betraf nicht nur die Datenerhebung, sondern zielte darauf ab,

gemeinsam mit einer Vielzahl relevanter Stakeholder lokale Präventionsstrukturen gegen die Ausbeutung landwirtschaftlicher Arbeitskräfte zu schaffen und zu stärken.

Die wissenschaftliche Arbeit umfasste Dokumentenanalyse und Stakeholder-Mapping, die Auswertung von Studien zur Situation der Arbeitskräfte in der Landwirtschaft (international, national und regional), Expert\*innen- und Gruppeninterviews, Fallanalysen sowie Informationsaustausch und Dialog mit Fachpersonen aus dem landwirtschaftlichen Produktionssektor, dem Genossenschafts-, Sozial- und Gesundheitswesens, der Gewerkschaften und der Aufsichts- und Strafverfolgungsbehörden. Darüber hinaus wurden Workshops und Trainings mit Akteur\*innen durchgeführt, welche im direkten Kontakt mit betroffenen Personen stehen.

Eines der Ergebnisse für Südtirol besteht in der Abfassung einer gemeinsamen Erklärung aller beteiligten Stakeholder zur Förderung fairer Arbeitsbedingungen in der Landwirtschaft, welche als gemeinsame Grundlage für ein abgestimmtes Agieren gegen Ausbeutung und Illegalität dienen soll. Darüber hinaus wurden detaillierte Praxis-Handreichungen in vier europäischen Sprachen erarbeitet, die u. a. die Betroffenen über Ihre Rechte informieren.



## Info Box

FUNDING TYPE  
FAMI 2014-2020

DURATION  
01/2020 — 06/2022

RESEARCH AREA  
Socio-cultural worlds: institutions, welfare, social professions, environment and population

UNIBZ RESEARCH TEAM  
Prof. Susanne Elsen, Dr. Claudia Lintner

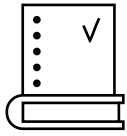
PROJECT PARTNERS  
18 national partners with Università degli Studi di Verona as Lead Partner

WEBSITE  
project-farm.eu

#### SELECTED PUBLICATIONS

- + Zadra, F., Viganò, F. & Elsen, S. (2022) Azioni di rete per la qualità sociale del lavoro agricolo e la prevenzione dello sfruttamento. In: ISTISAN, *Rapporto sull'agricoltura sociale*. (in press)
- + Elsen, S. & Zadra F. (2022) Narratives on seasonal workers: diversified positions in a network for fair agricultural labor in South Tyrol. In: *Wiesinger et al. Abhängige Beschäftigte in der Landwirtschaft*. Schriftenreihe – Agrarsoziale Gesellschaft. (in press)
- + Zadra, F. & Elsen, S. (2022) Building a prevention network against agricultural labor exploitation in Northern Italy. In: *Journal of Labor Research* (under review).

← Poster © Project FARm



## Research Projects

## Info Box

### ARGOP 2 – Argumentation in open-ended questions in large scale CB assessment of learning

The goal of the research is to define, validate and implement theoretical and operative tools for assessing argumentative skills in students. This is performed in the frame of the Italian national assessment system, which is switching from paper-and-pencil assessment to Computer-Based-Testing, and with an interdisciplinary approach involving Mathematics, Italian language and English L2 assessment. The unibz research team interacts with a parallel research team settled in the Department of Linguistics of the Alma Mater Studiorum-University of Bologna, and the ICT team of EduVal Project srls, the agency who commissioned the study.

Basing on firm quantitative data, research within the ARGOP 2 project aims to define patterns for classifying argumentations of students when answering an Open Ended Question test in Mathematics (but also usable for the Italian Language and English L2 proficiency assessments). As operative outputs, the research team will produce and test syntaxes for the setting of a blended ICT-human based correction of large-scale assessments and write guidelines for the formulation of Open Ended Question tests aimed at assessing argumentation. It must be noted that “argumentation” is a transversal competence, which

is explicitly stated as a target both in National curricula and in International studies and surveys. A key point of the research is a deep analysis of data collected by the INVALSI (National Institute for the Evaluation of the Education and Training System) during the Field Trial and Main Study campaigns of 2018, 2019 and 2021. The research team interacts with the EduVal Project team in collecting, classifying, and analysing data from approx. 1,200,000 students (Field Trial and Main Study) every year. This huge amount of data constitutes a unique source of information and of evidence for educational research in general.

Working on these data, researchers will be able to define and validate syntaxes for the automatic correction of students’ answers to Open Ended Question tests: the target is to correctly classify 70–95% of cases (depending on the item), and also give a qualitative description of these answers and of the other “skew” cases. In parallel, the research team analyses and classifies “human” correction, validating the results by a qualitative comparison with the national curriculum framework, the INVALSI framework and results from educational research on argumentation.

The research compares these syntaxes and their efficacy with the analogous scripts developed by the Italian Language and the English L2 research teams, thus gaining an interdisciplinary insight in the topic of argumentation.

FUNDING TYPE  
Research Contract

DURATION  
22/10/2020 — 28/02/2022

RESEARCH AREA  
Educational Contexts, Disciplines and their Teaching

UNIBZ RESEARCH TEAM  
Prof. Giorgio Bolondi (Principal Investigator), Dr. Federica Ferretti

PROJECT PARTNER  
EduVal Project Srls

- SELECTED PUBLICATIONS
- + Pozio, S., & Bolondi, G. (2019). Difficulties in formulating a geometric situation algebraically; hints from a large-scale assessment. In: M. Graven, H. Venkat, A. Essien & P. Vale (Eds.) *PME 43. Proceedings of the 43<sup>rd</sup> Conference of the International Group for the Psychology of Mathematics Education* (Vol. 3, pp 225–232). Pretoria, South Africa: PME.
  - + Bolondi, G. & Ferretti, F. (2021). Quantifying Solid Findings in Mathematics Education: Loss of Meaning for Algebraic Symbols. *International Journal of Innovation in Science and Mathematics Education*. 29 (1), 1–15.
  - + Bolondi, G., Ferretti, F., & Spagnolo, C. (2021). Argomentare in Matematica. Analisi di protocolli di studenti su catene di quesiti INVALSI proposti in diversi gradi scolastici. In P. Falzetti (a cura di) *I dati INVALSI. Uno strumento per lo sviluppo delle competenze trasversali* (pp.50–69). Milano: Franco Angeli.

As a by-product, we are defining operative Guidelines for the formulation of argumentative OEQs, to be used by test authors and research teams engaged in developing large-scale assessments.



## Cooperation and Internationality

La Facoltà ha creato negli anni una ricca rete di collaborazioni a livello locale, nazionale e internazionale, che vedono coinvolte sia università ed enti di ricerca, sia istituzioni pubbliche.

In particolare, per l'area di ricerca **Educazione Permanente – Processi e Progetti educativi e di sviluppo, con un focus specifico sull'Alto Adige** si possono citare le collaborazioni con l'Intendenza Scolastica Italiana, il Department of Education dell'Università di Gothenburg (SE), la Fondazione Carano 4 Children, che promuove iniziative sui temi del cambiamento climatico e sulla parità di genere, rivolte ai bambini, e con il German speaking Innovative Learning Environment Network (ILE).

L'area di ricerca **IN-IN Education: INnovative and INclusive Education – Didattica innovativa e inclusiva**, vede in particolare la collaborazione con la Fondazione Guido Brodolini per uno studio riguardante la competenza imprenditoriale nell'IFP (Istruzione e Formazione Professionale) che vede coinvolti 8 Paesi europei, tra cui l'Italia.

Per l'area di ricerca **Psicologia e promozione del benessere nei contesti educativi**, si segnalano le attività del Joint Research Laboratory SWAPv-IT, in collaborazione con la Flinders University (AU) e l'Università di Bologna, sulla prevenzione del bullismo e del cyberbullismo, che collega 20 paesi nei cinque continenti.

Nell'ambito dell'area di ricerca **Lingue e plurilinguismo in Alto Adige** sono attive diverse collaborazioni, ad esempio con l'ente ufficiale del turismo dell'Alto Adige e con agenzie e operatori turistici locali per un progetto di ricerca incentrato sugli usi, le credenze e le percezioni degli operatori turistici locali riguardanti l'uso dell'inglese come lingua internazionale per la comunicazione, o il progetto transnazionale online MSSP2 (Meisei Summer School Project 2020) sull'insegnamento della lingua inglese ai giovani studenti, avviato in collaborazione con la Meisei University (JP). Inoltre, proseguono la collaborazione con il centro interuniversitario AIM (Analisi dell'Interazione e della Mediazione), per attività di ricerca e divulgazione sui temi dell'interazione e della mediazione in contesti istituzionali e la collaborazione con l'Istituto ladino "Micurá de Rù" per il progetto relativo alla Grammatica normativa per il ladino della Val Badia; infine, sono attive molteplici collaborazioni nel campo della formazione degli insegnanti, in particolare con le Università di Vechta (D), Tallinn (EE), Hildesheim (D), Ain Shams (EG), Masaryk (CZ) e l'Universidad Autónoma del Estado de México (MX).

L'area di ricerca **Esperienze e linguaggi estetici** evidenzia collaborazioni incentrate sull'insegnamento dell'educazione fisica e della musica, in particolare con le Università di Grenoble (FR) e della Tessaglia (GR), con la Hacettepe University (TR) e con ricercatori dell'Università di Chieti; con l'Università del Lussemburgo (LU), la Dublin City University (IE), le Università di Lisbona e di Siviglia (ES) e di Trnava (SK); con la LMU-München (DE), l'Accademia Musicale di Oslo (NO), e con le Università di Bologna e Roma 3.

Nell'ambito dell'area di ricerca **Ambiti formativi, discipline e loro didattica nella scuola**, è significativa la cooperazione internazionale avviata con MedECC, una rete di scienziati al lavoro sui cambiamenti climatici e ambientali nel Mar Mediterraneo.

All'interno dell'area di ricerca **Dinamiche socio-culturali: istituzioni, welfare, professioni sociali, ambiente e popolazione**, le collaborazioni più rilevanti sono avviate con l'Ufficio Servizi Sociali di Bolzano, il Netz-Network dei Centri Giovanili dell'Alto Adige, l'ufficio per la tutela dei bambini e dei giovani e l'inclusione sociale, e il Villaggio del Bambino dell'Alto Adige; con l'Università di Jyväskylä (FI), con le Università di Trento, Trieste e della Calabria e con la Scuola Claudiana e la locale Azienda Sanitaria; con la società per la ricerca archeologica Arc-team, la Società austriaca per la ricerca sulle fortificazioni, il Museo della



guerra di Rovereto, l'Associazione Bellum Aquilarum di Sesto, l'Associazione Antropologica Alto Adige- EVAA e l'Associazione turistica di Sesto. E' stata inoltre rafforzata la collaborazione con la Polizia Postale del Trentino-Alto Adige e la rete locale contro la violenza di genere (GEA) ed è in corso una collaborazione con le università di Osaka e Kyoto (JP), Chicago (USA), Cork (IE), The New School (FR), Manchester (UK), Museum of Nature, Berlin (DE) e Goldsmith University of London (UK) all'interno di un progetto sul worldbuilding speculativo che mira a defamiliarizzare il colonialismo europeo.



## Research Events

8 April 2021

**EVAA-Seminar of the work-in-progress ethnographic film *The Chalice. Of Sons and Daughters* by Cătălina Tesăr. An ethnographic film with Romanian Cortorari Roma presented on the occasion of the International Romani Day.**

Romanian Cortorari Gypsies from Transylvania convey a strong commitment to the possession of specific putative objects, namely chalices which were bequeathed to them by their ancestors and passed on from father to son. Presentation coordinated and chaired by Elisabeth Tauber. Online Event.

[www.ev-aa.org/de/events/the-chalice.php](http://www.ev-aa.org/de/events/the-chalice.php)

13–18 April 2021

The documentary section “**Piccole lingue DOC**” (**Small DOC languages**), dedicated to the theme of linguistic minorities, was held as part of the “Bolzano Film Festival Bozen” (Bolzano). It was curated by members of the Faculty in collaboration with the master’s degree course in Applied Linguistics. The section was accompanied by online meetings (Q&As) and in-person meetings with some of the directors of the works.

[www.filmclub.it/2020/it/programma-2021/sezioni/](http://www.filmclub.it/2020/it/programma-2021/sezioni/)

29 April 2021

Urban Nothdurfter organised the public online-seminar “**Die Gestaltung des Sozialen in Südtirol – Rückschau und Ausblick**” on the construction of local welfare systems.

[www.unibz.it/en/events/137760-die-gestaltung-des-sozialen-in-suedtirol-rueckschau-und-ausblick](http://www.unibz.it/en/events/137760-die-gestaltung-des-sozialen-in-suedtirol-rueckschau-und-ausblick)

May – July 2021

September – December 2021  
**Cultures of Mountain Peoples in Comparative Perspective.** A series of seminars exploring the possibility of connecting the sociocultural experiences of inhabitants in different mountain areas, organised by the Faculty of Education of the Free University of Bozen-Bolzano (unibz) and the MFEA-The Malinowski Forum for Ethnography and Anthropology (unibz), in collaboration with the Anthropological Association South Tyrol (EVAA) and the Museo degli Usi e Costumi della Gente Trentina, with the contribution of the Stiftung Südtiroler Sparkasse.

10 June 2021

**Complexity and Narrative. Integrating Science and Humanities for science education.**

The workshop, organised in collaboration with the Department of Education and Human Sciences of UNIMORE, brought together more than 80 scholars from different disciplines (scientists, philosophers, narratologists and pedagogues) to address issues related to the integration of the sciences and the humanities.

9–11 September 2021

The international conference on **Theatre and Public Space** was held at the Teatro Stabile di Bolzano and in the lecture rooms of the Free University of Bozen-Bolzano. The event, made possible thanks to the collaboration between unibz and the cultural institution of the Teatro Stabile di Bolzano (80% of funding came from the unibz CRC research funds and 20% from the Theatre institution), gave an opportunity to illustrate data gathered within the unibz RuTisp research on the social and political role of theatre in the globalised society.

**Theatre and Public Space** was a prestigious international event that hosted leading Italian and foreign scholars of performance and social sciences and received large press coverage.

29–30 September 2021

**Storytelling as a Cultural Practice – Pedagogical and Linguistic Perspectives.**

Online event. 1<sup>st</sup> International Conference focusing on the role the art of storytelling plays in educational contexts and on the learning opportunities it opens up  
[www.unibz.it/en/events/137277-storytelling-as-a-cultural-practice-pedagogical-and-linguistic-perspectives](http://www.unibz.it/en/events/137277-storytelling-as-a-cultural-practice-pedagogical-and-linguistic-perspectives)



16, 20–21 October 2021

The conference **BRIMA Primar (Brixner Mathematiktag für den Primarbereich – Bressanone invita alla matematica)** was initiated in 2017 with the purpose of disseminating the state of the art of research in mathematics education for kindergarten and primary school among professionals in the Province of Bozen-Bolzano. Ever since its first edition, though, BRIMA has aroused great interest in other provinces of Italy as well as in Austria, Germany, and Switzerland so that in 2021 the organizers were forced to switch to an online-format: two keynotes and up to 6 webinars on Saturday 16<sup>th</sup>, held in German and Italian by internationally renowned scholars from Switzerland (Prof. Brunner, PH Thurgau) and Colombia (Prof. Bruno D'Amore, Universidad distrital Francisco José de Caldas, Bogotá), followed by another 6 webinars in both languages during the following week. The event was a great success in attendance, counting more than 800 participants a day with an excellent feedback. [brimaprimar.events.unibz.it/de/home](http://brimaprimar.events.unibz.it/de/home)

4–5 November 2021

**Creative Work: possible futures after Covid-19.** International workshop organized together with King's College London and attended by scholars from Europe and the US. The workshop discussed the living and working conditions of creatives across European and extra-European nations, to map future directions and scenarios for the creative and cultural work.

2–4 December 2021

Sixth International Conference on **Education Territories Nature – Citizenship Paths Beginning at School**, aiming at a re-organisation of the work started with the 2016 Conference by interdisciplinary working groups. Focus of the event is Education as a project for action and change, connected with Territories and Nature and thus turning into an utmost priority, because no relationship with Others and with the future is possible without education. [eduterranatura.events.unibz.it](http://eduterranatura.events.unibz.it)

2  
→



1 ← "Storytelling as a cultural practice" Event

Illustration © unibz

2 ← "Storytelling as a cultural practice" Event

Illustration © unibz

# Faculty of Design and Art



© Stefania Zanetti

## KEY DATA

### PEOPLE

339 Students  
15 Tenured Prof.  
19 Researchers  
68 Contract Prof.  
24 Technical and  
Administrative Staff

## BACHELOR

+ Design and Art –  
Major in Art  
+ Design and Art –  
Major in Design

## MASTER

+ Eco-Social Design



## Research Areas



Dean — Prof. Nitzan Cohen

The Faculty of Design and Art focuses on research activities centered on exploratory, evaluative, and participatory investigations; these concern issues and processes that connect design and art to knowledge fields and scientific disciplines like sociology, culture, philosophy, technology, environment, and ecology.

The ongoing goal is to develop and disseminate new ideas, new methodologies, creative practices, and new forms of knowledge production. New courses of action and combinations of practices, discourses, and critical reflections between creating, inventing, testing, and exhibiting as new forms of design and art-based research. The Faculty's research activities span from more established forms of design and art, such as product design, communication design and contemporary art practices to emerging or established sub-fields like eco-social design and/or art, participatory design and art practices, and a wide scope of experimental relations with issues related to

anthropology, sociology, biology, artistic intelligence, and education.

Synergies between practitioners, scientists from humanistic disciplines, artists, designers, and creative methods generated an increasingly interdisciplinary network that links together different faculties of unibz and these with other universities, art institutions, museums, and research labs in Italy, Europe and worldwide. The Faculty's international research network is wide and continuously expanding with research partners located in Austria, Germany, Switzerland, The Netherlands, Portugal, Spain and the UK, and Erasmus partners in Australia, Mexico, New Zealand, and the US.



Vice Dean for Research — Prof. Gerhard Glüher

Research at the Faculty of Design and Art can be conceived as linking and comprising classical disciplines; nevertheless, the knowledge generated by the Faculty's investigations cannot be restricted to one single discipline as a large part of it consists of practical action, an innovative idea, and a visual approach. Such forms of research are, for example, exhibitions, participatory social interventions, investigations into methods of augmented reality visualisation, living spaces and forms of life, and experimental investigations into new materials and (bio)technological processes.

Each of the three research clusters has its own profile but research groups are combined in a flexible way to generate the best possible knowledge. Most of the research topics are related to current social and environmental situations with a constant focus on designing optimised living conditions and ways of communicating.

### **MAKE: Exploring Innovative Approaches to the Ideation of Artefacts and Spaces**

**Coordinator:** Gerhard Glüher

The research cluster "make" explores innovative approaches to the ideation of artefacts and spaces and alternative ways of enhancing the intrinsic value of the artwork.

Special focuses are the Design Friction Lab, that develops and investigates innovative and sustainable materials, "do-it-yourself (DIY)" processes and the interfaces between electronic technologies and design, and the research field "public space" that investigates into the possibilities of 3D mapping and digital reconstructions of the physical space.

### **TRANS-FORM: Exploring Design, Art and Social Practices for political and eco-social Transitions**

**Coordinator:** Aart van Bezooijen

The cluster's research focus brings it close to the Master in eco-social design and its working methods are based on a participatory understanding of design. The cluster develops new forms of communication and possible solutions for future and current topics within the framework of "sustainability". The topic "care" was specified by the aspect "work" and was investigated in the light

of socio-political issues. Intense publishing activity included printed and online publications as well as the design and concept of websites, as is common in design-based research. Worth mentioning is the “Well-Use-Values” project, in which an interactive toolkit is developed as a new communication format exploring the concept of values in eco-social work; the outcome will be available in its applied research form. A new cumulus Network was activated and started the “Co-create” research project. In this way research activities are connected with teaching on a high level.

**ENABLE Design & Art Competences, Material Culture and Human Development**

**Coordinator:** Andreas Metzner-Szigeth

This cluster encompasses research interests that deal with artistic processes and forms of expression centering around aesthetics, design, and art theory as well as with sociological and didactic issues and methods. Therefore, the results are scientific textual forms but artistic and experimental forms of research in design disciplines also make a clear appearance.

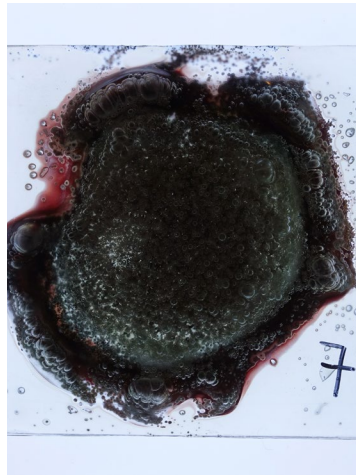
The focus in this cluster is on the area of interfaces, interaction, and evolution of digital technologies, as well as on an art-related field which investigates “embodied knowledge” in artistic actions, and on innovative forms of visualisation, graphic design, print media and design and media. Established in 2018 as a joint initiative of the Free University of Bozen-Bolzano and the Autonomous Province of Bolzano-Bozen, the Platform Cultural Heritage and Cultural Production aims to research the cultural heritage of the European region of Tyrol-South Tyrol-Trentino, to disseminate information and to attract interest on it, and this aiming at involving a broader public in the themes of heritage and of making the latter comprehensible as a cultural production and as a relevant part of the present. In the recent two years the Platform focused on themes that are crucial both locally and internationally, such as the dissonant heritage of the First World War and the legacy of fascism in Bolzano-Bozen, or the fragile heritage of twentieth-century architecture; the platform has also organized events, conferences, and visits open to the public, as well as a series of meetings held as part of the Studium Generale.



## SVIP Scientific Visualization: Impact on Practice

Scientific Visualizations: Impact on Practice (2019–2022) is an interdisciplinary research project. Fostering a collaboration between members of the Faculty of Design and Art and members of the Faculty of Science and Technology, it assessed the relationship between design and art and scientific visualization practices. Contributing to the field of image studies and art theory, the project involved art and media theorists, a team of scientists, a designer, and an artist. The goal was to consider the diverse roles and modes visual arts can adopt in shaping the scientists' relationship with their visual production and imagination. To this aim, art and media theorists observed and participated in the process, in which this relationship unfolded.

The project SVIP was organized into four phases set up by the art theorists: after a first phase of mutual acquaintance, the second phase was dedicated to the cooperative process between a designer (M. M. Moretti) and the scientists; the third phase consisted of the collaborative artistic intervention of Italian artist Elena Mazzi; the fourth phase was dedicated to dissemination. Artistic practice and design practice have been shown not only to produce different results, but also to develop in different ways.



As a first step, the designer assisted the scientists in the so-called “visual abstracts”, that is, in visualisations intended to synthesize an article’s content that is to be sent to academic journals and facilitate its effective dissemination among the scientific community and a broader audience. Due to their being somewhere between scientific knowledge and information dissemination, the graphic abstracts produced by Moretti and the scientists became the shared ground for interdisciplinary, design-science collaboration. Drawing on Gestalt principles applied to data visualization and on the research work led by Edward Tufte, the series of visualizations resulting from these collaborations was well-received by the scientific community.

Rather than providing a service to the scientists, the artist’s work pursued a translation of scientific contents into an art piece: Mazzi structured a series of workshops

FUNDING TYPE  
Internal Funding

DURATION  
09/2019 — 08/2022

RESEARCH AREA  
ENABLE

UNIBZ RESEARCH TEAM  
Prof. Stephan A. Schmidt-Wulffen (Principal Investigator), Dr. German A. Duarte Peñaranda, Dr. Matteo Maria Moretti, Dr. Andreas. Facchetti

Prof. Stefano Cesco, Prof. Tanja Mimmo, Dr. Luigimaria Borruso (Faculty of Science and Technology)

PROJECT PARTNER  
Elena Mazzi

designed for scientists to reflect on their experimental practice and allow them to explore the experimental dimension of her work as an artist. Scientists were invited to a glass laboratory (Vetroricerca Studio in Bozen-Bolzano), where they were encouraged to enter the artist’s sphere of experimentation. Copperialities is a video installation, in which Mazzi merges the exchanges just described in a multimedia artwork that challenges formalizations of scientific data. The installation will be presented at the Free University of Bozen-Bolzano in April 2022 and at the PAV – Parco Arte Vivente in Turin (June – August 2022).

↑ © Faculty of Design and Art



## Co-Create – Co-designing connected objects with and for children in remote

Il progetto di ricerca Co-create, finanziato dalla Libera Università di Bolzano, si proponeva di espandere il processo di co-progettazione con i bambini, da un ambiente fisico di classe e di laboratorio a un processo di co-creazione a distanza in cui bambini di località diverse, con diverso accesso a strumenti e strutture, potessero collaborare alla creazione di idee di oggetti connessi, o smart.

Il risultato previsto era la creazione di strumenti digitali/analogici che consentissero ai bambini di collaborare a distanza alla creazione di nuove idee per la tecnologia digitale e di riflettere al contempo sulle questioni critiche legate all'uso consapevole e sensato di tale tecnologia.

Il progetto prevedeva una collaborazione con Roberta Bonetti (UNIBO), l'Istituto Comprensivo

Difesa Grande di Termoli e Samlabs per condurre una serie di workshop collaborativi online intitolata Nuove tecnologie per il futuro.

L'obiettivo era insegnare agli studenti (13-14 anni) come funzionano le tecnologie intelligenti, attraverso un processo di progettazione collaborativa in cui hanno ideato oggetti intelligenti per la loro scuola. Ogni studente ha avuto a disposizione un kit Samlabs che ha permesso di costruire i propri prototipi con sensori e attuatori, collaborando con altri studenti nei laboratori online per sviluppare idee, imparare gli uni dagli altri ed elaborare riflessioni collettive.

FUNDING TYPE  
Internal Funding

DURATION  
09/2021 — 08/2021

RESEARCH AREA  
MAKE

UNIBZ RESEARCH TEAM  
Prof. Secil Ugur Yavuz (Principal Investigator), Prof. Nitzan Cohen

Prof. Stefano Cesco, Prof. Tanja Mimmo, Dr. Luigimaria Borruso (Faculty of Science and Technology)

PROJECT PARTNERS  
Università di Bologna, SAM Labs, Istituto Comprensivo "Difesa Grande" Termoli

WEBSITE  
cocreate.projects.unibz.it



La serie di workshop online è stata seguita da un workshop fisico a Termoli, dove gli studenti hanno costruito prototipi interattivi utilizzando tecniche di mock-up low-fi.

- 1 ← Toolkit for hacking plush toys to give them a second life © Photo by Curzio Castellán
- 2 ↑ Prototypes of robots built with everyday materials with DIY instructions © Photo by Curzio Castellán





## Well-Use-of Values. Social Design Toolkit

Das Projektes Well-Use of Values beschäftigte sich mit der Entwicklung eines spielähnlichen Instruments (Toolkit), welches ökosoziale Initiativen und Kleinunternehmen dabei unterstützt, ihre Werte, die darauf beruhenden Aktivitäten und deren Nutzen zu verdeutlichen und erfolgreich zu kommunizieren. Hierfür wurde mit mehreren Akteuren des öko-sozialen Bereichs in der Europaregion Tirol-Südtirol-Trentino zusammengearbeitet.

dieser Werte nach innen und außen zu erleichtern.

Mithilfe gestalterischer Ansätze wurde an den zwei miteinander verknüpften Fragen gearbeitet:

- + Wie kann der Nutzen ökosozialer Arbeit visualisiert und kommuniziert werden?
- + Wie können generierte Werte innerhalb von Organisationen, Initiativen oder kollaborativen Netzwerken identifiziert werden, insbesondere in solchen, die heterogen sind und in nicht-hierarchischer Weise arbeiten?

FUNDING TYPE  
Internal Funding

DURATION  
10/2018 — 03/2022

RESEARCH AREA  
TRANS-FORM

UNIBZ RESEARCH TEAM  
Prof. Kris Krois (Principal Investigator),  
Dr. Jennifer Schubert

PROJECT PARTNERS  
Lab:bz, La Foresta, Officine Vispa

WEBSITE  
[welluse.projects.unibz.it](http://welluse.projects.unibz.it)



Im Mittelpunkt der Forschung stand das Verständnis der theoretischen und praktischen Arbeit, welche auf Idealen und neuen Wertschöpfungsmodellen einer transformativen Wirtschaft basiert.

Gemäß dem Ansatz "Forschung durch Design" und der Erforschung partizipativer Designprozesse wurden Experteninterviews und Workshops mit drei Initiativen durchgeführt, über Mappings erarbeitet und durch Feedback-Sitzungen in Fokusgruppen abgerundet. Das dabei entwickelte digitale Workshop-Konzept basierte auf einem explorativen digitalen Whiteboard. In einem zweiten Schritt wurden die gesammelten Inhalte und Ergebnisse systematisiert und zur Erstellung einer weiter ausgearbeiteten analogen Version des spielähnlichen Instruments mit dem Namen VALUE MATTERS verwendet.

Im Laufe des Projekts wurden sozial, ökologisch und/oder politisch engagierte Initiativen und Organisationen dabei unterstützt, zu erkennen und zu artikulieren, auf welchen Werten sie ihre Unternehmungen aufbauen und welcher Nutzen (abseits eines finanziellen) sich daraus ergibt. Ziel war es, eine Diskussion über Grundwerte innerhalb der Organisationen anzustoßen sowie die erfolgreiche Kommunikation

← "Well-Use-of Values" project © Illustration by  
Anna Laumer



## Cooperation and Internationality

In 2021 research activities and international cooperations continued, in spite of the great challenge posed by the pandemic situation. Public activities like exhibitions and participation in art and design fairs and competitions could be activated again and also dissemination activities could be re-started, with researchers participating in online and on-site international and national scientific conferences, workshops and exhibitions. Our international Research network is wide and continuously expanding. We are currently collaborating with partner from Austria, Finland, Germany, Holland, Portugal, Spain and the UK, with Erasmus partners in Australia, Mexico, New Zealand, and in the US.

In 2021 the Faculty coordinated or was involved in 34 new and ongoing projects with an overall budget of about 1.7 million (internal and external funding).

March 2021

A team of seven researchers of the faculty participated in the initiative New Bauhaus of the Mountains: they organized the NEB Festival in Bolzano and the NEB public conference and workshops during the Klimahouse fair, launched the Project website and organized cross-thematic workshops during the year. Seven thematic clusters were developed: Circular Design and Bio-Economy; Digital transformation for the common good; Education through Art and Design; Valorization of sustainable and beautiful built environment; Design and

Art for Democracy; Creative Industries and Inclusive Society, and Sustainable and affordable housing.

05– 10 September 2021

At the Salone del Mobile, the world's most famous design fair, **Prof. Giorgio Camuffo** presented the project BASE with students from the Faculty. The idea of BASE was to bring together a selected group of independent, research-based projects that interpret design as a method beyond the creation of functional mass-produced objects.

10 October – 18 December 2021

Prof. Camuffo organised a series of online lectures based on the research work carried out for his book *IMAGO, 1960–1971*, which collects and documents the magazine *Storie di grafica italiana* (directed by Michele Provinciali). The book's publication was followed by a series of 30 online conferences on the little studied history of facts and people in Italian graphics, presenting episodes useful to understand how the design profession has changed.

22 May– 21 November 2021

Dr. Davide Ferrando made an exhibition contribution in connection with his project "Home Delivery 2.0" at the 17<sup>th</sup> Architecture Biennale in Venice.

November 2021

Roberto Gigliotti and Nina Bassoli edited an issue of "Turris Babel", the journal of the Alto Adige Architects Chamber, dedicated to public space and its activation. The structure of the issue is defined by five statements that guided the editors in the choice of the projects selected for publication: Tools, Stages, Voices, Grounds and Fieldworks. Five chapters animate the narration of the issue, knotted into a single narrative canvas, like five possible acts of a single, multi-voiced performance. The projects were not collected by geography, nor by typology; rather, the local territory is considered a constellation of specific and potentially universal realities and the authors tried to look at actions beyond walls, limits and boundaries so that the stories they draw between the pages of the magazine, cross, in short, a series of projects "dedicated to public space and its activation".



↑ Turris Babel Journal Cover



## Research Events

06 marzo 2021

### **Transforming the City by Care (TCC). Design e interventi in collaborazione con i cittadini di Bolzano.**

Il prof. Kris Krois ha condotto il workshop e la conferenza ad esso collegata, incentrati su 10 micro-interventi nel quartiere Don Bosco di Bolzano. È stato presentato il Progetto Transforming the City by Care (TCC), che è nato dagli intenti comuni e dalla collaborazione tra la Libera Università di Bolzano, la cooperativa sociale OfficineVispa e l'Ufficio Famiglia, Donna, Gioventù e Promozione sociale del Comune di Bolzano ed è stato sviluppato nell'ambito del Master in Eco-Social Design.

23–26 settembre 2021

### **By Design or by Disaster: Workstorming – transformative work for livelihoods.**

Serie di conferenze con speaker internazionali organizzata in collaborazione con il Master in Eco-Social Design e collegata al festival "hier und da" svoltosi in Alta Val Venosta.

Gli interventi hanno posto quesiti e aperto discussioni importanti per la ricerca su temi quali, ad esempio, se sia possibile creare domanda nel mercato del lavoro per un lavoro realmente trasformativo; oppure quali strutture

e programmi siano necessari a supporto dello sviluppo di pratiche orientate alla trasformazione che possano, allo stesso tempo, fornire mezzi di sostentamento agli operatori; o ancora, come possano essere sviluppate le istanze potenziali al crocevia tra lavoro sociale, design trasformativo e innovazione sociale?

01 ottobre–04 novembre 2021

**Storie di grafica italiana**, serie di 23 conferenze aperte al pubblico, curate dal prof. Giorgio Camuffo. Importanti designer e ricercatori nel campo del design italiani hanno analizzato svariate tematiche, quali ad esempio La grafica svizzera in Milano; John Alcorn e l'approdo del PushPinStyle in Italia; Saul Steinberg. La teoria del naso e altre illuminazioni; Fortunato Depero; Le riviste della controcultura in Italia; Gianni Sassi; Antonio Tubaro e l'utopia Didattica; I fratelli Castiglioni e i grafici, oltre ad affrontare argomenti più teoretici e storici.

02–25 novembre 2021

Serie di conferenze tenute dal prof. Aart van Bezooijen:

- + Material Talks – Biofabricated Materials
- + Material Talks – Do-it-Yourself Materials
- + Material Talks – Hemp

10 dicembre 2021

Aleida Assmann, Elsbeth Wallnöfer, Hans Heis, Gabriele Di Luca, Martin Bredenbeck hanno preso parte in qualità di speaker alla conferenza scientifica **"Heimat – Ancora oggi? Sulla durata e attualità di un concetto"** organizzata dalla Piattaforma Patrimonio Culturale Produzione Culturale.



1 ↑ © Image by bydesignorbydisaster

2 ← Material Talks – Do-it-Yourself Materials

Banner © Photo by Sofia Duarte

# Competence Centre for Regional History

KEY DATA

PEOPLE

5 Researchers

1 Administrative Staff



Director — Prof. Oswald Überegger

The Competence Centre for Regional History has historical-scientific purposes, with activities on the research and mediation fields centering on the historical Tyrol and the Alpine region and aiming in particular at conducting basic historical research, intensifying scientific cooperation, and strengthening the network of regional historical research in the Alpine region. In the course of 2021, the said historical research and mediation activities were consolidated and expanded. Moreover, three new projects were launched: one on memory culture, focusing on women's biographies and street names; a second project centering on letters of the nobility as sources for kinship research in the early modern period and a third one casting new light on norms and practices for the control of 'deviant' mobility in Tyrol, on the basis of sources from the Austrian archives dating back to the second half of the 19<sup>th</sup> century.

The Centre also sought to set new highlights in the field of history communication with the initiative "History on Tour", a lecture programme set up for South Tyrolean

educational and historical associations. The first series of historical lectures in the educational programme was held in 2021.

The Competence Centre's research activities focus on the following three research areas.

**Regional Contemporary History Coordinators:** Oswald Überegger and Karlo Ruzicic Kessler

This research area analyses regional history during the 20<sup>th</sup> century, with a special focus on history after 1945 and on historical memory cultures. Coming to terms with the history of the 20<sup>th</sup> century is still difficult and controversial in South Tyrol: the end and the consequences of the First World War, fascism and National Socialism, option and resettlement, the "bomb years" and finally the history of autonomy are not only object of scientific research, but also subject to controversial and often instrumentalised public debate. The aim of this research area is to objectify the discourses and to provide new impulses for coming to terms with regional contemporary history.

**Regional History of the Modern Age Coordinator:** Francesca Brunet

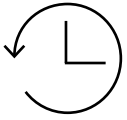
The "long" 19<sup>th</sup> century in the Tyrolean region is the focus of this research area. On a regional level, the 19<sup>th</sup> century can be described as an elementary development phase, a "laboratory of modernity" (E. Frie), which still can be taken as a framework for our under-

standing of Tyrol, "Tirolizität" or "Trentinità", and the "Tyrolean region". This development process is closely interwoven with nationalisation, social differentiation, and medialisation.

After 1800, a completely new sphere of action and perception emerged, which was generated by state-institutional practice, religious-ecclesiastical transformation, socio-economic change, cultural modernisation, and communicative consolidation and these peculiar regional-historical issue are dealt with by researchers adopting a basic heuristic approach.

**Regional Women's and Gender History Coordinator:** Siglinde Clementi

Within this research area, the category "gender" is given new significance in the analysis of regional history. Since the 1970s, a differentiated view on women's and gender history has begun to take hold and to call for "gender" to be considered as a relational category in all historical epochs. In regional history, women's and gender history is still strongly marginalised and underexposed. This research area aims to counteract these deficits and focuses in particular on the transition period from the 18<sup>th</sup> to the 19<sup>th</sup> centuries, when modernity was shaped, on the first half of the 20<sup>th</sup> century with Fascisms and the total wars, and on the transition period to postmodernism, in which the 1970s feminism stood out as a political and cultural driving force.



## Der Soziale Wohnbau in Südtirol 1945–1980

Steigende Immobilien- und Mietpreise rücken Wohnungsfragen europaweit wieder stärker in den Fokus des öffentlichen Interesses. Die historische Untersuchung der Wohnungspolitik in Südtirol kann dazu beitragen, im regionalen Maßstab Ursachen für gegenwärtige Wohnungsprobleme zu eruieren und verschüttete Lösungskonzepte neu zur Diskussion zu stellen.

Methodisch zielt das Forschungsvorhaben auf einen Vergleich der verschiedenen Wohnbauprogramme, die in den ersten drei Jahrzehnten nach Ende des Zweiten Weltkriegs von der italienischen Regierung und der Autonomen Provinz Bozen initiiert und umgesetzt wurden. Neben der Darstellung des quantitativen Umfangs der diversen Wohnbauinitiativen und ihrer architektonischen Ausgestaltung im Rahmen urbaner und ländlicher Siedlungsplanung soll insbesondere eruiert werden, welche (ethnischen) Bevölkerungsgruppen mit welchen Wohnbauprogrammen gezielt gefördert wurden und wie erfolgreich die verschiedenen Wohnbauprogramme im Erreichen ihrer selbstgesteckten Ziele waren. Der Erfolg sozialer Wohnbaupolitik misst sich daran, wie stark sie dazu beitragen kann, soziale Spannungen abzubauen und den allgemeinen Lebensstandard einer Gesellschaft zu heben.

Am Beispiel Südtirol lässt sich zeigen, dass Wohnbauprogramme den hohen gesellschaftlichen Ansprüchen nicht immer gerecht werden. In den 1950er- und 60er-Jahren verschärfte eingeschränkte Mitspracherechte der Regionalverwaltung im Bereich der Wohnungspolitik (insbesondere in Bezug auf die Wohnungszuteilung) die Spannungen zwischen den Südtiroler Sprachgruppen, die sich erst infolge der Föderalisierung staatlicher Wohnungspolitik verflüchtigten. Ab den 1970er-Jahren zeitigte die regionale Wohnungspolitik in Kombination mit arbeitspolitischen Maßnahmen vor allem in Südtirols Landgemeinden positive Effekte, zumal sie dazu beitrug, die Abwanderung einzudämmen. Gleichzeitig eröffneten Enteignungen von Ackerland für die Errichtung geförderter Mehrfamilienhäuser wiederum neue ökonomische und kulturelle Konfliktfelder.

DURATION  
11/2019 — 10/2022

RESEARCH AREA  
Regional Contemporary History

PRINCIPAL INVESTIGATOR  
Dr. Joachim Gatterer



## Cooperation and Internationality

Nel 2021 il Centro di Competenza ha collaborato con svariati partner nazionali ed esteri.

Il Centro di Competenza collabora a HISTOREGIO, grande progetto Euregio che vede coinvolte anche le Università di Bolzano, Innsbruck e Trento e che prevede una serie di iniziative di ricerca e di mediazione, con l'obiettivo di rafforzare la cooperazione internazionale nel campo della storia regionale, in un contesto multilingue.

Oswald Überegger è membro del comitato consultivo scientifico internazionale del progetto **Informal Communication and Information 'From Below' in Nazi Europe** che, come Leibnitz Junior Research Group, ha sede presso l'Istituto di Storia Contemporanea di Monaco. Lo scopo è analizzare l'interazione tra l'informazione ufficiale "dall'alto" e la diffusione dell'informazione non ufficiale "dal basso" nel nazionalsocialismo, nonché il ruolo del passaparola, da una prospettiva di studi culturali e di storia culturale.

Oswald Überegger è un membro associato del gruppo di ricerca **Sexual Violence in the First World War: Military Court Records of the k.u.k. Army and Ego-Documents as Sources**, che coinvolge diversi dipartimenti dell'Università di Vienna (Storia, Storia contemporanea, Storia economica e sociale, Storia dell'Europa orientale) e il Centro di Competenza di Storia regionale.

Siglinde Clementi è membro del comitato consultivo internazionale del progetto di ricerca **Noble Siblings: Wealth Arrangements and Social Configurations from the Sixteenth to the Eighteenth Centuries** avviato dal Dipartimento di Storia Economica e Sociale dell'Università di Vienna e finanziato dall'Austrian Science Fund FWF.

Siglinde Clementi è membro del consiglio della Società Italiana delle Storiche, l'associazione nazionale italiana per la storia delle donne e di genere.

Karlo Ruzicic-Kessler è membro associato del progetto di ricerca "Das Ende des Kalten Krieges und die österreichischen Bundesländer" e come tale collabora con l'Università di Innsbruck, l'Università di Hildesheim e l'Università di Vienna.

Francesca Brunet è membro associato del progetto di ricerca internazionale e interdisciplinare **Milano and Ticino (1796-1848). Shaping the Spatiality of a European Capital**, finanziato dal Fondo Nazionale Svizzero per la Ricerca Scientifica (FNS) e realizzato dall'Università di Lucerna, dall'Università della Svizzera Italiana – Archivio del Moderno, e dall'Université Paris 1 – Panthéon Sorbonne, in collaborazione con l'Università di Milano, l'Università Cattolica di Milano, il Politecnico di Milano, l'Università di Innsbruck e l'Accademia Austriaca delle Scienze.



## Research Events

In 2021, the Competence Centre for Regional History organised two international conferences, two international workshops and several evening lectures.

3–4 June 2021

The international conference **Construct, Transform, Control. Legal transfer and space management in the early 19<sup>th</sup> century** was held online and was organised as part of the SNF-Synergy Projekt CRIIS\_177286. As such it was a collaboration between the Competence Centre for Regional History (Francesca Brunet), the University of Lucerne, the University of Italian Switzerland and the University of Paris 1-Panthéon Sorbonne.

16–18 September 2021

The international conference **Kinship and Business. Law, Gender and Generational Perspectives (16<sup>th</sup>–20<sup>th</sup> Centuries)** was organised by the Competence Centre (Siglinde Clementi) in collaboration with the Institute of Economic and Social History of the University of Vienna and the Department of Economics and Management of the University of Trento.

1  
→



15 October 2021

The international workshop **Rinchiudere, costringere, allontanare. Lo spazio come strumento di separazione e controllo sociale tra il secondo Ottocento e il primo Novecento / Einsperren, beschränken, ausweisen. Der Raum als Mittel der Separierung und sozialen Kontrolle vom späten 19. bis zum frühen 20. Jahrhundert / Locking up, forcing, removing. Space as an instrument of separation and social control between the second half of the 19<sup>th</sup> century and the early 20<sup>th</sup> century** was organised by the Competence Centre (Francesca Brunet) in collaboration with the Institute for Interdisciplinary Legal Studies at the University of Lucerne - lucernaiuris, and the Università della Svizzera Italiana, Archivio del Moderno.

11–13 November 2021

The international conference **Regionale “Frühfaschismen”. Faschistische Herrschaftsdurchsetzung und -rezeption im interregionalen Vergleich / Prefascismi regionali. Esercizio e ricezione del potere fascista in un confronto interregionale** was organised at the Free University of Bolzano, Bressanone by Oswald Überegger and Karlo Ruzicic-Kessler.



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1 ← Image of the “Kinship and Business” Event

2 ← Informationsschrift des Landtages

und der Landesregierung, Heft 5/1972, S. 49

© Autonome Provinz Bozen (Hg.)

# Competence Centre Tourism and Mobility

KEY DATA

PEOPLE

3 Researchers

1 Professor

1 Administrative Staff



Director — Prof. Thomas Bausch

In 2021 the Competence Centre was successfully reconfirmed, and in spite of the Covid-19 crisis ongoing projects were continued and new projects could be launched. Especially in the research area “Methods and Theories”, researchers could start various projects on the mobility and movement behaviour of cyclists, for instance in Bruneck-Brunico to evaluate the biking lanes in the city, or in Eppan-Appiano and Vahrn-Varna to analyse the success of e-bike commuter projects. In addition, researchers started a preparatory work focused on the development of methods for data collection in the traffic network as well as on the observation of intermodal behaviour, carried out by using GPS-based movement patterns. Also, the research team launched a large intercultural study in May, investigating how sustainability and sustainable tourism are understood in different countries and cultures.

In 2021, a two-phase explorative study was carried out analysing the connection between the destination image of tourists and their holiday experiences. Before

the holiday, the study participants were asked about the destination image they had pictured, and they were asked again after their holiday stay. The data analysis now identifies factors that trigger a change in the destination image. The results flow into a regular exchange with the IDM Südtirol Alto Adige to improve destination marketing.

In 2021, the research activities of the Competence Centre Tourism and Mobility were organised in three main research areas, coordinated by the Centre’s Director prof. Thomas Bausch.

## Methods and Theories

Tourism and mobility are the result of human behaviour, combining personal preferences, social and personal norms, and the possible accessible alternatives when it comes to deciding how to travel. In this research area, the Competence Centre aims at providing new theoretical and methodological contributions to better understand behaviours in tourism and mobility, and to develop effective strategies and management techniques, focusing on cycling as part of a sustainable mobility in South Tyrol.

## Destination Development

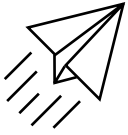
In this research area, research is focused on Destination brand equity and hybrid consumers and examines how the image of a destination develops in the consumers’ minds, and how this image contributes to the brand equity of

destinations. It is assumed that consumers have an individual and changing image of destinations, but it is still impossible to determine how the travellers’ personal image of the destination changes between the first visit and the subsequent ones, or to clarify, to what extent measures aiming to create a sustainable destination contribute to the envisioned destination image. This research area wants to answer these two questions and provide management and marketing solutions for South Tyrol.

## Network Strategies

Digitalization can help close the information gap before and during a guest’s stay at a specific destination and hosts are currently investing a lot in digital information tools. Nevertheless, the human factor still plays a key role in tourism, especially in South Tyrol where most accommodation facilities are small family businesses. Face-to-face dialogue between hosts and guests remains a key asset but should be merged into a visitor flow management system. With specific tools, hosts could create a network allowing to differentiate recommendations for trips and visits to attractions, thus influencing public transportation usage, ticket reservations, and even parking lot management near hot-spots and resulting in a better management of the visitors’ flow. The Competence Centre is currently preparing a study to analyse key aspects in the host-guest communication, such as FAQ and recommendations given, or which technologies are used.





### How holiday stays change destination image: a pre-after stay analysis

Research on tourism has produced contradictory results concerning both the question of how the destination image is affected by previous visits of the site, and the related concepts of experience and familiarity. While the influence of these concepts on the destination image has been investigated numerous times, there is constant debate on their operationalisation, the frequently missing differentiation between the said concepts (and further concepts such as awareness, knowledge, and expertise), and the contradictory findings about their effects on the destination image.

The researcher team chose an explorative approach to develop, operationalise and test a model showing the interrelationship of the pre-visit image, the personal experience during the visit, and the post-visit image.

This research project consisted of two survey phases: the first one took place in May 2021 and the results were then complemented with additional data gathered during a second phase, which took place in the Fall of 2021. This two-phase approach was chosen because it allowed to understand all the travellers' pre-trip expectations and impressions and later to assess the role of the visit on the development of the destination image. In this way, the researchers were not only able to compare the actual experience at the destination to the pre-trip expectations and to check whether these expectations were fulfilled, but also to assess the post-visit destination image held by the German and Italian participants.

**DURATION**  
2019 — 2023

**RESEARCH AREA**  
Destination Development

**UNIBZ RESEARCH TEAM**  
Dott. Florian Ortanderl (Principal Investigator), Prof. Thomas Bausch

**PROJECT PARTNERS**  
IDM Südtirol Alto Adige, Allgäu GmbH - Gesellschaft für Standort und Tourismus

- SELECTED PUBLICATIONS**
- + Bausch, T., Gartner, W. C., & Humpe, A. (2021). How weather conditions affect guest arrivals and duration of stay: An Alpine destination case. *Int. J. Tourism Research*. doi.org/10.1002/jtr.2459
  - + Bausch, T., Gartner, W. C., & Ortanderl, F. (2021). How to Avoid a COVID-19 Research Paper Tsunami? A Tourism System Approach: *Journal of Travel Research*, 60(3), 467–485. doi.org/10.1177/0047287520972805
  - + Bausch, T., Schröder, T., Tauber, V., & Lane, B. (2021). Sustainable Tourism: The Elephant in the Room. *Sustainability*, 13(15), 8376. doi.org/10.3390/su13158376
  - + Bausch, T. (2021). Managing hybrid destinations: Challenges and lessons from the Alps. In N. Boukas & D. Stylidis (Eds.), *Tourism marketing in Western Europe* (pp. 108–126). CABI. doi.org/10.1079/9781789248753.0006





## Cooperation and Internationality

Das Kompetenzzentrum hat die bestehende Zusammenarbeit mit Institutionen der Autonomen Provinz Bozen, den Gemeinden und den Stiftungseinrichtungen weitergeführt und ausgebaut. Einige Beispiele:

Zusammenarbeit auf Landesebene mit dem Ressort Landwirtschaft, Forstwirtschaft, Tourismus und Bevölkerungsschutz (Teilnahme runder Tisch Tourismus, Austausch zum Landestourismusentwicklungskonzept), dem Ressort Mobilität und Verkehr sowie der STA Südtiroler Transportstrukturen AG.

Kooperation mit Green Mobility Südtirol im Rahmen einer ergänzenden Datenauswertung der Mobilitätsbefragungsdaten.

Zusammenarbeit mit der Stadtgemeinde Bruneck und Green Mobility Südtirol zur Vorbereitung einer Evaluationsbefragung zu Verbesserungsmaßnahmen für die Fahrradmobilität in der Gemeinde Bruneck (Durchführung 2022).

Mitarbeit an den Arbeitsgruppen der IDM Südtirol zur Tourismusvision 2030 sowie im neu gegründeten Beirat für Umwelt und Nachhaltigkeit der Drei Zinnen Bergbahnen AG.

Vorträge im Rahmen von Veranstaltungen der Gemeinde Rasen-Antholz (Quo vadis? Mobilität im Fokus), der Handelskammer Bozen (Tag der Innovation 2021: Nachhaltige Unternehmensentwicklung) sowie Teilnahme am Expertenworkshop der Beobachtungsstelle für nachhaltigen Tourismus der EURAC Research.

Vorbereitung einer Studie zu Lebensraumqualität Südtirol und Tourismus als Vertiefungsstudie zum Landestourismusentwicklungskonzept in Zusammenarbeit mit EURAC Research.

Die Zusammenarbeit mit Forschungsinstituten wurde fortgesetzt oder neu aufgenommen, um gemeinsame wissenschaftliche Veröffentlichungen zu ermöglichen.

Die bestehende Zusammenarbeit mit der University of Minnesota (William C. Gartner) und dem Lehrstuhl für Tourismus an der Hochschule München (Andreas Humpe) wurde fortgesetzt und führte zur Veröffentlichung des Artikels "How weather conditions affect guest arrivals and duration of stay: An alpine destination case" (International Journal of Tourism Research, 2021, vol. 23–6).

Die Zusammenarbeit mit dem Lehrstuhl für Tourismus an der Fachhochschule München (Tilman Schröder) führte zu einer Publikation über das Verständnis von Nachhaltigkeit ("Sustainable Tourism: The Elephant in the Room." Sustainability, 2021, 13(15), 8376) und erforscht derzeit weitere interkulturelle Unterschiede in der Wahrnehmung von Nachhaltigkeit. Die Universität von Ostfinland (Raija Komppula) bringt weiteres Fachwissen in die laufende Forschung ein.

# Competence Centre for School Inclusion

## KEY DATA

### PEOPLE

4 Researchers  
3 Professors  
1 Administrative Staff



Director — Prof. Heidrun Demo

The Competence Centre for School Inclusion is active since March 2020 as a competence centre for research, networking and scientific communication in the area of inclusive education. It rests upon a broad idea of school inclusion as a constant developing of ways to tackle all students' diversities. Research in the field of inclusive education helps to grant to granting participation and achievement to all learners by identifying and removing barriers in the school culture and its policies and practices. This also means a responsibility towards the groups of children and students that are more at risk of experiencing exclusion and underachievement.

Research activities conducted at the Competence Centre aim at presenting and discussing research evidence from the Italian and South Tyrolean inclusive school system that can be found in international scientific networks and at developing inclusion in local kindergartens and schools through practice-relevant research activities.

Research is organised in two main areas.

## Development of inclusion in kindergartens and schools

Geographically, the Autonomous Province of Bozen-Bolzano is a perfect bridge between the culture of Italian and German speaking countries, that's why researchers in this research area have at first focused on the building of a joint, intercultural theoretical framework for school inclusion. This was developed under the coordination of Simone Seitz during a Research Week organised in 2021 and will result in an edited volume under the overarching topic of educational justice.

The Competence Centre also cooperated with other European Universities and with primary and lower secondary schools in a more empirical research topic, e.g. the Erasmus+ project "Digitalization and Inclusive Education" aiming at the development of digitalisation into an effective support for inclusive education.

Inclusive planning is also investigated, focussing on the critical role of the Individual Educational Plans (IEPs) and analysing specifically the tensions caused by the current normative framework that provides for a planning intended for the entire class, at the same time calling for specific IEPs for pupils with Special Educational Needs (PI Heidrun Demo). Moreover, the new Italian regulation on assessment prompted a new research line, which investigates the relationship between assessment and inclusion (PI Simone Seitz).

## Teacher training for inclusive education

Three main topics are crucial in this research area:

"FUTURE LAB. Lebensplanung/ Progetto di vita", a training course for in-service teachers funded by the European Social Fund. The course focused on how students with a disability can be granted an independent life and manage to move over to secondary schools and ended in November 2021 (PI Heidrun Demo). A successful bilingual training course for in-service secondary school teachers and educators addressed the topic of challenging behaviours in schools. The course will be completed in 2022 and aims at building learning environments that can prevent challenging behaviours or sustain their management, with a special focus on the school drop-out phenomenon (PI Vanessa Macchia). A third issue addressed in this area is the development of international learning resources for the initial training in inclusive education for teachers. The Centre obtained funding for the Erasmus+ project "All means all – an interactive, modular, multimedia Open Textbook for an inclusive and intersectional, multi-dimensional approach in teacher education" (PI Heidrun Demo).

The Competence Centre also cooperates with the Rector's Delegate for Disability in unibz to develop internal training on inclusive teaching for the teaching staff, with a specific attention to the rights of students with disabilities.



### **DigIn – Digitalizzazione e educazione inclusiva: per non lasciare indietro nessuno nell'era digitale**

Le chiusure sperimentate dalle scuole di vari Paesi durante il periodo pandemico hanno evidenziato varie criticità legate alla fruizione della didattica a distanza da parte di tutte le alunne e tutti gli alunni. Tale situazione sembra aver esacerbato l'esclusione di alcuni gruppi di ragazzi e ragazze, per i quali il passaggio alla modalità a distanza ha costituito un ostacolo all'apprendimento e alla partecipazione alle attività di classe per varie ragioni, tra cui le talvolta limitate competenze digitali degli insegnanti e la competenza nell'applicarle nella didattica in un'ottica inclusiva. Il progetto DigIn nasce in questo contesto e ha come obiettivo principale arrivare a utilizzare le tecnologie per superare le barriere all'inclusione vissute da alunne ed alunni con disabilità. Per ottenere tale risultato, si intende fare leva sullo sviluppo di competenze nell'ambito dell'educazione digitale e inclusiva da parte del corpo insegnante.

Due sono le linee d'azione adottate per garantire l'accesso e la partecipazione alla didattica digitale da parte di tutti/e:

- 1) assicurare che le tecnologie educative utilizzate per l'apprendimento siano accessibili;
- 2) supportare gli/le insegnanti nell'implementazione di tali tecnologie nella loro pratica didattica in modo inclusivo.

Tutto ciò si concretizza in una serie di obiettivi specifici, quali la realizzazione di un corso di formazione online per insegnanti volto a sviluppare le loro competenze digitali e la capacità di sostenere gli studenti con disabilità in un ambiente inclusivo; la raccolta di Best Practices a supporto della progettazione di nuove metodologie e materiali didattici digitali innovativi per l'inclusione di tutti/e; lo sviluppo di linee guida per il corpo docente, in riferimento all'accessibilità/fruibilità di risorse digitali esistenti, in linea con i principi e le strategie dell'Universal Design for Learning; l'autovalutazione dei propri punti di forza e delle aree da migliorare nell'uso delle tecnologie in senso inclusivo, da parte delle scuole partecipanti.

La partecipazione di diversi Paesi ed enti o istituzioni (università, scuole, ONG) costituisce una risorsa strategica del progetto, in quanto garantisce non solo una prospettiva interculturale, ma anche la condivisione di una varietà di esperienze e di approcci nell'ambito dell'educazione digitale e inclusiva.

Gli esiti del progetto costituiscono perciò un punto di partenza fondamentale nell'ottica del potenziamento della didattica inclusiva in risposta all'eterogeneità della classe, tramite l'utilizzo delle tecnologie digitali.

**FUNDING TYPE**  
Erasmus+ Knowledge Alliances – Grant agreement 2020-1-AT01-KA226-SCH-092523

**DURATION**  
06/2021 – 05/2023

**RESEARCH AREA**  
Development of inclusion in kindergartens and schools

**UNIBZ RESEARCH TEAM**  
Prof. Heidrun Demo (Principal Investigator), Prof. Dario Ianes, Dr. Rosa Bellacicco

**PROJECT PARTNERS**  
5 partners from Austria, Bosnia and Herzegovina, and North Macedonia, with Pädagogische Hochschule Steiermark as Lead Partner



## Cooperation and Internationality

Seit seiner Gründung im Frühjahr 2020 bildet die Zusammenarbeit mit lokalen Stakeholdern wie auch jene mit Experten auf internationaler Ebene einen wichtigen Schwerpunkt des Kompetenzzentrums. In Anknüpfung an die Initiierungen in seinem Gründungsjahr, gelang es dem Zentrum im Jahr 2021 weitere Kontakte mit lokalen Stakeholdern zu knüpfen und, über die fortwährende Zusammenarbeit mit Experten\*innen aus dem In- und Ausland, den Aufbau eines internationalen Netzwerkes weiter auszubauen.

Auf lokaler Ebene wurden in 2021 regelmäßige Treffen des Kompetenzzentrums mit den Inspektoren für Inklusion der drei Bildungsdirektionen des Landes Südtirol instituiert. Im Rahmen der Vorbereitung und Realisierung der beiden ESF-Projekte FUTURE LAB und ChallengeINschool arbeitete das Kompetenzzentrum weiter mit den drei Bildungsdirektionen der Provinz Bozen zusammen. Daneben kam es aber auch zu Zusammentreffen mit lokalen Institutionen und Vereinen, wie dem Arbeitskreis Eltern Behinderter (AEB), dem Eltern-Kind-Zentrum (ELKI) oder dem Südtiroler Monitoring-Ausschuss für die Rechte von Menschen mit Behinderungen.

Darüber hinaus wird die lokale Vernetzung über die Mitgliedschaft in einigen wichtigen lokalen Arbeitsgruppen und Vereinigungen gefestigt. Heidrun Demo ist Mitglied der institutionsübergreifenden Arbeitsgruppe Inklusion des Landes (IAIL; Gruppo di Lavoro Interistituzionale Provinciale per l'Inclusione – GILP) und des Südtiroler Monitoring-Ausschusses für die Rechte von Menschen mit Behinderungen (Osservatorio provinciale per i diritti delle persone con disabilità). Vanessa Macchia hingegen wurde zur Vize-Präsidentin des Dienstleistungszentrums für das Ehrenamt (DZE) Südtirol ernannt.

Auf internationaler Ebene fand auch 2021 ein regelmäßiger Austausch mit den Mitgliedern des wissenschaftlichen Beirats des Kompetenzzentrums statt. Daneben boten die Organisation und Realisierung der Research Week im Juni und September 2021 Momente des besonders intensiven Networkings. Neben den verschiedenen Beiträgen externer Expert\*innen (z.B. Mai-Anh Boger, Lorella Teri, Valentina Migliarini) wurde der Dialog im Rahmen eines gemeinsam realisierten Herausgeberwerkes fortgeführt und gepflegt. Fortgeführt wurde ebenfalls die Zusammenarbeit mit internationalen Experten (Joanne Banks, Rune Hausstatter) zur Thematik der Ressourcenzuteilung im Rahmen inklusiver Bildung.

Weiter ergaben sich neue Kooperationen im Forschungsbereich: eine mögliche Zusammenarbeit mit der Universität Frankfurt zum Thema "Barrierefreie Hochschule" sowie die Teilnahme an der Einreichung eines Antrages für die Finanzierung des Netzwerkes „Responsibility in Knowledge Production for Equity in Education: Students at Risk in European Education Systems“ gemeinsam mit der Pädagogischen Hochschule Ludwigsburg.



## Research Events

In 2021 the members of the Competence Centre for School Inclusion organised two events for teachers and other professionals in order to spread research results and possible contributions to the development of research-informed practices.



April and May 2021  
After the success of the Open Dialogue format organised by the Faculty of Education in 2020, the Competence Centre offered an analogous series of online events for teachers active on the local territory. Within the framework of four online meetings, the **Open Dialogues on School Inclusion** focused on diverse topics, aiming to create an open space for dialogue between researchers and practitioners by means of an input or informative part and a subsequent discussion section. The online meetings, all of them bilingual, were attended by around 300 teachers.  
[www.unibz.it/de/news/137754-offene-dialogue-zur-inklusion-im-bildungsbereich](http://www.unibz.it/de/news/137754-offene-dialogue-zur-inklusion-im-bildungsbereich)

15, 23, 29 October 2021  
The Conference **Didattica e inclusione scolastica – Emergenze educative / Inklusion im Bildungsbereich – Neue Horizonte**, has been organized by the Faculty of Education of unibz for the past 10 years but in 2021 it was taken over by the Competence Centre for School Inclusion with the aim to turn it from a national into an international bilingual (German/Italian) event. Discussion focused on theories, approaches, methods and tools that support learning and participation in an inclusive environment, with special attention paid to inclusive school development, collaboration in the classroom, at school and in networks, successful dealing with challenging behaviour, integrated digital didactics. Despite the online format, the conference reached 373 participants, the number including pre-school and primary school teachers, lower- and upper-secondary school teachers as well as freelancers, researchers, and students.

[didatticainclusione.events.unibz.it](http://didatticainclusione.events.unibz.it)

28 May 2021  
Finally, the Competence Centre sustained the conference organised at the Faculty of Education **Pensare IN grande. Pedagogia speciale per la prima infanzia (0-6)**, organised by Vanessa Macchia with the patronage of SIPeS and focusing on special pedagogy in support of pre-school children (0-6 years). The conference was attended by 250 teachers, educators, early childhood collaborators 0-6, researchers, parents, representatives of educational institutions.  
[www.unibz.it/it/events/137853-pensare-in-grande](http://www.unibz.it/it/events/137853-pensare-in-grande)

# Competence Centre for Plant Health

## KEY DATA

### PEOPLE

3 Researchers  
1 Professor  
1 Administrative Staff



Director — Prof. Tanja Mimmo

Plants are a fundamental element of our environment and provide the basis for our food supply chain. The different microclimatic zones in South Tyrol allow the cultivation of a variety of different crops, with a cultivated area of almost 25,000 hectares, where mainly apple orchards and vineyards, but also a number of different special crops are grown. Healthy plants are a prerequisite for high-quality food and sustainable agricultural productivity. Yet, crop health is endangered by climate change and the consequent rise in extreme weather events and by warmer temperatures and the spreading of invasive and destructive pests. The main objective of the Competence Centre is to study abiotic and biotic stress drivers to understand their influence on plant health, to investigate changes and foresee upcoming challenges, and to develop novel technological approaches. Basic research in the plant-environment interconnections is coupled with practice-oriented research projects. This will enable researchers to reach a real-time assessment of the direct impacts and to develop practical solutions, which in turn

can be taken as an important basis for facing future challenges in South Tyrolean agriculture and forestry. The research results will therefore contribute significantly to a more sustainable agriculture in South Tyrol.

The research activities of the Competence Centre are divided into three research areas:

### **Abiotic factors**

**Coordinator:** Tanja Mimmo

The ability of plants to adapt to their environment is crucial for their very survival. Various abiotic stress conditions, e. g. water or heat stress, or unfavourable chemical and physical properties of the soil, often limit plant health and growth. This research area combines plant genetics and physiology with soil chemistry and microbiology to study the plant-soil-environment interactions, which are fundamental aspects for a sustainable agriculture. In particular, the research activities focus on a more in-depth study of the adaptation strategies developed in cases of soil with low nutrient availability; on the plant-microorganism interactions in the rhizosphere; and on the effects of agronomic practices on the chemical and biological quality of the soil.

### **Biotic factors**

**Coordinator:** Hannes Schuler

Biotic factors are an additional important factor for plant health. Pathogens and insects can cause plant damage and have negative consequences on plant health.

Therefore, the protection of plants plays an essential role in the agricultural production: it calls for preventive measures and, above all, for a regulation of harmful organisms through direct control. The aim of this research area is therefore to investigate the biology, ecology and epidemiology of pathogens and pests and their interaction with the plant in order to develop solutions for an efficient and sustainable plant protection.

### **Technology and Management**

**Coordinator:** Fabrizio Mazzetto

Researchers collect, process and analyse a large amount of data and information to monitor plant health, recording significant environmental parameters relevant to the agricultural production and tracking each single work step for these data to be exploited later on. A second focus is the development and production of innovative mechatronic and robotic solutions for automatic plant protection and early detection of diseases. A third focus is on the development of rapid methods for evaluating primary and secondary drift phenomena in controlled environments; they are carried out on full-scale machines, and aim at assessing the environmental, social and economic sustainability of these technologies. In addition, synthetic smart materials and nanomaterials, as well as sensors will be integrated with plants to measure and enhance their properties.



## **FIGHToplasma – Genomica di popolazione dei fattori che influenzano la trasmissione del fitoplasma**

Una delle malattie più rilevanti che colpisce i meli è quella detta “degli scopazzi del melo”. I sintomi principali consistono nello sviluppo di rami dal caratteristico aspetto simile a una scopa di saggina, con stipole allargate e un sistema radicale più debole. Tali cambiamenti fisiologici portano alla formazione di frutti piccoli e insapori. L'impatto economico di tale malattia è particolarmente evidente in caso di focolai, poiché ad oggi l'unica soluzione consigliata è l'eradicazione degli alberi infetti che causa importanti perdite economiche.



L'agente responsabile degli scopazzi del melo è il batterio 'Candidatus Phytoplasma mali'. Si tratta di un batterio senza parete cellulare, che vive come patogeno obbligato all'interno del floema. Ha un genoma

piccolo (circa 600 kb) con diversi elementi ripetitivi. Alcuni geni codificano per proteine effettrici, che disturbano l'equilibrio ormonale della pianta e la sua fotosintesi.

In Italia, “Candidatus Phytoplasma mali” è trasmesso da due insetti vettori, *Cacopsylla picta* e *Cacopsylla melanoneura*, che diffondono il fitoplasma nutrendosi del floema delle piante infette. La loro efficienza come vettore varia da regione a regione: *Cacopsylla picta* è il vettore principale nel Nord-Est, *Cacopsylla melanoneura* nel Nord-Ovest. Finora non è chiaro se queste variazioni siano causate dalla presenza di individui geneticamente diversi, da una diversa composizione della loro comunità microbica o da sottotipi di fitoplasma distinti.

Il progetto FIGHToplasma mira a individuare i fattori che influenzano l'acquisizione e la trasmissione del fitoplasma. Questo è il primo studio che prende contemporaneamente in esame l'intero sistema tripartito: insetto – microbioma – fitoplasma. Per comprendere questa complessa interazione, studi precedenti hanno utilizzato una combinazione di singoli marcatori genetici con una risoluzione limitata. In questo lavoro si applica invece un approccio che considera il genoma completo dell'insetto e dei suoi simbionti, utilizzando tecnologie di sequenziamento all'avanguardia (Illumina, Nanopore). Queste tecniche, unite ad esperimenti di acquisizione

### FUNDING TYPE

Joint projects Austria — South Tyrol / Alto Adige

### DURATION

03/2020 — 12/2023

### RESEARCH AREA

Biotic factors

### UNIBZ RESEARCH TEAM

Prof. Hannes Schuler (Principal Investigator), Dr. Erika Corretto, Dr. Jessica Dittmer

### EXTERNAL PARTNERS

University of Natural Resources and Life Sciences BOKU Wien, Centro di Sperimentazione Laimburg Research Centre, Fondazione Edmund Mach, Università di Torino

### SELECTED PUBLICATIONS

+ Barthel, D., Schuler H., Galli J., Borruso, L., Geier, J., Heer, K., Burckhardt, D. & Janik, K. (2020). Identification of Plant DNA in Adults of the Phytoplasma Vector *Cacopsylla picta* Helps Understanding Its Feeding Behavior. *Insects*. 11, 835.

e trasmissione del fitoplasma, permetteranno di determinare i fattori coinvolti nella diffusione degli scopazzi del melo. Le conoscenze ottenute saranno cruciali per lo sviluppo di strumenti appropriati per monitorare e controllare la malattia.

← Dr. Erika Corretto applying insect cages to phytoplasma-infected apple trees

© Prof. Hannes Schuler





## Cooperation and Internationality

In 2021 the Competence Centre cooperated with the Department of Earth and Environmental Sciences (Prof. Bruno Basso) and the Kellogg Biological Station of Michigan State University (USA)

as well as with University of Padova's Department of Agronomy, Food, Natural Resources, Animals and Environment (Prof. Maurizio Borin and Prof. Paolo Sambo) in order to develop a

conceptual framework for smart agriculture and digital twin and present its application to a case study of N fertilization management in arable farming systems.



## Research Events

Im Einklang mit der Mission des Kompetenzzentrums für Pflanzengesundheit haben die Mitglieder des Zentrums an mehreren Online-Seminaren, Workshops und Konferenzen teilgenommen.

6. September 2021

Vortrag von Hannes Schuler im **Naturmuseum Bozen** mit dem Titel „Auch Insekten haben eine Darmflora – Spannende Geschichten zu Symbiose, Konkurrenz und Manipulation zwischen Insekten und Mikroorganismen“.

30. September 2021

An der **Pre-COP26 Konferenz Towards climate-smart Alpine forests** in Mailand nahm Hannes Schuler mit einem Vortrag zum Thema „The role of bacteria and fungi in the population dynamics of the European spruce bark beetle“ teil.

5. November 2021

Teilnahme von Tanja Mimmo an der Podiumsdiskussion über „Nachhaltigkeit in aller Munde! Nachhaltigkeit im Weinbau: Wahrnehmungen, Mythen und Perspektiven“ im Rahmen des **Meraner Wine Festivals 2021**.

23. – 24. November 2021

Im Rahmen des vom Verein der Absolventen Landwirtschaftlicher Schulen organisierten **Weinbau-seminars** hielt Tanja Mimmo den Vortrag „Auswirkungen von Kupfer auf die chemischen und biologischen Bodeneigenschaften“.

16. Dezember 2021

Für den Ausbildungslehrgang **Bodenpraktiker/in 2021/22** war Tanja Mimmo als Referentin des Seminars über „Nährstoffdynamiken in der Rhizosphäre: von Mobilisierungsprozessen bis zur Nährstoffaufnahme der Pflanzen“ innerhalb des Moduls 3 – Mykorrhiza, Wurzeln Wasserhaushalt im Agrarökosystem tätig. Der jährlich angebotene Weiterbildungskurs „Bodenpraktiker/in“ ist ein gemeinsames Projekt der Arbeitsgemeinschaft für die biologisch-dynamische Wirtschaftsweise Bozen – Trient VFG und Bioland Südtirol und richtet sich an Landwirtinnen und Landwirte mit Interesse, mehr über den Lebensorganismus Boden zu erfahren und darüber zu diskutieren.

# Competence Centre for Social Work, Social Pedagogy and Social Policy



Director — Prof. Ulrike Loch

A centre for social research in South Tyrol supporting specific, research-based answers to social questions had been pursued for more than a decade. Hence, the establishment of the Competence Centre for Social Work, Social Pedagogy and Social Policy in 2021 owes much to the cooperation between the local government, unibz and relevant stakeholders of the social sector, and to the financial support of the Social Department of the Autonomous Province of Bolzano-Bozen.

Generally, social questions and developments are brought about by local, regional, national, and international actors and organisations as well as by legislation, decrees, and European directives. On account of its history, geographical position, and multilingualism, South Tyrol shapes its social tasks and services in accordance with national developments and progress in the German-speaking countries and within the EU.

The Centre aims at investigating topics of great relevance for the territory in view of local, national, and international developments and of the research context, namely the strategic position of the Free University of Bozen-Bolzano. The researchers' work places emphasis on participatory research.

The Competence Centre's activities revolve around three main research areas.

## **Child and Youth Welfare**

**Coordinator:** Ulrike Loch

This is a crucial research area in social work, in which relevant research topics such as child protection, out-of-home care, outpatient help, and children's rights are investigated. Researchers confront questions such as: How can children, young people and their families be strengthened? The up-coming project on child poverty was developed in cooperation with relevant stakeholders of the centre. It is related to the UN's first Sustainable Development Goal, the European Child Guarantee, and the impact of the Covid 19 pandemic on South Tyrol.

## **Ageing, Care, Diversity, Gender and Migration**

**Coordinators:** Giulia Cavrini and Dorothy Zinn

This research area deals with the effects of demographic change and the related challenges that

significantly determine the development of social welfare, as well as the resulting tasks and responsibilities for social work. The focus is on the ageing of society, migration, and the increase in cultural diversity.

## **Social Policy, Social Innovation, Social Protection and Participation**

**Coordinator:** Ulrike Loch

This research area centres around a proactive design and monitoring of social policy, social planning, and participation; special attention is paid to socio-spatial approaches to action and to the promotion of civil society engagement as well as to the innovation of social services, involving relevant stakeholders and users.

### KEY DATA

#### PEOPLE

2 Researchers  
3 Professors  
1 Administrative Staff



## SuCa – Design of a sustainable care security for South Tyrol’s future

In recent years, the issue over the possible future direction of care provision has become increasingly critical because of demographic change and a more complex socio-economic context. Care organisation and care financing are two faces of the same coin in South Tyrol, so that a viable concept must take into account both the existing and the planned care services and care facilities, as well as the desires and expectations of the South Tyrolean population, and the practicable forms of financing.

Many of the involved issues entail socio-political and distributional aspects, which must be taken into account for a financing instrument to be up to the South



Tyrolean population’s legitimate expectations. A “best” model probably does not exist, as is shown by the many different approaches to care coverage to be found in OECD countries. That’s why the need was felt for a reference frame to work out proposals based on local conditions and show their strengths and weaknesses.

Researchers therefore conceived an interdisciplinary project combining the competences of different research teams: economic research aimed at the economic-financial evaluation of the care system sustainability; statistical research on demographic data on the ageing of the population and their health status; sociological research to analyse the most common welfare models and develop a qualitative-quantitative evaluation of the existing structures for LTC (Long Term Care) in South Tyrol.

The SuCa project aims at providing data-based evidence and scientific analysis to support informed political decision-making, by:  
a) mapping the current form of LTC provision in the Province of Bozen-Bolzano (formal/institutional vs. informal care);  
b) understanding how and to what extent demographic and non-demographic drivers influence the social and financial

FUNDING TYPE  
Internal Funding

DURATION  
10/2021 – 12/2022

RESEARCH AREA  
Aging, Care, Diversity, Gender and Migration

UNIBZ RESEARCH TEAM  
Prof. Alex Weissensteiner (Principal Investigator), Dr. Federica Viganò, Prof. Giulia Cavrini, Dr. Elisa Cisotto, Prof. Ulrike Loch, Nadia Paone

PROJECT PARTNERS  
Provincia Autonoma di Bolzano – Autonome Provinz Bozen, Universität Innsbruck

sustainability of LTC provision through a factor analysis;  
c) investigating optimal models (in terms of social and financial sustainability) and developing comparative research on alternative LTC models, taking into account some specific variables related to the Province of Bozen-Bolzano.

← Talfer-Talvera Meadows © Eleonora Lunardonì



## Cooperation and Internationality

Die Intensivierung der Zusammenarbeit mit lokalen Stakeholdern sowie nationalen und internationalen Forschungsinstitutionen gehört zu den willkommenen Aufgaben des Kompetenzzentrums.

1  
→



Von Beginn an wurde deshalb die Vernetzung mit Expert\*innen innerhalb des Territoriums im Bereich der Forschung gestärkt. So besteht der wissenschaftliche Beirat des Kompetenzzentrums neben Mitgliedern der Universität Trient, Fachhochschule St. Gallen (CH) und University of Leuven (BEL) auch aus Vertreter\*innen lokaler Einrichtungen: dem Ressort Familie, Senioren, Soziales und Wohnbau (Direktor Luca Critelli), dem Verein HANDS Onlus (Direktor Bruno Marcato) sowie den Sozialdiensten der Bezirks-gemeinschaft Vinschgau (Direktorin Karin Tschurtschenthaler). Diese Mitglieder des Beirates repräsentieren den Bereich der öffentlichen und freien Träger des Sozialwesens sowie der Sozialverwaltung des Landes.

2  
→



Neben der Kooperation mit dem wissenschaftlichen Beirat organisiert das Kompetenzzentrum mindestens zweimal jährlich forschungsrelevante Arbeitstreffen mit Mitgliedern der Arbeitsgruppe Sozialforschung der Freien Träger des Sozial- und Gesundheitsbereichs in Südtirol sowie mit Verantwortlichen des Sozial- und Gesundheitswesens des Landes, u. a. dem Betrieb für Sozialdienste Bozen, der Familienberatung (fabe), dem Dachverband für Soziales und Gesundheit, dem Verband der Seniorenwohnheime Südtirols, dem SOS Kinderdorf und der Lebenshilfe. Im Rahmen dieses Austausches wurde beispielsweise das Thema (Kinder-)Armut als aktuelles Forschungsthema des Kompetenzzentrums angestoßen.

Prof. Ulrike Loch wurde 2021 zum Mitglied des Sozialbeirat des Landes Südtirols ernannt; ferner arbeitet sie mit in der Arbeitsgruppe „Südtiroler Generationenstiftung – Dopo di noi“, die von der Lebenshilfe und SOPHIA, Sozialgenossenschaft für Forschung, geleitet wird, zusammen.

2021 wurden Forschungsaktivitäten in Zusammenarbeit mit den sozialen Diensten (und deren Zielgruppen) in Südtirol, Sardinien, Friaul-Julisch Venetien und dem Trentino durchgeführt. Auf Basis der Forschungsprojekte soll zukünftig ein jährlich stattfindender Fachtag für Soziale Arbeit und Sozialpolitik stattfinden, der sich an Sachverstän-

diger und Stakeholder richtet. Ulrike Loch ist Mitherausgeberin der jährlich erscheinenden deutsch-/englischsprachigen Fachzeitschrift „Österreichisches Jahrbuch für Soziale Arbeit“ (Annual Review of Social Work and Social Pedagogy in Austria). 2021 erschien die Schwerpunkt-ausgabe „Partizipation und Soziale Arbeit“.

1 ↑ Centre's research team

2 ← Cooperation © Pexels



## Research Events

### **Evento kick-off**

Il Centro di Competenza si è presentato al pubblico il 16 novembre 2021 con un evento kick-off, organizzato online e rivolto principalmente a professionisti e stakeholder del settore sociale, che è stato seguito da circa 70 persone con molte partecipazioni anche dall'estero. Il Prorettore alla Ricerca di unibz, prof. Johann Gamper, e la direttrice del Centro, prof.ssa Ulrike Loch, hanno aperto la sessione, nel corso della quale è stato presentato il team e sono state esposte le principali aree di ricerca del Centro illustrando anche i primi due progetti di ricerca, incentrati sui temi della cura e della povertà. Nel suo intervento, l'assessora provinciale al sociale Waltraud Deeg ha sottolineato il ruolo importante che la ricerca orientata alla pratica riveste anche nel lavoro in provincia.

Il Centro conduce infatti la propria attività di ricerca all'interno di una rete internazionale e allo stesso tempo con particolare attenzione alle esigenze e alle particolarità regionali, con un approccio partecipativo nel quale la ricerca viene fatta con le persone, non sulle persone. In questo modo, anche i soggetti dei rispettivi temi di ricerca sono coinvolti nella raccolta e nell'analisi dei dati. In quest'ottica di partecipazione, l'evento kick-off è servito anche a raccogliere domande e desideri concreti da parte dei partecipanti, per poter orientare le ricerche future in modo più fruttuoso.

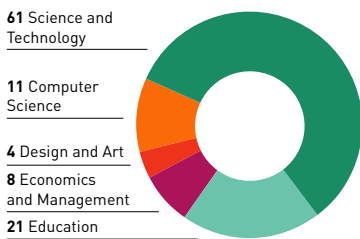
# Figures on Research Projects and Funding 2021

In 2021, unibz completed 198 research projects. 180 new research projects were started, of which 105 were externally funded for a total value of 5.8 MM €

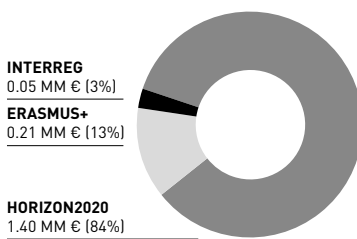
10 new projects funded or co-funded by EU programmes were started with a total budget of 1.66 MM € allocated to unibz

unibz signed 71 research contracts with third parties for a total value of 1.93 MM €

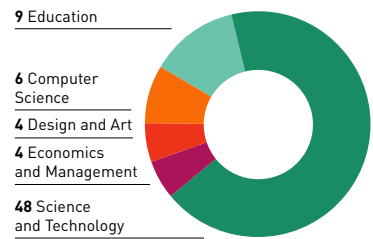
Number of Externally Funded Projects by Faculty



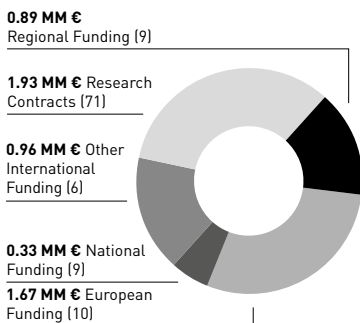
European Funding by Funding Programme



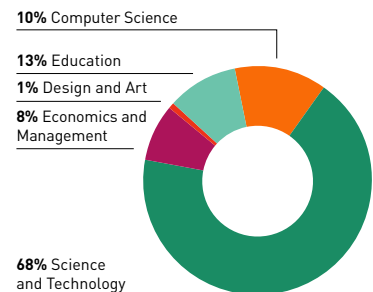
Number of Research Contracts by Faculty



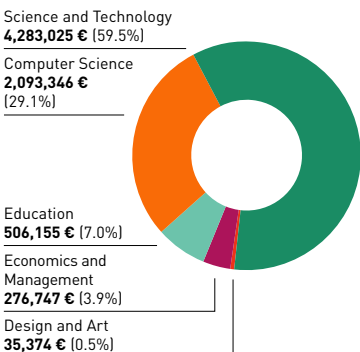
External Funding by Funding Source (and Number of Projects)



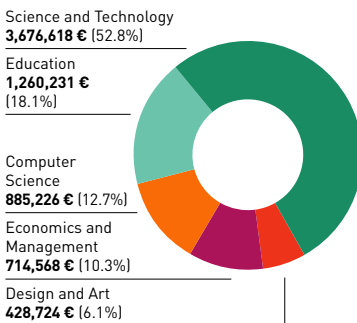
Research Contract Funding by Faculty



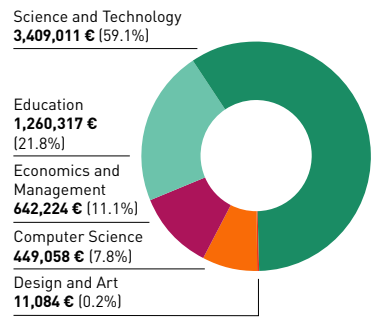
External Funding 2019



External Funding 2020

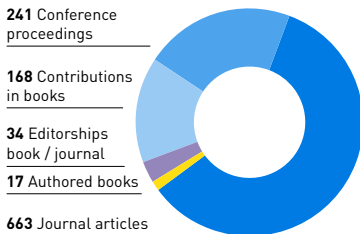


External Funding 2021

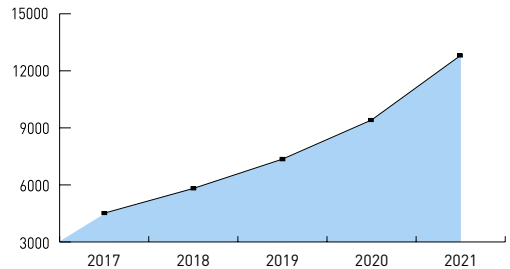


# Figures on Peer-reviewed Publications in 2021

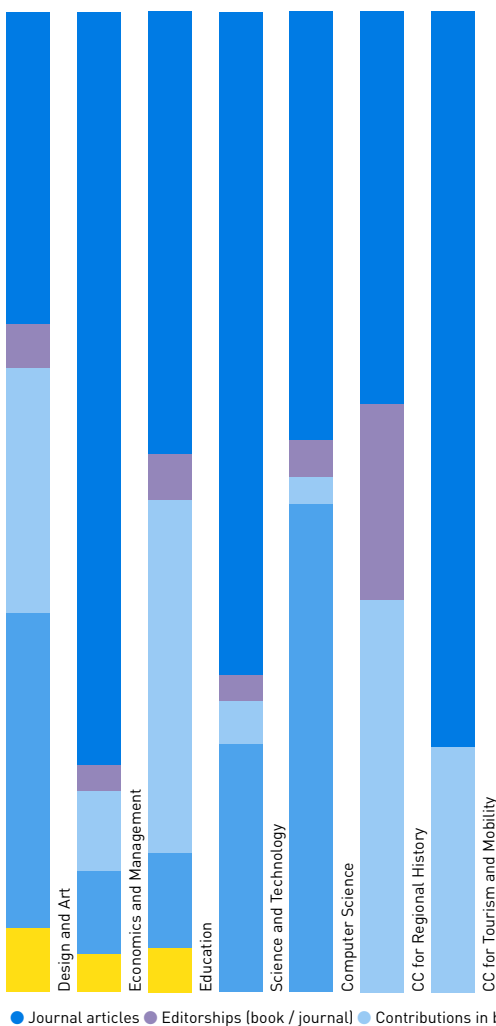
unibz Publications 2021 by Publication Type (Source: Boris)



unibz Citations – Peer-reviewed publications from authors with unibz affiliation (Source: Scopus)

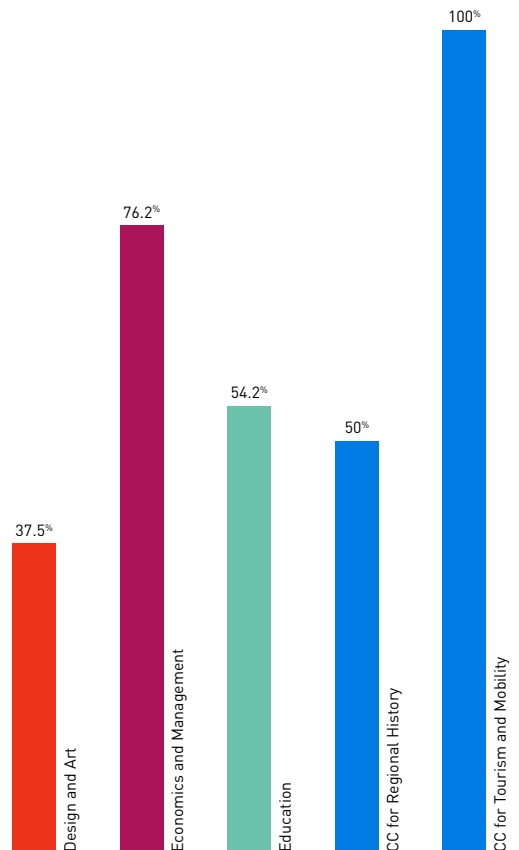


Publications by Faculty / Competence Centre and Publication Type (Source: Boris)



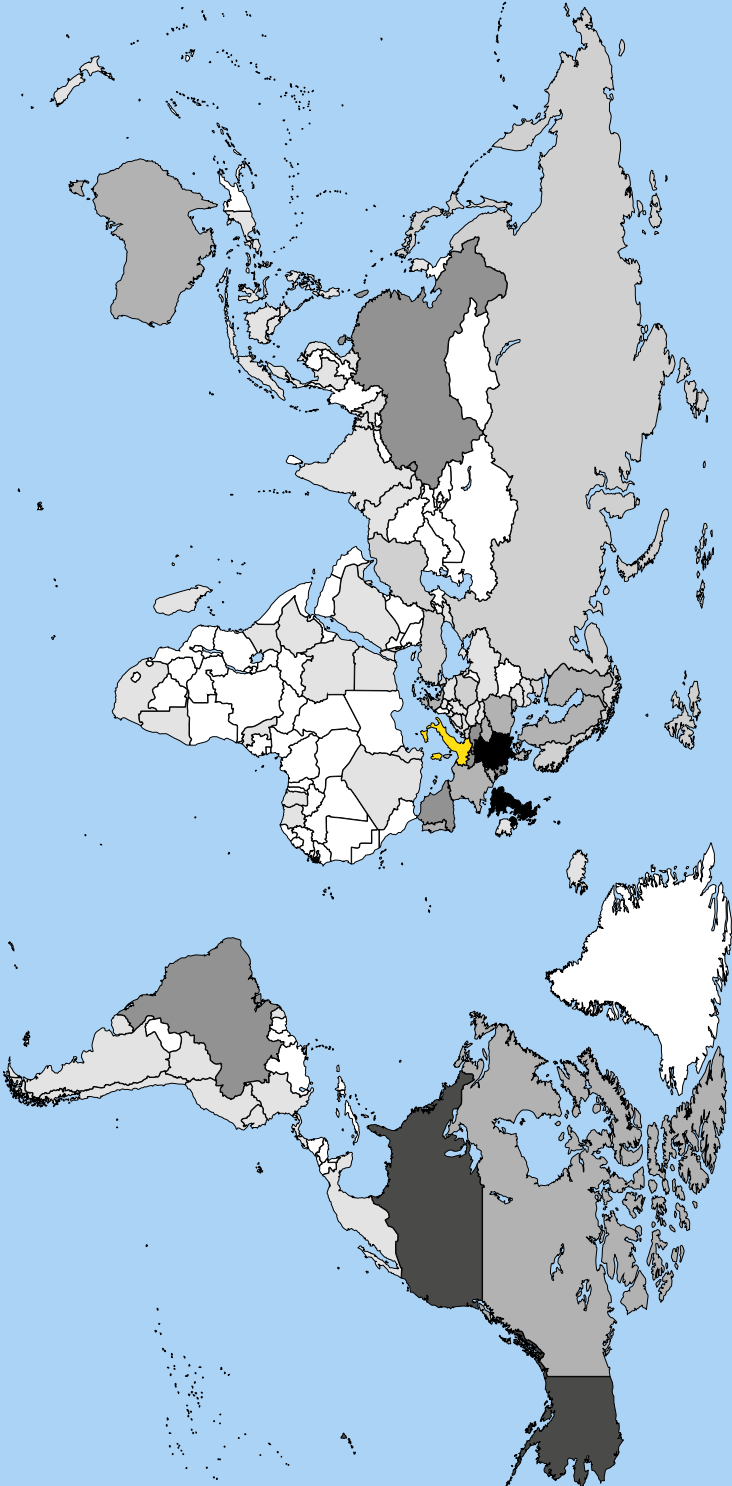
% of A-Class Academic Journal Articles – Compared to the total number of articles published in academic journals in the same year

A-Class: Excellence journals in the non-bibliometric scientific areas (as rated by ANVUR). Not applicable to the Faculties of Computer Science and Science and Technology (STEM subjects)  
(Source: Boris)



# 2021 unibz Publications – Co-Authors Network

[Source: boris – unibz]



Number of Co-authored Publications



>900 101-150 81-100 61-80 41-60 21-40 11-20 1-10 0





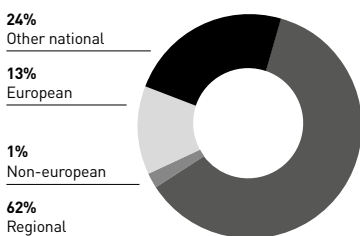
# Industry and Society

## Partner for Research and Development

unibz is a partner for research and innovation and works in close collaboration with local, national and international businesses and institutions. This direct collaboration between science, business and society creates new technologies, products and services and the practical relevance of research and teaching is reinforced by joint projects. The focus is therefore to promote Knowledge and Technology transfer and collaboration between Research and Industry.

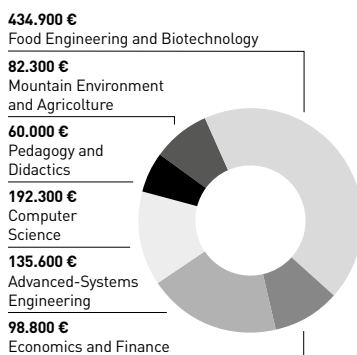
In 2021 all five Faculties of unibz collaborated in 124 contract research projects, of which 65 completed and 59 ongoing, with local, national, and European industry partners and institutions. The overall external funding amounts to 1.9 million euro, of which 62% come from regional cooperation contracts. This enhances once more the close connection of unibz with its territory as well as its central role within the research and innovation ecosystem of the region.

Research contracts 2021 by geographical location of companies or organisations:



Companies and research institutions can also finance scholarships for doctoral studies through a convention with the university. The call for applications can include specific research topics for these positions. 25 new PhD conventions between unibz and private companies/R&D institutions were signed in 2021 for six PhD programs at the five faculties (including projects financed also by the Italian Ministry of University and Research MUR through the PON programme – Programma Operativo Nazionale):

2021 PhD conventions with public/private funds for a total value of 1 mio. €:



Another form of collaboration between the University and Industries are the so-called “PhD executive – corsi di dottorato industriale”, which offer study grants reserved for companies’ employees and are based upon specific conventions. The prerequisite for the company concerned is a proven record of highly qualified activity in the R&D

(Research and Development) field, as well as the positive outcome of the company’s candidate within the scholarship programme. The successful candidate can then follow a tailored research programme in partnership with his/her home company.

## Patente und Marken: Intellectual Property Rights

Erfindungen und Patente zeigen die Innovationskraft einer Universität sowie ihre Kompetenz in verschiedenen Technologiefeldern. Die Universität unterstützt ihre Forscher bei Patent und Marken-anmeldeverfahren und in der Verwaltung des geistigen Eigentums zur wirtschaftlichen Verwertung ihrer Forschungsergebnisse.

IP Products unibz as of 2021:

- 1** Granted patent filed by unibz
- 22** Granted patents filed by unibz researchers
- 1** patent filed by unibz
- 5** registered trademarks filed by unibz
- 3** trademarks filed by unibz

## Spin-off & Start ups

Con AIAQUA srl la Libera Università di Bolzano ha accreditato a luglio 2021 il suo secondo spin-off, che punta sulla gestione innovativa e sostenibile delle risorse idriche.

In tempi di crescente richiesta idrica, l’approvvigionamento urbano di acqua potabile – e più in generale anche in ambito irriguo e industriale – sta diventando sempre più difficoltoso a causa di



una gestione spesso non efficiente, che non tiene adeguatamente conto dei cambiamenti climatici o sociali. A livello nazionale, la perdita di risorse idriche è stimata raggiungere il 40%.

Il miglioramento del servizio idrico è necessariamente subordinato ad un'interazione tra rinnovamento tecnologico, gestione sostenibile e pianificazione delle attività.

È proprio qui che entra in gioco AIAQUA, offrendo un sistema di consulenza all'avanguardia e soluzioni innovative per la gestione dei sistemi idrici – soluzioni basate sui più recenti metodi scientifici, con le quali l'azienda si pone l'obiettivo di ottimizzare l'approvvigionamento idrico attraverso la riduzione degli sprechi di acqua ed energia, di aumentare la resilienza delle reti, incrementare la sicurezza del servizio, l'efficienza energetica e la pianificazione della manutenzione e del rinnovo degli impianti. I soci fondatori sono Andrea Menapace e Ariele Zanfei, due giovani ricercatori della Libera Università di Bolzano, insieme ai professori Francesco Ravazzolo,

docente di Econometria e Maurizio Righetti, docente di Costruzioni Idrauliche. Lo spin-off è entrato a far parte dello Start-up Incubator del NOI Techpark .

[www.aiaqua.tech](http://www.aiaqua.tech)  
[www.unibz.it/it/home/companies-and-partnerships/knowledge-technology-transfer/spin-off/](http://www.unibz.it/it/home/companies-and-partnerships/knowledge-technology-transfer/spin-off/)

L'imprenditorialità è un tema importante per l'Ateneo che sostiene, tramite il suo Corso di Studio in Entrepreneurship e Innovazione, la creazione di nuove idee ed imprese dei suoi studenti. In stretta collaborazione con il Business Incubator al NOI Techpark, ogni anno i nostri studenti e laureati partecipano ai programmi dell'Incubatore per la fondazione di nuove start-up. Nel 2021 nell'ambito del Pre Incubation programme sono nate cinque nuove imprese, fondate da studenti o laureati di unibz.

### **unibz and the European network**

unibz is actively promoting the collaboration of its researchers within European research and innovation networks, together with the Research Center Laimburg and the Autonomous Province of Bozen-Bolzano and by means of a common liaison office in Brussels.

Some of these networks are UNLiON (Universities Informal Liaison Offices Network), an informal network of 51 Brussels-based liaison offices representing 157 excellent universities in Europe, Japan and Russia, and GIURI (Gruppo Informale di Uffici di Rappresentanza Italiani), an

informal platform bringing together the liaison offices and representatives of Italian stakeholders' interests at European institutions, and active in the field of Research & Innovation (universities, research centres, industries, trade associations, financial intermediaries, regions and local authorities). GIURI organises an annual networking reception as well as regular meetings with representatives of the European Commission, the European Parliament, the R&I Attaché of the Permanent Representation of Italy to the EU, the National Representatives in the Program Committee of Horizon 2020.

[www.unilion.eu](http://www.unilion.eu)  
[www.linkedin.com/company/giuriit](http://www.linkedin.com/company/giuriit)

The Autonomous Province of Bozen-Bolzano is member of the Network of European Regions for Innovations in Agriculture, Food and Forestry (ERIAFF), an informal association of regional Authorities that works on themes of common interest, also involving regional stakeholders.

unibz researchers also cooperate with other thematically focused working groups that are active in the fields of Agriculture and Food: Agroecology Working Group, High Tech Farming, Plants Protein Working Group, Food System Working Group and Forested Region Working Group.

[www.eriaff.com](http://www.eriaff.com)

↑ © Photo by Silvan Schuppisser on Unsplash

unibz is also silver member of EIT FOOD, a pan-European organisation that accelerates innovation to build a future-fit food system that produces healthy and sustainable food for all.

[www.eitfood.eu](http://www.eitfood.eu)

## **BITZ fablab**

BITZ unibz fablab ist das 2018 eröffnete Digital Fabrication Lab der Freien Universität Bozen. Die von BITZ organisierten und geförderten Aktivitäten unterstützen und verbreiten die Maker-Kultur und das Wissen über die Herstellung von Prototypen mithilfe digitaler Produktionstechnologien.

Trotz der fortlaufenden Covid-Einschränkungen konnte das Fab Lab 2021 großteils zugänglich gehalten werden, um die Forscher und Studierenden bei

der Realisierung ihrer Projekte zu unterstützen. Gemeinsam mit der Smart Mini Factory wurde die Digital and Technology Summer School organisiert, sowie einige Führungen für externe Schulklassen. Die neue Mitgliedschaft im italienischen Netzwerk der Fab Labs (U-Fab Network) ermöglicht dem BITZ zukünftig auch die Teilnahme an gemeinschaftlichen Forschungsprojekten.

Seit der Eröffnung des Fab Lab haben sich über 1000 Nutzer eingeschrieben, wobei der Frauenanteil mit 61% im Vergleich zu 39% an männlichen Nutzern deutlich höher ausfällt.

BITZ ist Mitglied des internationalen Netzwerks für Fablabs.

[fablabs.io/labs/bitzunibzfablab](http://fablabs.io/labs/bitzunibzfablab)  
[bitzfablab.unibz.it](http://bitzfablab.unibz.it)

## **Smart Mini Factory**

Das Smart Mini Factory Labor (SMF) ist ein Lernfabriklabor für die angewandte Forschung und die Lehre. Es untersucht und simuliert moderne und fortschrittliche Konzepte von Produktionstechnologien und -methoden im Kontext von Industrie 4.0.



2021 war das Labor in sieben Forschungsprojekten in Zusammenarbeit mit Südtiroler Unternehmen und einem Gesamtbudget von rund € 150.000 involviert. Zusätzlich wurde ein neues Forschungsprojekt gemeinsam mit ETH Zürich und Eurotube erarbeitet, welches sich der Erforschung eines digitalen Zwillings der mobilen Fabrik zur Fertigung von Bauelementen für eine Hyperloop-Teststrecke in der Schweiz widmet (Beginn 2022). Das für unibz akquirierte Forschungsbudget beträgt knapp € 266.000.

1  
→



Hinzu kamen im Laufe des Berichts-jahres didaktische Projekte, Third Mission Aktivitäten wie Newsletter und Webinars für lokale Unternehmen sowie der Beitritt als offizielles Mitglied des Internationalen Verbands der Lernfabriken (IALF).

In der Forschung zu Industrie 4.0 platzierte sich die Freie Universität Bozen mit ihren Publikationen zum Thema weiterhin unter den Top 10 Universitäten weltweit (Quelle: Scopus Datenbank).

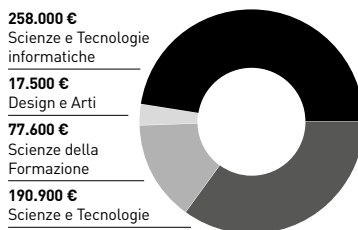
[smartminifactory.it](http://smartminifactory.it)

## Progetti FSE-ESF

L'attività di progettazione dell'Ateneo per il Fondo Sociale Europeo (FSE) – Europäischer Sozialfonds (ESF) interessa quattro Facoltà: Scienze della Formazione, Scienze e Tecnologie informatiche, Scienze e Tecnologie e, dal 2021, anche Design e Arti. Al tradizionale contrasto alla dispersione scolastica si sono affiancati progetti tesi all'innovazione, declinata soprattutto in termini di aggiornamento continuo del personale impiegato nelle aziende del territorio o delle categorie svantaggiate.

Nel corso del 2021 sono stati conclusi sei progetti, finanziati per un importo di € 266.000, che hanno coinvolto il personale di dodici aziende. Inoltre, sono stati presentati nove nuovi progetti, tutti approvati e in corso di realizzazione nel 2022, per un finanziamento complessivo pari a € 278.000.

Distribuzione fondi FSE per Facoltà (progetti attivi nel 2021):



## NOI Techpark

3 faculties and 13 laboratories/research centres represent the Free University of Bozen-Bolzano at the NOI Techpark, covering six research areas: Energy Resources and Energy Efficiency, Agricultural Sciences, Industrial Engineering and Automation Technology, Food Sciences, Digitalization and Entrepreneurship, Innovation and Management.

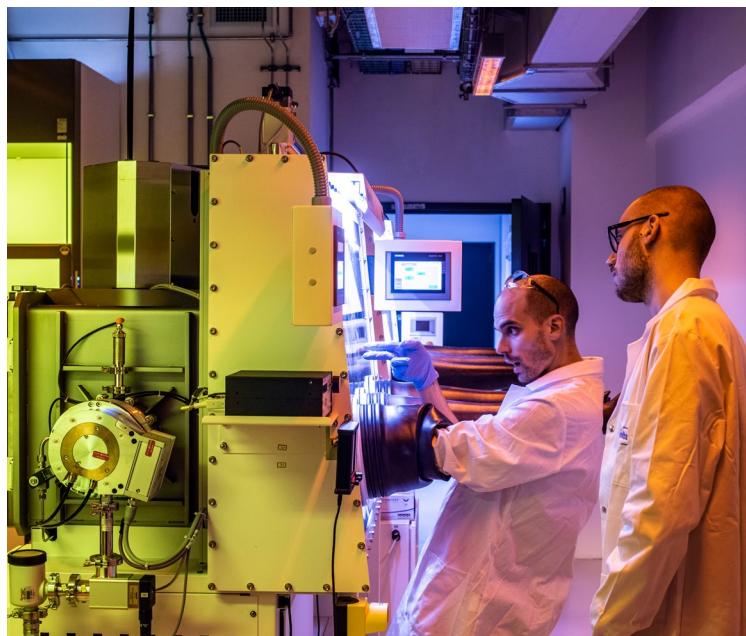
One research focus is on interdisciplinary cooperation and interaction with local and international industry partners.

In 2021 unibz collaborated in 116 research projects in its laboratories at the NOI Techpark: 164 different cooperation partners were involved, e. g. private companies, R&D institutions, and other public institutions, of which 79 are Industry partners, with an overall third-party funding budget of 7.08 million euro (data refer to 4 out of 6 unibz Research Areas at the NOI Techpark, active for the entire year 2021).

1 ← Workshop at BITZ unibz fablab © Photo by Eleonora Lunardonì

2 ← Smart Mini Factory lab © Photo by Serena Osti

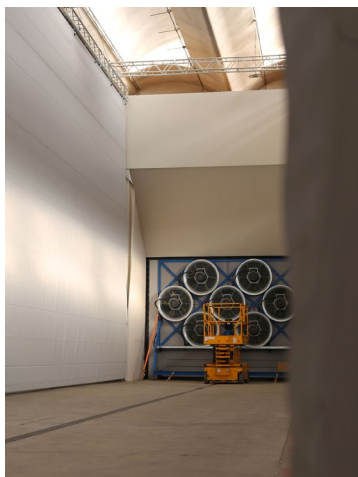
3 ↓ © Photo by Ivo Corrà



## Inaugurazione dei laboratori B5 al NOI

Il 3 dicembre 2021 sono stati inaugurati i nuovi laboratori della Libera Università di Bolzano al NOI Techpark, ospitati nell'edificio B5: un passo importante per la ricerca della Facoltà di Scienze e Tecnologie nei settori dell'innovazione tecnologica e green in agricoltura, automazione e robotica, fluidodinamica industriale, produzione energetica da fonti sostenibili e rinnovabili, tutela del territorio e protezione dai rischi idrogeologici legati ai cambiamenti climatici. Gli ambiti privilegiati di azione dei quattro nuovi laboratori sono illustrati di seguito.

**Il Laboratorio di Innovazioni AgroForestali** diretto dal prof. Fabrizio Mazzetto, docente di Meccanica e meccanizzazione



agraria, sviluppa nuove tecnologie per applicazioni agricole, forestali ed ambientali nel quadro di un'agricoltura di precisione che passa attraverso la digitalizzazione del settore. Particolare rilevanza assumono le esigenze del territorio per quanto riguarda la stabilità dei mezzi agricoli su terreni mon-

tani; il laboratorio offre inoltre inediti apparati di misura per lo svolgimento di test su macchine a scala reale, in tal modo soddisfacendo esigenze sia di ricerca, sia di certificazione in base alle vigenti normative nazionali ed europee.

**Il FIRST Lab (Field Robotics South Tyrol Lab)** diretto dai prof. Renato Vidoni, docente di Meccatronica e robotica, e Karl Von Ellenrieder, docente di Controlli automatici e Robotica mobile, è il naturale collegamento fra le attività di ricerca dell'ingegneria meccatronica, dell'automazione e dell'ingegneria agroforestale.



La missione del FIRST Lab è implementare una ricerca applicata di tipo interdisciplinare che si collochi all'intersezione degli ambiti della meccatronica, robotica e automazione e dell'ingegneria agro-forestale, in stretta collaborazione con le PMI del territorio.



**Il Laboratorio di Termofluidodinamica** diretto dal prof. Maurizio Righetti, docente di Costruzioni Idrauliche, si rivolge ai settori strategici della produzione idroelettrica, dei processi di conversione energetica, e a tutti i processi industriali (e non) che dipendono da fenomeni di fluidodinamica in generale. In collaborazione con le pubbliche amministrazioni e le aziende, anche locali, il laboratorio si occupa ad esempio dell'ottimizzazione della produzione idroelettrica alla luce dei cambiamenti climatici, della sperimentazione di turbine innovative e di progetti sperimentali per il contenimento del dissesto idrogeologico.



**Il Laboratorio di Bioenergy e Biofuels** diretto dal prof. Marco Baratieri, docente di Fisica tecnica, svolge ricerca sulla produzione energetica da biomasse. Lavorando sulla caratterizzazione dei combustibili e sull'ottimizzazione di processo, vengono applicati sia tecnologie tradizionali di combustione, sia processi innovativi quali pirolisi, gassificazione e processi

idrotermici. Il laboratorio si propone di valorizzare le biomasse forestali e gli scarti delle filiere agro-alimentari per la produzione combinata di energia, combustibili e materiali che, in una prospettiva di economia circolare, possono rappresentare alternative sostenibili e rinnovabili rispetto agli equivalenti tradizionali ottenuti da risorse fossili.



Tutti i progetti e laboratori ospitati nell'edificio B5 sono finanziati dal Fondo Europeo di Sviluppo Regionale (FESR) – Programma d'Investimenti per la Crescita e l'Occupazione 2014-2020 e dalla Provincia Autonoma di Bolzano.

[noi.bz.it/en/laboratories](http://noi.bz.it/en/laboratories)

In addition to the technical laboratories, the Centre for Family Business Management (head: Prof. Alfredo De Massis) operates as a local and international reference point for research, education, and knowledge-transfer activities in the field of family businesses.

#### unibz Labs at NOI

##### **Agroforestry Innovations Lab**

Head: Prof. Fabrizio Mazzetto  
Laboratory for the development of agri-food technologies

##### **Bioenergy & Biofuels**

Head: Prof. Marco Baratieri  
Laboratory for researching energy production from biomass

##### **Building Physics**

Head: prof. Andrea Gasparella  
Laboratory for the thermal physics of buildings

##### **Field Robotics Lab**

Head: Prof. Renato Vidoni/Prof. Karl Von Ellenrieder  
Laboratory for the development of machines and robots for outdoor activities

##### **Food Technology**

Head: Prof. Matteo Scampicchio  
Laboratory for investigating food processing and technologies

##### **Human-centered Technologies Lab**

Head: Prof. Angelika Peer  
Laboratory for the research and development of embodied artificial intelligence

##### **Micro4Food**

Head: Prof. Marco Gobetti  
Laboratory for food fermentation

##### **NMR Lab**

Laboratory managed by both Research Centre Laimburg and Free University of Bozen-Bolzano  
Laboratory for analyzing the origin of agricultural products

##### **Oenolab**

Head: Prof. Emanuele Boselli  
Laboratory for oenology and alcoholic drinks technology

##### **Sensing Technologies Lab**

Head: Prof. Paolo Lugli/Prof. Luisa Petti  
Laboratory for the development of electronic sensor systems

##### **Smart Data Factory**

Head: Prof. Diego Calvanese  
Laboratory for the acquisition and smart analysis of complex data

##### **Thermo Fluid Dynamics Lab**

Head: Prof. Maurizio Righetti  
Laboratory for investigating dynamic fluids

# New Professorships

## Computer Science



### Oswald Lanz

**POSITION:** Full Professor of Computer Vision and Deep Learning (ING-INF/05) / **FORMER POSITION:** Researcher and Head of Research Unit at Fondazione Bruno Kessler, Trento. Head of Research at Covision Lab, Bressanone-Brixen.

**RESEARCH FOCUS:** Prof. Lanz is especially interested in Computer Vision and Deep Learning, with focus on video analysis: tracking, activity recognition and forecasting, text-video retrieval; and anomaly detection in images, for visual inspection and defect detection in production.



### Michael Haller

**POSITION:** Full Professor of Next-Generation Interfaces (ING-INF/05) / **FORMER POSITION:** Professor at University of Applied Sciences Upper Austria (AT)

**RESEARCH FOCUS:** Smart Textile Interfaces, Physical Prototyping, Next-Generation Interfaces, Human-Computer Interfaces, Ubiquitous Computing.



### Marco Montali

**POSITION:** Full Professor of Information Processing Systems (ING-INF/05) / **FORMER POSITION:** Associate Professor of Information Processing Systems at unibz – Faculty of Computer Science

**RESEARCH FOCUS:** Prof. Montali's activity is mainly dedicated to Foundational and applied techniques grounded in artificial intelligence, and Formal methods and process mining for the intelligent management of dynamic systems operating over data, with a specific focus on business/work processes and multiagent systems.

## Design and Art



### Giorgio Camuffo

**POSITION:** Full Professor of Visual Communication (ICAR/13) / **FORMER POSITION:** Associate Professor of Visual Communication at unibz – Faculty of Design and Art

**RESEARCH FOCUS:** Prof. Camuffo focuses his research on three themes: Design for children – the

study of the ways, tools and spaces used in the designers' projects to improve children's creative learning; Communicating science/ Mapping climate change – the study of the relationship between science and the tools, professions and modes of design, with particular reference to climate change; History of the Italian Graphic Design.



### Secil Ugur Yavuz

**POSITION:** Associate Professor of Eco Social Design (ICAR/13) / **FORMER POSITION:** Researcher at unibz – Faculty of Design and Art

**RESEARCH FOCUS:** Prof. Ugur Yavuz's research interest lays in-between analogue and digital making to give rise to new modalities of interaction, ways of alternative production and new types of hybrid materials, such as e-textiles. Her research aims at opening debates, provoking and stimulating new visions of interaction within the entanglement of our social and technical spheres towards sustainable and desirable future(s).



## Economics and Management



### Monica Rosini

**POSITION:** Associate Professor of Public Law (IUS/09) / **FORMER POSITION:** Senior Researcher at unibz – Faculty of Economics and Management  
**RESEARCH FOCUS:** Public Law – Law of Regions and Autonomies



### Paolo Maria Perego

**POSITION:** Full Professor of Accounting (SECS-P/07) / **FORMER POSITION:** Associate Professor of Accounting at unibz – Faculty of Economics and Management  
**RESEARCH FOCUS:** Prof. Perego's research focus is on Management Accounting, Performance measurement and Management control systems; Customer Accounting; Sustainability Accounting and Assurance; Integrated Reporting



### Davide Ferrari

**POSITION:** Full Professor of Statistics (SECS-S/01) / **FORMER POSITION:** Associate Professor of Statistics at unibz – Faculty of

Economics and Management  
**RESEARCH FOCUS:** Prof. Ferrari is currently interested in data integration, composite likelihood procedures, model selection, and inference methods for high-dimensional data. Recently, he has started working on model selection and estimation methods for intractable likelihoods in the context of complex econometric and environmental data.

## Education



### Sven Nickel

**POSITION:** Full Professor of Early Literacy (L-LIN/14) / **FORMER POSITION:** Full professor at the University of Bremen: Didactics of German language, literature and literacy with focus on language and literacy education in the early years.  
**RESEARCH FOCUS:** Literacy as key to reading and writing skills development: Literacy education, reading and spelling acquisition, emergent literacy, dialogical reading, home literacy environment and family literacy programs.



### Lorenzo Spreafico

**POSITION:** Associate Professor of Educational Linguistics (L-LIN/02) / **FORMER POSITION:** Senior Researcher at the University of Bergamo  
**RESEARCH FOCUS:** Prof. Spreafico's

current work focuses on speech learning and teaching in relation to diverse populations, including monolingual and multilingual children and adults.



### Giulia Gabrielli

**POSITION:** Associate Professor of Musicology and history of music (L-ART/07) / **FORMER POSITION:** Senior Researcher at unibz – Faculty of Education  
**RESEARCH FOCUS:** Prof. Gabrielli's work centres on liturgical manuscripts, sacred vocal music, cantus fractus and musica franciscana, with special focus on the sources preserved in Trentino and in South Tyrol.



### Demis Basso

**POSITION:** Full Professor of General and Cognitive Psychology (M-PSI/01) / **FORMER POSITION:** Associate Professor of General Psychology at unibz – Faculty of Education  
**RESEARCH FOCUS:** Prof. Basso's research activity is mainly devoted to the study of the human cognitive processes (visuo-spatial planning, prospective memory and working memory), as well as their relationship with education and media. His scientific interests include also the study of human factors, life-skills and wellbeing.



### **Antonella Brighi**

**POSITION:** Full Professor of Developmental and educational psychology (M-PSI/04) / **FORMER**

**POSITION:** Associate Professor of Developmental and educational psychology at unibz – Faculty of Education

**RESEARCH FOCUS:** Prof. Brighi's activity brings into focus the risks and the protective factors connected to bullying and cyberbullying, included prejudicial bullying and sextortion; she combines research with action programmes carried out in schools and online. The of wellbeing throughout youngsters' development is investigated by focussing on early socio-emotional skills and social adjustment in peer groups from preschool to adolescence.

### **Science and Technology**



### **Raffaella Di Cagno**

**POSITION:** Full Professor of Agricultural Microbiology (AGR/16) / **FORMER POSITION:** Associate Professor of Agricultural Microbiology at unibz – Faculty of Science and Technology

**RESEARCH FOCUS:** Prof. Di Cagno research activities extend from molecular microbiology and biotechnology of sourdough, cheese and vegetable/fruit lactic acid bacteria to phenomics, proteomics, metagenomics and tran-

scriptomics of lactic acid bacteria in response to environmental adaptation in situ (e.g., plant niches), and to the synthesis of biogenic compounds by lactic acid bacteria, also focusing on the biotechnological exploitation of food by-products as food ingredients and dietary supplements.



### **Petti Luisa**

**POSITION:** Associate Professor of Electronics (ING-INF/01) / **FORMER POSITION:** Senior Researcher at unibz – Faculty of Science and Technology

**RESEARCH FOCUS:** Prof. Petti's research focuses on Flexible and Printed Electronics, the Internet of Things, Environment-friendly Production of Electronic Devices, Disposable and Biodegradable Electronics and Smart Sensors and Sensor Systems.



### **Camilla Wellstein**

**POSITION:** Associate Professor of Environmental and applied botany (BIO/03) / **FORMER POSITION:** Senior Researcher at unibz – Faculty of Science and Technology

**RESEARCH FOCUS:** Prof. Wellstein's research covers a wide range of topics, such as Functional Biodiversity, Global Change Ecology, Vegetation Ecology, Plant Ecology, and Molecular Ecology; she is also active on the fields of Biogeography, Plant Functional

Traits, Climate Change and Restoration Ecology and also Nature Conservation, Grasslands, Forests and High Mountain Ecosystems.



### **Guido Orzes**

**POSITION:** Associate Professor of Management Engineering (ING-IND/35) / **FORMER POSITION:** Senior Researcher at unibz – Faculty of Science and Technology

**RESEARCH FOCUS:** Offshoring and Reshoring strategies, Social and environmental sustainability and Global Sourcing organizational design and International Purchasing Offices.



### **Massimiliano Renzi**

**POSITION:** Associate Professor of Fluid Machines and Energy Systems (ING-IND/08) / **FORMER POSITION:** Senior Researcher at unibz – Faculty of Science and Technology

**RESEARCH FOCUS:** His research interests mainly focus on Fluid machines and energy systems; Hydroelectric and pump-as-turbines in small-scale systems, also for energy recovery and pumped storage; Thermal management in electric/hybrid powertrains; Vehicle electrification; Use of biofuels and hydrogen enriched fuels; Energy systems optimization and machine learning, and Cogeneration.



**Giovanna Ferrentino**

**POSITION:** Associate Professor of Food science and technology (AGR/15) / **FORMER POSITION:** Senior Researcher at unibz – Faculty of Science and Technology

**RESEARCH FOCUS:** Her research activity focuses on innovative technologies for the pasteurization of liquid and solid foods based on supercritical fluids alone or in combination with high power ultrasounds; valorization of food waste and by-products by applying green extraction technologies based on supercritical fluids for the recovery of bioactive compounds; encapsulation of bioactive compounds using supercritical fluids (i.e., particles from gas saturated solutions (PGSS)); and Extrusion cooking for the texturization or functionalization of proteins-based products.



**Hannes Schuler**

**POSITION:** Associate Professor of General and applied entomology (AGR/11) / **FORMER POSITION:** Senior Researcher at unibz – Faculty of Science and Technology

**RESEARCH FOCUS:** His research covers various aspects in the field of insect ecology, diversity and evolution including the association of microbes with insects and their impact on the ecology and evolution of their hosts; the invasion dynamics of invasive species

and their influence on the native ecosystem; the factors influencing the efficiency of vectors of plant diseases and the influence of greening on the insect biodiversity and the dynamics of pest species.



**Sergio Angeli**

**POSITION:** Associate Professor of General and applied entomology (AGR/11) / **FORMER POSITION:** Tenured Researcher of General and applied entomology at unibz – Faculty of Science and Technology

**RESEARCH FOCUS:** His research centres on entomology, and specifically on agricultural and forest entomology; chemical ecology and ecological interactions between insects and plants; insect olfaction; semiochemicals; volatile organic compounds (GC-MS) characterization; electroantennography; apiculture as well as on the impact and monitoring of pesticides and insect as food and feed.



**Giovanni Modanese**

**POSITION:** Associate Professor of Mathematical physics (MAT/07) / **FORMER POSITION:** Senior Researcher at unibz – Faculty of Science and Technology

**RESEARCH FOCUS:** Applied mathematics, complex systems, theoretical physics.

**Regional History**



**Oswald Überegger**

**POSITION:** Full Professor of Contemporary History (M-STO/04) / **FORMER POSITION:** Senior Researcher at unibz – Faculty of Science and Technology, Head of the Competence Centre for Regional History unibz since 2013.

**RESEARCH FOCUS:** Contemporary History and Austrian History, especially on Habsburg History, WWI, Fascism and Regional History.

# Awards and Distinctions

## Science and Technology

2–5 August 2021

At the 4<sup>th</sup> European Industrial Engineering and Operations Management Conference (IEOM 2021) in Rome, Italy, **Dominik Matt** and **Erwin Rauch** received double reward: Prof. Dominik Matt was awarded the *Distinguished Educator Award 2021* and Dr. Erwin Rauch received the *Outstanding Professor in Industry 4.0 Award 2021*. Prof. Dominik Matt and Dr. Erwin Rauch also received the *ADRF Park's Prize* for "Axiomatic Design Research Foundation (ADRF)".

1–2 September 2021

**Matthias Gauly** was awarded with the prestigious *Honorary Membership of EAAP*, the European Federation of Animal Science and also received the *Distinguished Service Award (DSA)* of the European Federation of Animal Science (EAAP) at the Annual Meeting held in Davos (Switzerland).

9–11 September 2021

**Franco Concli** and **Cristian Cappellini** were awarded the *Best Paper Award* for the article "FEM Modeling of Tool Wear in Hard Turning Operations" at the World Symposium on Mechanical – Materials Engineering & Science (WMMES 2021) held in Prague (CZ).

20 October 2021

**Francesco Patuzzi** was awarded the *Research Award 2021 of the Stiftung Südtiroler Sparkasse* for his work on "State-of-the-art of

small-scale biomass gasification systems: An extensive and unique monitoring review". The prize is awarded for outstanding achievements in current research activities.

22 December 2021

The prize for Outstanding Review Editors for the year 2021 was won by **Luisa Petti** (*Frontiers in Nanotechnology journal*).

22 December 2021

**Niko Münzenrieder** was acclaimed 2021 Emerging Leader (*Journal of Physics D: Applied Physics*)

2021 brought about further acknowledgments: **Erwin Rauch** was mentioned in the Onalytica Who's Who report on Industry 4.0 under the *Top 100 Industry 4.0 Thought Leader of 2021*; moreover, the *International Journal of Design Creativity and Innovation* awarded outstanding and most read papers published in 2020, and **Yuri Borgianni** and **Lorenzo Maccioni** were honoured for their article "Forms of stimuli and their effects on idea generation in terms of creativity metrics and non-obviousness".

## Computer Science

2–9 February 2021

**Nicholas Troquard** was selected as *Distinguished Senior Program Committee Member* at the 35<sup>th</sup> AAAI Conference on Artificial Intelligence (virtual event).

April 2021

**Barbara Russo**, **Andrea Janes**, and **Matteo Camilli** were the winners of the *Best Paper Candidate* (the top three papers) for their work "A Multivariate Characterization and Detection of Software Performance Anti-patterns" at ICPE 2021 (12<sup>th</sup> ACM/SPEC International Conference on Performance Engineering).

20–21 May 2021

**Xiaofeng Wang** and **Jorge Melegatti** were awarded the *Distinguished Paper Award* at the 13<sup>th</sup> IEEE/ACM International Workshop on Cooperative and Human Aspects of Software Engineering (CHASE 2021) for the paper "Surfacing Paradigms underneath Research on Human and Social Aspects of Software Engineering"

14–16 June 2021

At the European Conference on Information Systems (ECIS) 2021, the *Distinguished Track Chair Award* went to **Xiaofeng Wang** for the contribution "Openness and IT track".

11–13 July 2021

The *ACM SIGCHI Development Fund* was assigned to **Maria Menendez Blanco** for the organisation of the Interactive Experiences at CHIItaly '21, which included 5,000 dollars for implementing the Interactive Experiences exhibition.

13–16 September 2021

The *Best Paper Award* at the 12<sup>th</sup> International Conference on Formal Ontology in Information

Systems (FOIS 2021) was granted to **Daniele Porello, Nicolas Troquard, Oliver Kutz, and Pietro Galliani** for the paper "Asymmetric Hybrids: Dialogues for Computational Concept Combination".

10–12 November 2021  
At the 2021 IEEE Vehicular Networking Conference (VNC), the *Best Paper Award* was won by **Michele Segata** for the paper "On the Progressive Introduction of Heterogeneous CACC Capabilities".

## Education

19 May 2021  
After having been named Distinguished bibliographer by the Modern Language Association of America (MLA, New York) in 2018, **Paul Videsott** has now been honoured as an *MLA Bibliography fellow* for his bibliographical work.

22 June 2021  
**Patrizia Tortella** received the *Silver Communications Awards* at the Costa Blanca Sports Science Event International Congress. Her presentation "Storytelling in movimento: un metodo per aumentare l'attività fisica nelle scuole dell'infanzia italiane durante la pandemia?" [Storytelling in motion: a method to increase physical activity in Italian pre-schools during the pandemic?] illustrates the results of a survey conducted with the help of questionnaires among kindergarten teachers who used the "Storytelling in Motion" method.

25 June 2021  
Four researchers from the Faculty of Education were awarded the *Prize of the Italian Pedagogical Society* [SIPED] for their work: **Michele Cagol** in the field of General and Social Pedagogy, for his monograph "Emozioni, ragione, etica in educazione. Per una pedagogia dei comportamenti complessi" [FrancoAngeli Milano, 2020]; **Daniele Morselli** in the field of Experimental Pedagogy, for his monograph "The Change Laboratory for Teacher Training in Entrepreneurship Education. A new Skills Agenda for Europe" [Springer Cham, 2019]; **Monica Parricchi** in the field of General and Social Pedagogy, for her monograph "Vivere il Mondo. Sentieri di educazione alla cittadinanza, dalla partecipazione all'educazione economica" [Living the World. Pathways to citizenship education, from participation to economic education] [FrancoAngeli Milano, 2019]; and **Maria Teresa Trisciuzzi** in the field of History of Pedagogy, for her monograph "Ritratti di famiglia. Immagini e rappresentazioni nella storia della letteratura per l'infanzia" [Family portraits. Images and representations in the history of children's literature] [ETS Pisa, 2019].

20 October 2021  
**Milvia Cottini** won the *Research Award of the Stiftung Südtiroler Sparkasse* for her outstanding scientific achievements; the two submitted scientific papers deal with the development of prospective memory in childhood.

## Economics and Management

10 May 2021  
**Valentina Forrer**, Erica Santini, Filippo Visintin and Enrico Zaninotto were awarded the *Best Paper Award* at the Spring Servitization Conference for their paper "Organizational solutions in the servitization and digital servitization journey".

27 May and 15 June 2021  
**Alfredo De Massis**, Fernando Munoz-Bullon, Maria J. Sanchez-Bueno, Pilar Velasco, and Silvio Vismara won the *Best Research on Diversity in the Family Award* at the Family Enterprise Research Conference and the *Best Paper Award on Gender Diversity* at the International Family Enterprise Research Academy for their paper "Women's leadership and leverage decisions: Exploring the nature of family firms and their governance".

16 June 2021  
**Oksana Tokarchuk, Jacob Barr** and Claudia Cozzio were winners of the *Best Research Paper* at the Annual International Conference Travel and Tourism Research Association for their work "Estimating Destination Carrying Capacity: The Big Data approach".

18 June and 14 October 2021  
The article "The influences of multiple intelligences on conflict occurrence and performance in global virtual teams" by **Marjaana Gunkel, Valerio Veglio**, and **Mahboobeh Davaei** won the *Journal of Global Mobility Best*

*Paper Award* at the Expatriate Management Track, EURAM Online Conference and the *Best Paper Award* at the Società Italiana Marketing SIM Conference.

4 August 2021

**Alfredo De Massis**, Tommaso Minola, Massimo Baù and Francesco Chirico were awarded the *Best Empirical Paper Award* at the Academy of Management Annual Meeting with their paper "Slack and performance in family-owned SMEs: An agency theory perspective".

20 October 2021

The *Research Award 2021 of the Stiftung Südtiroler Sparkasse* was granted to **Paola Rovelli** for her scientific analysis focusing on the top management of small and medium enterprises.

6 December 2021

**Alfredo De Massis** e **Sascha Kraus** have been entered in the prestigious *Top Business and Management Scientists* ranking published by Research.com.

## Design and Art

The IAUD International Design Award 2021 in the category Awards for Student Design Challenge went to **Kuno Prey** and 16 students for their competition entry "Bastoni – 16 Interventions of modern walking". The prize was awarded by the International Association for Universal Design (Tokyo, Japan) together with EIDD Design for All Europe at an online conference on 28

January 2022. The student project "Bastoni", which began in 2021, encouraged the participants to reinterpret walking sticks. Under the direction of Kuno Prey and together with the lecturers Luca Martorano and Alvise Mattozzi, the students developed 16 design drafts, which were realised in the workshops of the faculty. The innovative design objects were exhibited at various locations in Germany and abroad – including at the Grassmesse in Leipzig.

A book with illustrations of the design objects, descriptions of the creative processes, interviews with the project lecturers, as well as specialist articles on the topic of design theory, sociology and cultural studies was published in 2022.

December 2021

**Giorgio Camuffo** was named Testimonial of Italian Design (Testimone del Design Italiano). Initiated by the Italian Ministry of Culture and the Ministry of Foreign Affairs and International Cooperation and the Italian Association for Industrial Design (ADI – Associazione del disegno industriale), the prize is awarded to Italian designers who have distinguished themselves through their work and activities to spread Italian design culture.





Prof. Giustino Tonon

Il 7 luglio 2021, mentre si trovava in bosco per svolgere un'attività di prelievo di campioni sperimentali, un destino crudele ha sottratto il prof. Giustino Tonon all'affetto dei suoi cari. La Facoltà di Scienze e Tecnologie e l'intera Libera Università di Bolzano hanno perso una delle figure di maggiore spessore scientifico e umano. Agli studenti è venuto a mancare un bravissimo docente, scrupoloso e serio, sempre molto apprezzato.

Giustino Tonon si laurea a Padova nel 1991 in Scienze Forestali. Qui comincia il suo percorso di ricerca, variegato e fruttuoso, con una tesi di laboratorio sulla micropropagazione del noce da legno. A metà degli anni 90 è a Firenze con una borsa di studio CNR e nel 1997 viene ammesso al Dottorato di ricerca presso il Dipartimento di Colture Arboree dell'Università di Bologna, sotto la guida del prof. Umberto Bagnaresi, che gli apre nuove prospettive su tematiche che vanno dalle dinamiche forestali allo studio del bilancio del carbonio del suolo e dell'ecosistema, alla castanicoltura.

La multidisciplinarietà, condizione necessaria per comprendere la complessità degli ecosistemi forestali, è uno degli elementi che più ha caratterizzato l'attività di ricerca di Giustino Tonon. A Bologna, fin dagli inizi della sua carriera di ricercatore nel 2001, avvia collaborazioni con colleghi afferenti a diverse aree di ricerca, come la pedologia e la chimica del suolo, alla base dell'interesse per i cicli biogeochimici e per il loro impatto sulle dinamiche forestali.

Il prof. Tonon, durante la sua carriera scientifica, ha contribuito all'avanzamento delle nostre conoscenze in molti settori di ricerca, dal ciclo dei nutrienti e del carbonio nelle foreste alpine e mediterranee, alla risposta degli ecosistemi alle perturbazioni naturali o causate dall'uomo, come il cambiamento climatico. Nei suoi studi sapeva coniugare con efficacia concetti di fisiologia dell'albero con approcci di ecologia forestale, integrando i processi a diversa scala, sia temporale che spaziale, dalla foglia, all'albero, alla foresta.



Questa interdisciplinarietà scaturisce dalla sua attenzione alle nuove tematiche, dalle biotecnologie al biochar, alla risposta del bosco ai cambiamenti climatici. Ciò gli permette di avviare negli anni tante altre proficue collaborazioni, sia in Italia che all'estero, ed in particolare col gruppo di ricerca sulle dinamiche dei popolamenti forestali della *Technische Universität München*, guidato da Hans Pretzsch (progetti *Bosco di Querce Lamborghini* e *CARE4C*). Queste doti e relazioni internazionali, Giustino Tonon le porta con sé quando nel 2010 si trasferisce, come Professore associato, presso la Libera Università di Bolzano, dove diverrà nel 2018 Professore ordinario. Presso la Libera Università di Bolzano, organizza, nel 2013, il IX congresso nazionale SISEF, durante il quale modula brillantemente l'incontro tra la grande tradizione forestale della Provincia di Bolzano e il mondo della ricerca in selvicoltura ed ecologia forestale italiano ed internazionale.

È in questo frangente che insieme ai colleghi Roberto Tognetti e Marco Marchetti (Università del Molise), Giuseppe Scarascia-Mugnozza (Università della Tuscia), a Franco Miglietta (CNR) e Damiano Gianelle (FEM), egli anima la nascita nel 2013 del Project Centre on Mountain Forests (MOUNTFOR) dell'EFI, ospitato dalla Fondazione Edmund Mach di San Michele all'Adige. La sua calda personalità contribuisce a far confluire la rete dei contatti di



MOUNTFOR nell'Azione COST CLIMO (*Climate-Smart Forestry in Mountain Regions*; 2016-2021), collaborando alla definizione del concetto di *Climate Smart Forestry*, ovvero di una selvicoltura che si adatta ai cambiamenti climatici per continuare a svolgere quell'azione mitigante che eventi estremi mettono a repentaglio. La passione per la ricerca e la dedizione all'insegnamento lo portano a coordinare brillantemente il programma di dottorato in *Mountain Environment and Agriculture*, esaltandone l'impronta internazionale, ad esempio, attraverso i progetti *Skill for Action* e *Care4C* sulla gestione adattativa e integrata delle foreste (con Francesco Giammarchi).

Insieme agli studi sui meccanismi che regolano la dinamica degli ecosistemi forestali sottoposti a disturbi ambientali e al loro monitoraggio, come dimostrano le responsabilità di coordinamento di unità di ricerca unibz in progetti PRIN 2012 (rete sperimentale sulle deposizioni azotate, con Maurizio Ventura) e 2017 (rete nazionale di monitoraggio con sistema *TreeTalker*, con Enrico Tomelleri), il prof. Tonon si spinge verso ambiti di ricerca applicata e lavora alla possibilità di sfruttare la biomassa legnosa per aumentare la capacità del suolo di sequestrare carbonio e per valorizzare la filiera di gassificazione del legno in Alto Adige (progetto *WOOD-UP*). Non mancano collaborazioni con il

mondo dell'impresa, attraverso percorsi di collaborazione industria-accademia, come il programma di scambio Marie Curie (con Pietro Panzacchi). L'intuizione che le nuove tecnologie rappresentino un'opportunità per migliorare l'inventariazione e la gestione delle foreste lo porta ad interagire con la Provincia di Bolzano, promuovendo le prime esperienze di questo tipo in Italia. Inizia allora un'intensa collaborazione con la Ripartizione Foreste della Provincia Autonoma di Bolzano, che porta a innovare le



tecniche di monitoraggio delle aree colpite dalla tempesta Vaia con l'applicazione di nuovi metodi di assestamento forestale.

Il prof. Tonon era un innovatore, sapeva fare tesoro della sua solida formazione e aveva l'umiltà di applicarsi per apprendere nuove metodologie di ricerca. Per questo motivo era un riferimento tra i giovani ricercatori, stimolandoli e fornendo loro l'esempio.

Giustino Tonon, oltre che per i successi e le capacità in campo scientifico e accademico, è rispettato e ricordato da chiunque lo ha conosciuto e ha lavorato con lui, anche e soprattutto per le doti umane, l'ironia, l'empatia, e la capacità di interagire con tutti in maniera amichevole, collaborativa, e sempre corretta. A tutti noi resta la responsabilità di far tesoro del suo insegnamento.

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