Politecnico di Torino

1859

POLITECNICO AT A GLANCE

For over 160 years, one of the most prestigious Italian and international public universities for polytechnic culture.

International Rankings

2021 QS WORLD UNIVERSITY RANKING

Overall Ranking | World

334
Top 26% globally

By broad Subject | World:

33
Engineering and Technology

By subject

28
Architecture/Built Environment

48
Art & Design

129
Computer science & Information Systems

80
Chemical Engineering

31
Civil & Structural Engineering

43
Electrical & Electronic Engineering

31
Mechanical, Aeronautical & Manufacturing Engineering

38
Mineral & Mining Engineering

16
Petroleum Engineering

129
Mathematics

2021 QS – GRADUATE EMPLOYABILITY RANKING

by Indicator World:

28
Graduate Employment Rate

PoliTO at a glance

Politecnico di Torino was the first Italian engineering school founded on the wave of the technical and scientific innovation that gave rise to the most prestigious polytechnic schools in Europe in the mid-19th century. It was founded as a School for Engineers in 1859, then becoming Regio Politecnico di Torino in 1906.

Engineers, architects, designers and urban planners have been trained at Politecnico di Torino for over 160 years with rigor, integrity and high-level standards. This long ever-changing history has turned Politecnico di Torino into one of the top twenty European technical universities for education and research in **Engineering**, **Architecture**, **Design and Spatial Planning**, with over 37,000 students and a teaching staff of more than 1,000. In an evolving global context disrupted by the effects of globalization, climate change, population aging, new and increasingly pervasive technologies, universities are expected to progress in order to produce an impact on a rapidly changing society.

Politecnico di Torino has therefore decided to transform itself into a **"platform" University** expected to be permeable, inclusive, open to the labour market and to industry, with a key role in innovation and lifelong learning. The goal is to become a driving force for a societal sustainable development. In its recent Strategic Plan "PoliTO 4 impact", Politecnico established some development guidelines focused on creating value chains, which join up education, research, innovation, financial services and the enhancement of intellectual property. The objective is to develop clusters for industrial development that can attract large companies, small and medium enterprises and start-ups in order to retain PoliTO graduates in the local territory.

The Campus

The campus model of Politecnico is similar to the Anglo-American one. There are four campuses in Turin with multi-purpose facilities for teaching, basic and applied research, as well as student services. Politecnico also has a regional network of technology centres (Alessandria, Biella, Mondovì, Valle d'Aosta), dedicated to research, technology transfer, specialized training and services for the territory. The historical campus of the University, located on the banks of the river Po, is the **Castello del Valentino**, one of the Savoy residences in the 17th century, nowadays included in the UNESCO World Heritage List. It hosts the Architecture departments and covers 23,000 m².

The main campus located in Corso Duca degli Abruzzi, measuring 122,000 m², houses the Engineering Departments. It was opened in 1958 and now stretches to the **Cittadella Politecnica** in Corso Castelfidardo: 170,000 m² of spaces for students, research activities, technological transfer and services. The **Cittadella of Design and Sustainable Mobility** is located in Mirafiori, a reconverted Fiat industrial site, as well as the Specializing Master's Programmes and Lifelong Learning School, which is currently based at the **Lingotto** campus.

Like many international universities, Politecnico has established a number of **campuses abroad**. Politecnico is now present in Uzbekistan, Tashkent, and China, in Shanghai (Tongji University). In collaboration with its partner Universities, PoliTO also established some Competence Centres for the development of joint activities, especially in the fields of Research and Technology Transfer: in China with the South China - Torino Collaboration Lab at the South China University of Technology (SCUT) and with the Energy Transition LAB in collaboration with the Shanghai Jiaotong University (SJUTU); in France with the Sydere Centre at the ECAM institute; in Japan with the POLITO-KIT JOINT LAB in collaboration with the Kyoto Institute of Technology (KIT).

Furthermore, PoliTO founded its own hub in Brussels, where the European Commission and other major EU institutions host their headquarters, with the objective of influencing European research funding policies and of presenting funding opportunities to its professors and researchers.

WORLD

Studying at Politecnico

In line with the new Strategic Plan "PolTO 4 Impact", Politecnico intends to reaffirm its key role in the field of education. Education represents a cornerstone of PoliTO mission, being the main channel to share, to the good of society, the fundaments of polytechnic knowledge, the new competences generated by research and the know-how of professionals, managers and entrepreneurs who are actively part of a rapidly evolving world of work.

A growing number of students and families keep choosing Politecnico di Torino. Following the tradition of the best European technical universities, Politecnico di Torino offers a **comprehensive catalogue of programmes** in Architecture, Design, Spatial Planning and Engineering (25 Bachelor's degree programmes and 33 Master's degree programmes in academic year 2021/2022), with over 30% English-taught programmes. The course catalogue also boasts first and second level Specializing Master's programmes, third-level programmes offered by the Doctoral School and the courses organized by the Postgraduate School in Heritage Architecture and Landscape.

The **Alta Scuola Politecnica** merges the great traditions of Politecnico di Torino and Politecnico di Milano and offers a joint high-level programme for Master's students. The ***Progetto Intraprendenti*** is a project for the most achieving Bachelor's students. This integrated academic path fosters students' personal growth, develops their multidisciplinary skills and encourages methodological debate and international mobility. In a.y. 2019/2020 Politecnico di Torino was one of the first Italian universities to launch a new **Professional Bachelor's degree programme in Industrial Manufacturing Technologies**. The objective is to train high-level technicians to be employed in the manufacturing industry meeting the human resources demand of businesses and, in particular, of SMEs.

STUDENTS

37,000
Bachelor's and Master's students – A.Y. 2020/2021

71.5%
male students

28.5%
female students

500
students enrolled in 1st and 2nd level Specializing Master's programmes, Lifelong Learning courses and training courses for businesses

62%
students from outside Piemonte (43% Italians from outside Piemonte, 19% international students)

1,020
Ph.D. candidates – 37th cycle

5,619
first-year students – A.Y. 2021/2022

BIG GLOBAL CHALLENGES
Human and Social Sciences for Science and Technology

Two professors, a human/social scientist and a technologist, show prospective engineers the major challenges of the future: a brand new initiative within Italian universities, emblematically named Big Global Challenges, offered by PoliTO as a mandatory course starting from a.y. 2021/22.

An interdisciplinary project which seeks to train more "creative" engineers, future professionals who will be prepared to take up social challenges and face the complexity of the present.

COURSE CATALOGUE

A.Y. 2022/2023

25

Bachelor's degree programmes

4 in Architecture, Design and Spatial Planning
21 in Engineering

33

Master's degree programmes

9 in Architecture, Design and Spatial Planning
24 in Engineering

26

English-taught educational paths

30

1st and 2nd level Masters and Lifelong Learning courses

16

Ph.D. programmes, including **5** programmes jointly organized with other universities (**3**) and research centres (**2**)

1

Educational path for Bachelor's students - Intraprendenti

1

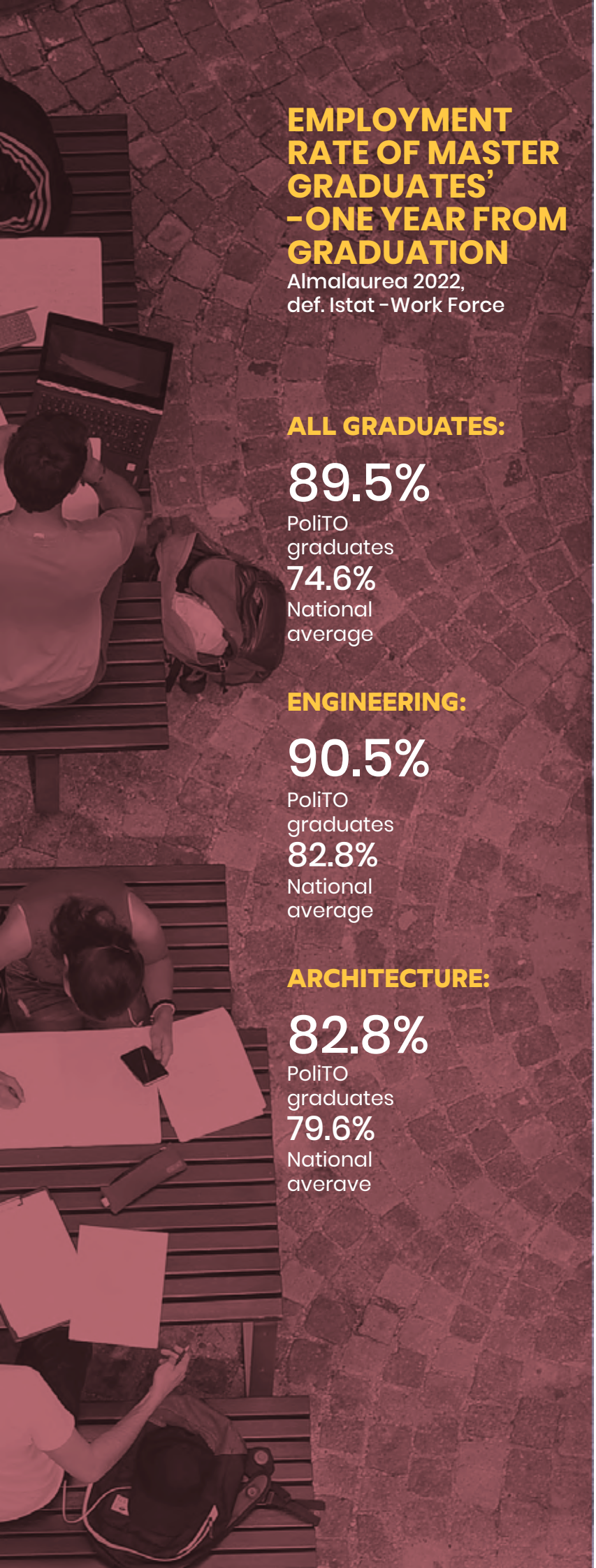
Educational path for Master's students - Alta Scuola Politecnica (ASP)

GRADUATES 2020

7,570

Bachelor's degree
— 3,954 graduates
— Average age: 23.7

Master's degree
— 3,610 graduates
— Average age: 26



EMPLOYMENT RATE OF MASTER GRADUATES' –ONE YEAR FROM GRADUATION

Almalaurea 2022,
def. Istat - Work Force

ALL GRADUATES:

89.5%
PoliTO graduates
74.6%
National average

ENGINEERING:

90.5%
PoliTO graduates
82.8%
National average

ARCHITECTURE:

82.8%
PoliTO graduates
79.6%
National averave

PoliTO ALUMNI ASSOCIATION

For over 100 years, the PoliTO Alumni Association has gathered former students, faculty member and researchers of Politecnico di Torino. In 1908 some "Valentinians" (that is how PoliTO students were called, being the Valentino Castle its official venue) decided to establish the Friendly Association of PoliTO Engineers Alumni on the occasion of celebrating their 35th graduation anniversary.

The current official name was launched in 1999, and in the following years there was a significant increase in the numer of members and in their participation, especially to the annual meeting, when PoliTO former students share their success stories to the public.

Ph.D. Programmes

Ph.D. programmes (Doctoral research programmes), which are the third level of university education, represent an even closer connection between education and research. An educational path that ensures the access to a successfull carrer, both in academia and in the private sector, as demonstrated by the many PoliTO Ph. D. graduates who have founded successful companies or quickly reached top positions in research centers and University in Italy and abroad.

The Doctoral School, founded in 1999, runs all 16 Ph.D. programmes offered by the University, three of which are organized jointly with the University of Torino and one with the National Institute of Metrological Research (INRIM). Moreover, the School has been working in close cooperation with the National Institute for Nuclear Physics (INFN) on electronic devices. PoliTO is also partner of 2 national Ph.D. programmes offered by the Ministry of University and Research (MUR).

Ph.D. graduates from Politecnico have scientific research abilities that allow them to express creativity and methodological rigour in the world of work to pursue an academic career or, more often, a career in industry. Ph.D. graduates represent bridges that can transfer the culture of progress to businesses thanks to their ability to manage innovation and to their creativity in designing and implementing projects and services. In recent years, Politecnico has decided to make substantial investments in its Ph.D. programmes, which are deemed a strategic target for the University. In order to enhance merit and talent, Politecnico has raised Ph.D. grants by 30% compared to national average levels and has increased the number of Ph.D. scholarships made available to candidates: 90% of Ph.D. candidates receive a scholarship or other forms of funding. Moreover, the most achieving Ph.D. candidates of each doctoral programme are awarded additional prizes for a total amount of 100,000 Euro per year. PoliTO seeks to further increase the number of international Ph.D. candidates.

Over the years, **Italian and international businesses have strengthened their cooperation with the Doctoral School** in areas of mutual interest: 25% of Ph.D. scholarships are funded by external non-academic bodies and at present there are 30 Ph.D. programmes offered in apprenticeship format. The Doctoral School pays significant attention to soft skills, given their high transferability across sectors and their impact on the career of Ph.D. graduates. To this end, the School offers a variety of soft skills courses (including online courses) and other high-level training opportunities, in cooperation with international universities, with partners such as the CERN in Geneva and with companies as UNIDO, Smat, Enel, Eni, Barilla, and the Ministry of Economic Development (MISE).

Ph.D. PROGRAMMES

1,020
Ph.D. candidates
- 37th cycle

16
Ph.D. programmes

SCHOLARSHIPS

90% of Ph.D. candidates receive a scholarship

Ph.D. grants are **30%** higher than national average level

25% of Ph.D. scholarships are funded by non academic bodies

30 Ph.D. programmes offered in apprenticeship format

INTERNATIONAL PH.D. CANDIDATES

25%
of all Ph.D. candidates

EXCELLENCE OF PH.D. CANDIDATES

72%
of Ph.D. graduates scoring 105/110

53%
of Ph.D. candidates scoring 110/110

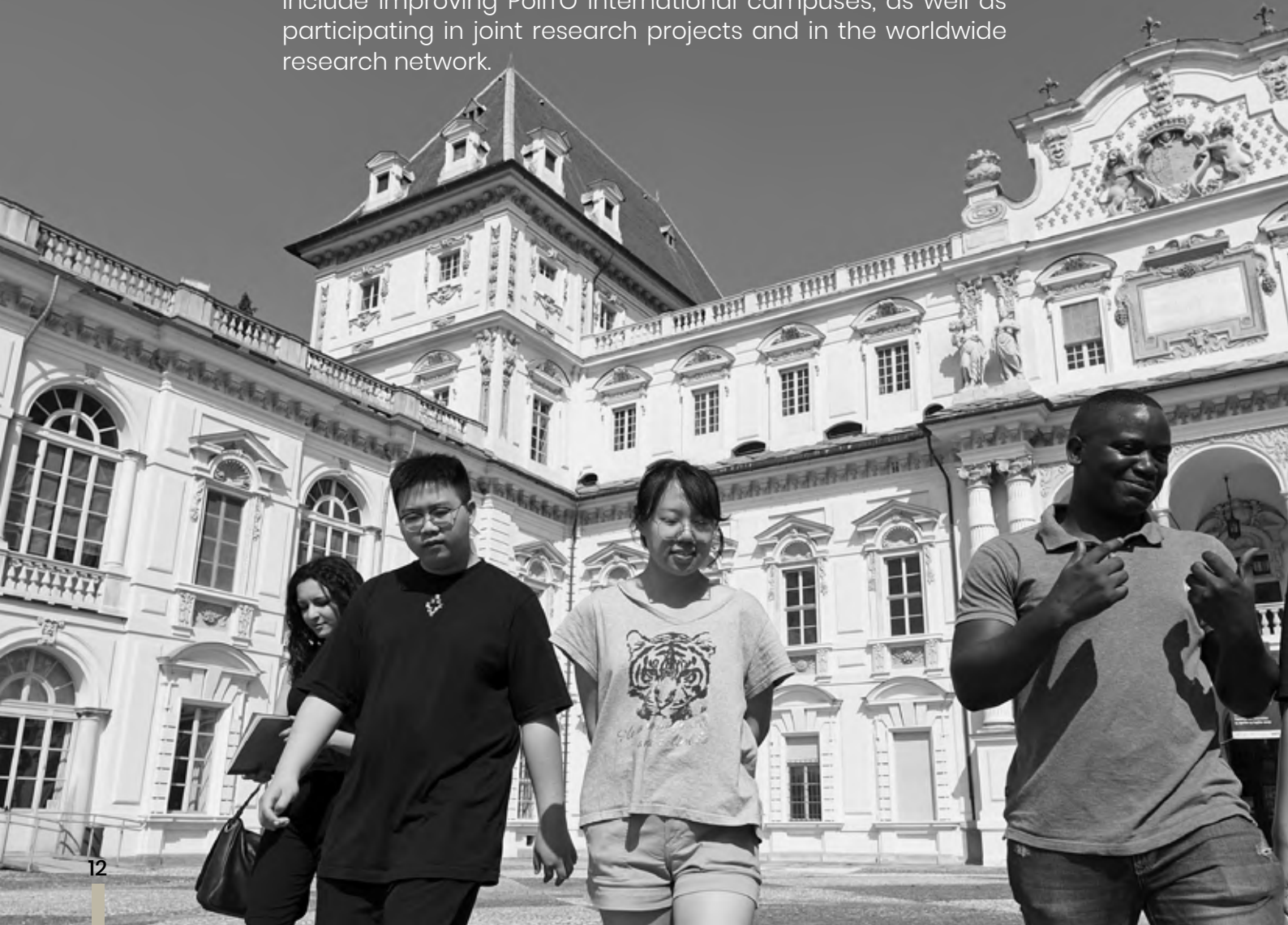
Specializing Master's Programmes and Lifelong Learning School

The Specializing Master's Programmes and Lifelong Learning School is a centre of excellence that defines groundbreaking educational polices and adresses the demands of the labour market Its programmes are designed to meet the need for **high-level technical training** that boosts the knowledge base already acquired by students during traditional degree programmes, and to address the constantly changing requirements of the world of work. They support and develop students' competitiveness and entrepreneurial skills.

The School addresses the needs of scientific and technological innovation from industry and the service sector. It designs and implements tailor-made training programmes for recent graduates, newly-employed staff members and senior professionals. To this end, the School works in cooperation with partner Italian and international universities, as well as with public bodies and major corporations. To keep up with the challenges of the digital transformation of industry and society, the School regularly updates its course catalogue with innovative scientific contents. The programmes allow participants to get on-the-job training providing them with the opportunity to gain experience in a company, in Italy or abroad. The Specializing Master's programmes and training courses are intended for Italian and international students: they are in line with the internationalization process of the University, and at the same time they preserve their traditional connection with the local community.

An international University

Politecnico di Torino believes in the importance of internationalization: **more than 19% of PoliTo students are international students from over 120 countries**. Over the years, Politecnico di Torino has signed about 1,000 international agreements and projects. The University takes part in the major university clusters and networks worldwide (Unite!, Cesaer, Cluster, Eua, Magalhaes, SEFI, ISCN and many more). Politecnico envisages a number of essential targets: establishing Politecnico di Torino among the top technical universities at international level; merging high-level scientific research with high-quality education and efficient actions for technology transfer and knowledge sharing. The goal of making our University a truly international and multicultural institution encompasses many challenges, including the development of an international and interdisciplinary course catalogue, the support for international mobility of students and members of the teaching staff as well as the internationalization of our faculty. Other priorities include improving PoliTO international campuses, as well as participating in joint research projects and in the worldwide research network.



UNITE! – University Network for Innovation, Technology And Engineering

PoliTO is part of one of the first 17 European University Alliances, which seek to innovate the European Higher Education Area. It gathers seven universities and connects several European regions in the fields of economics, entrepreneurship and innovation. The objective is to renew European higher education through its Erasmus+ pilot project, and thanks to a common research and innovation agenda developed within its Horizon 2020 project.

Unite! seeks to connect engineering, science and technology with the major societal challenges by engaging students, faculty and staff – providing skills for a new generation of European and global citizens.

PARTNER UNIVERSITIES:

- Northern Europe: two major cities and regions with a strong background in entrepreneurship and innovation: Aalto in Espoo-Helsinki (Finland) and KTH Stockholm (Sweden).
- Western Europe: two partners from the two largest economies and drivers of the European Union, TU Darmstadt in Germany (Hessen, Rhein-Main Region), coordinator of the alliance, and Université Grenoble Alpes / Grenoble INP (France / Rhone Alpes)
- Southern Europe: three economic and industrial centres stretching from Portugal to Northern Italy: Politecnico di Torino, University of Lisbon in Portugal and UPC Barcelona (Spain/Catalonia).

INCOMING STUDENTS

5,487 international students enrolled in A.Y.2020/2021

120 countries of origin

COUNTRIES OF ORIGIN

ASIA	**63%**
EUROPE	**18%**
AMERICA	**10%**
AFRICA & OTHER COUNTRIES	**9%**

Main countries

China	19%
Iran	9%
Turkey	8%
Pakistan	5%
India	5%
Uzbekistan	5%
Romania	6%
Colombia	4%
Albania	3%
Lebanon	3%

INTERNATIONAL AGREEMENTS

310	General agreements
68	Europe
114	Asia
53	South America
46	North America
21	Africa
8	Oceania

427 Erasmus+ "Programme Countries" agreements

78 Erasmus + "Partner countries" agreements

168 Double degree and student mobility agreements

STUDENTS' MOBILITY: - A.Y. 2020/2021

894 Incoming students

487 Outgoing students

Research

The international context of scientific research is becoming increasingly complex on a global scale. Politecnico di Torino plays an active role in this scenario orienting its research towards the **major global societal challenges**. The objective is to have a thriving impact on both the local community and the country and to make a greater contribution to the work of the international scientific community.

The new frontiers of scientific and technological research require a multidisciplinary and collaborative approach involving both universities and the socio-economic system in order to allow research to provide tangible responses to the Sustainable Development Goals of the 2030 Agenda.

Politecnico enhances its 11 Departments and Interdepartmental Centres, the "places" where research is conducted, in order to strengthen a comprehensive model of research and knowledge transfer ranging from the conception of ideas to the dissemination of results throughout the entire value chain. Both the **Departments and the Interdepartmental Centres** seek to foster new opportunities and stimulate innovation in order to position themselves on the technological frontier with a strong interdisciplinary approach and cutting-edge research infrastructures.

Politecnico di Torino has made significant investments in the research infrastructures of its interdepartmental centres. Thanks to the funds received from Regione Piemonte, up to the present the University has been able to boost and provide open access to **10 infrastructures** in order to share knowledge and technology with the local community.

Politecnico has also launched the OpenPlatforms model in order to showcase its strategic research competences to the outside world. The **Platforms** *(Piattaforme)* are not necessarily physical places. They are spaces of interaction where businesses can find resources and skills in high demand on the market and can meet their need for innovation on six thematic areas: Circular and Sustainable Economy, Digital Revolution, Energy&Water, Heritage and Urban and Territory regeneration, Manufacturing 4.0,

RESEARCH FUNDING – SOURCE: FINANCIAL STATEMENT 2020

52
Million EUR
research revenue
20% of PoliTO
total revenue

29
Million EUR from
competitive calls

23
Million EUR from
research contracts
with public and
private sector

SCIENTIFIC PUBLICATIONS – 2021

2,252
Publications in
scientificjournals

909
Conference
proceedings

38
Monographs or
scientific papers

382
Books contributions

With regard to international research grants, since 2014 Politecnico has received funds amounting to 104 million Euro for 268 projects in the framework of the Horizon 2020 Programme. The University now ranks 4th nationally and 57th at European level in terms of number of funded projects.

In line with its Strategic Plan, Politecnico supports both fundamental and collaborative research projects with both internal actions and calls for proposals also funded by banking foundations (Compagnia di San Paolo and Fondazione CRT).

The **H2020@POLITO** and **ERC@POLITO** projects offer faculty members and researchers a whole set of actions and tools. These projects are going to continue through a new project that will support the participation of Politecnico into the next Horizon Europe framework programme (2021-2027).

Politecnico seeks to boost research projects by promoting internal competitive calls such as the "Create a network around your research idea" call *(Metti in rete la tua idea di ricerca)*, which has funded collaborative research projects submitted by new and early career faculty in cooperation with academic and non-academic bodies. Politecnico has also launched the Starting Grant project, which aims to attract professors of international standing from other institutions.

Politecnico strongly focuses on the **internationalization process of its research** through several initiatives that boost mobility and enhance cooperation with top-level research centres worldwide. In this framework, Politecnico has a Call for joint projects for the internationalization of research, which aims to strengthen the cooperation with universities ranked in the top 50 positions of international rankings or located in strategic geographical areas. Another important initiative is the MITOR programme (since 2009) for the support of joint research projects between the Massachusetts Institute of Technology (MIT) and Politecnico di Torino.

NATIONAL AND REGIONAL RESEARCH GRANTS – 2014-2021

227
National and Regional Projects

42
Million EUR

Including:

1
"Competence Industry Manufacturing 4.0" Competence centre launched in the framework of the "Industry 4.0" call of the Ministry of Economic Development (MISE)

Projects funded by the Ministry of Education, University and Research (MIUR) in the framework of 10 National Clusters

57
PRIN Projects (2015 and 2020 MIUR calls)

27
Regional Platforms Projects (Smart Factory, Health and Well-being, Bioeconomics)

3
IR2 projects| Industrializationof research results

1
CTE NEX project – Casa delle Tecnologie Emergenti

RESEARCH PROJECTS WITH FOUNDATIONS

78
R&D Projects with Compagnia di San Paolo

1
"*1,000 dottorandi di ricerca*" projcet with Fondazione CRT

INTERNATIONAL RESEARCH GRANTS (2014-2021)

341
European and international project

115
Million EUR

268
Horizo2020 Projects, among which 68 coordinated by PoliTO

104
Million EUR | 16% success rate

5
Horizon Europe Projects, among which 1 coordinated by PoliTO

3
Million EUR

3
EIT Communities

Other activities include the call for proposals to host **Long Term Visiting Professors**, which seeks to attract experts and scholars of high scientific standing and proven international reputation from abroad. Politecnico di Torino is also running an array of **joint projects in cooperation with high-level international institutions to support research through the mobility of Ph.D. candidates**.

Our University is part of **prestigious international networks** such as ECSEL, N.ERGHY, ECTP, NEREUS, IAF, EPIC, EERA, EGVIA, EFFRA. It also has a large number of industrial partners which include: Finmeccanica, Ansaldo, Avio Aero, ENI,

FCA (Fiat Chrysler Automobiles), Ferrari, General Motors Powertrain Europe, Enel, Ferrero, HP, IBM, Indesit, INWIT, Italdesign, Michelin, Microsoft Italia, Nokia, Philips, Piaggio, Pininfarina, Pirelli, Siemens, SKF, STMicroelectronics, Terna, TIM, Thales Alenia Space.

In 2013, Politecnico di Torino was awarded the "HR Excellence in Research" logo by the European Commission for its commitment to offering positive and challenging working conditions to its international researchers and for implementing the principles of the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers.

Erc Projects (Polito Host Institution) European Research Council

20
ERC Projects

24,7
Million EUR

Ongoing

ANFIBIO

Nanotechnologies to improve markers of tumours and viruses

Thanks to gold nanoparticles, the project aims at enhancing Raman spectroscopy, a method to analize materials' used to detect cancer and viral bio-markers in bodily fluids, with a non-invasive analysis approach.

BIORECAR

Regenerate cardiac tissues after heart disease

The BIORECAR project proposes an innovative and multidisciplinary approach for in situ "direct reprogramming" of infarcted heart tissue into functional cardiac tissue, using bioengineering tools, including biomimetic biomaterials and nanomedicine.

CO2CAP

Recover energy from CO_2 emissions

The objective of the project is to save energy by developing devices that absorb CO2 and charge the electrodes of a supercapacitor at the same time.

CRYFORM

A sustainable revolution for medicine and agriculture

The project intends to substitute synthetic stabilizing agents used in pharmacology and biotechnology with natural, biocompatible and biodegradable crystals allowing the development of innovative multiphase formulations, easily soluble and capable of controlled release of active ingredients.

DYNAPOL

Moleculat models for designing new types of bioinspired dynamic materials

The DYNAPOL project develops multiscale molecular models and uses advanced computational simulation and machine learning techniques to discover the fundamental chemical-physical principles in order to learn how to design new types of artificial materials with bio-inspired dynamic properties that are similar to those of living materials.

IDEAL DRONE

Drones for emergency management

The Ideal Drone project will equip a swarm of drones flying over a catastrophe area (i.e. a burning or collapsed building) with a customized sensor network able to provide indoor localization of victims and rescuers, to monitor their vital signs as well as the environmental conditions of the area.

PRE-ECO

Innovative models for the design of 3D printed composite materials

The PRE-ECO project will develop new mathematical models to allow the industrial use of 3D printed composite VAT materials (Variable Angle Tow) with the objective of obtaining lighter and more robust components for various applications such as aeronautics.

RADICAL HOUSING

Addressing the housing crisis on a global scale

The “housing issue” is not a one-standing problem, but is linked to various contemporary urban issues. The project investigates how communities face housing shortage and react to it.

SUN2RISE

Producing fertilizers from air and water using solar energy

The project combines photovoltaic production of electricity with the conversion of dinitrogen to ammonia, a compound at the base of fertilizers in agriculture. This is the ambitious goal of the project, which advances new scenarios for solar energy conversion and agriculture

XTRAUS

Preventing cancer recurrence with nanotechnologies

The project seeks to develop a cutting-edge technology to fight circulating tumour cells (CTCs) in the bloodstream and to reduce cancer relapse: a novel, remotely activeted, non-immunogenic, CTL-targeted nanoparticle, which acts against circulating tumour cells in the bloodstream, with substancial reduction of off-target damage to other cellss and healthy tissues.

321

A year of calculations in just a second: electromagnetic modeling in real time

The project seeks to transform the computational complexity of mathematical models into Computational Electromagnetics by drastically reducing the computational cost of numerical simulations. This will pave the way to new applications in brain activity assessments, mind-machine interactions, diagnostic imaging and electromagnetic dosimetry.

Departments, Centers and ‘Piattaforme’

Departments

Politecnico di Torino has 11 Departments which are reference centres in the different fields of study of Engineering, Architecture, Design as well as Territorial, Urban, Environmental and Landscape Planning. Besides organizing and managing teaching, Politecnico Departments coordinate vertical research and promote the sharing of research results.

MANAGEMENT AND MATHEMATICS

DIGEP

Department of Management and Production Engineering

for the field of study that explores the relationship between production systems of goods and services and the economic environment in which they operate, thus blending engineering approaches with economics and management.

DISMA

Department of Mathematical Sciences

for the fields of study that deal with Mathematical Sciences and their interaction with Engineering and Architecture.

INDUSTRIAL ENGINEERING

DENERG

Department of Energy

for the fields of study of energy and sustainable development. It aims to improve existing energy technologies, promote n ew ones and contribute to the rational and informed use of energy resources.

DIMEAS

Department of Mechanical and Aerospace Engineering

for the fields of study that cover a broad spectrum of manufacturing activities typically associated with an advanced industrial society. These activities range from traditional to cutting-edge domains in the mechanical and aerospace fields.

DISAT

Department of Applied Science and Technology

for the fields of study that explore the fundamental principles of matter and energy, their transformation and related engineering applications.

INFORMATION TECHNOLOGY

DAUIN

Department of Control and Computer Engineering

for the field of study of Information and Communication Technologies (ICT). It studies the methodologies and technologies used for management, processing and transmission of information.

DET

Department of Electronics and Telecommunications

for the field of study of Information and Communication Technologies (ICT) that include telecommunications, electronic devices, circuits, technologies and systems, electronic measurement and characterization techniques, as well as electronic bioengineering.

CONSTRUCTION AND ENVIRONMENTAL ENGINEERING, ARCHITECTURE, SPACIAL PLANNING AND DESIGN

DAD

Department of Architecture and Design

for the fields of study that investigate the art and science of design, both in architectural and urban buildings and in product design.

DIATI

Department of Environment, Land and Infrastructure Engineering

for the fields of study that explore the technologies for the safeguard, protection and management of the environment and the land, for a sustainable use of resources as well as for the optimal and eco-sustainable development of infrastructures and transport systems.

DISEG

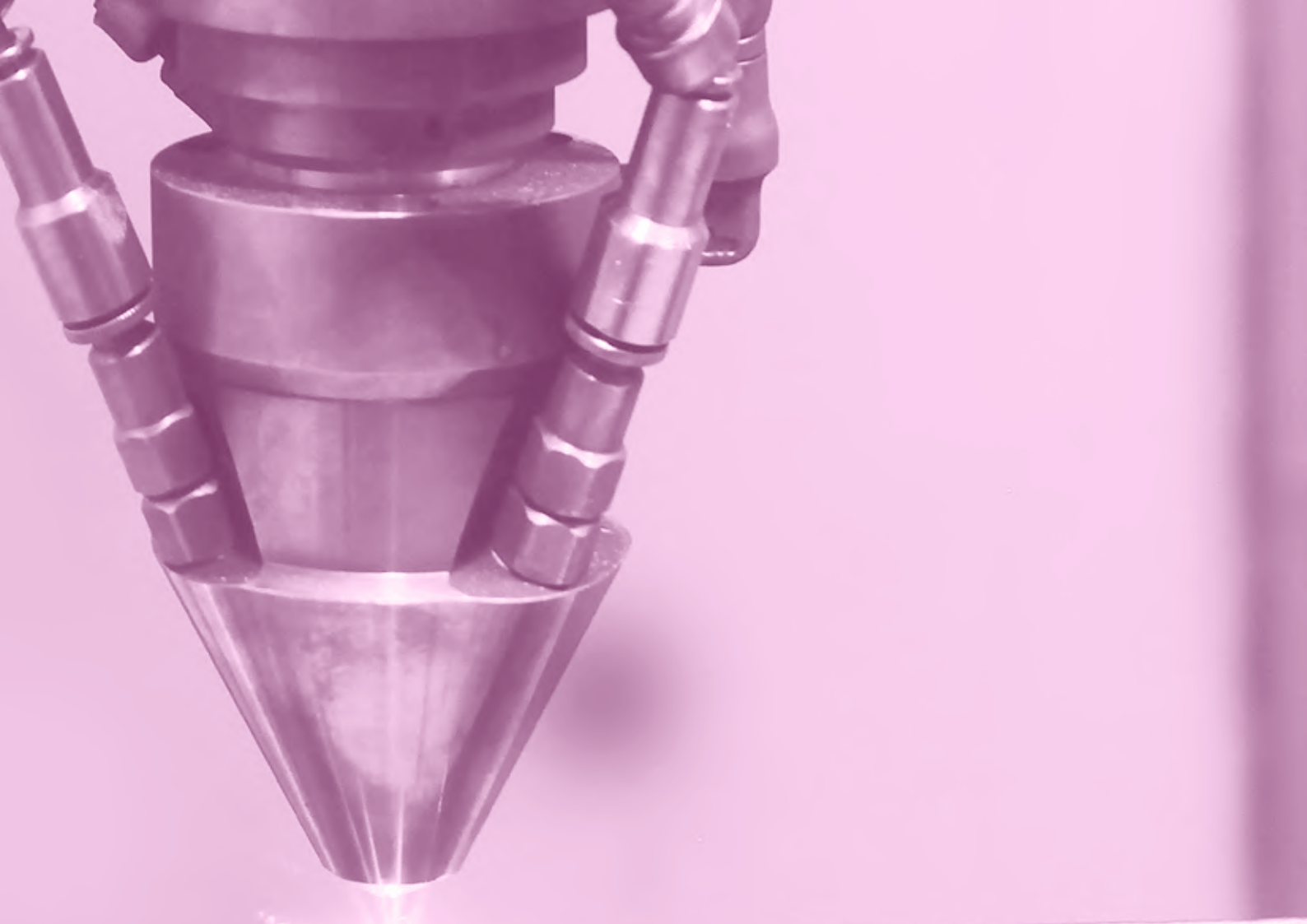
Department of Structural, Geotechnical and Building Engineering

for the fields of study that deal with safety issues and functional and formal planning of constructions, taking into account environmental and human actions and their integration with the natural and the built environment, their uniqueness and their impact on the territory.

DIST

Interuniversity Department of Regional and Urban Studies and Spatial Planning

for the fields of study that explore the processes of territorial transformation and government, both on a local and global scale. These processes are analysed from a sustainability perspective in their physical, economic, social, political and cultural aspects as well as in their interrelationships.



Interdepartmental Centres

Large higher education institutions and especially the major technical universities have to tackle emerging technological and societal challenges. They also need to work across the frontiers of several disciplinary fields including advanced robotics, the Internet of Things, neuro-technologies, advanced materials, to mention just a few.
Politecnico di Torino has also set itself the strategic objective of encouraging interdisciplinary cooperation among technological and scientific fields. To this end, Politecnico has established the Interdepartmental Centres, places where researchers from the various Departments can interact with each other in order to **share and produce knowledge** with breakthrough technologies.

CARS@POLITO

Centre for Automotive Research and Sustainable mobility

This Centre conducts research in the field of Automotive Engineering and Intelligent Transportation Systems, especially in five areas of interest: Green Vehicles, Safe & Integrated Mobility, Affordability & Competitiveness, Urban Mobility & Logistics, New Mobility Solutions based on the principles of the Sharing Economy. The Centre is committed to finding solutions to the societal challenges of traffic congestion, air and noise pollution, road safety and quality of public transport.

CWC

CleanWaterCentre@PoliTO

This Centre tackles the technological challenges of water safety and supply. The mission of the Centre is to design and develop cutting-edge water treatment systems for the public sector and for industrial use. These systems purify and reclaim contaminated water streams efficiently using alternative energy sources.

EC-L

Energy Centre Lab

In the framework of the Politecnico Energy Centre Initiative (ECI), this multidisciplinary laboratory works to develop models and scenarios for the new energy transition. Its goal is to design energy systems that are increasingly interconnected and to predict their behaviour and impact on different spatial and temporal scales. The Centre also deals with the economic and environmental impact of energy technologies and infrastructures and it studies how users manage energy flows.

FULL

Future Urban Legacy Lab

The mission of the Centre is to study the challenges of an increasingly urbanised world and to explore the future of global and local urban legacies. In particular, the Centre is committed to tacking wicked problems in mid-size cities with a new interdisciplinary approach to urban phenomena based on the integration of morphology, economics, evidence-based design and socio-technical knowledge.

IAM@POLITO

Integrated Additive Manufacturing

This Centre seeks to create a multidisciplinary research platform for additive manufacturing. Its objective is to tackle the challenges posed by machines, materials and related applications. The Centre is committed to developing new generation systems for Industry 4.0 production in cooperation with its industrial partners.

J-TECH@POLITO

Advanced Joining Technology

This Centre is striving to become a top-class research hub for advanced joining technology, with expertise on high-temperature and adhesive-based joining, laser and friction stir welding, characterization techniques such as X-ray tomography and other custom-built testing facilities.

PEIC

Power Electronics Innovation Centre

This is a research and technology transfer centre engaged in power electronics. Its main goal is to provide efficient and reliable power conversion solutions for strategic applications such as hybrid and electrical vehicles, infrastructures for electrical battery charging, electrification of aircrafts, electrical energy production from renewable sources and advanced systems for industrial production.

PIC4SER

PoliTO Interdepartmental Centre for Service Robotics

This Centre studies and develops innovative technologies and experimental solutions in the field of autonomous and collaborative robotic systems. The fields of study include precision agriculture, smart cities, search and rescue operations, patrolling and early warning systems, living support for elderly and disabled people and territory monitoring.

PHOTONEXT

Inter-Departmental Centre for Photonic Technologies

This Centre is committed to studying photonic technologies. It conducts experimental and applied research in three key areas: optical fibre ultra-high speed communication systems, optical sensors and optical components for industrial applications.

POLITOBIOMED LAB

Biomedical Engineering Lab

This Centre is a platform where scientific experts from Politecnico cooperate with bioengineers who have in-depth knowledge of their subject and a multidisciplinary approach. The objective of the Centre is to develop research and innovation in order to tackle the societal challenge of promoting health and wellbeing of all citizens throughout their entire life cycle.

R3C

Responsible Risk Resilience Centre

R3C is the first Italian research centre which studies environmental and socioeconomic vulnerabilities of territorial systems with an interdisciplinary approach. The Centre supports institutions, businesses and civil society in their challenge to adapt to the ongoing global transition by offering resilient models and solutions. The Centre promotes resilience and adaptation strategies to secure territorial and cultural heritage, thus implementing the goals of the 2030 UN Agenda. R3C proposes a new interdisciplinary research methodology to enhance innovation and transformation of vulnerable territories.

SISCON

Safety of infrastructures and Constructions

The Centre offers the necessary multidisciplinary skills to manage infrastructures and complex buildings in a safe way. In particular, the Centre seeks to conduct innovative research and promote technology transfer in the fields of structural integrity and safety, performance and degradation of construction materials, monitoring and active control, inspection and maintenance protocols for civil infrastructures. An experimental multi-scale approach joins up cutting-edge technologies for materials analysis, electronic sensors and real-scale tests on existing constructions such as bridges, complex buildings, tunnels and dams. The Centre also boasts state-of-the-art computational capacities and modern AI and data analysis techniques.

SMARTDATA@POLITO

Big Data and Data Science Laboratory

The Centre works on Big Data technologies and Data Science approaches. Since these two fields of study are highly multidisciplinary, the Centre brings together experts in machine learning, algorithms and data modelling who work in close cooperation with managers and experts from various engineering disciplines.

Piattaforme

The *Piattaforme* (Platforms) are coordination tools that promote and enhance skills, services, products and infrastructure available at PoliTO. The *Piattaforme* indeed connect the PoliTO ecosystem, which includes its auxiliary and subsidiary companies, with public and private external stakeholders interested in research and innovation conducted in partnership with Politecnico.

The main goal is to foster cooperation with companies and public bodies, enhancing the understanding of what PoliTO can offer and how to establish an active collaboration.

Moreover, the *Piattaforme* seek to collect demands from the outside, fostering a comprehensive response from the Departments of PoliTO involved in the various sectors of research and innovation.

STRATEGIC AREAS

CIRCULAR ECONOMY & SUSTAINABILITY

DIGITAL REVOLUTION

ENERGY, WATER & CLIMATE

MANUFACTURING 4.0

URBAN REGENERATION

3D MOBILITY

Innovation

The Third Mission

Politecnico di Torino has always recognized the fundamental importance of the "Third Mission" of universities. As it is natural for any technical university, Politecnico di Torino has supported the development of Piemonte and Italy by cooperating with industry in the different phases of our history. At the beginning, PoliTO supported the construction of our civil infrastructures; later, it participated in the first wave of industrialization in the Nineteenth Century. It also contributed to the "electric revolution" during the Second Industrial Revolution, as well as to the massive industrialization of the first and second post-war periods, all the way up to the electronics and information technology revolutions of the last decades.

Similarly, today Politecnico di Torino is working to advance the "Fourth Industrial Revolution" by exploiting the results of its decade-long research in its Industry 4.0 Competence Centre. The "Third Mission", originally intended as and limited to technology transfer, has expanded its sphere of action. **Sharing and co-generating knowledge** have become more and more important in the relations with the private sector. The role of academia towards society in disseminating research results and promoting open debate on the social, economic and political impact of technologies is gaining momentum. The result of this process is a new model of university: **an open, accessible campus, keen to quality of life and inclusiveness**, which promotes dialogue with society and is able not only to develop new technologies, but also to foster positive applications inspired by sustainable development.

Technology Transfer

At Politecnico di Torino, Technology Transfer activities aim to boost the capacity to enhance our research results. Politecnico di Torino fosters company competitiveness and promotes the dissemination of polytechnic culture also to businesses. It helps Public Administrations and policy makers to define measures and norms that may advance the virtuous development of a society undergoing significant technological and societal changes. In the pursuit of these strategic objectives, our University seeks to strengthen its "innovation value chain", which starts from the development of competences and research results and stretches all the way up to their industrial application to produce innovative goods and services.

For this reason, Politecnico di Torino works with local stakeholders to build an **"innovation ecosystem"** formed by complementary bridging institutions that can ensure full, uninterrupted and effective coverage of the Technology Transfer value chain. In particular, if we can join up the offer of innovation, businesses (representing the potential demand for innovation) and the financial sector, we will be able promote an "early market" that may speed up both the development and the adoption of new technologies.

COMPETENCE INDUSTRY MANUFACTURING 4.0

5 Million EUR from the Ministry of Economic Development (MISE) on Industry 4.0, plus new upcoming funds from partner companies. **The Competence Industry manufacturing 4.0** ranks first in the MISE ranking and focuses on advanced Manufacturing in the automotive and Aerospace sectors. It works in cooperation with 24 private companies.

CIM4.0 is housed in the TNE spaces at Mirafiori, and is the main national cluster for manufacturing companies oriented to the digitalization of industrial processes in view of Industry 4.0. CIM4.0 offers to companies:

- two pilot demonstration lines to test cutting-edge technologies (Additive Manufacturing and Digital Factory)
- open calls to support investments
- training to learn how manage change

KNOWLEDGE GENERATION

LabTT - Interdepartmental Laboratory for Technology Transfer

CLIK - Contamination Lab & Innovation Kitchen

EIC - Entrepreneurship and Innovation Centre

PROTECTION AND VALORIZATION

(end of 2021)

1,071
Filed patent applications (total)

421
Active patents

224
Active patent families

23%
Joint ownership with companies/organizations

20%
IP securities in agreements with Spin-offs and other companies

ACTIVE PATENTS BY SECTOR

44
Aeronautics| Aerospace| Automotive

5
Architecture | Design

122
Biomedical| Chemical | Pharmaceutical

34
Energy | Renewables

48
Physics | Materials| Nanotechnology

99
Computer | Electronics | Telecommunications

35
Civil Engineering| Environmental| Building

34
Industrial Engineering| Mechanics| Mechatronics

SPIN-OFFS

65
Spin-offs created so far (up to 31 December2021)

32
Spin-offs currently operating (up to 31 December2021)

3.3
Million EUR of funds (on 2020)

+55
Million EUR, currentpost-money value (up to 31 December2021)

PROOF OF CONCEPT CALLS

PoC@Polito

1.6 Million EUR (2016-2018)
45 funded projects

PoC INSTRUMENT

2.7 Million (2019-2021)
+50 funded projects

PoC-OFF

340K EUR (2021)
7 funded projects

PoC INSTRUMENT 2.0

3 Million EUR budget (2022-2024)

PoC with Venture Capital funds

+600K EUR (2019-ongoing)
6 funded projects

PROMOTION OF RESEARCH RESULTS

www.knowledge-share.eu

A showcase for research results in collaboration with Netval

1,600 patents from **90** organizations and universities

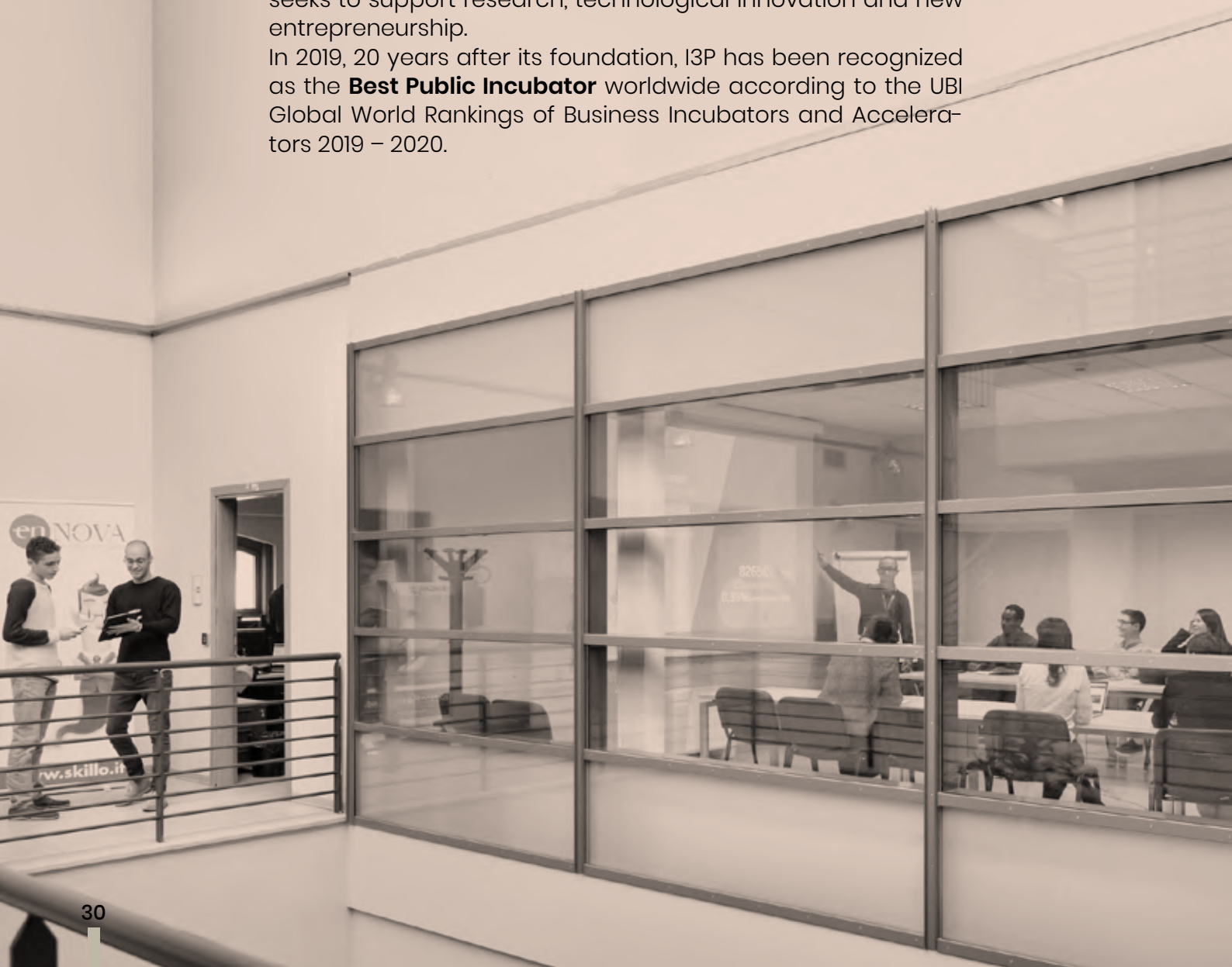
INTERNATIONAL RELATIONS FOR TECHNOLOGY TRANSFER

A global academic network to foster technology transfer

- Global Venture Lab - UC Berkeley
- CESAER
- UNITE.H2020

I3P The Innovative Enterprise Incubator

I3P - the Innovative Enterprise Incubator of Politecnico di Torino is one of the most important university incubators in Europe. Founded in 1999, I3P is based in the Cittadella Politecnica and supports the creation of new high-tech companies, founded by university researchers and entrepreneurs. The incubator offers them offices, strategic and specialist consultancy as well as a continuous stream of networking opportunities with investors and corporate clients. Up to the present, over 250 start-up companies have exploited research results from various sectors and from the field of Social Innovation. The companies have attracted risk capital investments worth over 60 million Euro and created about 12,000 new jobs.
I3P is part of the global strategy of Regione Piemonte which seeks to support research, technological innovation and new entrepreneurship.
In 2019, 20 years after its foundation, I3P has been recognized as the **Best Public Incubator** worldwide according to the UBI Global World Rankings of Business Incubators and Accelerators 2019 – 2020.



2021 RESULTS

904
Ideas accepted

114
Projects launched

52
Startups launched

22
Companies admitted

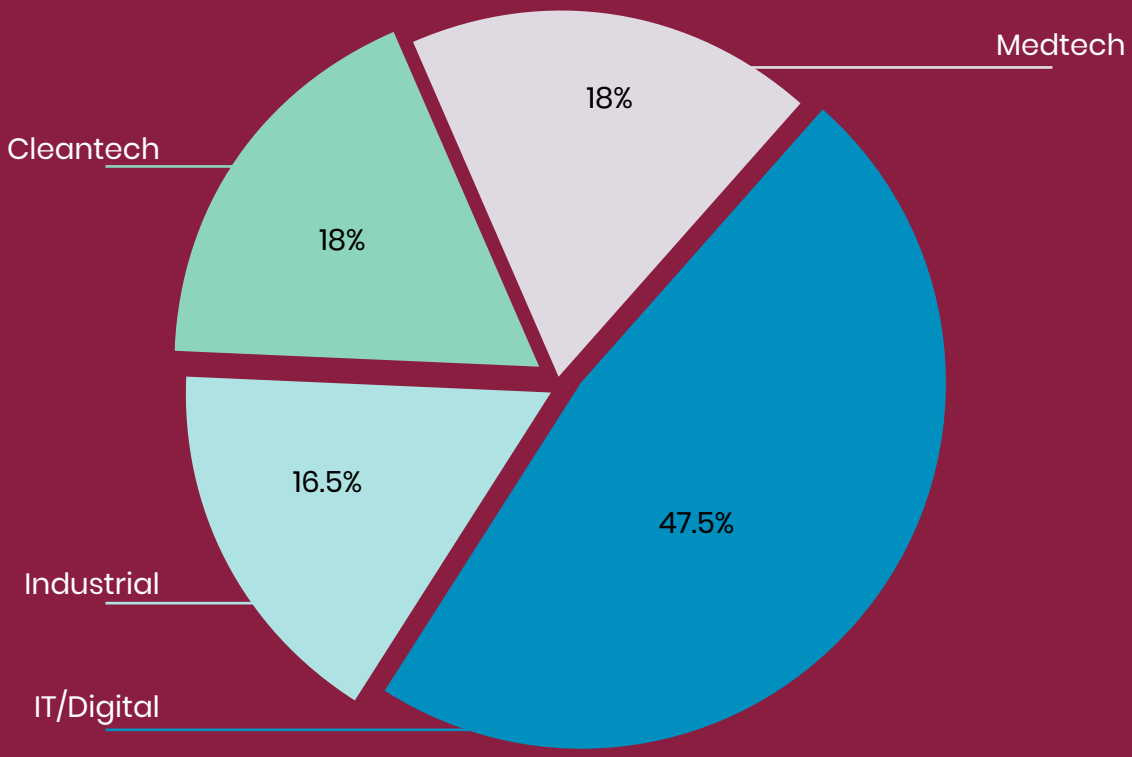
3,81
Million EUR
Seed investments

33.87
Million EUR
EarlyStage investments

STARTUP EMPLOYMENT

2,091
Active job places
on 31 December, 2020

STARTUP SECTORS



Culture and Communication

Within the scope of the “Third Mission”, Politecnico seeks to strengthen its commitment to interacting with society in order to disseminate its research results and exchange views with citizens and institutions on current issues.

Politecnico is an open community that stems from society and wishes to evolve with society through a close dialogue inspired by common values.

To this end, the University organizes conferences and events to exchange views with the various members of society, such as private companies, institutions and citizens, focusing on its role as an institution that creates and promotes culture.

BIENNALE TECNOLOGIA

In 2019, Politecnico organized the first edition of the Festival della Tecnologia, a four-day event with conferences, debates, workshops, exhibitions and shows. The Festival has been an opportunity for citizens, businesses, universities, public administrations and the third sector to meet, discuss and reflect on the challenges of an increasingly technological world. From 2020 the initiative turned into the ***Biennale Tecnologia***: a biennial four-day event, a wide-ranging initiative aimed at sharing an inclusive and open reflection on the relationship between technology and society, starting from the most recent technological innovations and going back to the Italian technological roots. All events share a strong multidisciplinary approach, also enriched by the languages of fiction, cinema, music and figurative arts. PoliTO also organizes a series of meetings and events between one *Biennale* and the following in ordert to guide the audience to the next edition of the festival.

OPEN CULTURAL EVENTS

- Biennale Tecnologia
- Tempi Difficili
- Notte europea delle Ricercatrici e dei Ricercatori
- Just The Woman I Am
- Top Experiences
- Salone del Libro
- Liberi Libri
- Prepararsi al futuro
- Cinque Libri

COMMUNICATION CHANNELS

- PoliFlash online magazine
- PoliTOweekly: weekly newsletter with news and appointments
- Press releases and media relations activities: to disseminate institutional activities, research projects and results
- Press review: a daily collection of selected articles about PoliTO, Universities, research and job opportunities

SCIENCE DISSEMINATION

Year 2021

5,700
Media Reports of Research/TT Activities

400
Conference and Seminars

+2,000
School students involved in outreach actions

SOCIAL MEDIA

up to May 2022

Facebook
79,700
followers

Instagram
38,100
followers

LinkedIn
166,100
followers

Twitter
18,600
followers

WeChat
2,400
followers

YouTube
16,000
followers

LIBRARIES

up to May 2022

2
Central Libraries

10
Departmental Libraries

467,000
Monographs

9,000
Print Journals

61,000
Theses

65,000
E-journals

300,000
E-book

92,000
Book loans

1,223,000
Yearly downloads of full-text electronic resources

60,000
Open access digital resources

Life at PoliTO

The Sustainable Campus

The sustainability policy embraced by Politecnico has a twofold objective. On one hand, it seeks to curb the production of factors that affect climate change in all aspects of our campus management (including energy, water, waste, food, mobility and the circular economy). On the other hand, our sustainability policy contributes to the training, development and overall experience of our staff members, students, communities and networks in which the University operates.

To this end, in 2015 Politecnico established the **Green Team**, a group of faculty members, students and employees who encourage the University to **adopt environmental and social policies adhere to the Sustainable Development Goals of the UN 2030 Agenda**.

Vertical actions in the field of sustainable energy, mobility, urban impact, food, water and waste management are complemented by cross-cutting actions with a wider impact within the scope of the "Third Mission" of universities. This includes advocacy campaigns for the inclusion of sustainability issues in research and teaching (i.e. the Sustainability Week), internal and external dissemination actions (using tools such as the Sustainability Report) towards the community intended in its broader sense, as the city and the networks of sustainable universities in Italy and worldwide.

Since 2015, Politecnico has been a member of the ISCN Network (International Sustainable Campus Network) and it is one of the founders and the current coordinator of the RUS Network (Rete delle Università per lo Sviluppo Sostenibile/ Network of Sustainable Universities).

Green Metric
2021
#20
in the world

The Impact
2021
#88
in the world for climate action (SDG13)

Well-being

Politecnico wishes to offer a **good, open and dynamic environment** to its academic community and to all the people who work and study on campus, ensuring a high quality of life from a physical, social and psychological point of view.
Politecnico is implementing specific welfare actions, advisory and counselling services in order to foster integration, inclusiveness and equal opportunities. The University also wants to strengthen the sense of belonging to the community through sports and other activities that bring people together.
Furthermore, Politecnico has signed the **European Charter of Researchers**. In application of its principles, PoliTO has been the first Italian university to appoint an impartial person (Researcher Ombudsman) who helps the research staff, especially early-stage researchers, to resolve conflicts and disputes.

PoliTO Sport

Politecnico is committed to enhanching university sports as an effective and cross-cutting tool for training, research, innovation and improvement of well-being and life. PoliTO Sport aims at:

- promoting sports as a tool for social inclusiveness;
- making it an integral part of the university experience;
- fostering the role of sports in scientific research.

The Masterplan

The transformation of the PoliTO community has a strong impact on the planning of its spaces. A few years ago, Politecnico di Torino has started a complex process to govern this evolution with the purpose of meeting the need for more and better spaces.

The Masterplan of Politecnico represents **a new and innovative tool also at international level**. It seeks to translate the manifold demands arising from the university community into real projects. The Masterplan shares our development projects with the local stakeholders and it contributes to the quality and development of the urban, environmental, cultural, socio-economic context, ensuring sustainable development.

Human Capital

Human capital is the greatest asset of the Politecnico. The active participation of the entire academic community is at the heart of the development policies of the University. Politecnico strives to increase staff **satisfaction, motivation and sense of belonging**. It is committed to a better distribution of workloads, to staff training and to the attraction of talented human resources. These actions are part of our Strategic Plan, which also intends to enhance skills and reward performance in the pursuit of shared growth.

TEACHING STAFF

302
Full Professors

419
Associate Professors

236
Researchers

29%
Female Population

ADMINISTRATIVE STAFF

889
Staff Members

60%
Female Population

up to December 2021

The Budget

The revenues of Politecnico in 2021 balance amount to approximately 296 million Euro.

In recent years, Politecnico has had a sound financial and economic situation. Our University has managed to get a growing percentage of the discretionary funds awarded by the Ordinary Financing Fund (FFO), but above all, there has been an increase in international competitive grants and partnership agreements with the private sector. The University is going to invest in the following directions: improving the quality of education and scientific research, upgrading facilities, promoting technology transfer policies and, above all, enhancing the human capital as our most valuable resource.

Tuition fees

UE and International research funds

Research contracts and technology transfer

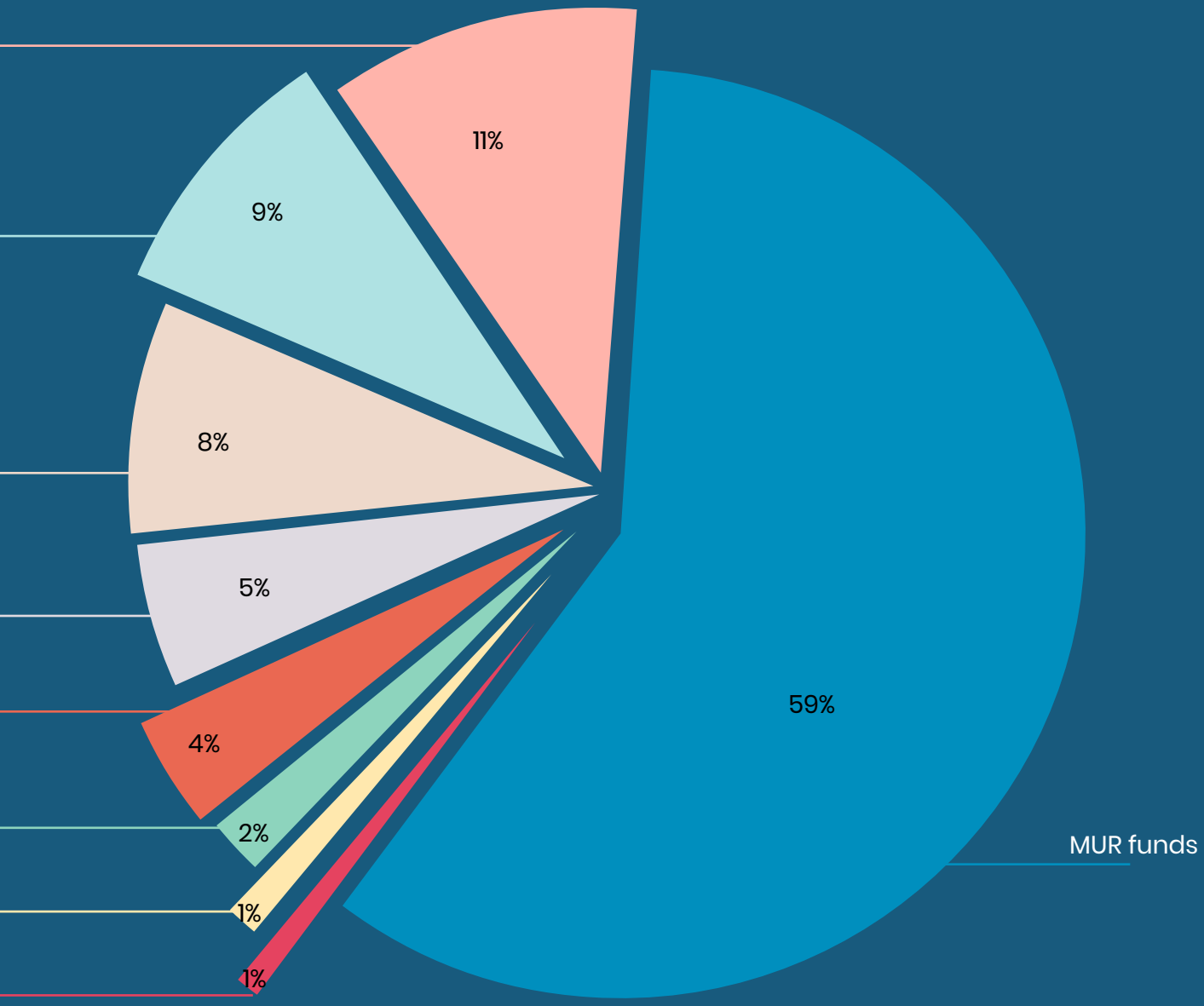
Other contributions (except MUR)

Other funds and revenues

Regional and local research funds

Research funds from MUR and other Ministries

Research funds from other organisations


11%
9%
8%
5%
4%
2%
1%
1%
59%
MUR funds

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