IMT Mines Albi-Carmaux
École Mines-Télécom

2023

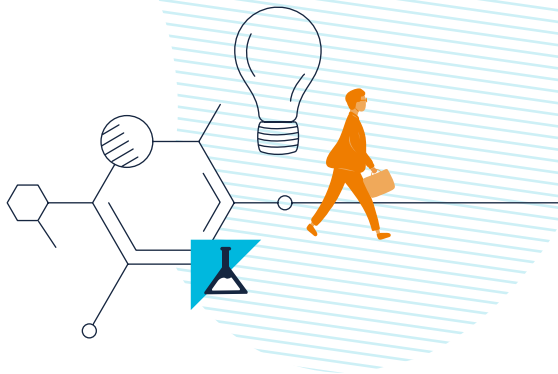
ANNUAL REPORT
IMT MINES ALBI

THE BEST OF

RÉPUBLIQUE
FRANÇAISE
Liberté
Égalité
Fraternité

01.

IMT MINES ALBI



A SCHOOL CONNECTING SCIENCE WITH PEOPLE FOR AN AGILE AND SUSTAINABLE SOCIETY

IMT Mines Albi is under the authority of the French Ministry of Industry and Energy and is part of **Institut Mines-Télécom, the number-one group of engineering and management graduate schools in France.** Positioned at the forefront of industrial and academic issues both in France and internationally, the school drives scientific and economic progress by integrating its four missions into an innovative virtuous circle:

• Training committed engineers

The school trains responsible general engineers who are leaders of transitions.

• Cutting-edge research and innovation

IMT Mines Albi supports the sustainable reindustrialization of the economy through cutting-edge scientific research aimed at improving and inventing new products and innovative processes.
These advances are carried out at three training and research centers:

- Industrial Engineering Center
- Clément Ader Institute – Albi - UMR CNRS 5312
- RAPSODEE UMR CNRS 5302

• Local and national economic development

IMT Mines Albi partners with companies to promote new dynamics, foster the creation of activities and encourage entrepreneurship to boost economic development both locally and nationally.

• Dissemination of scientific and technical culture

IMT Mines Albi is committed to disseminating a culture of science, technology, and innovation throughout local areas with the aim of fostering greater awareness of these fields.

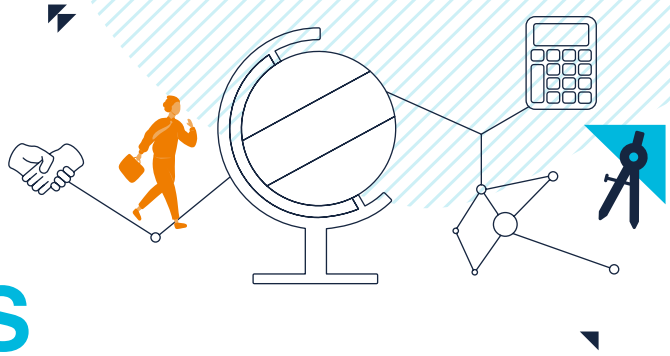
Four scientific expertise fields

The school has chosen to specialize in four areas of expertise, in harmony with its environment and the strategic themes of the ecological, digital and industrial transitions for a more responsible world:

- **Materials and processes for aeronautics and space**
- **Renewable energies, biomass, waste, and eco-activities**
- **Powders, health, and nutrition**
- **Organization dynamics**

02.

KEY FIGURES



TRAINING

985 **total number of pupils** in different courses *including*
- 874 in engineering training
- 167 in apprenticeship
- 25 Master DNM, Advanced masters
- 86 PhD students
- 16% foreign students
- 36% women
- 37% student grant recipients

RECRUITEMENT

335 **students** in all courses

RESEARCH AND INNOVATION

6,3 M€ **research contracts** *(CNRS, Armines, school)*

184 **publications** *including*
- 131 high-level publications

36 **HDR** *(Accreditation to supervise research)*

16 **chairs and joint laboratories**

4 **R&D platforms**

INDUSTRIAL ENGINEERING CENTER

2,3 M€ **contract activities**

46 **high-level publications**

56 **staff**

CLÉMENT ADER INSTITUTE - ALBI

1,3 M€ **contract activities**

31 **high-level publications**

75 **staff**

RAPSODEE CENTER

2,7 M€ **contract activities**

51 **high-level publications**

103 **staff**

RESOURCES

362 **staff** *including*
- 45% women
- 23% researchers (except PhD students)
- 9% R&D engineers

32,1 M€ **annual revenue** *including*
- 6,1 M€ own resources

SCIENTIFIC AND TECHNICAL CULTURE

1,550 **external visitors** to school events *including*
- 495 schoolchildren

ALUMNI GRADUATED IN 2022

94,5% **net employment rate within 6 months**

9% **employed abroad**

40,019 € **annual gross salary** (with bonuses in France)

39,407 € **average salary - women** (with bonuses in France)

40,425 € **average salary - men** (with bonuses in France)

TECHNOLOGICAL INCUBATOR

14 **number of startups** incubated in 2023

86% **5-year survival rate** of business created with the support of the school

IMT KEY FIGURES

10,700 engineering and management students

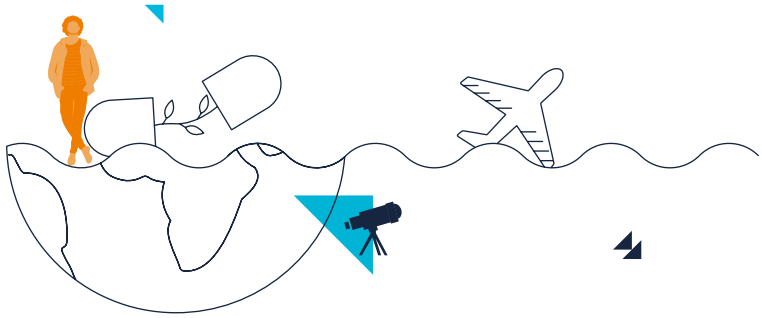
94.2% net employment rate of graduates (average for all schools)

nearly 80 M€ resources of receipts and innovation

+2,700 international publications (SCOPUS database)

+5,200 individual and collective initiatives to support the transformation of SMEs and ETIs

03. OUTLOOK



IMT Mines Albi's activities are related to five of the transition and reindustrialization objectives of the France 2030 Plan:

- Become the leader in green hydrogen
- Decarbonize our industry
- Produce 20 biopharmaceuticals to treat cancer, chronic diseases including age-related diseases, and create the medical devices of the future
- Produce the first low-carbon aircraft
- Play a full part in the new space adventure

MAKING IMT MINES ALBI A DRIVER OF SOCIETAL CHANGE

IMT Mines Albi has adopted a new strategic plan for 2023-2027, which establishes IMT Group's strategic guidelines and aims to contribute to the **objectives of the France 2030 Plan.** This strategic plan designed to provide visible and concrete responses to pressures on natural and energy resources and current reindustrialization approaches is part of **Institut Mines-Télécom's Objectives and Performance Contract** for ensuring the growth of its engineering workforce and strengthening the development of partnership research.

The plan was inspired by IMT's mission statement: ***"All together to imagine and build a sustainable future and train its key stakeholders."***

A strategic plan based on 7 foundational measures

1. Develop targeted international research and training
Push back boundaries and position the school as a key international player in higher education and research.

2. Diversify recruitment and train environmentally conscious multidisciplinary engineers
Help meet the growing demand in France for over 15,000 engineering graduates per year.

3. Promote transdisciplinary research collaboration
Provide solutions for industrial sectors and public policies to address the challenges of transition.

4. Transform the campus to support transition
Increase its contribution to the ecological transition.

5. Support economic development to benefit local areas
Strengthen the economic resilience of local areas in response to major technological, environmental, and societal changes.

6. Continue to improve strategic performance
Support the quality policy and implementation of the Sustainable development and social responsibility policy.

7. Strengthen the school's path toward achieving its objectives
Ensure the sustainability of the guidelines.

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INFLUENCE

Under the aegis of Institut Mines-Télécom, IMT Mines Albi is committed to dynamic growth driven by targeted partnerships and promising and progressive initiatives that will strengthen its position and increase its influence.

A FIRST EVER IMMERSIVE TRAINING PROGRAM

IMT Mines Albi and its **Industrial Engineering Center (CGI)** have worked extensively and for many years with the **Georgia Institute of Technology** on the research side of their activities. The associated international laboratory "*Sentient Immersive Response Networks*" (SIReN), which interprets data generated by complex systems and uses this information to make decisions, is a flagship example of their work.

This year, IMT and the Georgia Institute of Technology decided to strengthen this collaboration by working on the international aspect of their activities and started designing the **first immersive training program** to prepare students and professionals to meet current and future challenges in logistics and supply systems. Two major educational innovations set this program apart:

- The program focuses on supply chains and features innovative approaches, the most prominent examples being the **Physical Internet and Artificial Intelligence.**
- It uses **hybrid teaching techniques** combining on-site and online courses via the "*Hybrid Immersive Teaching Campus*" (HITeC), a platform which offers unique immersive teaching in collaboration with a number of industrial partners who enrich the program with practical application cases.

« I commend IMT Mines Albi for its dynamism. With this innovative and original project, it is leading several IMT schools in one of our strategic areas: industry of the future." »
Odile Gauthier, *Executive Director of IMT*

A new research chair

The "Digital Twins for Industrial Systems" research chair aims to **design, develop, operate and maintain a digital twin** to support industries in their future transformation and help them gain competitiveness through focusing on production systems engineering. The research will be tested and put into application by the chair's industrial sponsors: Siemens, Pierre Fabre and Inoprod. This IMT chair includes Mines Saint-Etienne, IMT Mines Albi and IMT Mines Alès schools and was created with support from Fondation Mines-Télécom.

Exploring and explaining waste recovery

As part of the Energy monitoring series by IMT and Fondation Mines-Télécom, IMT Mines Albi hosted a panel discussion on "The unsuspected potential of our waste". The IMT Mines Albi scientific teams from the RAPSODEE center UMR CNRS 5302, with support from experts from companies specialized in this field, discussed and presented various approaches to **recover non-recyclable waste** replace dwindling raw materials, and **explore a range of unsuspected applications.**

05.

COMMITMENT

IMT Mines Albi is fully committed to contributing to the 17 Sustainable Development Goals (SDGs) established by the UN in 2015. All IMT Mines Albi activities naturally contribute to achieving these SDGs by 2030.

A GLOBAL APPROACH FOR A SUSTAINABLE FUTURE

Through its training programs, IMT Mines Albi raises awareness among its students and trains them in the global and local issues addressed by the SDGs. Its research activities focus on innovative and sustainable solutions to the social, economic, and environmental challenges facing society. Economic development initiatives aim to promote a responsible, inclusive, and sustainable economy. Finally, the dissemination of scientific and technical culture helps increase awareness and empowers people take ownership of these issues.

« At IMT Mines Albi, meeting the SDGs is not only an objective, it is an inherent part in our missions and our vision for a more sustainable and equitable future for all. » **Lionel Luquin**, *Director of IMT Mines Albi*

IMT Mines Albi continued to take action throughout 2023.

90% Of publications in open access format

2023 saw IMT Mines Albi's excellent results confirmed, based on publications from the previous year. The National Barometer of Open Science revealed a rate exceeding **90% for the opening of scientific publications**.This official result testifies to the institution's determination and commitment.

"Transition meetings" for engineering students

Following the launch of the new **"Humanity and Transitions" program**, engineering students had the opportunity to participate in several "Transition Meetings" with economic and institutional stakeholders to discuss environmental, digital, and industrial challenges in the field.

Installation of a biomass boiler room for the campus

The installation of the wood-fueled biomass boiler allows for carbon-neutral heat production. Production transitioned from 100% natural gas to **90% locally sourced wood and 10% biogas.**

A summer school focused on green hydrogen and methane

The RAPSODEE center UMR CNRS 5302 worked in partnership with the University of Toulouse and INSA Toulouse to organize a **Summer School on renewable gases** as part of the EUR BioEco initiative with the aim of opening up the entire sector of green gas produced from renewable raw materials.

A fair trade grocery store on campus

The "Engineers for Sustainable Development" association won the Grand Prize for "Cultivating Equity" as part of a national call for projects for their **fair trade grocery store offering bulk, organic and local produce** for students and staff. The project was also supported by alumni through donations organized by the Mines Albi Alumni Association and Fondation Mines-Télécom.

Certification from the french league for the protection of birds (LPO)

Recently certified as an LPO Refuge, IMT Mines Albi contributes to the collective efforts to protect nature to ensure **the furtherance and growth of biodiversity on campus.**

Learn more about our commitments

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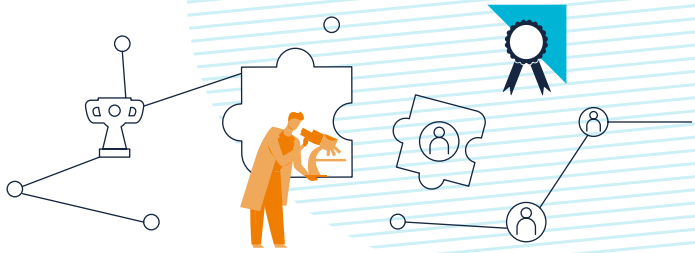

COLLABORATION

IMT Mines Albi pursues a collaborative approach to explore and strengthen innovation that supports its partners' future training and research projects.

A KEY PLAYER IN INNOVATION AND RESEARCH

- IMT Mines Albi has established **six partnership agreements, joint laboratories and teaching chair** with various industrial leaders: Airbus, EDF, ENEDIS, EPSI (radar surveillance system), LISI Aerospace, Trifyl (Waste recovery association) and SOGEFI (automotive equipment manufacturer).
- IMT Mines Albi organized its **very first "Ingé Innov" trade show** that allowed companies to work together with engineering students on practical issues related to innovation, research and entrepreneurship projects.
- ICA-Albi UMR CNRS 5312 organized the first workshop on *In-Situ Resource Utilization* (ISRU). The event brought together **space experts** to address the scientific and technological challenges related **to the habitability of the Moon.**
- Ange Nzihou, Professor at RAPSODEE center UMR CNRS 5302, and Claire White, Professor at Princeton University, have developed an innovative ecological process for **converting biomass-waste into graphene**, which creates sustainable opportunities for its production.

RECOGNIZED INTERNATIONAL EXPANSION

IMT Mines Albi has obtained the two-star **«Bienvenue en France»** certification for the second time, a recognition of its outstanding policy of welcoming international students.

Focus on Africa

- Through the RAPSODEE center, the school has established major partnerships with African and French higher education institutions as part of the Sustainable Engineering of Biobased products (ANR PEA IDBio) project. This project for the UNESCO IDBio Chair and supported by Fondation Avenir Afrique, aims to **promote sustainable development in Africa**, while prioritizing gender equality.
- IMT Mines Albi has also been selected as one of the three French institutions for the "*World Bank's Partnership for skills in applied Science, Engineering and Technology*" (PASET) Program **to host African students on PhD courses.**
- IMT Mines Albi is contributing to the **development of an entrepreneurial track and the creation of an incubator** at the University of Lomé in Togo. Due to the constraints within the country, the school has adopted a frugal innovation approach which it also applies in France.

Recognition at every level

IMT Mines Albi and in particular the RAPSODEE center UMR CNRS 5302 and ICA-Albi UMR CNRS 5312 have been recognized worldwide with seven of their research professors listed in Stanford University's ranking of **the most influential researchers.**

In terms of training and innovation, incubated companies, research projects and school students have won multiple awards:

The Engineering of the Future Award 2023 went to 4 students with their project H2oven, a purifier designed to provide low-cost drinking water using renewable solar energy;

The Fondation Mines-Télécom award for the best final-year internship for a placement carried out with a green hydrogen-production start-up;

ITNIGHT2023 3rd prize for the DECAPOD project, a decision-making system combining artificial and human intelligence in virtual reality, supported by CGI;

The 2023 Inn'ovations competition award in the «Innovation and ecological transition» category went to the start-up Cactile for its innovative, eco-designed tile for smart rainwater storage and management.

IMT MINES ALBI WOULD LIKE TO THANK THE MANY ORGANIZATIONS, COMPANIES, AND COMMUNITIES WITH WHOM THE TEAMS WORKED IN 2023 FOR THEIR SUPPORT:

AD'OCC, Accenture, ACTIA Automotive, Aegys, AGAMAN, Agap2, Agilea, Airbus, Airbus Humanity Lab, Airbus Opérations, Albi Colis Services, Albi Expo, ALDES, Alpha Recyclage Composites, Alpha Recyclage Franche Comté, Alten, Altran Technologies, Amarenco, Arcelor Mittal, Armée de Terre, Ash'UP, Banksia, Artisans Bâtisseurs Toulousains, Association Graulhet Le Cuir, Banksia, Blanc AERO Industries, Bosch Rodez Services, Bosh France, Briane Environnement, bpifrance, CABI Group, Cactile, Capgemini, CCI Tarn, CGI, CHU Toulouse, CIMPA, Communauté d'agglomération de l'Albigeois, Conseil départemental du Tarn, Curim Pet, Cyclorgaz, Dassault Systèmes, DERBI, DGA, Diota, Domaine oléicole RIGAUD, Eco-Tech Ceram, ECTI, EDF, EDF Hydro Sud-Ouest, EFOR Group, Eiffage Energie Systèmes, EKO!, Elioz, Enedis, ENGIE, EP2C Group, EPSI, Ergopolis, Ertchart Energie, Etandex, Evo, EXPLEO Life Sciences, Face Tarn Aveyron, Fin'tech Industrie, Forterro France, Furoflow, Générale du Solaire, Good Move, GRDF, Groupe Lactalis, Groupe Pochet, Hopteo, IKOS, Immersive Factory, IMPAC Ingénierie, Ingeliance Technologies, Inoprod, Intraterra, Jacobs Clean Energy, Institut de Recherches Internationales SERVIER, Laboratoires Pierre Fabre, Laboratoires Phodé, Laboratoires URGO, Laborie, Lactalis Nestlé Ultra-Frais, Laporte Euro, Laposte, Le Bon Sens du Ré-Emploi, Lefort Francheteau, Leo Parma, Lisi Aerospace, Maline, Ville d'Albi, Maison Bruyère, Marine Nationale, Mecanic Vallée, Nataïs, Naval Group, Neoen, Nexter, Next4, Notrelec, Novo Nordisk, NUMIX, Payet, Percall Group, Pharma Plan, Pôle AgriSudOuest, Prayon, Protection Civile du Tarn, Prony Resources, Qair Energy, Report One, Réseau Initiative Tarn, Région Occitanie, Robert Bosh SAS, Safra Automobiles, Safran Aircraft Engines, Sanofi, Sanofi-Aventis, Scalian, Scalian OP, SETEC EOCEN, SERA, Siemens, SII Sud-Ouest, Sogefi Filtration, Solutec, Sopra Steria, Spie Industrie, T2P Aluminium, Terratools, Terres cuites d'Occitanie, Thetrys, Total Energies, Toulouse Métropole, Tryfil, UPSA, Urbasolar, Valdelia, Veolia, Volvic.

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