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MOMENTS OF THE YEAR
The year 2019 drew attention to the challenges faced by our society as a whole – accelerated climate change, notably calling into question mobility in general and air transport in particular, geographical and social divisions, decline in multilateral initiatives and growing geopolitical tensions, etc.

ISAE-SUPAERO’s mission is to contribute, through its excellence, to the emergence of solutions by training the engineers of tomorrow with new technologies and developing them and encouraging innovation in all its forms through the resources available on campus and support for start-ups. And there are many opportunities in the aeronautics and space fields.

But excellence also means diversity in recruitment, encouraging talents from varied origins, notably by providing scholarships with support from the ISAE-SUPAERO Foundation and the ISAE-SUPAERO-ENSICA Alumni Association, and developing new channels such as apprenticeship.

The entire ISAE-SUPAERO team shares these ambitions and is fully dedicated to reach them, with excellence and passion.

Only collective intelligence will enable us to initiate the rapid changes that are needed, which is why ISAE-SUPAERO is at the heart of regional, national and international initiatives and works in partnerships with the most prestigious universities, laboratories and research institutes, as well as the leaders in the aeronautics and space industries.

Together, we can build the future of our dreams.
Once again, 2019 was an excellent year for ISAE-SUPAERO’s development along three lines – training, research and innovation.

**Training**

Year after year, the diversity of the backgrounds, profiles and nationalities of the students on campus has been increasing. For the first time, we have exceeded 40% international students in our annual recruitment. While, four years after the launch of the Ingénieur ISAE-SUPAERO program, all of our engineering students now receive the same diploma, they actually follow widely varied pathways with an ever-growing range of options (fields, sectors, complementary certification, double degrees abroad, dual competences with HEC and Sciences Po, research programs, entrepreneurship programs, etc.). We have initiated an Advanced Master in Innovation (MGPIE) and have prepared new training programs encouraging this diversity in 2020:

- Engineering training through apprenticeship organized with our ISAE Group partners and accredited by CTI at the end of 2019;
- A joint Franco-German program in system engineering with TUM Munich;
- Advanced Master in Artificial Intelligence and Business Transformation for continuing education.

Beyond our campus, we have expanded our distance learning offer with two MOOCs in English, enabling us to reach over 7,500 learners around the world.

**Research**

The assessment drawn up after the HCERES audit shed light on the significant growth of our research activities over the past five years. In 2019, we counted more than 110 publications in peer-reviewed journals and over €10 million in order intakes (contracts and research chairs). The year 2019 was also the year of CubeSats. In July we launched EntrySat, our first CubeSat, and made a strong contribution to the success of EyeSat, another 3U CubeSat, launched in December under the auspices of CNES and monitored ever since by our control room. We also took part in the launch of ANITI, one of the four “interdisciplinary institutes for artificial intelligence” set up in France with support from the French government and industries.

**Innovation**

A few months after the launch of the new Advanced Master in innovation mentioned above, our new dedicated space, “InnovSpace”, opened its doors at the end of the year. It brings together on campus a design lab, mechanical and electronic FabLabs, immersive reality spaces and a hosting area for start-up. Students, staff and our partners are now free to adopt it and make it a site for creativity and shared innovation. The year 2019 also brought the commercial takeoff of 3 start-ups born on our campus – with some ten people hired by each: DIODON Drone Technology, founded by two engineering students who graduated last year; U-Space, created by young engineers at the Institute in the area of CubeSats; and Hinfact, set up by research professors on the topic of man-cockpit interfaces. These initial success demonstrate the merits of the actions undertaken over the last four years in support of entrepreneurship.

Beyond our campus, nearly 40 start-ups have been founded by students and graduates from the Institute since 2016!

All these positive results in the areas of innovation, research and training help to maintain the attractiveness and excellence of our programs and to ensure that our diplomas will continue over the long term to be a driving force in the aerospace industry, and to making a positive commitment for the future of our societies! The fight against climate change is one of the leading challenges facing us and the aerospace sector took a great step forward in mobilizing in this area in 2019. ISAE-SUPAERO intends to play its role in inventing the “decarbonized” air transport of tomorrow by contributing to the research underway and training the young engineers who will meet this challenge in the coming decades.
The Objectives and Performance
Contract signed with the Ministry
of the Armed Forces sets the course
for 2017-2021

4 major objectives:
/ Develop the Institute’s international
attractiveness for the best students and
professors from around the world;
/ Develop international reference laboratories
in aerospace research in partnerships to promote
the ISAE-SUPAERO brand;
/ Constantly develop initial training and continuing
education to meet new needs among industry
and students;
/ Be an active, influential institution in the changing landscape of
higher education and research, nationally and internationally.

Highlights
/ Accreditation for 3 new programs:
Mastère Spécialisé Management de Projets Innovants & Entrepreneuriat
(MGPIE – Advanced Master in Innovative Project Management & Entrepreneurship),
MS Executive Education “Artificial Intelligence & Business Transformation”
(AIBT), and Engineering through apprenticeship at the ISAE Group.
/ A good year for research:
over €10 million in order intakes (research contracts + sponsorship), more than 110 scientific publications in peer-reviewed journals, signing of the CONCORDE agreement on design and certification methods for drone systems under the ONERA-ENAC- ISAE-SUPAERO research federation, launch of the EntrySat and EyeSat CubeSats.
/ Reinforced international openness: the level of 40% international students was exceeded in recruitments for 2019, the highest level of the “Bienvenue en France” label was obtained.
/ Improved visibility for innovation on campus, with the opening of the new InnovSpace (design lab + FabLab+ hosting area for start-ups) and the commercial takeoff of 3 start-ups born on the Institute’s campus (Diodon Drone, U-Space and Hinfact).
**The Essentials for 2019**

**Human resources**
587 employees
including 113 permanent research professors

1700 students
from 55 countries
including 247 PhD students

**Finances**
Subsidies for Public Service Charges: €36.7 million
Total budget: €61.4 million
including €7.2 million in investments
Commitment to a responsible, sustainable future

At the heart of the aerospace sector, our Institute has a unique responsibility to invent the decarbonized air transport of tomorrow and is mobilized to meet the challenge.

Solid foundations in the subject of sustainable development

- Research into a sustainable world with three strategic lines in relation to the environment and three teaching and research chairs: the CEDAR chair with Airbus (Eco-Design for Aircraft), the AEGIS chair with Safran (Aero Engine Innovative Studies) and the new ISAAR chair with Daher (Innovative Solutions for Aviation Architecture & Regulation).
- Training for committed engineers: courses that include the issues of eco-design, energy transition and circular economy; the “Environmental Engineering” certificate; student projects; “Rentrée Climat” week rolling out the “La Fresque du Climat” (Climate Fresco) activities.
- Eco-campus: biomass heating system, green roofs, bicycle access, etc.

Taking action and raising awareness: a multitude of actions and stakeholders

There are many stakeholders at our Institute who work together to increase awareness among our students and staff concerning sustainable development challenges:

- The Sustainable Development Center organizes various events, exhibitions and conferences: “Recyclerie” (recycling center), “Allons-y à Vélo!” (Let’s go by Bike), our carbon footprint and food waste, etc.
- The OSE l’ISAE-SUPAERO diversity program organizes “La Fresque du Climat” (Climate Fresco) for some 200 middle and high school students.
- Student clubs: Supaero4Earth, zero-waste student residence, beehives, vegetable gardens, Low Tech objects, etc.
- The ISAE-SUPAERO Foundation is working to change its rationale to include energy transition.
“Excellence with passion” – that is our motto. Since 1909, hand-in-hand with the aeronautics and space industry, excellence has been our heritage, our foundation and our ambition. At the heart of our activities, our disciplines and our professions, we cultivate and instill this desire for perfection.
More than 30 programs

“Ingénieur ISAE-SUPAERO”

“Engineering through apprenticeship at the ISAE Group”

“Master in Aerospace Engineering (MAE)” in English

15 Advanced Masters®, 13 of them in English

5 Research Masters

6 Doctoral Schools

Continuing education: 9 post-graduate diplomas

16 Certificates of Advanced Studies for professionals,
43 short modules and a catalogue of programs offered by our affiliate EUROSAE
Ingénieur ISAE-SUPAERO

A day for increasing awareness on sustainable development among our future engineers

One day during the first week of classes for 1st-year students was fully dedicated to sustainable development. The aim? Increasing awareness and leaving an impression on our new students as to their essential role as engineers in society, and more specifically to mobilize them for the challenge of designing "decarbonized" aircraft.

The students took part in a nationwide initiative – #LaRentréeClimat, whose goal was to train 10,000 students at France’s Grandes Écoles on the issue of climate change through a participatory workshop based on collective intelligence called the "Fresque du Climat" (Climate Fresco). This workshop, designed and developed at ISAE-SUPAERO, consists in finding the causal links between the 42 cards in the game and thus co-constructing a real climate change “Fresco”.

The students attended conferences on the subject (Solar Impulse Foundation, OpenAirlines, Blueturn) and talked with alumni involved in sustainable development initiatives.

PACC: support for our students throughout their studies

Since 2017, PACC (Parcours d’Accompagnement à la Construction du Cursus – Support Pathway to Building a Curriculum) has been progressively set up over the 3 years of the engineering program. From improved self-knowledge – to be able to make enlightened choices (mobility, double degrees, gap years, stages, etc.) – to drawing up a professional project, not to mention developing a communication toolbox, this evolutionary pathway is adapted to each individual and provides a coherent view of the training program.

The final component of the system is a “Réussir son Embauche” (Get Hired!) boot camp for 3rd-year students. The program for these 3 days includes sharpening your speaking skills to promote your competence and the logic of your professional project, positioning yourself in the market, negotiating your salary and updating your résumé or LinkedIn page, etc.

270 graduates in 2019 including 51 foreign students

32 graduates followed a Research Master program alongside their 3rd year

55 earned an additional certificate

1046 engineering students in 2019

149 of them joined the program as part of a double degree with a partner school (French or foreign)

51 ISAE-SUPAERO students were preparing double degrees at a partner school

41 graduates have had their skills validated by a 2nd degree (Imperial College Business School, London School of Economics, Toulouse School of Management, Master ITE de Polytechnique, DESIA certificate, etc.). Six graduates will complete their double curriculum at HEC in 2019-2020.

103 have spent a semester or a school year abroad

8 and a half months is the average duration of their experience abroad
Engineering through apprenticeship

The new “Industrialization and methods for aeronautics and space” program:
The Commission des Titres d’Ingénieur (Engineering Title Conferment Commission) has accredited the program!

The year 2019 brought us an apprenticeship program on the level of the entire ISAE Group, a program designed for holders of DUT, BTS or scientific “licence” diplomas, and its accreditation by the CTI – it is scheduled to begin with the 2020 school year with a class of 30 apprentices. This program, designed in cooperation with GIFAS, will open its doors at ISAE-SUPAERO in September 2020. The recruitment campaign for the first class has been open since the month of January.

For further information, see page 26
Master Aerospace Engineering

The number of applicants on the rise

The Master in Aerospace Engineering welcomed 95 students for its fourth session, an increase of more than 20% over the 2018 academic year. For the first time, the total number of students enrolled in the Master exceeded 200.

An MAE student welcomed to the Élysée Palace

Edwin Joseph Munoz Lopez, a Master in Aerospace Engineering student involved in the "Make Our Planet Great Again" dynamic, was welcomed to the Élysée Palace in December 2019. At the initiative of the President of the French Republic, Emmanuel Macron, "Make Our Planet Great Again" is a call to research profressors, student entrepreneurs, associations and NGOs to get mobilized in the fight against climate change.

The "ARTERY in MICROGRAVITY" (AIM) research team in orbit with ESA

The AIM team, headed by two second-year students in the Master in Aerospace Engineering Space Systems program, Olivia Drayson and Nicolo Bernardini, won the very first ESA "Orbit Your Thesis" program in October 2018. The research team has grown and now includes nine members from the Master in Aerospace Engineering program. In 2020, the future experiment will be placed in an ice cube on board the international space station (ISS) and will be used as a test bench for studying vascular hemodynamics in microgravity. The ESA Academy will finance the cube's launch to the ISS and will follow the AIM team throughout the year, assisting in developing their experiments and supporting the project financially.

76 students graduated from the Master in Aerospace Engineering program
The new MGPIE program: training the players in innovation

The MGPIE (Management de Projets Innovants & Entrepreneuriat - Management of Innovative Projects & Entrepreneurship) program joined our lineup of Advanced Master® programs in 2019.

In direct connection with our school’s policy of developing innovation and entrepreneurship, this new program aims to develop innovation and the entrepreneurial spirit simultaneously while teaching how to manage “DeepTech” technological projects (from the original idea through to the marketing phase). This program is offered to future entrepreneurs, startuppers and intrapreneurs, and is based on innovative technologies adapted to the current and future needs in a variety of fields: aeronautics, medical, energy, etc.

MSc in Engineering
Aeronautics in Malaysia

From 2014 to 2019, ISAE-SUPAERO provided assistance to the National Defense University of Malaysia (NDUM) to set up the first Master’s Degree in Aeronautics in Malaysia, the MSc in Engineering Aeronautics (MSEA). This project, which benefited from financial support from Airbus Helicopters, consisted in phases of engineering training, teacher training and pedagogical and methodological assistance. In accordance with the agreement between the parties to the project, after the MSEA, the best two students joined the 2nd year of the MAE Master in September 2019. After this program, they will hold both degrees: the MSEA Master from NDUM and the MAE Master from ISAE SUPAERO. The project’s closing meeting was held in Kuala Lumpur in November during the NDUM commencement ceremony presided over by the King of Malaysia in his role as Chancellor of NDUM.
Scholarships granted in 2019

Partnerships with the institutions that provide financial support to the Master of Science and Advanced Masters® students are essential assets for our attractiveness, notably abroad.

Scholarships granted in 2019:

- 3 merit scholarships from the ISAE-SUPAERO Foundation for welcoming foreign Master students.
- 3 MBDA scholarships for Indian and Indonesian students.
- 2 CEDAR scholarships granted under the CEDAR Chair with Airbus.
- 3 GIFAS scholarships.
- 1 ARISE scholarships under the ARISE Chair with Thalès.
- 1 TSAE scholarships (Toulouse graduate School of Aerospace Engineering)
- 3 scholarships from the Occitanie Region's Regional Professional Training Program (PRFP).

In all 13 merit scholarships granted

including 4 to female students

and 3 scholarships for job seekers.
Continuing education

We have consolidated our offer of short internships with certification, comprising:
- 9 positions.
- 16 certificates.

This offer now proposes 9 post-graduate degrees, 16 school certificates (40 to 120 hours) and 43 short modules (10 to 45 hours of training), all from our Advanced Master®. It is a response to the desire to offer training in space, digital technologies and artificial intelligence.

European Consortium for Advanced Training in Aerospace (ECATA)

21 high-potential candidates for the European aerospace industry worked together for 6 months on the subject of "exploiting artificial intelligence in future aircraft systems" as part of the leadership training program. The group was made up of employees from Airbus, Safran, BAE Systems, Leonardo, SAAB, Dassault Aviation, MTU and Latecoere. This year, the program was taught on the campuses of Politecnico di Torino, Cranfield University and ISAE-SUPAERO.
Doctoral programs

A member of the Université Fédérale de Toulouse Midi-Pyrénées and accredited by 6 doctoral schools, we welcome PhD students to ISAE-ONERA in six doctoral teams and to the Clément Ader Institute, covering a wide range of scientific disciplines in connection with the aeronautics and space field:

International cooperation

The growth in international research cooperation is a major focus. Beyond the possibilities for researcher mobility, mobility for PhD students is an important lever in international cooperation and is often easy to put in place.

The year 2019 brought us new agreements, jointly supervised international doctorates, theses with two new internationally renowned partners, the Royal Melbourne Institute of Technology in Australia and the University of Texas at Arlington in the United States. Our longstanding connections with the Université de Sherbrooke and Polytechnique Montréal have been reinforces by two jointly supervised doctorate programs. Lastly, the ISAE-SUPAERO mobility program has enabled five PhD students to take research trips abroad (United States, Australia and Brazil) and thus to strengthen cooperation with our teams.

PhD student awards

- Thibault Lunet received the Paul Caseau award in the field of computer science and high-performance computing.
- Vincent Laquerbe received the Thesis Prize at the Journées Nationales Micro-Ondes (National Microwave Days) for his work on microwave/plasma interactions.
- Jonathan Detchart, Florian Monteghetti, Quentin Nénon and Rémi Roncen won the ISAE-SUPAERO Foundation’s Thesis Prize.

Internationally

- Alexandre Le Roch won the IEEE Nuclear and Plasma Sciences Society Paul Phelps Award.
- Joel Serra received the 2nd thesis prize from the Clean Sky Academy.
- Marine Ruffenach won an Amelia Earhart fellowship.
Research

Over 400 researchers on campus (with ONERA)

2 research units assessed by HCERES

1 University Research school supported by the Institute

22 patents and invention disclosures

112 scientific publications
Our science policy

The scientific projects and topics at ISAE-SUPAERO are constantly being energized, improved and renewed by the commitment and excellence of the scientific staff. Through its science policy, ISAE-SUPAERO balances its goals for publications, activities and resourcing:

- Jointly improving the impact of its publications in the best scientific revues and targeting some of them for better international scientific recognition in Aerospace Engineering;
- Encouraging discovery, innovation and disciplinary cross-pollination to face economic, societal and environmental challenges using cross-cutting activities organized along five strategic lines;
- Developing effective, sustainable resourcing for research to find flexibility, robustness and performance.

*Research at the Institute continues to move forward, as can be seen in the volume of order intakes, doctoral activities and the number of publications.*

The year 2019 was marked by the signing of the CONCORDE project agreement that makes a significant contribution and provides structure to ONERA and ISAE-SUPAERO for their activities within the ENAC – ISAE-SUPAERO – ONERA research federation; the success of ANITI which should give real impetus to artificial intelligence activities at the Université Fédérale de Toulouse; and the exploitation of the new seismometer measurements on Mars as part of the InSight mission. The year 2019 also brought us the HCERES assessment of the performances of our research activities over the last five years and the relevance of our project for the next five years.

The 6 training and research departments ensure training actions and foster the training-research link, developing in-depth disciplinary and interdisciplinary scientific topics at the laboratories.

/ Aerodynamics, Energetics and Propulsion (DAEP)
/ Aerospace Vehicle Design and Control (DCAS)
/ Mechanics of Structures and Materials (DMSM)
/ Complex System Engineering (DISC)
/ Electronics, Optronics and Signal Processing (DEOS)
/ Languages, Arts, Culture and Society (LACS).
Positive assessment for the HCERES audit

Research assessments by HCERES (High Council for the Assessment of Research and Higher Education) are carried out every five years and require a twofold effort by all laboratories audited: that of drawing up quantitative and qualitative assessments of the research activities carried out during the previous five years and that of an exercise of projection over the coming five years. Four entities that we are involved in were audited in 2019: the ENAC – ISAE-SUPAERO – ONERA research federation, the Aeronautics-Astronautics doctoral school, the Clément Ader Institute (ICA) and the ISAE-SUPAERO Research unit which includes the DAEP, DCAS, DEOS and DISC departments. For this last entity, the major result was the very strong progress made in terms of scientific production and contractual financing, results that will have to be consolidated in the coming years.

The ANITI project:

developing a new generation of artificial intelligence

The ANITI (Artificial and Natural Intelligence Toulouse Institute) project under the 3IA initiative, accredited at the end of April 2019, groups together key players in artificial intelligence (AI) in the Toulouse ecosystem. ANITI’s purpose is to provide AI systems (symbolic reasoning, formal methods and learning methods) and explainable, robust, reliable applications to meet the challenges and needs of industry. In fact, the most effective in-depth learning methods still often lack the properties of robustness, formal guarantees for their behavior and explanatory and normative transparency. This makes it hard to integrate such algorithms into critical systems such as airplanes, given the necessity for formal certification. Symbolic reasoning and formal methods provide reliable, explainable, robust AI, but are usually incapable of taking into account high-volume data on real systems or learning from it. ANITI will explore different hybrid AI approaches to extend learning methods in various areas of learning representations and robust modelling. ISAE-SUPAERO is represented at ANITI with a Chair dedicated to neuroadaptive technology to improve the man-machine partnership and the major contributions with researchers associated with several other Chairs at ANITI. This will enable the Institute to make progress on its research in a dynamic context, the general goal being to produce explainable artificial intelligence, which is an important step in the design of systems requiring certification.

ANITI Chair: how do we manage the Man/Machine partnership?

Also in the context of the ANITI project, ISAE-SUPAERO has initiated a Chair dedicated to neuroadaptive technology to improve the man-machine partnership. One particularity of this Chair is that it implements advanced tools in artificial intelligence and state-of-the-art measurement technologies in the neurosciences to better understand the brain’s performances and its limits in the complex situations of man-machine collaboration. The challenge will be to develop brain-computer interfaces (BCIs) to obtain real-time estimates of the condition of several human operators (e.g. fatigue, stress, level of cooperation) so that intelligent systems can adapt and serve humans. The work carried out by this Chair will have applications in many critical fields (piloting aircraft and driving automobiles, for example) but also in medicine (monitoring patients and functional reeducation, for example).

CONCORDE:
a structuring project for the ENAC - ISAE-SUPAERO - ONERA research federation

The CONCORDE “Analysis and integrated design for the certification of future drone systems and their operations” project was signed with the Agence de l’Innovation de Défense (AID – Defense Innovation agency) in December. It provides structure for the ENAC – ISAE-SUPAERO – ONERA research federation, which is focused on the subject of “system design and operations”. CONCORDE offers an engineering approach directed by integrated, multidisciplinary models to meet analysis and qualification targets for MBSA (Model Based Safety Analysis) and MBSE (Model Based System Engineering) integrated design for drone systems. The work deals with the need to develop new, safe, integrated multi-physical design methodologies and the methods and tools for verification, validation and proof of compliance. For this, the work will use new tools, algorithms and progress in AI and the processing of large masses of data for obtaining and validating models, then on formal methods and system engineering for the MBSE and MBSA approaches. It is a question of producing the building blocks of certification guidelines for future systems integrating functions run by artificial intelligence (AI), functions ensuring advanced autonomy, as well as models and functions based on intelligent processing of complex data or large masses of data. On the contractual level, this project covers a renewable 3-year period whose scope will restructure a large part of the Institute’s activities.
Space activities

The InSight mission
The InSight mission was selected by NASA in August 2012 as part of the DISCOVERY program. It was deployed on November 26, 2018, as the first geophysical observatory on Mars, providing scientific knowledge essential to understanding the fundamental processes at work in the formation of telluric planets and their evolution. It carried two scientific instruments to achieve this - the SEIS seismometer and HP3, an instrument for measuring heat flows from the planet's core.

The SEIS seismometer, which measures seismic activity, the flow of meteorite impacts and the tides on Phobos, has been operational on the Martian surface since the start of 2019. It identifies the characteristics of Mars's deep internal structure, providing information on the thickness of the planet's crust, the composition and structure of its mantle and the size of its core. Its development began more than 10 years ago at the Institut de Physique du Globe de Paris with support from CNES, CNRS, ISAE- SUPAERO and a wide panel of international contributors (ETH Zurich, Max Planck Institute in Lindau, Imperial College London and the Jet Propulsion Laboratory).

The researchers at the Institute notably contributed to the InSight mission through the SEIS instrument’s performance model, mission’s performance model, the specifications for the scientific software and the instrument’s operation on Mars. They also contributed to exploiting scientific data and notably produced a model of the link between the dust devils which are very common on this site and certain seismic measurements.

EntrySat, the first CubeSat dedicated to studying atmospheric reentry of space debris
EntrySat is a mission carried out by ISAE-SUPAERO with support from CNES in the context of the JANUS student projects. EntrySat, a project involving over 100 students, was launched by the international station on July 3, 2019, and is operated by CSUT (Centre Spatial Universitaire Toulousain – Toulouse University Space Center). Collisions in orbit and the process of disintegration during satellite reentry have demonstrated that over time orbital debris represents a threat for safety in the Earth’s orbit as well as a potential threat during the reentry of massive objects. Furthermore, our current knowledge of the destruction process for satellite or launcher components when reentering the atmosphere remains incomplete.

The EntrySat experiment consists in injecting a 3U CubeSat- type nanosatellite into low-Earth orbit.
Enoskelet: an ambition to revolutionize mobility for children with cerebral palsy

Amaury Ciurana, a ISAE-SUPAERO student preparing a double degree with X-HEC Entrepreneurs, has received the €1 million award from the Fondation Jean-Jacques et Félicia Lopez-Loreta for the Enoskelet project. This project, inspired by a ISAE-SUPAERO researcher, consists in creating an exoskeleton for children with physical disabilities through motorized assistance for walking.

The aim of the Enoskelet project is to provide autonomy through a system that helps to manage balance, but also a proper gait pattern.

Bringing together everyday movement and rehabilitation, it provides an alternative to wheelchairs and walkers for a potential target of thousands of children.

Research in neuroergonomics and human factors awarded internationally

The “Neuroergonomics and Human Factors” research term received the 2019 commercial aviation safety trophy from the famous aeronautical journal Aviation Week in Washington D.C. on March 14, 2019. This award recognizes the pioneering nature of the work carried out at ISAE-SUPAERO and its influence on the design of future cockpits.

Increasing visibility for the DAEP’s Turbomachines and Propulsion (TMP) group

The year 2019 brought an opportunity to measure the growth in the DAEP’s Turbomachines and Propulsion (TMP) group team’s influence and visibility, both in the academic community and toward upstream sectors. Guillaume Dufour included the scientific committee at the ISAIF conference (International Symposium on Experimental and Computational Aerothermodynamics of Internal Flows) and the editorial board at the IJTPP (International Journal of Turbomachinery Propulsion and Power). Nicolas Binder was coopted at the Euroturbo committee that organizes the biannual ETC conference and steers the IJTPP. This is proof of peer recognition of the department’s work.

AddimAlliance partnership agreement

ISAE-SUPAERO was recognized as a player in additive manufacturing by signing the AddimAlliance partnership agreement, which will bring together regional additive manufacturing platforms in the Occitanie/Pyrénées and Nouvelle Aquitaine regions. This provides high visibility for the activities developed by our researchers on this topic, not only for industrial partners, but also for the regional scientific community. The international Aerospace Additive Manufacturing conference organized in Toulouse was an opportunity to present AddimAlliance to the community of industrial and scientific players.

Workshop in Multidisciplinary Design Optimization (MDO)

Following the 2nd European Workshop on MDO held in Toulouse in November 2019, we organized a workshop called MDO PhD Days on our campus under the ENAC - ISAE- SUPAERO – ONERA federation. This event was a real success with 13 presentations from PhD students from all around Europe (Delft, Milan, DLR, DTU, Clément Ader Institute, etc. and, of course the ENAC – ISAE-SUPAERO – ONERA federation) and the United States (University of Michigan). This event will be held in Toulouse again to encourage scientific exchanges on the subject of MDO.
Here and everywhere around the world, our activities lead us to enter into interactions with women and men, professionals, researchers, professors, students and partners. This desire to go further, to expand our possibilities and to create new connections is built into our DNA. We grow through these exchanges and this sharing.
International

93 partner universities
28 partner countries

45 Erasmus agreements in 14 countries
36% of graduates were international students

21% of students obtain a double degree with a partner university

490 foreign students with 66 nationalities on our campus

40% foreign students recruited in 2019

New international agreements to go

As part of our international policy, certain geographical regions not yet covered were explored to find academic partners, notably Africa and the Middle East, quickly producing concrete results with new agreements:

/ in Lebanon, with two French-language universities, Université Libanaise, Faculté de Génie (ULFG) in February, and Université Saint-Joseph de Beyrouth in October,
/ in Morocco, with the French-language École Mohammadia d’Ingénieurs (EMI) at the Université Mohammed V de Rabat (UMSR) in July.

We have also expanded in two other areas:
/ India: reinforcement, with IISC in Bangalore, of the draft agreement with the DIAT (Defence Institute of Advanced Technology) in Pune, in partnership with Dassault Aviation.
/ Australia: 3 Australian students were welcomed to the Master in Aerospace Engineering program, implementation of a jointly supervised doctoral thesis with the RMIT (Royal Melbourne Institute of Technology), 4 Nicolas Baudin scholarship students came to our laboratories, discussions on research partnerships under CRC SmartSat, etc.

In the context of the renewal of certain agreements, the new international policy has made it possible to expand the fields offered to foreign students, such as “Management Engineering” and “Life Sciences” with the École Polytechnique Fédérale de Lausanne (EPFL) or Politecnico di Milano.

Lastly, this year took the deployment of our “ambassador program” to a wider scale abroad, with promotional actions by the Institute’s students and staff in foreign countries such as Italy, Spain, Portugal, Brazil, China, Canada, South Korea, Argentina, etc.
Welcoming students from all horizons

The "Bienvenue en France" label has been granted

In 2019, we obtained the "Bienvenue en France" label on our first try with the maximum level of 3 stars, issued by Campus France for the quality of our training offer and our system for welcoming foreign students.

The Nicolas Baudin scholarship program

ISAE-SUPAERO was the first beneficiary of the mobility scholarships under the Nicolas Baudin program at the French Embassy in Australia enabling Australian students to come to our laboratories for one semester of research.

Special programs

Second session of the Spring Semester in Aerospace Engineering

The Spring Semester in Aerospace Engineering program welcomed 13 new students from non-French-speaking partner universities for a semester: KTH Stockholm (Sweden), University of Southampton (UK), National University of Singapore, Kyushu Institute of Technology (Japan) and the University of Illinois at Urbana Champaign (USA).

ENAC, ISAE-ENSMA and ISAE-SUPAERO working together for the “2019 GEA Aviation Summer Program”

This 6-week program for undergraduate students from American universities that are partners with these 3 schools provides an overall understanding of aeronautics, with courses, conferences, and visits (Paris Air Show).

Origin of international students

Distribution by programs in 2018-2019

- **Engineers**
  - Asia: 9%
  - America: 15%
  - Africa: 15%
  - Europe: 61%

- **Master**
  - Asia: 56%
  - America: 8%
  - Africa: 22.5%
  - Europe: 51%

- **Advanced Masters®**
  - Asia: 38%
  - America: 8%
  - Africa: 22,5%
  - Europe: 51%

- **PhDs**
  - Asia: 11%
  - America: 22%
  - Africa: 24%
  - Europe: 43%
Sponsorships and business relations, a pillar of the Institute’s strategy

12 teaching and research Chairs*: connections with the aerospace industry and innovation

1/ Daher ISAAR Chair (Innovative Solutions for Aviation Architecture & Regulation)
   Design and certification for innovative CS 23 architectures
2/ AIRBUS - Chair in Eco-Design of Aircraft (CEDAR)
3/ MBDA Chair - excellence program for India and Indonesia
4/ AXA Chair - Neuroergonomics for aircraft safety
5/ Nucléudes Chair - Impact of radiating environments on space systems design
6/ GIFAS Chair - Support for the ISAE Group
7/ TAS - ITA Chair - Teaching on small satellite platforms
8/ THALES AVS-ARISE Chair - Architecture and Engineering for Embedded Systems
9/ DASSAULT Aviation Chair - CASAC Aircraft System Architecture
10/ SAFRAN - AEGIS Chair - Aero Engine Innovative Studies
11/ AIRBUS D&S ARIANE GROUP SAC LAB Chair - Advanced Spatial Concepts
12/ TAS Partnership - CMOS image sensors applied to space

*of which 11 are through the ISAE-SUPAERO Foundation

Strong initiatives for inventing the sustainable air transport of tomorrow

Several research Chairs have been created at ISAE-SUPAERO in recent years to work on new air transport concepts that emit less CO₂. These include the Cedar "Chair for Eco-Design of Aircraft" created by Airbus 6 years ago and renewed at the 2019 Paris Air Show. It supports research on innovative concepts to prepare the next generations of transport aircraft. The ISAAPAR "Innovative Solutions for Aviation Architecture & Regulation" Chair agreement signed with Daher in July will carry out research on the design and certification of light hybrid electric propulsion aircraft.

First successful flight of the distributed propulsion aircraft model

The demonstrator developed under the CEDAR (Chair for Eco-Design of Aircraft) Chair undertook its first flight last October. Named DECOL for "DEmonstrateur CONtrôle Latéral" (Lateral Control Demonstrator), this drone equipped with eight electric motors providing 1,200 watts (W) of power followed a precise flight plan and tested more than 70 flight parameters. This protocol was used to check the take-off, landing and stalling speeds, and to validate the measurement and control systems. This first flight was a major step forward in the development of this demonstrator with its 2-meter wingspan.

A special moment between sponsors and scholarship students

At the end of September, the sponsors in charge of merit scholarships, GIFAS, Airbus, MBDA and Thalès AVS, took part in the 3rd sponsor/scholarship student meeting. It was a wonderful opportunity to share a moment of goodwill and to talk about each of our foreign students’ pathway in the MSC program and in the Engineering program at ISAE-SUPAERO. Scholarship students from 20 different nationalities were able to talk to their sponsors about their projects for the future.
In 2019, we consolidated the number of partners, notably with the renewal of the partnership with Altran, Accenture and increased cooperation with Daher and Liebherr.

Sectorial diversification of our partnerships has continued, driven by industrial demand as well as by students who want to explore new sectors of activity. A partnership agreement was signed with Naval Group. The excellence of the dual competence ISAE SUPAERO Engineer / Business Manager profiles also enabled us to develop a new kind of cooperation targeting DESIA students, with consulting firms such as KXIOP, STEP Consulting, Capgemini, Cylad, Wavestone and PWC. Lastly start-ups, which are highly sought after by students, also hosted a "Start-up Corner" at the Villages Entreprises forum in October.

"Réseau des Partenaires" events

We have developed inter-partner actions whose purpose is to encourage connections with companies and to bring out new ideas for cooperation: The first "Printemps des Partenaires" (Partner Springtime), organized in May 2019, brought together HR and ISAE-SUPAERO ambassadors from partner companies, as well as students from all of our programs for a treasure hunt on campus and a debating exercise. The "Partner Morning" meeting, in a creative workshop format, was held in September 2019 and was an opportunity for exchanging information on the key figures for the new academic year and to share good practices in the network of ISAE-SUPAERO ambassadors organized in companies.

Career Center: a major asset in helping our students enter the workforce

The Career Center’s mission is to accompany students from all training programs entering the workforce by creating bridges with businesses. More than 800 students came looking for advice in individual interviews or collective workshops in 2019. More than 2,000 job and internship offers were posted on the Institute’s Job Board. Thanks to the partnership agreements signed this year, more than 40 events on campus or at industrial sites were proposed to students to enable them to gain a better understanding of the world of industry and to expand their networking.

Positions of engineering graduates

- 66 - Research & development, scientific and technical studies (other than computer sciences)
- 37 - Studies – consulting and expertise
- 15 - Studies and development in IT systems
- 8 - Industrial and technical IT
- 8 - Other service or department
- 5 - Production - Operations
- 3 - Marketing
- 3 - Experimental research
- 3 - Purchasing, supplies, logistics
- 2 - Audit
- 2 - Management, finance, accounting
- 2 - General Management
- 5 - Other (Project Management, etc.)

Main recruiters

AIRBUS / THALES / SAFRAN / DASSAULT / MBDA / ACCENTURE / ARIANE GROUP / AKKA / ALTRAN

Source: survey of first jobs in the class of 2019
The ISAE-SUPAERO ecosystem

ISAE Group, an essential partner in the aerospace industry

Bringing together, under one umbrella, all of France’s Grandes Écoles in aeronautical and space engineering to better meet the needs of the industrial sector and of students – that is the vocation of the ISAE Group, created in 2011.

The schools in the ISAE Group share the common values of excellence, openness and innovation. Their ambition is to train multidisciplinary engineers with varied profiles who can mobilize and coordinate all the technical and managerial skills that the aerospace industry will need to deal with major geostrategic, technological, ecological and socioeconomic challenges.

In 2019, the ISAE Group signed a partnership with the École Supérieure des Technologies Industrielles Avancées (ESTIA) in Bidart, in the Nouvelle Aquitaine region.

5 Grandes écoles
/ ISAE-SUPAERO (Toulouse)
/ ISAE-ENSA (Poitiers)
/ SUPMECA (Saint-Ouen)
/ ESTACA (Saint-Quentin-en-Yvelines et Laval)
/ École de l’Air (Salon-de-Provence)

The Group’s development supported by GIFAS

For five years now, GIFAS (Groupement des Industries Françaises Aéronautiques et Spatiales – French Aeronautics and Space Industry Group), which represents more than 400 small businesses and major industrial groups in the sector, has provided substantial financial support for the development, reputation and diversity of the ISAE Group and its schools.

Strategic reflections at 4 commissions
/ Training
/ Digital Learning
/ International Relations
/ Promotion-image

Launch of an apprenticeship training program at the ISAE Group

In order to meet the needs of the aeronautics and space industry, the schools in the ISAE Group, in close cooperation with GIFAS, have jointly developed an apprenticeship training program that will open its doors at ISAE-SUPAERO in September 2020 before being deployed at other schools in the Group in 2021 and 2022.

The development of apprenticeship is part of a national policy and is notably a response to the critical difficulties in hiring faced by some small businesses and the strong rise in production rates in the aerospace industry. This program will train engineers specialized in industrial engineering for the aerospace sector who are able to provide an efficient interface between engineering offices and production lines.

For a period of 3 years, beyond the indispensable scientific and technical basics, this program will include courses on the technical and societal challenges facing the engineers of tomorrow, such as sustainable development, human management and innovation. It will also include a vital practical aspect to be deployed during alternating periods at one or more companies in the aerospace sector, with at least 5 weeks abroad.

Spotlight on two events organized in 2019

Success for the 1st ISAE Group Debating Week-End

The 1st ISAE Group Debating Week-End was held at ISAE-SUPAERO in April 2019. Inspired by the debates held at the House of Commons in the UK, debating is an exercise in which teams of students face off to defend their points of view on a variety of subjects in English before an audience and a jury.

Bringing together some forty students and professors from the various schools, the ISAE Group Debating Week-End was a privileged opportunity to develop eloquence and the ability to defend points of view on more or less complex subjects.

Organization of the annual Space Seminar

The 2019 seminar was held at ISAE-SUPAERO on the topic of “Space and Defense”. Several conferences and roundtables helped the approximately one hundred students who participated to understand defense policy, habit in extreme spatial environments, the outlook for space defense, the civilian-military duality, and the dangers of asteroids for our planet. Alongside this seminar, students were also able to attend a fascinating conference on the “First 100 Days of InSight”.

6,000 students
4,500 engineering students
1,600 graduates each year
160 partner universities (from 140 countries on all continents)
A network of 41,500 alumni

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A network of 41,500 alumni
ISAE-SUPAERO-ENSICA Alumni Association

more than 23,300 graduates

more than 17,700 employed

4 commissions:
/ Relations with the School and Professional Organizations
/ Publications & Social Media,
/ Engineering Professions,
/ Community Coordination.

6 clubs:
/ Culture & Travel Club,
/ ISAE Executive Club,
/ History & Memory Club,
/ ISAE Alumni Entrepreneurship Club,
/ ISAE-SUPAERO Women’s Club,
/ ISUPAERO Decarbo Club.

The Alumni network in action:
/ regional chapters, consulates abroad, company correspondents and class delegates;
/ highlights: participation in welcoming new engineering students, award ceremonies at “talent night”, publication of the alumni directory, general meeting in June;
/ ISAEEdre, quarterly information bulletin;
/ cocktails, dinners;
/ more than 2,500 job offers;
/ afterwork events and career interviews;
/ travel;
/ an active presence on social media, notably Facebook and LinkedIn.

The Alumni Association working alongside ISAE-SUPAERO:
/ at official bodies, the board of directors, training and research council, and juries;
/ promoting engineering training among students at scientific preparatory schools and l’X students
/ with the engineering students: participation in the back-to-school chains, afterwork welcome events for new students, honor loans granted to needy students, organization of a “diploma itinerary” day and theme dinners with alumni, participation in the graduation ceremony, graduating class sponsorships.

The Alumni Association is a partner of the ISAE-SUPAERO Foundation and is one of its 4 founding members, with:
/ a representative on the board of directors, who serves as general secretary;
/ the organization of roadshows at companies, in collaboration with ISAE-SUPAERO.

12 % of alumni are abroad:
450 in North America
1,240 in Europe
300 in Asia
The ISAE-SUPAERO Foundation, increasing support for the Institute’s projects and students through sponsorship

88 beneficiaries supported in 2019!

Recognized as a public interest organization in 2008, the Foundation works to develop ISAE-SUPAERO’s worldwide reputation by speeding up innovative projects that contribute to a sustainable world through donations collected from individual sponsors (alumni, parents of students, students and aerospace enthusiasts) and from sponsor companies. Company sponsorships make it possible to set up teaching and/or research Chairs with the Institute, as well as excellence programs. The generosity of private individuals mainly goes to student projects, PhD students and research professors in the following forms:

- 11 scholarships for international mobility;
- 13 scholarships to support exchanges for research;
- 4 scholarships to support extracurricular projects;
- 4 scholarships to support entrepreneurial projects;
- 9 scholarships for participating in or organizing international conferences;
- 4 thesis awards;
- 1 entrepreneurship award.

€341,000 raised from private individuals and €2.9 million from companies in 2019.

A successful first campaign and a new recognition program

In 2018, the Foundation wound up its first campaign launched in 2011 – “Give Wings to their Passion” - with €20 million collected: 1,037 donors and 49 sponsor companies and institutions contributed to support projects in 5 main areas:

- research and teaching,
- entrepreneurship,
- ISAE-SUPAERO’s international reputation,
- innovative teaching,
- diversity and social openness through the OSE l’ISAE-SUPAERO (Dare at ISAE-SUPAERO) diversity program

In 2020, in view of continuing to encourage ambitious projects by students, research professors and PhD students at ISAE-SUPAERO, the Foundation set up a new recognition program giving donors the possibility to give a name to a space on campus to demonstrate their attachment to the Institute.

This year also brought the launch of an original Class Gift bringing together three classes (1980, 2000 and 2020) for a joint project whose ambition is to get an electric drone to fly 3,000 km. Join us at the end of 2020 to see how the project turns out and how much money is collected!

OSE l’ISAE-SUPAERO (Dare at ISAE-SUPAERO) diversity program

A committed approach developed to promote and guarantee equal opportunity for everyone to have access to higher education:

The partners include 11 high schools and 11 middle schools in the Toulouse academic region. 2,500 young people are involved, and 600 of them receiving individual support from over 150 students, research professors, staff and alumni. Academic support, notably tutoring for disabled students, discovering the world of higher education, discovering the industrial and aeronautical sectors, and scientific and technical workshops are all organized throughout the school year.

An example of a project carried out in 2019:

In an approach to increasing awareness of sustainable development, all of the partner schools took part in the Climate Fresco. More than 40 students trained in hosting this educational tool initiated 200 middle and high school students on how the climate works and the consequences of climate change. These students thus became stakeholders in the issue of ecology at their schools. This project, carried out in collaboration with the La Fresque du Climat association and the Institute, contributes to the implementation of an educational policy aimed at combating climate change and encouraging biodiversity.
Committed to the dynamics of invention

With passion and commitment, we give the keys to education, research, initiation, innovation and business to all our students. Every one of them is free to dream and create to go ever further. We are here to let their projects take flight.
Innovation
We support entrepreneurship and innovation

Innovation in digital learning, a major challenge for our Institute

Educational and teaching transformations and digital learning comprise a major challenge for ISAE-SUPAERO, as can be seen in the IDEA (Innovative Digital Education for Aerospace) team set up in 2018. It is aimed at three complementary lines of action:

- R&D for teaching technologies, production of content or digital training and support in dispensing training. The year 2019 was marked by the wide variety of achievements impacting the entire Institute. These include:

  - 3 MOOCs: the 5th session of the MOOC Avion, which remains a great success among aeronautics fans, while the Airplane MOOC and DynaMOOC were ISAE-SUPAERO’s first steps into the world of English-language MOOCs. The committed, enthusiastic learners were happy to find original courses in English on the international platforms. They were all praised for the quality of the pedagogical innovation of the content and interactions, notably for the simulators that allowed concrete handling of the scientific concepts presented.

  - Two innovative projects have taken shape in the form of operational prototypes: IREAL, for Interactive Remote Experimentation for Aerospace Learning, is an educational digital platform for aerospace experimentation. The experiments presented are accessible anywhere at any time, no matter how many learners there are. They can be used in different educational contexts, from practical work as part of conventional face-to-face courses to the application of an active approach in a distance learning format. IREAL digitizes the experiments so they can be multiplied, enabling everyone to have enough time to absorb the fundamentals of the parameters, environment and results.

  - ADNs, for Aerospace Digital Nuggets ("Pépites numériques d’apprentissage aérospatiales" in French), are an important aspect of our course digitalization strategy: reusing digital content. ADNs are decontextualized, editorialized and qualified micro-content that integrate high-quality, interactive, multimedia pedagogical contributions. It is a project with the UNIT foundation and its members for the general use of this principle in a foreseeable multi-establishment context. The formats and the infrastructure for hosting the target platform are designed to feed into a system of collecting and analyzing educational uses in accordance with the current standards of tracking learning.

InnovSpace, a new space for innovation

This new space dedicated to entrepreneurship and innovation provides our students with a prototyping area with three spaces: a "mechanical" part, an "electronic" part and a "3D printing" part. InnovSpace also includes a concurrent engineering center, first used by the CSUT (Centre Spatial et Universitaire de Toulouse – Toulouse University Space Center), as well as an immersive technology room, a video studio and a creativity space.

Lastly, InnovSpace welcomes innovative projects by our students and the start-ups hosted on campus.
Spotlight on three promising projects

**U-Space** is a company founded in February 2018, a spin-off from ISAE-SUPAERO. From mission design through to trials, launch and in-flight operations, U-Space provides turnkey space systems whose purpose is to facilitate access to space for all thanks to quality, high-performance CubeSats.

It proposes solutions that are fully adaptable to the customer’s needs to address a wide range of missions for commercial, governmental, scientific or academic applications. In December 2019, CNES entrusted U-SPACE with the development of the NESS nanosatellite and a first contract was signed for the production of a satellite.

NESS’s goal is to perform planetary surveillance of the civil radiofrequency spectrum and to analyze sources of interference. With NESS, U-SPACE is truly entering into NewSpace, with orbital validation of the concept of very small satellites with very low masses, developed in a “design to cost” approach.

**Hinfact** creates and develops technologies for improving flight parameter monitoring by the pilots in the cockpit. According to the NTSB (National Transportation Safety Board), 48% of accidents or incidents are related to ill-suited or inadequate monitoring of flight parameters.

The first product is for pilot training. The HinSight software suite provides support for two aspects of pilot training:

- The tablet application for simulator instructors makes use of flight data and eye-tracking data to automatically detect all major events during the session in order to inform the instructors at the right time and to use this during their debriefing;

- The associated SaaS software is designed for officials and chief flight instructors and helps them to analyze all the simulator sessions with a view to widely improving the training programs.

This technology is based on eye-tracking technology and the expertise at ISAE-SUPAERO’s Human Factors laboratory. Today, Hinfact has 12 employees and plans to hire more for its growth in 2020.

**Dron’Aero** develops autonomous drones for winegrowers whose vineyards cannot be treated using a tractor. Equipped with a navigation system and an automatic reloading base for energy and treatment liquid, these flying machines provide precision spraying.

The objective is to demonstrate that using this system reduces operating costs and the consumption of inputs, improves safety for personnel and preserves the environment.
Moments of the year
Four engineers from the Apollo missions meet with our future engineers

For the 50th anniversary of the Apollo 11 mission and Mankind’s first step on the Moon, four NASA engineers came to share their experiences with a large, attentive student audience. Manfred Von Ehrenfried, Gerry Griffin, Sy Liebergot and Bill Moon piloted the Odyssey of the Apollo missions (from 7 to 17) from the control room in Houston, Texas, USA. This conference, “To the Moon Back and Forward”, was organized by our professors, students and the “Space” student club, and was an opportunity to relive the conquest of the Moon and to project into the future of space exploration.

Six students at the Mars Desert Research Station (MDRS)

From February 23 to March 17, six of our students took off to the Mars Desert Research Station (MDRS) in the Utah desert. In this desert environment, geological similar to that on the planet Mars, the student crew was confronted with a period of confinement to carry out scientific experiments in real-life situations.

The Airexpo air meeting

For several decades, our students have joined forces with students from ENAC to organize the famous Airexpo meeting at the Muret-Lherm site, where enthusiasts and the general public are able to see the Patrouille de France, the Rafale Solo Display and the French Air Force’s Stunt Team. An event not to be missed yet again in 2019, when the Guest Speaker was Sophie Adenot, helicopter test pilot.

The Hyperscan project at the 2019 Paris Air Show in Le Bourget

At the 2019 Paris Air Show in Le Bourget, attended by ISAE-SUPAERO, our neuroergonomics team’s Hyperscan project was presented at the Ministry of the Armed Forces stand. Hyperscan, at the crossroads between neurosciences, artificial intelligence and human factors, has the ambition to develop technologies for monitoring two operators to assess their level of cooperation. This multidisciplinary project has been developed as part of the Man Machine Teaming (MMT) work launched and financed by the DGA (Direction Générale de l’Armement - Directorate General of Armaments) and coordinated by Dassault Aviation and Thalès, for a new way of thinking about machine autonomy and their interactions with Humans.
Open House Days are a big hit!

Our 2019 ISAE-SUPAERO Open House Days were a hit thanks to the participation of many students, visitors and staff members! Nearly 2,500 visitors and parents of our students came to discover our campus and to talk with our students and research professors.

Five students work on an aircraft equipment project to make the sky accessible to all

The Aéro-Médalier is an aviation equipment project to enable people who have lost the use of their legs to pilot all kinds of aircraft. This equipment is unique in that it is transferable from one airplane to another to make up for the lack of airplanes equipped with standard hand controls.

As part of their Engineering-Corporation Project (PIE), a team of five 3rd-year engineering students had the opportunity to work with Philippe Carette, flight instructor and father of the Aéro-Médalier project. Their goal is to build a functional demonstrator in pursuit of the production of a prototype to be presented to the aviation authorities for flight certification.

Training in aviation law: a partnership with Université Toulouse 1 Capitole

Université Toulouse 1 Capitole and ISAE-SUPAERO signed a partnership agreement on July 5, 2019, for the development of courses in aviation law.

At the beginning of the 2019 academic year, our Institute took part in teaching a new post-Master LL.M course in Aviation Law at Université Toulouse 1 Capitole’s European School of Law, which in turn will take part in teaching aviation law for our Master in Aerospace Engineering.
The main players in drones come together for the Rendez-vous Aéro de l’Innovation

This second edition of the Rendez-vous Aéro de l’Innovation, organized on our campus by ISAE-SUPAERO and ENAC, focused on the topic of «Drones and their uses, how do we ensure reliable development?» In response to this issue, industrial stakeholders, researchers, representatives of start-ups and representatives of the regulatory authorities were in attendance. Among them, Henri Seydoux, CEO of Parrot, presented his vision of the new uses of civilian drones.

Successful launch of EyeSat, the university nanosatellite

EyeSat, the university nanosatellite, was placed in orbit on December 18, 2019, by Arianespace, carried by the Soyuz (VC23) rocket launched from the Guiana Space Center. Students and engineers from ISAE-SUPAERO took part in the design, development and validation of this satellite’s flight software under the auspices of CNES. The EyeSat mission has three objectives:
/ Observe zodiacal light in the visible range, in polarized and non-polarized light, to produce a deep, comprehensive 360° color image of the Milky Way,
/ Embed and fly the new miniaturized technologies from the work by Research and Technology (R&T) at CNES for technological demonstrations,
/ Training students in the space engineering professions.

Ingénieur ISAE-SUPAERO Graduation Ceremony

The Ingénieur ISAE-SUPAERO program’s Class of 2019 was honored to welcome and receive the expert advice of Guillaume Faury, CEO of Airbus & Guest Speaker at the ceremony, Sophie Adenot, helicopter test pilot, and Vincent Lecrubier, CEO of Sterblue, sponsors of the Class of 2019.