• ISAE-SUPAERO (General Presentation - Key Figures & Research)

• Academic Programs

• Study @ ISAE-SUPAERO (admission process and requirements)

• Campus Life

• Q/R with Pau and Victor, double degree students ESEIAAT/Supaero
5 reasons to study at ISAE-SUPAERO
Key Figures at a Glance

- **1909**
- **122** Professors & Researchers
- **241** PhD students
- **1900** Students
- **24500** Alumni
- **65 M€** Budget
- **628** students graduated a year
- **40%** Foreign Students
- **> 100** International Academic Agreements

ISAE-SUPAERO
International connections

An international campus
countries of origin of the international students on campus

- 93 foreign partner universities
- 59 nationalities on campus
- 30% international students
- 20% of graduates start their careers abroad
- 80% of foreign students find a job in France after graduation
Since 1909...

Creation of l’Ecole Supérieure d’Aéronautique or « SUPAERO » by Colonel Roche

Nationalization: Ecole Nationale Supérieure d’Aéronautique

SUPAERO moves to Toulouse and becomes l’Ecole Nationale Supérieure de l’Aéronautique et de l’Espace (ENSAE)

1909
PARIS

1930

1945

1961

1968

1979

2007

2015

TOULOUSE

Creation of a single institution, ISAE

SUPAERO

ENTA – ENICA - ENSICA

ISAE-SUPAERO

ISAE-SUPAERO on a single campus

1909

1930

1945

1961

1968

1979

2007

2015

TOULOUSE
A few of our alumni...

**ELODIE VIAU (M2008)**
Director of Telecommunications and Integrated Applications at the European Space Agency

**PRIYANKA DAS RAJKAKATI (S2017-D2021)**
Aerospace engineer & Artist, awarded Forbes India 30 under 30

**AUDE VIGNELLES (E1991)**
Chief Technology Officer at the newly created Australian Space Agency

**LUCA PARMITANO (MS2009)**
Italian Astronaut at ESA

**ANTHEA COMELLINI (S2017, D2021)**
Flight dynamic engineer for deep-space navigation at ESA

**OLIVIA DRAYSON (M2019)**
PhD student in Environmental Toxicology at the University of California Irvine

**JUAN CANTILLO (S2004)**
Senior Exploration Advisor at TotalEnergies, Manager of LNG exports to Japan

**THOMAS PESQUET (S 2001)**
Astronaut at ESA

**OUSSAMA KHATIB (D1980)**
Full Professor at Stanford University, Director of the Robotics Laboratory

**GUILLAUME FAURY (S1992)**
CEO Airbus

E: Ingénieur ENSICA / S: Ingénieur SUPAERO / M: Master / D: PhD
3 out of the 6 astronauts of the last ESA selection (2009 ESA Group) were at SUPAERO

**Thomas Pesquet**, France, SUPAERO 2001

**Samantha Cristoforetti**, Italy, Erasmus SUPAERO 2007

**Luca Parmitano**, Italy, PMP in experimental flight test engineering, SUPAERO 2009
Industrial Strategic Partnerships

- Safran
- Dassault Systemes
- Sopra Steria
- Alstom
- Bain & Company
- Thales
- MBDA
- Collins Aerospace
- Airbus
- Capgemini
- Siemens
- Accenture
- Volocopter
- Continental
- Liebherr
- ATR
- Nexter
- Parrot
- Atos
- Alten
- ArianeGroup
- EY
- Alteia
- Expleo
Research @ISAE-SUPAERO

**DAEP:** Aerodynamics, Propulsion & Energetics

**DMSM:** Structures & Materials

**DISC:** Applied Math, Computer Science, Embedded Systems, Networks, System Engineering, Data Science...

**DEOS:** Electronics, Optronics, Signal Processing, CMOS Sensors...

**DCAS:** Aerospace Systems, Control...

**LACS:** Languages & Humanities
<table>
<thead>
<tr>
<th>Research Topics</th>
<th>Modelling &amp; Simulations of Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Turbo-machinery &amp; Propulsion</td>
<td>Experimental &amp; Digital Aeroacoustics</td>
</tr>
<tr>
<td>• Aerodynamics</td>
<td>Aerodynamics &amp; Propulsion of Drones</td>
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<tr>
<td>• Fundamental Fluid Dynamics</td>
<td>Innovation in integrated architectures</td>
</tr>
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<td></td>
<td>Fluid-Structure Interactions</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Research Topics</th>
<th>Composite &amp; Metallic Material Durability &amp; Damage</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Mechanical System Modelling</td>
<td>Structure Modelling, Static &amp; Dynamic Qualifications</td>
</tr>
<tr>
<td>• Composite Materials &amp; Structures</td>
<td>Multi-Physics Conception &amp; Simulations</td>
</tr>
<tr>
<td>• Surfaces, Machining, Materials &amp; Tools</td>
<td>Fluid-Structure Interactions &amp; Multidisciplinary Optimisation</td>
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<td></td>
<td>Additive Manufacturing, Bioinspired Dynamics, Shells with Vibroacoustic Interaction</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Research Topics</th>
<th>Fluid-Structure Interactions &amp; Multidisciplinary Optimisation</th>
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</thead>
<tbody>
<tr>
<td>• Applied Mathematics</td>
<td>Aerospace Communication Networks, Connected Objects</td>
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<tr>
<td>• Communication Networks</td>
<td>System Engineering: Processes &amp; models, Cyber-Physics System Simulations</td>
</tr>
<tr>
<td>• Decision Systems</td>
<td>Industrial Engineering, Data Science, Optimisation, Machine Learning</td>
</tr>
<tr>
<td>• Critical System Engineering</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Research Topics</th>
<th>Command &amp; Control of Aerospace Systems</th>
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</thead>
<tbody>
<tr>
<td>• Aerospace Vehicle Design</td>
<td>Multidisciplinary Integrated Design</td>
</tr>
<tr>
<td>• Command &amp; Control</td>
<td>Advanced Space Systems</td>
</tr>
<tr>
<td>• Neuroergonomy &amp; Human Factors</td>
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</tbody>
</table>

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<thead>
<tr>
<th>Research Topics</th>
<th>Robust &amp; Adaptive Antennas, RADAR &amp; Navigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Signal, communication, antennas, navigation</td>
<td>Digital Radio-communications</td>
</tr>
<tr>
<td>• CMOS Image Sensors</td>
<td>Space Instrumentation for Planetology &amp; Applications</td>
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<tr>
<td>• Space Systems for Planetology &amp; Applications</td>
<td>CMOS Image Sensors</td>
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<tr>
<td></td>
<td>Optical Communications</td>
</tr>
</tbody>
</table>
Academic & Research Facilities

AeroAcoustic Wind Tunnel
80 m/s
1.8x1.8 test section

Low-Reynolds Wind Tunnel
Perfect 2 m/s
1.2x0.8 test section

TurboJet Test Bench
250 daN Thrust
Bypass ratio 6
SFC 0.5 kg/h/daN
Impact / Drop Tower
2 – 18 kJ
1 – 10 m/s
Low gravity tests 0.01 – 0.1g

Gaz Gun
5 – 70 kJ
100 – 700 m/s
Impacts on Composite Materials

15 Clean Rooms
500 m2
ISO 7 – 8 class
Satellite Integration & Optoelectronics Integration
Academic & Research Facilities

**Autonomous Systems Platform for UAVs & Robots**
- 400 m³
- OptiTrack 8 vehicles 1mm accuracy

**Critical Embedded Systems Platform**
- 8 Computers
- 6 – 32 cores
- 200 Hz
Fleet of 10 aircrafts
Instrumented TB20
Robin DR 400
Aquila...

Two Flight Simulators
For Human Machine Interface
design & Flight Dynamics
**Academic & Research Facilities**

**Neuro Ergonomy Center**
A research team on human factors and more specifically on human-computer interaction

**INNOVSPACE**
800 m² collaborative space dedicated to creativity
Meeting and exchange place dedicated to innovation and entrepreneurship (hosting of start-ups)

**Ground Stations for Satellite Tracking & Operations**
- UHF / VHF
- 15 dB crossed Yagi antenna (Cayenne)
- S-band, 30 dB gain 1.3 m parabolic antennas

**Satellite Command & Control Center**
- Full ground segment for TM/TC PUS standard
- Space link extension with CNES S-band ground station
Toulouse

TOULOUSE
European capital of Aeronautics and Space
25% of the European workforce
Toulouse, the second city for students in France

Campus: 22 hectares (54 acres)
Housing: 900 student rooms in the campus
Toulouse: European Capital for Aerospace Activities
Academic Environments: Other Laboratories
ACADEMIC PROGRAMS
ISAE-SUPAERO Programs & Bologna Process
=> Possibility to do an internship in Semester 4 (30 ECTS) [in place of the electives course and the other modules]
=> Possibility, under conditions, to sign a professionalization contract in Year 3 (work-study periods)

Both options are not compatible with each other
<table>
<thead>
<tr>
<th>Field (« Domaine ») [140 hrs]</th>
<th>Major (« Filière ») [240 hrs]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aircraft Design &amp; Operation (COA)</td>
<td>Fluid Dynamics (DF)</td>
</tr>
<tr>
<td>Airplane Architecture</td>
<td>Aerodynamics</td>
</tr>
<tr>
<td>Helicopter Architectures</td>
<td>Turbo-machinery &amp; Combustion</td>
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<tr>
<td>More Electrical Aircraft</td>
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<tr>
<td>Propulsion Systems</td>
<td></td>
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<tr>
<td>Neuro-ergonomy</td>
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<tr>
<td>Spacecraft Design &amp; Operation (COS)</td>
<td>Structure &amp; Materials (SM)</td>
</tr>
<tr>
<td>Space Systems, Satellite &amp; Applications</td>
<td>Computational Structural Mechanics</td>
</tr>
<tr>
<td>Space Propulsion &amp; Launchers</td>
<td>Aerospace Materials</td>
</tr>
<tr>
<td>Autonomous Systems (SA)</td>
<td>Signals &amp; Systems (SiSy)</td>
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<tr>
<td>Robotics</td>
<td>Electronics</td>
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<tr>
<td>UAVs</td>
<td>Signal &amp; Image Processing</td>
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<tr>
<td>Missiles</td>
<td>Control Theory</td>
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<tr>
<td>Sustainable Transport &amp; Energy Systems (ETE)</td>
<td>Earth &amp; Space Science &amp; Observation (OTSU)</td>
</tr>
<tr>
<td>Energy Sources &amp; Networks</td>
<td>Earth Science &amp; Observation</td>
</tr>
<tr>
<td>Transportation Systems &amp; Intermodality</td>
<td>Space Science &amp; Observation</td>
</tr>
<tr>
<td>Modelling &amp; Simulation of Complex Systems (MSXS)</td>
<td>Computer Science, Networks &amp; Telecoms (ITR)</td>
</tr>
<tr>
<td>Applied Mathematics</td>
<td>Computer Science for Critical Systems</td>
</tr>
<tr>
<td>Applied Physics</td>
<td>Networks &amp; Telecommunications</td>
</tr>
<tr>
<td>Neuro IA</td>
<td>Decision Science (SD)</td>
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<tr>
<td>Neuro Ergonomia</td>
<td>Data Science &amp; Operation Research</td>
</tr>
<tr>
<td>Neural Sciences</td>
<td>Financial Engineering</td>
</tr>
<tr>
<td>Interdisciplinary Engineering Project [80 hrs]</td>
<td>Operations &amp; Supply Chain Mgmt</td>
</tr>
<tr>
<td>4-to-6 Student Project</td>
<td>Project Mgmt</td>
</tr>
</tbody>
</table>
• Double degree

• Semester Exchange

• Research project

• Free mover

Double degree and exchange agreement with our Engineering program (Msc) 🇫🇷

Not with our Master of Science in Aerospace Engineering 🇬🇧
Many ways to study @ISAE-SUPAERO

1. You have to be selected by your University
=> Contact your University first!

2. If nominated for the double degree...
   - An application link will be sent to you
   - Application deadline: **April 15th, 2023**
   - Required documents: Transcripts of Records from all previous academic years / Motivation Letter in French / Resume/CV in French / ID/Passport

   French level certificate (B1) is required, you can provide it later.

   Double degree students will have access to an intensive French course in August 2023

Contact email: admission-ingenieur@isae-supraero.fr
• Double degree

• Semester Exchange

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Year 2

Erasmus+ = you don't pay the tuition fee at ISAE-SUPAERO during the 1st year of the double degree at ISAE-SUPAERO

Year 3

Tuition fee to be paid at ISAE-SUPAERO

2800€ [EU] / 4800€ [Non EU] per year (2022-2023)

You don't have the Erasmus+ status in Year 3

4 spots / year for UPC-ESEIAAT
• Double degree
• Semester Exchange
• Research project
• Free mover

1 or 2 semester(s) during the 2nd year of our Engineering program (semesters 3 and/or 4)

1 semester during the 3rd year (semester 5)

For 1 year-long mobility during the 3rd year (semesters 5 and 6) = fee-paying DES Diploma program
• Double degree

• Semester Exchange

• Research project

• Free mover

Potentially granted for a research project in one of our lab

You have to be chosen by one professor

[Link]
• Double degree

• Semester Exchange

• Research project

• Free mover

Outside the scope of the agreement

Fees & links (2022-2023)

• Programme Ingénieur [link] : 2800€ / 4800€

• MSc [link] : 5000€ / 12500€

• Advanced Master [link] : depends on the programme
CAMPUS LIFE
22 hectares along the Canal du Midi
2000 people on campus
Student accommodation
1 restaurant/cafeteria
About a hundred student clubs and numerous sports activities
Campus Life
Campus Life
ISAE-SUPAERO Student Clubs…

All clubs…
Focus on

THOMAS PESQUET, MAN IN SPACE: SPACE AT THE HEART OF OUR DNA
Focus on

PERSEVERANCE & SUPERCAM

A WORLD FIRST: HEARING THE SOUNDS OF PLANET MARS THROUGH A MICROPHONE MADE AT ISAE-SUPAERO

APRIL 2022: Publication in “Nature” science journal of the analyses of Martian sounds
Launched in November 2020, The UNIVERSEH European University Project aims to build a thematic European University dedicated to “Space” that addresses all academic disciplines: medicine and health, humanities and social sciences, art & culture, economics & business, innovation & entrepreneurship, science & engineering...
Focus on

Ecological and societal transition

ISAE-SUPAERO IN THE TOP 3 OF THE MOST COMMITTED INSTITUTIONS IN THE ECOLOGICAL AND SOCIETAL TRANSITION, AND FIRST FOR “TRAINING”

ISAE-SUPAERO PUBLISHES ITS AVIATION AND CLIMATE REFERENCE
DART PROJECT (Double Asteroid Redirection Test)

A TEAM OF ISAE-SUPAERO RESEARCHERS TAKES PART IN THE FIRST INTERNATIONAL PLANETARY DEFENCE MISSION!

The aim of the mission is to launch a missile probe that will crash into the near-Earth asteroid Dimorphos to modify its orbit and thus test our ability to avoid collisions with the Earth.
Focus on Víctor, double degree student

Víctor Muñoz Morales
victor.mun.mor@gmail.com

2\textsuperscript{nd} year
- Maths, fluids, structures... but also sports, art and languages.
- Stage de substitution / Internship (2B)

3\textsuperscript{rd} year
- Domaine: Conception et Opération des Systèmes spatiaux (COS)
- Filière: Informatique, Télécommunication et Réseaux (ITR)
- Stage de fin d’études / Internship (3B)

Activities and clubs
- Scuba diving, music production, nanosatellite club (Tolosat)...
Focus on Víctor, double degree student
Focus on Víctor, double degree student
Thank you for your attention