

Isae



Supméca

Key facts and dates: ISMCM, CESTI, Supméca, ISAE-Supméca

- **1948** : the Institut Supérieur de Matériaux et de la Construction Mécanique (**ISMCM**) was founded in 1948 for perfecting the study of materials and their use in mechanical engineering.(FIM, Ministry of Defence)
- **1956** : the Centre d'Études Supérieures de Techniques Industrielles (**CESTI**) was created as an engineering school connected to the ISMCM. The engineering school set up a 3 year curriculum with a strong integration between scientific courses and industrial internships
- **1994** : a branch was created in Toulon (CESTI Toulon).
- **2003** : The CESTI was renamed **Institut Supérieur de Mécanique de Paris – Supméca**.
- **2009** : a new training building was put into operation in Saint-Ouen
- **2014** : The branch Supméca Toulon becomes a separate engineering school (*Seatech*).
- **2018** : Supméca joined the ISAE Group.
- **2021** : Supméca became a full member of the ISAE Group and was renamed **ISAE-Supméca**.

ISAE-Supméca is...

- A public institute
- **Labelled DD&RS since 2017** for its good practice in terms of sustainable development and social responsibility
- **Certified ISO 9001 since 2021**
- Employing
 - 56 permanent academics
 - 100 temporary academics
 - 50 administrative and technical staff

The Curricula are approved by the Commission des Titres d'Ingénieur diploma accreditation body (CTI)

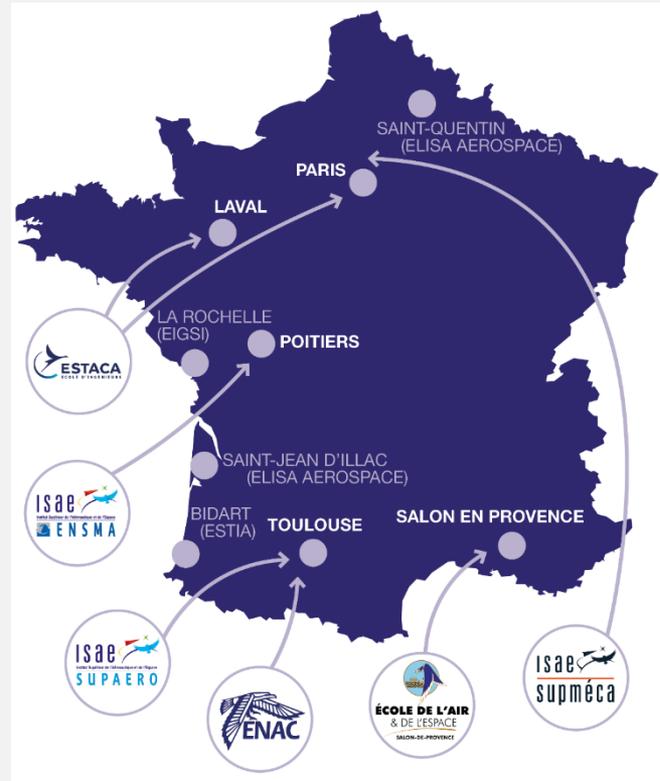
Key figures

- **3 curricula leading to 3 engineering degrees at Master level**
 - Degree in Mechanical Engineering (regular student status) ~150 students/year
 - Degree in Industrial Engineering by apprenticeship ~48 apprentices/year
 - Degree in Aerospace Engineering by apprenticeship (Since 2022, #24 apprentices/year in 2024)
- **600 students / year (#675 in 2025), 200 graduates / year (#225 en 2025)**
- 30 % scholarship holders
- 25 % women
- 14 % foreign students
- **41 foreign partners in 21 countries**
- More than **7 000 Alumni**

With an influence on its territory

- Site policy supported by CY Cergy Paris Université
- Scientific and industrial partnerships, startups hosting
- Research clusters
 - Systematic : Vice-Presidence of the « Drone Hub »
 - ASTech : Vice-Presidence for the topic « Factory 4.0 »
 - Next Move, Comestic Valley
- Student associations activity linked to local needs (help in doing homework...)
- Cultural and scientific mediation, conferences with a local component
- City of Saint Ouen, Plaine commune, Departement, Region

The ISAE Group network



Key figures

Total number of students: **6 500**

Number of engineering students: **4 000**

Total number of graduates in 2021: **2000**

Number of PhD students: **475**

Number of partner universities : **160**

Alumni: **68 000**



Every year, the Group trains more than half of the young engineers hired by companies in the aerospace sector.

Partnership with GIFAS since 2015



Au niveau national et international



ISAE-Supméca
ISAE-ENSMA
ENSEIRB-MATMECA
ENSMM
ENSIAME
ENSTA Bretagne
ENSCI
SeaTech
Sigma



Application in progress

ISAE-Supméca, a strong link with industry

- a strong integration between teaching, research and industrial partnerships
- a teaching approach that focuses on industrial projects and case studies **(30%)**
- at least 12 months of industrial experience (internships or apprenticeship contract) **(30 %)**

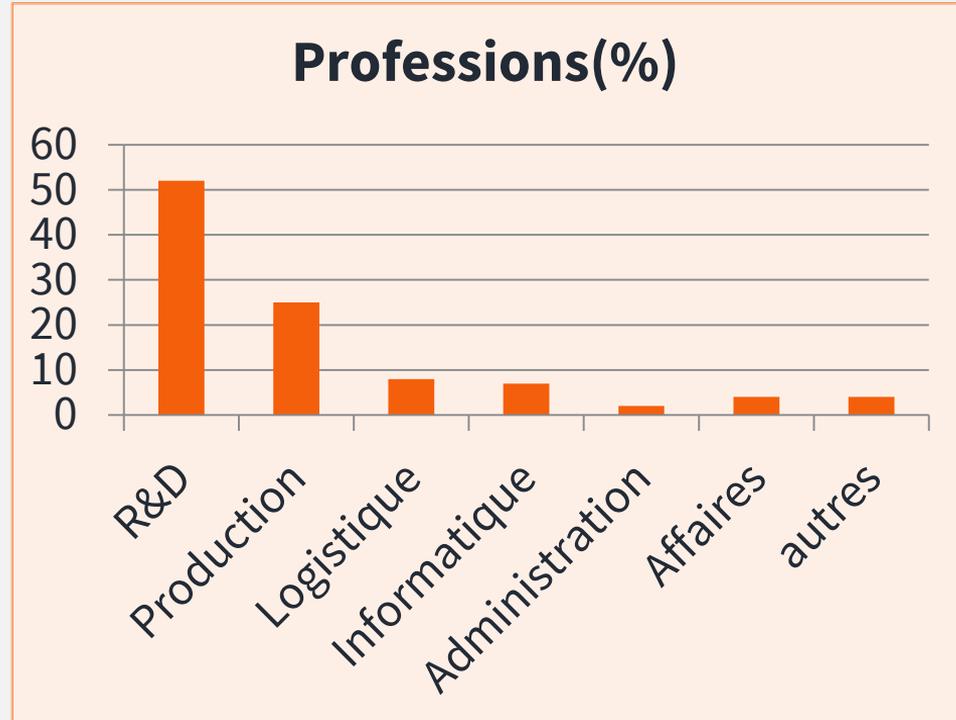
Employment data (promo 2022)

- First average annual salary : **40,96 K€ for students, 41,75 K€ for apprentices**
- **87%** of graduates employed just after graduation, **67%** before graduation, **99%** six month after

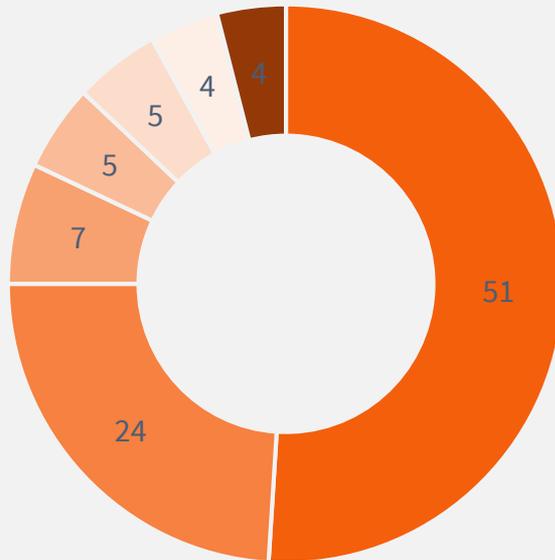
ISAE-Supméca graduates professions and skills

Skills

- Numerical engineering
- Mechatronic and mechanical systems
- Design
- Modelling
- Simulation
- Materials
- Production systems
- Logistics
- Industrial design



Activity sectors of the graduates (%)



■ aéronautique	Aeronautics
■ automobile	Automotive
■ énergie	Energy
■ métallurgie, fabrication de produits	Metallurgy, product manufacturing
■ ferroviaire, naval	Rail, naval
■ technologie de l'information	Information technology
■ autres industries (luxe...)	Other industries (luxury...)

Recruitment

The recruitment of the engineering students is mainly based on the « Concours Communs INP », a national selective examination (CCINP)

Path	MP	PC	PSI	PT	TSI
Available places	45	22	50	12	3

Recruitment also possible after ATS #5, PASS'INGENIEUR #2, L2 renforcée #3
Bachelor holders B3 #3 ; M1#4)

The apprentices are recruited after BTS-BUT, CPGE or Bachelor
Since 2021, contribution to the « Cycle préingénieur » carried out by CY Tech

Student life

Catering and accomodation

- On-campus restaurant
- Two student residences reserved for ISAE-Supméca (40 and 130 apartments – PARIS2024)

Clubs et associations



Student club, ISAE-Supméca Junior Company, BaAar...

Supméc'aéro, Mecalink, 4L Trophy, Robotics...

Sports : rugby, handball, football, basket, tennis, climbing...

Art Club, Photo Club, Music Club...

Sustainable development, Apiary...

Remedial courses association for pupils in difficulty, Sum'égalité, New Défi...

Engineering curriculum

Regular student status

Skills

A renowned expertise:

- Strong skills in mechanical engineering
- Mastery of numerical tools
- Skills in modeling and simulating complex mechanical and mechatronic systems
- Mastery of part-process-material matching
- Ability to manage, design and implement complex industrial systems.

General structure of the curriculum



Core courses

Courses:

- Information science and mathematics
- Mechanical engineering
- Methods and technologies for systems engineering
- Business and management sciences
- Communication and professional culture

Projects:

- Tutored engineering project
- Design office project
- Final project

Foreign languages:

- English (mandatory) – TOEIC 800 min
- Second foreign language (mandatory): German, Spanish, Italian, Chinese, Japanese, Portuguese, French as a foreign language.

Elective courses and majors

From the second year, the students can personalise their curriculum by choosing 6 elective courses among a list of 40.

In the last year, 4 majors are offered :

- Simulation in Mechanical Design (SCM)
- Mechatronics & Complex Systems (MSC)
- Materials & Processes, Simulation (MPS)
- Supply Chain management and Logistics(SPL)

Internships in France or abroad

Internships account for **1/3 of the curriculum** (12 months).

ISAE-Supméca encourage ses étudiants à effectuer un des deux stages longs à l'étranger et à vivre une expérience *recherche* en laboratoire.

Operator internship	1 month	Understanding the basics of a company
Assistant engineer internship	5 months	Consolidate the career plan
Engineer internship	6 months	Practising as an engineer

Academic mobility in France or abroad

- **Master in France:** Paris Saclay with Centrale-Supélec, l'ENS (6 different Masters), Paris Dauphine, l'Institut Galilée – Université Sorbonne Paris Nord, l'ENSTA.
- **Mobility in one of the ISAE Group schools:** ISAE-SUPAERO, ISAE-ENSMA, ESTACA,
- **Mobility within the Polyméca network:** ISAE-ENSMA Poitiers, ENSMM Besançon, ENSIAME Valenciennes, ENSTA Bretagne, ENSCI Limoges, SeaTech Toulon, Enseirb Matmeca Bordeaux, Sigma Clermont Ferrand.
- **Mobility in one of our international partner universities:** 41 partner universities in 21 different countries (United-Kingdom, Canada, Brasil, Norway, Spain, Japan...).

Double-degree in a partner university in France or abroad

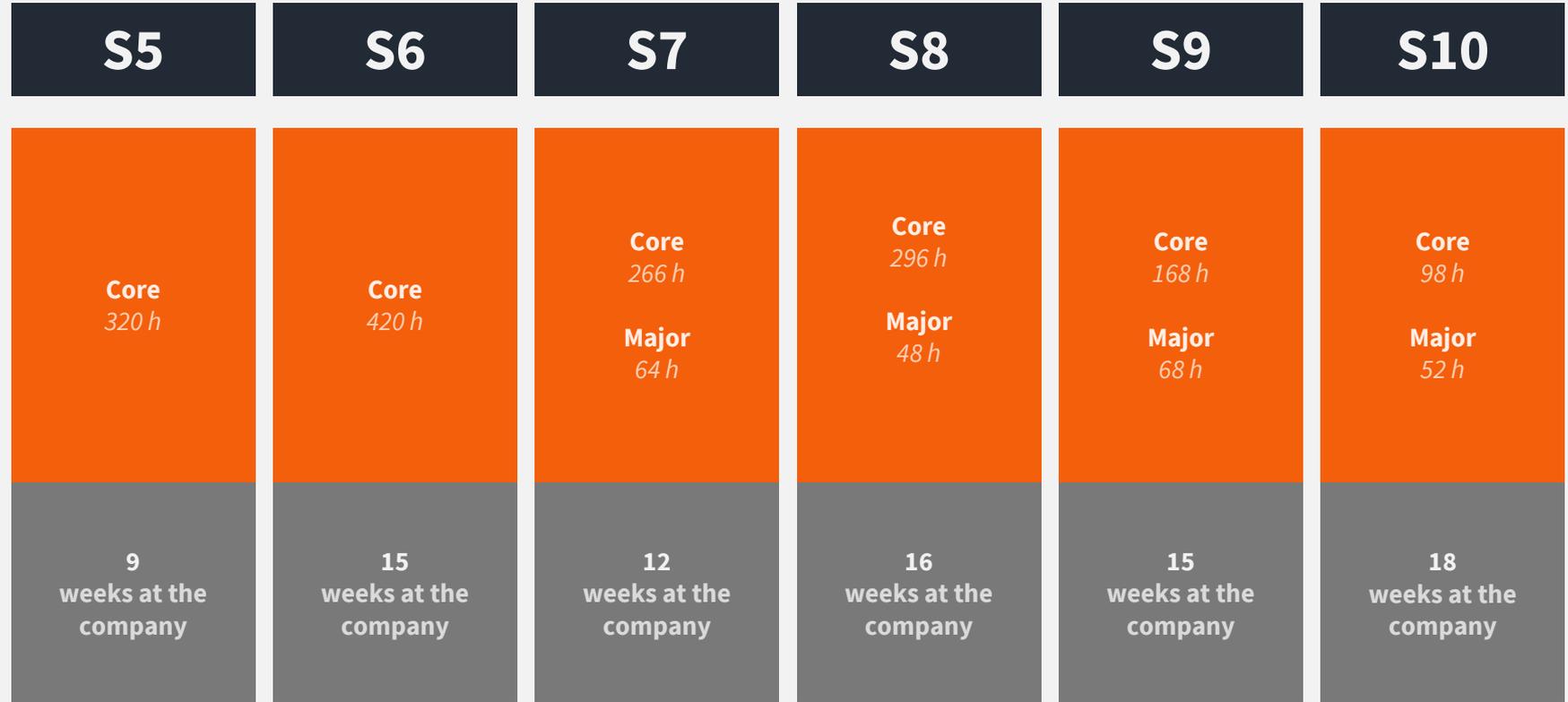
- **In France:** IFP School and members of the Polyméca network
- **Abroad:** 16 Double-degrees (HS Esslingen|Germany; UBA|Argentina; UFU, UFPE, UFTM|Brasil; EPM, ETS|Canada; UCD|Ireland, POLITO, POLIMI, Federico II University|Italy; Kyutech, UEC|Japan; ENSAM Mèknes|Marocco; Cranfield University|United Kingdom; ENIS|Tunisia)



The curriculum by apprenticeship

Engineering degree by apprenticeship

General structure of the curriculum by apprenticeship



Unités d'enseignements

- Sciences de l'information et mathématiques
- Sciences de l'ingénieur
- Méthodes et technologies pour l'ingénierie système
- Sciences de l'entreprise et management
- Culture communicationnelle et professionnelle

Projets

- Mini projets, serious game
- Projet de parcours
- Projet de synthèse

Lv1 obligatoire : anglais

- Stage d'un mois au RU

2 Majors offered from the 2nd year(240 h)

Mechatronics	Production systems
Systems engineering	6 Sigma method
Design of mechatronic systems	Systems engineering applied to production-related conveyor systems
Introduction to robotics	Design of experiments
Fast 8D	Logistics
	Company management tools

Organisation générale de la formation AE

S5	S6	S7	S8	S9	S10
Tronc commun 330 h	Tronc commun 370 h	Tronc commun 264 h Projet Recherche 90 h	Tronc commun 246 h	Tronc commun 120 h Parcours 290 h	Tutorat pour le mémoire final d'ingénieur Parcours
11 semaines en entreprise	18 semaines en entreprise	11 semaines en entreprise	24 semaines en entreprise	Projet en partenariat avec l'entreprise 90 h	31 semaines en entreprise

Recruitment

Apprentices are admitted on the basis of an application, tests and an individual interview.

They must be under 26 when they sign the employment contract.

- **They must have one of the following degrees :**
 - Bachelor's (technical or scientific)
 - BTS (ATI / MCI / CRCA / CPI / Aéro)
 - DUT (GMP / MP / GIM)
 - CPGE PT / TSI
 - other equivalent degree
- **They must find a company** which will host them for 3 years by signing a specific contract by apprenticeship. The dead-line for the signature is December 31.

The Research

QUARTZ Laboratory

ISAE-Supméca, ENSEA, Paris 8, ECAM-EPMI

QUARTZ Laboratory

EA 7393

Pr. Imad TAWFIQ



Research activities

<https://www.quartz-lab.fr/>

- Quartz has a complementary multidisciplinary and expertise in specialized themes giving rise to original research.
- A significant number of publications and numerous events.
- Strong involvement in national and international doctoral training.
- Involvement in numerous competitiveness clusters thanks to its multidisciplinary.

Guardianships and locations

Primary guardianships :

ISAE-Supméca

ENSEA

Secondary guardianships :

- ECAM-EPMI
- Université Paris 8

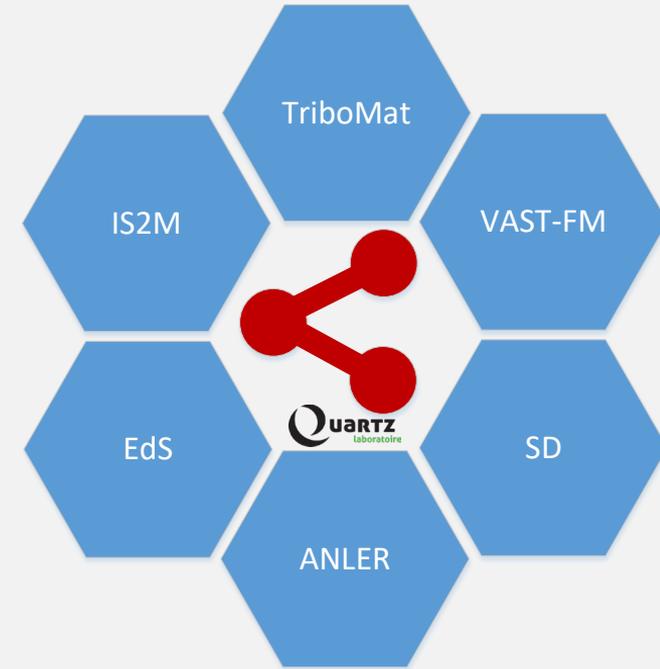
Four sites :

1. Saint Ouen (ISAE-Supméca)
2. Cergy (ENSEA, ECAM-EPMI)
3. Montreuil (Université Paris 8)
4. Tremblay (Université Paris 8)

Organization and scientific structure

The Quartz laboratory is structured into **six teams**:
19 Full Pr, 34 Ass Pr, 19 researchers, 3 Post-Doc, 4 IGR, 4 admin, in total 83 members and 64 doctoral students

1. Vibrations, Acoustic, Structures & Mechanical Shape
2. Tribology and Materials
3. Sustainable Systems
4. Mechatronic and Multi-physics Systems Engineering
5. Non Linear Automatic and Renewable Energy
6. Systems Electronics



Research activities

Mechanical systems or mechanisms (1/2)

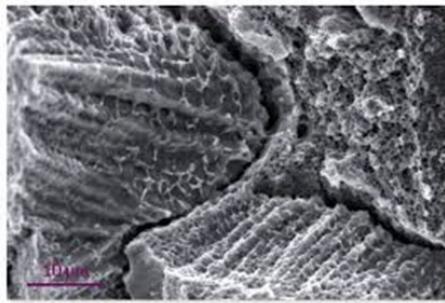
→ 5 areas covered

MATERIALS

Damage

Dynamic behavior

Elaboration



ASSEMBLIES

Nonlinearity in vibration

Damage

Friction

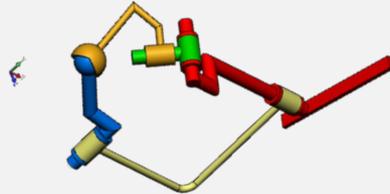


Research activities

Mechanical systems or mechanisms (2/2)

**GUIDE
TOLERANCES**

Cinematic



ACOUSTIC

Absorption

CONTACTS GUIDAGES

Damage

Friction



→ Theoretical approaches / Simulations / Experimental studies

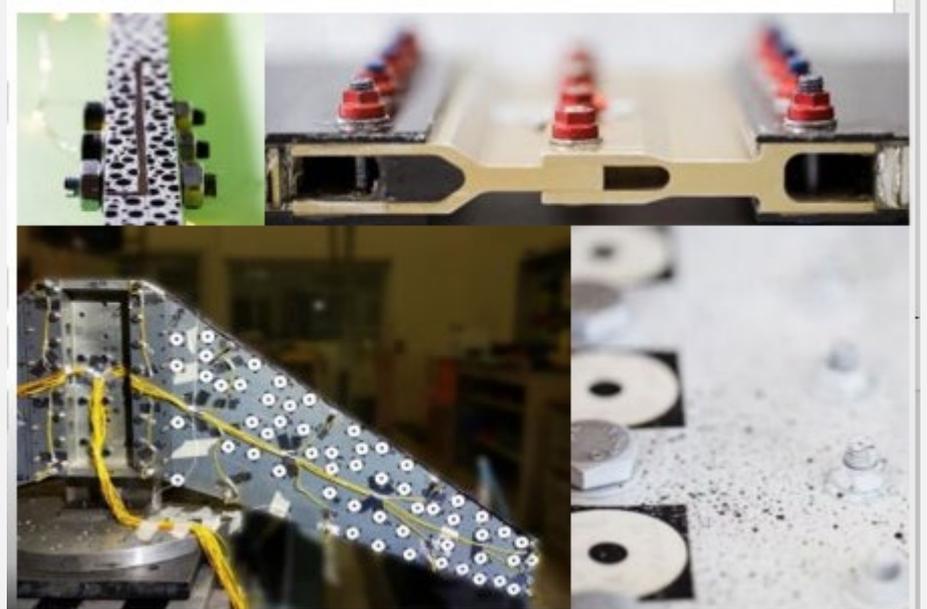
Research activities

CONTACTLESS MEASUREMENTS IN DYNAMICS

Image Processing & Video Analysis

MACHINE LEARNING FOR DYNAMICS

Monitoring of Systems & Processes
Structural Health Monitoring



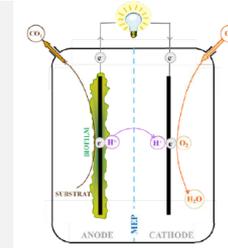
Research activities

Sustainable systems

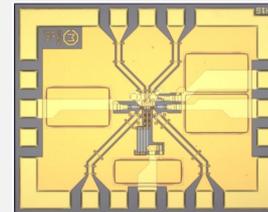
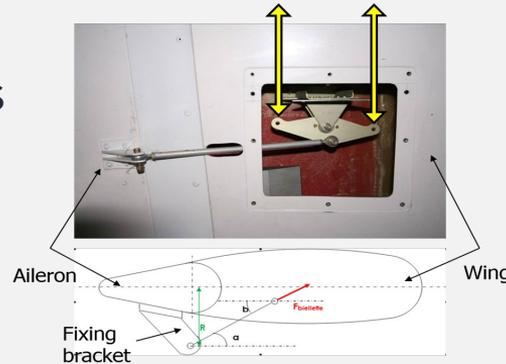
Obsolescence Engineering
Production Systems
Design Problem Specification



Non-linear automatic
and renewable energy
Transport of tomorrow
Production of
electrical energy



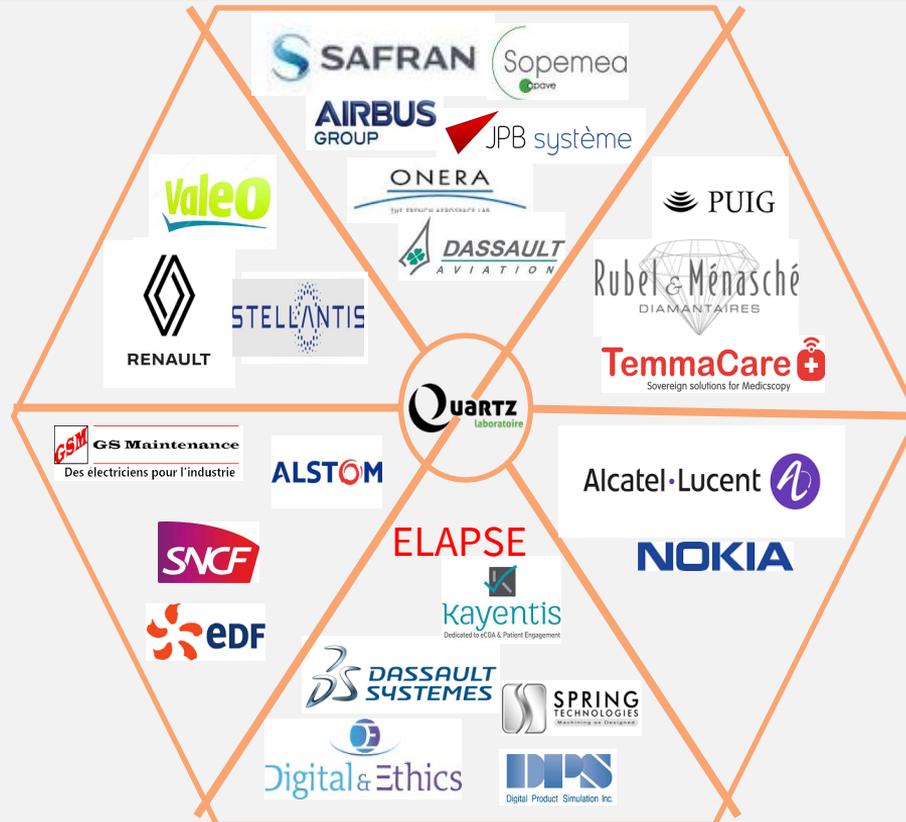
Mechatronic systems
engineering



Electronic systems
Circuits for
telecommunications
H. D. 100 Gb/s

→ Theoretical approaches / Simulations / Experimental studies

Industrial collaborations



Industrial collaborations



United
States
Canada
Mexico

Brazil
Chile



Italy
UK
Belgium
Austria
Spain
Romania
Norway

Algeria,
Tunisia,
Morocco,
Senegal,
Mauritius,
Ethiopia,
Mauritania



Japan
China
Vietnam
Israel
Indonesia
Thailand

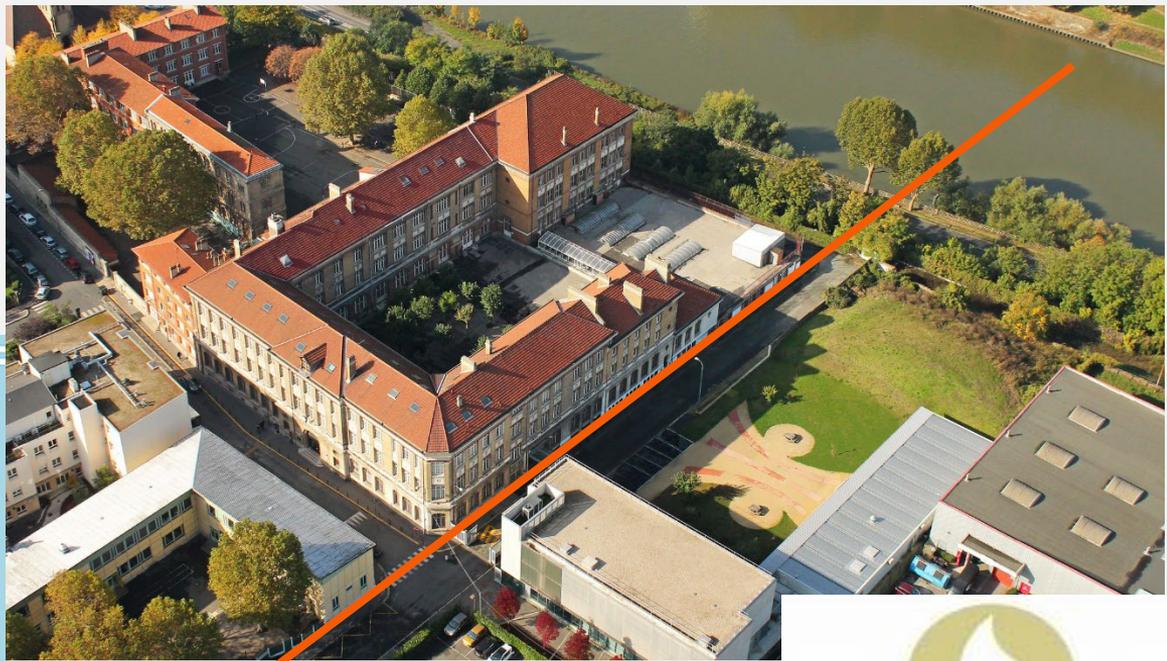
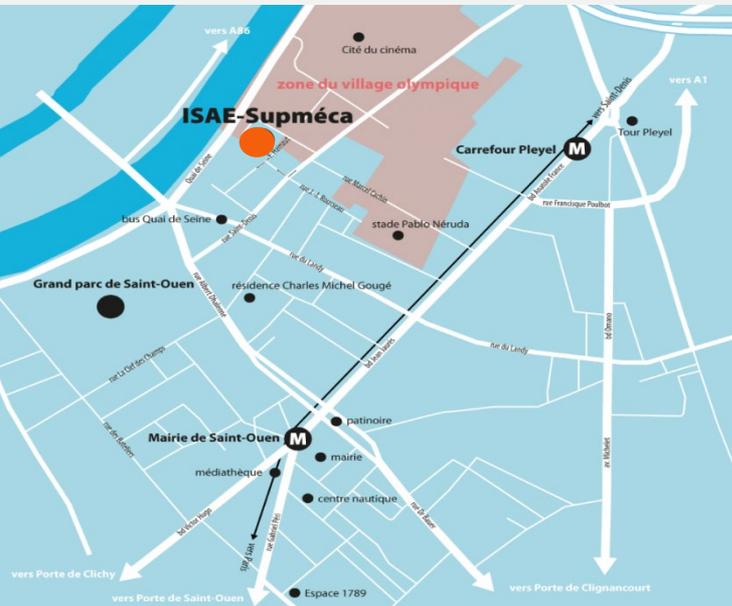
Some examples of recent projects

- EnerMan (ENERgy-efficient manufacturing system MANagement) - *Horizon 2020* (the EU's research and innovation funding programme)
- Projects funded by the French National Research Agency (ANR):
 - Dynatimbereyes (*Video-based vibration analysis of medium and high wood constructions*);
 - ExFLEM (*harnessing Extreme wave events in non-linear FLEXible Elastic Metamaterials*);
 - ASHENDO : Determination of the non-propagation thresholds of bonded metal/composite assemblies under mechanical and water loads in relation to the initial defects of the adhesives
- Winner of the Challenge « AI for Industry 2021 » (DA, IdF)
- National Recovery Plan : *Plan de relance* (research activities with DPS, SkyReal, PUIG, ArianeGroup, PTC-FAYAT, Keyprod involving 7 senior engineers and 13 junior engineers)



View of the campus

Location





IMAGES GROUPEMENTS - COLLAGE DPA

Ecole Pratique de Commerce et d'Industrie. — Saint Ouen (Seine).





