

portes
OUVERTES
ENTREZ
DANS LA SCIENCE !

*raconter
la science.
imaginer
l'avenir*

RENCONTRES ■ ATELIERS ■ ANIMATIONS ENFANTS ■ EXPOSITIONS ■ PROJECTIONS ■ VISITES

ENTRÉE GRATUITE

PROGRAM

Saturday, October 12, 2019

#IsaeSupaeroJPO





MECHANICS AND AERODYNAMICS HUB

/// DAEP – Department of Aerodynamics, Energetics and Propulsion ///

- ➔ **Energy transition for aviation.** Presentation of the role of energy transition in a research laboratory studying aerodynamics and aircraft propulsion. *In front of the building*
- ➔ **Aircraft propulsion – what does the future hold for electric power?** Visit to the museum with aircraft engines, presentation of the research facilities, a helicopter compressor, as well as electric propulsion. *Museum*
- ➔ **"Da Vinci", scientific heritage...** Leonardo Da Vinci, visionary scientist, observer of nature and father of experimental methods, paved the way to biomimetics... Presentation of the department's research on imitating nature and its inspiration in the field of aviation and drones. Presentation of the flapping flight test benches, long-endurance drone, Martian drone, propeller test benches and drone models, demonstration of the Bucky robot arm dedicated to dynamic drone qualification in a wind tunnel. *SaBRe Hall*
- ➔ **Aerodynamic wind tunnels.** Demonstrations in educational wind tunnels on the subject of the aerodynamics of aircraft wings: lift, drag, wingtip vortices, stall, etc. *Subsonic Wind Tunnel Hall*
- ➔ **Shock tube.** The nuclear fusion process, the source of the energy produced in the heart of the stars, is still uncontrollable today. One of the keys to mastering it lies in the development of hydrodynamic instability – Richtmyer-Meshkov instability – during fusion experiments. This instability annihilates the fusion process by producing a turbulent mixture of Deuterium and Tritium. The experiments carried out in partnership with the CEA seek to provide the keys to understanding the mechanisms governing this instability in order, in the long term, to block them and thus open up access to this inexhaustible source of energy. *Shock Tube Room*
- ➔ **Aeroacoustics.** Presentation of activities on the subject of aeroacoustics, awareness of the acoustic facilities. *Aeroacoustic Wind Tunnel*

/// DMSM – Department of Mechanics of Structures and Materials ///

Building 38 – Vibration Hall 38 066

- ➔ **Introduction to Aeroelasticity.** Presentation of the main aeroelastic phenomena. Illustration through a simple manipulation that everyone can do.
- ➔ **Exoskeleton, the augmented human.** Creation of an exoskeleton for walking and re-educating children with cerebral palsy.
- ➔ **When the nose of the plane is twitching.** Analysis of a vibrating structure.
- ➔ **Separation and Launch System for drone-carried rockets.** Presentation of the test system – students can get involved in concrete projects through to shooting off real rockets.
- ➔ **S3PAC.** Collages and take-off of the aircraft of the future.
- ➔ **3D printer magic.** Initial demonstration of CAD parts on a computer and real parts. Introduction to our 3D printers.
- ➔ **Cosmos 2099: Living on the Moon.** Use lunar materials to build a lunar base and live on the Moon.



- ➔ **Origami workshop for children.** Make a paper Concorde and other airplanes.
- ➔ **Consuming just what we need.** Exhibition of original materials and parts obtained after processing.
- ➔ **The infinitely small in 3D.** Electronic microscope observations. *Room 38 142 (1st floor)*
- ➔ **Workshop of the future.** 30-minute commentary on an additive production machine, in groups of 10 people maximum. *Meeting place: Main Hall 38*
- ➔ **Aeromodelling Club.** Presentation of the 1/30th model of the A350-1000 and this year's project. *In front of building 38*



AEROSPACE HUB

/// DCAS – Department of Aerospace Vehicle Design and Control ///

- ➔ **The NewSpace at ISAE-SUPAERO.** Tour of the EntrySat satellite control center and presentation of the research and development activities in nanosystems for space applications. *NB: for the tour, 10 people every 20 minutes (pick up reservation tickets in Building 11). Hall / Room 11.142*
- ➔ **Alone Several people on Mars.** Moon and Mars Rover simulations, planetary visits in virtual reality, a fun introduction to space mechanics, Mars base design. *Hall*
- ➔ **PEGASE Flight Simulator.** "How does the pilot behave in his plane?" Visit to the flight simulator with a presentation of research activities on human factors to improve flight safety. *NB: 6 people every 20 minutes (pick up reservation tickets on site). Room 11.138*
- ➔ **Escape Game on Aviation and Space .** 16 aviation and space enigmas await you.. How many can you answer? Select a challenge and meet it to get free. *Continuous Room 11.138*
- ➔ **Objective Mars: Via the Moon?** Fifty years ago Man walked on the Moon. What do the coming years hold for us? Will the next astronauts go to Mars or to the Moon? This is the kind of questions that the students in the MARS Club are interested in. From analog missions in OG Flight to scientific popularization, come and see the many projects focusing on the conquest of space. Workshop hosted by students from the MARS Club at ISAE-SUPAERO. *Hall*
- ➔ **Cubesat Supaero.** General presentation of the Tolosat Nanosatellite. *Hall*
- ➔ **SUPAERO Space Section.** Presentation of the work and rockets. *In front of the building*

AIR SAFETY CONFERENCE: The airplane is one of the safest forms of transportation. This conference will use a few case studies to illustrate how we ensure that aircraft designs are safe.

JOËL JÉZÉGOU, research professor in aircraft maintenance, navigability and operations
Room 11.006 – 11:30 am





PHYSICS AND SYSTEMS HUB

DCAS /// Department of Aerospace Vehicle Design and Control ///
DISC /// Department of Complex System Engineering ///

- ➔ **Demonstrations and exhibitions of mobile and aerial robots and their embedded systems**
Drones: friends or enemies? You will be invited into the exhibition room where various – and sometimes surprising – vectors will be presented. You will discover the embedded systems that make these machines smart and autonomous. You can also remotely operate a mobile robot with the “Robot Firefighter Game”.
As a bonus: every 30 minutes there is a demonstration of an Autonomous Pursuit Mission (break between 12:30 pm and 1:30 pm). *Rooms 07-008 and 07-009*

DCAS /// Department of Aerospace Vehicle Design and Control ///

- ➔ **The Iboat.** Exhibition and presentation of the ISAE-SUPAERO drone boat.. *Hall (near Room 07.007)*

DISC /// Department of Complex System Engineering ///

- ➔ **SMARTIES, a simulator for studying avionics systems.** An avionics system cannot be summed up in just one computer, but rather is a multitude of computer components that communicate with each other. SMARTIES offers a complete architecture for faithfully reproducing and testing complex avionics systems in order to study certain properties (such as electricity consumption, fault tolerance, reliability, etc.). *Room 07-046*
- ➔ **Robots learning to learn.** Artificial intelligence seeks to design computer programs that think about the world around them. At ISAE-SUPAERO, the SuReLI team is working on virtual or real-life robots that learn a behavior through successive attempts based on their interaction with their environment (real or simulated), just like a human learns to play a video game. *Room 07-046*



- ➔ **Robotics-Embedded System Experimentation based on the Mindstorms Platform.** We propose to let you discover how to make a robot capable of carrying out a mission autonomously. Various missions and robots will be presented to provide an understanding of the behavior of an autonomous robot based on sensors. The language used does not require any particular skills as it is quite intuitive. *Attention: limited access (pick up reservation tickets on site). Duration: 30/45 minutes*
Workshop close from 1 pm to 2 pm. Room 07-062



- ➔ **Tetalab.** Introduction to soldering, electronic kits and sound equipment.
Workshop close from 1 pm to 2 pm. Room 07-062

DEOS /// Department of Electronics, Optronics and Signal Processing ///

Level 1

- ➔ **LASERs for Communicating at the Speed of Light on Earth and in Space.** Understanding how light waves are used to transmit information over several thousand kilometers at a very high rate. Illustration of a few optical principles: refraction; guiding light in optical fibers; shaping laser beams; transmission of information with fiber optics.
Room 07.121
- ➔ **Seismology – Space Instrumentation.** Presentation of the team's different experiments: seismic phenomena, Mars microphone and the Insight mission.

- ➔ **What machines see.** Robots perceive a great deal of information in their environment, analyze it and use their memory to make the best decisions to act and interact with us. But what does an autonomous car or a mobile robot really see? What does a laser measurement look like? How does a robot feel gravity? How can a robot use a camera to see and understand its environment? Come and see us to see things through their eyes!
- ➔ **Image Sensors, an Eye on the World.** Presentation of the various steps in producing a CMOS image sensor for scientific and space applications and examples of their applications in observing the Earth, climate effects and radiometric measurements.



- ➔ **Activities for children and teens.** Fun activities with robotics and lasers.
- ➔ **Open-air data.** In this workshop we explore the safety mechanisms used in aviation communications and GPS navigation. Are these systems vulnerable? How can they be improved in the future? *RALF Room - 07.113*

/// Aeroscopia ///

- ➔ Excerpts of their exhibition and models. *Hall*

/// Les maths en scène – Math where you least expect it! ///



- ➔ Collaborative origami workshop, robotics workshop, math and movement workshop (cycloid). Workshop on polyhedrons with the creation of a giant stellated polyhedron (outdoors). Miscellaneous games (puzzles etc.). *Hall*

/// Airexpo ///

- ➔ Presentation of the air meeting organized by ISAE-SUPAERO student. *Hall*

FORUM



/// Department of Engineering Programs ///

- ➔ **Information on the Ingénieur ISAE-SUPAERO program**
“As for the future, your task is not to foresee it, but to enable it” A. de Saint Exupéry.
- ➔ **“My student life at ISAE-SUPAERO” Circuit**
- Amphitheater presentation: the Ingénieur ISAE-SUPAERO program
 - Campus visit with a student
- Amphitheater 4 // 11:15 am – 2 pm – 4 pm*

/// Masters and Advanced Masters® Department ///

- ➔ **Let your career take off!** Information on the Advanced Master®, Master of Science and Executive Education programs.
- ➔ **Presentations hosted by Didier Delorme, Director of Master and Advanced Master® training:**
- Master of Science in Aerospace Engineering: 12 pm and 3 pm
 - Advanced Master®: 11:15 am and 2 pm. *Rooms 61 101 and 61 102*
- ➔ **Discussions with the Heads of the Master and Advanced Master® Programs**
Rooms 61 110 and 61 111 (identify yourself at the forum first)

/// Sustainable development and social responsibility hub ///

- ➔ **A school committed to solidarity.**
Presentation of projects in favor of sustainable development promoted by students and staff. Making your studies a success when you have a disability – at ISAE-SUPAERO you can!
- Fun workshop on the consequences of climate change: “The Climate Fresco” – between 2 pm and 4 pm.
 - “LSF Café” in partnership with SODEXO.



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Samedi 12 octobre 2019
10h00 - 18h00



/// OSE l'ISAE-SUPAERO ///

- ➔ **OSE l'ISAE-SUPAERO (Student Diversity Program)**, ISAE-SUPAERO's equal opportunity program, wants to show you what it does (tutoring, scientific and technical workshops) through photos and videos. You can also ask questions, think about and discuss the various stereotypes and prejudices that exist today using games for young and old alike! Join us to play, have fun or just talk and share.

/// ISAE-SUPAERO Foundation ///

- ➔ **Providing support to those who dream of the future**
Presentation of the Foundation and the projects it supports.
Introduction to the Foundation's new raison d'être involving support for innovative projects that contribute to a sustainable world. How to join us or support us?

/// A special "sustainable development" activity for children ///

-  ➔ make your own ecological flowerpots. And for the grownups, play at identifying our actions in connection with sustainable development!
At the Foundation, OSE l'ISAE-SUPAERO and sustainable development and social responsibility stands

/// ISAE SUPAERO ENSICA Alumni Association ///

- ➔ Presentation of the alumni network

/// ISAEELLES ///

- ➔ Space history from the women's perspective. Presentation of the history of women in the conquest of space and of the club's activities.


/// Innovative teaching and digital learning at ISAE-SUPAERO ///

- ➔ **Digitalization of scientific experiments for educational uses at ISAE-SUPAERO.** Do your first practical work in structural dynamics on the IREAL-Innovative Remote Experimentation for Aerospace Learning platform.
- ➔ **Micro-learning at ISAE-SUPAERO.** Discover the prototype of the ADN-Aerospace Digital Nuggets platform.
- ➔ **Innovative teaching for aerospace education.** Presentation of educational resources and innovative projects from the IDEA team serving the teaching staff at ISAE-SUPAERO.
- ➔ **In a teacher's shoes.** Production for the green-screen filming an educational video clip.

/// Planetarium ///

-  ➔ Sign up at the reception desk to attend a session. *Outdoors – in front of the gymnasium*


/// Astronomy Club ///


-  ➔ History of the constellations and discovery of the planets. *Outdoors – in the alleyway leading to the Forum*

CULTURE HUB


/// LACS – Department Languages, Arts, Cultures and Societies ///

/// In association with the ISAE-SUPAERO International Club ///

-  ➔ Building competition with a Kapla construction set on the theme "imagining the future" (open to all). A giant canvas for painting and/or collage. *Room 05.035*


-  ➔ Videos in different languages. Stories to come: storytelling for all audiences at 11 am and 3 pm. *Room 05.036*

/// Photobooth ///

-  ➔ Go home with your souvenir photo of the day. *Hall*

/// Library ///

Library (upstairs)


-  ➔ Detective party. Come and help us with our investigation to find the murderer!. *Ages 10 and up, 1 hour, sign up at the reception desk. 3 sessions: 11 am – 2:15 pm – 4:15 pm*

-  ➔ Reading for the little ones (3-7 year-olds). *Duration: 30 minutes, limited to 15 people. 1:30 pm and 3:30 pm*

-  ➔ Board games (ages 8 years and up). *Duration: 30 minutes, limited to 15 people.. 1:30 pm and 3:30 pm*

- ➔ HISIS Exhibition – History of ISAE. Greatest hits of student life on campus in the 70s. *Hall*


/// Fermat Science: a different approach to math! ///

-  ➔ Join in the game and get your brain working to solve the different brain-teasers. *Room 05.042*

/// Supaero Robotik Club ///

- ➔ Presentation of the robots used for the 2019 Coupe de France, demonstrations against teams made up of former students. General presentation of the club's objectives. *Room 05.044*

/// Planète Sciences ///

-  ➔ Throughout this activity, children will be able to ask questions and discover what a launcher is, its characteristics, the necessary conditions for a rocket to take off correctly, how it works, but they will also learn about such topics as the atmosphere, earth's gravity, with, as a conclusion, the launch of their own construction – a rocket in the air!! *Room 05.046 – register at reception, ages 7 and up*

/// Sport and space ///

- ➔ Sports played at the ISS; experiments in the ISS to help us understand the human body. *Room 05.048*

INNOV'SPACE

- ➔ Discovery of the prototyping unit, the tools, machines and software available to students and the collaborative operations that facilitate emergence of innovative projects. *Caution, only 20 people can be admitted at the same time*

/// Rêve Ailes Club ///

- ➔ Presentation of the club's activities, including the construction and an outreach part.

Samedi 12 octobre 2019 – 10h00 - 18h00

