MD AE 2019 "Microwaves and Diagnostic for Aerospace Engineering"

You will arrive on Monday, July 1, 2019 at Toulouse Blagnac airport where you will be welcomed. You can choose to fly to Toulouse via Paris, Amsterdam, London, Istanbul, Munich or Frankfort…

Courses will start on Tuesday, July, 2nd

The France Excellence 2019 Summer School "Microwaves and Diagnostic for Aerospace Engineering" will take place from 1 to 28 July 2019 in Université de Toulouse, INP-ENSEEIHT (Ecole Nationale d’Electrotechnique, d’Electronique, d’Informatique d’Hydraulique et Télécommunications) de Toulouse.

The LAPLACE (Laboratory for PLAsma and Conversion of Energy) will be involved.
A very good level in electrical engineering / electronic systems and a good level in English are required for registration.

1 - FACILITIES

ARRIVAL IN FRANCE
At their arrival in France, participants will be welcomed at Blagnac airport or Matabiau train station downtown, by members of the International Relations Office as well as by students of Toulouse INP or by people from the TOUL’Box and will be conducted to their accommodation.

ACCOMODATION
You will be housed in one of the recent university residences in downtown Toulouse, a new residence offering single studios with private bathroom. The residence is located 10 minutes away from the underground station + 10 mn by metro.)

MEALS
Meals are an opportunity to meet and interact with teachers and animators in a more relaxed setting while practicing French.

You will enjoy your lunch at one of the University restaurants in downtown Toulouse (a prepaid personal access card will be provided). The dinners will be taken at the University restaurant from 19:00. A snack (hot drinks / cakes) will be offered between 16:00 and 16:30 every day of classes.

TRANSPORTATION
The INP-ENSEEIHT is located in the hyper downtown Toulouse, accessible on foot or by metro from CROUS residences in the city center. A transport card (pastel card) and a metro/bus pass for 1 month will be given upon arrival.

END OF THE SUMMER SCHOOL
Your return to your home country will be on Sunday, July 28, 2018 from Toulouse Blagnac Airport or or Matabiau train station downtown.

2 - SCIENTIFIC SYLLABUS

LECTURES
Aeronautics and space are central themes for France, China and a number of other countries. They bring innovation, research, growth and jobs. Microwaves for telecommunications, diagnostics and in particular for embedded electrical systems, are topical scientific themes, with a high potential for innovation, the object of current partnership research with industry in the field, both for aeronautics and other scientific or societal fields.
Discover the research in the fields of engineering for aeronautics and space
The "all-in" summer school MD AE 2019 will offer you high-level courses and mini-projects, fully taught in English, meetings with French, European or international researchers as well as industrials in the context of visits or conferences. During this month, an initiation to research will be offered to the students, through mini projects and personal research projects, allowing them to implement their learning, including that of French leaning. An introduction to French language and culture will be offered through French as a Foreign Language (FFL) sessions.

The LAPLACE (Laboratory for PLAsma and Conversion of Energy, http://www.laplace.univ-tlse.fr/?lang=en ), joint research unit of French National Scientific Research Center (CNRS), Institut National Polytechnique of Toulouse (INPT) and Paul Sabatier University (UPS), will support this Summer School. It will allow the students to discover the world of research in aeronautical engineering and space around electrical engineering and electronic systems. LAPLACE is not only the highest concentration of research in Electrical Engineering and Plasma of France, it is especially the only one to cover in an integrated way the continuum "plasma / materials / systems". Students attending this School will be able to meet and exchange with PhD students from our institutes and laboratory, especially for those who would like to prepare a PhD in France. Our program includes cultural visits accompanied by the Engineering Students of our Institute but also by Sino-speaking lecturers/researchers from our laboratory. These cultural activities will allow the students to discover our amazing Region of Occitanie, https://www.laregion.fr/Tourism-for-everyone , its wonderful cultural heritage and delicious gastronomy (wines and terroir) but also other famous French wines like Bordeaux and its vineyards. Paris will be discovered during a 4 day trip in the middle of 4 weeks of training.

The courses will be given at INP-ENSEEIHT http://www.enseeiht.fr/en/index.html in the heart of Toulouse. They will be ensured by teachers-researchers of this school as well as by researchers from LAPLACE (Laboratoire Plasma et Conversion d’Energie http://www.laplace.univ-tlse.fr ).

The courses deal with 2 important scientific topics for aeronautical engineering and space: Microwave techniques and Diagnostic of embedded systems.

The planned contents are:

i) Introduction to microwave techniques:
   - Propagation and radiation of electromagnetic wave
   - Passives components
   - Antennas systems
   - Computer aided design for microwave component for aerospace application
   - Microwave material interaction.

ii) Diagnosis and health monitoring of electromechanical systems:
   - Degradation and faults in electromechanical systems, static converters, passive components (capacitors and inductors), cables and insulators, mainly for aerospace industry,
   - Introduction to diagnosis, supervision and health monitoring, principles and examples of existing protections and monitoring solutions,
   - Introduction to dependability,
   - Classification of diagnosis approaches: model and signal based diagnosis methods, examples of degradation monitoring and fault detections.

iii) Others topics
   - Initiation to documentary research
   - Development of a personal research project

A detailed schedule will be available in early 2019, the definitive program will be available early April 2019
OTHER SCIENTIFIC ACTIVITIES

Laboratory research projects

Research projects are proposed in order to apply the theoretical aspects seen during the courses. They also make it possible to work in conditions close to those encountered in our Research Laboratories, during research initiation projects or PhD theses.

The practical works and workshops proposed will concern:
- Microwave Techniques
- Planar antenna for local network in aircraft
- Microwave applicator for composite processing
- Computational Electromagnetic for space application
- Diagnostic
- Detection of mechanical unbalance through spectral analysis (Fast Fourier Transform, Concordia transform),
- Experimental nonlinear lifespan modeling of electrical wire insulation samples for embedded electrical machines.

These projects will give rise to oral presentations, evaluated at the end of the school by a jury composed of teacher-researchers and researchers from our Institutes, in conditions close to the French doctorate scholarship competition.

Laboratory visits

During the weeks proposed for this School, conferences and visits of Laboratories will be organized, in particular LAPLACE and also other research laboratories located at INP-ENSEEIHT.

3- CULTURAL SYLLABUS

FRENCH COURSES

Course of French as a Foreign Language

The program offers 30h of French lessons judiciously distributed throughout the course period (an intensive part at the beginning of the School, followed by a sequence of slots from 1h to 1h30 per day on the continuation of the School)

These courses will be taught by teachers from our Institutes for groups of 12-15 students. According to the number of students. The first week, classes on French culture will facilitate integration into French daily life. "Ambassadors" (i.e. Chinese engineering students and Chinese PhD students from our Institutes) will be mobilized to help and tutor the neo-coming students during these weeks (during visits for example).

VISITS

Outside of class, many activities will be offered. A more detailed list will be given later. As an example here is the cultural visit organized for 2018 Summer School program:
- Tourist Rally to discover the city of Toulouse, https://www.toulouse-visit.com/
- Festivities of the National Day / Fireworks on the Garonne.
- Visit of Saint-Emilion, Bordeaux for discover the chateaux of the vineyards,
- Visit of Paris.

4- RESUME

NAME OF THE SCHOOL: MD AE: Microwaves and Diagnostic for Aerospace Engineering
Welcome date: 2019, Tuesday, July, 2nd
You will arrive on Monday, July 1, 2019 at Toulouse Blagnac airport where you will be welcomed.
You can choose to fly to Toulouse via Paris, Amsterdam, London, Istambul, Munich…

From 1 to 28 July 2019 in Université de Toulouse, INP-ENSEEIHT
The total number of places is limited to 15. A very good level in electrical engineering / electronic systems and a good level in English are required for registration.

The price does not include the trip Home country-Toulouse and back.
Accommodation, meals and local transportation are all included (except the break to Paris mid-July)
The summer school will deliver 6 ECTS.
The summer school is open to MASTER students.

**Price: 2800 € / student.**

School registration fees include all logistical and educational expenses (excluding the 4 days break to Paris for Bastille Day).

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