



## HES-10 - UIE-PhD Intensive course

Padova, May 13-18 - 2010



The HES-10 UIE-PhD intensive course has the main aim to establish a scientific cooperation among young PhD students and researchers from different institutions operating in the field of Electroheat, Electromagnetic Processing of Materials and Biomedical applications of Electromagnetism. It's a tradition to organize such a school just before a conference dealing with proper topics like HES, MEP or other conferences.

The course has a duration of four-five days, during which specific topics in the form of full immersion lectures will be developed with the help of some laboratory tutorials. This year three subjects have been chosen: application of microwave heating to EPM, biomedical applications of electromagnetic fields, and optimization methods for the design of electromagnetic devices with special reference to examples of biomedical applications.

The course will be divided in frontal lectures and laboratories. The laboratories will be of two types, following the different topics proposed during the frontal lectures. At the end of the laboratory activities, a presentation of a short project or a summary of laboratory activities will be presented by the two groups of students.

### Accommodation

We are booking some single-bed, double-bed and triple-bed rooms small hotels near to the Department of Electrical Engineering at very convenient prices (not more than 30-35 EUR per night and per person breakfast included). An early registration to the Intensive course is recommended in order to guarantee this type of accommodation. The same accommodation will be available also for the days of the conference.

### Daily expenses

For lunches, public transport, evening meals one needs about 20 EUR per day.

### Participation fee

The participation fee is 250 EUR and includes: lunches, dinners, coffee breaks and the full participation to HES-10 conference, banquet excluded.

Contact Address	Ph. ++39 049 8277552 Fax ++39 049 8277599 E-mail: <a href="mailto:fabrizio.dughiero@unipd.it">fabrizio.dughiero@unipd.it</a>
Laboratory of Electroheat Department of Electrical Engineering Via Gradenigo, 6/A 35131 Padova Italy	<b>Deadline for registration</b> March 30 <sup>th</sup> 2010

## Programme

### Wednesday 12<sup>th</sup> May

**20.00 – Pizza together at “Le Pe Pen” pizzeria at Piazza Cavour - Padova**

### Thursday 13<sup>th</sup> May:

#### Morning (8.30 – 12.30)

2 hrs lesson on “Fundamentals of microwave-materials interactions”,

Teacher: eng. Paolo Veronesi

2 hrs lesson on “An Introduction to Inverse Problems and Optimisation in Electromagnetism”

Teacher: Prof. Paolo Di Barba, University of Pavia

#### Afternoon (14.00 – 18.00)

Short presentation of the research work by the attendants at the intensive course (about 5 minutes each – 4 slides)

Forming of 2 working groups on the basis of curricula and presentation of attendants and with regards to the projects proposed by the supervisors. Presentation and planning for the developing of the projects from supervisors; this part of the program will be done in separate rooms for two different projects.

Group N.1: 4 hrs laboratory experiments on: “Dielectric properties measurements of materials in powder, solid and liquid form; use of the VNA”

Teachers: eng. Paolo Veronesi, prof. Cristina Leonelli

Group N.2: 4 hrs laboratory on : “Case Studies. 1) Non-invasive thermometry for the thermal ablation of liver tumors. 2) Synthesis of a field source for the magnetic stimulation of peripheral nerves.”

Teacher: Prof. Paolo Di Barba, University of Pavia

### Friday 14<sup>th</sup> May:

#### Morning (8.30 – 12.30)

2 hrs lesson on “Microwave heating in chemical transformations and materials processing”,

Teacher: prof. Cristina Leonelli

2 hrs lesson on “Analysis and synthesis of electromagnetic fields: numerical methods and computer codes”

Teacher: Dr. Maria Evelina Mognaschi

Afternoon (14.00 – 18.00)

Group N. 1: 4 hrs laboratory experiments on: “Inorganic and organic reactions under microwave irradiation”

Teachers: eng. Paolo Veronesi, prof. Cristina Leonelli

Group N. 2: 4 hrs laboratory on : “A tutorial on field simulation of bioelectric activity in the peripheral nervous system”

Teacher: Dr. Maria Evelina Mognaschi

**Saturday 15<sup>th</sup> May:**

Morning (8.30 – 12.30)

2 hrs lesson on “Electromagnetic fields for Hyperthermia treatments”

Teachers: Prof. Fabrizio Dughiero and Dr. Robert Ivkov

2 hrs lesson on: “Electromagnetic Processing of Materials”

Teachers: Prof. Egbert Baake

**Monday 17<sup>th</sup> May:**

Morning (8.30 – 12.30)

2 hrs lesson on “Industrial applications of high power microwave heating”,

Teacher: Juan Monzò Cabrera

2 hrs lesson on “Electromagnetic Processing of Materials”

Teachers: Prof. Egbert Baake

Afternoon (14.00 – 18.00)

Group N. 1: 4 hrs laboratory experiments on: “Inorganic and organic reactions under microwave irradiation”

Teachers: eng. Paolo Veronesi and Juan Monzò Cabrera

Group N. 2: 4 hrs laboratory on : “Practical Laboratory on Electromagnetic Processing of Materials”

Teachers: Prof. Egbert Baake

**Tuesday 18<sup>th</sup> May:**

Morning (8.30 – 12.30)

2 hrs lesson on “Electromagnetic fields for Hyperthermia treatments”

Teachers: Prof. Fabrizio Dughiero and Dr. Robert Ivkov

2 hrs lesson on “Multiobjective optimisation in electromagnetic design”

Teacher: Prof. Paolo Di Barba

Afternoon (14.00 – 17.00)

Preparation of the report and presentation of the projects by the two laboratory groups

Participation to the welcome reception of HES-10