



WPI



Pre-HES-13 Intensive Ph.D. Course

University of Padua, Italy

May 15-21, 2013

Microwave Heating – Concepts and Principles of Modeling and Optimization

Instructor: *Vadim V. Yakovlev*

Assistants: Fernando Bressan, Przemyslaw Korpas, and Mateusz Kryszicki

SYLLABUS & SCHEDULE

Wednesday May 15

14:30-16:30 – PART 1: **Lecture 1: *Introductory Topics. Major Numerical Techniques***
Electromagnetic and electromagnetic+thermal coupled problems. FDTD and FEM. Modeling tools.

Thursday May 16

9:00-11:00 – PART 2: **Lecture 2: *Methods, Tools, Illustrations***
Modeling tools (*cont'd*). Computational strategy for CAD. Examples of modeling projects.

14:00-16:00 – PART 3: **Computer Lab 1:** Introduction to *QuickWave-3D*; initial instructions

16:00-18:00 – PART 4: **Computer Lab 2:** Practical work with *QuickWave-3D* – tests & exercises

Friday May 17

9:00-11:00 – PART 5: **Lecture 3: *Optimization Aspects & Outstanding Issues***
Optimization of microwave heating. Examples of optimization projects. Problem of computational resources.

14:00-14:30 – PART 6: **Computer Lab 3:** Assignment of *QuickWave-3D* projects

14:30-18:00 – PART 7: **Computer Lab 4:** Practical work on *QuickWave-3D* projects

Monday May 20

14:00-18:00 – PART 8: **Microwave Lab 1:** Characterization of microwave systems with magnetron and solid-state generators.

Tuesday May 21

10:00-11:30 – PART 9: Student presentations of *QuickWave-3D* projects.