

Master of Science in Plasma Physics & Applications Laser Fusion Energy



CZECH TECHNICAL
UNIVERSITY
IN PRAGUE

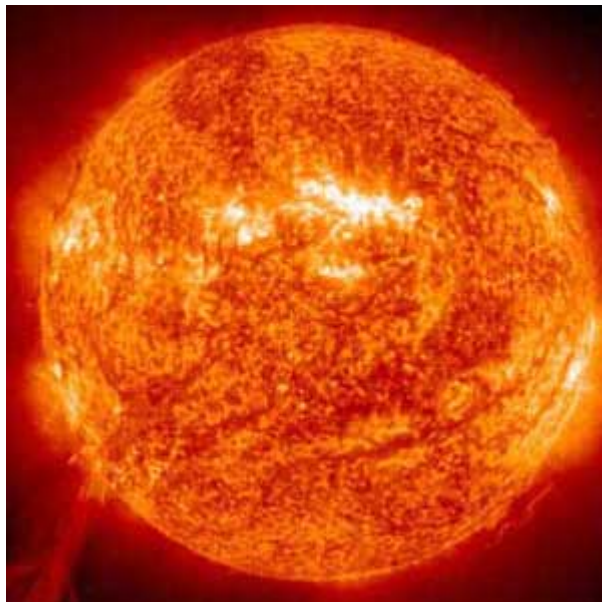
Imperial College
London



instn



Queen's University
Belfast



Objective

The main objective of the 2 years training program is to prepare high quality scientists & engineers in the field of laser matter interactions and in particular in laser driven fusion for energy production. Graduates may participate in research relevant to HiPER or other laser matter interaction related projects.

Outcome

The main target group of the PLAPA project are graduate students from the European universities graduated with a bachelor (or equivalent) degree in Natural Sciences or Engineering (Physics, Electrical or Electronic Engineering, Mathematics Material Science...). The proposed curriculum provides training in the modern domains of science and technology related to the laser generated dense plasmas.

Three directions

Inertial Fusion (IF)

laser matter interactions
laser fusion engineering
high performance computing

Laser Physics (LP)

high power laser technologies
nonlinear optics
innovative optics materials

Plasma Science (PS)

high energy density physics
laboratory astrophysics
warm dense matter

HiPER project



HiPER, the European High Power laser Energy Research project is dedicated to fundamental research and technology developments in the domain of inertial confinement fusion as a future green energy source.

<http://www.hiper.org>

Curriculum structure

I Semester

→ Introduction to Plasma Physics →
Electrodynamics → Principles of Scientific
Computing → Research Methodologies → →
Introduction to Quantum Mechanics

II Semester

→ Laser Physics & Technology → Atomic
Processes in Plasma → Plasma Diagnostics
& Photon Transport → Plasma Kinetics →
Short Pedagogical Project

III Semester

IF → Principles of Laser Fusion → Laser
Matter Interaction → Plasma Diagnostics &
Particle Beam Transport in Matter → Target &
Reactor Technology → Modeling & Numerical
Methods for Plasma Physics

LP → Principles of Laser Fusion → Laser
Matter Interaction → Radiation & Laser
Safety → Non Linear Optics → High Power
Lasers & Diagnostics

PS → Laser Matter Interaction → Non Linear
Optics → Dense Plasmas → Non Linear
Dynamics & Instabilities in Plasma →
Modeling & Numerical Methods for Plasma
Physics

IV Semester

MSc Thesis in one of the Partner
Universities

Methods & strategy

- ✓ 2 year MSc training
- ✓ European Credit Transfer System (120 ECTS)
- ✓ The ECTS credits are equally distributed among 4 semesters
- ✓ Use of Diploma Supplement
- ✓ Three complementary directions: I) Laser Physics, ii) Inertial Fusion Technology iii) Plasma Science
- ✓ Individual research projects and personal training in leading European laboratories
- ✓ Development of an online educational platform
- ✓ Close relation between the fundamental science and modern technology
- ✓ Student and teacher mobility across the Europe
- ✓ Close relation between the university professors and high profile engineers

Why fusion ?

- ✓ Thermonuclear fusion is the method providing unlimited energy for all the world clean from long lived radioactive waste.
- ✓ The research in two alternative approaches for fusion -- magnetic and inertial fusion are approaching the culmination point of feasibility demonstration.
- ✓ Training in laser fusion opens doors in many applications in fundamental science, high power laser engineering and high resistance material technologies
- ✓ This program provides links between the fundamental science and high level technologies on the field of green energy production.

Applications

Please submit your application to:
Mrs Eleni Seimeni - TEI of Crete
e-mail: seimeni@chania.teicrete.gr
<http://plapa.chania.teicrete.gr>

Deadline: 30th of September 2014