



**Università
degli Studi
di Palermo**

Dipartimento di Ingegneria
Direttore: prof. Antonino Valenza



Co.R.I. PROJECT COURSE ANNOUNCEMENT

Prof. Dimitris Charalambidis, Emeritus at the Department of Physics, University of Crete, IESL-FORTH (<https://www.iesl.forth.gr/>), Heraklion (Crete, Greece), Chief Scientific Advisor at ELI-ALPS (Extreme Light Infrastructure Attosecond Light Pulse Source, <https://www.eli-alps.hu/>), Szeged (Ungheria), will hold a short course on "Physics and Technology of Femto and Attosecond Lasers", within the activities of a UniPa Co.R.I. Project 2022 (Azione D3).

Schedule will be as follows:

- Tuesday April 4th, 15:00-18:00.
- Wednesday April 5th, 15:00-18:00.
- Thursday April 6th, 15:00-18:00.

Venue will be Viale delle Scienze, Edificio 6 (ex D.I.N.), Second Floor, Aula A210. A list of subjects is attached.

Moreover, on Monday April 3rd and Friday April 7th, from 10:00 to 13:00, Prof. Charalambidis will be available for further discussions conversations with the students on fs laser technologies and their applications and on research and job opportunities at the European Research Infrastructure (Edificio 6 (ex D.I.N.), Second Floor, Room # 2020).

Students who will attend the lectures may apply for credits, according to the rules of their own study programme.

Further informations can be asked to Prof. Salvatore Basile (tel.: 09123899064, email: salvatore.basile@unipa.it).



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PHYSICS & TECHNOLOGY OF FEMTO & ATTOSECONDS LASERS
Dimitris Charalambidis
University of Crete/FO.R.T.H.-I.E.S.L.

Tuesday April 4th, 2023
Coherent light sources: Properties and principles

Introduction to optical coherence
Temporal coherence
Wiener Khinchin theorem
Spatial coherence
Measurement of coherence
Gaussian beams
Resonant optical cavities
Light matter interactions
Laser oscillations and amplification

Wednesday April 5th, 2023
fs - laser pulse technology and metrology

fs pulses
Linear propagation
Dispersion and dispersion control
Non-linear propagation and processes
Q-switching
Mode-locking
Kerr Lens Mode-locking
Optical parametric oscillation/amplification
Chirped Pulse Amplification –
fs pulse amplifiers
Temporal characterization of pulses

Thursday April 6th, 2023
**Attosecond physics and applications – the ELI user European
Research Infrastructure**

Attosecond pulse generation in gaseous media
Atomic response-Three step model
Macroscopic response-Phase matching
Surface laser plasma attosecond pulse generation
Attosecond pulse metrology
Attosecond pulse application
Introduction to the ELI ERIC user European Research Infrastructure