Co.R.I. PROJECT ANNOUNCEMENT
UPDATE

Prof. Dimitris Charalambidis, Emeritus at the Deaprtment of Physics, Universtity of Crete, IESL-FORTH (Institute of Electronic Structure and Laser – Foundation for Research and Technology-Hellas) in Heraklion (Crete, Greece), Chief Scientific Advisor at ELI-ALPS (Extreme Light Infrastructure Attosecond Light Pulse Source), Szeged (Ungheria), will held a cycle of lectures on "Physics and Technology of Femto and Attosecond Lasers", within the activities of a UniPa Co.R.I. Project 2018 (Azione D3).

The cycle will consist of three lectures from Tuesday 12/10/2021 to Thursday 14/10/2021, 15:00-18:00 (nine hours).
Venue will be Room A210, Edificio 6 (ex DIN side), second floor, Viale delle Scienze.
Below please find a list of subjects.
Students who will attend the lectures may apply for credits, according to the rules of their own study programme.

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

Light, lasers & more

Dimitris Charalambidis
Univ. of Crete/FO.R.T.H.-I.E.S.L.
Lectures to be given in the Univ. of Palermo during 11/10-15/010/2021

Statistical properties of light (3h lecture)

1. Introduction to statistical optics – optical coherence
2. Temporal coherence – temporal coherence function – complex degree of temporal coherence – coherence time – coherence length,
3. Spectral power density – Wiener Khinchin theorem
4. Spatial coherence – mutual coherence function - complex degree of coherence – mutual intensity – coherence area.
5. Measurement if coherence through interference – Interference of two waves – Interference and temporal coherence – Interference and spatial coherence.

Lasers and coherent light sources (3h lecture)

1. Gaussian beams
2. Resonant optical cavities
3. Light mater interactions
4. Laser oscillations and amplification
5. Mathematical description of pulses
6. Linear propagation
7. Dispersion
8. Dispersion and dispersion control

From fs - laser pulse technology and metrology to attosecond pulses (3 h lecture)

1. Non-linear phenomena
2. Self-phase modulation (SPM); Self-focusing (SF)- B Integral/beam collapse
3. Mode-locking
4. Kerr Lens Mode-locking
5. Optical parametric oscillation/amplification
6. Chirped Pulse Amplification – Regenerative amplifier – multi-pass amplifier
7. Temporal characterization of pulses
8. FROG
9. SPIDER
10. Three step model (s)
11. Attosecond pulses (generation, characterization)
12. Attosecond pulse applications