Co.R.I. PROJECT COURSE ANNOUNCEMENT

Prof. Dimitris Charalambidis, Emeritus at the Department of Physics, Universtity 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). **This year course will focus on the topic of the 2023 Nobel Prize in Physics**.

Schedule will be as follows:

- Monday, 20 May 2024, 15:00-18:00.
- Tuesday, 21 May 2024, 15:00-18:00.
- Thursday 23 May 2024, 15:00-18:00.

Venue will be Viale delle Scienze, Edificio 6 (ex D.I.N.), Second Floor (room to be decided). A list of topics is attached.

Moreover, on Friday, 17 May, from 16:00 to 18:00 and Wednesday, 22 May, from 10:00 to 13:00, Prof. Charalambidis will be available for further discussions with graduate and PhD 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).

PHYSICS & TECHNOLOGY OF FEMTO & ATTOSECONDS LASERS

Dimitris Charalambidis
University of Crete/FO.R.T.H.-I.E.S.L./ELI-ALPS

Lectures on the topic of the 2023 Nobel Prize in Physics

I) Introduction to laser mater interactions. Regimes, processes, dynamics
II) Introduction to short laser pulses. Temporal characterization techniques in the optical regime.
III) Introduction to attosecond pulses. The three step model. Generation of high order harmonics. The synthesis of attosecond pulse trains.
IV) Propagation effects phase matching. Limitations on the emitted XUV pulse energy. Generation of intense attosecond radiation.
V) Generation of isolated attosecond pulses. Generation by few cycle pulses. Polarization gating.
VI) IR-XUV cross-correlation temporal characterization techniques of attosecond pulse trains and isolated pulses.
VII) XUV autocorrelation techniques and the XUV-pump-XUV-probe experiments.
VIII) Selected examples of IR-XUV pump-probe and XUV-XUV pump-probe experiments.
IX) Laser surface plasma harmonics.
X) Introduction to the ELI-ALPS European Research Infrastructure.