PSSI Lecture Series 001

Title: Plasma-based particle accelerators and applications: current status and future directions

Name of Speaker: Prof. Gianluca Sarri (***KAW LEGACY AWARD WINNER 2024***)

Affiliation of speaker: Professor in the School of Mathematics and Physics
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Website of the speaker: https://pure.qub.ac.uk/en/persons/gianluca-sarri

Date: June 25, 2024 (Tuesday)

Time: 15:30 hrs (Indian Standard Time, i. e. GMT+05:30 hrs)

Venue: MSTeams (online)

Online Link: https://teams.microsoft.com/l/meetup-join/19%3akCsyW_M72P7qwfAJCuufHOs5Ak3G4IQO0RXrDb402tA1%40thread.tacv2/1718649901343?context=%7b%22Tid%22%3a%22624d5c4b-45c5-4122-8cd0-44f0f84e945d%22%2c%22Oid%22%3a%22208a000d-bdcb-49e5-9fb7-710c9c28579c%22%7d

ALL ARE CORDIALLY INVITED

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Abstract:
Plasma-based wakefield accelerators provide a promising platform for the miniaturisation of particle accelerators, thanks to the ultra-high accelerating gradients (in the region of 10 s–100 GV/m) that they are able to sustain. In addition, plasma-accelerated electron beams possess unique and appealing characteristics, including femtosecond-scale durations and micron-scale source sizes, in conjunction with high charge and low normalised emittance. These characteristics have been demonstrated to enable a wide range of state-of-the-art applications in a relatively compact and inexpensive setup.

In this talk, we will provide an introductory review of the current state of the art of plasma-based accelerators, and discuss their potential in a wide range of applications, including probing new regimes of fundamental physics, driving the next generation of light sources, and producing high-quality secondary beams of positrons and muons.

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Bio Profile:
Gianluca Sarri is Professor of Physics at Queen's University Belfast (UK) and author of >120 peer-reviewed publications in the field of high-temperature plasma physics and applications, where his group has obtained several landmark results, including the first generation of an electron-positron plasma, the first detection of non-classical radiation reaction in the field of a laser, and the first laser-driven generation of high-quality and high energy positron beams. Prof. Sarri is an organiser of several international conferences, he is one of the leaders of the EuPRAXIA facility, and he is a member of several international strategy groups and steering committees on particle acceleration.

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