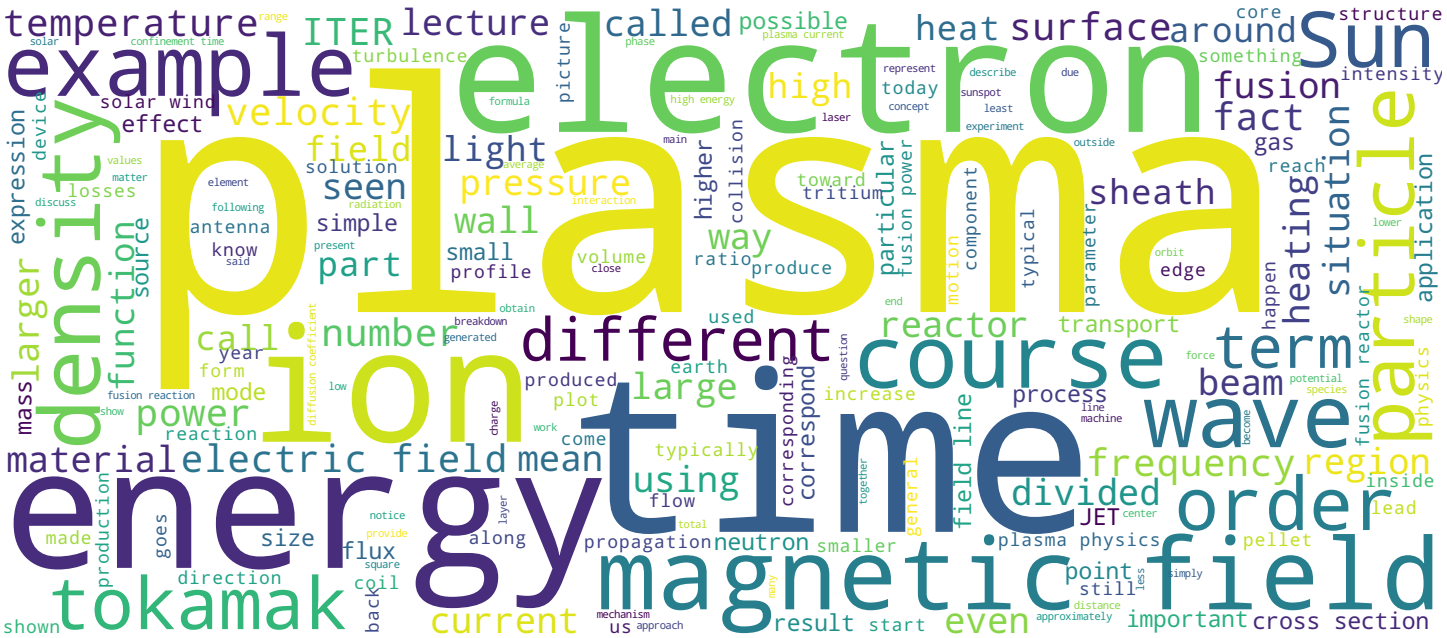

EPFL

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Video

In the next few lectures we will present different aspects of the interaction of high power lasers with matter. We will see that the irradiation of matter by laser pulses at high intensities leads to the production of different kinds of hot plasmas. Using lasers to create hot plasmas allows us to study matter in extreme conditions in the laboratory. Several of the parameters of the plasmas that are generated by high power pulse lasers including temperature, density, and pressure, are comparable to those of stars such as our sun or our planetary course. Large scale laser facilities were initially developed for studying laser plasma interactions and plasma physics in the context of inertia confinement fusion. In more recent years they have progressively turned into playgrounds for a larger scientific community with many new applications in mind. Laboratory astrophysics, planetary science, matter in extreme conditions, particle acceleration, and intense sources of high energy particles and radiation have become new keywords in this field. Since the laser parameters constantly evolve in time in terms of energy, power or posteration, new frontiers can be explored.

Notes

Summary

0m 00s

Quantum electrodynamics and high field fundamental physics could be addressed soon on the ultra high power laser facilities that will be operated at multi-petawatt levels. In the first lecture of this part of the course, you will first get a general description of laser target interaction and of the evolution of laser irradiated solid target. The second lecture will be dedicated to the propagation of light in plasmas, while the absorption of laser energy by a plasma will be described in the third lecture. An example of application of laser plasma interactions for the production of high energy ion beams will finally be discussed. These lectures will be presented by Francois Amiranov and [inaudible 00:01:53].

Notes

Summary

1m 11s