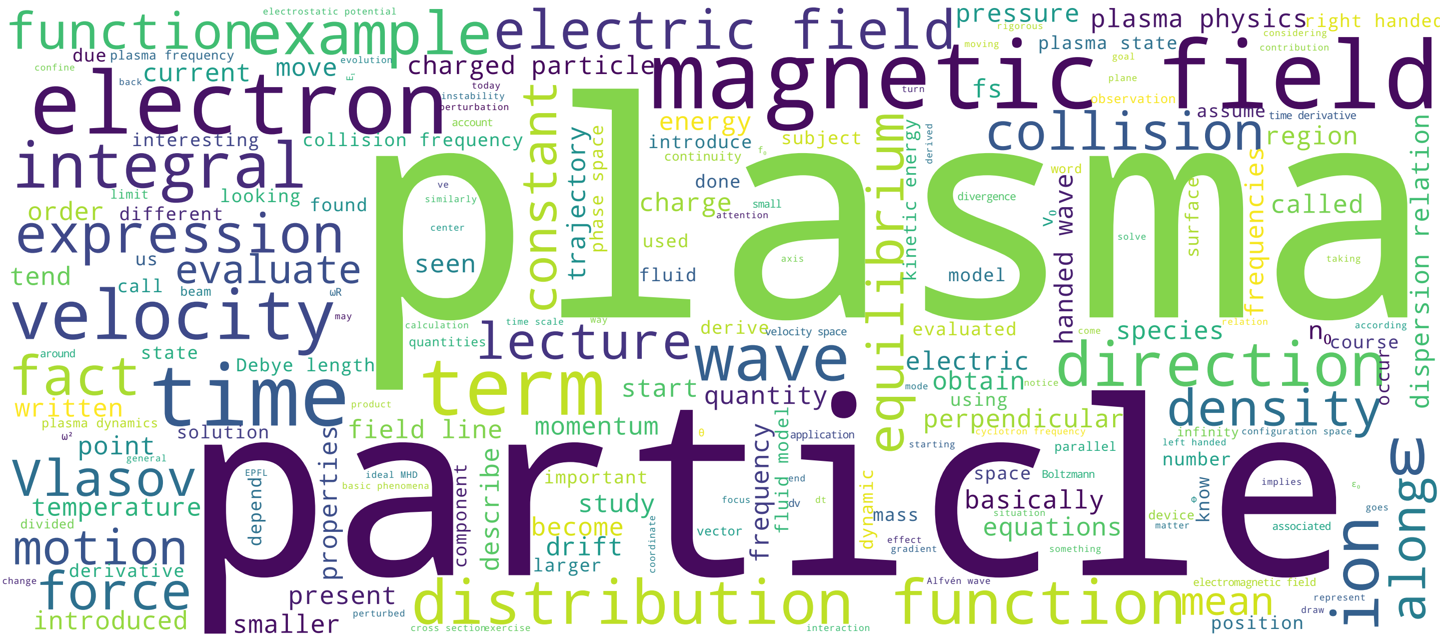

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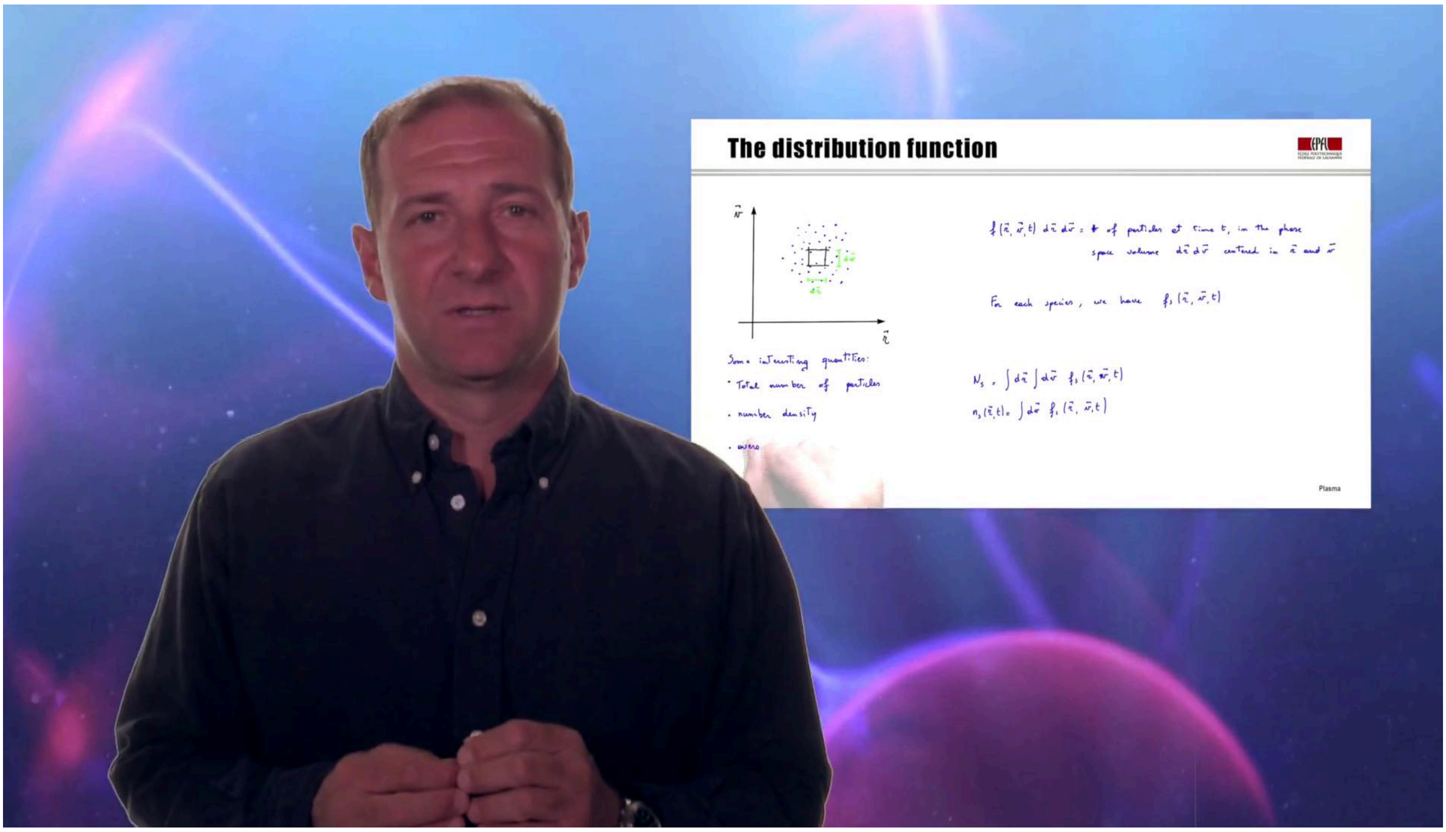
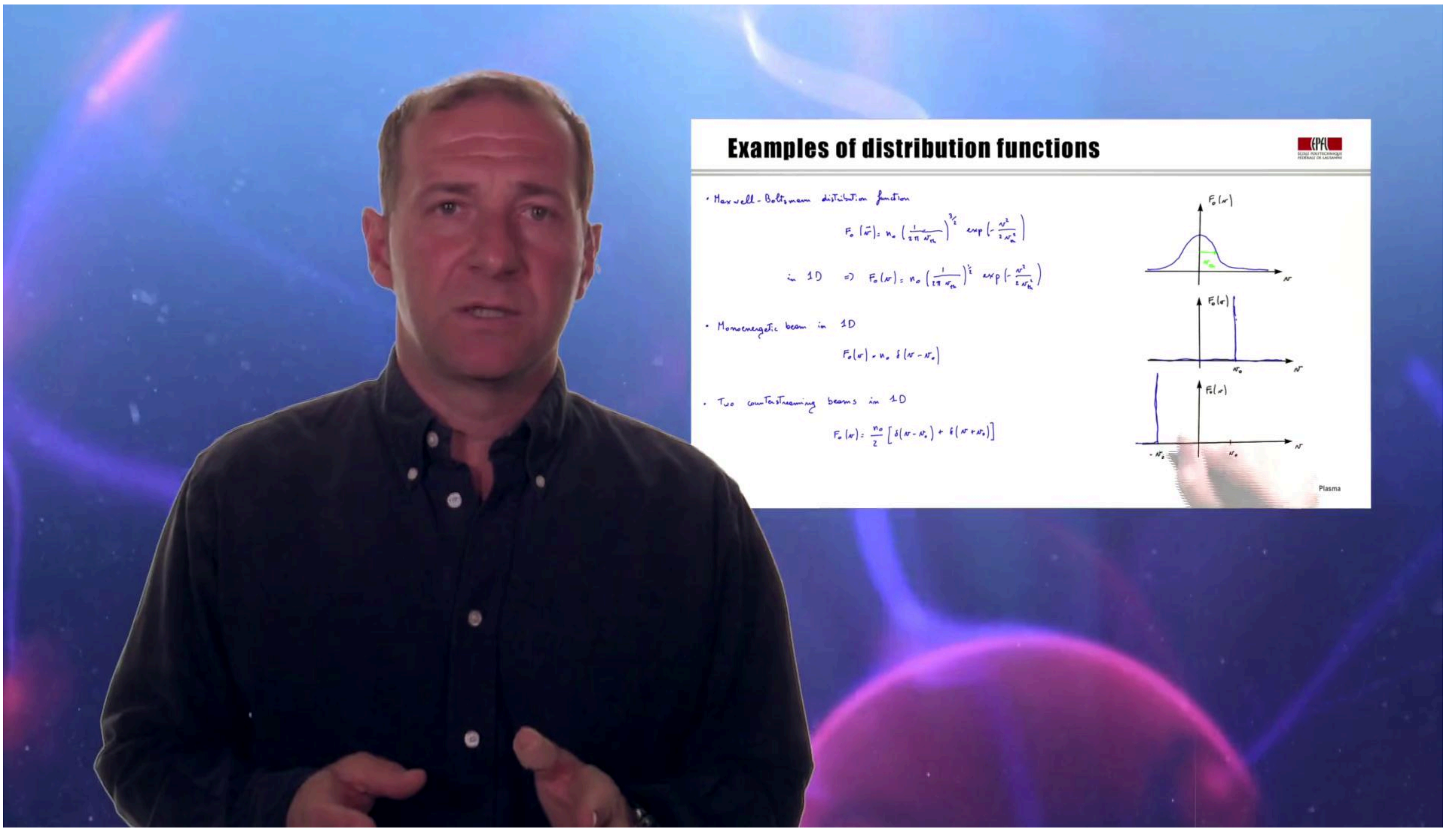


When a gas is heated above a certain temperature, or it is subject to strong electromagnetic fields, it gets ionized, and a transition towards the so-called fourth state of matter, plasma state, is observed. Being constituted by electrical charges, ions and electrons, a plasma responds to electric and magnetic fields including those that are produced by itself. It actually turns out the plasma is an extremely complex medium characterized by non-linear phenomena that occur over a very wide range of temporal and spatial scales. Understanding the plasma behavior is thus extremely challenging, and before turning our attention to the applications, it is necessary to disentangle, at least partially, this complexity uncovering together some of the basic phenomena that characterize the plasma state. This is, in fact, the goal of the first three lectures. These will be devoted to the study of the most important basic phenomena in plasmas and to the models that are typically used to describe the plasma dynamics. A warning: these studies will require the use of relatively advanced analytical techniques. This might result tough at first, but your efforts will be rewarded.

Notes

Summary

0m 00s



During the first lecture you'll be introduced to the basic concepts related to the plasma state. A rigorous definition of plasma will be given. The most important spatial-temporal scales for the plasma will be introduced. The trajectory of electrically charged particles will be evaluated in assigned electromagnetic fields.

Notes

Summary

1m 11s

As you will see, this is already enough to shed some light on a principle behind the confinement of plasma, for example, for fusion energy applications. This lecture will be given by professor Paolo Ricci, the head of the theory group at CRPP.

Notes

Summary

1m 33s