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Introduction to Plasma Physics

Tuesday, 29 August 2023 10:15 (1h 10m)

Abstract: In this introductory lecture, fundamental aspects of plasma physics will be developed, such as plasma occurrence in Nature and in the lab, quasi-neutrality, Debye shielding, electron plasma oscillations, and Alfvén waves. Particle orbits in magnetic fields will be explored in view of magnetic containment of plasmas and applications of plasmas in industry and medicine will be presented. Finally, inertial and magnetic fusion concepts will be reviewed and discussed in terms of their potential for energy generation.

Lecturer: Vinícius Duarte's research is focused on the resonant interaction between fast ions and Alfvénic modes in tokamaks via analytical and numerical modeling. His current research interests include collisional kinetic theory, Alfvénic modes, whole-device modeling, quasilinear transport, wave chirping and galactic dynamics. Duarte received a US Department of Energy Early Career Award in 2023. He is a Member of the ITPA Energetic Particle Physics Topical Group and serves on the Editorial Board of Physics of Plasmas and on the Executive Committee of TTF. He obtained his PhD in Physics in 2017 from the University of São Paulo, for which he received the Brazilian Physical Society thesis prize. After a postdoc at Princeton Plasma Physics Laboratory (PPPL), he moved to the research staff in 2020. (Text informed by Lecturer).

Presenter: Dr DUARTE, STAFF RESEARCH PHYSICIST, Vinicius Njaim (Princeton Plasma Physics Laboratory, PPPL, USA)

Session Classification: Vision Introductory Lectures