PLASMA ASSISTED SURFACE MODIFICATION

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Duração: 8 horas
Data: 19/08/2017 (sábado) - UNESP - São José dos Campos
Av. Eng. Francisco José Longo, 777 - Jardim São Dimas, São José dos Campos – SP - CEP 12245-000
Horário: das 8h00 às 12h00 e das 14h00 às 18h00.

Conteúdo:

Part I. Fundaments of Plasma Physics (4h) (Lecturer Prof. Dr. Milton Kayama, FEG, UNESP)

Introduction:
-Definition of plasma
-Laboratory plasmas: gases and atomic processes
Basic theory:
- kinetic theory, Vlasov equation, Maxwell‘s equations, magnetized fluid equation
- Single particle motion: particle motion in magnetic field, particle drifts
- Plasma phenomena: Debye shielding, plasma oscillation, collision and diffusion in weakly ionized plasma
- Waves in plasma: electron plasma waves, ion waves, dispersion relation, electromagnetic waves in plasma
- Plasma sheaths and Langmuir probes: Bohm sheath criterion, sheath characteristics, Langmuir probes.
- Plasmas at thermodynamic equilibrium and thermonuclear fusion

Part II. Atmospheric plasmas (4h) (Lecturer Prof. Dr. Konstantin G. Kostov, FEG, UNESP)

Introduction:

-Basic properties of plasmas at atmospheric pressure

-Pashen curves, filamentation, basic atomic processes at high pressure, non-equilibrium plasmas

Warm plasmas:

-Arc discharge, Gliding arc, Applications

Non-thermal Plasmas:

-Corona discharge, basic properties, applications

-Dielectric barrier discharge (DBD)

- Properties, electrical characterization
- Applications: surface funcionalization, pollution control, light sources, ozone generation, bio-medical applications

-Cold plasma jet

- Principle of operation, Classification of plasma jets
- Characterization of plasma jets (electrical and optical)
- Interaction of plasma jets with solid surface. Basic atomic processes
- Plasma jets in contact with liquids
- Applications in plasma medicine, food industry.