

# Master Physique fondamentale et applications

## Power sources and materials in extreme environments

### Informations

Composante : Faculté des Sciences

### Langue(s) d'enseignement

Anglais

### Contenu

High Power Microwaves: Generation and Transmission - 1. Introduction / 2. Different types of microwave tubes and their applications / 3. Introduction to waveguides and mode converters / 4. Overview of modern electron cyclotron resonance heating systems for fusion applications and technological spin-offs

Strong Heat Flux and Irradiation Effects on Materials - 1. Point defects in materials / 2. Linear defects and plastic deformation of solids / 3. 2D defects: interfaces of crystals

Plasma Material Interaction and Material Damage - 1. A plasma-material interaction perspective / 2. Fundamental aspects of particle - material interaction / 3. The eV range: (binding) potentials and energy-losses / 4. The keV range: stopping range and displacement damage / 5. The MeV range: thermal spike and nuclear transmutation / 6. Analytical and technological applications

### Compétences à acquérir

High Power Microwaves: Generation and Transmission - 1. Learn the basic principles of high-power microwave generation / 2. Introduction to the technology of high-power microwave transmission

Strong Heat Flux and Irradiation Effects on Materials - 1. Know the structural defects in materials / 2. Understand their role under irradiation

Plasma Material Interaction and Material Damage - 1. Understand how fast particles generate damage in a material / 2. Anticipate the modification of materials submitted to extreme conditions in various fields (fusion, aerospace, semiconductor industry...)

### VOLUME HORAIRE

- Volume total: 40 heures
- Cours magistraux: 20 heures
- Travaux dirigés: 20 heures

### Codes Apogée

- SPFCU22C [ELP]

### Pour plus d'informations

[Aller sur le site de l'offre de formation...](#)



Dernière modification le 18/06/2024