

## Short course on

# Materials, Technologies and Applications in Nuclear Fusion



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### FARES:

Free assistance with registration

### INSCRIPTION:

Send an email before **1<sup>st</sup> April** to Ana Flores ([aflores@mater.upm.es](mailto:aflores@mater.upm.es)) with your personal data

### ATTENDANCE CERTIFICATE:

Any participant could get an attendance certificate if it indicates it during the inscription

### LOCATION:

Departamento de Ciencia de los Materiales. ETS de Ingenieros de Caminos, Canales y Puertos  
Universidad Politécnica de Madrid  
C/ Profesor Aranguren s.n.  
E28040-Madrid

### SCHEDULE:

#### Monday 7<sup>th</sup> April

09:30-10:30 Seminar  
11:30-13:00 Session Ia  
15:00-16:30 Session Ib

#### Tuesday 8<sup>th</sup> April

09:30-11:00 Session IIa  
11:30-13:00 Session IIb

#### Wednesday 9<sup>th</sup> April

09:30-11:00 Session IIIa  
11:30-13:00 Session IIIb

#### Session II: Steels in nuclear fusion

- ✓ Steels in energy production (phase diagrams, metallurgy, thermal aging, ...)
- ✓ Martensitic 9%Cr-steels (low activation requirement, properties, production, welding technologies, breeding blanket applications)
- ✓ Oxide dispersion strengthened steels (productions, properties, related problems)

#### Session III: High heat flux materials

- ✓ Tungsten materials (production, properties)
- ✓ Divertor design (overview, requirements, concepts)
- ✓ Tungsten armour (specific testing and characterisation methods)
- ✓ High heat flux materials for structural applications (CuCrZr, Cu-composites, W-composites)

### TOPICS:

#### Session I: Deformation and damage mechanisms in metals

- ✓ Structure and defects (metallic bonds, lattice, crystallography, grains, phases, ...)
- ✓ Material properties and underlying mechanisms (elasticity, plasticity, toughness, fatigue, creep, ...)
- ✓ Irradiation damage (basics, dpa, hardening, swelling, transmutation embrittlement, ...)