Title of the talk:
Transparent and conductive materials for energy applications

Abstract of the talk:
The past few years have seen a considerable amount of research devoted to nanostructured transparent conductive materials, which play a pivotal role in many modern devices as well as in several energy technologies. The latter concern for instance solar cells and light-emitting devices. Currently ITO (Tin-doped Indium oxide), the most commonly used material for such applications, suffers from two major drawbacks: indium scarcity and brittleness.

LMGP, a materials laboratory specialised in chemical methods for the synthesis of thin films and nanomaterials, tries to develop innovative transparent electrodes, concerning their main functional properties of as well as the challenges which we still face in terms of efficient integration in devices for several energy technologies.

I will present a general view of TCM elaboration with a specific focus devoted to:

- Fluor-doped Tin Oxide (FTO) with enhanced diffusion capabilities which shows tuneable high haze factors from almost zero to 60% by using a simple and cost effective method,
- p-type transparent electrodes based on Cu$_2$O by doping with different cations, allowing the enhancement of electrical properties and thermal stability
- Silver nanowire (AgNW) networks, which appear as a promising substitute to ITO with excellent optical and electrical properties, which can be improved by combining with atmospheric pressure spatial atomic layer deposition (AP-SALD) technique, which enhances the stability of AgNW networks thanks to a very conformal coating.

CV
Carmen Jiménez obtained her PhD degree in Physics in 1991 from the Universidad Autónoma de Madrid. Her main activity concerns the deposition and characterisation of thin films; and since her postdoctoral stage at LMGP in 1993-94, she specialised in the synthesis of films by MOCVD. She worked as research engineer in MOCVD process for Jipelec. Since 2002, she joined the CNRS as research engineer at LMGP, where she is involved in the MOCVD activity. She is author or co-author of around 100 publications. Since January 2014, she is deputy director of LMGP.

Scientific interest
- MOCVD and ALD process for the synthesis of thin films
- p-type transparent conductor oxides
- Nanostructured materials
- Perovskite oxides (superconductors, resistive switching memories)