

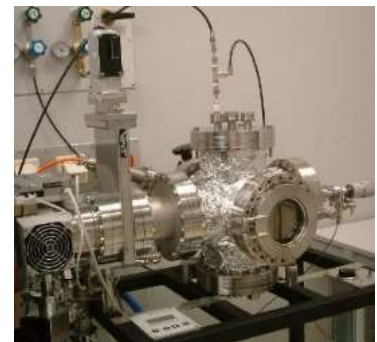
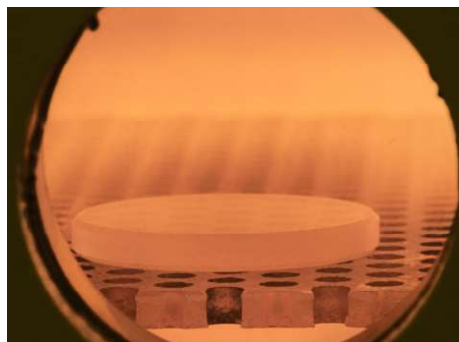
Institute for Optoelectronic Systems and Microtechnology

The Institute for Optoelectronic Systems and Microtechnology (ISOM) is a multi-departmental research institution devoted to graduate research and education in electrical engineering, which is affiliated to the Universidad Politécnica de Madrid (UPM). ISOM was created on March 16th 2000 as the result of the proposal presented by several research groups from the departments of Electrical Engineering, Photonic Technology, Applied Physics to Information Technology and Applied Physics to Architecture and Environment. This personnel is divided in two research groups: Semiconductor Devices Group (GDS) and Magnetic Devices Group (GDM). Its size as well as the large experience in research during the last two decades, in particular participating in numerous projects funded by the European Union, make this team distinctively well suited for research and development activities.

Facilities and infrastructures

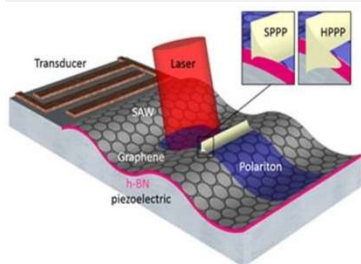


- ❑ ISOM facilities include a 400 m² cleanroom (100-1000 class), and 300 m² of characterization and processing laboratories. In addition, there are areas dedicated both to Industrial Cooperation and Technology Transfer and External Services.
- ❑ Inside the cleanroom among many processing apparatus such as e-beam evaporators, annealing ovens and there are several crystal growth systems including molecular beam epitaxy for nitrides, arsenides and antimonides, chemical vapor deposition for graphene and sputtering for piezoelectric and magnetic materials. A class 100 lab inside the cleanroom is dedicated for the optical lithography and one of the most powerful e-beam lithography systems available (10 nm per line).
- ❑ The characterization labs include a scanning electron microscope equipped with cathodeluminescence (UV,VIS,IR) and EDX, a atomic force microscope, optical benches for cryostats for UV, VIS, IR photoluminescence, X-ray diffractometers and Probe stations for measuring at room, low and high temperatures.

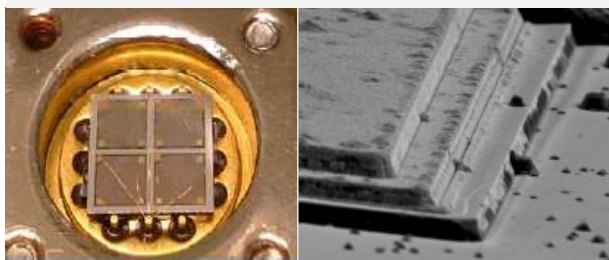


Research areas associated with Big Science

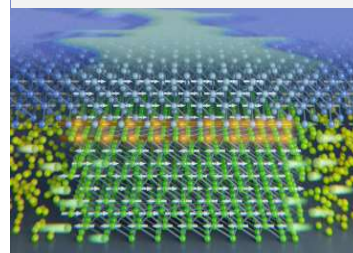
2D Materials



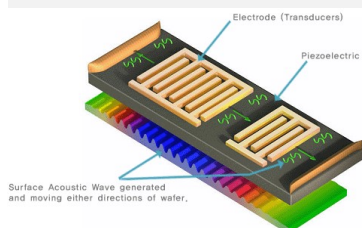
Nanophotonics and IR plasmonics



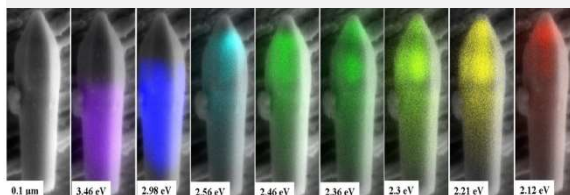
Spintronics



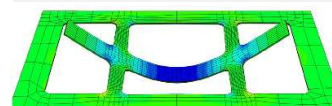
SAW-based devices



Epitaxy of nanostructures (LEDs, LDs,...)



Magnetic sensors and devices



Main projects in Big Science

- **NEWTON** (New portable multi-sensor scientific instrument for non-invasive on-site characterization of rock from planetary surface and sub-surfaces), H2020. Ref: 730041, (2016-2019). www.h2020-newton.eu.
- **ZOTERAC** (Zinc Oxide for TeraHertz Cascade Devices), H2020. Ref: 665107 (2015-2019). www.zoterac.eu.
- **SAWTrain** (Dynamic electromechanical control of semiconductor nanostructures by acoustic fields), H2020. Ref: 642688 (2015-2019). www.sawtrain.eu.
- **nanoGREAT** (Graphene NANOcomposites REActors at preindustrial Technology readiness), KIC Added Value Activities (2016-2018) <https://eitrawmaterials.eu/project/nanogreat/>.
- **NMAT2D-CM** (Nuevos Materiales Bidimensionales: Caracterización, Propiedades y Aplicaciones), S2018/NMT-4511 (2019-2022).
- **OXIPLIR** (Plasmónica basada en óxidos para fotodetectores de IR), TEC2017-85912-C2-1-R (2018-2020).
- **MAGORBIT** (Fabricación y caracterización de nanodispositivos magnéticos con aplicaciones en magnónica y sistemas de gran acoplo espin-órbita), MAT2017-87072-C4-3-P (2018-2020).

Collaboration with Large European Scientific Facilities

- **ISOM** is a node in the ICTS (Unique Scientific and Technical Infrastructures) distributed Network of White Rooms for Micronanofabrication (MICRONANOFABS) of the Spanish Ministry of Science and Innovation. Currently, we have been included in the European Network of White Rooms called EURONANOLAB (www.euronanolab.eu).



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