

CONTRATOS PREDOCTORALES 2022 SEVERO OCHOA

PROJECT TITLE / JOB POSITION TITLE:

Imperfectly perfect complex oxides for energy harvesting

JOB POSITION RESEARCH LINE:

RL1.- Sustainable Energy Conversion and Storage Systems

RESEARCH PROJECT / RESEARCH GROUP DESCRIPTION:

The rapid development of electronic devices, telecommunication systems and advanced sensors along with the increasing concerns regarding global warming have highlighted the requirements for portable, lightweight and flexible sources of electricity that can supply these state of the art devices in areas far from official electricity grids and can also be integrated with diverse substrates. The implementation of advanced materials capable to harvest small amounts of energy from the environment and transduce energy from one to another has notably prompted a shift in the design approach of electronic systems towards the above mentioned goals. In this line, the study of multifunctional oxide materials that can offer ferroelectric, piezoelectric, photovoltaic and magnetic properties introduce a variety of intriguing phenomena that could be simultaneously exploited for multienergy harvesting. Relevant aspects in the use of these materials are (i) the difficulty to be prepared with atomic precision to control the introduction of defects to nanoengineer their properties and (ii) to be integrated in versatile substrates (rigid, flexible) for its wide use. This project aims to go beyond the state of the art by developing 2D multifunctional complex oxides by cost-effective methodologies, integrate them in arbitrary devices and study their structure, optical, ferroelectric and magnetic properties to exploit they potential as non-conventional multifunctional oxide energy harvesters.

JOB POSITION DESCRIPTION:

The research will focus on developing novel 2D oxides, perform chemical nanoengineering and carry out advanced chemical, electrical and optical characterization with high gain perspective in the field of wearable and lightweight optoelectronic devices. The researcher will work with a dynamic interdisciplinary team of research chemists and physicists devoted to develop and nanoengineer functional materials (thin films, nanocomposites and core-shell nanostructures) by cost-effective deposition techniques.

-Conduct research in the area of functional oxide materials

- Design and implement experiments for novel 2D oxides
- Publish research results in peer-review scientific or technical journals and present results at external seminars and conferences
- Collaborate with international research groups to accomplish research goals

REQUIRED LANGUAGES

ENGLISH: Excellent

Skills/Qualifications:

- *Degree in Materials Science, Applied Physics, Chemistry
- *Currently enrolled in a Master's Degree (or already finished) in Materials Science, Applied Physics, Chemistry
- *Ability to perform as an innovative experimentalist, experience on thin film synthesis and optical and electrical characterization would be appreciated.
- *Proficient verbal and written communication and interpersonal skills to collaborate effectively in a multidisciplinary team environment and present and explain technical information

GROUP LEADER:

Dr. Mariona Coll

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Research project / Research Group website :

<https://icmab.es/coll-bau-mariona-permanent-researchers>

RELATED LINKS TO THE POSITION (optional)

Most relevant publications related to the topic:

<https://doi.org/10.1021/acs.chemmater.8b04380>

<http://dx.doi.org/10.1016/j.apsusc.2019.03.312>

<https://doi.org/10.1021/acsami.1c24450>