

Reference: 27/004

Category: R-1.1

Project: TOPOIONICS - ERC Starting Grant

Research group: Nanoionics and Fuel Cells, IREC, Barcelona

Group leader: Prof. Albert Tarancón

Principal investigator: Dr. Francesco Chiabrera

Publication date: 1 October 2026

Application deadline: 1 December 2026

Estimated starting date: January 2027, with flexibility depending on the candidate's availability.

“R1 – PhD position in Iontronic Materials for Brain-Inspired Computing”

Position description

The Nanoionics and Fuel Cells group at IREC is seeking a motivated MSc graduate in Materials Science, Physics, Chemistry or a related field to pursue a PhD within TOPOIONICS - Topological Ionics for Adaptive Neuromorphic Networks, an ERC Starting Grant project led by Dr. Francesco Chiabrera, exploring new materials for brain-inspired computing. The project aims to use ionic motion to reshape the structure and electrical properties of oxides, enabling devices that adapt their internal connectivity in response to external signals.

The successful candidate will investigate oxide thin films and freestanding membranes at the intersection of materials science, electrochemistry and neuromorphic electronics. By combining materials synthesis, membrane fabrication and advanced characterization, the researcher will explore how ion insertion can enable new neuromorphic functionalities. The position offers hands-on training in modern fabrication and measurement techniques, opportunities to develop original experimental approaches, and collaboration with an international network of researchers.

Research activities:

- Develop oxide thin films with tunable properties for iontronic applications.
- Fabricate freestanding oxide membranes and explore their integration into functional devices.
- Investigate materials and devices using structural, electrochemical and electrical characterization.
- Design experiments and develop measurement methods to understand how ion insertion influences material properties.
- Contribute to collaborative research and share findings through scientific publications and international conferences.

Qualifications and experience

Essential:

- A completed master's degree in Materials Science, Physics, Chemistry, Nanoscience or a closely related field by the appointment date.
- An interest in experimental materials research and the ability to analyze quantitative data.
- Good written and spoken English and the ability to work independently and collaboratively.

Desirable:

- Experience with oxide thin films, pulsed laser deposition or structural and surface characterization.
- Experience or interest in electrochemistry, solid-state ionics, defect chemistry, impedance spectroscopy or ion insertion in solids.
- Programming or data-analysis skills and an interest in linking materials behavior to electronic devices.

Employment and application

The position is planned for 36 months. The successful candidate will join an international research environment at IREC in Barcelona. Salary and employment conditions will follow IREC policy and the applicable call.

Applicants must submit the following documents by email to irecjobs@irec.cat and fchiabrera@irec.cat :

- Curriculum Vitae, specifying the completed degree and any relevant professional experience.
- BSc and MSc transcripts.
- Motivation letter.

Please quote reference 27/004 when applying.