**OFERTA DE TRABAJO**

# Technician in Nuclear Magnetic Resonance (NMR)

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| **Position:** | **Technician in Nuclear Magnetic Resonance (NMR)** | | |
| **Reference:** | **TMS-NMR (ELECTRICAL ENERGY STORAGE)** | | |
| **Professional category:** | **Senior Máster Technician** | | |
| **Work Center:** | University of Extremadura. Caceres Campus. | | |
| **Number of places:** | **1** | **Reservation percentage, if applicable:** | |
| **Department:** | **ELECTRICAL ENERGY STORAGE** | | |
| **Offer date:** | WEB Publication | **Deadline for submitting bids:** | **15 calendar days**, starting from the day after publication on the WEB |
| **Application for participation:** | **Published together with the present call** | **Application submission method for candidates:** | Applicants must send all the documentation from point **5** of the terms and conditions, indicating **Ref. TMS-NMR (ELECTRICAL ENERGY STORAGE)** |
| **Documents to accompany the application:** | The related documents in **point 5 of the Terms and Conditions of the call for applications.**<br><br>In addition to the mandatory documentation listed above, including the detailed CV and supporting certificates, the submission of the following document will also be taken into consideration:<br><br>- Cover letter (maximum 2 pages). | | |
| **Contact information for submitting applications** | FUNDECYT-PCTEX (Science and Technology Park Building), Research Avenue, s/n, PCTEX Building, University of Extremadura Campus - 06006 Badajoz (Spain)<br><br>Email: ciiae.personal@fundecyt-pctex.es<br><br>www.fundecyt-pctex.es<br><br>www.ciiae.org | | |
| **Estimated start date:** | **January/ February 2027** | **Probation:** | **2 MONTHS** |
| **Waiting list** | Yes, according to the regulations in points **9** and **10** of the Call for Proposals | | |
| **Conditions and requirements for applicants:** | Those established in point **4** of the Call for Proposals | | |

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| **Members of the selection committee:** | **President:** Paula Sanz Camacho |
| | **Secretary and member:** Lucía Cordón Masero |
| | **Secretary and member (Substitute):** Cristina Cortés Gragera |
| | **Member:** Yanio Milian Rodríguez |
| | **Member:** Rayees Ahmad Rather |
| **Tasks to be developed:** | Position Context: The Iberian Centre for Research in Energy Storage (CIIAE) is a recently established research centre dedicated to the design, development, and characterization of advanced materials for energy-related applications.<br><br>The research activities cover a wide range of materials, from inorganic materials, such as perovskites, hydrates, silica materials, zeolites, metal-organic frameworks (MOFs), metal and metal oxide nanoparticles, and paramagnetic materials (cathode and anode materials for batteries and supercapacitors), to organic and hybrid materials, oils, redox-active organic compounds for redox flow batteries, covalent organic frameworks (COFs), carbon nitride polymers, phase change materials, etc.<br><br>The centre is equipped with an NMR spectrometer for both liquid and solid-state applications (Bruker Avance NEO 500 MHz), as well as a Magnettech ESR5000 EPR spectrometer.<br><br>The successful candidate will be responsible for the operation, maintenance, user support, and scientific support of the Nuclear Magnetic Resonance (NMR) and Electron Paramagnetic Resonance (EPR) facilities, working closely with the centre's research groups and external collaborators.<br><br>The technician will have the following duties and responsibilities:<br><br>1. Equipment Operation and Use:<br><br>• Perform Nuclear Magnetic Resonance (NMR) experiments in both solid and liquid states, implementing, optimizing, and developing routine and advanced NMR techniques according to the requirements for material characterization and product identification across the centre's different research lines, as well as for external academic and industrial users.<br><br>The techniques include the routine acquisition of one-dimensional (1D) spectra of different nuclei ($^{1}H$, $^{13}C$, $^{19}F$, $^{31}P$, $^{15}N$, among others), as well as two-dimensional (2D) homonuclear correlation experiments (COSY, TOCSY, NOESY) and heteronuclear correlation experiments (HMBC, HSQC), among others, for liquid-state NMR.<br><br>In the field of solid-state NMR, the techniques include routine experiments involving the detection of various nuclei ($^{1}H$, $^{13}C$, $^{19}F$, $^{31}P$, $^{23}Na$, $^{119}Sn$, $^{29}Si$, $^{27}Al$, among others), using MAS, spin-echo, and cross-polarization (CP-MAS) techniques, as well as more |

advanced techniques such as MAT-PASS, 2D EXSY (for paramagnetic materials), MQMAS, STMAS (for quadrupolar nuclei), and heteronuclear correlation techniques such as HETCOR, HMQC, and HSQC, among others.

The position also includes the operation, management, and maintenance of Electron Paramagnetic Resonance (EPR) instrumentation, as well as the development, implementation, and optimization of experimental methodologies and the performance of continuous-wave EPR (CW-EPR) measurements on solid and liquid samples, including under flow and cryogenic conditions. Experimental techniques include spin trapping, spin labelling, and photo-EPR experiments, among others.

- Assist in the complex interpretation of results in collaboration with the research groups. Develop protocols for sample preparation, data acquisition, and data processing (using TopSpin and DMFit software).
- Develop and perform in situ and in operando experiments using NMR and EPR techniques, including the use of flow systems (InsightMR), for the real-time monitoring of compound synthesis processes, the study of reaction mechanisms, the monitoring of electrochemical processes, the observation of temperature-induced structural changes, and the characterization of redox flow battery systems (Redox Flow Batteries).

2. Equipment Management: Assume operational responsibility for the NMR equipment (liquid-state and solid-state probes), as well as the EPR equipment.

- Ensure the maintenance and management of the equipment (NMR and EPR), guaranteeing the optimal operation of the facility, including the refilling of cryogenic liquids (helium and nitrogen).
- Operate and calibrate the magic angle, as well as perform advanced NMR experiments using reference standards and carry out preventive maintenance of the equipment.
- Coordinate with specialized technical services, manage and procure consumables, and organize and monitor the shipment of defective NMR probes for repair or maintenance.
- Laboratory coordination: manage equipment bookings, sample traceability, measurement records, and Standard Operating Procedures (SOPs).

3. User Support

- Manage measurement requests and user training.
  Train users in equipment operation, the required measurement procedures, and the interpretation of results.
- Provide support to the centre's research groups and external collaborators.

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| | 4. Scientific Proposals, Reporting, and Research Outputs<br>• Support the preparation and submission of scientific proposals for access to specialized research infrastructures, including national or European programmes such as PANACEA or similar initiatives, as well as providing technical and scientific advice on the design of advanced experiments and the planning of measurements at specialized facilities.<br>• Prepare technical reports and manage the data generated.<br>• Contribute to scientific publications, research projects, and funding proposals. |
| **Required academic qualifications:** | Master's degree in Chemistry, Physics, or Materials Engineering, with at least five years of demonstrated experience in advanced Nuclear Magnetic Resonance (NMR) spectroscopy and NMR-based structural characterization of inorganic and organic materials, or a PhD specializing in Nuclear Magnetic Resonance (NMR). |
| **Another formation:** | The following qualifications and experience will be considered an advantage:<br>• Theoretical and practical training in Electron Paramagnetic Resonance (EPR).<br>• Experience in the design and development of in situ and in operando cells using additive manufacturing techniques (3D printing), in collaboration with engineering services, with the aim of adapting the instrumentation to the specific requirements of the experiments and expanding the platform's characterization capabilities.<br>• Demonstrable experience in one or more energy storage technologies. |
| **Contract duration:** | Permanent scientific-technical contract under Article 23 bis of Law 14/2011, subject to funding and initially scheduled to run until 31 December 2027 |

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| **Remuneration:** | BS: 38.720,97 € | **Financing:** | Pursuant to Section 1 of the Call for Applications |

**Details of the selection process:**

- **Technical test:** NO
- **Language:** YES **(will be assessed during the interview)**
- **Job interview:** YES

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| **Evaluation:** evaluable criteria and sub-criteria | **MERIT AND CURRICULAR ASSESSMENT PHASE (COMPETITION)**<br>**Maximum score: 65 points**<br>**(Applicants who do not achieve at least 32 points will be excluded.)** |
| | – Experience in solid-state and liquid-state NMR, including both routine and advanced experiments. Proven track record demonstrated through scientific publications or recognition of contributions to NMR-based research work. **Up to 20 points.**<br>– Experience in the management and maintenance of NMR spectrometers. **Up to 10 points.**<br>– Experience in the interpretation of NMR results. **Up to 10 points.**<br>– Experience in in situ or operando measurements, particularly for photocatalysis, redox flow systems, or batteries. **Up to 5 points.**<br>– Experience in the development of in situ components and cells. **Up to 5 points**.<br>– Experience in EPR. **Up to 10 points.**<br>– Demonstrable experience in one or more energy storage technologies (battery materials, PCMs, MOFs, zeolites, etc.) will be considered an asset. **Up to 5 points**. |
| | **INTERVIEW PHASE (COMPETITIVE EXAMINATION)**<br>**Maximum score: 35 points**<br>(Applicants who do not achieve at least 17 points will be excluded.) |
| | – Candidate's interest in joining the organisation, availability to start, and motivation for performing the duties of the advertised position. **Up to 5 points.**<br>– Suitability of the candidate's knowledge, experience, and other required qualifications for the position profile. **Up to 15 points.**<br>– Competencies, aptitudes, skills, and abilities, including leadership, organisational, analytical, team management, and communication skills. **Up to 5 points.**<br>– Excellent interpersonal skills, including communication, problem-solving and conflict-resolution abilities, organisational and team management skills, adaptability to change, assertiveness, and empathy. **Up to 5 points.**<br>– Communication skills in English and/or Spanish. **Up to 5 points**. |

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The Authorising Authority: Carolina Grau Ferrando, Managing Director, FUNDECYT-PCTEX

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