# T-FORS2023OE: PhD in Physics

The mission of the hired person is to work in the group of the Observatori de l'Ebre (OE) to develop the research, knowledge transfer and dissemination activity carried out by the OE, as well as support for OE observational activity linked to the project Traveling Ionospheric disturbances Forecasting system (T-FORS) (GA - 101081835) (https://t-fors.eu/)

**Deadline for applications: April 27th, 2023, at 13:00.**

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| **Title of the topic** | T-FORS |
| **Host Institution** | Ebro Observatory – Ramon Llull University<br>Roquetes (Tarragona), Spain<br>http://www.obsebre.es – http://www.url.edu |
| **Supervisor** | Dr. David Altadill (Observatori de l'Ebre-URL) |
| **Financial Framework** | T-FORS project<br>CE (GA - 101081835) |
| **Salary** | The gross monthly salary is 2300,00 €. |
| **Duration of the contract** | 18 months that could be extended according to budget availability, with a trial period of 1 month. |
| **Expected starting time** | From May 15th. |
| **Profile of applicant** | • Training in geomagnetism and aeronomy<br>• Research experience in the study, detection, and characterization of magnetic and/or ionospheric perturbations and its relationship with space weather events.<br>• Ability to work with geophysical data processing and analysis.<br>• Scientific programming ability in Fortran, Python, Matlab, or similar.<br>• Knowledge of English. Ability to write scientific articles in English and to participate in international scientific conferences also in English.<br>• Experience working in international research teams.<br>• Ability to work in LINUX and Windows environments. |
| **Description of the topic** | • Research based on the study, analysis, characterization and modeling of physical variables related to Earth's magnetic field and ionosphere, on a local, regional and global scale.<br>• Research, characterization and modeling of transient phenomena in the Earth's magnetic field and ionosphere, and of their mechanisms of external origin, in transient |

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| | phenomena of solar activity (space weather), and/or internal, in transient coupling phenomena atmospheric (atmospheric weather). Specifically, in the frame of T-FORS project, validation of T-FORS results regarding to the TID (Traveling Ionospheric Disturbances) forecasting and the identification and characterization of potentially early indicators.<br>• Research, characterization and modeling of the impact of transient phenomena in the Earth's magnetic field and ionosphere in technological systems.<br>• Product development and knowledge transfer to mitigate the pernicious effects of transient phenomena in the Earth's magnetic field and ionosphere in technological systems.<br>• Participate in the dissemination, communication and exploitation activities in the frame of T-FORS.<br>• Visualization, dissemination and outreach of the research and observation activities of the OE (writing reports and scientific articles, and participation in the program of outreach activities of OE). |
| **Description of the project** | The main objective of the T-FORS project is the development of new validated models able to issue forecasts and alerts for TIDs several hours ahead, exploiting a broad range of observations of the solar corona, the interplanetary medium, the magnetosphere, the ionosphere and the atmosphere. To meet this main goal, it is necessary to address the following specific objectives:<br><br>• Develop new prediction models based on databases of detected TID characteristics and of their drivers developed in the frames of past Horizon 2020 and national projects, using Machine Learning (ML Learning) algorithms to forecast the occurrence and propagation characteristics of large scale TIDs and statistical modelling to estimate the occurrence probability and propagation pattern of medium scale TIDs.<br>• Improve scientific understanding of the origin and evolution of TIDs that will lead to a proposed inventory of potential early indicators, assessing the validation results of the prediction models.<br>• Develop prototype services based on requirements from the users' community and following harmonized standards and quality control procedures similar to the best practices of meteorological services and relevant community activities.<br>• Perform on ground demonstration tests for the validation of the usability of the T-FORS prototype services, analyzing the effects of TIDs on HF skywave radars and relevant applications and the effects on HF direction finding systems. |

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| | • Propose a comprehensive architectural concept, including the densification of ground instrument networks, and new space missions, and possible future adjustments in order to develop a real-time operational service compatible and complementary to the ESA Space Weather services.<br><br>The Ebro Observatory, in the frame of T-FORS, is the leader of the work package responsible of Dissemination, Communication and Exploitation activities. In addition, OE participates in the majority of working packages, standing out in the validation works of the results, specially with all related to Large Scale TIDs. |
| **Requirements** | To be admitted to this selection process, candidates must meet the following requirements om the deadline for submitting applications:<br>• Be nationals of any member state of the European Union or, in the case of citizens of countries that are not members of the EU, prove legal residence and work permit in Spain.<br>• Be of legal age.<br>• Prove official PhD degree in Physics or similar.<br>• Have the C1 level of Catalan language, with the accreditation of the Direcció General de Política Lingüística, or the equivalent. Official accreditation must be provided. |
| **Applications** | Interested persons who meet the requirements, can request their incorporation into the offer by sending an e-mail to the electronic address secretaria@obsebre.es including the code "**T-FORS2023OE**" in the subject.<br>The deadline for submitting applications is **April 27th at 13:00** official time in peninsular Spain.<br>With the application submitted to take part in this process, the candidate declares that he/she meets the requirements established in the THIRD section of the rules (see below), attaching the following documentation:<br>• Curriculum Vitae.<br>• PhD degree.<br>• Accreditation of Catalan knowledge (C1).<br>• Copy of the of the necessary documents to reliably certify compliance with the assessable merits.<br>• Photocopy of the national ID card, Passport or any other legal identity document in European Union.<br>• Letter of motivation accrediting his/her interest to occupy the job, no more than four pages long.<br>• Letters of recommendation (optional)<br>• List of scientific publications of the candidate (doctoral thesis, project reports and/or scientific articles). In the case of reports, the doctoral thesis and articles that have not been |

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| | published in open access mode, an electronic copy of the documents will be attached.<br>By submitting the application, applicants consent to the processing of personal data that are necessary to take part in this call and for the processing of the selection process, in accordance with current legislation. |
| **Complete rules** | The complete rules of this call can be found at: https://www.obsebre.es/images/oeb/pdfs/ca/OfertesTreball/20230406_Bases-Convoca-Investigador-T-FORS.pdf |
| **Contact** | For any enquiry, please contact Dr. David Altadill (david_altadill@obsebre.es) or Dr. Antoni Segarra (asegarra@obsebre.es) adding T-FORS2023OE into the subject line. |

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