Call for expression of interest for one (1) Postdoctoral Researcher position in “Radio Weak Lensing” at the Institute of Computer Science (ICS) Foundation for Research and Technology – Hellas (FORTH)

Position: One (1) position for the HORIZON project TITAN
Project: “TITAN – Frugal Artificial Intelligence and Application in Astrophysics” (Grant Agreement number: 101086741) funded under HORIZON-WIDERA-2022-TALENTS-01
Desired starting date: January 1st, 2024
Duration: 1 year with possibility of extension
Location: Heraklion, Crete, Greece
Opening date: 31/8/2023
Closing date: 15/9/2023
Ref.: “TITAN-PostDoc.2023-radio”

Description

Radio-astronomy is entering the golden age, with new sensitive instruments such as LOFAR, LWA, and SKA, providing opportunities to study the close and distant universe. Radio Weak Lensing is an emerging field where galaxy shapes are extracted from radio interferometric measurements to perform cosmological studies. Image formation from radio instruments requires the reconstruction from a subset of Fourier components. Given the restored images, the challenge lies in detecting sources and deriving their electromagnetic spectrum in very large images (up to 10k x 10k pixels), while taking into account direction dependent effects.

Recent breakthroughs in computational models such as sparse theory, compressed sensing theory, and deep learning, have made a significant impact. However, state-of-the-art approaches based on regularization
cannot identify the shapes of galaxies with sufficient accuracy, while approaches that fit models to galaxies directly on the visibilities become problematic in dense regions, since visibilities encode global spatial information while preventing the use of available shape measurements from optical images. The project TITAN, funded under HORIZON-WIDER-2022-TALENTS-01 aims to address these challenges by developing cutting-edge frameworks based on advanced signal processing and (deep) machine learning, capable of analyzing large observation datasets.

Within this project, we seek one Postdoctoral Researcher who will explore the introduction of weak lensing-specific constraints in deep learning models that prevent galaxy shape distortions, extending paradigms from optical methodologies to the radio domain. The effort will focus on large-scale reconstruction algorithms able to optimize the measurement of shape parameters from SKA interferometry through the coupling of deep-learning-based image priors with geometric shape regularization. The post-doctoral researcher will be located at the premises of FORTH with a strong collaboration with the CosmoStat Laboratory at CEA Saclay. The post-doctoral researcher will be advised by Jean-Luc Starck (FORTH/CEA), Francois Lanusse (CEA), and Panagiotis Tsakalides (FORTH).

Required qualifications:
- Ph.D. in Astrophysics, Computer Science, or related field
- Experience with the analysis of radio astronomy data
- Publications in related fields
- Working experience in related European and/or National R&D projects
- Willingness and ability to work cooperatively within a team, to learn, and to adapt to the projects
- Physical presence at FORTH, Heraklion, Crete for the duration of the position
- Good knowledge of English
- Completed military service (if applicable)
- Letters of recommendation

Desired qualifications:
- Experience with SKA-model observations
- Experience with weak lensing models
- Decision-making and representation of the team at national and international levels

Application Submission
Interested candidates can submit their applications via http://www.ics.forth.gr/jobs/en/ using the link “Apply for the position” under the announcement. Applications must include:
- Detailed CV, including qualifications and interests in the above areas and proof thereof
- Scanned copies of academic titles; academic transcripts for undergraduate and postgraduate degrees
- Letters of recommendation, detailed presentation of prior work, studies and/or publications, demonstrating knowledge of desired skills.
- Certificate of completion of military obligations (for Greek citizen male candidates)

Contact Information:
For information and questions about the advertised position, the activity of the group or the Institute, please contact Jean-Luc Starck at jstarck@cea.fr and Panagiotis Tsakalides at tsakalid@ics.forth.gr.

Selection Announcement
The result of the selection will be announced on the website of ICS-FORTH. Candidates have the right to appeal the selection decision, by addressing their written objection to the ICS secretariat within five (5) days since the results announcement on the web. They also have the right to access (a) the files of the candidates as well as (b) the table of candidates’ scores (ranking of candidates results). All the above information related to the selection procedure will be available at the secretariat of ICS-FORTH in line with the Hellenic Data Protection Authority. Access to personal data of co-candidates shall be limited to personal data (and relevant
data) and supporting documents which have been the basis of the evaluation of the candidates for the specific post(s). Prior to the announcement of the personal data and/or documents of the co-candidates to the applicant, FORTH will inform the data subjects in an appropriate way.

Disclaimer

FORTH is compliant with all legal procedures for the processing of personal data as defined by the Regulation EU/2016/679 on the protection of natural persons with regard to the processing of personal data.

FORTH processes the personal data and relevant supporting documents that you have submitted to us. Processing of that data is carried out exclusively for the needs and purposes of this specific call. Such data shall not be transmitted to or communicated to any third party unless required by law.

FORTH retains the above data up to the announcement of the final results of the call, unless further process and reservation is required by law or for purposes of exercise, enforcement, prosecution of certain one’s legitimate legal rights’ as defined in the Regulation EU/2016/679 and/or in national law.

We inform you that under the Regulation EU/2016/679 you have the rights to be informed about your personal data, access to, rectification and erasure, restrictions of process and objection to as provided by applicable regulation and national laws.

We acknowledge also to you, that you have the right to file a complaint to the national Data Protection Authority. For any further information regarding exercise of your personal data protection rights, you may contact the Data Protection Officer at FORTH at dpo@admin.forth.gr.

You have the right to withdraw your application and consent for the processing of your personal data at any time. We inform you that, in this case, FORTH shall destroy such documents and/or supporting documents submitted and shall delete the related personal data.