



VACANCY NOTICE – 2023-IPR-S4001-FGIV-022709

FG IV Scientist - Exploratory Research Project

Optical Physical(ly) Unclonable Functions for optical authentication and Cryptography (OPUF4C)

Type of contract	Member of the European Commission's contract staff, Function Group IV (article 3b of the Conditions of Employment of Other Servants)
Duration of contract	36 months employment contract for the Exploratory Research Project Optical Physical(ly) Unclonable Functions for optical authentication and Cryptography (OPUF4C). Employment contracts for this category of staff can be renewed up to maximum 6 years.
Area	Nanotechnology
Place of employment	Ispra (IT)
Indicative basic salary	3877,47 - 5616,29 € (applicable as of 1 st of July 2022) For more detailed information please consult: Working Conditions

WE ARE

The [Joint Research Centre \(JRC\)](#) provides independent, evidence-based knowledge and science, supporting EU policies to positively impact society.

The current vacancy is in the Digital Systems for Safeguards and Non-Proliferation Unit of the Directorate for Nuclear Safety and Security of the JRC.

The Digital Systems for Safeguards and Non-Proliferation unit provides research, technology and instruments for nuclear safeguards and security to inspection agencies, States and operators. Activities range from nuclear non-destructive analysis and process monitoring to containment & surveillance, verification and detection technologies.

Further information: [Nuclear safeguards and security \(europa.eu\)](#).

The Scientific Development Programmes Unit is in charge of the overall JRC Exploratory Research Programme.

The vacancy is within the **Exploratory Research Project Optical Physical(ly) Unclonable Functions for optical authentication and Cryptography (OPUF4C)**. The JRC Exploratory Research Programme is a strategic initiative characterised by ideas that might lead to novel results and qualitatively enrich current JRC scientific work.



WE PROPOSE

The jobholder will carry out scientific and technical tasks in accordance with the Exploratory Research Project Optical Physical(Iy) Unclonable Functions for optical authentication and Cryptography (OPUF4C) with special emphasis on the optical characterization and analysis of novel nanomaterial composites/smart materials for their use as hardware primitives for security applications.

The successful candidate will:

- Execute optical readout setup implementation and PUF device characterization: i.e. setup automation, testing of suitable data extraction (binarization) and error correction algorithms, NIST randomness tests, determination of fractional hamming distances and of independent challenge-response pair space;
- Support the security analysis of fabricated PUF prototypes;
- Perform nanofabrication tasks in cleanroom environment: extension and development of nanofabrication protocols, characterization and assessment of complexity and uniqueness by microscopic (SEM, AFM) and spectroscopic (UV-VIS spectrometry) techniques and optical modelling of novel material architectures when needed;
- Provide regular and accurate reports on scientific activities every twelve months and a final report.

WE LOOK FOR

A scientist with the following essential qualifications:

- A doctoral diploma in physics, photonics, nanotechnology or related field, alternatively completed university studies of at least three years attested by a diploma and at least five years professional experience in a field relevant to the position;
- Extensive knowledge/experience in theory of light-matter interaction on the nanoscale;
- Broad knowledge in the area of optical setup design and implementation;
- Good oral and written communication skills in English (B2).

In addition, the following competences will be considered as an advantage:

- Knowledge of nanofabrication and optical and surface characterization of nanostructures (AFM, SEM);
- Knowledge of light propagation in random media and wavefront shaping;
- Proven knowledge of scripting languages (e.g. Matlab, Python) and optical simulation software (e.g. Lumerical);
- Solid record of research activities relevant for the post including publications in international peer-reviewed journals;
- Knowledge of other languages;
- Ability to work in a team and in a multi-cultural environment.

The candidate is expected to be creative and work independently.

HOW TO APPLY

If you are **already on a valid CAST FG IV reserve list**, or you **have already applied to one of the calls below**, you can directly submit your application at <http://recruitment.jrc.ec.europa.eu/?type=AX>.

Interested candidates should provide a CV and cover letter explaining their motivation and aptitude for the vacancy and the described research areas and tasks. In the list of



publications accompanying the CV, please highlight your five most relevant publications.

If not, before applying to this position, **you must register** for one of the two following:

- the [Call for Expressions of Interest | EU Careers \(europa.eu\)](https://europa.eu) (CAST Permanent FG IV), which is used by a wide range of organisations (institutions, bodies, offices and agencies of the European Union), or
- the [specialised call for researchers](#) (JRC Call COM/1/2015/GFIV – Research), which is mainly used by the JRC.

Note that each of the calls above has **different minimum eligibility requirements and different selection tests**.

The JRC cultivates a workplace based on respect for other people and the environment, and embraces non-discriminatory practices and equality of opportunity. In case of equal merit, preference will be given to the gender in minority.