



EUROPEAN COMMISSION  
DIRECTORATE-GENERAL  
HUMAN RESOURCES AND SECURITY  
HR for Specific Sites & Services  
**HR for JRC**

## **March 2024 – Call for expression of interest – scientific trainees**

As the science and knowledge service of the Commission, the mission of the Joint Research Centre is to provide independent, evidence-based knowledge and science, supporting EU policies to positively impact society. The JRC is located in 5 Member States (Belgium, Germany, Italy, the Netherlands and Spain).

Further information is available at <https://ec.europa.eu/jrc/en>

The place of traineeship can be one of the following JRC sites: Ispra (Italy), Geel (Belgium), Petten (the Netherlands) or Karlsruhe (Germany).

The JRC cultivates a workplace based on respect for other people and the environment, and embraces non-discriminatory practices and equality of opportunity.

### **Thematic areas**

The JRC science and knowledge activities cover a variety of areas, including agriculture and food security, health, industry and space, energy, natural resources, mobility, creativity and an inclusive society, civil security for society, environment and climate change, nuclear safety and security, crisis management, population dynamics and migration, digital transformation and data, cybersecurity, artificial intelligence as well as innovation and growth.

For the March 2024 call, the JRC seeks to recruit a number of scientific trainees, in different thematic areas relevant for the organisation. The thematic areas are clustered in 20 fields as listed below. More detailed information, project descriptions, as well as relevant candidate profiles are available in [Annex I](#).

If the candidate's profile fits in more than one field, the applicant is encouraged to choose the one for which more specialised.

The scheme focuses on candidates with strong scientific background. However, some fields also give the opportunity for candidates with a more generalist profile to apply. Depending on the application fields, candidates will be expected to perform desktop work and/or experimental tasks.

**Fields for the March 2024 call** (projects details in [Annex I](#))

<b>Field number</b>	<b>Title</b>	<b>Laboratory experience</b>
<a href="#"><u>1</u></a>	Knowledge management, visual communication and data visualisation (including knowledge management for nuclear safety, security, safeguards and decommissioning).	No
<a href="#"><u>2</u></a>	Science communication and scientific networking in a multi-disciplinary environment at the triangle of science-policy-society. Foresight & knowledge management (identification of emerging disruptors and evaluation of policy gaps). Participatory and deliberative democracy; science and technology studies; humanities and arts; future of democracy; indigenous and traditional knowledge; standardisation; innovation.	No
<a href="#"><u>3</u></a>	Modelling, data and quantitative data for spatial analysis (statistics, GIS, spatial modelling, new data).	No
<a href="#"><u>4</u></a>	Data science: Population trends, Demographic analysis and Migration.	No
<a href="#"><u>5</u></a>	Macro- and Micro-Economic modelling; Nowcasting; Macro- and Micro-econometrics; Applied statistics; Composite Indicators and Scoreboards; Education; Skills and employment; Fiscal policy analysis; Financial markets and corporate finance; Sustainable finance; Research and Innovation; Resilience; Decision Analysis.	No
<a href="#"><u>6</u></a>	Analysis of the Digital Transformation and its impacts on society, economy and the environment. Education and skills for the digital and green transitions.	No
<a href="#"><u>7</u></a>	Data science, data processing and analysis (including big data and support to policy).	No
<a href="#"><u>8</u></a>	Artificial Intelligence.	No
<a href="#"><u>9</u></a>	Technology monitoring & assessment (evolution, trends, emerging and disrupting technologies); technology foresight; technological sovereignty; strategic autonomy; economic security; value/supply chain analysis; dependency risk analysis; gaps analysis; resilient infrastructure.	No
<a href="#"><u>10</u></a>	Public Health, including: non-communicable diseases; Cross-border health threats, diagnostics and detection; Cancer; Quality assurance; Rare diseases; Zero Pollution; One Health; Risk assessment; New approach methodologies (NAMs); Epidemiology and surveillance.	Yes (specific projects)
<a href="#"><u>11</u></a>	Regulatory Science, including: food and feed safety; Food quality and authenticity; Human nutrition; Analytical chemistry; Medical devices, Advanced materials incl. nanomaterials; Micro(nano)plastics; Novel nicotine products; Chemoinformatics.	Yes
<a href="#"><u>12</u></a>	Nuclear Science and Technology.	Yes (specific projects)
<a href="#"><u>13</u></a>	Ecosystem services and Natural Resources.	No
<a href="#"><u>14</u></a>	Climate Change (Adaptation and Mitigation); Sustainable transport (including technologies); Climate neutral cities; Air pollution.	Yes (specific projects)
<a href="#"><u>15</u></a>	<b>A.</b> Sustainability characterisation and life cycle assessment of products, facilities, economic activities, and consumption patterns. <b>B.</b> Sustainable Development Goals (SDGs), Territorial Engagement and Sustainable Urban and Rural Development, Sustainable and Resilient Tourism.	No
<a href="#"><u>16</u></a>	Security and Hybrid Threats.	No

<a href="#"><u>17</u></a>	Energy: Hydrogen; Natural gas; Biogas and biomethane; E-fuels; Batteries; Digitalisation; Interoperability; Energy efficiency; Renewables; Industrial decarbonisation; Heating and cooling; Innovation and competitiveness; Clean energy supply chains; Energy security and markets; Social aspects; Renovation of buildings; Clean energy infrastructure planning.	Yes (specific projects)
<a href="#"><u>18</u></a>	Digital security: forensic, drones, counter drone systems.	Yes (specific projects)
<a href="#"><u>19</u></a>	Radiochemistry and radioprotection.	Yes
<a href="#"><u>20</u></a>	Next-generation wireless communications; Satellite radio navigation systems; Quantum technologies.	Yes

## Requirements of the Call

### Specific eligibility requirements for this call:

- **Nationality:** open to nationals of Member States of the European Union and of countries associated to the [Research Framework Programmes](#).

The recruitment of candidates from non-Member States (under Research Framework Programmes), may require additional compulsory administrative procedures imposed by the national authority of the country hosting the JRC site.

- **Degree:** the call is open to recent university graduates who have completed at least a standard 3-year higher education degree (180 ECTS credits), corresponding to a complete Bachelor's cycle (or equivalent) at the closing date of the present call.

The last degree must have been awarded no longer than five years before the closing date of the present call. Without excluding candidates who are currently enrolled in a Master's degree or Ph.D. (or its equivalent) and are preparing a thesis.

- **Languages:** candidates from Member States must have a thorough knowledge of at least two Community languages, one of which should be English (minimum C1 level, according to the Common European Framework for Languages - CEFR). Candidates from non-Member States must have a thorough knowledge of at least English (minimum C1 level, according to the CEFR).

- **Previous experiences:** candidates **are not eligible** if for more than **six weeks**:
  - have benefited from any kind of traineeship (formal or informal, paid or unpaid) within a European institution or body;
  - have had or have any kind of employment within a European institution or body, including anyone who is or has been an assistant to a Member of the European Parliament;
  - have been or are a consultant or researcher for/within an European Institution or body;
  - have been or are a temporary staff member within an European Institution or body;
  - have been or are a contract staff member, an auxiliary contract staff member, an auxiliary agent or an interim staff member of any EU institution or body.

More information on general eligibility requirements in [Annex II](#).

## Selection criteria

Candidates are evaluated anonymously on the basis of the following criteria:

- Level of education: minimum bachelors' degree;
- Level of knowledge of English;
- Level of knowledge of any other official/working language of the EU, as well as other non-EU languages, if any;
- Relevant field related work experience, if any;
- Field related methodologies, field related technologies, IT skills, if any;

- International profile (education/work/volunteering abroad, mobility, aptitude to work in an international atmosphere), if any;
- Papers, publications, participation in conferences/summer schools, if any;
- Motivation and quality of reasoning, including suitability for the field(s).

Not all candidates in the database will be contacted. Candidates might be contacted for informal interviews directly by the team interested. Being in the database means that you might receive an offer, but does not constitute an offer in itself. An offer is not final until the contract is signed.

Supporting documents will be verified in the recruitment phase. Originals may be requested at any time for verification.

## **Conditions of Traineeship**

The conditions of the Traineeship Programme are governed by the [Rules Governing the Traineeship Scheme of the Joint Research Centre](#).

The place of traineeship can be one of the following JRC sites: Ispra (Italy), Geel (Belgium), Petten (the Netherlands) or Karlsruhe (Germany).

The next traineeship session will start in March 2024 and will run for a fixed period of 5 months. Under exceptional circumstances, a postponement of the start date may be possible. The duration of the traineeship may not be for less than three months. Candidates should be aware that any postponement of the start date might have an impact upon candidates' eligibility for other career opportunities at the European Commission.

The trainee is awarded a monthly allowance in the amount of 25% of the basic remuneration for an official at grade 5/1 (Commission decision C/2007/1221), adjusted by the correction coefficient applied to the JRC site where the traineeship takes place, per month of in-service training actually carried out. The amount of the basic monthly allowance in 2023, adjusted by the applicable correction coefficient of the site, is set in between € 1.263,74 and € 1.524,12.

A trainee whose place of recruitment is less than 50km from the JRC site where the traineeship will take place is awarded half of the basic grant. Trainees who receive a scholarship, salary, lump sum or any other form of payment can benefit from a monthly allowance that brings their total income up to the standard JRC level.

No tax or social security contributions will be withheld or paid by the European Commission with respect to the above stated allowances.

## **Further opportunities**

Candidates interested in further opportunities at the European Commission can find information here: <https://epso.europa.eu>

At the time of publication of this call, access to the talent management programme “[JPP](#)” (Junior Professionals Programme) is open also to JRC scientific trainees. The admission is subject to specific eligibility requirements and further boundary conditions.

## **Data Protection**

For further information on how the JRC processes your personal data, please consult our page for [“Data protection in the selection and/or recruitment process”](#).

The Commission ensures that candidates’ personal data are protected as required by Regulation (EU) 2018/1725 on the processing of personal data by EU institutions and bodies. This safeguards the confidentiality and security of such data.

## **JRC contact details**

For any technical problems with your application, please contact:

[HR-JRC-RECRUITMENT-TOOLS-SUPPORT@ec.europa.eu](mailto:HR-JRC-RECRUITMENT-TOOLS-SUPPORT@ec.europa.eu)

For questions related to this call, please contact:

[HR-JRC-ISPRA-TRAINEES@ec.europa.eu](mailto:HR-JRC-ISPRA-TRAINEES@ec.europa.eu)

## ANNEX I

FIELD	PROJECTS DESCRIPTION
<p><b>FIELD 1</b> - Knowledge management, visual communication and data visualisation (including knowledge management for nuclear safety, security, safeguards and decommissioning).</p>	<p>Examples of relevant projects include (but are not limited to): Knowledge management, citizen engagement, science communication and networking, including event management, in a multi-disciplinary environment at the interface between science-policy-society. Visual communication (including graphic design, photo and video editing), data visualisation, digital communication and content management.</p> <p>Relevant for applicants with humanities and/or communications background, digitalisation and knowledge of management of scientific publications.</p>
<p><b>FIELD 2</b> - Science communication and scientific networking in a multi-disciplinary environment at the triangle of science-policy-society. Foresight &amp; knowledge management (identification of emerging disruptors and evaluation of policy gaps). Participatory and deliberative democracy; science and technology studies; humanities and arts; future of democracy; indigenous and traditional knowledge; standardisation; innovation.</p>	<p>Examples of relevant projects include (but are not limited to):</p> <ul style="list-style-type: none"> <li>• Contribute to the work of the Knowledge Centre on Migration and Demography (KCMD) by carrying out data and statistical analyses of existing knowledge, literature reviews and synthesis, contributing and producing knowledge on migration and demography, tailored to the needs of the Commission Directorates-General. This knowledge may include also narratives and forward-looking scenarios based on current trends and developments.</li> <li>• Elaborate reports describing nuclear science results and their societal relevance in non-scientific language.</li> <li>• Provide support for and participate in activities related to: citizen engagement in different policy fields; future of democracy; deliberative democracy; ethics of science and technology; indigenous knowledge, in particular in the Arctic, to inform policymaking.</li> </ul> <p>Relevant for applications with sociology, communications, political science, anthropology, social sciences, humanities, innovation, science and technology studies backgrounds.</p>
<p><b>FIELD 3</b> - Modelling, data and quantitative data for spatial analysis (statistics, GIS, spatial modelling, new data).</p>	<p>Examples of relevant projects include (but are not limited to): The collection, elaboration of geographical and statistical data at various spatial and temporal scale for the analysis of the status and trends of cities and regions within and outside the European Union. Data and subjects of study might cover specific themes (e.g.: urbanisation, economy, transport, tourism etc.) or a combination of themes for integrated assessment.</p> <p>Smart Infrastructures Analysis, Modelling and Integration. Decision-support tool designed to identify priority areas for securing food. In the frame of the S&amp;T Support to Regional Centres of Excellence for the Green transition activities in Sub-Saharan Region, the customisation of decision-support tools designed to identify priority areas for action/investments in specific sectors will be a key priority. The trainee will support the identification of</p>

	<p>indicators to customised and adapt the current Clean Energy Access Prioritiser (CEAP) to the food security sector. The CEAP is a web-based multi-criteria tool that integrates various geospatial datasets combining factors such as energy demand, environmental conditions, and social aspects. The tool is valuable for policymakers, international donors, governments, and philanthropic investors.</p> <p>The collection, elaboration of geographical and statistical data at various spatial and temporal scale for the analysis of various hazards (floods, droughts, wildfires, earthquakes, tropical cyclones) and disaster risk inside and outside the European Union. Exploring the use of artificial intelligence for better understanding of current and future risk.</p> <p>Relevant for various profiles and thematic areas, all candidates with modelling knowledge, various modelling tools and techniques welcome. GIS and/or statistical skills would be positive assets.</p>
<b>FIELD</b>	<b>PROJECTS DESCRIPTION</b>
<p><b>FIELD 4</b> - Data science: Population trends, Demographic analysis and Migration.</p>	<p>Examples of relevant projects include (but are not limited to) building the taxonomy for Disaster Risk Management.</p> <p>The main tasks are the following :</p> <ul style="list-style-type: none"> <li>• Annotation of content from the Daily Flash reports of the Emergency Response Coordination Centre for training of AI algorithms to systematically track damage and loss.</li> <li>• Analysing dynamic risk drivers of humanitarian crisis and contributing to country analysis reports.</li> <li>• Contribute to the work of the Knowledge Centre on Migration and Demography (KCMD) by carrying out data and statistical and analyses of existing knowledge, literature reviews and synthesis, contributing and producing knowledge on migration and demography, tailored to the needs of the Commission Directorates-General. This knowledge may include also narratives and forward-looking scenarios based on current trends and developments.</li> </ul> <p>Relevant to all candidates specialised in data analytics and data science, in various thematic areas, including the development of data analysis tools and interfaces to large Earth Observation datasets.</p>
<p><b>FIELD 5</b> - Macro- and Micro-Economic modelling; Nowcasting; Macro- and Micro-econometrics; Applied statistics; Composite Indicators and Scoreboards; Education; Skills and employment; Fiscal policy analysis; Financial markets and corporate finance;</p>	<p>Examples of relevant projects include (but are not limited to):</p> <ul style="list-style-type: none"> <li>• Macro-modelling and macro-econometric nowcast models for scientific support to the broad area of macroeconomic and fiscal surveillance, with emphasis on the European Semester and Recover and Resilience Facility implementation.</li> <li>• Development of empirical analyses in the field of sustainable economy and finance, including financial risks from climate change and the socioeconomic aspects of the European Green Deal.</li> <li>• Perform empirical analysis in the field of foreign investments in</li> </ul>

<p>Sustainable finance; Research and Innovation; Resilience; Decision Analysis.</p>	<p>Europe and contribute to the mapping of industrial ecosystems.</p> <ul style="list-style-type: none"> <li>• Perform empirical analyses in the field of inequality (income, consumption, wealth) and contribute to research activities related to the middle class.</li> <li>• Provide support for and participate in activities related to the Commission’s work on resilience and sustainable and inclusive wellbeing frameworks (“beyond GDP”).</li> <li>• Scientific support to European Commission policy process and decision-making in relation to macroeconomic and fiscal surveillance, with particular emphasis on the European Semester and Recovery and Resilience Facility (RRF) implementation. Also, support to the EC agenda to ensure fair twin transitions and fostering a resilient and innovative society. This is achieved by developing and using a wide range of macro-and micro-econometric models and microsimulation models (GAP, GM, QUEST EUROMOD, EUROLAB, CORTAX, EDGE-M3) as well as nowcasting models.</li> </ul> <p>Relevant for candidates with scientific background, expertise in economics/econometrics, DSGE and financial modelling disaggregated analysis, microsimulation techniques, data science and/or data visualisation. Research and policy interests in: development of macro- and micro-econometric models and relevant quantitative methodologies (DSGE models in particular) to be used for economic financial, environmental and social policy analysis and support, as well as for macro-economic policy analysis and for supporting macro-economic projections and forecasting; development and use of micro-economic models to be used for analyses microeconomic impacts of policies, in particular fiscal policies; developments of links between macro and micro models for richer analyses of policy impacts. Strong analytical and communication skills and data handling are essential.</p>
<b>FIELD</b>	<b>PROJECTS DESCRIPTION</b>
<p><b>FIELD 6</b> - Analysis of the Digital Transformation and its impacts on society, economy and the environment. Education and skills for the digital and green transitions.</p>	<p>Examples of relevant projects include (but are not limited to):</p> <ul style="list-style-type: none"> <li>• Mapping the digital industrial ecosystem (actors, activities, relationships,);</li> <li>• Analysing impacts of policies and investments on digital transformation;</li> <li>• Analysis of technical and organisational enablers for European data spaces;</li> <li>• Economic Analysis of the data and platform economy;</li> <li>• Analysis of the role of digital innovation;</li> <li>• Innovation of digital governance and modernisation of the public sector;</li> <li>• Schools and regional authorities in Spain, Portugal and across Europe are producing digital strategy documents on the use of digital technologies, a large number of which is based on the SELFIE tool. This analysis will help reveal how digital transformation is enacted at the School level.</li> </ul>

	Research combining technology and social and economic aspects to understand the impacts and strategic role of digital technologies, data and digital platforms for the economy and society, and to support the modernisation of public sector.
FIELD	PROJECTS DESCRIPTION
<b>FIELD 7</b> - Data science, data processing and analysis (including big data and support to policy).	<p>Examples of relevant projects include (but are not limited to):</p> <ul style="list-style-type: none"> <li>• Quantum computing and Quantum Machine Learning for analysis of big datasets in the field of Mental health.</li> <li>• Data science for skills intelligence analysis: using data from online job vacancies for analysing emerging skills demands and the task content of jobs in Europe, in collaboration with CEDEFOP. Skills in data science and experience in R, Python, Stata sought.</li> <li>• Algorithmic management of work: studying how the use of algorithms for the coordination of work by companies' impact on work organisation and job quality, and also how could policies increase the transparency and fairness of algorithms at work. Social Sciences background and knowledge/skills on digital technologies, which could assist in the analysis of qualitative data and literature review.</li> <li>• Digital transformation and the future of European social protection systems: studying how the digital transformation is affecting European social protection systems, and how can European policies respond. Social Sciences background and knowledge/skills on digital technologies could assist in the analysis of qualitative data and literature review.</li> </ul> <p>Support to the Project Portfolio INDUTRANS that provides policy support to strengthen the sustainability and competitiveness of EU industrial base helping to bring about the twin green/digital transition and to achieve Open Strategic Autonomy through technological sovereignty in various sectors of society, i.a., energy, space, security, etc. Example of activities: monitoring and analysis of news/information related to: (i) changing dynamics and drivers of key global value chains to help reduce undesired dependencies of the EU on global competitors or third countries, (ii) key players identification and analysis of selected key technologies, (iii) analysis of supply chain disruption types (i.a., natural hazards, industrial hazards, etc.), and (iv) contribution to methodology development related to the above activities.</p> <ul style="list-style-type: none"> <li>• Implementation of Encrypted computing for ML model for pathogens detection. Data breaches have remained relentless, and the data sets leaked have steadily grown. The core reason is that attackers break into servers where confidential data is available. The notion of secure computation promises to keep data always encrypted and protected on servers, even during data processing, so that it is not available to attackers who break in. JRC will be working on pre-existing models of processed genomic data of bacteria (Pathogens detection) for the implementation an end-to-end homomorphic encryption model.</li> <li>• Tracking virus genomic sequences in wastewater would improve community prevalence estimates and detect emerging variants. Recently several advances helped to make this</li> </ul>

	<p>detection easier and with fewer errors. There is a further need to analyze and benchmark the proposed detection methods and validate results.</p> <ul style="list-style-type: none"> <li>• Genomic fingerprinting for pathogen identification. Microorganisms are the most pervasive life form on the planet. Some of them are beneficial for humans and some are harmful, and it is very important to correctly identify them once encountered in the wild. The current classification methods are based on the analysis of several well-conserved genes. However, sometimes those few genes are unable to provide a clear differentiation signal, and this can cause dangerous misclassifications with associated poisoning and outbreaks. It is needed to provide estimation on how reliable genetic databases are and suggest possible ways to complete them, using a variety of bioinformatics tools, worldwide genomic databases and machine learning methods.</li> <li>• Text and Data Mining. Focus on Web Text Mining and unconventional data sources like on-line media and social media. Information retrieval and extraction, multilingual models, framing and persuasion techniques, sources discovery. Media monitoring and analysis in support to policy. Trend analysis and weak signals from news.</li> </ul> <p>Relevant to all candidates specialised in data analytics, data science and natural language processing, in various thematic areas, as described (but not limited to) in the projects above.</p>
<b>FIELD</b>	<b>PROJECTS DESCRIPTION</b>
<p><b>FIELD 8</b> - Artificial Intelligence.</p>	<p>Examples of relevant projects include (but are not limited to):</p> <ul style="list-style-type: none"> <li>• Human-AI interaction and social impact of AI</li> <li>• Evaluation of AI systems, including recommender systems</li> <li>• Trustworthy AI, including transparency, fairness and accountability of machine learning and recommender systems</li> <li>• Algorithm-supported decision making</li> <li>• Data-driven policy making</li> <li>• Diversity in AI</li> </ul> <p>Support to the Project Portfolio INDUTRANS that provides policy support to strengthen the sustainability and competitiveness of EU industrial base helping to bring about the twin green/digital transition and to achieve Open Strategic Autonomy through technological sovereignty in various sectors of society, i.a., energy, space, security, etc. Example of activities: monitoring and analysis of news/information related to: (i) changing dynamics and drivers of key global value chains to help reduce undesired dependencies of the EU on global competitors or third countries, (ii) key players identification and analysis of selected key technologies, (iii) analysis of supply chain disruption types (i.a., natural hazards, industrial hazards, etc.), and (iv) contribution to methodology development related to the above activities.</p> <ul style="list-style-type: none"> <li>• Malicious Learning [Backdoors attacks in the wild]</li> <li>• Use of advanced AI tools for the analysis of multimodal health datasets. The trainee will be involved in the team working on this area, in activities such as: Explainability on Large Language</li> </ul>

	<p>Models and their evaluation: anchors, graphs and ontologies; RLHF model fine-tuning on health datasets; Multimodality in context benchmarks and capabilities; Graph conditioned transformers; Quantization of Neural Models.</p> <ul style="list-style-type: none"> <li>• Application of advanced fine tuning methods like: Parameter-Efficient Fine-Tuning (PEFT), Low Rank Adapters~(LoRA) and QLora, and Reinforcement Learning from Human Feedback with AI Feedback (RLAIF)</li> <li>• Neurosymbolic AI. Next Generation Artificial Intelligence-Assisted Tools for Excelling Regulatory Acceptance, Global Harmonization and Research Evaluation in the Life Sciences ensuring complex Epidemiological and Toxicological Data streams as input for Pragmatic Frameworks for the Application of New Approach Methodologies in One Health Risk Assessment</li> </ul> <p>Trustworthy Artificial Intelligence and transparency of algorithms, applied Artificial Intelligence.</p>
<b>FIELD</b>	<b>PROJECTS DESCRIPTION</b>
<p><b>FIELD 9</b> - Technology monitoring &amp; assessment (evolution, trends, emerging and disrupting technologies); technology foresight; technological sovereignty; strategic autonomy; economic security; value/supply chain analysis; dependency risk analysis; gaps analysis; resilient infrastructure.</p>	<p>Examples of relevant projects include (but are not limited to):</p> <ul style="list-style-type: none"> <li>• Check of alignment with Green Deal principles of all CEN (environmental) standards.</li> <li>• Support to the Project Portfolio INDUTRANS that provides policy support to strengthen the sustainability and competitiveness of EU industrial base helping to bring about the twin green/digital transition and to achieve Open Strategic Autonomy through technological sovereignty in various sectors of society, i.a., energy, space, security, etc.</li> </ul> <p>Example of activities: monitoring and analysis of news/information related to: (i) changing dynamics and drivers of key global value chains to help reduce undesired dependencies of the EU on global competitors or third countries, (ii) key players identification and analysis of selected key technologies, (iii) analysis of supply chain disruption types (i.a., natural hazards, industrial hazards, etc.), and (iv) contribution to methodology development related to the above activities.</p>
<p><b>FIELD 10</b> - Public Health including non-communicable diseases; Cross-border health threats, diagnostics and detection; Cancer; Quality assurance; Rare diseases; Zero Pollution; One Health; Risk assessment; New approach methodologies (NAMs); Epidemiology and surveillance.</p>	<p>Examples of relevant projects include (but are not limited to):</p> <ul style="list-style-type: none"> <li>• Chemicals causing Germ Cell Mutagenicity: Desk research on evaluation of data collected for REACH registered chemicals to better understand to which extent mutagenicity in somatic cells might be predicting germ cell mutagenicity and lead to classification.</li> <li>• Supporting the Knowledge Centre on Cancer, namely activities on improving cancer prevention and care and measuring the burden of cancer and other non-communicable diseases.</li> <li>• Systematic review of breakthrough technologies for pandemic preparedness, including for detection and diagnosis.</li> <li>• Applications of AI systems in healthcare and medicine</li> <li>• Characterisation of innovative medical countermeasures, such as nanovaccines, RNA-therapeutics, antibody therapeutics and nanomedicines.</li> <li>• Research and evaluation of non-animal methodologies to</li> </ul>

	<p>identify hazardous chemicals of concern (e.g. carcinogens, endocrine disruptors, developmental neurotoxicants).</p> <ul style="list-style-type: none"> <li>• Development and application of chemical exposure and risk indicators for human health using available monitoring data from e.g. IPCHEM.</li> <li>• Qualification of new approach methodologies including organoids and organ on the chip technologies for the hazard assessment of nanomaterials.</li> <li>• Supporting the development of guidelines &amp; quality assurance schemes for cancer care within the European Initiatives on Breast, Colorectal and Cervical cancer. The initiatives aim to improve cancer care across all care processes: screening, diagnosis, treatment and end-of-life care.</li> <li>• Mental health.</li> </ul>
<b>FIELD</b>	<b>PROJECTS DESCRIPTION</b>
<p><b>FIELD 11</b> - Regulatory Science including food and feed safety; Food quality and authenticity; Human nutrition; Analytical chemistry; Medical devices, Advanced materials incl. nanomaterials; Micro(nano)plastics; Novel nicotine products; Chemoinformatics.</p>	<p>Examples of relevant projects include (but are not limited to):</p> <ul style="list-style-type: none"> <li>• Supporting the revision of the Directive on ceramic food contact materials. The revision foresees the development of test conditions for ceramic bakeware, the extension of the metals analysed (beyond lead and cadmium) and extension to other vitreous materials such as glass and enamel.</li> <li>• Detection methods for agri-food fraud (wine, honey, spices)</li> <li>• FoodOmics</li> <li>• New Psychoactive Substances</li> <li>• E-cigarettes</li> <li>• TOBLAB: laboratory infrastructure to support the fight against illicit tobacco products</li> <li>• Laboratory based analysis of food, feed and environmental samples: Analytical science covering analytical chemistry including DNA analysis</li> <li>• Methods for the identification and quantification of nanomaterials in food</li> <li>• Methods for the identification and quantification of micro(nano)plastics in water</li> <li>• Methods for improved characterisation of medical devices</li> <li>• Case study related to the area of safe and sustainable advanced materials and chemicals</li> <li>• Knowledge management related to the area of safe and sustainable advanced materials and chemicals</li> <li>• Support to the development of certified reference materials to monitor chemicals of environmental relevance, residues and contaminants in food, and the origin of animal proteins. Chemicals may include, among others, the classic persistent pollutants (e.g. PFAS), other recognized hazardous chemicals (e.g. endocrine disruptors, pharmaceuticals), micro plastics, but also emerging chemicals. Matrices that may be considered for reference material development are mainly water, soil, food and human samples. The origin of proteins used in feed is a measure against transmissible diseases and certified reference materials containing specific DNA fragments need to be developed to set common and reliable control thresholds.</li> </ul>

FIELD	PROJECTS DESCRIPTION
<p><b>FIELD 12</b> - Nuclear Science and Technology.</p>	<p>Examples of relevant projects include (but are not limited to):</p> <ul style="list-style-type: none"> <li>• Nuclear fuel cycle (including spent fuel and radioactive waste management);</li> <li>• Nuclear reactor safety - including emergency preparedness and response, security and safeguards security and safeguards;</li> <li>• Structural materials;</li> <li>• Nuclear data;</li> <li>• Decommissioning of nuclear installations and site remediation;</li> <li>• Radiation protection and environmental radioactivity monitoring;</li> <li>• Non-energy applications (in particular nuclear medicine, nuclear for space).</li> <li>• Research and policy support in nuclear science, technology and engineering for energy production and non-energy applications.</li> </ul> <p>Trainees are welcome with background in engineering, physics, chemistry, material science, artificial intelligence, modelling and robotics. Candidates with different profiles but with a strong interest in the field are encouraged to apply as well.</p>
<p><b>FIELD 13</b> - Ecosystem services and Natural Resources.</p>	<p>Examples of relevant projects include (but are not limited to):</p> <ul style="list-style-type: none"> <li>• Big data and deep learning approaches for forest monitoring with Earth Observation. Satellite constellations are generating unprecedented amounts of data that document Earth as it goes through profound changes. Applying deep learning and big data techniques to remotely sensed data provides the opportunity to describe and understand these changes more systematically and precisely than ever before. This traineeship will apply novel image analysis techniques to Earth Observation data to monitor forest disturbances such as logging, pest outbreaks, and wind storms, and understand their patterns and dynamics.</li> <li>• Validation and comparison of global forest maps. The EU strongly committed to fight deforestation and forest degradation. Regulation (EU) 2023/1115 prohibits the placement of commodities and products associated with deforestation and forest degradation on the EU market or export from EU countries. Geospatial information, including maps, can play a supportive role in implementing this law. To this end the JRC produces a global forest map of 2020. The trainee will participate in the refinement of the map, comparisons with similar products for macro-regions, and map validation.</li> <li>• Building a spatiotemporal tool for smarter fisheries management. Habitat information for target, unwanted and bycatch species can be combined to derive the optimal fishing grounds that limit bycatch. Weighting factors associated to each habitat represent the management objective between the desired catch and the protection need of the non-targeted species. Such spatio-temporal tools can represent substantial progress towards</li> </ul>

	<p>the implementation of an ecosystem approach to fisheries management. The trainee will support in building the tool in Matlab and testing it using existing species habitats to derive spatio-temporal optimal monthly fishing grounds.</p> <ul style="list-style-type: none"> <li>• Assessing soil carbon dynamics in an urban context. Soil organic carbon dynamics in urban areas are largely unknown and unaccounted. Urbanization influences soil carbon stocks and flows, which, in turn, affect soil-derived ecosystem services that underpin green infrastructure development and human well-being. The traineeship will look to integrate high resolution EO data with soil data and biogeochemical models for selected urban areas to assess the feasibility of developing an EU-wide monitoring system as called for by the EU Soil Monitoring Law.</li> <li>• A real-time pest-spread simulator to help detection, prevention and control of plant-pathogen outbreaks in EU crops. Complex interactions between landscape environmental features and the traits of a pathogen determine the epidemiological dynamics of plant-pest outbreaks. The trainee will support the development of a flexible, user-friendly platform to test the potential outcome of any hypothetical epidemic spread event (starting from any crop in Europe) by selecting a few key parameters (such as the preferred hosts, and how far/fast the pathogen can move). The software will serve as a proof of concept for developing a larger tool that the Commission could use to simulate scenarios and identify current and future phytosanitary vulnerabilities in EU crops. Phyton coding skills are needed.</li> <li>• Biodiversity and Chemicals: Desk research on evaluation impact of chemical pollution on biodiversity, especially due to pesticides use.</li> <li>• Development and application of chemical exposure and risk indicators for ecosystems health using available monitoring data from e.g. IPCHEM.</li> </ul> <p>Relevant for all candidates with scientific background specialised in environmental and agronomic issues, with particular focus on ecosystem services, biodiversity, sustainable resource use as well as food security and agricultural production systems.</p>
<b>FIELD</b>	<b>PROJECTS DESCRIPTION</b>
<p><b>FIELD 14</b> - Climate Change (Adaptation and Mitigation); Sustainable transport (including technologies); Climate neutral cities; Air pollution.</p>	<p>Examples of relevant projects include (but are not limited to):</p> <ul style="list-style-type: none"> <li>• Electro-magnetic Compatibility testing in at JRC Vehicle Emissions Laboratory: Laboratory experimental and analytical activities in testing cars and charging infrastructure (wired and inductive charging technology) for Electro-magnetic compatibility.</li> <li>• Artisanal small scale gold mining: technology used, source locations, global mercury emissions and implementation of mitigation measures.</li> </ul>

	<ul style="list-style-type: none"> <li>• Modelling air quality in Europe using the on-line SHERPA model: testing the model and developing a user guide for its use</li> </ul> <p>Climate Change (Adaptation and Mitigation), Sustainable transport (including technologies), climate neutral cities, air pollution, industrial pollution.</p>
FIELD	PROJECTS DESCRIPTION
<p><b>FIELD 15</b></p> <p><b>A.</b> Sustainability characterisation and life cycle assessment of products, facilities, economic activities, and consumption patterns.</p> <p><b>B.</b> Sustainable Development Goals (SDGs), Territorial Engagement and Sustainable Urban and Rural Development, Sustainable and Resilient Tourism.</p>	<p>Examples of relevant projects include (but are not limited to):</p> <ul style="list-style-type: none"> <li>• Evaluation of patterns of urban and rural development in Europe. It includes both quantitative and qualitative elements to study the sustainability of territorial development in Europe.</li> <li>• Sustainability assessment of economic activities in the frame of the EU taxonomy and of corporate transition plans.</li> <li>• Environmental assessment, environmental economics, use of life cycle assessment for supporting impact assessment of policies.</li> <li>• Emissions from industry and economic activities.</li> <li>• Sustainable and Resilient Tourism.</li> <li>• Analysis of sector/product circularity and sustainability in support of European Environmental Product Policies.</li> <li>• Mapping of material and product flows in the circular economy</li> <li>• LCA4Policies. The LCA4Policies project investigates the environmental profile of products/services along their supply chain. It supports the use of LCA into policies by developing methods, indicators and monitoring approaches. LCA4Policies focuses on the assessment of sustainability solutions at various levels: micro-scale (e.g. analysis of products &amp; services), meso-scale (e.g. analysis of key industrial sectors), or macro-scale (e.g. Mass Flow Analysis at the EU level). It also assesses behavioural aspects of consumption (related to e.g. types of consumed products and their intensities).</li> </ul> <p>Relevant for candidates with a background in: engineering; natural sciences; economics; regional and urban planning; qualitative and quantitative analysis of pollution; environment; sustainability; and/or knowledge of related policies, such as the Sustainable Development Goals (SDGs) including their synergies and trade-offs.</p>
<p><b>FIELD 16</b> - Security and Hybrid Threats.</p>	<p>Examples of relevant projects include (but are not limited to):</p> <ul style="list-style-type: none"> <li>• Support to the creation of a Hybrid Threat related incidents database. This may include data collection, incident analysis as well as support to the creation of methodologies for semi-automatic incident classification.</li> <li>• Support the drafting of Hybrid Threat related case studies and analyses.</li> <li>• Support the further conceptualization of Hybrid Threats. Focus is on building resilience against Hybrid Threats and discouraging Hybrid Threat actors from engaging in/escalating</li> </ul>

	<p>Hybrid Threats.</p> <ul style="list-style-type: none"> <li>• Support the analysis of Hybrid Resilience baselines.</li> <li>• Support the implementation of the (proposed) directive on the Resilience of Critical Entities, which considerably widens the focus of the current directive on the protection of European critical infrastructure.</li> <li>• Support the protection of Public Spaces by developing tools to assess vulnerability and risk, also applicable for Critical Infrastructure.</li> <li>• Contributing to knowledge management and scientific communication for Disaster Risk Management.</li> <li>• Analysing dynamic risk drivers of humanitarian crisis and contributing to country analysis reports.</li> <li>• Support the Terrorism and Extremism event database.</li> </ul>
<b>FIELD</b>	<b>PROJECTS DESCRIPTION</b>
<p><b>FIELD 17</b> - Energy: Hydrogen; Natural gas; Biogas and biomethane; E-fuels; Batteries; Digitalisation; Interoperability; Energy efficiency; Renewables; Industrial decarbonisation; Heating and cooling; Innovation and competitiveness; Clean energy supply chains; Energy security and markets; Social aspects; Renovation of buildings; Clean energy infrastructure planning.</p>	<p>Examples of relevant projects include (but are not limited to):</p> <ul style="list-style-type: none"> <li>• Hydrogen value chain, to understand hydrogen contribution to the decarbonisation of the energy system. The activities consist in: assessment of the technologies and of their environmental impact (LCA) and/or in experimental activities in JRC hydrogen electrolyzers testing laboratory.</li> <li>• Battery value chain - study of advanced batteries behaviour under real working conditions, to understand the safety and performance behaviour.</li> <li>• Bioenergy and alternative fuels assessment: analysis of different alternative fuel options for transport (road, aviation, waterborne), bioenergy systems providing flexible solutions and intermediate bioenergy carriers (pyrolysis oils, bio-crude, microbial oils, algae oils, etc.). Type: desk top research; data analysis, spatial analysis integrating statistical and geospatial data; Life Cycle Analysis (LCA), and modelling.</li> <li>• Data collection and analysis of decarbonised gases and natural gas.</li> <li>• Integrated renovation of buildings.</li> <li>• Security of Supply.</li> <li>• Clean energy supply chains; EU manufacturing capacities for clean energy value chains.</li> </ul>

FIELD	PROJECTS DESCRIPTION
<p><b>FIELD 18</b> - Digital security: forensic, drones, counter drone systems.</p>	<p>Examples of relevant projects include (but are not limited to):</p> <ul style="list-style-type: none"> <li>• Contribution to the development of multimedia large dataset and the study of multimedia forensic techniques related to image and video analytics, computer vision and signal analysis. Support to the Project Portfolio INDUTRANS that provides policy support to strengthen the sustainability and competitiveness of EU industrial base helping to bring about the twin green/digital transition and to achieve Open Strategic Autonomy through technological sovereignty in various sectors of society, i.a., energy, space, security, etc. Example of activities: monitoring and analysis of news/information related to: (i) changing dynamics and drivers of key global value chains to help reduce undesired dependencies of the EU on global competitors or third countries, (ii) key players identification and analysis of selected key technologies, (iii) analysis of supply chain disruption types (i.a., natural hazards, industrial hazards, etc.), and (iv) contribution to methodology development related to the above activities.</li> <li>• Apply novel techniques of Artificial Intelligence in the field of detection of physical security threats (e.g. drones, robots, visual and audio detection, facial recognition and matching, intelligent perimeter detection, area occupancy, sensor data fusion and decision support systems, chemical/explosives detection, behaviour analysis, etc).</li> </ul> <p>Relevant for candidates with a background in one or more of the following areas are strongly encouraged to apply: digital signal processing, computer networks, security, laboratory work, image and video analytics techniques (enhancement, restoration and filtering, segmentation, features and descriptors, etc.), Machine Learning and Deep Learning techniques.</p>
<p><b>FIELD 19</b> - Radiochemistry and radioprotection.</p>	<p>Examples of relevant projects include (but are not limited to):</p> <ul style="list-style-type: none"> <li>• Determination of Hard-To-Measure Radionuclides;</li> <li>• Implementation of new automatized analytical techniques for the determination of radionuclides, including MonteCarlo code simulations;</li> <li>• Determination of isotopic ratios for radionuclides environmental impact studies;</li> <li>• Implementation of good radioprotection practices;</li> <li>• Implementation of fast analytical methods for radioprotection purposes.</li> </ul>
<p><b>FIELD 20</b> - Next-generation wireless communications; Satellite radio navigation systems; Quantum technologies.</p>	<p>Examples of relevant projects in this field include, but are not limited to:</p> <ul style="list-style-type: none"> <li>• Simulation and experimental work on satellite communications megaconstellations (e.g., Starlink, IRIS<sup>2</sup>); integration of satellite and terrestrial communications systems.</li> <li>• Hands-on laboratory work on wireless communications technologies (e.g., 5G, 6G, next-generation WiFi releases, vehicular communications systems, etc.) using state-of-the-art</li> </ul>

	<p>instrumentation equipment and research facilities.</p> <ul style="list-style-type: none"> <li>• Desk research and hands-on laboratory work in the EU Global Navigation Satellite Systems (GNSS) Testing and Demonstration Hub located in the JRC Ispra campus (<a href="https://op.europa.eu/s/vMWq">https://op.europa.eu/s/vMWq</a>). Support to field tests and performance assessment of Galileo/EGNOS satellite navigation platforms. Synergies between GNSS and Low Earth Orbit (LEO) satellite communications megaconstellations.</li> <li>• Test and evaluation of quantum communications equipment.</li> <li>• Investigation of the potential of quantum computing for optimising radio spectrum usage.</li> </ul> <p>Candidates with a background in one or more of the following areas are strongly encouraged to apply: wireless communications, computer networks, satellite communications systems, digital signal processing, laboratory work in electronics or photonics, quantum science.</p>
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## ANNEX II

### 1. ELIGIBILITY CRITERIA

The JRC reserves the right to amend the eligibility criteria as and when necessary.

#### 1.1 Nationality

Trainees are selected from nationals of the Member States of the European Union (EU) or of the countries associated to the Research Framework Programmes. A derogation based on nationality from the Director-General is required for every non-EU national.

#### 1.2 Diplomas

Candidates must provide copies of diplomas with the relevant Europass Diploma Supplement<sup>1</sup> (or if missing - the relevant university transcripts, certificates), of all university or post-university studies declared in the web application ESRA<sup>2</sup>. If the degree course has been completed, but an official degree certificate has not yet been received/awarded, an official statement from the university confirming the degree result has to be provided. For declared on-going studies an official declaration from the relevant university must be provided. If recruited for a traineeship, originals/certified copies of all diplomas declared and, if applicable, official certified translations will be required.

Candidates whose university or post-graduate diplomas are not issued in one of the official EU languages must provide a translation of these documents in any of the official languages of the EU but preferably in one of the three working ones (English, French, German).

#### 1.3 Knowledge of Languages

Knowledge of languages other than the mother tongue declared via the web application ESRA must be supported by appropriate documentation (e.g. diplomas, certificates, proof of having studied in the language in question, etc.). The candidate must be in possession of the appropriate document by the

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<sup>1</sup> For further information about the Europass Diploma Supplement - <https://europa.eu/europass/en/diploma-supplement>

<sup>2</sup> ESRA is the JRC's database-driven web application that manages part of the recruitment process for trainees: <http://recruitment.jrc.ec.europa.eu>

closing date of the call.

In order for the trainee to fully profit from the traineeship and to be able to follow meetings and perform adequately:

- Candidates from Member States must have a thorough knowledge of at least two Community languages, one of which should be English. The required level is minimum C1 according to the CEFR (Common European Framework of Reference for Languages: Learning, Teaching Assessment).
- Candidates from non-Member States must have a thorough knowledge of at least English. The required level of English is minimum C1 according to the CEFR (Common European Framework of Reference for Languages: Learning, Teaching Assessment).
- Additional language skills might be required in accordance with the requirements of the profile.

#### **1.4 Prior Employment/Traineeship**

The JRC wishes to offer the opportunity of a traineeship to as many people as possible. Therefore, applications are not considered eligible from those candidates who for more than six weeks:

- have already benefited or benefit from any kind of traineeship (formal or informal, paid or unpaid) within a European institution or body;

or

- who have had or have any kind of employment within a European institution or body, including anyone who is or has been an assistant to a Member of the European Parliament, a consultant or researcher, a temporary staff member, a contract staff member, an auxiliary contract staff member, an auxiliary agent or an interim staff member of any EU institution or body.

#### **1.5 Other**

Candidates shall inform the Human Resources of any change in their situation that might occur at any stage during the selection and recruitment phases.

Trainees may not be assigned to any service where a conflict of interest might occur, irrespective of prior professional experience or nationality.