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

March 2023 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 support EU policies with independent evidence throughout the whole policy cycle. 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 is an equal opportunities employer that encourages diversity in its applications.

Thematic areas

The JRC focuses on strengthening the knowledge base for policymaking; global challenges (health; culture, creativity and an inclusive society; civil security for society; digital, industry and space; climate, energy and mobility; food, bioeconomy, natural resources, agriculture and environment); innovation, economic development and competitiveness; scientific excellence; territorial development and support for Member States and regions.

For the March 2023 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 II.

If a candidate's profile fits in more than one field, the applicant is encouraged to choose the one for which he/she is 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 2023 call are as follows

Field number	Title	Laboratory experience
1	Knowledge management and visual communication, data visualisation (including knowledge management for nuclear safety, security, safeguards and decommissioning).	No
2	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.	No
3	Modelling, data and quantitative data for spatial analysis (statistics, GIS, spatial modelling, new data).	No
4	Data science: Population trends, Demographic analysis and Migration.	No
5	Resilience, Innovation, Economics, Macro- and Micro-Economic modelling, Composite Indicators and Scoreboards, Macro- and Micro-econometrics, Applied statistics, Fiscal policy analysis, Financial markets and corporate finance, Sustainable finance, Innovation.	No
6	Analysis of the Digital Transformation and its impacts on society, economy and the environment. Education and skills for the digital and green transitions.	No
7	Data science, data processing and analysis (including big data and support to policy).	No
8	Artificial Intelligence	No
9	Technology monitoring & assessment (evolution, trends, emerging and disrupting technologies); technology foresight; technological sovereignty; strategic autonomy; value/supply chain analysis; dependency risk analysis; gaps analysis; resilient infrastructure.	No
10	Public Health	Yes
11	Regulatory Science	Yes
12	Nuclear Science and Technology	Not mandatory
13	Ecosystem services and Natural Resources	No
14	Climate Change (Adaptation and Mitigation), Sustainable transport (including technologies), climate neutral cities, air pollution.	Yes (specific projects)
15	A. Sustainability characterisation and assessment of products, facilities, economic activities, and consumption patterns. B. Sustainable Development Goals (SDGs), Territorial Engagement and Sustainable Urban and Rural Development, Sustainable and Resilient Tourism.	No
16	Global security and Hybrid Threats	No
17	Energy (hydrogen, e-fuels, batteries, digitalisation, interoperability, energy efficiency, renewables, industrial decarbonisation, heating and cooling, innovation and competitiveness, energy security and markets, social aspects, renovation of buildings).	Yes
18	Waste and the circular economy	Yes (specific projects)
19	Digital Forensic, Wireless communication, Drones, counter drone systems & Global navigation satellite systems.	Yes (specific projects)
20	Radiochemistry and radioprotection	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

- **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 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 on Annex I.

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 relevant field.

Not all candidates in the database will be contacted. 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. A candidate might get an invitation for a short online interview with the team interested.

Supporting documents will be verified in the recruitment phase. Originals may at any time be requested 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 on 1 March 2023 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 2022, adjusted by the applicable correction coefficient of the site, is set in between € 1.155,75 and € 1.414,87. 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/en.

At the time of publication of this call, access to talent management programs, such as the "JPP", is reserved for Blue Book trainees in Commission DGs. Subject to specific eligibility requirements and further boundary conditions, which will be communicated at a later stage, JRC trainees may also become eligible.

Data Protection

For further information on how the JRC processes your personal data, please click on the link below for data protection in the selection and/or recruitment process:
https://joint-research-centre.ec.europa.eu/working-us/jobs-jrc/temporary-positions/data-protection-selection-andor-recruitment-process_en

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

ANNEX I

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[1] (or if missing - the relevant university transcripts, certificates), of all university or post-university studies declared in the web application ESRA[2]. 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 closing date of the call.

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

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

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 his/her prior professional experience or nationality.

ANNEX II

FIELD	PROJECTS DESCRIPTION
FIELD 1 - Knowledge management and visual communication, data visualisation (including knowledge management for nuclear safety, security, safeguards and decommissioning).	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. Relevant for applicants with humanities and/or communications background, digitalisation and knowledge of management of scientific publications.
FIELD 2 - 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.	Examples of relevant projects include (but are not limited to): • Contribute to the Africa Knowledge Platform. The trainee will contribute to the enhancement of AKP by developing new knowledge products to be disseminated through the Platform. 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. • Elaborate reports describing nuclear science results and their societal relevance in non-scientific language. • Contribution to the food system governance and agroecological transitions: a review of the literature, looking at the role the activation of social processes plays in fostering food system transformations, with an emphasis on agroecological transitions. Relevant for applications with sociology, communications backgrounds, political science, anthropology, social sciences, humanities.
FIELD 3 - Modelling, data and quantitative data for spatial analysis (statistics, GIS, spatial modelling, new data).	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. GIS and/or statistical skills would be positive assets. Smart Infrastructures Analysis, Modelling and Integration. Relevant for various profiles and thematic areas, all candidates with modelling knowledge, various modelling tools and techniques welcome.

FIELD	PROJECTS DESCRIPTION
FIELD 4 - Data science: Population trends, Demographic analysis and Migration.	Examples of relevant projects include (but are not limited to) building the taxonomy for Disaster Risk Management. The main tasks are the following : • Participation to the definition and fine-tuning of the DRMKC taxonomy with UNDRR/HOME/ECHO. • Annotation of content from "Project Explorer", "DRMKC News", "Documents" and "Scientific outputs" with the use of a specific tool to be decided. Condition: DRMKC developers set-up the specific tool and the list the options • Extracting dynamic risk drivers of humanitarian crisis and constructing possible scenarios from Humanitarian Needs Overview reports in the context of the INFORM Initiative • Literature review and data collection of the vulnerability indicators projections under different climate change and socioeconomic pathways needed for the further development of INFORM climate change risk tool. • 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. 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.
FIELD 5 - Resilience, Innovation, Economics, Macro- and Micro-Economic modelling, Composite Indicators and Scoreboards, Macro- and Micro-econometrics, Applied statistics, Fiscal policy analysis, Financial markets and corporate finance, Sustainable finance, Innovation.	Examples of relevant projects include (but are not limited to): • 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. • Development of empirical analyses in the field of sustainable finance, including financial risks from climate change. • Perform empirical analysis in the field of foreign investments in Europe and contribute to the mapping of industrial ecosystems. • Perform empirical analyses in the field of inequality (income, consumption, wealth) and contribute to research activities related to the middle class. • Provide support for and participate in activities related to the Commission's work on resilience and sustainable and inclusive wellbeing frameworks ("beyond GDP"). • 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. Relevant for candidates with scientific background, expertise in economics/econometrics, DSGE and financial modelling disaggregated analysis, microsimulation techniques and/or data science. 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 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 skills and data handling are essential.
FIELD	**PROJECTS DESCRIPTION**
FIELD 6 - Analysis of the Digital Transformation and its impacts on society, economy and the environment. Education and skills for the digital and green transitions.	Examples of relevant projects include (but are not limited to): • Mapping the digital industrial ecosystem (actors, activities, relationships,); • Analysing impacts of policies and investments on digital transformation; • Analysis of technical and organisational enablers for European data spaces; • Economic Analysis of the data and platform economy; • Analysis of the role of digital innovation; • Innovation of digital governance and modernisation of the public sector; • 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. 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. Research on education and training (E&T) practices, skills and competences in a life-long learning perspective as well as on automation implications of labour markets and re-skilling needs.

FIELD	PROJECTS DESCRIPTION
FIELD 7 - Data science, data processing and analysis (including big data and support to policy).	Examples of relevant projects include (but are not limited to): • Support to JRC COVID-19 Test Methods and Devices Performance Database management and to EU digital COVID certificate information transfer. The trainee will be part of the team that curates the JRC COVID-19 Test Methods and Devices Performance Database, analysing documentation and information sent by manufacturers, and reviewing related literature. • 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. • 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. • 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. • Support to the Observatory of Critical Technologies for defence, space and related civil industries, which implements Action 4 of the "Action Plan on Synergies between civil, defence and space industries" (COM(2021) 70 of 22 Feb 2021). It will provide regular monitoring and analysis, including risk analysis, of existing and emerging Critical Technologies, their potential applications, value chains including key players, needed research and testing infrastructure (in particular in relation to standardisation and certification), desired level of EU control over them, and existing or potential gaps and dependencies. • 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. • Tracking virus genomic sequences in wastewater would improve community prevalence estimates and detect emerging variants. Recently several advances helped to make this detection easier and with fewer errors. There is a further need to analyze and benchmark the proposed detection methods and validate results.

	• 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. Relevant to all candidates specialised in data analytics and data science, in various thematic areas, as described in the projects below.
FIELD	**PROJECTS DESCRIPTION**
FIELD 8 - Artificial Intelligence.	Examples of relevant projects include (but are not limited to): • Human-AI interaction and social impact of AI • Evaluation of AI systems, including recommender systems • Trustworthy AI, including transparency, fairness and accountability of machine learning and recommender systems • Algorithm-supported decision making • Data-driven policy making • Diversity in AI • Support to the Observatory of Critical Technologies for defence, space and related civil industries, which implements Action 4 of the "Action Plan on Synergies between civil, defence and space industries" (COM(2021) 70 of 22 Feb 2021). It will provide regular monitoring and analysis, including risk analysis, of existing and emerging Critical Technologies, their potential applications, value chains including key players, needed research and testing infrastructure (in particular in relation to standardisation and certification), desired level of EU control over them, and existing or potential gaps and dependencies. • Malicious Learning [Backdoors attacks in the wild] Trustworthy Artificial Intelligence and transparency of algorithms, Applied Artificial Intelligence.
FIELD 9 - Technology monitoring & assessment (evolution, trends, emerging and disrupting technologies); technology foresight; technological sovereignty; strategic autonomy; value/supply chain analysis; dependency risk analysis; gaps analysis; resilient infrastructure.	Examples of relevant projects include (but are not limited to): • Check of alignment with Green Deal principles of all CEN (environmental) standards. • Support to the Observatory of Critical Technologies for defence, space and related civil industries, which implements Action 4 of the "Action Plan on Synergies between civil, defence and space industries" (COM(2021) 70 of 22 Feb 2021). It will provide regular monitoring and analysis, including risk analysis, of existing and emerging Critical Technologies, their potential applications, value chains including key players, needed research and testing infrastructure (in particular in relation to standardisation and certification), desired level of EU control

	over them, and existing or potential gaps and dependencies.
FIELD	**PROJECTS DESCRIPTION**
FIELD 10 - Public Health	Examples of relevant projects include (but are not limited to): • Biodiversity and Chemicals: Desk research on evaluation impact of chemical pollution, especially due to pesticides use, on the biodiversity. • 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. • Reference materials to monitor the impact of chemicals on human health and environment (often inherently correlated) and protection against most harmful contaminants. This entails their monitoring in environmental media (such as water and soil) but also human exposure to recognised hazardous chemicals like endocrine disruptors (including pharmaceuticals), per- and polyfluoroalkyl substances, microplastics but also emerging chemicals. • 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. • Systematic review of breakthrough technologies for pandemic preparedness. • Applications of AI systems in healthcare and medicine • Characterisation of innovative medical countermeasures, such as nanovaccines, RNA-therapeutics, antibody therapeutics and nanomedicines. Non-communicable diseases; Cross-border health threats; Cancer; Rare diseases; Zero Pollution; One Health; Chemical risk assessments; Non-animal methods; Epidemiology and surveillance; Health risk assessment.
FIELD 11 - Regulatory Science	Examples of relevant projects include (but are not limited to): • 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. • Detection methods for agri-food fraud (wine, honey, spices) • FoodOmics • New Psychoactive Substances • E-cigarettes • Laboratory based analysis of food, feed and environmental samples: Analytical science covering analytical chemistry and DNA analysis • Analytical methods for the detection, quantification and identification nanomaterials in food • Analytical methods for the detection, quantification and identification micro(nano)plastics in drinking water • Case study related to the area of safe and sustainable advanced

	materials and chemicals • Knowledge management related to the area of safe and sustainable advanced materials and chemicals Food and feed safety; Food quality and authenticity; Human nutrition; Analytical chemistry; Advanced materials incl. nanomaterials; Micro(nano)plastics; Novel nicotine products; Chemoinformatics.
FIELD	**PROJECTS DESCRIPTION**
FIELD 12 - Nuclear Science and Technology	Examples of relevant projects include (but are not limited to): • Nuclear fuel cycle (including spent fuel and radioactive waste management); • Nuclear safety, security and safeguards; • Nuclear reactor materials; • Nuclear data; • Decommissioning of nuclear installations and site remediation; • Radiation protection and environmental radioactivity monitoring; • Non-energy applications (in particular nuclear medicine, nuclear for space). Research and policy support in nuclear science, technology and engineering for energy production and non-energy applications. Trainees are welcome with background in engineering, physics, chemistry, material science, artificial intelligence, modelling and robotics.
FIELD 13 - Ecosystem services and Natural Resources	Examples of relevant projects include (but are not limited to): • Translating policy drivers to pressures on land through mapping and modelling. The trainee will look at the policy side or prepare the suitability maps for the modelling work on woody biomass flows. • Socio-economic impact of bilateral fisheries agreements. The trainee will investigate the fishing capacity and fishing opportunities in African countries. • Biodiversity footprint. The trainee contribution will be in support to the integration of ecosystem services, soil science and life cycle assessment (LCA), towards the improvement of current LCA approaches for biodiversity assessment of value chains. • Evaluate the interactive effects of farming practices and experimental duration on environmental and climatic impacts, based on meta-analyses literature. The trainee will use text mining techniques to identify for selected farming practices the role of experimental duration on the environmental and climatic impacts, using as material the farming practices database developed in Imap. Relevant for all candidates with scientific background specialised in environmental issues, with particular focus on ecosystem services, sustainable resource use as well as agricultural production systems.

FIELD	PROJECTS DESCRIPTION
FIELD 14 - Climate Change (Adaptation and Mitigation), Sustainable transport (including technologies), climate neutral cities, air pollution.	Examples of relevant projects include (but are not limited to): • 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. • Application of machine learning techniques for super-resolution air quality modelling and mapping. • Air pollution health impact and cost analysis in Eastern Europe and Central Asia. Climate Change (Adaptation and Mitigation), Sustainable transport (including technologies), climate neutral cities, air pollution, industrial pollution
FIELD 15 **A.** Sustainability characterisation and assessment of products, facilities, economic activities, and consumption patterns. **B.** Sustainable Development Goals (SDGs), Territorial Engagement and Sustainable Urban and Rural Development, Sustainable and Resilient Tourism.	Examples of relevant projects include (but are not limited to): • 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. • EU taxonomy for sustainable economic activities. • Assessing sustainability in EGD policies. The project aims at making a stocktaking of targets set for EU Green Deal policies and link them to SDGs targets, through the creation of visualisation tools and dashboard. • Environmental assessment, environmental economics, use of life cycle assessment for supporting impact assessment of policies. • Emissions from industry and economic activities. • Sustainable and Resilient Tourism. Relevant for candidates with an engineering/natural sciences/economics background in 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.
FIELD 16 - Global security and Hybrid Threats	Examples of relevant projects include (but are not limited to): • 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. • Support the drafting of Hybrid Threat related case studies and analyses. • Support the further conceptualization of Hybrid Threats. Focus is on building resilience against Hybrid Threats and discouraging Hybrid Threat actors from engaging in/escalating Hybrid Threats. • Support the analysis of Hybrid Resilience baselines. • 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.

	• Building the taxonomy for Disaster Risk Management. • Participation to the definition and fine-tuning of the DRMKC taxonomy. Expected output: analysis document, visual map of the list of terms and proposed structure of the terminology with relations among terms, possibly in a machine-readable format (e.g. excel, JSON). • Annotation of content from "Project Explorer", "DRMKC News", "Documents" and "Scientific outputs" with the use of a specific tool to be decided. • Extracting dynamic risk drivers of humanitarian crisis and constructing possible scenarios from Humanitarian Needs Overview reports in the context of the INFORM Initiative. • Literature review and data collection of the vulnerability indicators projections under different climate change and socioeconomic pathways needed for the further development of INFORM climate change risk tool. • Terrorism and extremism database.
FIELD	**PROJECTS DESCRIPTION**
FIELD 17 - Energy (hydrogen, e-fuels, batteries, digitalisation, interoperability, energy efficiency, renewables, industrial decarbonisation, heating and cooling, innovation and competitiveness, energy security and markets, social aspects, renovation of buildings).	Examples of relevant projects include (but are not limited to): • Hydrogen value chain. Techno-environmental assessments of part of the chain, to understand and maximise its contribution to the decarbonisation of the energy system. These activities may imply the use of LCA methodology or experimental activities in the field of hydrogen production and transport. • Battery value chain - study of advanced batteries behaviour under real working conditions, to understand the safety and performance behaviour. • 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: Desktop research; data analysis, spatial analysis integrating statistical and geospatial data; Life Cycle Analysis (LCA), and modelling. • Data collection and analysis of decarbonised gases and natural gas. • Integrated renovation of buildings.
FIELD 18 - Waste and the circular economy	Examples of relevant projects include (but are not limited to): • The candidate will follow the operational and data aspects of the smart bin already in place in our canteen, which currently collects data on plastic disposal. The main goal of the traineeship will be to increase the number of smart bins (including for other waste streams) in order to enrich our data sets and measure the impact of our sustainability initiatives. This would provide us with better data insights on our operations, help us to improve our waste management practices in view also of the Circular Economy (3R methodology) and environmental protection within the ambit of the EU Green deal, optimise our resources and cut down on costs. • In the framework of eco-sustainable mobility, the candidate should evaluate the best possible management of the batteries especially regarding end-of-life (Li-ion, Pb, etc.) for our car

	fleet and E-bikes. Both safety and health hazards should be assessed together with the environmental aspects as well as the internal procedures to be established. Provide support to the "Smart Bin" project in collaboration with the Digital Energy Solutions (DES) Living Lab of the JRC.
FIELD	**PROJECTS DESCRIPTION**
FIELD 19 - Digital Forensic, Wireless communication, Drones, counter drone systems & Global navigation satellite systems.	Examples of relevant projects include (but are not limited to): • Experimental work on secure satellite communications systems. • Experimental work on wireless and cellular communications, vehicular communications, 5G/6G. • 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 Observatory of Critical Technologies for defence, space and related civil industries, which implements Action 4 of the "Action Plan on Synergies between civil, defence and space industries" (COM(2021) 70 of 22 Feb 2021). It will provide regular monitoring and analysis, including risk analysis, of existing and emerging Critical Technologies, their potential applications, value chains including key players, needed research and testing infrastructure (in particular in relation to standardisation and certification), desired level of EU control over them, and existing or potential gaps and dependencies. Relevant for candidates with background in one or more of the following areas: digital signal processing, wireless and cellular communications (WiFi, 5G, 6G), computer networks, security, radio spectrum, laboratory work, image and video analytics techniques (enhancement, restoration and filtering, segmentation, features and descriptors, etc.), Machine Learning and Deep Learning techniques.
FIELD 20 - Radiochemistry and radioprotection	Examples of relevant projects include (but are not limited to): • Determination of Hard-To-Measure Radionuclides; • Implementation of new automatized analytical techniques for the determination of radionuclides, including MonteCarlo code simulations; • Determination of isotopic ratios for radionuclides environmental impact studies; • Implementation of good radioprotection practices; • Implementation of fast analytical methods for radioprotection purposes.