

European Space Agency Traineeship Scheme

Call Rules 2022

Version 1.0



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The Malta Council for
Science & Technology



**GOVERNMENT OF
MALTA**

MINISTRY FOR EDUCATION,
SPORT, YOUTH, RESEARCH
AND INNOVATION
PARLIAMENTARY SECRETARIAT
FOR YOUTH, RESEARCH
AND INNOVATION

1. Introduction

1.1. In a knowledge-based economy, it is imperative to have a strong base of scientific research that ultimately leads to intellectual and economic growth for society.

1.2. Through an agreement between the European Space Agency (ESA) and the Malta Council for Science and Technology (MCST), seven Training Opportunities are being offered to Maltese citizens in space-related research areas, specifically mentioned hereunder:

- Cyber Security [Ref. M-2022-DG5-X]
- Cyber Security [Ref. M-2022-HIFI-I]
- Space Application for Green Transition – Mitigating the Impact of Climate Change (Earth Observation data) [Ref. M-2022-EOP-SD]
- Accelerating EO Space Applications with AI Powered Digital Platform Technologies [Ref. M-2022-EOP-SD]
- Big Earth Observation Data Analytics with Artificial Intelligence [Ref.M-2022-EOPS83]
- Moon Exploration Architecture [Ref. M-2022-HRE-E]
- Gamification of Avatars for EAC XR projects (Moon, Mars and ISS)

The abovementioned research areas have been made available based on vacant trainee opportunities within ESA departments. Specific details on each of these opportunities, including eligibility criteria, are available within the annex of this document.

2. Nominations & Financing

2.1. The key objective of this scheme is to identify Maltese individuals who would like to specialise in space-related research to one of the above specified research fields. The ESA Traineeship Board will shortlist eligible candidates based on merit for final selection of two candidates by ESA itself. For the nominees selected by ESA, MCST shall finance the following elements:



- 2.1.1. The travel costs to the country where the research is taking place and back to Malta. MCST shall pay for one trip to the research centre and one trip back to Malta at the end of the course. MCST is not liable to pay for any travelling in between these two journeys.
- 2.1.2. A subsistence amount of €2,160/month (two thousand and one hundred and sixty Euros per month) for twelve months to the selected candidate.
- 2.2. Through the shortlisting process, preference will be given to applicants who have not benefited from prior ESA-related scholarships and traineeships offered by Maltese entities.
- 2.3. Furthermore, an emphasis will also be placed on the potential for the selected applicant to exploit any of the research/training undertaken during the Traineeship upon his/her return to Malta.

3. Explanatory Notes and Definitions

- 3.1. The **Agreement** shall mean a legally binding document to be signed by the Traineeship Awardee as a beneficiary of the Traineeship and the Malta Council for Science and Technology. The Agreement shall include these Regulations. The Agreement shall be signed no later than one month before the commencement of research or the publication of ranking, whichever comes last.
- 3.2. The **Applicant** shall mean a person who submits a Traineeship application.
- 3.3. The **Malta Council for Science and Technology (MCST), for and on behalf of the Foundation for Science and Technology**, is the entity which administers the 'ESA Traineeship Scheme', and which has an agreement with ESA on this regard. It is through the said Agreement that the Maltese Applicant may be nominated for research. MCST is also entrusted with the ranking of Applicants as part of the ESA Traineeships Board, for awarding of Traineeships and overseeing the scheme.

- 3.4. **MQF (Malta Qualification Framework)** shall act as a translation device to make national qualifications more readable across Europe, promoting workers' and learners' mobility between countries and facilitating their lifelong learning.
- 3.5. **Traineeship** shall mean an award of financial aid for an Applicant to further education or research in a particular field of science. At the end of Traineeship, the Traineeship Awardee is to have proof that he/she has successfully completed the programme of research for which the Applicant has applied for.
- 3.6. **Traineeship Awardee** shall mean the Applicant who is granted the Traineeship.

4. Eligibility

- 4.1. In order to apply for an ESA Traineeship, an Applicant must apply in his/her own capacity by **close of business by Tuesday, 27th September 2022**.
- 4.2. By the closing time and date of this call for applicants, applicants must be:
- 4.2.1. a Maltese citizen who has been residing in Malta for the past five (5) years. Provided that for the purposes of calculating this 5-year requirement, consideration shall not be given to such period of time during which such Maltese citizen has been residing outside Malta for study, health or work purposes or any other purpose which the MCST may consider, or
 - 4.2.2. a Maltese citizen who is a worker or self-employed in Malta, or
 - 4.2.3. a national of an EU/EEA state or a family member of such EU/EEA national (as defined in LN 191 of 2007 and in LN 205 of 2004 respectively for EU and EEA nationals), provided that such person has obtained permanent residence in Malta in accordance with LN 191 of 2007 and in LN 205 of 2004 respectively for EU and EEA nationals, or
 - 4.2.4. a national of an EU/EEA state who is in Malta exercising his/her Treaty rights as a worker, self-employed person or person retaining such status in accordance with LN 191 of 2007, or

- 4.2.5. a third-country national who has been granted long-term residence status under LN 278 of 2006.
- 4.3. Applicants shall be in possession of the required educational qualifications as specified in the specific training opportunity text presented in the annex of this document.
- 4.4. It is the responsibility of Applicants, in possession of qualifications awarded by foreign Universities/Higher Education Institutions, to produce an evaluation report on the comparability of qualifications issued by the Malta Qualifications Recognition Information Centre (MQRIC) within the Ministry of Education and Employment (as per Mutual Recognition Of Qualifications Act – *Act XVIII of 2002*). A copy of the said report issued by the MQRIC, or the designated authority in case of warrants, shall be attached to the application, with the original presented at the interview. However, Applicants whose qualifications are obtained from a foreign University or Higher Education Institution listed on the website of MQRIC as Approved Institutions(<https://ncfhe.gov.mt/en/register/Pages/register.aspx>), are not required to produce the evaluation report on comparability of qualifications as long as the course is listed as one of the regular courses of the University.
- 4.5. Applicants submitted by employees of the Public Service/ Public Sector require the endorsement of the Permanent Secretary of the Ministry concerned through the Head of the relative Department subject to a written confirmation whether leave of absence for the duration of the Traineeship has been granted. If leave of absence with full pay is granted, MCST may review the amount of subsistence cost allocated after consultation with the proper Government authorities.
- 4.6. Applicants in possession of other national/ESF (or a combination of both) public grants or national/ESF/Commonwealth (or a combination) scholarships shall be eligible for the ESA Traineeship Scheme, provided that the Regulations governing the other scheme allow the temporary suspension of the scholarship vis-à-vis the deadlines concerning the duration of the course and/or the University where the applicant is undergoing studies allows such a temporary suspension of studies. In the event that an Applicant is granted an ESA Traineeship and the Malta Council for Science and Technology becomes aware, after the grant of such a Traineeship, that the Traineeship Awardee

had, at any point in time, whether prior to the award of the ESA Traineeship, or after such award, accepted any such national/ESF public grant or national/ESF/Commonwealth scholarship without a formal written approval, the Traineeship Awardee shall be liable to refund the Amount/s up to then granted to him/her in full, and this without prejudice to any other legal action which may be taken with this regard.

- 4.7. If selected, the Applicant is expected to commence the traineeship between **Quarter 4 of 2022**, or as otherwise directed by the European Space Agency. The start date will be agreed following selection of the awardees.

5. Types of Traineeships

- 5.1. The Malta Council for Science and Technology shall forward to the European Space Agency, a ranked list of candidates who wish to specialise in space-related fields of research. The European Space Agency will then select the candidates who will be granted the Traineeship as indicated in Clause 1.2.

6. Administration of the ESA Traineeship Scheme

- 6.1. The ESA Traineeships Scheme is administered by the Malta Council for Science and Technology (MCST).
- 6.2. The ESA Traineeships Board, set up by MCST, shall operate the process of nomination. The ESA Traineeships Board shall be responsible for all matters concerning the selection and determination of appropriate nomination/s according to the rules.

7. Application Forms

- 7.1. Applicants are invited to apply using the appropriate application forms template available at the Malta Council for Science and Technology website.

7.2. The form must be completed **in full, signed and submitted** to MCST together with the following documents:

7.2.1. Applicant's University/College transcripts (detailed);

7.2.2. MQRIC evaluation reports (where applicable);

7.2.3. Copy of the Identity Card (both sides); and

7.2.4. Curriculum Vitae.

7.2.5. Two (2) Reference Letters as per Clause 7.4.

7.3. Applications for Traineeships, together with any other associated documentation referred to in section 7.2 are to be scanned and sent to space.mcst@gov.mt. Alternatively, they may be sent by post to:

Dr Michael Quinton
Executive (Space Engagements & Programmes)
Malta Council for Science and Technology
Villa Bighi
Marina Road
Kalkara, KKR1320, Malta

7.4. Two (2) Reference Letters from academic / professional referees are to be sent by the Applicants to their respective referees of their choice. Completed forms (and any other reference letters the applicants may wish to submit), are to be scanned and sent to space.mcst@gov.mt by **Tuesday, 27th September 2022, close of business**. Alternatively completed forms may be delivered by post in a sealed envelope to the abovementioned address in Clause 7.3.

7.5. Late and incomplete applications shall not be considered by MCST.

7.6. In case of applications submitted by post, all Applicants are to request an acknowledgement for receipt of application from the receiving office if the form is submitted by hand. Alternatively, applications may be sent by registered post. The

Applicant must ensure that the application is received by the respective deadline. MCST does not assume any responsibility for applications not received in time.

7.7. The application deadline is **Tuesday, 27th September 2022, close of business.**

8. Confidentiality of Submissions

- 8.1. Unless otherwise stated, all application submissions shall be treated in strict confidence. All applications will be passed-on in their entirety to the ESA Traineeship Board.
- 8.2. The data collected by MCST via the application is in line with:
 - 8.2.1. The ESA Traineeship Scheme – Call Rules 2022;
 - 8.2.2. Data Protection Act, Chapter 586 of the Laws of Malta and Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data and repealing Directive 95/46/EC (General Data Protection Regulation).
 - 8.2.3. The legitimate basis to process personal data submitted by the data subject by virtue of his/her written application for this traineeship is Regulation 6 (1)(b) of the General Data Protection Regulation (“GDPR”), as ‘processing is necessary in order to take steps at the request of the data subject prior to entering into a contract’.

9. Selection Process

- 9.1. The role of the ESA Traineeships Board is to evaluate and nominate candidates to ESA.
- 9.2. Eligible Applicants shall be called for an interview on a pre-agreed date and time. No alternative arrangements shall be made to change the date and time of the interview unless there is an exceptional circumstance (supported by written proof) that warrants the change in such date and time. The aforementioned exceptional circumstance shall be examined, and such alternative date and time may be communicated by the Board, at its discretion.

- 9.3. In the case of Applicants unable to attend for the interview due to being abroad, such interview may take place via videoconference. It is the Applicant who has to ensure to be at a place where such facilities are available and that the video and audio link on his/her end, is adequate to ensure a proper interview throughout. The ESA Traineeships Board does not assume any responsibility if the interview fails to materialize properly due to any technical reason. An alternative date for interview may be given by the ESA Traineeships Board depending on the circumstances which lead to the failure of such an interview.¹

10. General Conditions of Award

- 10.1. Applicants will be notified of their ranking by MCST.
- 10.2. If the nominated Applicants are accepted by the European Space Agency to follow the research, the Awardees shall have to sign an Agreement which stipulates the terms and conditions of such award. The ESA Traineeships Board reserves the right to review the provisional nomination if any information reveals that the Applicant is ineligible for the Traineeship.
- 10.3. Applicants shall be expected to take up the award from the date stated in the Agreement and confirmed by the European Space Agency.
- 10.4. Should any conflict arise between the interpretation of clauses in these Regulations and the Agreement, the Regulations shall prevail.
- 10.5. If for any reason, the Applicant cannot start his/her research on the date indicated by the European Space Agency, the ESA Traineeships Board reserves the right, on notification of such intention, to nominate the next person on the ranking list.

¹ A video conference interview may prevail the need for a physical interview in case of a pandemic, in order to adhere to the sanitary requirements stipulated by the health authorities in the intervening time.

- 10.6. The Malta Council for Science and Technology reserves the right to publish the names of successful Applicants. These names may be published on the website and/or publications of the Malta Council for Science and Technology and/or any other Government entity. In applying for an award, the Applicant gives consent for such publication in the event that her or his application is successful.
- 10.7. Awards are to fund the research stipulated within the Agreement and funding will not be extended to enable the Awardee to complete an additional research and/or qualification other than that for which the selection was made.
- 10.8. Any intellectual property including patents directly arising from or derived from the research funded by the Traineeship and carried out by the Awardee shall be covered by an Intellectual Property Rights (IPR) agreement that acknowledges that the research work carried out is partially funded by the ESA Traineeships Scheme.
- 10.9. The ESA Traineeships Scheme may seek to obtain any rights in intellectual property owned by the Awardee.
- 10.10. On award of a Traineeship, the ESA Traineeships Board and/or the Malta Council for Science and Technology shall make any information submitted by the Applicant available to public authorities for accountability purposes.
- 10.11. Traineeship Awardees are expected to take on full-time responsibilities with ESA. Those Awardees who intend to commit to or continue paid employment during the duration of their Traineeship shall need to seek approval from the Malta Council for Science and Technology and the European Space Agency, prior to the commencement of their Traineeship. Approval must also be sought should the Awardees decide to commence employment throughout the Agreement period. In cases where the Awardee is seeking to receive or receives a salary over and above the subsistence offered through this Traineeship, the Malta Council for Science and Technology reserves the right to change the subsistence rate specified in Section 2.1(b). Unapproved employment shall be deemed to be a breach of these Regulations and the Agreement signed between the Traineeship Awardee and the Malta Council for Science and

Technology and shall lead to the termination of the Traineeship and the obligation on part of the Traineeship Awardee to reimburse all the amounts awarded until such time.

10.12. Traineeship Awardees shall be requested to write a report at the end of the first 6-months of the Agreement period (mid-term report) and another report upon completion of the Traineeship describing the research/training undertaken with ESA. A template and guidelines for both these reports will be provided by the Malta Council for Science and Technology, and only reports that conform to the criteria and specifications provided by MCST will be accepted for review. The Malta Council for Science and Technology retains the right to consider termination of the Traineeship should the Awardee fail to provide a mid-term report or should the content of the report not follow the templates and guidelines provided. The Malta Council for Science and Technology also retains the right to publish any information within these reports on the organisation's website and any other relevant medium.

10.13. The Malta Council for Science and Technology encourages Traineeship Awardees to publish any of the research findings that emerge during the Traineeship on peer-reviewed journals or to present these findings in relevant conferences and events. Copies of all publications resulting from the Traineeship shall be sent to the Malta Council for Science and Technology, within 30 days of being made public. The Malta Council for Science and Technology should also be notified within 30 days following the submission of a patent application by the Awardee that is connected with the research/training undertaken during the Traineeship.

10.14. Following consultation with the European Space Agency, the Malta Council for Science & Technology may publish any publications sent by the Awardee in Malta and these may become freely and electronically available on open access publication. Furthermore, on signing a Traineeship Agreement, the Awardee commits himself/herself to participate in one or two public dissemination events in which the research undertaken at ESA is described and the support offered through the ESA Traineeship Scheme is acknowledged.

10.15. The date for the duration of the Traineeship cannot be extended beyond 12 months.

11. Termination prior to completion of programme

- 11.1. Traineeship Awardees who for any reason discontinue their placements shall inform the Malta Council for Science and Technology in writing with immediate effect.
- 11.2. The Malta Council for Science and Technology shall on thirty (30) days written notice terminate the award if the Traineeship Awardee's:
- 11.2.1. progress is deemed unsatisfactory by ESA or the research institute; and/or
 - 11.2.2. discontinues the placement without justifiable cause; and/or
 - 11.2.3. is in breach of any provision of these Regulations and does not remedy the breach within thirty (30) days of receipt of written notice requiring him/her to do so.
- 11.3. Traineeship Awardees who have their award terminated under conditions stipulated in Clause 11.2 (first two [2] bullets only) during the first three calendar months of his/her placement, shall be exempted from refunding any amounts paid by the Government of Malta as per Clause 2.1(b). The first three (3) month period shall be considered as a probation period. Following this probation period, the Awardee shall be required to refund the entire award, if the Awardee is found in breach of Clause 11.2. The refund shall be done within three (3) months of terminating the research period.
- 11.4. Scholarship Awardees who cannot pursue further their placement due to unforeseen health situations or exceptional circumstances as approved by the Malta Council for Science and Technology shall not be deemed to be in breach of these regulations. In such situations, the Traineeship Awardee must provide justifiable explanation as to why the placement was not completed. For termination, documented evidence, medical certificates, and testimonials must accompany each claim. The Malta Council for Science and Technology is in no way bound to waiver all claims put forward. The Malta Council for Science and Technology reserves the right to appoint its own expert, be it medical or otherwise to advise and assess the case of the claimant.

12. Interpretation of the Rules

12.1. This document endeavours to establish comprehensive and unambiguous rules governing The ESA Traineeship Scheme 2022. However, should circumstances arise where the rules are inadequate, unclear, and ambiguous or conflicting, the Council shall exercise its discretion in the interpretation of the rules or will extrapolate the rules as necessary through the setting up of ad hoc committees.

13. Further Information

13.1. For further queries, please contact:

Dr. Michael Quinton

Executive (Space Engagements & Programmes)

Email: space.mcst@gov.mt

Tel: +356 2360 2120

13.2. For escalated queries, please contact:

Ms Ruth De Brincat

Senior Director for Strategy, Research and Technical Affairs

Email: ruth.debrincat.2@gov.mt

Tel: +356 2360 2176

Annex – ESA Traineeship Opportunities 2022



T01: Cybersecurity M-2022-HIF-I

Reference	Title	Duty Station
M-2022-HIF-I	Cyber-security	ESRIN
<p><u>Overview of the unit's mission:</u></p> <p>Within ESA's IT Department, the IT Security Section provides IT solutions in the following domains of IT and cyber security.</p> <p>Specifically, the section hosts ESACERT, which is ESA's Computer/ Cyber Emergency Response Team. The main task of ESACERT is cybersecurity incident response, but the team is currently also performing many other activities such as security communications, awareness and phishing campaigns, pro-active security services (vulnerability scanning, pen-testing etc.), security monitoring (EDR, SIEM) and maintains relationships with other CERTs and SOCs. For this ESACERT is relying on a broad range of advanced tools and solutions.</p> <p>The ESA Security Office is currently putting in place the C-SOC, which will become the ESA-wide Cyber Security Operations Center and get data and information from various tenants, including many space-specific systems and applications. The C-SOC will be co-operated by the IT department and the directorate of Operations.</p> <p>The section also develops security aware applications and information protection solutions as well as being the guardian of the IT department's ISO27001 certification.</p>		
<p><u>Overview of the field of activity proposed:</u></p> <p>Under the supervision of a seasoned Cyber security professional you will have the opportunity to prepare the acquisition and implementation of an investigation platform and/or a cyber security analysis solution to reinforce the ESACERT capabilities by:</p> <ul style="list-style-type: none"> • Understanding the tool sets used by ESACERT and the future CSOC. • Identify the Security analysis and investigation current capability and future needs • Perform a requirement's analysis • Testing and prototyping potential solutions • Follow-up the implementation of the selected solution • Assist with integration and the definition of interfaces with existing tools • Assist with the validation of solutions. • Liaising with industry partners <p>There may be an opportunity to participate to other projects and deal with live incidents depending on the academic profile and experience of the successful candidate.</p>		
<p><u>Education and additional requirements:</u></p> <ul style="list-style-type: none"> • Master-level degree in Computing, computer science, cyber security, or information technology or similar. • Technical knowledge in one of the following domains: software development, scripting, networks, data mining, artificial intelligence, cyber security, intrusion and penetration testing, ethical hacking, • High motivation and self-starter; • Good interpersonal and communication skills; • Ability to work in a multi-cultural environment, both independently and as part of a team; • Fluency in English and/or French, the working languages of the Agency 		

T02: Cybersecurity M-2022-DG-5X

Reference	Title	Duty Station
M-2022-DG-5X	Cyber Security	ESEC
<p><u>Overview of the unit's mission:</u></p> <p>Under the authority of the Director General, the ESA Security Office is responsible for the coordination, supervision and control of the implementation of all security measures applicable to personnel, documents, physical infrastructure, Communications and Information Systems (CIS) in ESA, whether classified or unclassified for both corporate general purpose and project-specific infrastructure. In addition, the Head of the ESA Security Office advises the Director General on all security matters.</p>		
<p><u>Overview of the field of activity proposed:</u></p> <p>ESA has launched a set of Cyber security initiatives that focus on the development of advanced and integrated capabilities necessary to approach the new complex and sophisticated cyber threats.</p> <p>As part of ESA's overall security measures and, in particular, cyber resilience efforts, the ESA Security Office has launched the Cyber Security Operations Centre (C-SOC) and the Security Cyber Centre of Excellence (SCCoE). The C-SOC and SCCoE will be located at European Space Security and Education Centre (ESEC) at Redu, Belgium, the ESA centre of excellence for cyber security.</p> <p>The Cyber Security Operations Centre (C-SOC) monitors, reacts and tracks relevant information and events with the objective of maintaining the overall security posture. The C-SOC detects and reacts to security incidents and maintains the overall security posture of the organisation, supporting the readiness of the organisation's defensive capabilities.</p> <p>The SCCoE provides training, test & validation services, and centralisation of forensic services/expertise as well as developing a distributed risk analysis process capability.</p> <p>The SCCoE, will work in synergy with the C-SOC, sharing security functionalities such as threat and vulnerabilities analysis tools and complementing capacity of the C-SOC such as the security functionalities to analyse a complex system in a synthetic cyber threat scenario in order to investigate potential security vulnerabilities.</p> <p>The training opportunity is particularly focused on these cyber security initiatives and therefore requires a keen interest an strong background in cyber security.</p>		
<p><u>Education and additional requirements:</u></p> <ul style="list-style-type: none"> • Master's degree in a technical or scientific discipline, related to Cyber Security. • Good interpersonal and communication skills • Ability to work in a multi-cultural environment, both independently and as part of a team • Fluency in English and/or French, the working languages of the Agency 		

T03: Big Earth Observation (EO) Data Analytics with Artificial Intelligence (AI)

Reference	Title	Duty Station
M-2022-EOP-S8E	Big Earth Observation (EO) Data Analytics with Artificial Intelligence (AI)	ESRIN
<p><u>Overview of the unit's mission</u></p> <p>The Φ-lab in ESRIN mission is to accelerate the future of Earth Observation (EO) by means of transformational innovations, i.e. innovations that completely transform or create entire industries via new technologies, with the aim to strengthen the world-leading competitiveness of the European EO industrial and research sectors.</p> <p>To achieve its mission, Φ-lab manages the full range of the innovation pipeline. We create or discover new transformational ideas, select and nurture the good ones, develop the corresponding “solution” or product by maturing and testing it, and finally we invest in the best ones via the InCubed programme to reach market adoption.</p> <p>A particular interest of the Φ-lab Explore office is to promote the use of Artificial Intelligence (AI) techniques to enable users and scientists to extract maximum information from the large amount of Earth Observation (EO) data sets.</p> <p>You are encouraged to visit the ESA websites: www.esa.int/ESA and philab.esa.int</p>		
<p><u>Overview of the field of activity proposed</u></p> <p>The emergence of big data creates new opportunities but also new challenges for scientists, business, data and software providers to make sense of the vast and diverse amount of data by capitalizing on powerful techniques such as Artificial Intelligence (AI). Until recently AI was mainly a restricted field occupied by experts and scientists, but today it is routinely used in everyday life without us even noticing it, in applications ranging from recommendation engines, language services, face recognition and autonomous vehicles. Over the last decade, Machine Learning has gone through a major revolution, through the unique convergence of powerful computing capability, easy access to large volumes of data, and the availability of new algorithms enabling robust training of large-scale deep neural networks.</p> <p>The application of AI to EO data (AI4EO) is just at its inception and there are certainly many areas of Earth Science and big data analytics, which could increasingly benefit from AI, leading to entire new types of value chain, scientific knowledge and innovative EO services.</p> <p>In this context, this traineeship opportunity aims to further explore the wider potential AI4EO applications, in particular through a development of new AI methods across applications, ranging from multi-sensor data fusion, edge computing, automatic change detection, transfer learning, up to mining of hyperspectral data. This includes adapting existing AI algorithms and tools to take account of the specific characteristics of EO data sets, physical measurement principles, and apply them to EO data applications (e.g. ESA Sentinels satellites). Topics of interest could be :</p> <ul style="list-style-type: none"> • The intersection of digital technologies with EO space applications in the field of AI • Green Transition covering the use and exploitation of AI4EO for understanding the impact of climate change • Gamification in relation to AI4EO, including augmented and virtual reality for EO data enquiring and navigation. <p>You will be part of a multi-disciplinary team of researchers and data scientists passionate about innovation, and work within an inspiring and collaborative open-space environment. You will help the team rapidly prototype and evaluate AI solutions for application to EO data sets and challenges, and also prepare training data sets to be used for development and evaluation of AI algorithms.</p>		



Education and additional requirements:

- Master-level degree in a technical or scientific discipline;
- Experience with general purpose programming languages (e.g. Python) and deep learning frameworks (e.g. Tensorflow, PyTorch);
- Natural curiosity and a passion for new subjects and research areas, including AI, EO, and New Space;
- Good interpersonal and communication skills;
- Ability to work in a multi- cultural environment, both independently and as part of a team;
- Fluency in English and/or French, the official languages of the Agency.

T04: Space Application for the Green Transition Covering the Use and Exploitation of EO Data for Mitigating the Impact of Climate Change M-2022-EOP-SD a)

Reference	Title	Duty Station
M-2022-EOP-SD a)	Space Application for the Green Transition Covering the Use and Exploitation of EO Data for Mitigating the Impact of Climate Change	ESRIN
<p><u>Overview of the unit's mission:</u></p> <p>The Data Applications Division in the Department of Science, Applications and Climate based at ESA/ESRIN in Frascati, Italy, is in charge of engaging scientific, public and commercial stakeholder communities, identifying their needs, implementing EO data exploitation projects, tools and platforms to address these needs, and progressively transferring validated results and applications from research to operations. The Division builds up new scientific and end-user communities and works with them in targeted R&D and demonstration activities, that range from science up to pre-commercial applications development, to advance Earth system knowledge, maximise ESA missions impact in society and underpin the definition of future EO systems. The Division is also responsible for coordinating ESA's EO training and education activities.</p>		
<p><u>Overview of the field of activity proposed:</u></p> <p>The IPCC confirms that the effects of climate change are now unavoidable, and urges accelerated adaptation action to mitigate the impacts, and at the same time as making rapid, deep cuts in greenhouse gas (GHG) emissions. In this context, the European Green Deal highlights the need to achieve carbon neutrality and zero pollution by 2050 while stimulating the required R&D to ensure European industry can effectively respond to the opportunities this Green Transition creates. This Green Transition needs to consider the complex and intertwined social-environmental-economic dynamics (e.g., pollution and biodiversity, energy security and transport optimization) and it calls for cross-cutting understanding and multi-source data integration to act effectively.</p> <p>The activity proposed for this Traineeship is to develop EO-based analytical tools for 2-3 specific Country-case studies and/or relevant high-priority subject matter (e.g., lithium fields monitoring, carbon offset monitoring activities, potential assessment for placement of new Pumped Storage Hydropower solutions), in support to the progressive implementation of the Green Transition.</p> <p>The scope of the activity will be to develop and test prototype methods for combining EO derived information with socio-economic data, industrial data etc that can provide the analytics necessary to support climate adaption decisions in key economic sectors such as energy, transport and construction.</p>		
<p><u>Education and additional requirements:</u></p> <ul style="list-style-type: none"> • Master-level degree in a technical or scientific discipline; • Technical knowledge in Earth Observation and data analysis tools; • Good interpersonal and communication skills • Ability to work in a multi-cultural environment, both independently and as part of a team; • Fluency in English and/or French, the working languages of the Agency. 		

T05: Accelerating EO Space Applications with AI Powered Digital Platforms Technologies M-2022-EOP-SD-b)

Reference	Title	Duty Station
M-2022-EOP-SD-b)	Accelerating EO Space Applications with AI Powered Digital Platforms Technologies	ESRIN
<p><u>Overview of the unit's mission:</u></p> <p>The "Digital Platforms Section" within Data Applications Division in the Earth Observation Directorate's "Science, Applications and Climate Department" explores innovation on shared services/tools to facilitate EO exploitation by EO/Data Scientists, Application developers and Value adders on leading edge cloud platforms.</p>		
<p><u>Overview of the field of activity proposed:</u></p> <p>As part of the "Digital Platforms Section", you will be involved in the prototyping of cutting edge cloud based EO processing and analytic capabilities. You will contribute to defining, developing and evaluating state-of-the-art EO platform AI capabilities that will allow value adders to accelerate that time to market for applications using EO space data.</p> <p>Specific focus shall be on strategies to collect and consolidate public training datasets at European or global level, possibly involving the citizens, with the scope to make them available as part of an AI powered platform capability.</p>		
<p><u>Education and additional requirements:</u></p> <ul style="list-style-type: none"> - Master-level degree in a technical or scientific discipline; - AI; - Knowledge of broader data science domain and Earth Observation science is an asset; - Good interpersonal and communication skills; - Ability to work in a multi-cultural environment, both independently and as part of a team; - Fluency in English and/or French, the working languages of the Agency. 		

T06: Moon Exploration Architecture M-2022-HRE-E

Reference	Title	Duty Station
M-2022-HRE-E	Moon Exploration Architecture	ESTEC
<p><u>Overview of the unit's mission:</u></p>		
<p>HRE-E ExPeRT has a mandate to plan and implement preparatory system studies (Phase 0, Pre-Phase A, Phase A/B1) and technology development activities for all ESA exploration destinations, including LEO, cis- lunar space, the Moon and Mars.</p>		
<p>HRE-E ExPeRT manages the development of Spaceship EAC, Spaceship ECSAT and similar low-TRL technology development initiatives and acts as a point of contact for the Directorate's technology preparation and matters related to ESA's Discovery, Preparation and Technology Development Programme (DPTP) and General Support Technology Programme (GSTP).</p>		
<p><u>Overview of the field of activity proposed:</u></p>		
<p>The Directorate is studying and analyzing potential European roles in the international sustainable exploration phase for the Moon. The conceivable scenarios rely on international collaboration among space agencies where the different elements of future Moon stations will be built by different stakeholders. The experience and the skills of the European industries put ESA in the position to offer several building blocks of a future Moon architecture as habitation, mobility solutions, power generation and distribution systems, industrial resource extraction and manufacturing.</p>		
<p>You will be inserted in the team of Moon future studies and he will contribute to the definition of a possible architecture of future Moon infrastructures.</p>		
<p><u>Education and additional requirements:</u></p>		
<ul style="list-style-type: none"> • Master-level degree in a technical or scientific discipline; • Technical knowledge in solution for human and robotic exploration; • Result orientation; • Good interpersonal and communication skills; • Ability to work in a multi- cultural environment, both independently and as part of a team; • Fluency in English and/or French, the official languages of the Agency. 		



T07: Gamification of Avatars for EAC XR projects (Moon, Mars and ISS) M-2022-HRE-O

Reference	Title	Duty Station
M-2022-HRE-O	Gamification of Avatars for EAC XR projects (Moon, Mars and ISS)	EAC
<p><u>Overview of the unit's mission:</u></p> <p>Within the XR-Lab, you will work with Virtual Reality tools for astronaut training and space exploration. The potential usage of XR (Virtual Reality, Augmented Reality or Mixed Reality) and associated haptic devices at European Astronauts Center (EAC) are suitable for Spacewalk (EVA), robotics, LUNA analogue facility and onboard ISS purposes requiring incremental preparation, prototyping and tests of tools helping the crew and ground support personal to design, prepare or complement space training.</p> <p>XR at EAC is also used in support of mission design for various missions (Low Earth Orbit -ISS-, European Large Logistics Lander -EL3- on the Moon, Gateway around the Moon or Mars).</p> <p><u>Overview of the field of activity proposed:</u></p> <p>The proposed activity will be centered on the application of game-design elements and game principles for ESA XR-Lab contexts and projects in frame of ESA Space Exploration.</p> <p>For planetary surface (Moon and Mars) as well as for zero-G applications and for specific teaching tools ESA has developed in VR, the introduction of avatars of the users but also for Non-Playing Characters (NPC) has become increasingly more important throughout the projects.</p> <p>To properly represent the user and its body in spacesuit (for Spacewalk applications), in plain cloth (for internal vehicle activities) or terrestrial application, you will implement the following tasks:</p> <ul style="list-style-type: none"> • Analysis of state-of-the-art avatars in serious games and various games; • Investigation of necessary Invert Kinematics to implement user and characters moves; • Implementation of procedural animations; • Optimization of ridged animations (suit, no suit); • Motion and animation adapted to various gravity conditions; • Implementation of avatars solutions within VR ESA XR-Lab programs; • Analysis and implementation of collaborative sessions where multiple users are connected to the same application. <p>In addition, you would investigate behaviors trees, Artificial Intelligence applied to avatars -AI- and fully body tracking techniques. For that latter, analysis and suggestion on subject movement captures will be necessary.</p> <p>You will be also focused on analyzing the current tools and XR-Lab on-going projects, complement them (Unreal Engine based) and create/modify relevant additional tools or models in close cooperation with the XR-Lab team.</p> <p><u>Education and additional requirements:</u></p> <ul style="list-style-type: none"> • Master-level degree in a technical or scientific discipline; • Technical knowledge: <ul style="list-style-type: none"> ○ Knowledge in Game development; ○ Knowledge and background in skills relating to VR/AR development; ○ Knowledge and relevant programming capability in this area and with relevant tools (e.g. Unreal Engine -UE- or Unity); ○ Experience with 3D software (Blender, 3Dsmax...); ○ Experience with blueprints (preferably UE) for games development; ○ Experience in Invert Kinematics (IK) and body tracking is a plus; • Fluency in English and/or French, the official languages of the Agency; • Communication skills; • Interpersonal skills and ability to work both autonomously and in team. 		



The Malta Council for
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