

ESERO Project

Information Day – For a future ESERO Sweden

24 February 2021

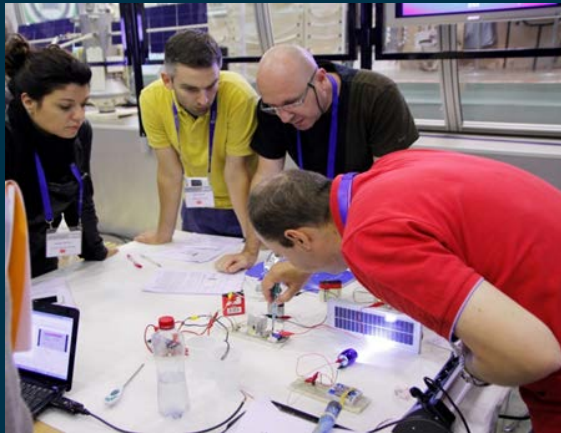
Clara Cruz Niggebrugge

ESERO & European STEM Education Projects Coordinator



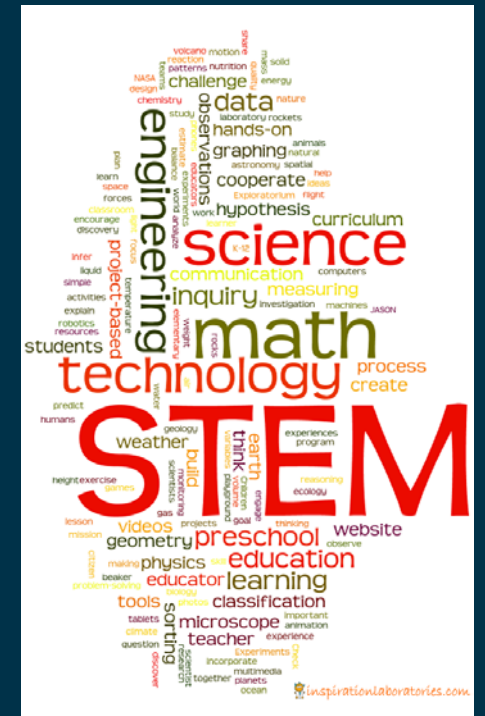
ESERO approach

- Targeting teachers to reach students
- Accredited STEM teacher training
- Large scale reach in the country promoting collaboration rather than competition for higher geographical coverage and expertise offer
- Innovative STEM didactics (e.g. inquiry, project-based learning, learning by design, etc.), contributing to change teaching practices
- Building partnerships and collaborations with relevant national entities



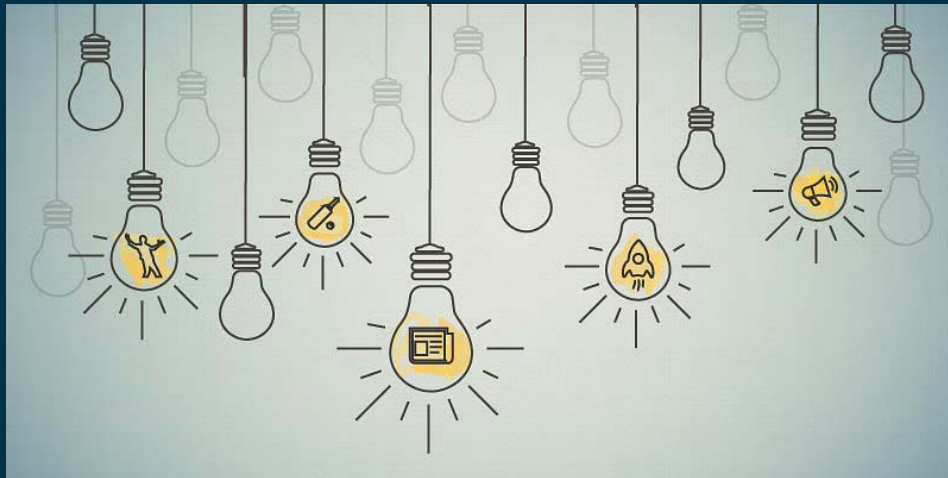
ESERO impact on school education

- **Space context motivational and inspirational** for teachers and students
- **STEM curriculum focus:** Offer used to accomplish the yearly curriculum/learning objectives
- Students at the centre of the learning process (from *passive* to *active* learning), so **increasing the classroom interest, engagement and attainment**
- Development of students' **transversal skills and competences** – such as team work, critical thinking and communication, which are also part of today's national curricula
- Use of state-of-the-art scientific results, data and facilities - **bridging the gap between theoretical science taught at school and the real practice of science**
- Increased awareness and understanding of **STEM-related jobs and careers**, especially in the space sector
- **Cross-curricular approach**, whenever possible (through school projects)



Benefits from the ESERO network

- regular exchange of information with ESA
- regular ESERO workshops hosted by ESA (twice a year)
- cross-ESERO/ESA thematic working groups on specific deliverables
- cross fertilisation
- exchange of best practices, know-how, expertise, classroom materials
- access to European level activities



ESERO deliverables / Statement of Work

Task 1 - ESERO Management

- Definition of an annual activity plan
- Management of related manpower
- Development and maintaining relations and cooperation with relevant space and education stakeholders
- Monitoring of education trends and curriculum developments; when applicable, contribution to evolution of national STEM curriculum
- Participation in meetings with ESA and the ESERO network - ESERO Steering Committee set-up
- Deliverables: reports (twice a year) and yearly activity plans

Task 2 - Teacher Training

- Pre-service and in-service STEM teacher training
- Training modules based on space-related classroom resources
- Officially accredited CPD whenever possible
- Presentation and promotion of ESA/ESERO/partners classroom materials
- Short/long teacher training courses for primary and secondary school teachers
- Online and Face-to-face (also MOOCS): combination to become permanent feature of ESERO offer



Future Learn

Subjects ▾ Courses ▾ Using FutureLearn ▾

Online Courses / Teaching

STEM Learning UK esero Ireland esero

NEW

Teaching Climate Change

Learn how to teach climate change to students aged 11-14 years old and engage them with the ESA Climate Detectives project.

[Join course for free](#)

Duration 3 weeks

Weekly study 3 hours

100% online
Try this course for free

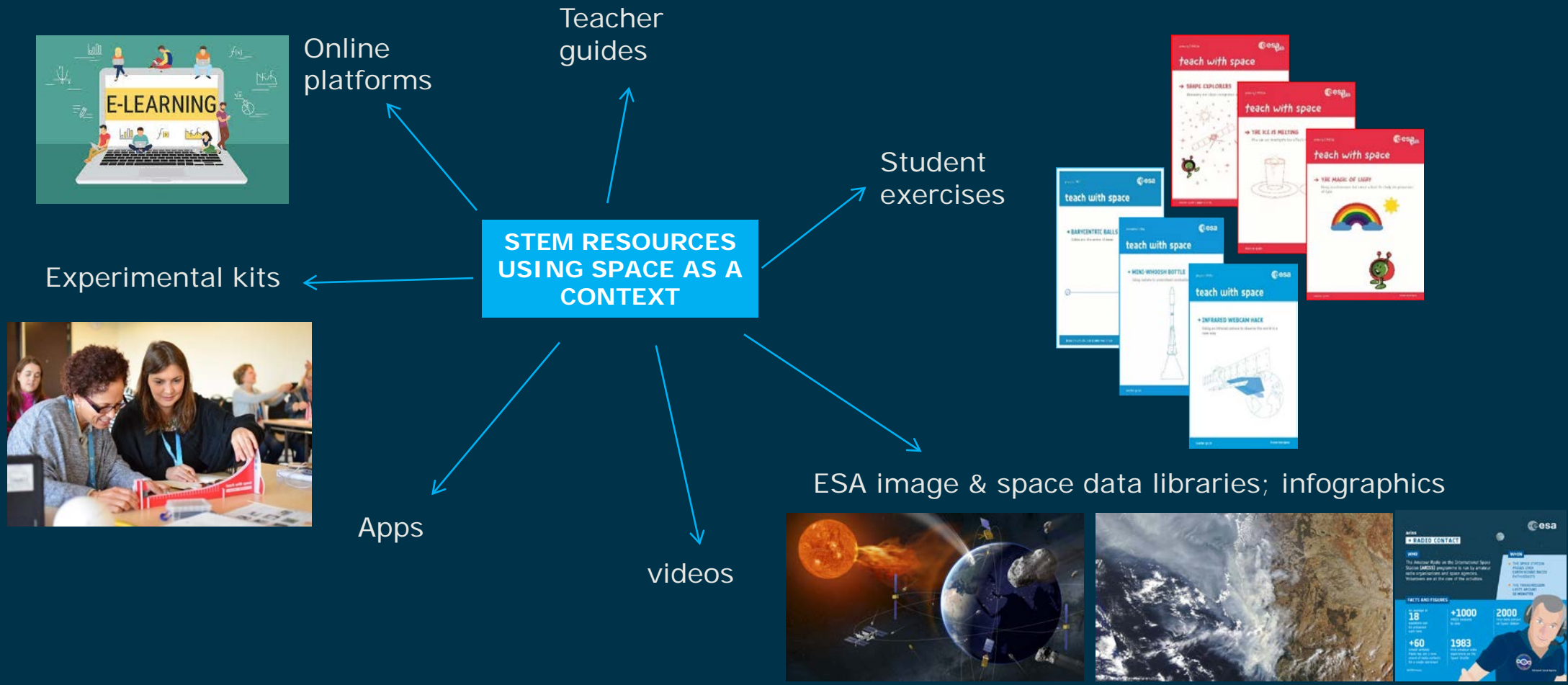
Task 3 – Classroom resources and activities

- translation and adaptation of existing ones (in particular ESA/ESEROs existing resources)
- development of new innovative space-related STEM teaching and learning resources
- through **ESA/ESERO working groups** work on the production of joint resources
- user friendly access to classroom resources (to widest possible number of teachers)
- organisation of national school projects and challenges on space related projects with a curricular basis
- Supporting participation in ESA European school challenges (Astro Pi, Mission X, Moon Camp, Climate Detectives and CanSat)



Didactics materials / Classroom resources

Different formats and supporting tools



An over-arching portfolio of didactics material and activities

Lærerkurser
Find aktuelle lærerkurser - og styrk din undervisning i astronomi og rumfart

Forløb og aktiviteter om rummet og rumfart
Find forløb og aktiviteter til undervisning i astronomi, forårsobservationer, rumfart og Den Internationale Rumstation

MOON CAMP
Moon Camp
Moon Camp er et undervisningsforløb til grundskolen hvor I skal designe jeres egen månebase med boliger, mad, vand og hvad der ellers skal være af faciliteter for at mennesker kan opholde sig i længere tid på månen.

Mission X – Træn som en astronaut
Mission X er et undervisningsforløb, hvor eleverne skal træne som en astronaut ved at lave både fysiske øvelser og forskellige forsøg. (0.-6. kl.)

CLIMATE DETECTIVES

Resources CPD News And Views Enrichment STEM Ambassadors Recognition About Us Careers In Space Primary Secondary

COVID-19 restrictions: [an update on our CPD and enrichment activities](#)

Quick searches: [Tim Peake](#) [Principia](#) [Browse all](#)

European Space Agency Resources – Secondary
53 RESOURCES
This collection contains a whole range of resources derived from ESA (European Space Agency) research. Many activities can be carried out as stand-alone lessons or mini projects in a STEM Club setting, as well as longer term student research projects ideal for EPQ purposes. There are many...

ExoMars collection
12 RESOURCES
This collection of resources support learning about STEM subjects using the context of exploring Mars. Using the context of the ExoMars mission, activities link to areas of the curriculum including: science, D&T and computing. There are...

James Webb Space Telescope - Secondary Resources
5 RESOURCES
This collection of resources has been written for design technology teachers to use primarily as part of the curriculum in lower secondary schools. The resources also include a guide to the James Webb Space Telescope, written for teachers and STEM Ambassadors.
All activities include...

European Space Agency Resources – Primary
33 RESOURCES

Mission to the Moon
1 RESOURCE
This collection of practical activities, investigations and games is all based on current lunar research. It supports many aspects of

James Webb Space Telescope - Primary Resources
5 RESOURCES
The James Webb Space Telescope will

Zoek lessen

Filter wissen

Lesmateriaal

Van planeten tot raketten en satellieten. ESERO heeft meer dan 150 lessen over aansprekende onderwerpen binnen ruimtevaart en sterrenkunde.

Groepen en klassen

- Po**
- 1 (20) 2 (20) 3 (23) 4 (25)
- 5 (27) 6 (27) 7 (40) 8 (40)
- Vmbo**
- 1 (1) 2 (1) 3 (0) 4 (0)
- Havo**
- 1 (62) 2 (62) 3 (0) 4 (1)
- 5 (1)
- Vwo**
- 1 (62) 2 (63) 3 (2) 4 (1)
- 5 (2) 6 (2)

Vakken

Lesduur

Voorbereiding

Werkvorm

Materiaalkosten



De atmosfeer van Mars

Wat zou er gebeuren als je op Mars rondloopt zonder bescherming? Leerlingen onderzoeken in deze les met twee proefjes waarom de atmosfeer belangrijk is voor het menselijk lichaam.

Po 7 - 8



Satellieten en Aardobservatie

NLT-module over hoe we de metingen van satellieten kunnen gebruiken om processen op aarde in kaart te brengen. De module gaat zowel over hoe de satellieten meten als hoe we de data kunnen gebruiken.

Vwo 5 - 6



Hoe bescherm je een satelliet in de ruimte?

Test engineer Charlotte Powels laat zien hoe zijn alle materialen testen voordat ze ruimte ingaan.

Havo 1 - 2, Vwo 1 - 2



Hoe verbouw je voedsel op Mars?

Wetenschapper Angelo Vermeulen vertelt hoe we het produceren van voedsel op Mars zouden kunnen aanpakken. Een gesloten ecosysteem is de oplossing.

Havo 1 - 2, Vwo 1 - 2



Kijken naar luchtvervuiling

In deze les werken de leerlingen met de satellietmetingen van stikstofdioxide.

Vwo 2 - 3



Nederland gezien vanaf boven

Met het Satellietdataportaal kun je veranderingen in het landschap goed monitoren.

Vmbo 1 - 2, Havo 1 - 2, Vwo 1 - 2



Robots op Mars - een mensrobot



Robots op Mars - een robot in



Hoe werkt een zonnepaneel?

Organised by school year, curriculum topic etc.
Benefiting from actual space activities and news, as much as possible

ESERO activities / Statement of Work

Task 4 – Awareness-raising activities

- Identification of opportunities to **promote the ESERO offer towards teachers and education stakeholders, for example through teacher conferences, science fairs, space weeks etc., educational events, ...**
- Organisation of **dedicated ESERO Teacher conferences** - opportunity for teachers to:
 - meet space professionals (inspirational talks)
 - Learn about ESERO classroom resources and activities
 - increase awareness about ESA, the national space sector & careers
- Participation to and/or organisation of space careers events
- **ESERO project website and social media**



ESERO activities / Statement of Work

Task 5 – Engagement with space industry and academia

- Collaborations with national industry and academia regarding role modelling/career and knowledge sharing, with a special focus on real practice of science.
- “ESERO - Space goes to School” : ESERO facilitates lectures of experts from space industry and academia in schools.
- Opportunities to seek in-kind or in cash support by national space industry and/or academia for ad-hoc activities, such as school projects (e.g. Cansat mentoring, expert consulting, Cansat launch opportunities, etc.).
- Collaborate with industry and academia to get support in the development of classroom materials and kits, concerning scientific/technical expertise and know how, and real practice of science.

esero EUROPEAN SPACE EDUCATION RESOURCE OFFICE
A collaboration between ESA & national partners

Home About Us Teacher Support Classroom Resources Projects **Space Careers** News & Events

Career Profiles Videos

CAREER PROFILES

The Space Industry offers a wide variety of careers and opportunities. You might be surprised at the variety of opportunities across maths, physics, chemistry, engineering and computing. Below you'll find a number of career stories of people working in diverse areas of the Space sector.

<p>Niamh O'Keeffe Project manager with Mallon Technology</p> <p>VIEW PROFILE ></p>	<p>Sinead O'Sullivan CEO of Fusion Space Technologies</p> <p>VIEW PROFILE ></p>	<p>Aidan Cowley European Space Agency- Research Fellow</p> <p>VIEW PROFILE ></p>	<p>Ivan Semeniuk Science Reporter for Canada's National Newspaper</p> <p>VIEW PROFILE ></p>
<p>David Gibbons Manager - ESA Space Solutions Centre Ireland</p> <p>VIEW PROFILE ></p>	<p>Dr. Michaela Musilova Senior Research Advisor for Mission Control Space Services</p> <p>VIEW PROFILE ></p>	<p>Claire FitzGerald Founding Director of Mapsphere Ltd.</p> <p>VIEW PROFILE ></p>	<p>Rory Fitzpatrick Chief Executive Officer of the National Space Centre, Cork</p> <p>VIEW PROFILE ></p>
<p>Rory Scarrott Research Assistant at University College Cork's MaREI Centre</p>	<p>Ruth McAvinia APPEC Communications and Outreach Co-ordinator</p>	<p>Elaine Kelly Mechanical Design Engineer</p>	<p>Owen Hughes Manufacturing Technician</p>

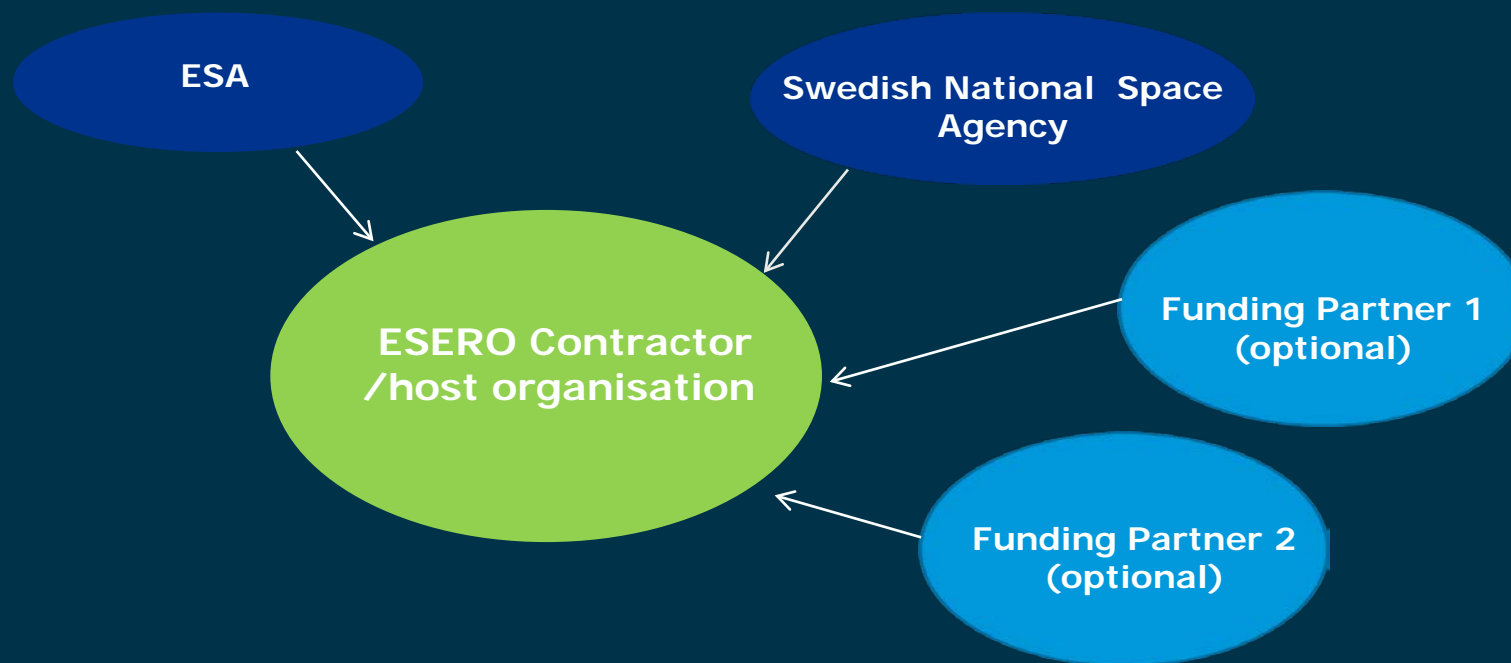
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PROJETO - INICIATIVAS - CARREIRAS RECURSOS - CIENCIA VIVA

LOGIN

<p>Engenheiro Aeroespacial</p> <p>Vasco Pereira, engenheiro aeroespacial na Airbus Defesa & Espaço, fala sobre a sua carreira como engenheiro de altitude e controlo orbital.</p>	<p>Engenheiro de Apoio do Segmento Terrestre</p> <p>Um Engenheiro de Apoio do Segmento Terrestre trabalha numa estação terrestre que dá apoio e comunica com aeronaves como satélites ou sondas científicas.</p>	<p>Engenheiro de Materiais</p> <p>Através do uso de materiais bem conhecidos, ou manipulando átomos para formar algo completamente novo, os engenheiros de materiais criam novas ferramentas e processos para levar a tecnologia um passo à frente.</p>
<p>Engenheiro Electrotécnico e de Computadores</p> <p>Bruno Carvalho, engenheiro electrotécnico e de computadores na CRITICAL Software, fala sobre a sua carreira como responsável pela área de negócios do espaço na sua empresa.</p>	<p>Engenheiro Eletrotécnico e de Computadores</p> <p>Ricardo Conde, engenheiro eletrotécnico e de computadores na Edisoft, fala sobre a sua carreira como gerente da estação de monitoramento da ESA.</p>	<p>Físico de Plasmas</p> <p>O projeto de uma nave espacial para exploração planetária requer um conhecimento profundo da física de plasmas para a entrada da nave espacial na atmosfera.</p>
<p>Geógrafo</p> <p>Gonçalo Vieira, Geógrafo no CEG/IGEOT da Universidade de Lisboa, fala sobre a sua carreira como investigador e docente na área dos efeitos das mudanças climáticas nas regiões polares.</p>	<p>Geólogo de Marte</p> <p>David Vaz, geólogo de Marte do Centro de Investigação da Terra e do Espaço da Universidade de Coimbra (CITEUC), fala sobre a sua carreira.</p>	<p>Historiador da Ciência</p> <p>Um historiador da Ciência estuda a evolução de uma área científica como a matemática, a física, química, etc.</p>

Funding ESERO Sweden project



Funding: = < 50% ESA (cash) + >= 50% from Space Agency + National Funding partners (cash and/or in-kind)

Funding scheme

The overall (ESA + national) funding goes to the ESERO leading organization, which then redistributes it to the other operational partners clearly identified in the approved proposal to ESA



Different models across ESEROs

ESERO Germany: The consortium is led by the Geomatics Research Group of the Ruhr-University of Bochum and further includes the Remote Sensing Research Group of University of Bonn (UoB); the Zeiss Planetarium Bochum; the Bochum Observatory; the Hausdorff Centre for Mathematics (UoB); the Physics Institute (UoB); the Argelander-Institute of Astronomy (UoB); the Institute of Physics Education at Cologne University; and zdi.NRW. ESERO Germany is co-funded by ESA and the members of the consortium, and managed in collaboration with DLR.

ESERO Spain: Based in Science Centre Parque de las Ciencias, Granada, ESERO Spain is funded nationally by the Parque de las Ciencias Consortium, the Andalucía Education Council of Junta de Andalucía, as well as partners in other Spanish regions, such as: Xunta de Galicia, Department d'Ensenyament Generalitat de Catalunya, Centro Astronomico Aragonês, Comunidad de Madrid, Generalitat Valenciana, and many others.

ESERO UK: based at the National STEM Learning Centre in York, it is operated by STEM Learning Ltd. Besides ESA, key funding partners include the Department for Education in England (DfE), Science and Technologies Facilities Council (STFC) and the UK Space Agency (UKSA).

ESERO Netherlands: based at the Nemo Science Learning Centre in Amsterdam, it is co-funded by ESA and the Netherlands Space Office (NSO).

Conclusion: Key ESERO Pillars

Task 2: Primary & secondary school-level teacher training (pre-service and in-service)

Task 3:

- Curricular didactics materials/classroom resources (lessons, experimental kits, etc) for national and European community
- Coordination of school projects

Task 5: Collaboration with industry and academia involved in space-related activities for: mentoring, support school activities, role modelling and careers

Task 4: Promotion of all offer



Task 1: Management / project coordination



Thank you!

<https://www.esa.int/Education>

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