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NEW EDUCATION KS WEBINAR

13th January 2021 11:00 CET

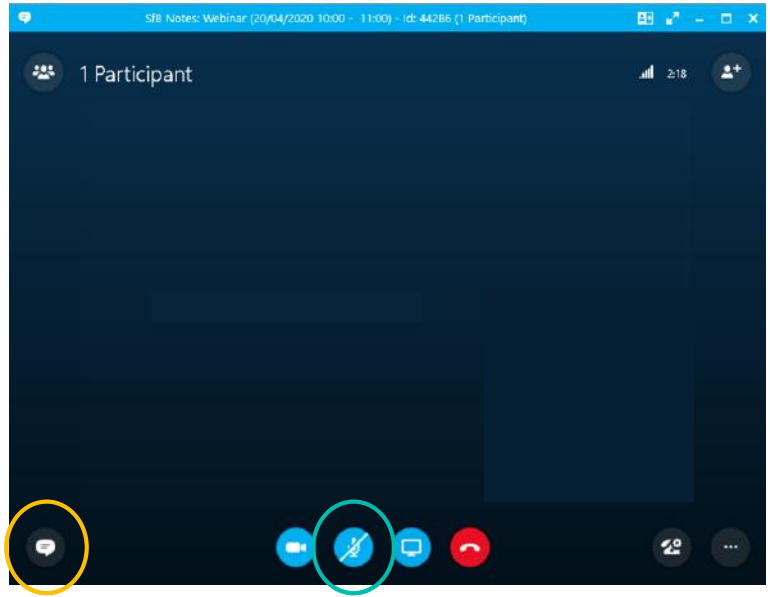
Giulia Manzetti (ESA)
Beatrice Barresi (ESA)

WELCOME TO THE WEBINAR!

Before we start...

- Due to the number of attendees, please **keep your microphones muted** at all times and switch off the webcam function

- You can use the **conversation function** anytime to submit your questions. They will be addressed during the Q&A at the end of the webinar



AGENDA

- **ESA introduction**
- **ESA's New Education Kick-Start Competition**
  - Introduction and objectives
  - Areas of interest
  - Value of Space
- **Education projects examples (with Guest Speakers)**
- **ESA Kick-Start - How to apply**
- **Open Questions & Answers session**

THE EUROPEAN SPACE AGENCY

Purpose of ESA

To provide for and promote, for exclusively peaceful purposes, cooperation among European states in space research and technology and their space applications.

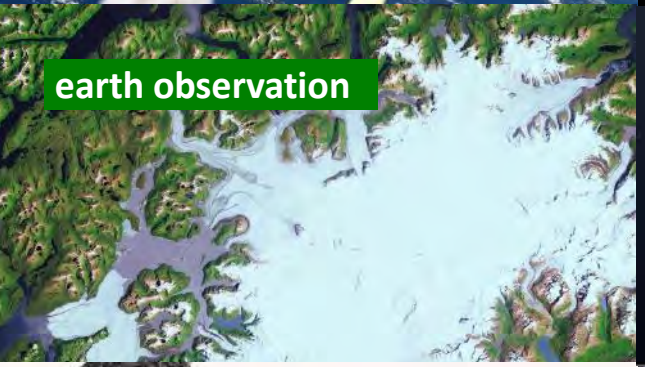
Facts and figures

- Over 50 years of experience
- 22 Member States
- 8 sites across Europe and a spaceport in French Guiana
- Over 80 satellites designed, tested and operated in flight

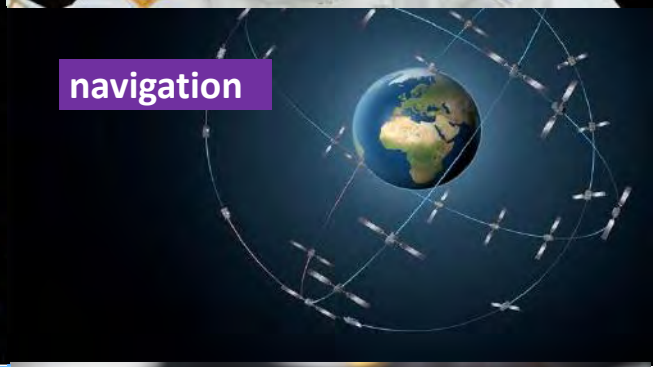

space transportation


science


human spaceflight


earth observation


telecommunications
and applications


navigation


exploration


operations


technology

ESA SPACE SOLUTIONS

- MARITIME
- HEALTHCARE
- TRANSPORT
- ENVIRONMENT
- AGRICULTURE
- MEDIA
- ENERGY
- EDUCATION
- AVIATION
- FINANCIAL
- SPACE WEATHER
- EARTH OBSERVATION
- SATELLITE NAVIGATION
- SATELLITE COMMUNICATION
- HUMAN SPACEFLIGHT TECHNOLOGIES

→ ESA SPACE SOLUTIONS OFFERS

esa space solutions

- Zero-equity funding (from €50k to €2M+ per activity)
- A personalised ESA consultant
- Technical support and commercial guidance
- Tailored project management support
- Access to our international network of ESA and partners
- Access to our network of investors
- Credibility of the ESA brand

NEW EDUCATION KS

New Education Kick-Start

Winners of the competition will run a 6 month study, called a Kick-Start.

During the Kick-Start, teams will look at:

1. Engaging with users
2. Assessing the technical feasibility
3. Developing the business model and plan

Kick-Start activities typically cost €80K and each winning team will receive 75% funding by ESA up to €60K

Visit: https://business.esa.int/funding/intended-tender/new-education

Areas of interest

- Citizen Science
- Serious Games
- Virtual Labs
- Education through Art

- **Citizen Science**

  Citizen science describes the practice of public engagement and collaboration in research and innovation, by designing experiments, providing new data, using experimental devices and sensors, and interpreting data by creating results that are interesting for many applications.

- **Serious Games**

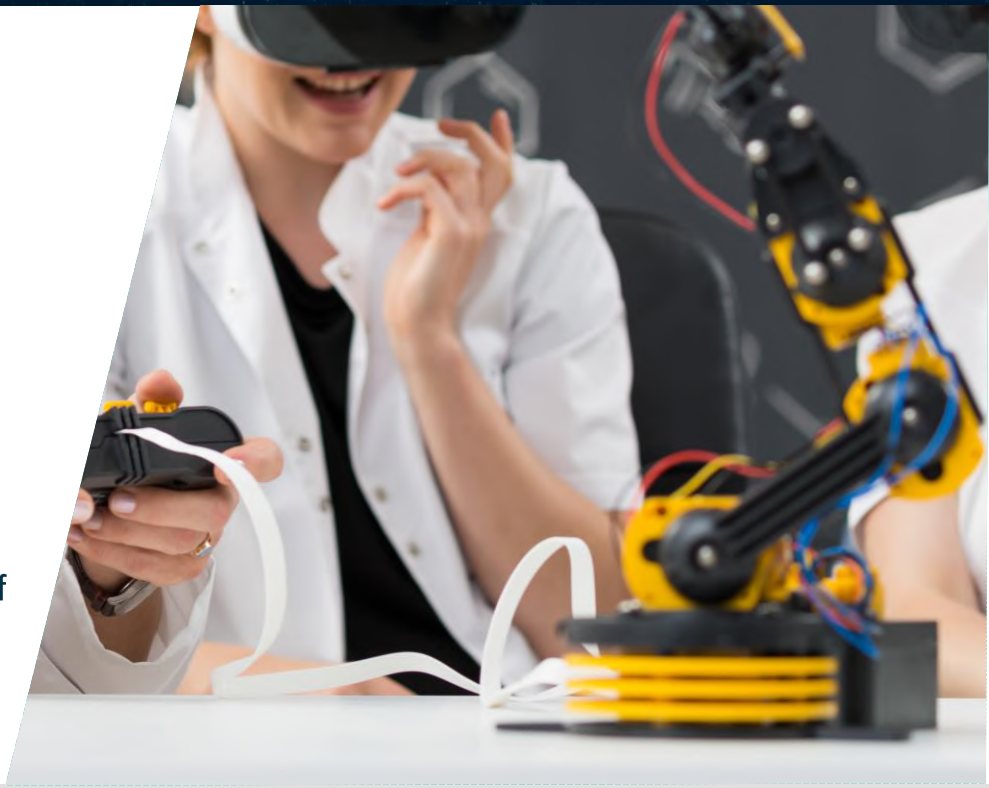
  Serious games combine learning strategies and game elements to teach specific skill. Serious games can be applied to different areas: Student education, Training, Healthcare, Emergency management, Engineering etc.

- **Virtual Labs**

  Virtual labs are interactive environments for creating and conducting simulated experiments, through a desktop computer or a VR headset. They allow STEM students to perform experiments that are difficult to perform in a traditional lab, due to its danger and high cost.

- **Education through Art**

  Earth Observation images can be used for creating pieces of art. Posters, animations and (digital) books with high resolution EO images can transmit strong messages related to environmental matters; e.g. showing the effects of climate change, the impacts of urbanisation and human settlement, or the fragility and beauty of our planet with its natural wonders.



VALUE OF SPACE

esa space solutions

Earth Observation

- Providing real-world data for the creation of virtual worlds;
- Providing maps for learning about the environment (in gamified contexts);
- Creating postcards, posters, murals, animations, books and digital books.

Satellite Navigation

- Positioning information for geo-locating students or other users “in-field”, and guiding them to real-world points of interest;
- Geo-locating data collected by students or other users;
- Providing geo-location information about situations in real time.

Satellite Communications

- Extending access to e-learning resources to remote regions;
- Connecting students from disparate parts of the world to facilitate inter-exchange of ideas and culture (e.g. “virtual exchange programmes”);
- Providing connectivity where terrestrial communications is insufficient.

EDUCATION PROJECTS (EXAMPLES)

ESA co-funded project examples

- Space for Children - Riccardo Boccuzzi (Hypex)
- S.T.E.L.L.E. - Giuseppe Santoro (Protom)
- DreamCoder 2.0 - Veronica La Regina (Nanoracks Europe)
- Space Edu Park - Livia Ranieri (Remedia Italia)
- Earth Blox for Education - Iain H Woodhouse (University of Edinburgh)
- Class@cross - Filomena Cuccarese (Openet Technologies S.p.A.)

A NEW **EDUCATIONAL TOOL** FOR CHILDREN & KIDS

Riccardo Boccuzzi, CEO, Hypex
r.boccuzzi@hypex.video

hypex

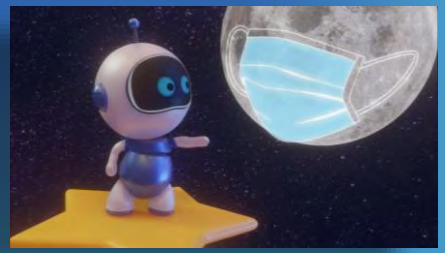
THE RIGHT CONTENT FOR THE RIGHT TARGET

1. Fantasy genre and a funny character as medium to learn
2. Children as protagonists to build empathy with the audience
3. Short enough to avoid boring, long enough to enjoy the ride

hypex

EDUCATIONAL STORYTELLING

1. Define the problem as something in common
2. Define the solution as something achievable
3. Talk about universal values in simple words



GAMIFICATION FOR A YOUNG AUDIENCE

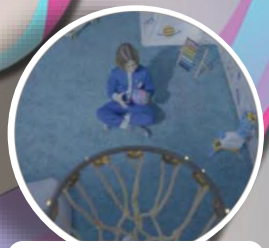
1. Let users interact with a real protagonist (no 3D)

2. Plan their choices to understand them

3. Collect their choices for behavioral analysis

READING

VIDEOGAME



BASKET

VIDEO ABSTRACT
FROM SPACE FOR CHILDREN

S.T.E.L.L.E. - Satellite Technology to Enabling new Learning and Lessons Environment

Giuseppe Santoro | Innovation lab manager
giuseppe.santoro@protom.com

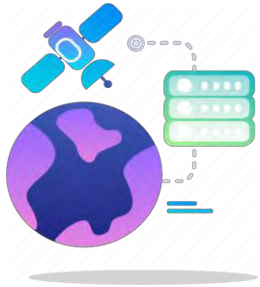
STELLE

STELLE project summary

Scuolab SDA (Satellite Data Augmented) – remote available interactive learning contents for frontal lessons as for self-learning sessions

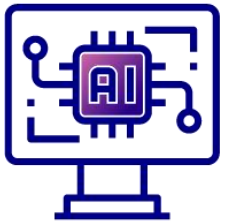
VR contents

Starting form ESA data and contents (available online) and will address climate topics (for example pollution) that will be described in a wide range of points of view and impact different fields.



Satellite Data Augmented

This solution will enable a qualified learning process enhancing the unlimited value of data collected by ESA satellites, making them available to a wide set of people using a simple and addictive way to perceive the value of data collected from our Earth

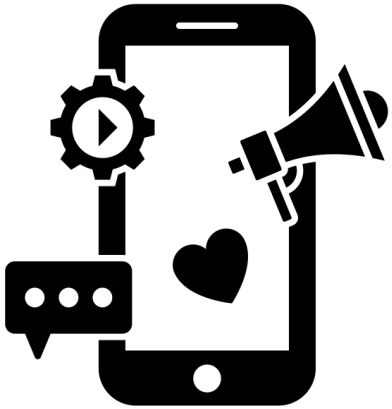


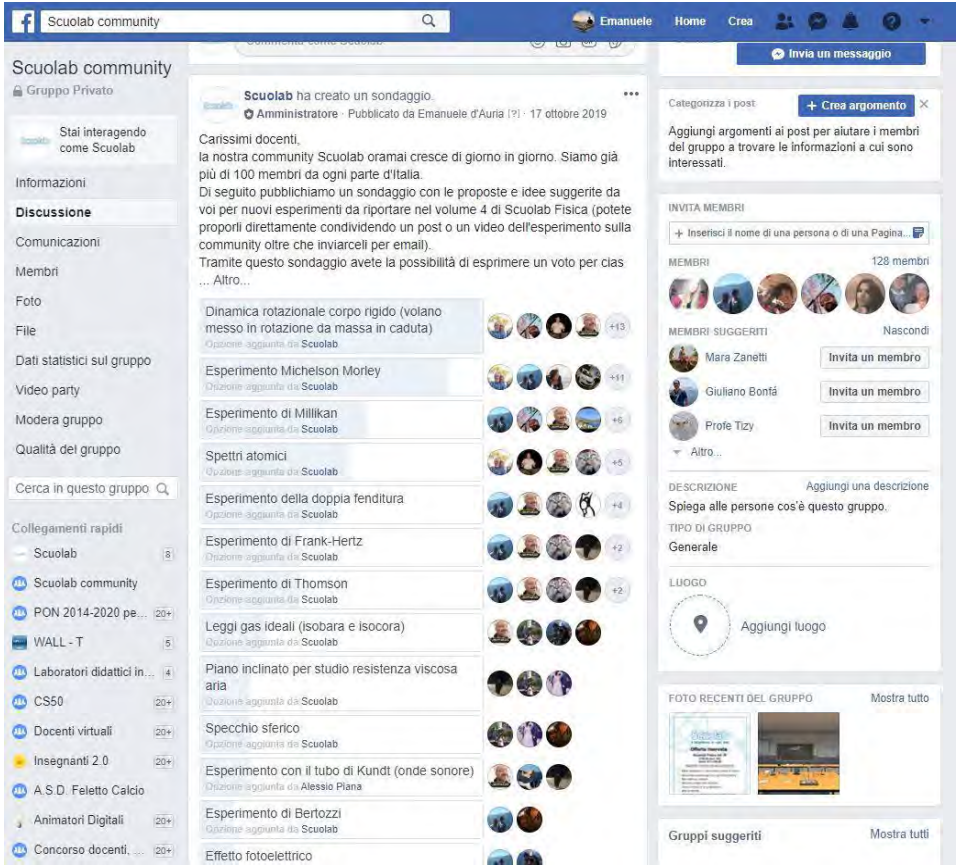
ML/AI

The AI-Artificial Intelligence will be used also to provide a decision support system both to professor and students giving qualified feedback on the general and individual learning

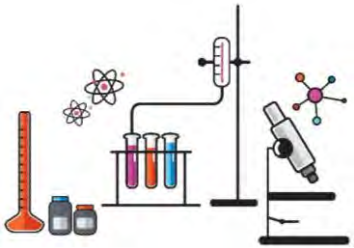
Value co-creation

Leading role of the teachers in the content creation





VR contents



Content	Related Lab & Experiences
Oceans' temperatures	Titration of dissolved in water oxygen, oxygenation's phenomena observations
Oceans' pH variations	Water's and other liquid's pH measurement and phenomena's observation of the effects of acid rains
Presence of serra effect's gas in the atmosphere and in the sea	Titration of CO2 concentration in water
Temperature's observation and variations in the sea and in terrestrial areas	Specific warming's measurement and warming's observations on bodies and virtual thermic cameras
Reflection capacity of the ground and reflectance phenomena	Refraction and reflection's experiments on materials and related observations
Radiations	Luminous radiations' interferences experiences and related observations
Big Data from Earth	Techniques and tools to try to discover grouping and correlations inside data

Interactive maps & lab experience scenario

DreamCoder 2.0

dreamUp DreamCoder

Nanoracks SPACE OUTPOST EUROPE

In partnership with

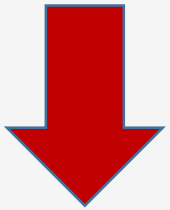
RINA

vlaregina@nanoracks.com

Problem Statement

- *Identification of the gap between the current status (DreamCoder 1.0) and the desired status (DreamCoder 2.0)*

- **Current Status:** DreamCoder 1.0 is a stand-alone tool to python-programming the sagan board via launchpad code editor and a learning section (Space Program provides an overview of key-elements of space sciences and coding subjects)



- **Desired status:** users (teachers and students) would be able to work remotely via digital access to a common virtual environment including the DreamCoder experience

dreamUp DreamCoder Nanoracks SPACE OUTPOST EUROPE *In partnership with* RINA

vlaregina@nanoracks.com

User needs

- Education is moving digital and covid-19 pandemics requires tele-school content **delivery** **[market sector: schools]**
- Education is getting a permanent and continuous need of individuals for fun and for learning new contents **[market sector: tech enthusiasts, individuals]**
- Education is becoming a team-building experience in smart working **[market sector: corporations]**

vlaregina@nanoracks.com

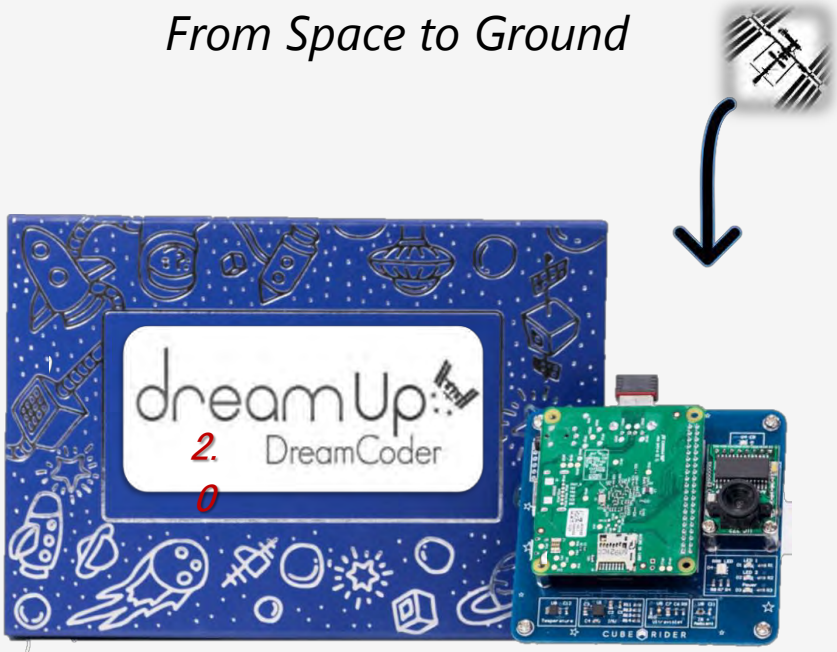
New Education measures @ Covid-19 outbreak

What is it?

- It is everyone's dream to digitally access the ISS
- Space demands a transdisciplinary background and skills to integrated various disciplines
- Assets are Space-based and Ground-based (Launchpad, Sagan board)
- Improvements for skills about IT & Electronics, Space Sciences, Python programming

DreamCoder 2.0

From Space to Ground



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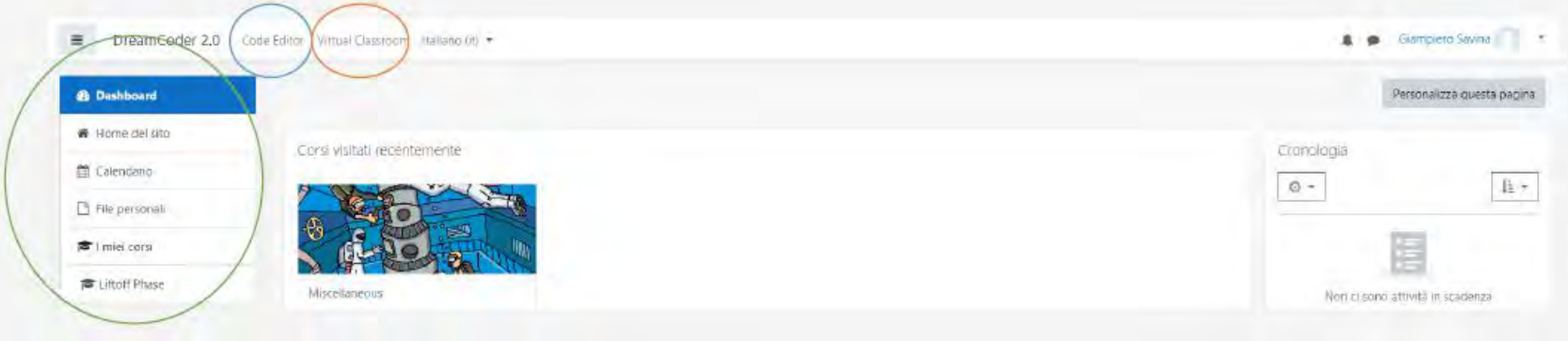
DreamCoder 2.0



Virtual Classroom

Code Editor

Dashboard

dreamUp DreamCoder

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ReMedia IT
get inspired

New education
An ESA Kick start activity

Space Edu-Park:
the Italian pilot
In lower secondary schools for STEM education.

THE SPACE EDU PARK PROJECT

WHAT IS THE PROJECT ABOUT

Space Edu Park is an educational project designed to create an innovative pedagogical method for students' learning at home. It is based on a new holistic didactic model and a **gamification approach. Space Edu Park is designed to be** a dedicated educational environment to provide **longer-term opportunity to create benefits in terms of a more engaging teaching/learning process.**

THE GOALS

Innovate the educational model, integrating **effective** an **engaging distance learning solutions** for **science education** following the approach of the **flipped classroom.**

Impact the emotional and cognitive dimensions of the learning process**.**

THE SPACE EDU PARK PROJECT

SPACE EDU PARK LEVERS

GAMIFIED E-LEARNING PLATFORM
Games, avatar, badges and rankings for students' engagement. Hard & soft skills development and evaluation

THE STORYTELLING
- Enhance the Earth Science Italian ministerial curricula in the form of an attractive and engaging story able to connect the different topics of the course

SPACE ASSETS
- Earth Observation
- Earth and Climate
- Copernicus
- Earth Explorers Missions

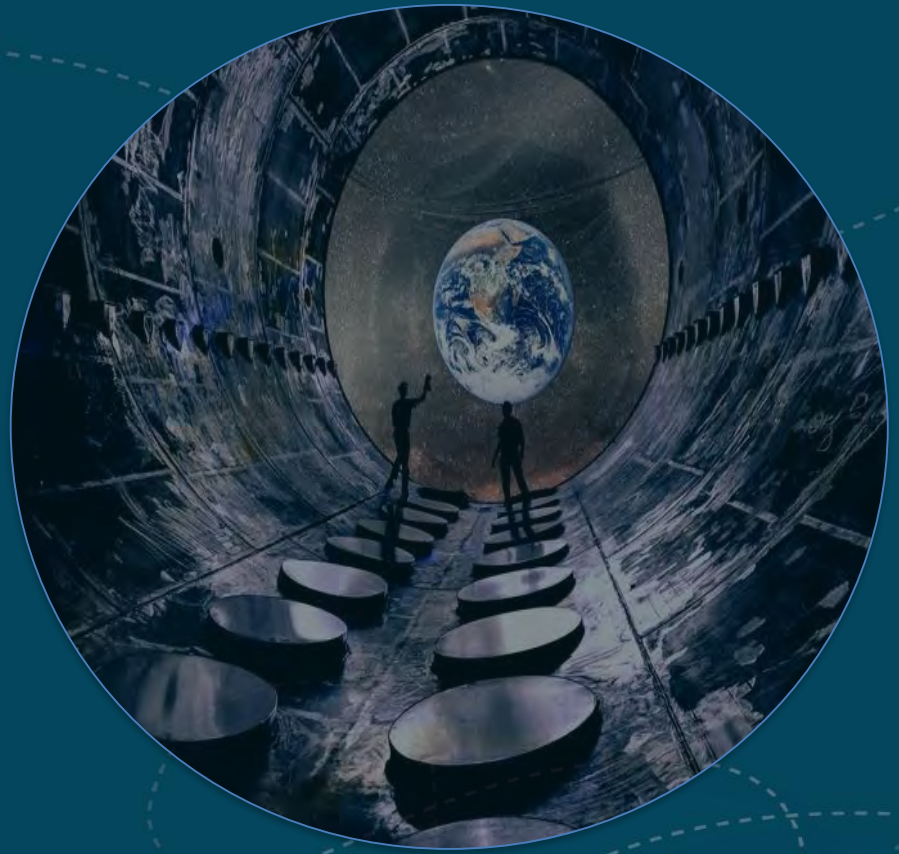
AR AND VR ENHANCEMENTS
- learning by doing
- engaging and captivating learning environments

THE SPACE EDU PARK PROJECT

THE PILOT

The pilot idea was born in **the current pandemic context in** which educational activities need to be all at once re-adapted as distance learning lessons. The pilot is designing a gamified **Earth science course** for the **Italian lower secondary students. T**he same platform, in future, will also be customised to host contents for older students and other topics.

We are ready to start the mission…Are you?



Earth Blox for Education

Iain Woodhouse i.h.woodhouse@ed.ac.uk

EARTH BLOX

EARTH BLOX

THE UNIVERSITY OF EDINBURGH

Quosient

EDINA

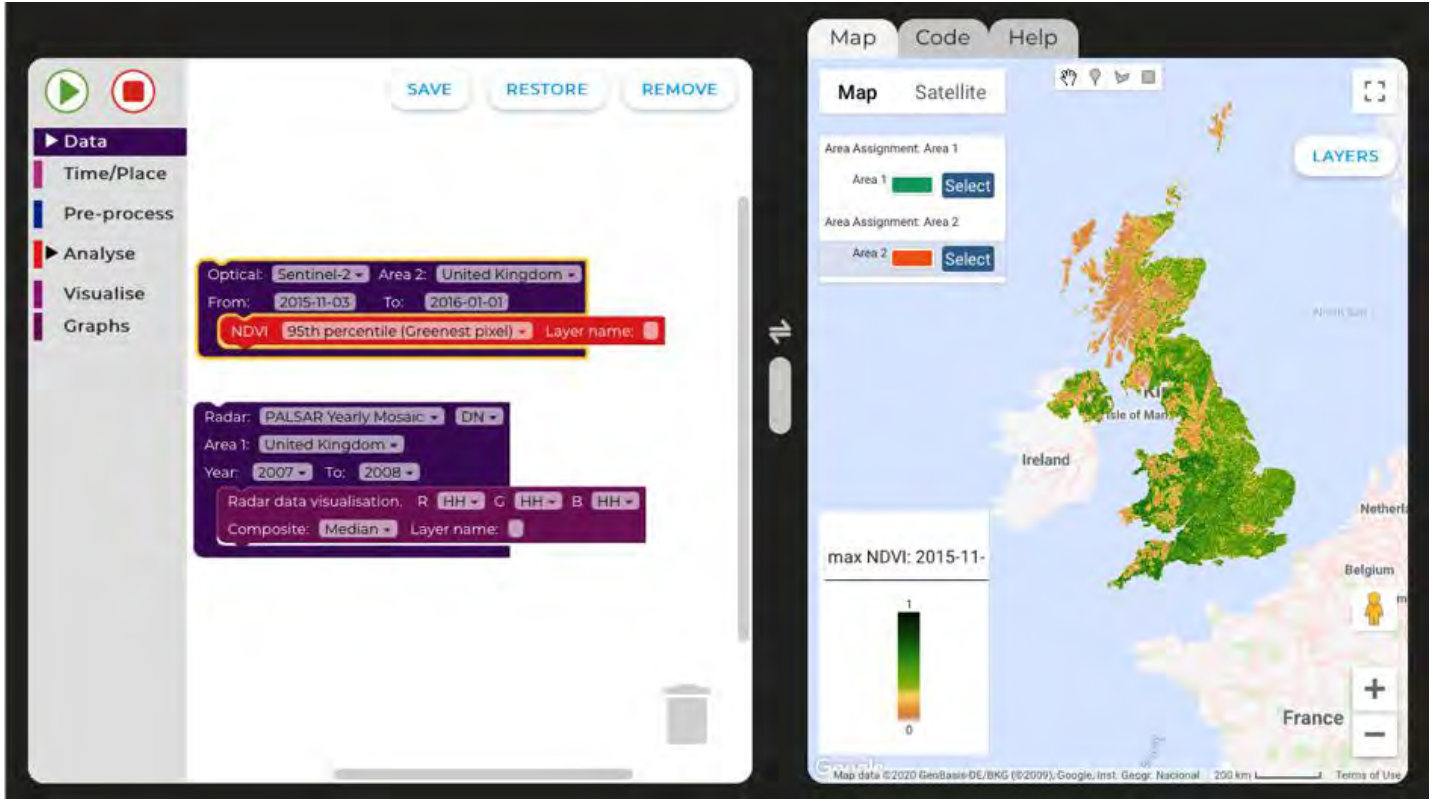
UNIVERSITY OF LEEDS

The Open University

University of Glasgow

STEM LEARNING

WWW.BLOX.EARTH **@EARTHBLOX**



HEADLINES

- Earth Blox for Education V.1.0 running and being used in classes.
- “*Really pleased with how its gone*.” (Staff at Leeds)
- “*The Earthblox stuff seems easier than the QGIS*” (Student at Leeds)

Key innovations in Earth Blox for Education

- VLE connectivity (authentication).
- Automated (formative/summative) assessments.
- Incorporate feeds from other APIs
- Two online courses in EO using Earth Blox

Class@cross

Demonstration project in response to

COVID 19 emergency

Filomena Cuccarese
Managing Director /Project Manager
Openet Technologies S.p.A.

Openet

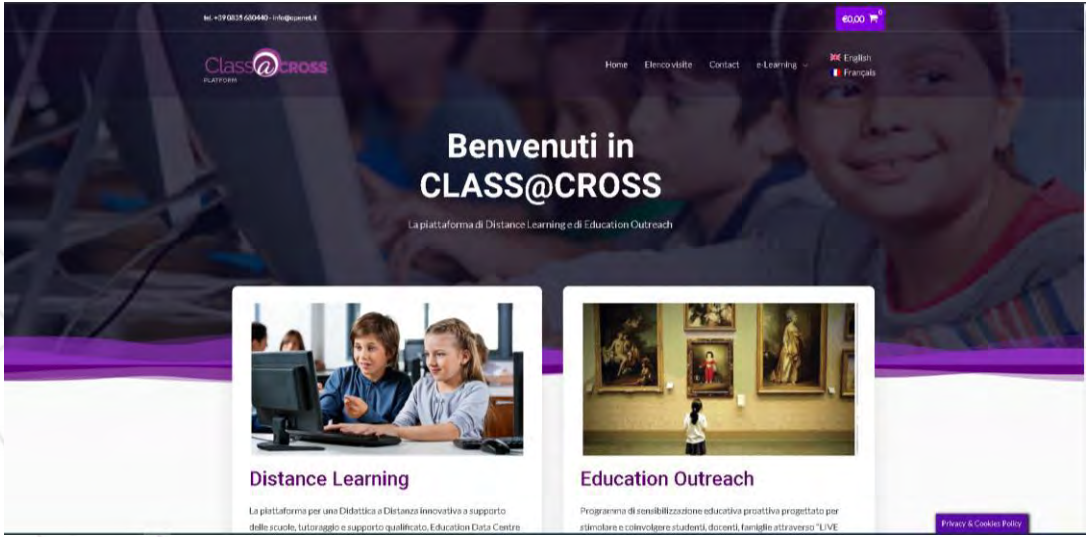
esa
European Space Agency

asi
Agenzia Spaziale Italiana

Class@CROSS

Aim of the project

The Class@cross project is developing a SATCOM solution integrated with the new 5G technology aiming at offering an **Education Outreach platform** accessible from any ICT device in order to enrich the educational opportunities with special regard to the social factors and cultural and scientific contents.



The Class@cross solution

The solution is based on the following elements:

A) Existing element developed during the ONE CLASS! Project

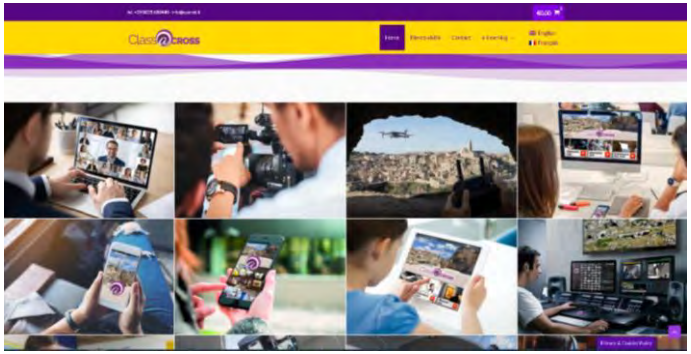
The Openet eLearning platform based on synchronous and asynchronous teaching)
B) New elements to be developed during the Class@cross Project

1. Mobile Application (APP) in order to support the portability of the service and widespread the participation and accessibility.

2. Education Outreach aiming at valorizing the social, scientific and cultural aspects:

- Laboratories: LABs within schools where teachers organize lab activities and users can access the contents both through the Live LAB channel and on demand and can interact with teachers. The possibility to schedule and book laboratories activities will be foreseen.
- Live Education: live tours/visits organized within museums, science centres, cultural centres/institutions (castles, royal palaces, theatres, national libraries, art galleries, museums, etc.) and more in general “places for cultural and scientific growth” aiming at bring culture and science at students’/teachers’ homes, resetting distances.

Openet sets up a tv/broadcasting centre within the science, research and cultural institutions in order to allow the production of “live” tours and visits that can be customized. Users have the possibility to create a direct link with the researcher, astronomer, cultural experts and enjoy a “live” participation thanks to the satellite and 5G technology (i.e. look at the solar system through the telescope, visit the planetary, visit the Park of Rocky Churches in Matera, be involved in a school laboratory activity and interact with the teacher, visit the botanic garden, etc.).



Innovation aspects

- Class@cross is proposing an **alternative solution to the Educational/eLearning tools/platforms available on the market**. The integration of the Openet eLearning Platform with the Education Outreach element creates the real benefit by offering the market a “one stop shop solution” rather than a service
- The proposed service represents an innovative solution because it **integrates a standard eLearning platform with the possibility to improve the scientific, cultural and social factors and facilitate access to contents different from those strictly related to the didactic path.** Several institutions dealing with culture, science, research can valorize their knowledge and resources heritage and contribute to enriching the didactic path of students and the professional and careers opportunities horizon.
- The Class@cross solution integrates all elements acting also as a “filter” for scientific and cultural contents (thanks to the activation of collaboration with the most representative institutions at a national and international level) supporting teachers and more in general schools in saving time and get high quality contents for their daily activities.
- Students and teachers can interact **facilitating social “virtual” interactions** in order for them to stay in contact with their friends and classmates and to reassure children that they are not alone. **Interactions with the guides** during the tours, represent the value added with respect to the virtual tours already available on the market offered by several platforms/channels, where the only possibility to enjoy contents is the “passive” way.
- The Class@cross solution offers to students, teachers but also families the opportunity to enjoy cultural and scientific contents thanks to “live” tours that can assure interactions and the possibility to personalize the tours/visits.

Partners

a) INAF Astronomic Observatory in Capodimonte, is the main Italian body for astronomical and astrophysics research from the ground and from space. It mainly offers space and astronomic outreach activities by virtualising most of its school related laboratories like:

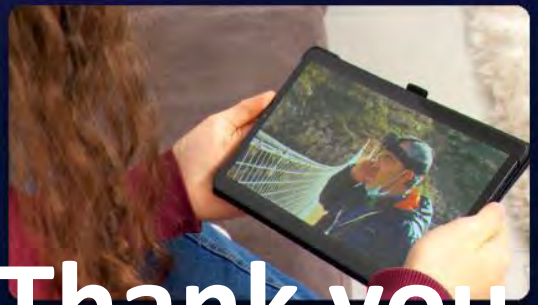
b) Comprehensive Institute E. Fermi Matera

School Labs: Comprehensive Institute “E. Fermi” of Matera allow students to virtually experience new learning methodologies and new skills in the direct relationship with business and technology. Thanks to the installed ultra-high definition audio-video infrastructure and the uplink satellite connection students are able to participate to all laboratories (technology and robotics, chemistry, biology, etc.) virtually and interact in real-time with teachers/tutors.

c) Parco della Murgia Materana, one of the most spectacular rock landscapes in Italy.

The park guides have cameras (even mounted on drones) that allow users to have the feeling of actually visiting the park and will be able to interact in real-time in order to satisfy all his curiosities. All these tours are supervised and conducted by highly qualified personnel who will always be available to interact with users connected through the Class@cross App (users previously registered and who have made reservations based on the digital tour calendar). Due to the need to transmit ultra-high definition audio-video content, content providers have the highest technological equipment for audio-video production and a highly performing network infrastructure.

The platform



Thank you

ESA KS - HOW TO APPLY

Who Can Apply?

- ESA Space Solutions can provide funding for Kick-Starts to any company residing in the following Member States: **Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Luxembourg, the Netherlands, Norway, Poland, Portugal, Romania, Spain, Sweden.**

- Teams from the following countries are not eligible: Austria, Greece, Switzerland and the United Kingdom.

- If you are considering applying, you must contact your National Delegation to obtain a **letter of authorisation** allowing the funding of the proposed activity.

- Contact details of each **National Delegate** can be found here: https://business.esa.int/national-delegations-0

- **Germany, Luxembourg,** and **Norway** have pre-authorised funding. Teams residing in these countries do not need to contact their National Delegate.

How to Apply

1. **Register** by completing online questionnaire on ESA-STAR Registration - minimum 'light registration': https://esastar-emr.sso.esa.int
2. **Download** the official tender **documentation** (Invitation to Tender) via EMITS from 14 January 2021: http://emits.sso.esa.int/emits/owa/emits.main
3. **Contact** your National Delegation to learn how to obtain a Letter of Authorisation
4. **Create** 'Bidder Restricted Area' in ESA-STAR
5. **Write your proposal**
6. **Submit** your proposal via 'Bidder Restricted Area' in ESA-STAR Tendering by 31 March 2021 at 13:00 CET

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Proposal Template

Your Proposal should include the following information:

1) Executive Summary (max 1 page)
2) Business Potential (max 5 pages)
3) Technical Concept (max 5 pages)
4) Team and Resources (max 3 pages)
5) Management (max 4 pages)
6) Financials (max 2 pages)

Kick Start Tasks

T0
Kick Off

T0 + 3 months
Mid-Term Review

T0 + 6 months
Final Review

WP1000: User Engagement → Service Requirements

WP2000: Technical Feasibility → System and Service Architecture

WP3000: Economic Viability → Business Plan

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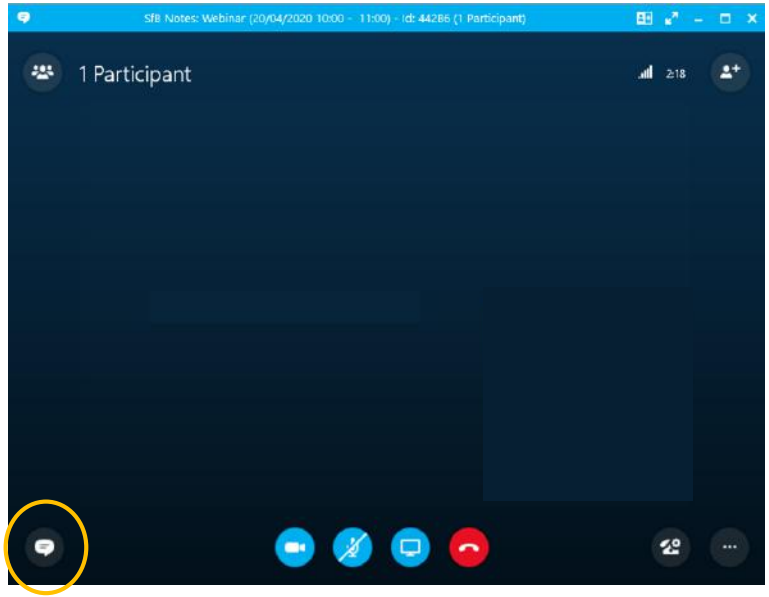
Overall Aim

Kick-Start — Explore the technical feasibility and commercial viability of a service

Demonstration Project — Develop the application and pilot the service with end users on board

Operational service — Ultimate aim is to have an economically sustainable service

OPEN QUESTIONS & ANSWERS SESSION



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