



Rapporti Tecnici INAF INAF Technical Reports

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STEAM Med

STEAM-Med: a co-design for Med Children

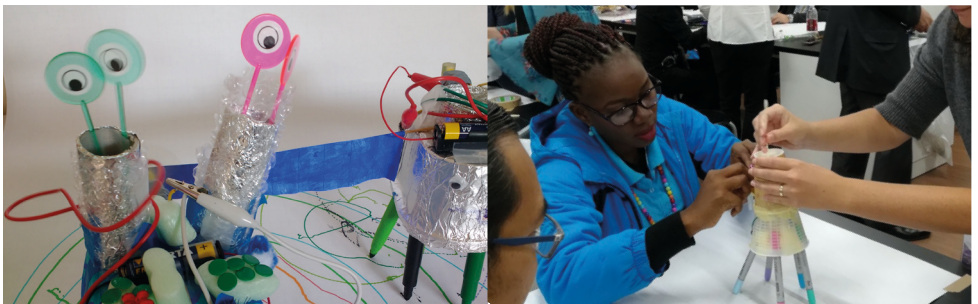
STEAM-Med is a global effort coordinated by I-OAE to build a community of practices and people centered on children in the approximate age-range 6-12 living in the Mediterranean area. We open up a space for an exchange of practices and ideas and to co-design a set of educational activities connected by a common storytelling. The results will be shared and refined in a regional summer school and then published on the OAE website. The whole project and process including the co-design will be documented and shared.



"International collaborations and networking activities could be crucial for educators [... because they] normally promote teacher training, networking occasions and activities and resources to share. They [...] provide ideas, sometimes funding, always motivation, and inspiration to teachers and kids everywhere."

Alessandra Zanazzi, I-OAE Italy

Often primary school teachers do not feel they are "good enough" to teach physics and astrophysics, they don't "own" their own teaching when it is about science; often at school children are taught the names of things and their description but this does not imply they have understood the concept. With this project we want to find a common ground, a general idea and then put together a series of experiences that can help children and also teachers to own basic ideas and concepts and understand also how Science works.



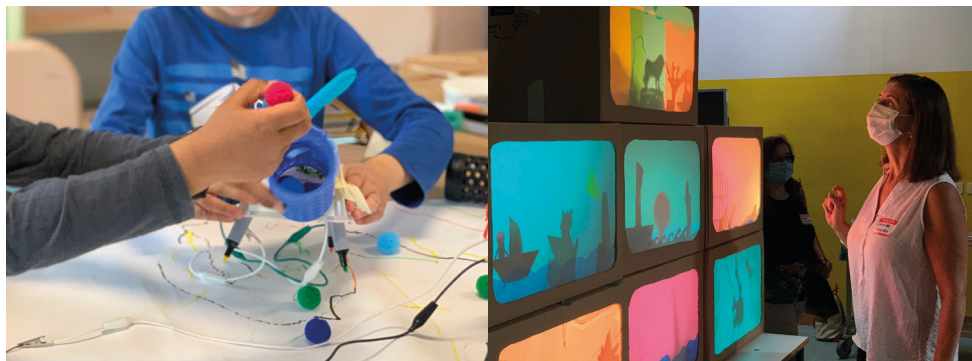


Officina degli errori

Kick Starter: Officina degli Errori/Officina della Luce

As a “kick starter” within STEAM-Med, for future communities of practices, co-design experience with teachers and STEAM learning at school, I-OAE also invested in an Italian educational project called “Officina degli Errori” (Workshop of Errors).

This project is a research/action project focused on the use of constructionist practices, such as tinkering, in formal education (primary school). This project - ongoing from 2017 - was fully codesigned with teachers with several rounds of interaction in different occasions and structures (teacher training, round table, co-facilitation of workshops, co-analysis of textbooks) not only about the teaching and learning process, but also about discussing the teachers’ feeling fit to teach STEM disciplines and what they expect from themselves, the meaning of science (and its teaching) in the knowledge society.

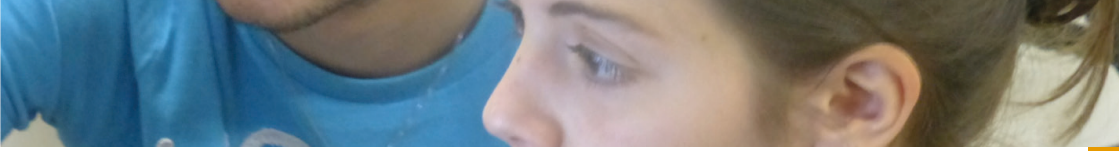


“Recent research has shown the importance of actively including teachers in designing and testing new educational materials.”

Joanna Holt, The Netherlands NAEC, Netherlands Research School for Astronomy

We are now testing the full “Officina degli Errori” at 5 schools in Italy (about 400 children and 40 teachers) implementing tinkering in a formal education environment and engaging the teacher with educational documentation thanks to INDIRE researchers (INDIRE – the National Institute for Documentation, Innovation and Educational Research, is the Italian Ministry of Education’s oldest research organisation).





Our project provides tinkering moments, in which children explore materials, express themselves, wonder about things and ask themselves questions in order to solve a problem; they work as a scientific community, exchanging ideas and solutions and building up together a shared knowledge. It is also important to provide moments of formalization and generalization of the constructed knowledge, so we collected hands-on labs which include some of the possible learning outcomes from the tinkering experience. The idea we are investigating in this round is LIGHT. Despite the pandemic situation, we are now collecting evidence of this process and of the usability within Italian primary schools.



Pixel

Design and test of game-based learning activities

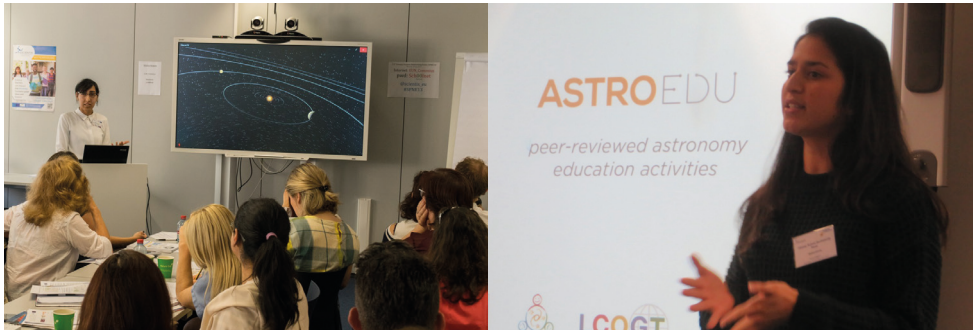
I-OAE has also started a co-design project with game scientists, which led to the creation of a board game, called PIXEL, which was recently presented in a National games convention, Lucca Comics and Games 2021.

PIXEL aims at improving the image resolution of astronomical objects, through engaging game mechanics mirroring the features of scientific research, promoting lifelong learning through STEM.



AstroEDU

astroEDU is an open-access platform for educators around the world to discover, review, distribute, improve and remix peer-reviewed education activities. astroEDU is the best place to find science activities, particularly those with an astronomical, earth or space science focus. In order to guarantee the quality of the scientific content, educational implementation and credibility, astroEDU activities are subject to a double review by an astronomer and by an educator.



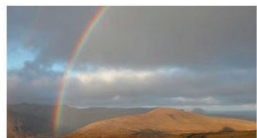
“With astroEDU we wanted to present astronomy education activities at their best. Peer review allows expert scientists and educators to give each author the benefit of their experience to improve education activities. The end result are high quality content, presented in an attractive fashion.”
Edward Gomez, Education Director, Las Cumbres Observatory

astroEDU is a project of the International Astronomical Union, within the framework of the IAU Office of Astronomy for Education. The Steering Committee is composed by Edward Gomez (LCO, UK), Jaya Ramchandani (The Story Of Foundation/Sirius Interactive, India) and Stefano Sandrelli (I-OAE, INAF). Starting from March 2022, the astroEDU Editor-in-Chief is Livia Giacomini (I-OAE, INAF).

FEATURED ACTIVITIES

Reading the Rainbow

DATE: 2022-03-15
 BY: C. SANCHEZ, J. SANCHEZ, SAN HOAQUIN STATE UNIVERSITY; SCOTT T. HERR, SAN HOAQUIN STATE UNIVERSITY



Rainbows are beautiful. By learning about how they work you can learn new things about what is shining the light.

THEME: AGE: 14+

Is the Sun rotating? Follow the sunspots!

DATE: 2022-04-30
 BY: PRISCILLA HUBER, GEMINI OBSERVATORY; MARLA CLAU STANLEY, GEMINI OBSERVATORY; DEBORAH SCHEIDT, GEMINI OBSERVATORY

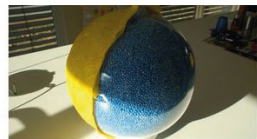


The Earth rotates on its axis, giving us night and day – but what about other celestial objects like the Sun?

THEME: AGE: 12 – 19

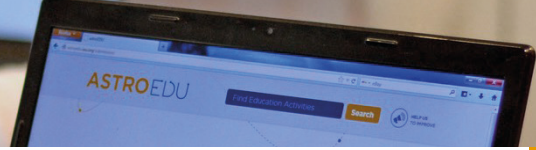
One Million Earths inside our Sun

DATE: 2021-03-30
 BY: HANNAH PITCHER, HEAS DAR ARMSTRONGS



Students will learn how to build a model of the Sun, which can fit nearly 1 million little Earth balls.

THEME: AGE: 4+



AstroEDU ITA

astroEDU ITA is the Italian version of the platform, managed by an independent editorial board by the Italian National Institute for Astrophysics in the framework of the I-OAE. Italian speaking teachers, educators and researchers can find in astroEDU ITA the best peer-reviewed education activities focused on astronomy, Earth or space science and can collaborate by submitting or reviewing.



Teaching astronomy takes both solid knowledge of the subject itself as well as educational skills, such as knowing appropriate methods and techniques for teaching."

Markus Pössel, OAE HQ Head

One of the main goals of astroEDU is to promote the use of excellent activities worldwide. To pursue this objective, different national versions of the online platform are built with independent editorial boards and submission is accepted in different languages.

ASTROEDU UNISCITI A NOI VOLONTARI Cerca

Misurare la velocità media di una cometa

Misuriamo la velocità media della cometa C/2019 Y4 nella prima parte della notte del 2 aprile 2020. Analizzeremo le osservazioni effettuate
Stefano Sandrelli, INAF; Giulia Lafrate, INAF; Riccardo Bevilacqua, INAF; Giulia Pantiri, INAF

Goals

- Osservare, descrivere, analizzare qualitativamente il movimento di un corpo
- Osservare, descrivere, analizzare quantitativamente il movimento di un corpo
- Essere consapevole della rappresentazione di un fenomeno
- Essere consapevole del significato di "misura" e di "errore" associato alla misura
- Essere consapevole del significato di "stimati" di una grandezza
- Essere consapevole della potenzialità delle tecnologie per rappresentare il movimento di un corpo
- Incoraggiare il pensiero critico-creativo

KEYWORDS
velocità media, distanza, errore, misura, traiettoria, tempo, spostamento, scuole secondarie

ETÀ
14 - 19

LEVEL
Secondary

DURATA
1h30

GROUP
Group

SUPERVISED
No

COST PER STUDENT
Free

LOCATION
Computer Laboratory

Equity in access to knowledge

The IAU is making a great effort in empowering diversity and equity in astronomical educational contexts, by designing welcoming environments and activities, so as to engage different learning styles and enhance the richness coming from diversity. “Equity, Diversity and Inclusion in Astronomy Education” was the title of one of the sessions of the 3rd Shaw IAU Workshop of last October, advancing the message that everybody should be given free and equal access to scientific culture.



“Each student is unique and has a unique learning style. Some can even be differently abled. But all of them also have unique learning strengths which are closely related to their unique learning styles. [...] how can we teach all this diversity together?”

Amelia Ortiz Gil, Spain NOC, University of Valencia Astronomical Observatory

I-OAE is engaged in designing and testing inclusive activities for astronomy education. One of the pilot project for this is the creation of educational laboratories based on the exhibits of the IAU “Inspiring Stars” international exhibition. In order to collect feedbacks and ideas for possible tactile and multisensory activities, I-OAE worked on the exhibition “Sotto lo stesso cielo” (under the same sky) on display at “Palazzo delle esposizioni” di Roma with some exhibits of the “Inspiring Stars” exhibition and the projection in the cinema hall of Journey through the Solar System of the Audio Universe project.





Photo from the Office of Astronomy for Education (OAE) Astrophotography Contest 2021

Title: Multicolored aurora in Iceland, by Marco Migliardi on behalf of Associazione Astronomica Cortina, Italy

Caption: 1st Place - Aurorae (still images): Multicolored aurora in Iceland
Credit: Marco Migliardi on behalf of Associazione Astronomica Cortina/IAU OAE.
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Brochure compiled & edited by I-OAE
Graphic designer: Laura Barbalini (INAF)
NAECs' map provided by Niall Deacon (OAE HQ)
Acknowledgments: Gwen Sanderson and Markus Pössel (OAE HQ)
for their kind revision and comments.

"Astronomy allows us to think about the past, present, future, who we are, why we are here, so philosophical questions are also playing a big part in the self- and diversity awareness process."

Stefania Varano, I-OAE

"Astronomy is considered a gateway science for education due to its ability to encompass many subjects present in school curricula worldwide, inspire curiosity and foster critical thinking."

*Jorge Rivero Gonzales, The Netherlands,
Joint Institute for VLBI ERIC*

"Astronomy education should not strengthen the divisions among different disciplines; rather, it should show that culture and knowledge are a whole - made up of different points of view, strategies, references and so on. And that different types of knowledge can co-exist without contrasts."

Stefano Sandrelli, I-OAE

"Evaluation is a continuous process that critically examines a program; it can improve program design and implementation, assess its achievements and improve upon its effectiveness. It helps teachers and learners to improve teaching and learning processes. Evaluation helps us to make evidence-based decisions."

Silvia Casu, I-OAE

Office of Astronomy for Education Center Italy members:

Stefano Sandrelli (Head), Sara Ricciardi (Deputy), Livia Giacomini (Officer), Stefania Varano (Officer), Amedeo Balbi (until April 2021), Giuseppe Bono (from November 2021), Caterina Boccato, Dario Del Moro, Elisa Di Carlo, Maysa El Yazidi, Gianluigi Filippelli, Giuliana Giobbi, Riccardo Leoni, Claudia Mignone, Silvia Casu, Rosa Valiante, Alessandra Zanazzi, Anita Zanella