

IAU Office of Astronomy for Education Center Italy

Activities and projects

#astronomyforabetterworld



The Office of Astronomy for Education Center Italy

The Office of Astronomy for Education Center Italy (I-OAE) is a joint project of a consortium of Italian partners led and represented by Istituto Nazionale di Astrofisica (INAF, National Institute for Astrophysics), the International Astronomical Union (IAU) and the IAU Office of Astronomy for Education.

The Italian consortium is constituted by: INAF, the Italian Astronomical Society (SAIt) and the University of Rome Tor Vergata (ToV).

I-OAE HQ are hosted by the INAF - Rome Astronomical Observatory, in Monteporzio. Personnel is selected on voluntary bases according to their interests and competence, in agreement with the Institutes they work for.

Research structures involved so far:

Milan

INAF - Astronomical Observatory of Brera

Padua

INAF - Astronomical Observatory of Padua

Bologna

INAF - Astrophysics and Space Science Observatory of Bologna

INAF - Institute of Radio Astronomy

Florence

INAF - Astronomical Observatory of Arcetri

Italian Astronomical Society Headquarters

Rome

INAF - Astronomical Observatory of Rome - Monteporzio, I-OAE Headquarters

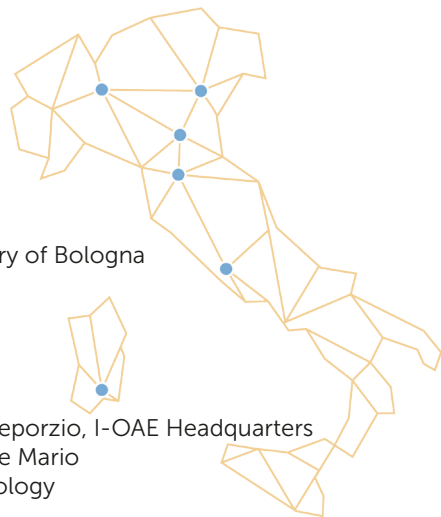
INAF - Astronomical Observatory of Rome - Monte Mario

INAF - Institute for Space Astrophysics and Planetology

University of Rome Tor Vergata

Cagliari

INAF - Cagliari Astronomical Observatory



The International Astronomical Union

The International Astronomical Union (IAU) is the international astronomical organisation that brings together more than 12 000 active professional astronomers from more than 100 countries worldwide. Its mission is to promote and safeguard astronomy in all its aspects, including research, communication, education and development, through international cooperation. The IAU also serves as the internationally recognised authority for assigning designations to celestial bodies and the surface features on them. Founded in 1919, the IAU is the world's largest professional body for astronomers.



About the IAU
<https://www.iau.org/administration/about/>

The Office of Astronomy for Education

IAU established Office of Astronomy for Education (OAE) in December 2019.

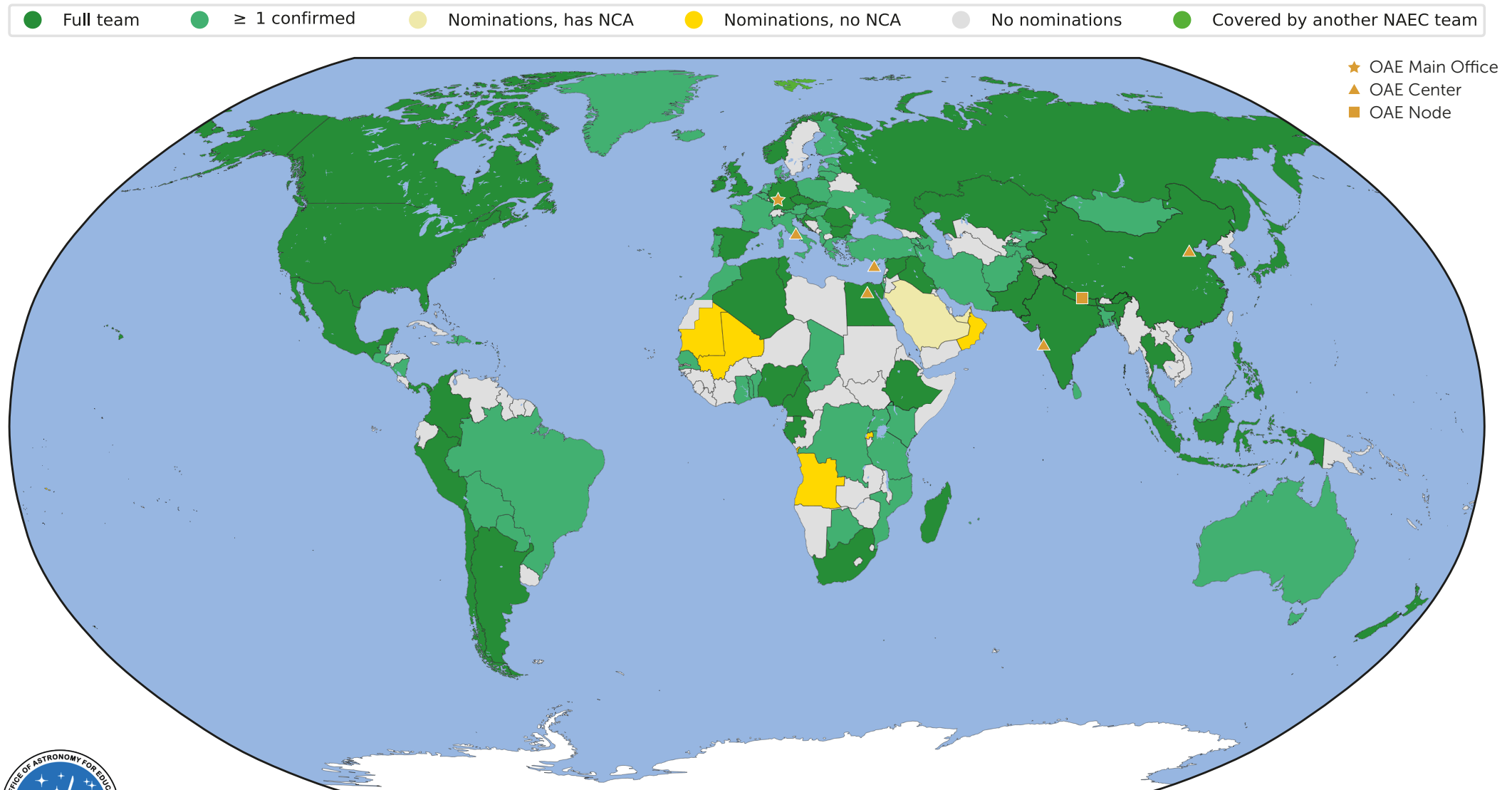
OAE is at the forefront of efforts by the IAU to leverage astronomy for education, specifically in the areas of science, technology, engineering and mathematics. The OAE's mission is to support and coordinate astronomy education by astronomy researchers and educators, aimed at primary or secondary schools worldwide. The IAU Office of Astronomy for Education headquarters are hosted at Haus der Astronomie (HdA), managed by the Max Planck Institute for Astronomy. HdA's hosting the OAE was made possible through the support of the German foundations the Klaus Tschira Foundation and the Carl Zeiss Foundation.



You can follow the activities of the IAU OAE at its website
<http://astro4edu.org>
or on Twitter and Facebook under @astro4edu

The NAECs strategy

The OAE main office in Heidelberg, its branch offices in China, Cyprus, Egypt, India, Italy, Korea and Nepal as well as a network of National Astronomy Education Coordinators in 99 countries, support the collation and translation of excellent astronomy education resources, help educators, astronomers and other stakeholders to get started in contributing to astronomy education, and support the creation of reliable and accessible education resources.



The IAU is the worldwide organisation of professional astronomers regardless of borders. See <http://astro4edu.org/maps/>



The 3rd Shau-IAU workshop on Astronomy for Education

The 3rd Shaw-IAU Workshop on Astronomy for Education was held online from the 12th to the 15th of October 2021. Organized by the OAE and supported by IAU and Shaw Prize Foundation, the 2021 workshop was aimed at answering a very well-defined question: **what should everyone know about astronomy education?** In addition to the efforts from the OAE office in Heidelberg, Germany, and from the I-OAE, also the Cyprus Centre and the Nepal Node made key contributions to organizing this event. The OAE Center India was not formally established at the time of this workshop, but also made significant contributions.



The annual Shaw Prize-IAU Workshops on Astronomy education that OAE organizes are funded by the Shaw Prize Foundation.

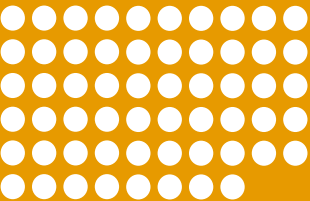
Astronomy across disciplines; Equity, diversity and inclusion in education; Teaching methods; Evaluation; International collaborations with an educational component; Earth as a planet; Teaching with astronomy exhibits: these are the 7 out of 18 sessions chaired by I-OAE members. 10 members took part in the Scientific Advisory Committee, too, while 7 participated in the Organising Committee. An I-OAE member took part in the Local Organising Committee and edited the Proceedings.



Numbers of the workshop

18 sessions

580 participants



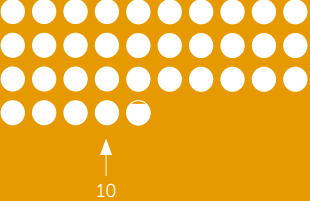
90 countries and territories

91 talks

31 posters

122 videos

349 pages proceedings



YouTube channel of the IAU's Office of Astronomy for Education
https://www.youtube.com/channel/UCHBfREIXElpIRWPj_zuXqtQ



Proceedings
<http://www.iau.org/static/announcements/pdf/ann21065a.pdf>

"All knowledge is socially constructed, including astronomical knowledge. Therefore, astronomy has to be viewed as a cultural product, even though every culture has its own version of astronomical knowledge. [...] it is empowering for learners to learn about how other astronomers of other cultures handle and understand the sky and the stars. Recognizing that cultures influence each other and have many commonalities may assist in addressing issues of domination, disrespect and powers."

Sivuyile Manxoyi, South Africa NOC & NAEC, South African Astronomical Observatory

"The learning experience should be meaningful and significant, learners should be able to experiment and understand with their own experience. The learning itself should be personal and creative as personal and creative is the work of scientists. STEM learning should be for all: we cannot allow the learners to boycott themselves thinking they "are not enough" for science" "in the knowledge society, it is a matter of democracy to allow children to connect with science, to develop their own ideas, and to act in our society as an active citizen."

Sara Ricciardi, I-OAE

MIRTO

MIRTO - Mediterranean Informal Round Table

The MIRTO project's final goal is to build a collaborative environment on a permanent basis for multicultural, trans-disciplinary projects, in order to highlight the cultural richness of those areas, and to promote activities supporting astronomy education.

MIRTO is focused upon all the countries of the Mediterranean area, and aims at encouraging cooperation with meetings, training courses, learning activities and other initiatives.



Representatives from 14 countries of the Mediterranean participated as speakers: Albania, Croatia Cyprus Egypt, Israel, Italy, France, Montenegro Morocco, Portugal, Slovenia, Spain, Syria, Turkey.

Every week, I-OAE organizes a 2 hour - online meeting in which at most NAECs from 4 different countries introduce themselves and their work for about 10 minutes. In the second part of the meeting, we discuss freely about the situation in our countries and about what we expect from the OAE office.

STEAM Med

STEAM-Med: a co-design for Med Children

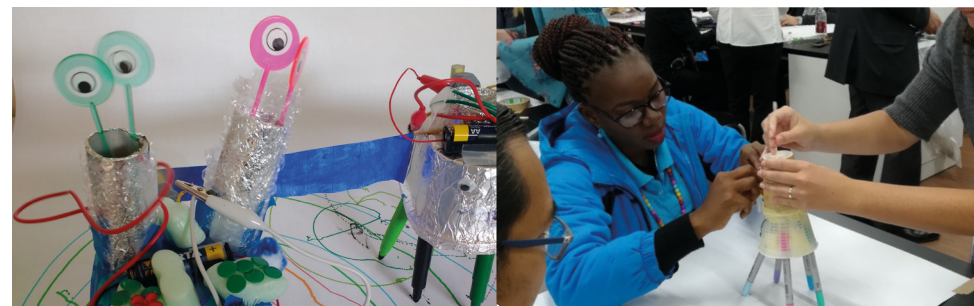
STEAM-Med is a global effort coordinated by I-OAE to build a community of practices and people centered on children in the approximate age-range 6-12 living in the Mediterranean area. We open up a space for an exchange of practices and ideas and to co-design a set of educational activities connected 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.



Equity in access to knowledge

This theme is the first OAE Review for which a panel was constituted.

A brief document based on the Equity, Diversity and Inclusion in Astronomy Education Session of the 3rd Shaw IAU workshop and its proceedings is in preparation, with general ideas on how to deal with diversity and equity in educational contexts, and possibly ease individual difficulties and different learning styles, thus enhancing the richness and opportunities which diversity brings.



"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, OAE-I 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.



Credits images: INAF, NASA,

"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, Mayssa El Yazidi, Gianluigi Filippelli, Giuliana Giobbi, Riccardo Leoni, Claudia Mignone, Silvia Casu, Rosa Valiante, Alessandra Zanazzi, Anita Zanella