

# Introducing Science on Stage Europe STEM Festivals, Science on Stage Türkiye & a Sample Delegate Project: "Ecco Homo!"

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**Abstract.** In this paper, in addition to introducing Science on Stage Europe STEM festivals along with Science on Stage Türkiye to education climates worldwide, it is also aimed to present "Ecco Homo! First People on Earth" which is an example of a STEAM plan that took place as a delegate project in one of these festivals. Science on Stage Europe is the largest non-governmental organization in Europe with its headquarters in Berlin, including 35 countries and spreading STEM education sharing with the motto "From Teachers to Teachers".

**Keywords.** STEM, Science on Stage Europe, Science on Stage Türkiye, Ecco Homo

## 1. Introduction

Science on Stage is the European Network for Science Teachers. It aims to improve STEM education in Europe by supporting and encouraging teachers in their professional development and growth. As an umbrella organisation, it supports 35 member countries in realising their activities. The ultimate goal is to promote a more scientifically literate population, to ensure quality education and to encourage students to consider a career in science, IT and engineering; true to the motto "teachers

make the difference".

Many teachers have great ideas how to excite students for STEM. The activities of Science on Stage focus on identifying, sharing and scaling up good practices. So they find their way into classrooms all over Europe. Therefore, Science on Stage Europe organises Europe's biggest educational festival from and for STEM teachers. The participants are selected through selective national events in the member countries. The Science on Stage festivals are the core of the network since they are the starting points for a wide range of national and international follow-up activities.

At the European Science on Stage festival each country is represented by its own STEM teacher delegation. Therefore each National Steering Committee organises its national pre-selection the year before the festival. Each country organises their national pre-selection in another way for example; some national events last four days, some only one, some other national events include students in on-stage presentation, some include actual research and some are open only for teachers, some are held virtually or through a written application.

A national jury selects the STEM teachers with the most innovative projects to be a part of their delegations.

Although all the national pre-selections are quite unique and have a selective character they have one thing in common: They are a great way to meet enthusiastic teachers and to exchange ideas and activities!

## **2. Historical background of Science on Stage Europe**

Science on Stage evolved out of Physics on Stage[3], which was initiated in 1999. Representatives of CERN, ESA and ESO Outreach Departments responded with Physics on Stage to the European Commission's Call for Proposals for the European Science and Technology Week 2000. This period lasted between the years 1999-2000 and could be titled as "Initiation Period".

In 2002 ESA (European Space Agency) organised and funded Physics on Stage 2 festival with support from CERN, ESRF, EMBL, EFDA and ESO. Along with the EIRO forum and with funding of the European Commission, Physics on Stage 3 was organised in 2003. This period lasted between the years 2001-2003 and could be titled as "Continuation Period".

Science on Stage was established in 2004. It followed the model of Physics on Stage with national activities leading to international festivals. The main difference was that from now on teachers of all-natural sciences could take part.

The first Science on Stage festival took place at CERN, Geneva, in November 2005. The second took place in April 2007 at ESRF/ILL in Grenoble. After funding of the European Commission ended in 2008, Science on Stage Germany as National Steering Committee (NSC) continued the series with the Science on Stage festival 2008 in Berlin. It was mainly supported by think ING., an initiative of the Federation of German Employers' Associations in the Metal and Electrical Engineering Industries. Up to this, it was the largest science education initiative ever undertaken in Europe and, in fact, unique in the world. This period lasted between the years 2004-2008 and in this period, Physics on Stage became Science on Stage.

In 2009, Science on Stage Europe was re-organised as a bottom-up initiative out of the 27 National Steering Committees (NSCs) with alternative funding. After the Science on Stage festival 2008 in Berlin, the festival took place in Copenhagen in 2011, supported by the Danish Ministry of Education. This period lasted between the years 2009-2011 and could be titled as re-organisation of Science on Stage Europe.

Non-profit association Science on Stage Europe was founded by the representatives of the participating countries in November 2011, recognized by German Law with headquarters in Berlin. In this sense, the year 2011 could be titled as "Foundation Year".

The tradition of organising the Science on Stage festivals via National Steering Committees have been carried on from the year 2012 onwards. This is why this period starting from 2012 can be titled as "Science on Stage Festivals Period". The 13th European Science on Stage festival will take place between 12-15 August 2024 in Turkey, Finland. In the past, the festival took place in various European Cities such as; Prague, Czech Republic (2022), Cascais, Portugal (2019), Debrecen, Hungary (2017), London, England (2015), Słubice, Poland/Frankfurt an der Oder, Germany (2013).

### **2.1. Science on Stage Europe Festivals**

Since the year 2000, eleven festivals have been held in various places in Europe. Starting with 'Physics on Stage', it was soon clear that all sciences should benefit from the exchange among teachers. Meanwhile, the Science on Stage festivals are Europe's biggest STEM teaching events.

The European festival 'Physics on Stage' was held for the first time in 2000. The target group included physics teachers who came together at the European Organisation for Nuclear Research (CERN) in Geneva. The event was organised by CERN, ESA and ESO.

From 2005 onwards, the initiative was continued under the name of 'Science on Stage'. From then on, all-natural sciences

were included. The organisational responsibility was laid into the hands of the seven research institutes on EU level that have formed the EIRO forum.

In 2007 it was decided to carry on the initiative by all member states. The continuation was enabled by the funding of the employers' association Gesamtmetall and its initiative think ING. Since then, nationally organised Science on Stage festivals took place every two years.

Delegate teachers, who are determined through national auditions held in each member country of this organization, participate in Science on Stage Europe Science Festivals which are being organized in one of the member countries every two years and exhibit their STEM projects at an international level. The project guide themes are open to pre-school, primary, secondary, high school and education faculties teacher candidates. These guides are; STEM for the Youngest, STEM Education for Sustainable Development, Digital Technologies in STEM Education, Diversity in STEM Teaching, STEAM in Education, Low Cost Experiments in STEM Education, Joint Projects, STEM for Teachers in Education.

Each Science on Stage Europe Festival is followed by international teacher exchanges and the possibility of submitting a joint project for a future festival.

Besides festivals, Science on Stage Europe networking offers teaching STEM materials developed by European STEM teachers. In international teams of 15-20 teachers have meetings and by working together they develop teaching concepts and ideas to be published as teaching STEM materials in several languages.

Science on Stage Europe also organises regular practical teacher trainings across Europe each based on festival projects, festival follow up activities and international teacher trainings.

## 2.2. Science on Stage Türkiye Festivals

Türkiye joined Science on Stage Europe Network Organisation as a member country

in 2014 and has been carrying out the national representation of Science on Stage Europe Festivals through the Science on Stage Türkiye [3]organization.

From the year 2014 onwards, Science on Stage Türkiye organised four national festivals. The first festival was held at METU Ankara on 30 November 2014. Five delegate projects were selected by the academic jury and the delegation represented our country at the Science on Stage Europe Festival held at Queen Mary University in London, England.

The second national festival took place on 7 May 2016, in Ankara. Nazım Hikmet Cultural and Congress Centre hosted 1200 participants including academicians, teachers, parents, students, school groups from many cities of Türkiye at this festival. One educator from Finland and one academician from Hungary were invited to the festival. They presented sample projects from their countries and performed scientific workshops at the festival. Many oral presentations, hands on activities and exhibitions took place at this festival. This national Science on Stage Festival was realized in collaboration with International Hands on Science Network and International Children Summit.



Figure 1. SonS Türkiye Poster, National Festival 2016



**Figure 2. SonS Türkiye 2018 Festival, National Council Hall, Ankara**

Third Science on Stage Türkiye Festival was held on 30 September 2018 in National Council Hall again in Ankara. The other partners of this festival were International Hands on Science Network, LUMA Center Finland and International Children Summit Coordination. Two educators from the Board of Education Council in China, two educators from Switzerland and the StarT Project Manager from LUMA Center, Finland were invited to this festival. Their participation with their oral presentations and science workshops highlighted the festival. Besides the teacher exhibition stands, student project exhibitions and presentations, many science shows took place at the festival. Türkiye was represented by eleven selected national delegates at Science on Stage Europe 2019 Festival.



**Figure3. Türkiye Delegation, SonS Europe 2019 Festival, Cascais, Portugal**

The quota for Türkiye had been risen to eleven by Science on Stage Europe due to

Türkiye's very active organizations and agenda of educational events, teacher trainings and projects that had been carried out all across the country.

In 2021, Science on Stage Türkiye initiated National Ambassadors Program. Teachers across the country were recruited. Selected teachers by Science on Stage Türkiye Board were assigned to become volunteer Science on Stage Türkiye Ambassadors. Since then, teacher training webinars, workshops have been held and many educational projects have been carried out by Science on Stage Türkiye with volunteer supports of SonS Türkiye Ambassadors.

Due to the world pandemic on 25-26 September, Fourth Science on Stage Türkiye festival was held online. The festival lasted for two days. Many educators, academicians and students from Kazakhstan, Spain, Hungary, Portugal, Switzerland, Norway were guest participants of Science on Stage Türkiye. The event was realised with the collaboration of International Hands on Science Network.

The Fifth Science on Stage Türkiye Festival will be held at National History Museum and Park in Ankara on 7 October, 2023. It will be realised with the collaboration of International Hands on Science Network, International Children Summit Coordination and Global Save Our Species Project Coordination.

### **3. A Sample Delegate Project from Türkiye: Ecco Homo**

Ecco Homo, was a Science on Stage Türkiye delegate project in Czech Republic in 2022. It was an educational study realised in the Pandemic Period. It started its work as an eTwinning project in 2020. It was constructed by the collaboration of different types of schools and teachers from different branches from Spain, Croatia, Jordan and Türkiye at their first sections of archaeological museums.

Ecco Homo was awarded with the Quality Label by the Croatian National Agency in 2021. It was also awarded with the Quality Label by National Agency of

Türkiye in 2022 and the European Quality Label in 2023. During the dissemination efforts of the project, it was participated in the competition held for Science on Stage Türkiye National Delegate Project Selections 2022 and was among the 11 projects selected from Türkiye and opened a booth as a STE(A)M project at Prague Clarion Congress Hotel on March 23-27. In 2022-2023, project was accepted into the Global Save Our Species Project Coordination together with the students.

### 3.1. Background of the Project

Paleolithic humans made tools of stone, bone (primarily deer), and wood.[1] The early paleolithic hominins, Australopithecus, were the first users of stone tools. Excavations in Ghana, Ethiopia have produced thousands of artifacts, and through radioisotopic dating and magnetostratigraphy, the sites can be firmly dated to 2.6 million years ago. Evidence shows these early hominins intentionally selected raw stone with good flaking qualities and chose appropriate sized stones for their needs to produce sharp-edged tools for cutting.[2]

Ecco Homo studied the unrecognized Paleolithic Period artifacts, each of which was a STEM piece in the first sections of archaeological museums abroad and in Türkiye listed below:

Abroad,

- Archaeological Museum of Murcia in Spain
- Archaeological Museum in Barcelona
- Krapina Museum in Croatia
- Amman Archaeological Museum in Jordan

Türkiye,

- Archeology Museum, in Adana
- Archeology Museum in Antalya
- "Eti Archeology Museum" in Eskişehir
- Rıdvan Çelikel and Istanbul Archeology Museums, University of İstanbul in İstanbul

- Ahmet Urkay Carpet Museum in Denizli
- Archeology Museum in Adıyaman
- Anatolian Civilizations Museum in Ankara [3]



**Figure 4. Students of Eryaman Şehit Ertan Akgül Anatolian High School at the Museum of Anatolian Civilizations**

### 3.2. Project Objectives

Ecco Homo, which prioritizes the use of museums for teaching, focuses on the "first people" on a thematic level. All partners, conduct research on the Paleolithic period sections in the archaeological museums. An examination of the concrete assets of a common human life in different geographies in Anatolia and the world helps us to find answers to the questions that can be asked about "First People". Ecco Homo studied the unrecognized Paleolithic Period artifacts, each of which was a STEM piece, in the first sections of the archaeological museums.

Teachers from Istanbul, Antalya, Denizli, Adıyaman, Ankara, which shed light on this period of Anatolian archaeology, together with the teachers from Spain, Jordan and Croatia, which attract attention the nations, have researched these settlements and artifacts that they observed.

"Ecco Homo/Here's Human!" is actually a museum education project. However, it also leaves its traces in nature and natural assets with "green environment" motto. Moreover, it is "right-based" as its material is human and works with different disciplines as a STE(A)M project.

Educational studies, which included the first cultural phase of world history, were carried out before museum visits, and these studies contributed our understanding in virtual or real tours in the museums.

In addition to the surveys we applied before the training, 'Leave your code to the time! The coding work that we made with our handprints, came to the fore in the project works.

Our Codeweek code is cw20-OY9Fr. Our coding activities continue for this year as well. Upload the events you have done on behalf of your schools. Let's get our Perfectionism Certificates together...

The rights-based works we did throughout the project helped us to look at museum education activities from a different perspective.

We attended the Gender Equality Workshop with the support of ICHILD. With the support of ICHILD, we trained Child Rights Ambassadors. We attended trainings, with Erdal Eser, Art History Department of Faculty of Literature, Sivas Cumhuriyet University. Final webinar called "Partnership in Life - Partnership in Art" emphasized "Here is the Human".

And the table we prepared for the closing became the name of our project as a result of the survey. Each of us is a part of nature. Nature contains a great balance, mathematical order and rhythm. Our handprints, our body are STEM parts.

Below is a list of goals in Ecco Homo project,

- First of all, to highlight the importance of working with ICT through eTwinning.
- To recognize the importance of virtual teaching and collaborative work with other students from different countries.
- Adaptation of teaching-learning process, through adequacy and flexibility of teaching programming.

Priority to continue paying special attention to students with specific educational support needs.

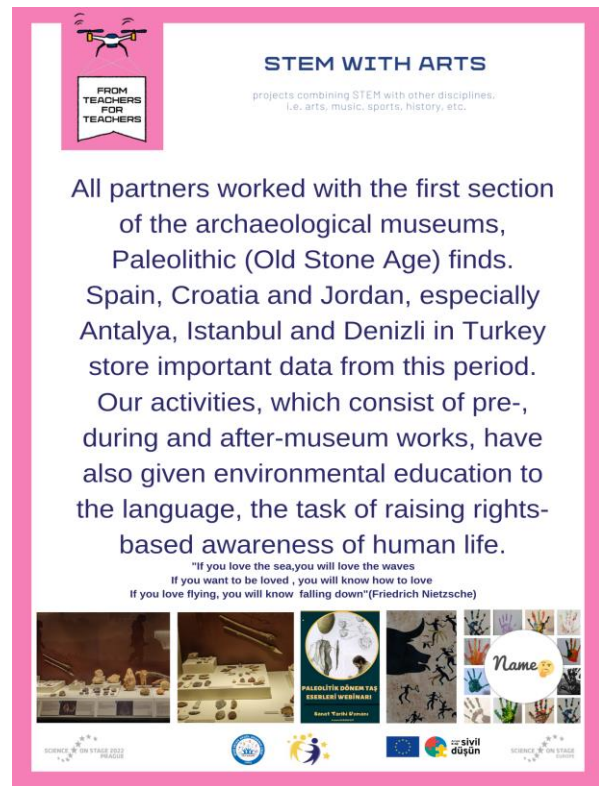


Figure 5. A STE(A)M Project, Poster Work, Prague Clarion Hotel,2022

### 3.3. Project Working Process

Teachers trained in different disciplines from different school types involving a special education school and students aged 14-18 came together for «Ecco Homo/Here is Human!», as an international eTwinning project. The student selection process started as soon as our partner schools were chosen, which coincided with the opening of our schools[4]. The project took remote executables into consideration regarding Covid-19's actions. Workschedule was rearranged in accordance with the new process shaped by Pandemic. Our project received support as a result of its coordinator's application to the EU Think Civil Program in the 2021-2022 academic year. This financial support led us to produce our project visibility materials with the students. With the support we received, we made two professional video shoots in the Paleolithic Period sections of the

Museum of Anatolian Civilizations and in the Ankara hall where the fossil findings were exhibited. And we completed the production work.

We were invited to Ankara University DTCF for the 9th National Anthropology Student Congress on May 9-10. This time, our students made the presentation on the stage. We, with our students and teachers, watched the presentations of University and Master's students who came for the festival from various parts of Türkiye for two days.

The Pandemic Period urged us to initiate our academic studies. Ecco Homo was carried out as an eTwinning project in 2020. It was awarded with the Quality label by the Croatian National Agency in 2021.

During the dissemination efforts, the project participated in the competition held for SonS2022. It was among the eleven projects selected from Türkiye, and opened a stand as a STE(A)M project at the Prague Clarion Congress Hotel on March 23-27.



Figure 6. A STE(A)M Project, Poster Work, Prague Clarion Hotel, 2022

At the same time, in Necmettin Erbakan University, project took part in UPUES Congress in 2022, organized by Konya

Metropolitan Municipality and Konya Provincial Directorate of National Education. This presentation was made online in English by our Spanish partner teacher Pedro Antonio Galindo Valero. It was a pleasure to watch the presentation from «Science Stage on Europe».

In 2022, we participated in the Solvo of Tomorrow competition organized by the Habitat Association. We participated in the "Nature Pioneers" activities with the Ministry of National Education and the Wildlife Conservation Foundation with the "Plastic Warriors" project. In addition to being a STE(A)M project, Ecco Homo also took on the task of being a Nature Education project in terms of using nature's first assets. TEMA Foundation shared the activities carried out as a high school representative with the 10th grade students in our school.

In 2022-2023, our project with our students was accepted to the Global Save Our Species Project Coordination.

Ecco Homo has a sister project. The Woman Has a Name! With the «Drop Your Code to Time» Codeweek events, both projects have reached countless schools. We repeated this event with our European colleagues at the Prague Clarion Congress Hotel, where we turned it into a workshop. The most impressive coding work of 2021-2022 was the coding work we did with the students of Boztekke Village, a village school in Giresun province.



Figure 7. Ecco Homo stand work at SonS Europe 2022 in Prague

### 3.4. Conclusions

While the project was working, it was realized that every piece of art in the museum was a STEM item. Our recommendation is the conversion of museums into the school environment, ensuring that different disciplines work in museums.

Ecco Homo has also completed its environmental rights, children's rights and gender equality studies.

### 3.5. Acknowledgements

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From Finland to Sirius, Zagreb to Eln Europa training centers, ICHILD and its experts, Women Have a Name!

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