

Astronomy as a Tool for Peace and Diplomacy: Experiences from the Columba-Hypatia Project

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Keywords

Astronomy for Peace

Science, and astronomy in particular, can be used for the benefit of society and for achieving the United Nations Sustainable Development Goals (SDGs). In this article we present the Columba-Hypatia project, a flagship Astronomy-for-Peace project, whose goal is to use the vision of the cosmos that astronomy imparts us with, to promote peace and diplomacy in post-conflict regions (SDG 16: Peace Justice and Strong Institutions) while also empowering women to be leaders in STEM and in the peace-building process (SDG 5: Gender Equality). The project is a joint endeavour by GalileoMobile and the Association for Historical Dialogue and Research (AHDR) that takes place on the divided island of Cyprus. Columba-Hypatia brings together children and educators from the separated communities of Cyprus to inspire them to be curious about science, while using astronomy as a tool for promoting meaningful communication, a feeling of global citizenship and a Culture of Peace and Non-violence. We describe the successes and challenges faced by the project in order to serve as an example of implementing Astronomy-for-Peace projects in other post-conflict regions.

Introduction

On Cyprus, Greek-Cypriots (GCs) and Turkish-Cypriots (TCs), the two main ethnic communities of the island, have been living separated from one another for over 45 years in a post-conflict environment¹. Between the TCs in the north-east of the island and GCs in the south-west is an area known as the “United Nations Buffer Zone in Cyprus” or “Green Line,” which is controlled by the United Nations Peacekeeping Force in Cyprus, and was established in 1964. Crossing the buffer zone, an area which ranges from a few metres to a few kilometres wide, was largely not possible until 2003 when checkpoint crossings were opened and allowed GCs and TCs access to both sides of the island. However, while the checkpoints have been open for almost 17 years, interaction and cooperation between the two communities is still rare and the political situation is at a general stalemate.

Achieving peace and strong institutions is one of the United Nations Sustainable Development Goals (SDGs). As evidenced by numerous projects carried out under the auspices of the International Astronomical Union Office of Astronomy for Development (IAU OAD)², astronomy, and science overall, can be of benefit to meeting these goals and advancing the wellbeing of society. Astronomy in particular is a well-

suited tool for bringing people together in post-conflict regions: it imparts us with a much broader perspective, allowing us to see beyond national and ethnic boundaries. Discovering our cosmic origins and our place in the universe naturally inspires a feeling of global citizenship, increasing our “in-group”³ (*Tajfel, 1971*) and empathy towards others (*Fukushima & Venugopal, 2015*). Furthermore, it is a topic which fascinates and excites, and as such is easily introduced in classrooms and extracurricular activities and helps attract both children and educators who might otherwise not be interested in engaging in “reconciliation” activities.

The aim of this grass roots project is to inspire children and the general public to be more curious about science and the universe and through this bring together children and adults from the two communities to learn about each other in order to break down prejudices and misconceptions. The initiative promotes meaningful communication and a Culture of Peace and Non-Violence in order to further the SDG 16: Peace, Justice and Strong Institutions and SDG 5: Gender Equality.

The Columba-Hypatia project is implemented by two organisations, GalileoMobile⁴ and Association for Historical Dialogue and Research (AHDR)⁵. GalileoMobile is an itinerant, non-profit out-

reach project that shares astronomy with students and teachers in schools and communities worldwide. The team is comprised of a group of volunteer astronomers, educators and science communicators from around the world. Since its inception in 2008, GalileoMobile has reached 1400 teachers and 16 000 students, donated more than 100 telescopes and organised public events for more than 2500 people in 14 countries⁶. GalileoMobile teaches astronomy across the world in a spirit of inclusion, sustainability and cultural exchange to create a feeling of unity under the same sky.

AHDR is an intercommunal organisation (i.e. it is composed of both GCs and TCs) based in Cyprus whose mission is to contribute to the advancement of historical understanding amongst the public, and more specifically amongst children, youth and educators, by providing access to learning opportunities for individuals of every ability and ethnic, religious, cultural, and social background, based on respect for diversity and dialogue of ideas.

The project began in 2017, first with the implementation of a one-day pilot run. The project subsequently obtained funding by the IAU OAD in 2017 to expand operations, and was followed by an inspired-by project in 2018. Additional educational materials were donated by the European

Southern Observatory's former education and Public Outreach Department (ESO ePOD)⁸ and Universe Awareness (UNAWA)⁹, and telescopes were donated by Meade Instruments Corporation¹⁰. In 2019 the project was again funded by the IAU, in the context of the IAU centenary celebrations, as a flagship project and example of best practices for using astronomy as a tool for peace and diplomacy. The project received additional funding from the Max Planck Institute for Astrophysics¹¹ in Garching, Germany.

Description of the Columba-Hypatia Project

The main phase of the project began in 2017 and ran throughout the entire year. The target groups of the project were children in primary schools, teenagers, the general public and educators from both the GC and TC communities.

The project focused on visits by science communicators from GalileoMobile and the local communities to public mono-communal primary schools and bi-communal activity days, where children ages 9-12 from the aforementioned schools came together to meet each other and participate in astronomy activities, which were modified from the *Handbook of Activities* from GalileoMobile¹². These are described in the following subsections. The bi-communal activities were carried out at the Home for Cooperation, a unique community centre located in the buffer zone in the heart of Nicosia, the divided capital of Cyprus. Jointly run by GCs and TCs, it is the embodiment of intercommunal cooperation, contributing to the collective efforts of creating a civil society through peacebuilding and intercultural dialogue. The Home for Cooperation essentially aims to act as a bridge-builder between the separated communities, memories and visions. It provides working spaces and opportunities for individuals and non-governmental organisations to design and implement innovative peacebuilding projects.

For the general public we held free astronomy outreach events in the afternoons and evenings in locations accessible to GCs and TCs. We also carried out astronomy activities at a bi-communal summer camp for youths. However, the main emphasis and focus of the project was on the

Audience	Number of participants in 2017
School children	~190
Teachers	~20
Youth	~100
General public	~150
Documentary viewers	~5700

Table 1. Number of participants in 2017 activity

mono-communal school visits and bi-communal activities, since these could reach the most diverse audience and have the largest impact.

The numbers of participants are listed in Table 1.

Mono-communal School Visits

During the mono-communal visits we focused on introducing the children to the project as well as basic astronomy concepts. The astronomy activities were chosen to give the children an idea of the place of the Earth in the context of modern astronomy and to introduce them to the vast scales and sizes of the universe, e.g. by comparing the sizes of stars and

planets through the activity "The Earth as a Peppercorn". We also carried out activities with the UNAWA Earth Ball to show how the Earth looks from space and introduce the concept of human-made borders. At the end of the day we carried out solar observations with the donated Coronado telescopes (Figure 1).

At the end of each school visit, we also prepared the children for the bi-communal meetings. This was done by discussing expectations and allowing the children to ask questions about the meeting and entering the buffer zone, since it is a demilitarised region which the children often perceive with apprehension.



Figure 1. Solar observations during a mono-communal training. Credit: Francesca Fragkoudi/Columba-Hypatia

Bi-communal Activity Days

During each of the five bi-communal days, one GC and one TC school were paired-up and children from the two communities came together in the buffer zone, specifically at the Home for Cooperation, to participate in astronomy activities and get to know each other in order to break down barriers and preconceptions.

Before starting the main activities, we carried out icebreaker activities which gave the children the opportunity to relax and introduce themselves to each other (Figure 2).

The main two activities carried out were selected such that they would give the children the opportunity to interact with their peers from the other community while also inspiring a sense of global citizenship. The selected activities were “Building a Cyprus Golden Record” and “Building Constellations in 3D”. For the former, the children were split into mixed groups of six to eight and they discussed what they would send to an alien civilisation as a representation of the whole island of Cyprus (Figure 3). Each group was responsible for a given topic that would be included on the Golden Record (e.g. food, music), much like the scientific groups that selected the content of the Golden Record on the Voyager spacecraft. The small group sizes allowed for easy interaction between the children. However, since the children did not speak the same language (Greek and Turkish), translators were necessary in each group to help the children discuss with each other.

The second activity, “Building Constellations in 3D” (Figure 4), was selected to encourage the children to think about how our point of view affects how we view a certain object or problem. Constellations appear the way they do because of our position in the galaxy—if we viewed them from a different position in the galaxy, they would appear different. Our point of view is therefore a crucial aspect to how we perceive a constellation. This type of experiment was chosen to help the children develop the ability to see multiple perspectives, which is invaluable given the complex historical situation in Cyprus and the differing interpretations of history that perpetuate the divide on the island.



Figure 2. Children from the GC and TC communities in Cyprus carrying out one of the ice-breaker activities during a bi-communal meeting. Credit: Fabio del Sordo/Columba-Hypatia

Events for the General Public

In 2017, two speaking events for the general public were done by astrophysicists from Cyprus and abroad on current topics in astrophysics, including gravitational waves, galaxy evolution and astronomy for development. Special emphasis was placed on having a representative number of female astronomers presenting their work in order to promote positive scientist role models, which is particularly necessary in Cyprus where gender inequality is prevalent in all aspects of society and especially in the sciences (European Commission, 2012). This action was done in consideration of SDG 5: Gender Equality. These talks were then followed by live music and telescope observations of the night sky. The events were held in the old town of Nicosia, south of the Green Line, as well as in the buffer zone. Both areas were easily accessible from both sides of the buffer zone.

As part of the Columba-Hypatia project, trainers from the project took part in the Cyprus Friendship Program summer camp, to carry out global-citizenship-related activities (Figure 5). During this summer camp, teenagers from the GC and TC communities come together for a week in the mountains of Cyprus to learn about each other, breaking down barriers and

stereotypes. Our participation included an astronomy intervention with talks by astrophysicists on modern topics of astronomy, question-and-answer sessions and telescope observations.

Project Reception

The project was anecdotally well received both by the teachers as well as the participating children. The participants showed enthusiasm and genuine curiosity about members of the other community, and reported feelings of improved understanding and empathy of each other after the bi-communal visits¹⁴.

As one child said, “There are too many things that we don’t know about each other; that’s why we shouldn’t see things only from our own point of view. When I first met them [referring to children from the other community] I felt left out. But after we got to know each other, everything became better.”

In order to measure this effect of the increase of the childrens’ in-group and empathy, in future instalments of the project we plan to evaluate the “Pale Blue Dot effect” in which “...knowing one’s place in the Universe alters perception and induces

more empathy towards fellow humans” (*Fukushima & Venugopal, 2015*). This will be achieved through questionnaires and interviews before and after the activities, developed in collaboration with psychologists and experts on Peace Education implementations.

Resources and Materials Developed

As part of the Columba-Hypatia project we translated selected activities from the GalileoMobile handbook into Greek¹⁵ and Turkish¹⁶ and adapted the activities where necessary. These activities are freely available online through the GalileoMobile website⁴.

We developed a 10-minute documentary¹⁴ summarising the goals and activities of the project, which shows the reception the project received from the children through short interviews. The film aims to serve also as inspiration for similar projects to be carried out.

As part of the 2019 implementation of the project we will develop an Astronomy-for-Peace handbook, which we hope will be used for other Astronomy-for-Peace activities in other regions around the world. We plan to make this handbook freely available online (see “The Global Component of the 2019 Implementation”).

Challenges in Project Implementation

The most important challenges we faced for implementing the project were due to the local context and political situation in Cyprus. Since there is very little official political contact between the two communities, and each side does not officially recognise the other, it was challenging to obtain permits from the Ministries of Education to visit the schools as well as permits to bring the children to the United Nations controlled buffer zone. To obtain access to the schools we also needed the permission of the headmaster or headmistress, who therefore had to be sympathetic to bi-communal initiatives. To bring the children to the buffer zone we had to obtain written consent forms from the parents, which were distributed and collected

by the teachers and schools. In some cases, parents did not allow their children to participate in the bi-communal events. However, it is worth noting that in some cases after the mono-communal school visits, the children were so enthusiastic about the astronomy aspect of the project that they were able to convince their parents to sign the consent form for the bi-communal visits. Since the bi-commu-

nal meetings had to be carried out outside of official school hours (due to lack of permits from the Ministries of Education) we had to rely heavily on the teachers committing their free time to bringing the children to the buffer zone to participate. Therefore, having contact with committed and motivated teachers and headmasters or headmistresses was crucial for the success of Columba-Hypatia.



Figure 3. Top: Talking about the Voyager space probes and the Golden Record. Bottom: The Cyprus Golden Record, constructed by children participating in one of the bi-communal activity days. Credit: Columba-Hypatia



Figure 4a & 4b. Students build the Columba Constellation. Credit: Columba-Hypatia

The other main difficulty faced during the implementation of the project was the reliance on volunteers for carrying out the bi-communal activity days. As stated earlier in “Description of the Columba-Hypatia Project”, we needed a large number of volunteers present during these activities. This was mainly due to the fact that we split the children into eight to ten small groups, and meant that we often needed the presence of at least 16-20 volunteers who would act as translators between Greek and English and Turkish and English¹⁷. It was therefore operationally challenging to ensure that that amount of people could be present for each of the bi-communal events on a purely volunteer basis.

The Global Component of the 2019 Implementation

During 2019 the project added an additional global component in its implementation. To this aim, one of the deliverables of the project is to develop an Astronomy-for-Peace handbook which will give some basic guidelines for how to implement Astronomy-for-Peace projects in differ-

ent contexts, the lessons learnt, and what was important for the Cypriot context. Every local context is different, therefore a set of rules that works globally is hard to develop. However, there are certain educational astronomy activities that are particularly suited to the promotion of global citizenship and peace, and there are certain important lessons that were learnt during the project implementation in the last three years. The handbook will be made publicly available on our website¹⁸ and through the IAU OAD.

The other aspect which contributes to the global component of the Columba-Hypatia project is the beginning of a network of Astronomy-for-Peace projects. This began during the International Institute for Peace Education (IIPE) conference in Cyprus in July 2019¹⁹. During this conference, projects in Zambia and Colombia were selected for their potential in implementing astronomy-for-peace programmes and invited to learn more at the IIPE conference. The goal will be for these projects to develop astronomy for peace programmes adapted to their local context with support from the Columba-

Hypatia team. Additionally, during the IIPE, contacts were made with a number of peace educators from around the globe, and the first seeds were planted for further collaborations three other countries with post-conflict regions. Other groups or individuals interested in such activities are encouraged to contact the OAD and the Columba-Hypatia team for support. The ultimate goal of this network is for it to grow and support Astronomy-for-Peace projects in various post-conflict contexts or divided communities around the world.

Summary

In this article we outlined outcomes and lessons learnt from the Columba-Hypatia: Astronomy for Peace project. The project uses astronomy as a tool for peace and diplomacy in the post-conflict region of Cyprus, thus serving as a flagship project in which astronomy is used for development, and in particular towards SDG 16: Peace, Justice and Strong Institutions and SDG 5: Gender Equality, by using

astronomy to break down barriers and stereotypes.

Notes

- ¹ More information is available on the United Nations Peacekeeping Force in Cyprus website: <https://unficyp.unmissions.org/about>
- ² International Astronomical Union Office of Astronomy for Development (IAU OAD) website: <http://www.astro4dev.org/>
- ³ An "in-group" is a social group one identifies with. Examples of in-groups include families, sport teams, gender identities or religions.
- ⁴ GalileoMobile website: <http://www.galileo-mobile.org/>
- ⁵ Association for Historical Dialogue and Research website: <https://www.ahdr.info/>
- ⁶ GalileoMobile programme reports are available on their websites : <http://www.galileo-mobile.org/galileomobile-resources/galileomobile-reports>
- ⁷ This included astronomy activities for children and youths carried out in the Buffer Zone. These were open to any participants who signed up beforehand.
- ⁸ European Southern Observatory: <https://www.eso.org/public/>
- ⁹ Universe Awareness (UNAWA): <https://www.unawe.org/>
- ¹⁰ Meade Instrument Corporation: <https://www.meade.com/>
- ¹¹ Max Planck Institute for Astrophysics: <https://www.mpa-garching.mpg.de/>
- ¹² GalileoMobile handbook on the GalileoMobile website: <http://www.galileo-mobile.org/galileomobile-resources/galileomobile-handbooks>
- ¹³ Cyprus Friendship Program: <https://friendships4peace.org/cyprus-friendship-program/>
- ¹⁴ Columba-Hypatia: Astronomy for Peace documentary: <https://www.youtube.com/watch?v=wWhBZcYIAcc>
- ¹⁵ Greek translations of selected activities from the GalileoMobile handbook: <https://drive.google.com/file/d/1yb46jbdYdh7-KMQ792Fn2tOd3o-8bFez/view>
- ¹⁶ Turkish translations of selected activities from the GalileoMobile handbook: https://drive.google.com/file/d/1EMBXJfxaldJ2cdY28yHWjjcySPJbelF_/view
- ¹⁷ There are not many Greek-Turkish translators who were able to work with children and on a limited budget, so translations needed to go through English during the activities.

¹⁸ Columba-Hypatia: Astronomy for Peace website: <https://www.columbahypatia-project.org/>

¹⁹ International Institute for Peace Education: <https://www.i-i-p-e.org/>

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Acknowledgements

The Columba-Hypatia project received funding from the International Astronomical Union's Office of Astronomy for Development, the Max Planck Institute for Astrophysics and the United Nations Peacekeeping Force in Cyprus. The project received donations in the form of telescopes and other educational materials from Meade Instruments, the European Southern Observatory, and Universe Awareness. The project team would like to thank the many volunteers without whom the original installations of the project would have not been possible. The project team would like to dedicate this article to the memory of our teammate Natalie Christopher, a shining star who left us too soon.

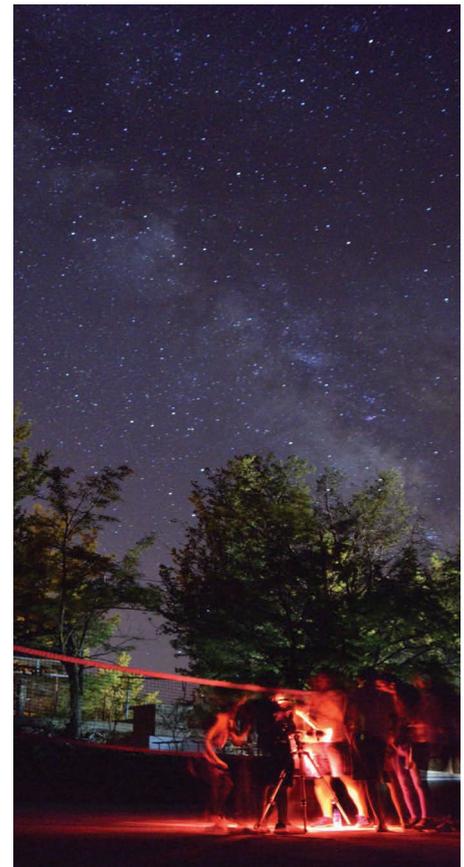


Figure 5. Columba-Hypatia activities at the Cyprus Friendship Program camp. Credit: A. Papadopoulos

Biography

Francesca Fragkoudi, originally from the island of Cyprus, is an astrophysicist and science communicator based at the Max Planck Institute for Astrophysics. Apart from her research on the evolution of galaxies such as our own Milky Way, she is the founder of the Columba-Hypatia: Astronomy for Peace project, which uses astronomy as a tool to promote a culture of peace and non-violence in her divided home country.