



Bringing astronomy to rural areas

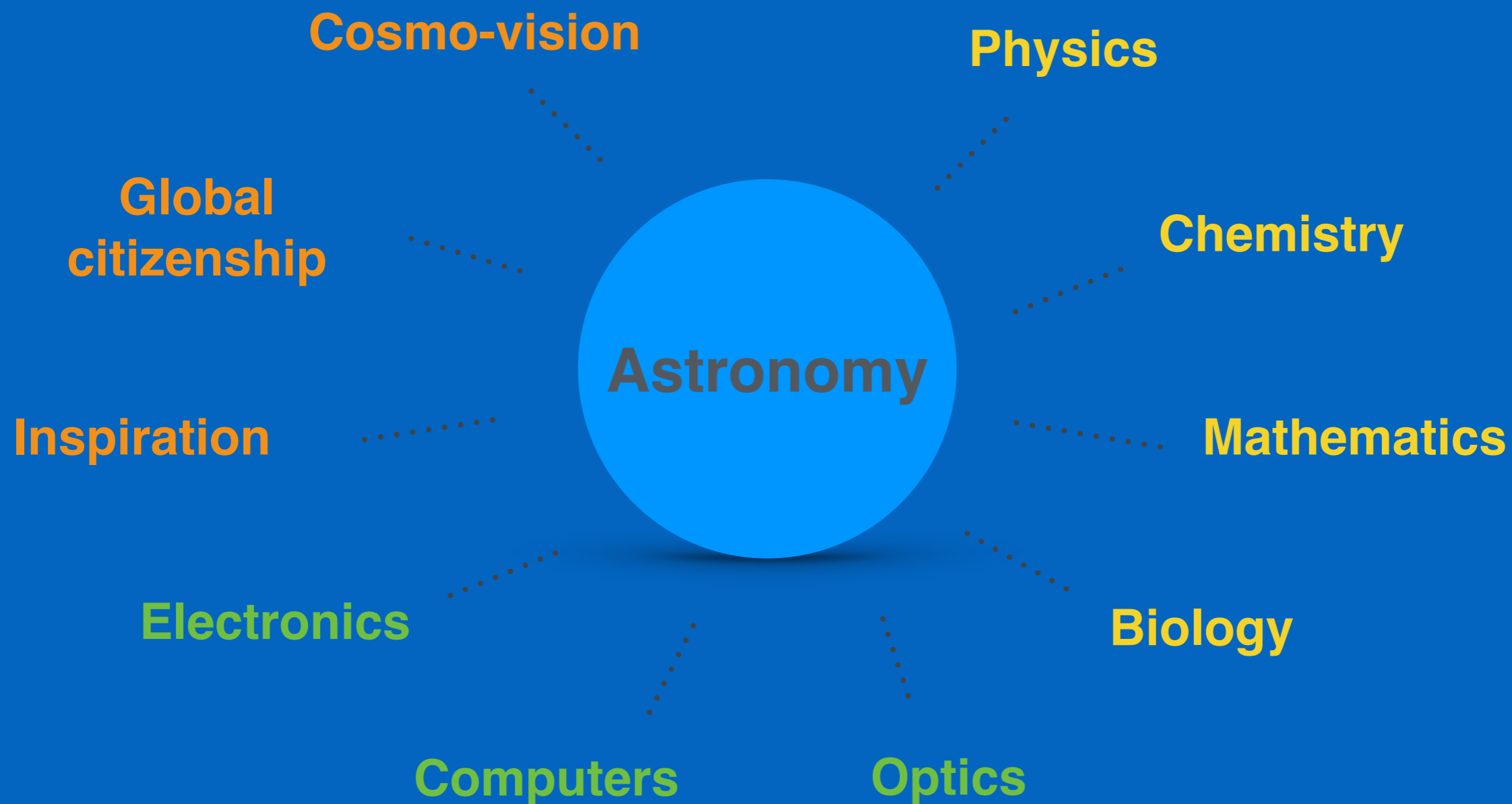
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¹ Imperial College London, ² Deutsches Zentrum für Luft- und Raumfahrt





Astronomy in our modern world



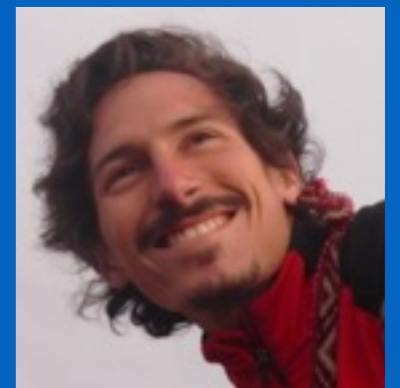
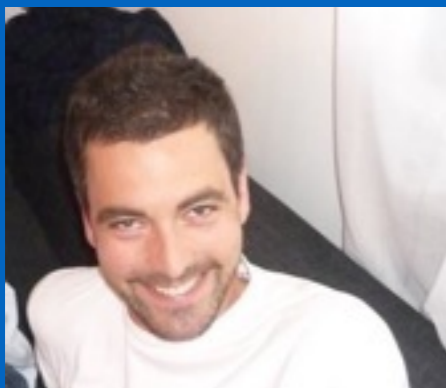


GalileoMobile



14 team members + 10 collaborators

All volunteers, young astronomers,
science journalists and educators.





GalileoMobile



Goals

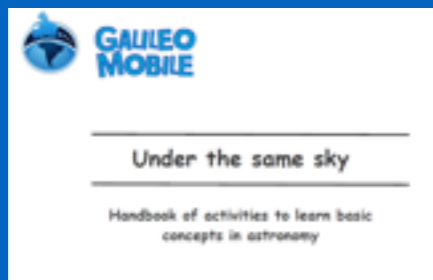
- To encourage a will of learning in young people residing in areas where science outreach programs are a rare opportunity.
- To provide schools and teachers the tools and knowledge to run the activities independently, to facilitate the long-term continuation of the program locally.
- To foster a cultural exchange by exploring, alongside modern scientific views, traditional astronomical understandings of the Sky and the Cosmos of the communities visited, hence promoting a message of peace and mutual understanding.
- To inspire young people by introducing them to some of the most fascinating subjects in modern Astronomy and to transmit our passion for this area of science.



Our Activities



Donate educational material



Teacher workshops



Activities with students





Expeditions





Chile, Bolivia & Peru



- **When? October - November 2009**
- **Duration? 8 weeks**
- **How many schools? 33**
- **1600 students, 600 teachers**

Chile, Bolivia
& Peru '09





Khagol Rath



India '12



- When? 2nd - 13th July 2012
- Duration? 2 weeks
- How many schools? 12
- 1400 students, 100 teachers



Max Planck Institute for Astrophysics



NORDITA



MPS





In the Land of Beauty



Uganda '13



- *When?* 23rd Sept. - 4th Oct. 2013
- *Duration?* 2 weeks
- *How many schools?* 5
- *4400 students, 50 teachers*





BraBo & Batacá



- When? 13 - 31 Oct. 2014
- Duration? 3 weeks
- How many schools? 5
- 500 students, 15 teachers

Colombia '14

● Brazil &
● Bolivia '14

- When? 21st Jul. - 25th Aug. 2014
- Duration? 4 weeks
- How many schools? 12
- 3000 students, 400 teachers





Products



GALILEO MOBILE

Under the same sky

Handbook of activities for teaching basic concepts in astronomy


www.galileo-mobile.org

Compilation of hands-on astronomical activities

Covers diverse topics: stars and constellations, the solar system, Sun, planets, galaxies, light and optics

Translated into 4 languages: English, Spanish, Portuguese, Kannada

Orion, the Hunter

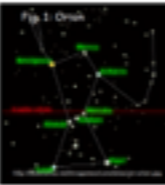


In this activity, we'll see the difference between the two-dimensional and three-dimensional distributions of celestial objects.

To do so, we'll make a three-dimensional model of the constellation called "Orion, the Hunter," a giant in Greek mythology.

Age	10 years and up, in groups of 10 or fewer participants
Duration	~ 45 min.
Activity Type	Experiments / Creation
Materials	<ul style="list-style-type: none"> Transparent pieces of thick plastic 9 or 10 balls of styrofoam or plastic, 10 cm in diameter Coloured strings Tape measure or ruler Adhesive tape and scissors
Optional material (to paint the balls)	Blue, red, and green paint, and paintbrushes

Orion, the Hunter



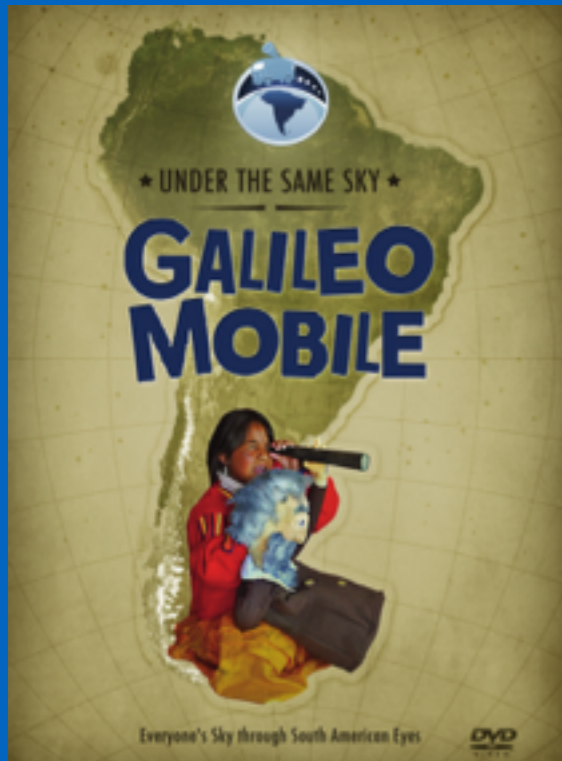
Procedure:

- Draw the constellation Orion on the plastic, based on Figure 1. Mark the location of each star in the constellation.
- Cut 9 pieces of string to the lengths listed in Table 1 (next page).
- Puncture the plastic in the places you marked, and thread the 9 pieces of string through the holes. Connect one of the balls to the other end of each string, following the model in Figure 2.
- Next, two participants should hold the plastic, and one should hold up the balls, stretching the plastic so that each string is tight (see Fig. 3 on the next page). The rest of the group should choose two locations (A and B) from where they'll observe and draw the shape of Orion the Hunter. The model constellation should be held fixed in the same place.
- Optional: the participants holding up the model can trade places with other participants to get a chance to observe. Together, they can take photos from their two different observation points.

Open source and freely available



Products



Documentary

Under the same sky

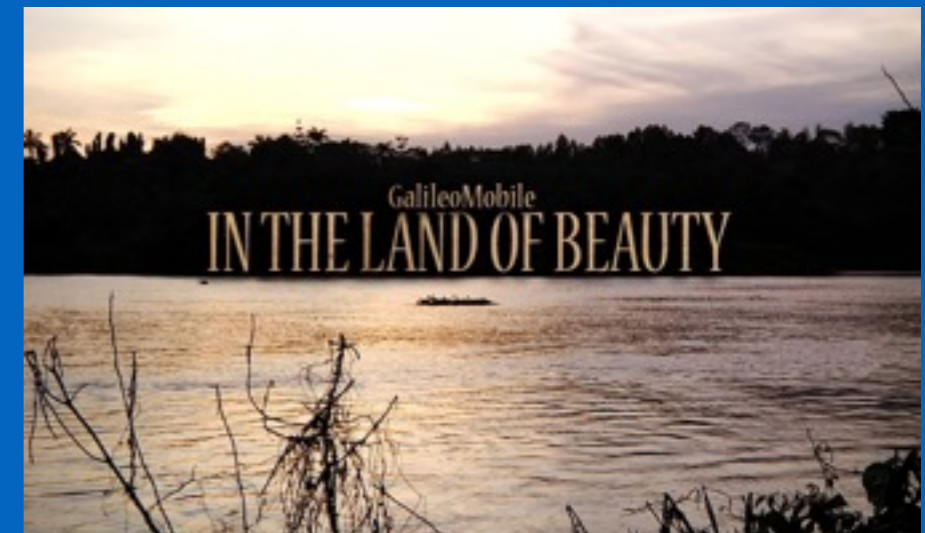
<http://vimeo.com/86717420>



Photo-book

Khagol Rath: GalileoMobile in India

<http://issuu.com/galileomobile>



Documentary

In the Land of Beauty

<http://vimeo.com/113110857>

Open source and freely available



Leonardo
(Estudiante)



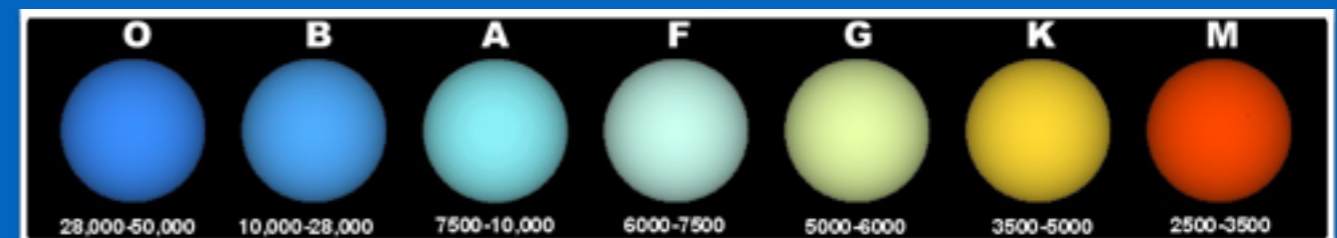
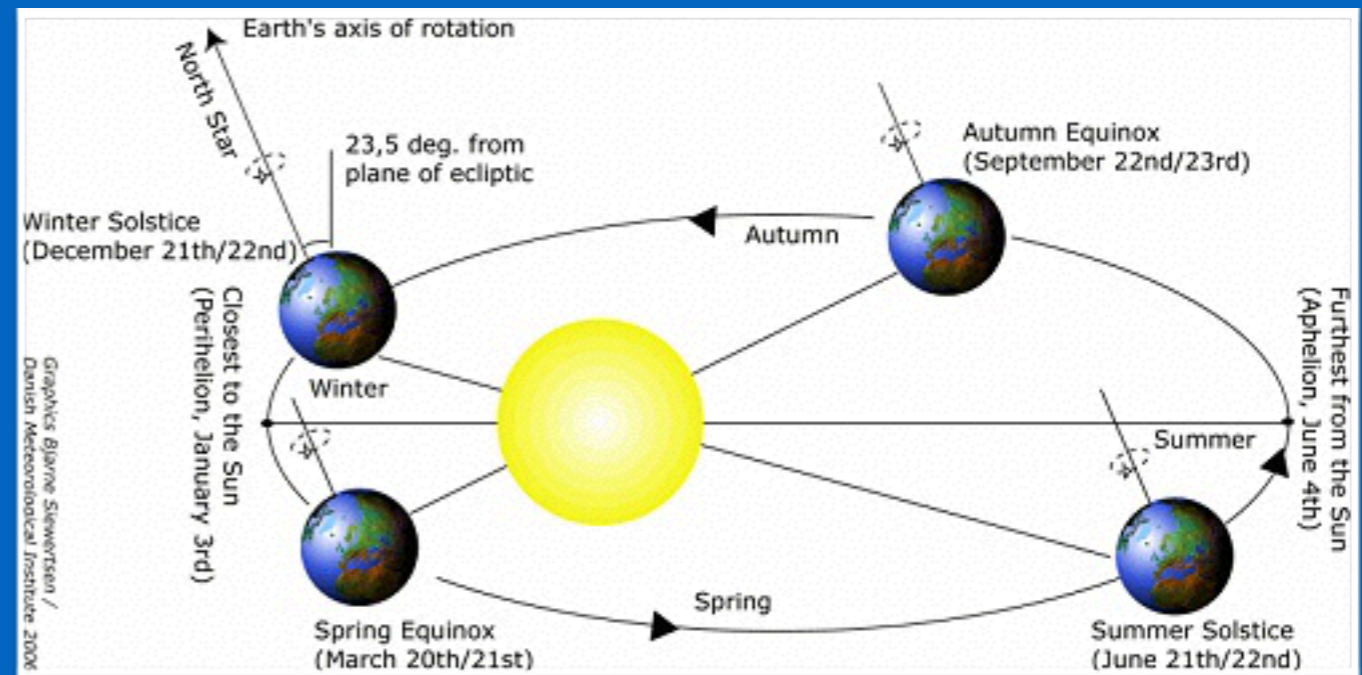




Differences and similarities



- Shape of stars and location
- Seasons
- Star colours and temperatures
- Rocky or terrestrial planets





Misconceptions



Differences:

- Countries (e.g. interaction between the students and members)
- Type of Schools

Similarities:

- High interest in astronomy
- Methodology to teach science
- Teachers provide facts and definitions
- Students memorize
- How to develop critical thinking?





Impact of GalileoMobile



- Indian Institute of Astrophysics created its first outreach program
- First planetarium in Cobija (Bolivia)
- Teachers motivated to use inquiry-based approaches
- Products (documentaries, photo-book) bring new members and collaborators and raise awareness
- Interaction with professional astronomers for career advice
- Global citizenship through international members





Impact of GalileoMobile



Activities for visually impaired students

- A Touch of the Universe kit
- Included activities using low-cost materials
- Activities not only useful for students with visual difficulties but also for children with regular vision





Impact on members



- Individual expeditions in own free time
- Allow to combine scientific career with a social involvement
- Opportunity to share our knowledge





Lessons learned



- Teachers should be involved in the activities to ensure sustainability
- Workshop for teachers
- Handbook of activities for donation
- Crowdfunding campaign
- Local collaborators to fund travel expenses
- Support from some of the members current employers
- On-going local support for the schools





Summary



- Every student should have access to astronomy
- Expeditions are a key to get to these students through activities and workshops
- Follow-up activities are vital after leaving the countries
- Products help us to raise interest
- Extend the project to new countries
- Continue spreading astronomy either due to direct or indirect contributions to society
- This year 2015 we are preparing a project that will build a network of schools in South America





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