

## Outreach activities of UniverSCiel association.

**Lucile Fayon (1)**, Ines Belgacem (2) and the UniverSCiel association (3)

(1) Institut de Physique du Globe de Paris-Sorbonne Paris Cité, Université Paris Diderot, Paris, France (2) GEOPS, Université Paris Sud, CNRS, University Paris-Saclay, Orsay, France (3) Institut de Recherche d'Astrophysique et de Planétologie, Université Paul Sabatier, Toulouse, France (fayon@ipgp.fr)

### 1. UniverSCiel association

Created in 2012 at the Institut de Recherche d'Astrophysique et de Planétologie (IRAP) based in Toulouse, UniverSCiel is a French non-profit association made of young astronomers (most are PhD students) volunteering on their free time to organize and to animate outreach events promoting astronomy and astrophysics for youth. The main focus of the association over the past 12 years has been the co-organization of the Astro-Jeunes festival. More recently, the association started to cover a wider spectrum of activities and to organize countless other events, such as day-long intervention in school and medical institutes or sky-watching sessions. In 2015, for its past accomplishments and dedication the association received the "Lucien Babonneau" prize of the science academy of Toulouse.



Figure 1: Logo of the UniverSCiel association.

### 2. Astro-Jeunes festival

The Astro-Jeunes festival was created 13 years ago to transmit passion and lessons of astronomy to children. It takes place in parallel of the astronomy festival of Fleurance, in southern France, one of the biggest festivals in the country. Every year, Astro-Jeunes welcomes every morning about 200 children a day (from 4 to 17 years old) during one week. It has been recognized by ESA (European Space Agency) as the largest European outreach event aimed at children around the theme of astronomy and space (2013). This event is entirely organized by the association members

and welcomes about a thousand of children every year.

The level of knowledge is adapted depending on children's age, as they are separated in groups based on it. In addition, a dedicated group (with children from 12 years old) focuses on the design, development and launch of a high-altitude stratospheric balloon, carrying on its board various probes selected and integrated by children (Fig. 2).



Figure 2: Picture taken by one of the installed cameras on the balloon realized by the children in 2016.

Over the duration of the festival (6 half days), we offer an insight into general astronomical culture, but also spotlights various main topics such as recent discoveries, experiments and manual crafts (Fig. 3). Those activities are enriched by a number of other events such as live discussions with astronomers from the largest observatories, astronauts in the ISS, but also the meeting with scientists and actors of the space world. More than a passive audience, we want youths to become actors of this week. To do so, we keep a certain freedom in the proposed activities, leaving them the choice to take the lead in their learning process. Our activities are punctuated by a 30 min break, during which we propose some original activities like for example sun observations or water rockets realizations. This week is concluded by a friendly fair where

kids are encouraged to bring their parents and show them what they have learnt. It's also punctuated by educational games where they can win prizes from our generous sponsors.



Figure 3: Telluric soils (Earth on the left, Mars at the middle and Moon on the right) and martian robots realized by the 8-10 years old group, in 2017.

For the 2018 edition, being even more ambitious a brand new group was launched and dedicated of learning about the more technical aspects of astronomy for kids between the ages of 10 and 14. This group will be dedicated to astronomical observations learning. Moreover, this year is special with the launch of Insight to Mars to study its interior. We wanted to take this opportunity to teach the participants all there is to know about this mission. That's why we put together an exhibition that is displayed all week long and open to all.

### 3. Experiments

Several experiments are realized by the association during the year in order to display them during the different outreach interventions and explain some key concepts of our work. One example is the "Cloud chamber" which is a particle detector (a transparent enclosure) that shows the charged particles tracks in a simulated fog (saturated alcohol vapour). Another experiment is the "Planeterella" which is a transparent vacuum chamber with two magnetized spheres and an electron gun. This experiment allows to visualize and understand the formation mechanism of the polar auroras. A hand-made experiment on "gravitational assistance" was also developed using a tight elastic cloth on which two metal balls of different weights are arranged. This allows to simulate one probe passing by one planet. Finally, the association is currently working on a mobile planetarium.

UniverSCiel also recently teamed up with another association "DDE" (Délires d'Encre) a year and a half ago to create an itinerant escape game. This game is made available for schools and scientific outreach events. Participants will step in astronaut shoes by facing a disaster scenario in the ISS (International Space Station) to solve space related puzzles to save the day!

### 4. Other outreach events

In the last two years, UniverSCiel also participated to the "Scientilivre" festival, whose objective is the discovery and awareness of science and reading. This event takes place once a year over a weekend, in October. For this event, the association presents its different experiments and a new exhibition depending on the festival yearly theme.

Interventions in primary and secondary schools are also planned throughout the year. This is the opportunity to build sky maps with children, to show them the Apollo 11 mission thanks to virtual reality, or to learn some basic notions about the stars by using a thermal probe and hand-made spectrometers.

### 5. And now ?

UniverSCiel has been quickly growing in the last couple of years and we have greatly diversified our activities. Because the association relies mainly on volunteer PhD students, the high demand of outreach activities can be hard to fulfil. One of our objectives in the close future is to expand and recruit new volunteers to be able to keep proposing fun and educational activities for all. We are continuously developing new experiments for show and tell. Our next endeavours include finishing the mobile planetarium and an experiment to illustrate extra-terrestrial planets transits before their star for instance.

### Acknowledgements

We acknowledge the continuous financial support of IRAP, the doctoral school SDU2E and the Observatoire Midi-Pyrénées (OMP), Toulouse, France. Our work was also made possible thanks to grants from the Région Occitanie and the Université de Toulouse (FSI project). We would also like to acknowledge our sponsors for their support and contribution in kind offered to the young participants of the festival Astro-Jeunes. An exhaustive list can be found at [universciel.info](http://universciel.info).