

## THE EPFL SCIENCE OUTREACH DEPARTMENT

Our mission is to foster public knowledge and excitement around science and technology and strive for better understanding of STEM (science, technology, engineering and mathematics) fields and issues in the society.

Today we live in a world where science and technology is implemented everywhere. These are essential to the existence and performance of our societies. In Switzerland, where they are virtually our only raw material, their transmission to younger generations is essential.

In the coming years, technological and scientific challenges at the entire planet will be even greater. We must find ways to ensure the sustainability of humanity, while ensuring the preservation of our environment. This means if we need new talents, scientists, engineers and architects.

In Switzerland,

- The portion of science and technology in schools has decreased in recent decades. At the primary level, there is almost no awareness about these issues.
- Girls choose scientific fields for their studies far less than boys. A targeted promotion to the public is essential.
- The reservoir of boys is also at risk: they account for only 40% of the student population at high school (gymnasium) and a small percentage chooses scientific options. Some promotion actions must also be undertaken for this public soon enough.

The Science Outreach department therefore aims to:

- promote science and technology among young girls and boys and raise their interest for these at a very early stage
- -Promote the dissemination of scientific and technological knowledge among the general public and work towards a better understanding of these issues and their importance for the society.

For youngsters, we have a programme called “Science interest me” The main goal of the program is to promote STEM subjects among youngsters especially among girls, another goal is to work with teachers, schools, and parents and to create a community for promoting STEM branches and encourage young girls and boys to consider these fields for their professional path or university studies. Having started with one course for 25 young girls in 2003, the program gained credit and recognition and was enlarged progressively. Today, the program, widest for promotion of science among youngsters including the gender dimension in Switzerland, is active with a presence in 7 French speaking cantons, and created several partnerships with private and public partners. More than 8’000 youngsters benefit from courses, workshops and other activities.

These activities were developed by our team, working in office of equal opportunities and the unit of promotion of science among youngsters. As the importance of these activities grew, the direction of EPFL decided to create a new department called “Science Outreach Department” in January 2015 and gather all the competences and actions in one unit, in order to increase their coherence and visibility. This newly created service in addition develops activities and events such as the Science Festival for the general public.

## OUR PROGRAM FOR YOUNGSTERS

Our program encompasses a wide range of activities and services for youngsters aged 7 to 16, such as workshops, courses, day camps, competitions, a library and documentation. We have a gender and learning by doing approach and regularly evaluate our actions to ensure that participants acquired know-how concerning knowledge, attitude or values related to STEM fields. We have a team of scientists with different backgrounds developing and running the programs. Every year over 80 EPFL students –with a majority of women- are hired to reinforce our team and they do play role models for youngsters attending our workshops, courses and camps.

**To-date we have been able to offer our activities and services for free, or at a symbolic cost. We need your financial help and support to continue and develop our program, and ensure that they are equally accessible to all youngsters independent of the financial considerations.**

With your support we can promote STEM subjects among youngsters to encourage them to choose scientific and engineering fields and break gender and social stereotypes.

With your support we can offer public schools either scientific workshops directly in classrooms with specially developed pedagogical material, or a one-week visit of our touring bus enabling classes to participate to a scientific hands-on workshop, get useful knowledge on the STEM fields of studies and learning by visiting an interactive exhibition.

### A FOCUS ON GIRLS

Girls and boys start off equal in mathematics and science performance and interest in school. Although they do equally well in both subjects, women are largely underrepresented in scientific and engineering fields in universities. To a great extent, this is due to our society's preconceptions regarding 'feminine' and 'masculine' jobs. One of the EPFL's objectives is to increase its number of female students. Several studies demonstrated that if we want to increase young girls' awareness concerning the choice of scientific branches, this must be done at a fairly early stage.



The EPFL has designed several activities exclusively for girls under 13 years old among which courses in mathematics, computer sciences and robotics. Such activities ensure an encouraging environment for the young girls and inspire them to register to the activities.

## Girls only workshops, boys only workshops

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### **Computer Science** (“Internet pour les filles”), 12 x 2 hours courses

To raise the interest of young girls in information and communication technologies. <http://funweb.epfl.ch/>

More than 2'500 girls aged 9-13 since 2003

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### **Mathematics** (“Maths en jeu”), 12 x 1 hour course

To re-discover mathematics with fun, through an original, non-school approach so that it no longer be considered as an obstacle but as a useful tool for a future scientific and technical career.

Participants aged 8 to 13 (140-160 participants per year)

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### **Robotics for girls**, 11 x 2 hours course

### **Robotics for boys** 11x 2 ours course

Using the fascination of robots using the Roberta approach to increase the interest of young girls in engineering fields and ICT.

Participants aged 11 to 13 (350-400 per year)

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### **Girls Only Scientific Day Camps**, 5 days camp

This activity is based on an experimentation investigation of science by girls. In parallel participants meet the scientific staff of the EPFL who prepares special events at this occasion.

Participants aged 7-10 and 11 -13 (120 participants per year)

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The objective of our workshops and day camps is:

- To show young girls and boys various scientific and engineering branches, the careers they open up and their usefulness in the society;
- To show that sciences are amazing and interesting;
- To break gender stereotypes.



## Documentation

Documentation consisting in a movie, brochures and comics was also developed. The film shows female scientists in their professional environment and their social life. Meetings are organized for youngsters and their parents, the film is shown and the appropriate information distributed. The documentation is also distributed to children and their teachers during the open days organized at the EPFL or during the Bus visit in different schools..



## Feedback

- Participants are very happy and would like to come back for other scientific activities. Many of them say that they would like to become a scientist.
- Parents and teachers are very satisfied and a positive dialogue about women in sciences is established with them.
- Very good echo in the media  
=> excellent to fight against stereotypes
- All activities are very successful and are booked one year before they take place.



## EXTRA-SCHOLAR ACTIVITIES FOR BOYS AND GIRLS



A great demand has been expressed for actions beyond Lausanne region and also for boys. The EPFL is convinced of the need of continuing special actions and measures for girls. It is also necessary to continue the dialogue that has been established with parents, teachers and other educational partners. It is also essential to develop activities in this field, to which the boys could also participate. For this last reason the following activities are developed for both boys and girls.



### Library and scientific workshops (“Polythèque & Polythèmes”),

A scientific library for children (boys and girls) from 7 to 12 has been set up. It includes more than 600 titles. As part of this library, scientific afternoons (Wednesday) are organized for children. Children in a small group of 15 have the opportunity to address different scientific themes with scientists who guide them and answer to their questions.



### Scientific Day camps , 5 days

This is based on an experimental investigation of science that means hands-on experimental experiences on chemistry, biology and physics by youngsters aged 11 to 13. In parallel, the participants meet the scientific staff of the EPFL who prepares special events at this occasion.



### Robotic Center (*building and programming robots using the Roberta approach*)

Three kinds of workshops are organized: especially for girls, for boys and girls and for teachers. The EPFL became a recognized centre (Roberta regional Centre) to organize these kinds of workshops. Courses are organized for children between 7 and 10 and 10 and 15 years old and also for primary and secondary school teachers. The Centre lends also robots to teachers who would like to organize robotic courses for their classes. These activities are very successful.



## ACTIVITIES IN SCHOOLS

### The EPFL Science Touring Bus

The Bus goes to different schools in different regions of Suisse romande. A presentation of scientific fields and experiments together with hand-on experiments are proposed to children in each school. The goals for this project are:



- To increase awareness and interest of children about the scientific branches.
- To establish a contact with prospective students, parents, teachers and other educational partners.
- To spread the scientific culture beyond the Lausanne circle.
- To encourage young people to choose scientific careers for their future.

### Workshops in classes

Upon teachers' request, our specialists in scientific mediation go to classes for a scientific workshop on a specific topic. A pilot project showed the great demand from teachers for such experiments in classes, using a different approach and enabling them to repeat the workshop thanks to a handout specifically developed for that.

## Testimonies

Following your workshops my daughters took the Mathematics/Physics options. The oldest one will start this option next year at the high school. I would like to take this occasion to thank you for having supported my daughters in their school orientation.

My daughter, Emma, completed the three-day Electricabrac workshop offered by your Program. She enjoyed each class and was enthusiastic about all the projects. She shared projects with classmates and teachers at school. We discussed about electric circuits, batteries, and engines at dinner! We greatly appreciate all your time, effort, and knowledge dedicated to organizing and implementing such an amazing science workshop.

I started in October 2014 my Bachelor in Computer Science at ETH Zurich. I chose to study Computer Science, thanks to the actions you have undertaken. I participated in 2007 in the workshop "Internet for girls" and that's what convinced me to study IT!

Over the years Alexandra has participated in a number of activities: Internet pour les Filles, Les Maths en Jeu, Je m'amuse avec les sciences, La science c'est...aussi pour les filles, la Journée "Oser tous les métiers", and holiday activities, to cite some of them. These activities have been interesting and stimulating for Alexandra and she enjoyed them a great deal. Exposing her to age-adequate science and math activities has made her comfortable with these subjects. And she has experienced first-hand that sciences have no gender. These activities are extremely important – I can say it as a parent and a female scientist. Thank you for all your work.

"I am in 3rd year gymnasium in mathematics and physics option. This option follows me, since I participated in the workshops of "Math en jeu" in fact. Going one hour a week, doing math while having fun convinced me to choose science. I also followed the workshops "Internet for Girls" which allowed me to create my own website and "Science for Girls" which consisted of a week on the weather, where I made my own instruments. All workshops have made me discover science subjects from a different perspective, much more interesting. They also helped me in my studies because some topics were seen in class and I was quite happy to know already about them. I think this is a real opportunity for girls and boys, to discover scientific studies from a different angle.

I would like to thank you for the visit of the bus in our town. The feedback received from the dean, teachers and students are extremely positive and the experience is a wonderful success. This bus is a great opportunity to approach the various fields of science, and talk about technical and scientific professions.

## The Science Festival (Scientastic)

Scientastic is the discovery of science and technology at the heart of the EPFL! A day to explore, experiment, question and meet with scientists, researchers who invent the world of tomorrow. It is also an opportunity to understand the impact of science and technology on our daily lives.

Workshops, conferences, shows, entertainment, exhibition stands, interactive demonstrations and live experiences in a friendly, interactive and participatory environment

Special scientific workshops for youngsters are developed every year for this festival and 2000 children and youngsters (7-16) years can follow a workshop during an hour. Youngsters as well as adults can benefit from the interaction with scientists in a special space called "How does it work?" around an interactive exhibition specially developed for this occasion.

<http://scientastic.epfl.ch/>

## SPONSORING

Our program runs thanks to our sponsors and partners. We have different sponsors and partners who help us for one or several actions and we are looking for other generous partners and sponsors. Each partner or sponsor can choose to support one or several activities for one, two or three years.

A list of activities and their costs is available upon request.

For example for 2015 KGF gave 30'000 CHF for 2 scientific weeks within the bus and 15 scientific afternoons, The Leister Foundation supported 2 weeks tour with the bus. L'Oréal Suisse gave the support for 3 scientific camps for girls. Our activities are also supported by 3 National Centers of Competence (NCCRs Robotics, Synapsy and Marvel), Cisco sponsored " My thesis in 180s".

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**THANK YOU**