Update: Science Gateway Education
Science Gateway – the idea
Science Gateway taking shape – 13 January 2022
Science Gateway Education

Labs
Discover your inner scientist

Science Shows
Explore the stories of discoveries

Online Learning
Engage online to find out more

TSF March 2022 | sciencegateway.education@cern.ch
Science Gateway Education

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• 45-90 min workshops in different languages & tailored to age groups
• Focus on independent hands-on experimentation and teamwork
• Two lab spaces for each 24 participants

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- Focus on surprising demonstrations and interactive storytelling
- Auditorium for 200+ people

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Patrick Thill

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Anja Kranjc Horvat

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- Videos with quiz questions, DIY experiments, material for educators
- Focus on independent learning
- Material in English and French

Guillaume Durey

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Educational Goals

• Creating memorable positive impressions related to STEM (science, technology, engineering and math)

• Fostering positive attitudes towards STEM, STEM professionals and STEM careers

• Raising awareness and understanding of nature of science, scientific methods, concepts and technologies

• Promoting the value of fundamental science
Design principles of education activities

- **Authenticity**: using the unique atmosphere to bring learners in contact with topics that are linked to CERN, using authentic research equipment under guidance from volunteers from CERN’s scientific community.

- **Hands, head & heart**: actively involving participants physically through hands-on manipulation, cognitively through surprising observations and educational explanations, and affectively through creating positive experiences with science and scientists.

- **Empowerment**: enabling participants of all ages and backgrounds to engage in science, empowering them to do more than they thought they can and showing that science is for everyone.
Topics

- Detectors & sensors: making the invisible visible
- Accelerators & magnets: manipulating particles
- Information Technology: creating a unique computing infrastructure
- Engineering: making the impossible possible
- Theory: rationalising, predicting and explaining phenomena
- Data reconstruction & analysis: making sense of observations
- Technology: manipulating robots, vacuum and cryogenics
- Applications: bringing CERN’s technologies into our everyday life
- Scientific methods, models and nature of science: doing science
- STEM careers: exploring STEM occupations and workplaces

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Science Shows Development

Updating existing shows based on audience and demonstrator feedback
Fun with Physics, Detection: Antimatter Show, Technology: Superconductors Take Off!

IT: Computing Technology and Data Analysis
Big data, trigger system, data storage and analysis, …

Theory vs Experiment: Quantum Physics
Light phenomena, quantum computing …

Science show evaluation protocol to support continuous development
PhD project starting in April 2022
Online Learning

Guillaume Durey
Overview of the Solvay Education Programme

level 1

Online social media education content
• Reach 1.3 million views per year via CERN social media
• Goal: to trigger STEM interest
• 25 short videos per year

level 2

Online course for high-school students
• 10 000 participants per year from around the world
• Goal: to develop interest in STEM
• 6 course chapters per year, 10-20 min explainer videos

level 3

On-site camp for high-school students at CERN
• 30 participants per year from around the world
• Goal: to build confidence & transform STEM interest
• 1 camp per year (1st camp in 2023, 2 camps in 2024)
Engineering: How do we move the CMS detector?
Engineering: ‘The power of air’

CMS air pad

Lab air pad in action
Engineering: ‘The power of air’
Thank you for your attention
Let’s discuss!