

Steffen Turkat, TU Dresden

Outreach Experience Report

SNAQs / April 13, 2022

About me

Study of Physics at TU Dresden

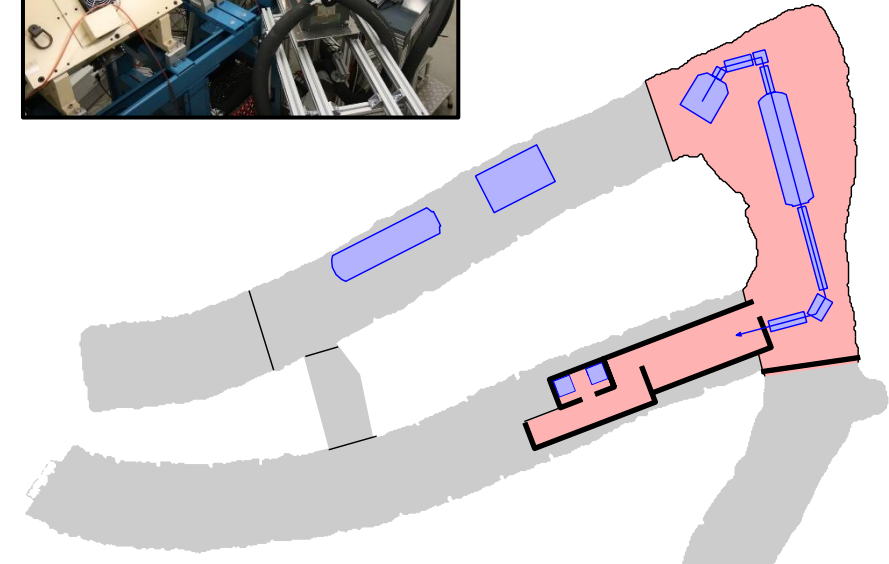
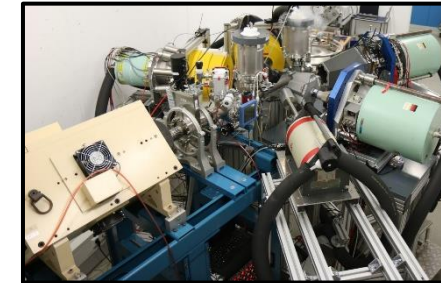
PhD project: Nuclear astrophysics at Felsenkeller

Active in Outreach/Teaching since 2016:

- Outreach, Masterclasses, Workshops etc.
- Teaching duties at university
- Supervising B.Sc/M.Sc. students
- Supervising high school students
- ...



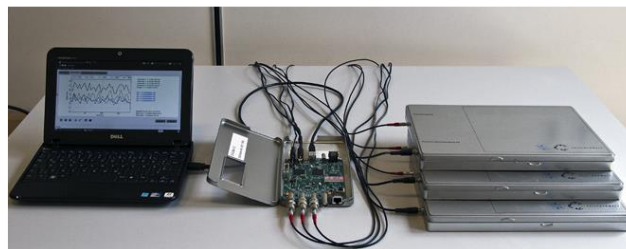
Source: Google Earth



Outreach possibilities in astro particle physics



Cloud chambers
Making particle traces visible



Scintillation panels
Muon coincidence detectors



Kamio-Can: Coffee pot used as Cherenkov detector



Hamster wheel
Muon angular distribution

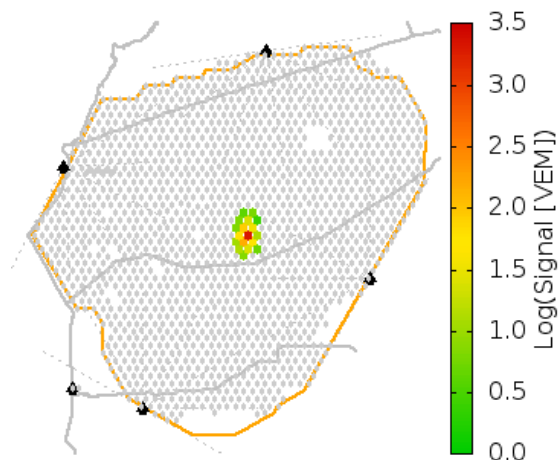
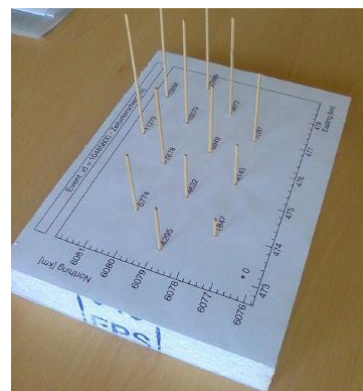
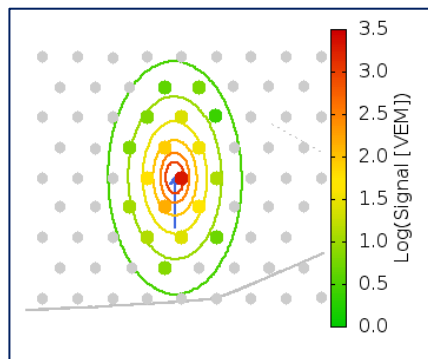
Outreach possibilities in astro particle physics

Auger Masterclass

→ Investigation of cosmic ray showers



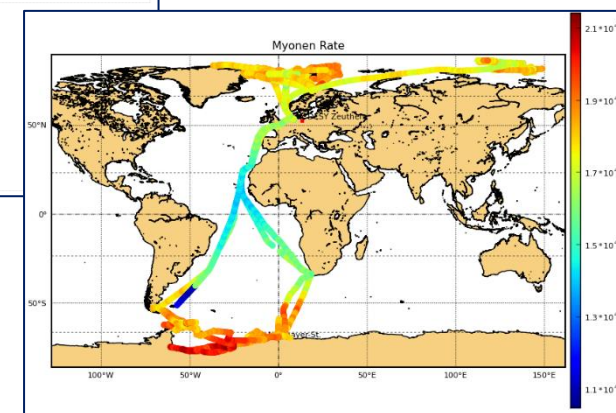
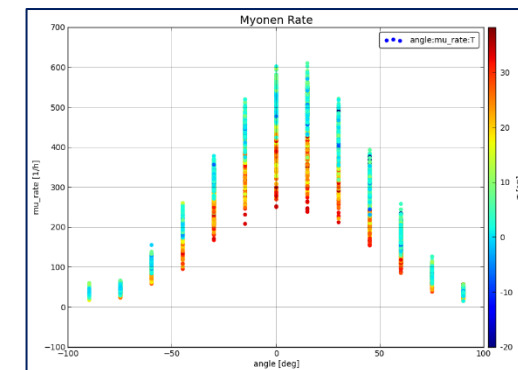
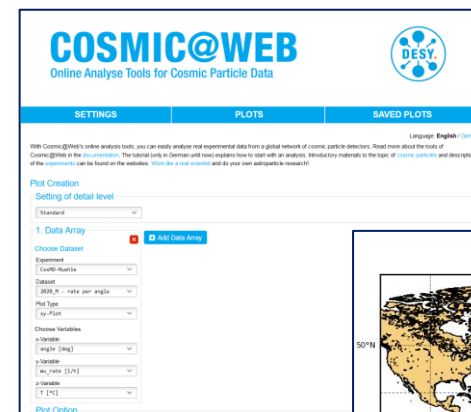
Source: auger.org



Source: auger.uni-wuppertal.de/

Cosmic@Web

→ Interactive online platform



Source: cosmicatweb.desy.de

Richard Feynman

→ The greatest science communicator of all time (my opinion)



BBC documentary

➤ “The fantastic Mr Feynman”

Source: <https://www.youtube.com/watch?v=H9fjhQMsDW4>

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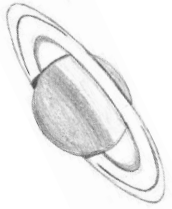
BBC documentary

- “The fantastic Mr Feynman”

Feynmans admirable techniques

- Respectful environment
- Takes no elitist point
- Criticism: “I believe, I don’t understand, I agree, I think...”
- Entertaining, enthusiastic & inspiring
- Raising deeper questions
- Takes you onto to a journey

My personal motivation for Outreach



For the broad population

- Sharing the excitement
- Legitimizing trust in science



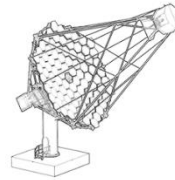
For physics students

- Forwarding knowledge that was granted to us



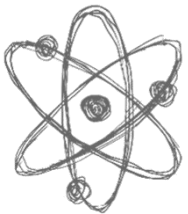
For the future generation

- Igniting their inspiration
- Showing that physics is more than rolling a ball on an inclined plane



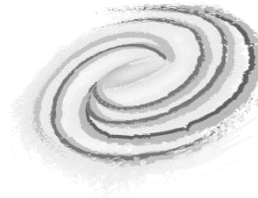
For teachers

- Teachers can act as multipliers
- Deepen the knowledge about nuclear physics, astrophysics, cosmology, particle physics etc.



For myself

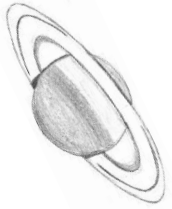
- Active role in society
- Teach yourself how to teach



Further matter of concerns

- Encourage girls for physics
- Support of specially gifted pupils

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- Sharing the excitement
- Legitimizing trust in science



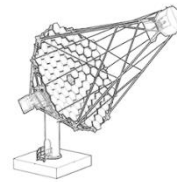
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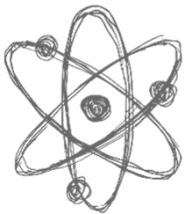
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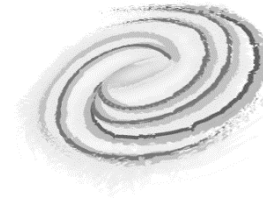
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For the broad population

→ Sharing excitement and legitimizing trust in science

Long Night of Sciences



Guided tours through our labs



Day of the open laboratory



Source: HZDR.de // Credit: Stephan Floss

Radio Podcast: "What is time?"



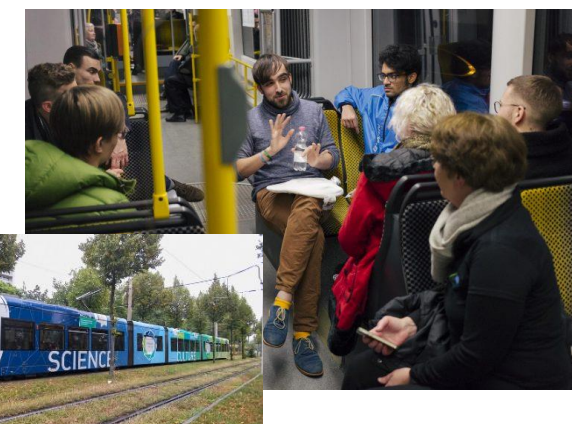
Source: MDR.de

Video Podcast: "Nuclear energy"



Source: Gute Frage, TU Dresden

Science tram: "The universe"

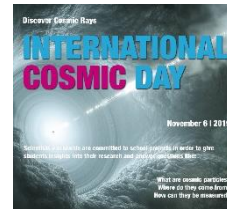


For the future generation

→ Igniting the inspiration

My personal experiences

- Workshop in a school
- Juniordoktor
- Physik am Samstag
- International Cosmic Day
- Science4Schools
- Expedition Campus
- CERN Summer School
- Schule MIT Wissenschaft



Source: <https://www.mfd-dresden.com/bestanden-mehr-als-100-neue-juniordoktoren/>



Source: juniordoktor.de



Source: tu-dresden.de

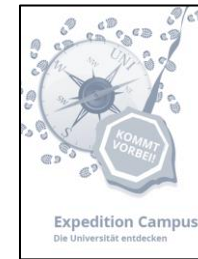


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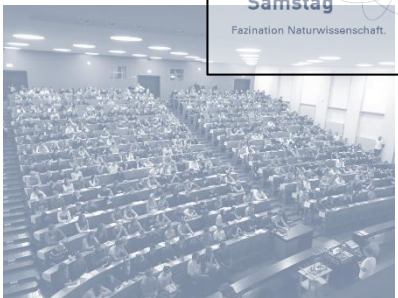
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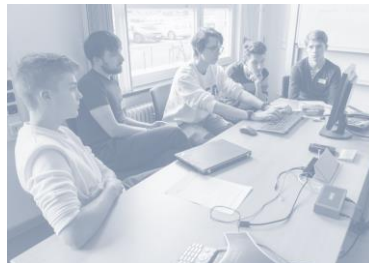
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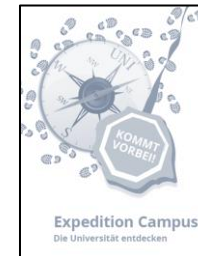


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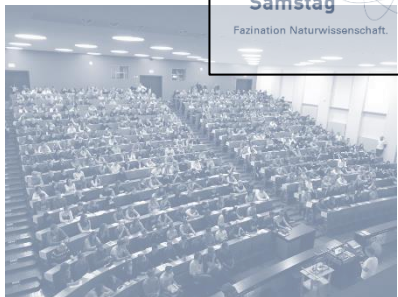
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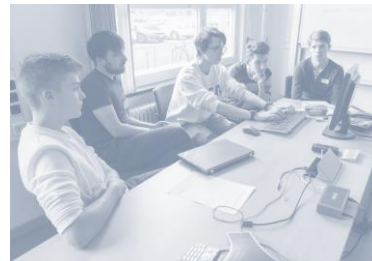
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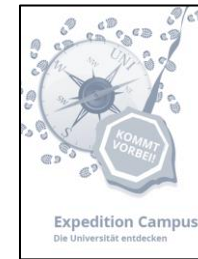


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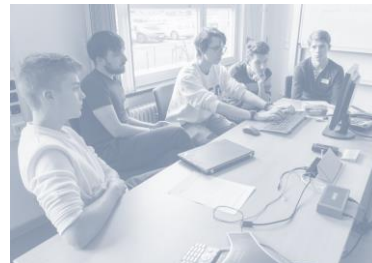
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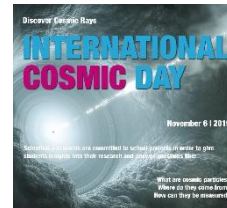


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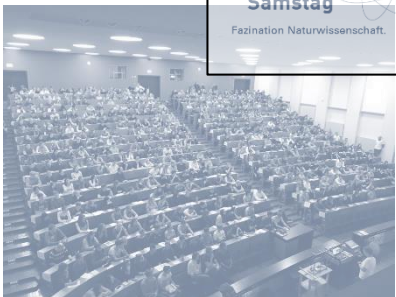
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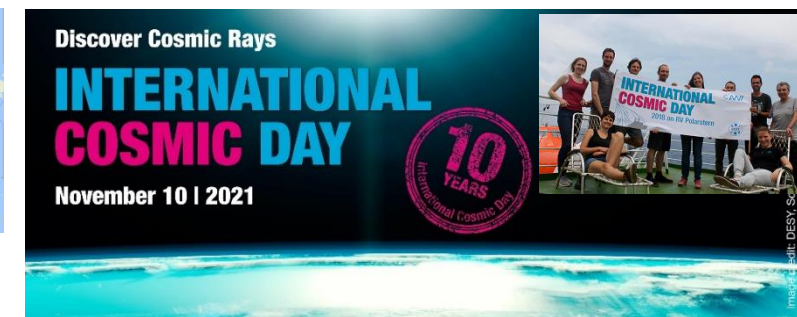
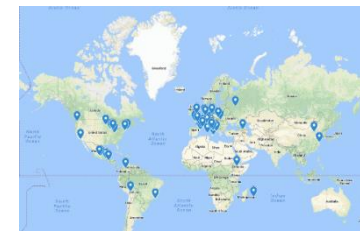


Source: tu-dresden.de



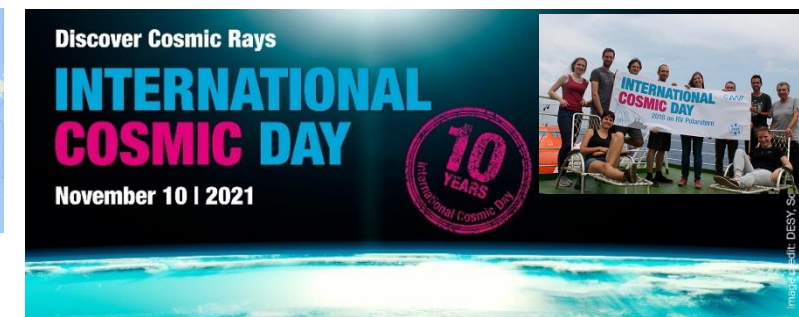
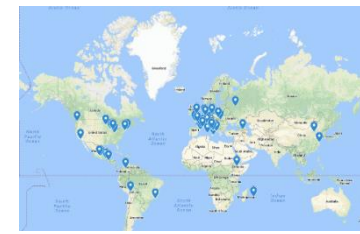
The international cosmic day

→ Being a scientist for one day



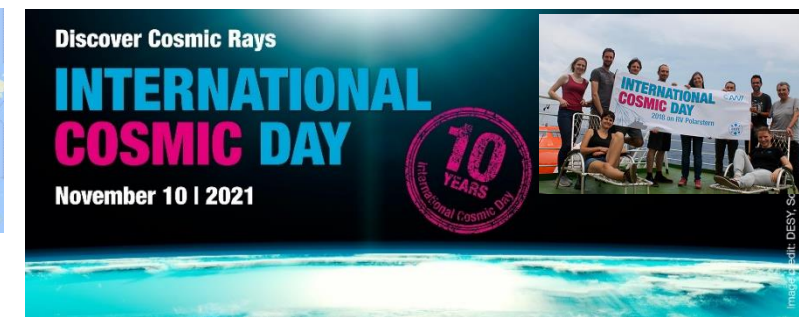
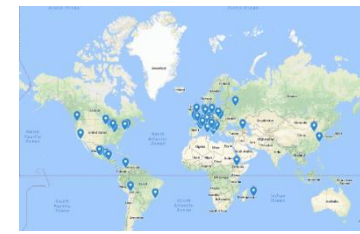
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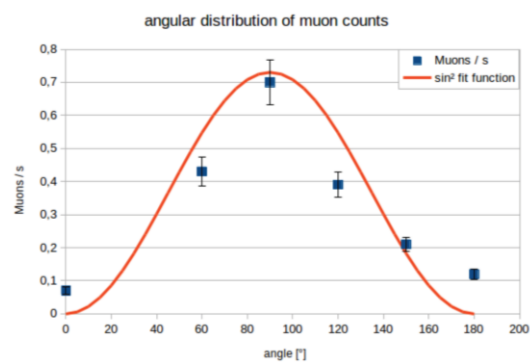
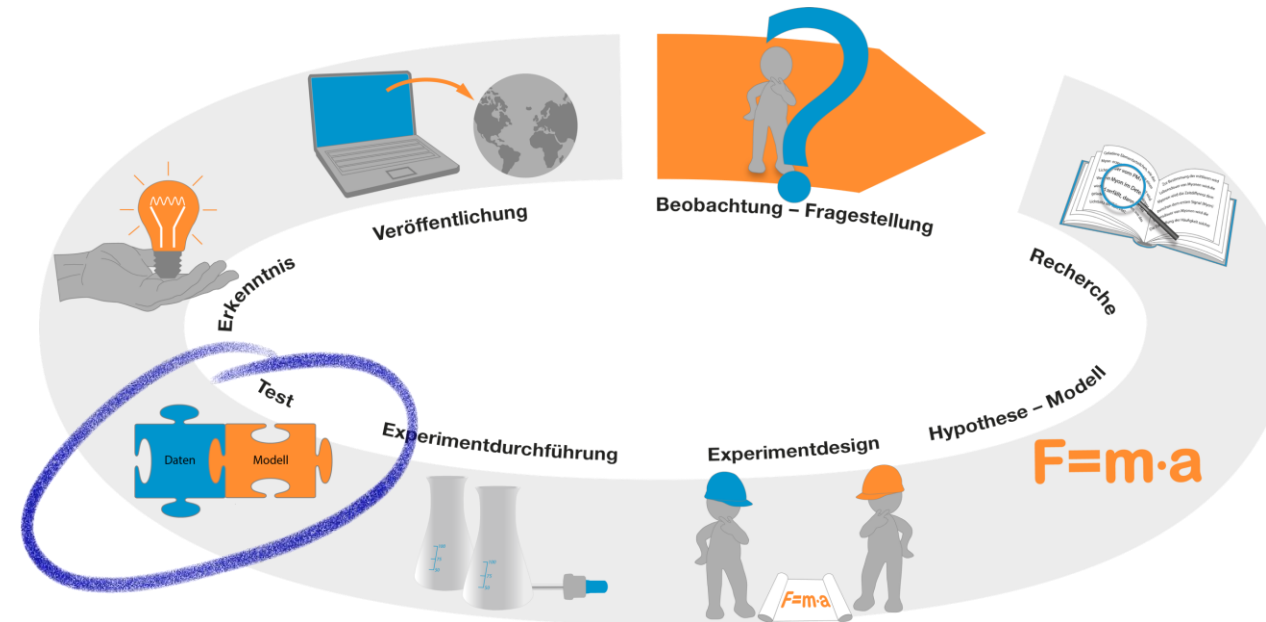
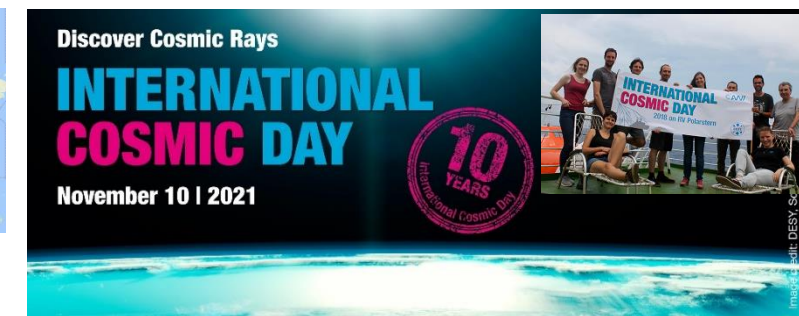
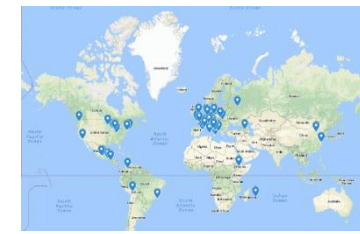
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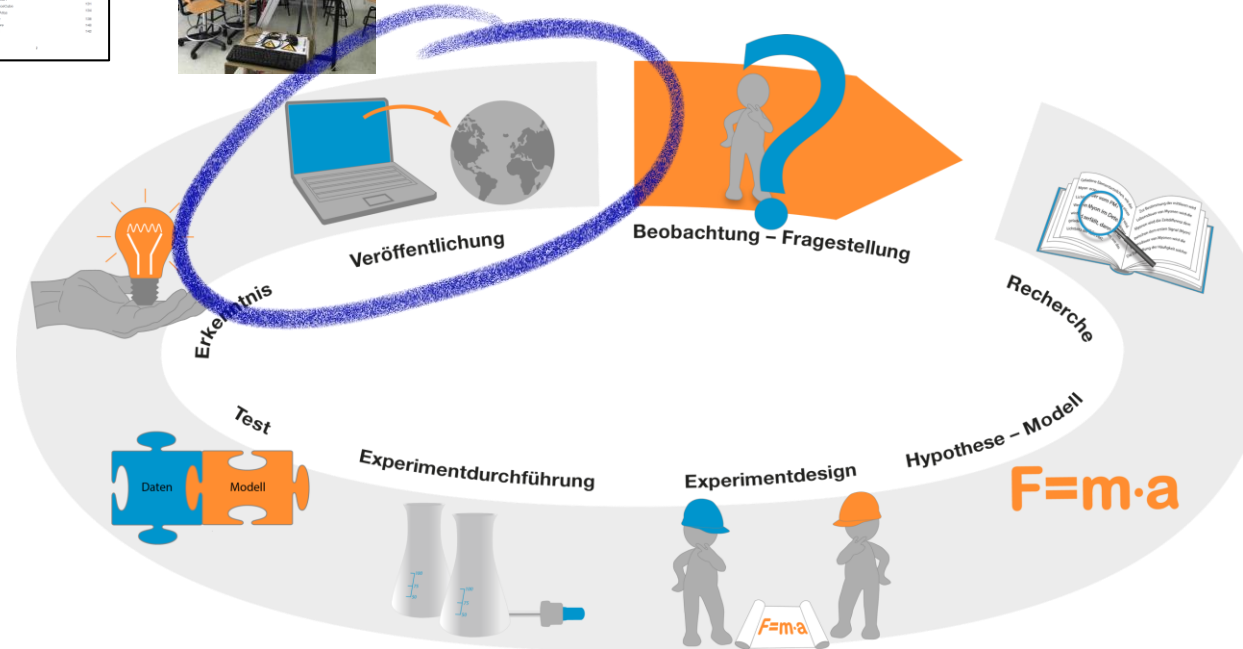
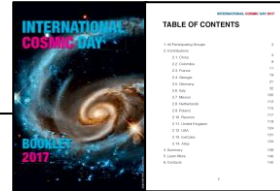
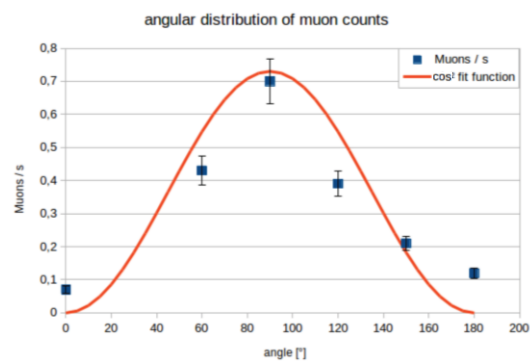
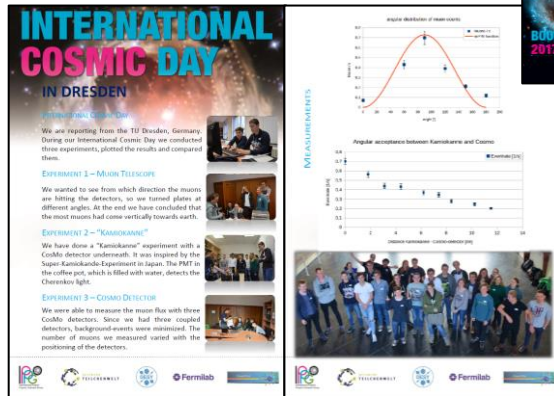
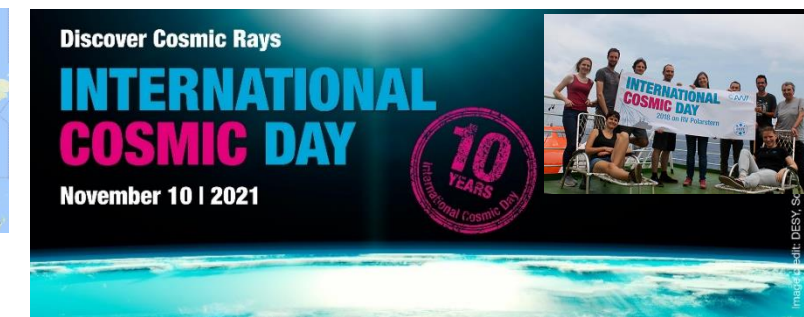
The international cosmic day

→ Being a scientist for one day



The international cosmic day

→ Being a scientist for one day



Encouraging girls for physics



Green light for girls

Source: Greenlightforgirls.org

Girls' day



Girls' Day
Mädchen-Zukunftstag

Source: Dresden.de



Low percentage of girls in physics and computer science courses

- Biology: 60 %



- Physics: 26 %



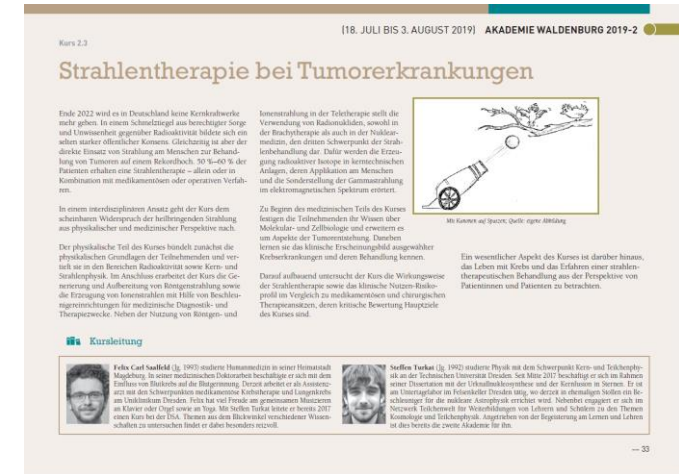
- Computer Science: 15 %



Source: <https://www.koerber-stiftung.de/mint-nachwuchsbarometer>

German Summer Academy 2017 + 2019

- Extracurricular program to promote highly gifted and motivated high school students
- 16 days during summer vacation
- Learning on university level
- Patron: **President of Germany**
- Funded by **Federal Ministry of Education and Research**



German Summer Academy 2017 + 2019



German Summer Academy 2017 + 2019



Source: <https://www.youtube.com/watch?v=LqgUprbSMzA>