

# Netzwerk Teilchenwelt

## = Network Particle World

A German Network on Particle Physics education and outreach  
funded by the German Federal Ministry of Education and Research  
1.1.2010 – 31.1. 2013

# We are...

... a German Network of

- **scientists**
  - (astro-)particle physics
- **students**
  - aged 15-19
- **teachers/trainers**
  - at schools, school labs, science centres etc.

→ in direkt contact to CERN





# We ..

- work with **students AND teachers to bring modern research to the class room**
- offer programs in **particle physics AND astroparticle physics**
- offer young scientists the chances and knowledge to improve **communication skills**





# Our Concept

- **4 programm levels**

- **Basic** introduction in particle physics
- **Qualification** participants organize own projects
- **Deepening the experience** - workshops at CERN
- **Research projects** at research institutes

*students AND teachers*

- **4 central elements**

- **local projects** all over Germany
- **workshops at CERN**
- design of **context materials**
- scientific **evaluation**

*particle physics- and cosmic-projects about the year*

# Activities 2010 / 2011 / 2012

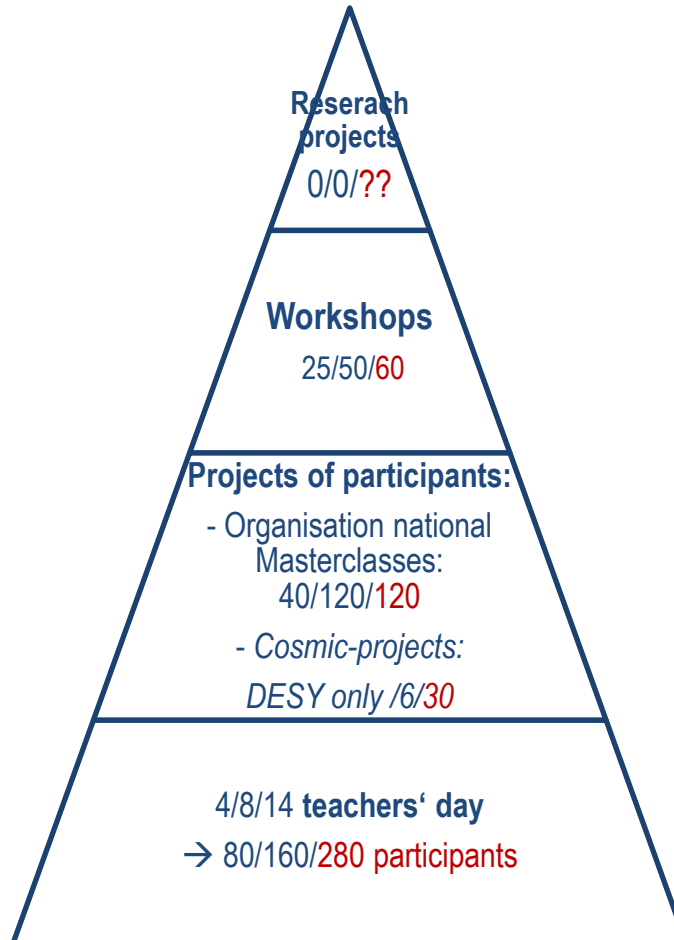
Research projects

CERN

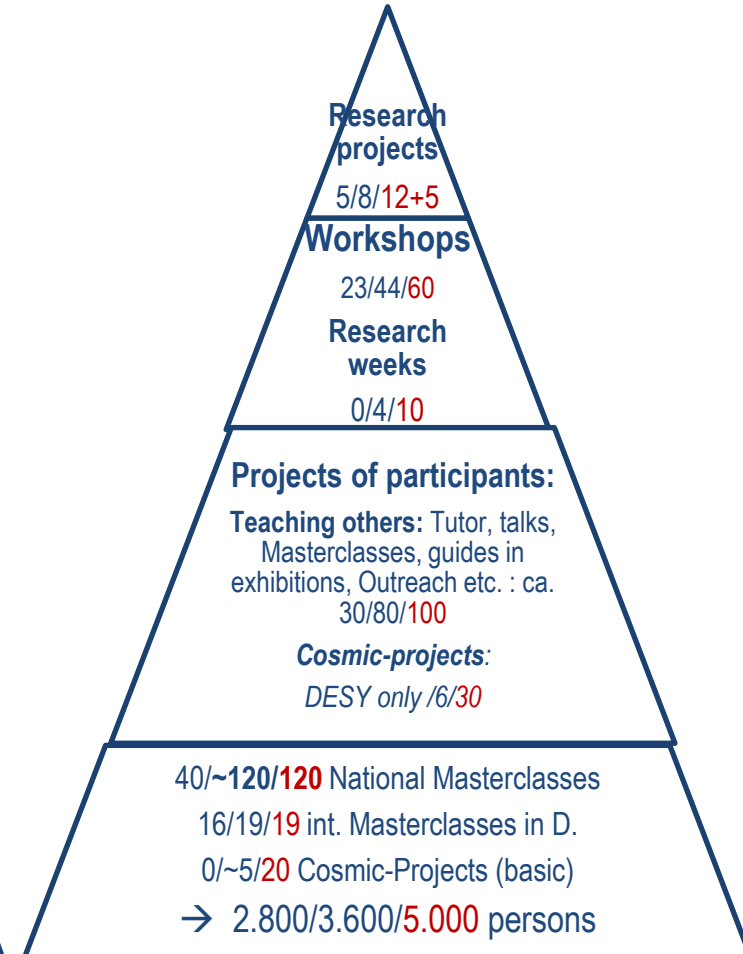
Qualification

Basic Programm

teachers/trainers



students



# activities: National Masterclasses

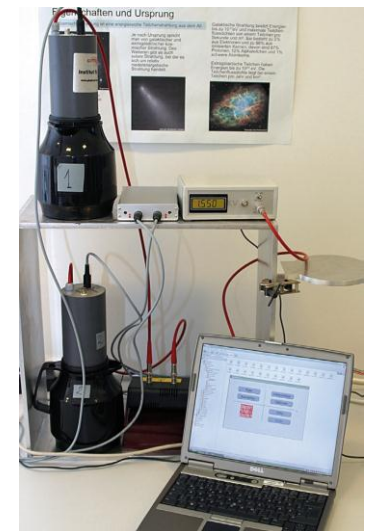
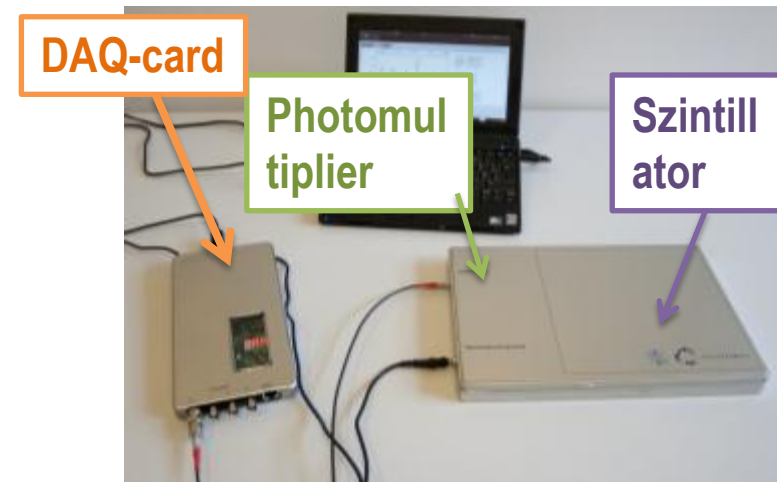
- **what:** about 120 „national masterclasses“ a year
- **where:** mostly in schools, also school labs, fairs, exhibitions
- **how :** 4-5 hrs, one talk, measurements, quiz, no videoconf
- **supervision:** mostly PHD-students, assisted by students (school) and teachers (materials in design and development)
- **group:** about 20 students
- **data:** LHC/LEP-measurements



National Masterclass in Lenggries (MPI München)

# activities: cosmic-project\* (DESY Zeuthen)

- **what:**  
20 „basic introductory days“,  
30 „project weeks“,  
~5 research projects a year
- **how:**  
„Scintillatorexperiment“, using Quarknet DAQ card  
„Kamiokanne“  
Web-experiments (Trigger Hodoskop, polar ship)  
mainly activities in „qualification“ and „research“  
stage
- **Students:** project week (1-2weeks)
- **Teachers:** teachers days
- **supervision:** mostly PHD-students and teachers





# activities: „qualification“ stage

**Students:** „spreading their knowledge to others“

- tutor in masterclasses, cosmic-experiments
- talks about particle physics at school
- guides in exhibitions; help with outreach-activities
- ... even holding a masterclass themselves

**Teachers:** „organizing particle physics projects“

- organising masterclasses, cosmic-projects
- preparation of masterclasses
- ...



# activities: CERN-workshops and project weeks (CERN, partially with German Teachers Program)

- **students:**

- 60 participants in two workshops a year (3 days)
- 10 participants in project weeks  
(own research projects)

- **teachers:**

- 60 participants in two workshops (5 days)
- **CERN-Workshops are a big motivation for activities in the „qualification stage“ and very effective training for teachers in modern physics**





# activities: research projects

## **Students:**

- research projects for 3-10 months  
(particle physics/astroparticle physics)
- often part of final school examinations
- work on own measurements
- Tutors: PHD-students and senior physicists  
at universities and teachers

## **teachers:**

- planning: research projects in  
(astro-)particle physics and didactics
- current problem: lack of physics teachers in German schools  
(no chance for sabbatical)

# backbone organisation / structure

- **Coordination:** Institute for nuclear and particle physics, TU Dresden
- **Workshops:** CERN, German Teachers Programme
- **Context material:** physics didactics, Uni Würzburg
- **Scientific Evaluation:** physics didactics TU Dresden
- since 2011: **Astroparticle project:** DESY in Zeuthen
- **Funding:** BMBF (1/2010-1/20123)
- **patronage:** the German Physical Society
- **Partner:** [www.weltderphysik.de](http://www.weltderphysik.de)



GEFÖRDERT VOM



Bundesministerium  
für Bildung  
und Forschung

# Local Organisation

- 22 institutes in „Netzwerk Teilchenwelt
  - 19 Institutes International Masterclasses
  - 8 Institutes teachers day
  - 15 Institutes astroparticle physics
- = almost all particle physics institutes in Germany

➤ around 140 scientists involved !





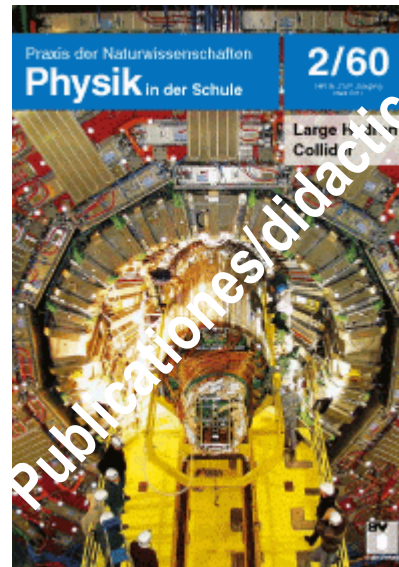
**Lots of people behind the scenes in the organisation team...**

... e.g. at a workshop to discuss the context materials at DESY in Zeuthen

# No network without: communication



[www.teilchenwelt.de](http://www.teilchenwelt.de)



Facebook/Twitter

# Upcoming public event in Germany: 23rd November „Tag der Weltmaschine“

- 16 german institutes
- public talks,  
science slams,  
student video contest
- award for  
„Netzwerk Teilchenwelt“  
in the campaign  
„Germany  
land of ideas“



Deutschland  
Land der Ideen

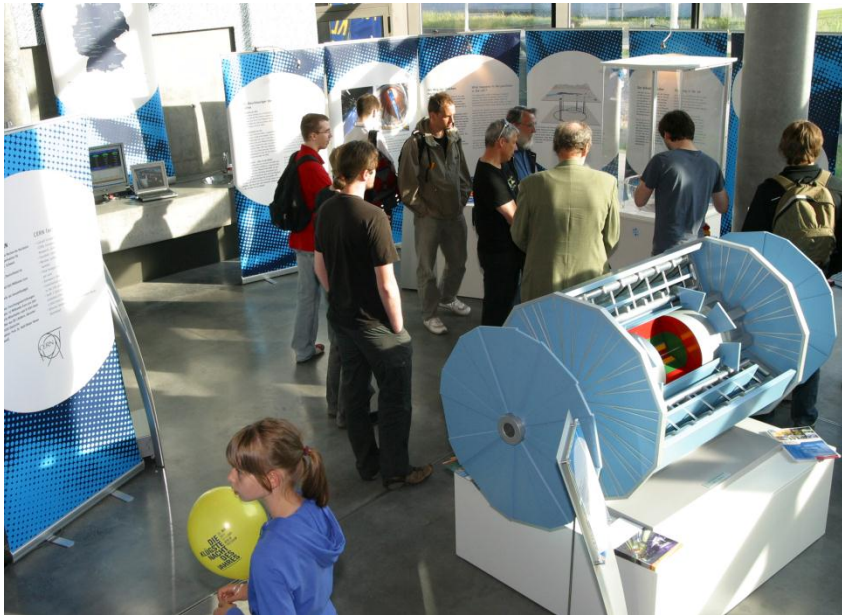


Ausgewählter Ort 2011

# Travelling exhibition „Weltmaschine“

[www.weltmaschine.de/service\\_material/e92/e69780/e79832](http://www.weltmaschine.de/service_material/e92/e69780/e79832)

- Will be in Bonn and in Dresden for that occasion
- Has an impressive record of venues:
  - Visited 24 locations in Germany in the last 2.5 years!





# 100 Years COSMIC RAY PHYSICS: Anniversary of the discovery by Victor Hess 7th Aug. 1912

- 2012: Conferences in Austria, Germany, USA, India
- German school initiative within „Network Particle Physics“:  
Common measurement of cosmic particles by school students  
~20 German institutes have identical detectors for students



- Idea to extend this initiative internationally:  
1 day in September 2012, coordination by ASPERA  
discussions with Fermilab have started
- Contact: [michael.walter@desy.de](mailto:michael.walter@desy.de)

Thank you!

More information:  
[www.teilchenwelt.de](http://www.teilchenwelt.de)

ORIGINALSCHAUPLATZ



PARTNER



SCHIRMHERRSCHAFT



PROJEKTLEITUNG



GEFÖRDERT VOM

