TECHNISCHE UNIVERSITÄT DRESDEN

Bundesministerium für Bildung und Forschung

DPG

welt der physik

Netzwerk Teilchenwelt

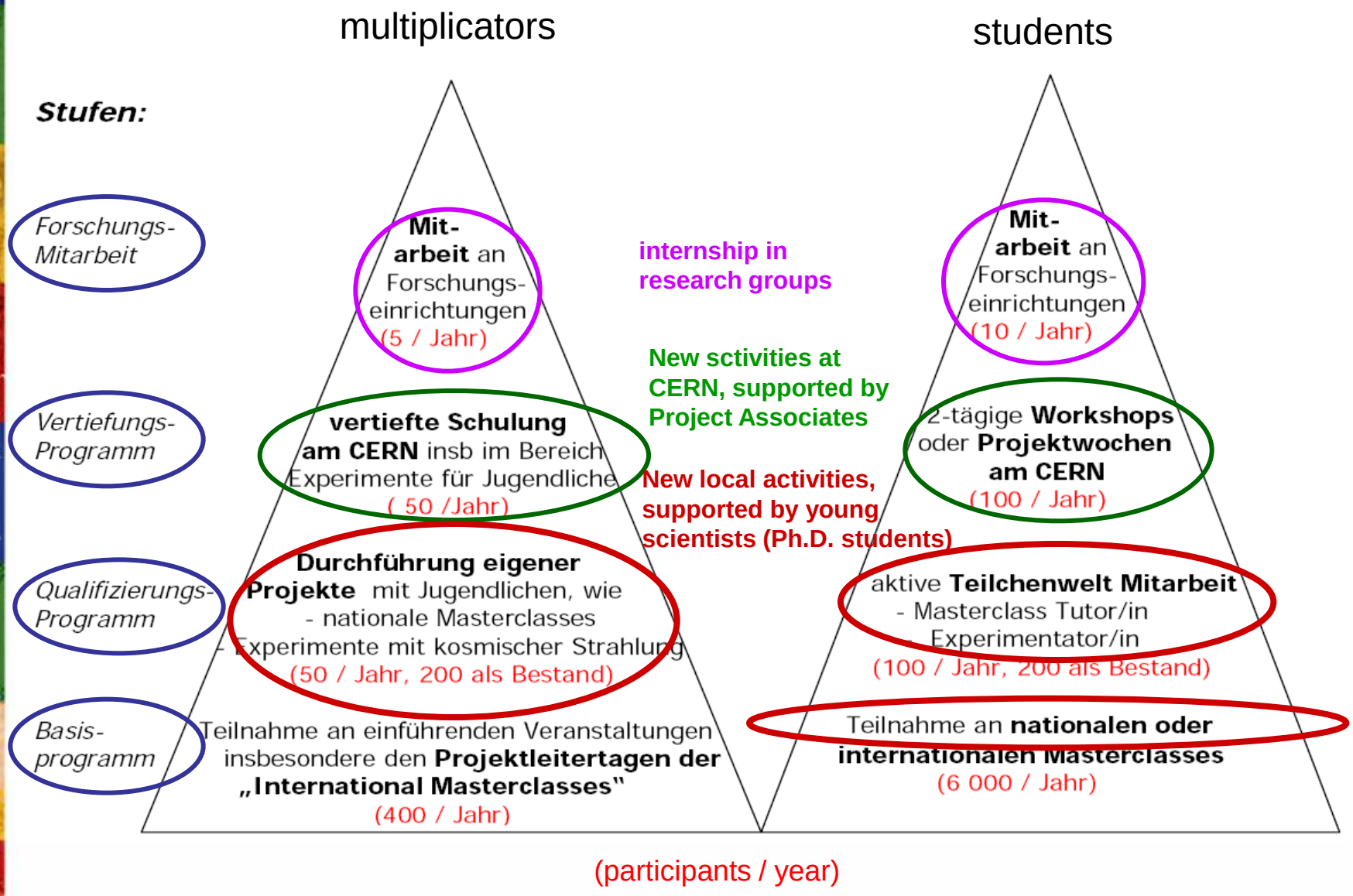
EPPOG Meeting Oslo
17.4.2010

Michael Kobel

Network Structure

- ***Network between scientists, young people and multiplicators for insight in scientific research in direct contact with CERN***
  - Students as young researchers aged 15-19
  - Multiplicators: Teacher as working group leaders at school workshop responsibles in museums, science centres or school labs
  - **All ~ 20 institutes of (astro) particle physics in D**
- **4 central elements**
  - **Local projects** all over the country (national masterclasses and cosmic rays)
  - **On-site experiences** at CERN
  - Development of **context materials**
  - Scientific **evaluation**
- **4 levels** for multiplicators and students
  - Basic level as introduction
  - Qualification level for membership
  - Advanced level at CERN
  - Research level internships at the institutes

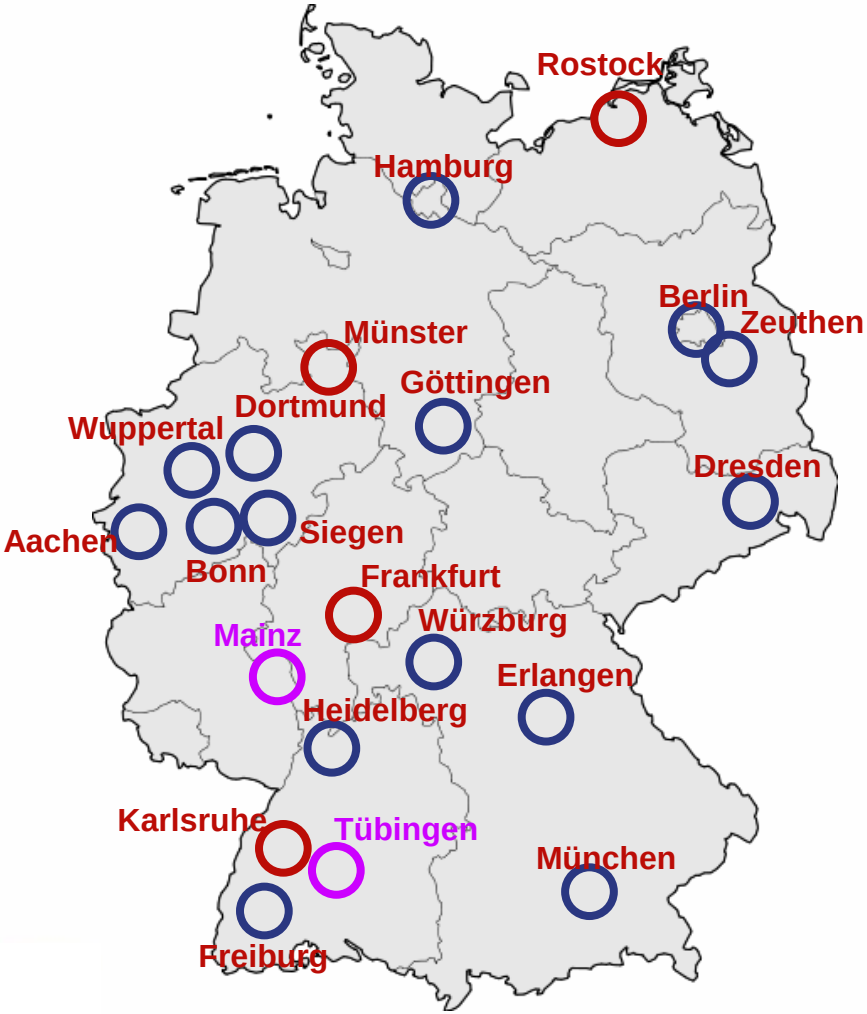
project overview Netzwerk Teilchenwelt



NETZWERK
TEILCHENWELT

Participating institutes, national masterclasses

- Covering most of Germany's states



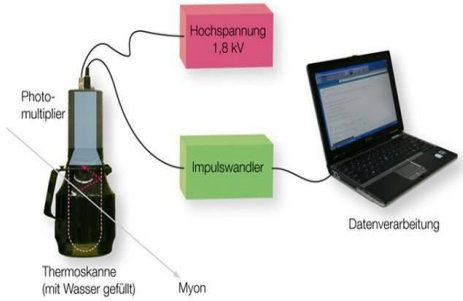
International Masterclasses:
2009: 14 Institutes
2010: +2 Institutes

Netzwerk Teilchenwelt
+ 4 Institutes

Cosmic ray experiments

DESY (HH, Zeuthen), Erlangen, Göttingen, Karlsruhe, Tübingen, Wuppertal, …

- Experiments at school or students at institutes:
  - Rate of cosmic ray = f (angle, air pressure, time)
  - Wide air showers
  - Lifetime of muons



- Example detectors (not complete)
  - **Viele:**
    Kamiokanne
  - **DESY in Zeuthen:**
    Cosmic Trigger Hodoscope
    Kamiokanne
    QuarkNet Detektor
  - **DESY in Hamburg:**
    QuarkNet Detektor
  - …

Kamiokannen-Exp.

QuarkNet Detektor

Cosmic Trigger Hodoscope

New local elements

- Events and Projects
  - **National local masterclasses at schools (or museums, ..)**
    - Material provided centrally
    - First (mostly) measurements with LEP events, (also testing LHC upgrade)
    - Later (mostly) measurements with LHC events
    - Aready succesfully tested 4x in 2009 / 2010 (Dresden, Meißen, Riesa, Oschatz)
      → student teacher thesis Dirk Stumpe, TUD, Aug. 2009
    - aim: ~ 6000 students per year in ~ 200 events
  - **Cosmic ray experiments (if available, not at all institutes)**
    - If portable: at schools
    - Else: at institutes
    - aim: ~ 100 students per year
  - **Supervision of project reports in research level**
    - aim: ~ 5-10 students per year for 6-12 months an institutes
- Personpower needed per event
  - 1 multiplicator (typ: teacher → 5-10 / institute / year)
  - 1 scientist (typ: Ph.D. student → 3-4 / institute)
    - Travel expenses and **small fee** from project

Further new elements

- **On-site experience at CERN (Sascha Schmeling, CERN)**
  - Training for multiplicators, 2-day workshops & project weeks f or students
    - „Live“ experiences and discussion wit h scientists
    - Advanced measurements with cosmic rays and/or LHC Data
  - Project Associate for organisation funded from project (Martin Hawner)
  - ***Project covers CERN stay and travel for Netzwerk members***

- **Context materials (Thomas Trefzger, Würzburg)**
  - „Work order“ to Würzburg Univ by the project (e.g. Ph.D. student N.N.)
    - materials for students (Preparation and Follow-Up)
    - Materials for multiplicators
    - Collection and description of relevant experiments

- **Scientific evaluation (Gesche Pospiech, MK., TU Dresden)**
  - Secondments and research years for saxonian teachers
  - Ph.D. students evaluation of long-term impact (Kerstin Gedigk)
    - Effectiveness of project elements
    - Reception of context material

- **New Branch„Lernwelten der Physik“ within www.weltderphysik.de**
  - Work order for extending the servers of "Welt der Physik"
  - Web editor (0,3 FTE) in project (Sven Sommer)

Project Status

- Funded by BMBF: Jan 2010 – Jan 2013 (740,000 €)
  - September 2008: idea and letter of intent
  - October 2008: press release Min. Schavan (Eröffnung Weltmaschine)
  - In the following: clarification of application boundary conditions
  - October 2009: final application to BMBF
  - end November 2009: approval of grant
- LHC start ideal boundary conditions for Kick-Off
- Win-win situation for everybody:
  - Public Acceptance of fundamental research
  - Visibility of Germany profitting from CERN
  - Education of young scientists in outreach and communication
  - Sicherung des Nachwuchses in physikalischer Forschung
- Expected key elements for success
  - Participation of all 20 Institutes
  - Participation of motivated Ph.D. students

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Official Kickoff Germany: Di 20.4.
Masterclass Kreuz Gymnasium Dresden

More information:
website with project description and press release

www.teilchenwelt.de

(preliminary version)

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