



Coordinated Outreach and Promoting Young Talents in Netzwerk Teilchenwelt

German LHCb groups meeting
Bochum, 23./24.9.2024
Uta Bilow, TU Dresden



NETZWERK
TEILCHENWELT

Public outreach

- ▶ Reach out to the people with our research topics, methods, technologies, and science in general

Goals

- ▶ Foster a connection between our community and the world outside
- ▶ Satisfy existing curiosity and spark interest in science
- ▶ Promote appreciation for fundamental research
- ▶ Stimulate to study STEM, attract new talents
- ▶ Build trust, create transparency, educate on Nature of Science



Pop-up exhibition Urknall unterwegs



Pub festival Beerology

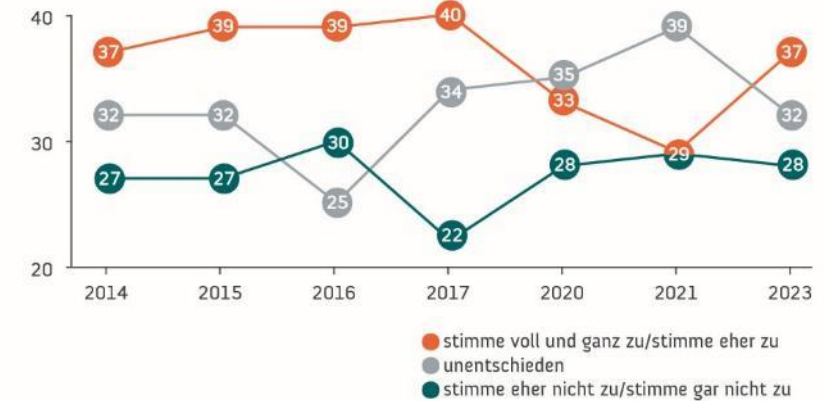
Public interest in science



- Communication of **own results** and **methods** highly requested
- Authenticity

Wissenschaftsbarometer 2022, Wissenschaft im Dialog/Kantar

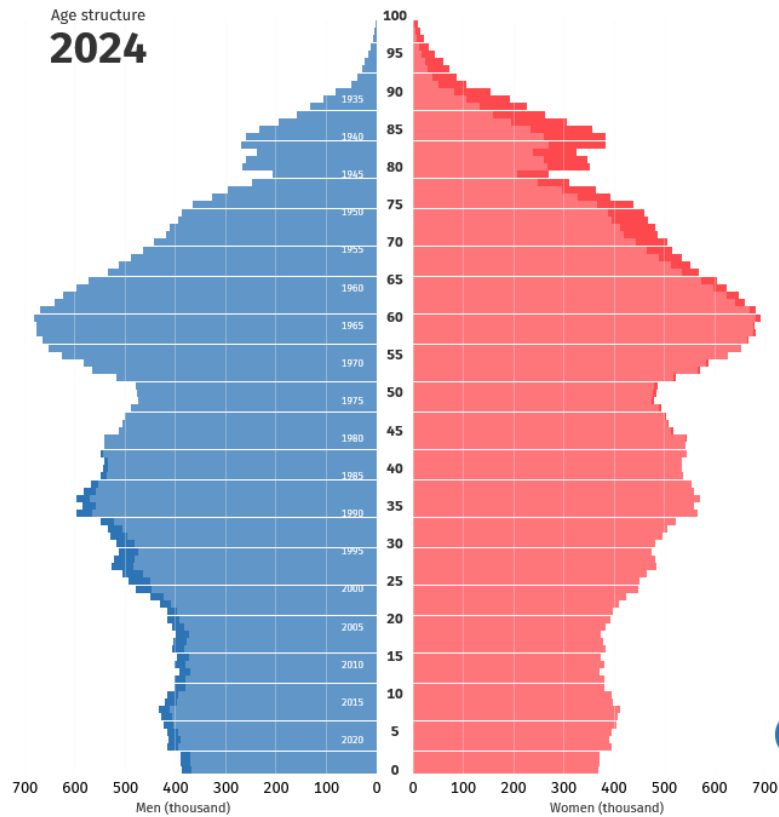
Zustimmung zu: "Wissenschaftler bemühen sich zu wenig, die Öffentlichkeit über ihre Arbeit zu informieren."



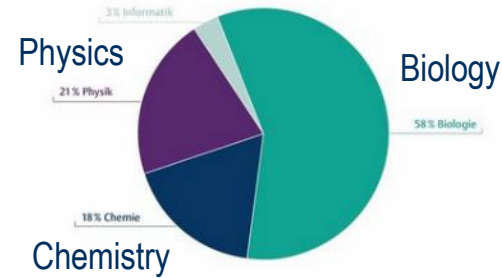
- Scientists make **too little effort** to inform the public about their work

Wissenschaftsbarometer 2023, Wissenschaft im Dialog/Kantar

German population and study choice

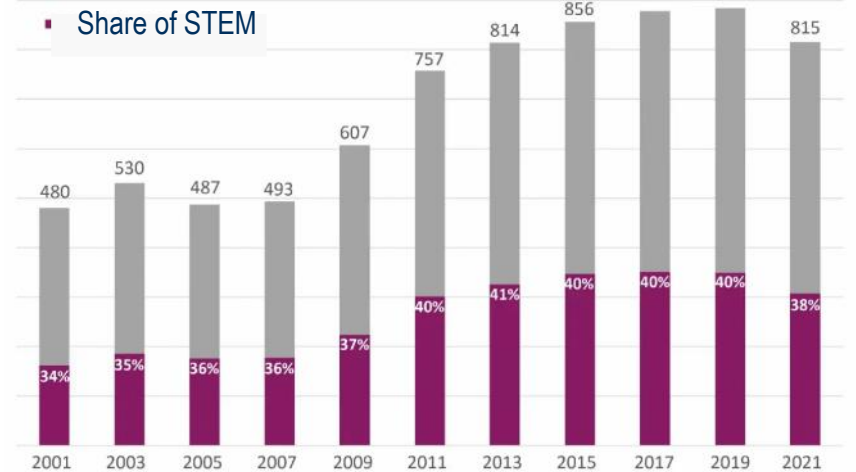


Statistisches Bundesamt

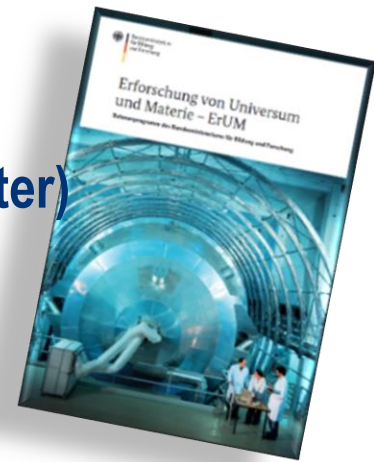


- Only 20% of high school students choose science on a higher level (advanced course or “Leistungskurs”)
- Specialization decisive for choice of field of study and professional development
- Number of university students in STEM studies going down (share is stable)

First-year students (in thousands)



BMBF Framework program ErUM (Exploration of the Universe and Matter)



▶ 4 Fields of action

- Large Scale Facilities
- Networking
- **STEM young scientists**
- **Transfer & participation**

▶ Explicitly supported via KleT³ project

- **KleT³: Kleinste Teilchen: Teilhabe und Talente** (2024-27)
- 2018-2021: KONTAKT, 2021-2024: KONTAKT2

→ Outreach is integral part of research within the framework program ErUM

▶ More outreach via LHC ErUM-FSP office, other funding sources (SFBs, EXC etc.), ...



MINT Nachwuchs

- Nachwuchs für MINT Fächer faszinieren
- Wissenschaftlichen Nachwuchs qualifizieren
- Karriereperspektiven schaffen

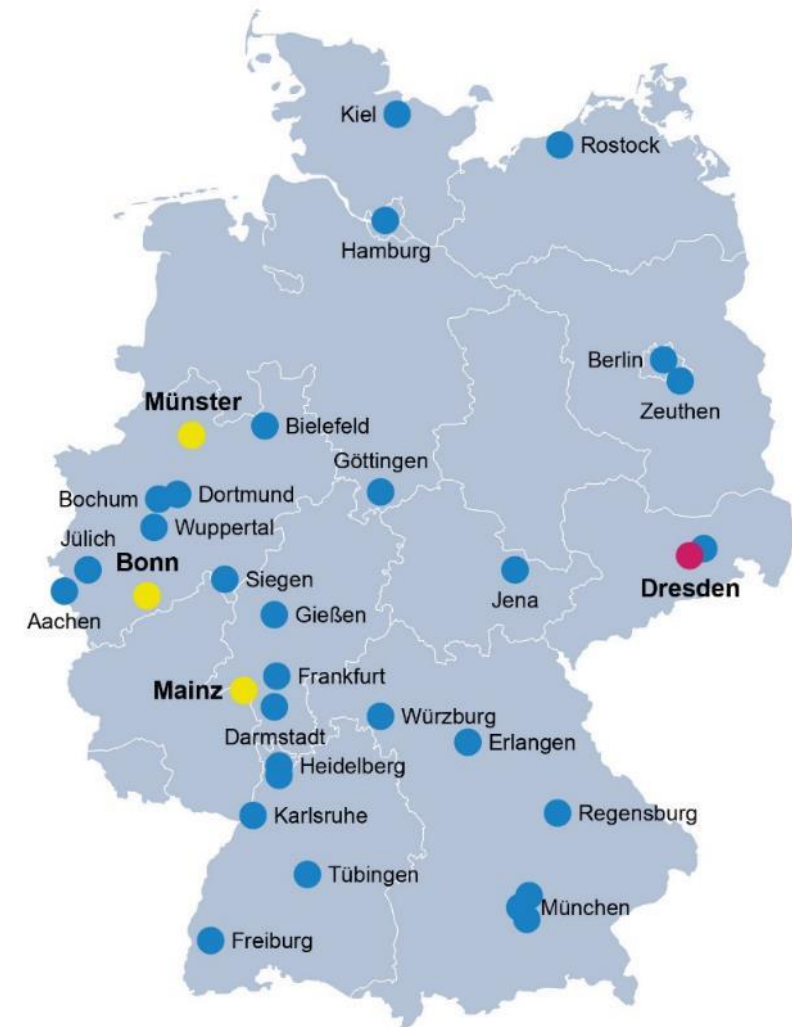


Transfer und Partizipation

- Wissenschaftstransfer von Forschung in Wirtschaft und Gesellschaft anregen
- Dialog zwischen Forschung und Bürgerinnen und Bürgern intensivieren

Netzwerk Teilchenwelt

- ▶ 34 universities/research labs
 - all LHCb institutes are present
 - Teilchenwelt contact person at each institute
- ▶ Joint outreach for Particle Physics since 2010
 - Bundle existing activities
 - Share structures and programs
 - Synergy effects
- ➔ **High visibility and impact of outreach**
- ▶ Target groups: high school students, young university students, teachers, broad public
- ▶ Project team: TU Dresden + hubs at Bonn, Mainz, Münster
- ▶ Collaboration with LHC ErUM-FSP office



Masterclasses

- ▶ Project day in school or university or online
 - International Masterclasses, International Day of Women and Girls in Science
- ▶ Talks and Q&A with researchers
- ▶ Own measurements and analysis of original data
- ▶ Diverse set
 - **LHCb: D0 lifetime**, Hadron Spectroscopy
 - ALICE, ATLAS, CMS, Belle II
 - Machine Learning, Numeric (Planetary Orbits)
 - Hadron Therapy
 - Nuclear Astrophysics
 - IceCube, Auger, Cosmic@Web

✓ **High school students do research supported by young scientists**



© Sebastian Neubert

Facilitators

- ▶ 150 PhD and Master students engaged
- ▶ guide Masterclasses, supervise students' research projects
- ▶ *get central reimbursement of expenses and travel cost**
- ▶ yearly science communication and outreach training
 - Next Workshop: 11.-13.11.2024 in Fulda
 - Fully funded by Heraeus foundation, except travel cost
- ▶ Frequent (online) onboarding events
- ▶ Acquire soft skills, for personal and professional development. (Outreach is an integral component of research ... and increasingly important for your career – be it for scholarships, grant applications or appointments.)

@Students: Please join this great team!

@Supervisors: Please support this important task!



ATLAS Masterclass in Bonn



Outreach workshop in Fulda

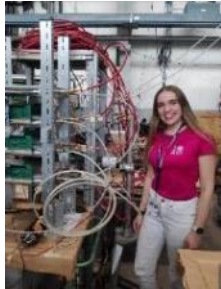
Inspire the next generation of scientists



Result from survey 2024:
38% of PhD students
guiding Masterclasses
attended a Masterclass
as a high school student

Masterclasses – first level of a multi-step program

*CERN project weeks**,
research projects at
institutes
List of 156 essays, incl.
46 awards



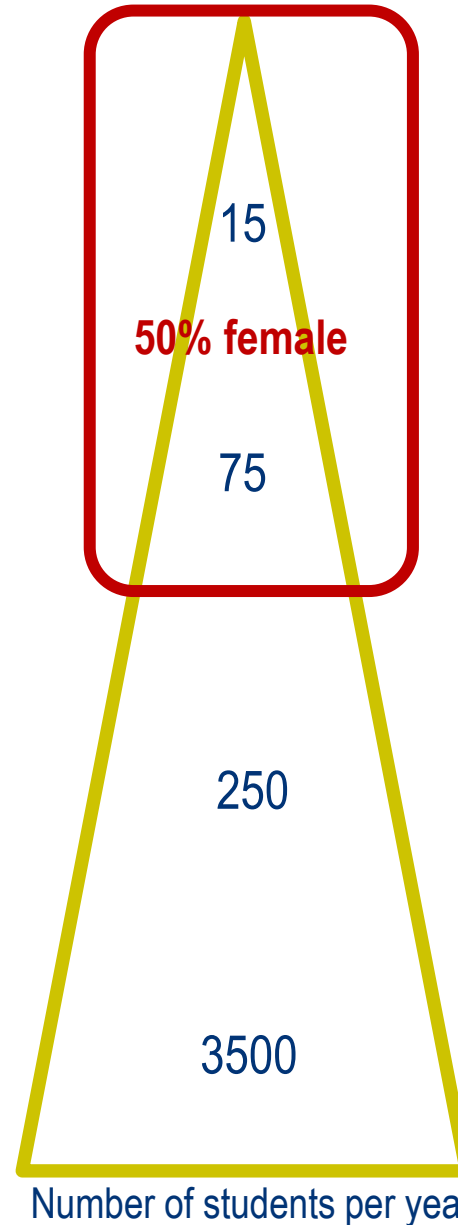
*CERN workshops**,
Particle physics
academy in Mainz



Active engagement,
detector projects



Masterclasses



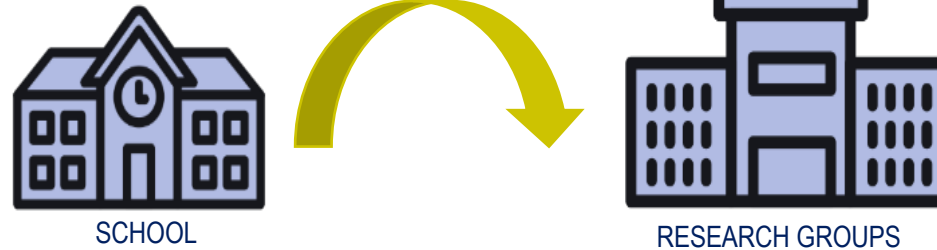
✓ **High proportion
of women on
higher levels**

Female share in
physics exams 2023:

- 22% Bachelor
- 25% Master
- 22% PhD

* currently suspended due to funding cuts

Fellow program



- ▶ 150 people, 50% female (program launched in 2017)
- ▶ Mainly alumni of CERN workshops
 - experienced talents, participated in several program levels, now studying physics or shortly before
- Foster connection between highly motivated students and research groups
- ▶ Central offers: yearly Fellow physics school, frequent online events Ask the expert (research highlights, career development), *yearly Fellow meeting**, *invitation to national physics conferences**
- ▶ Local offers: internships, invitation to group events (scientific, outreach, social), excursions, colloquia, regulars' table etc.

Win for Fellows: Close and early connection to research, extra training, networking

Win for groups: Close connection to highly motivated, well trained students, support in science and outreach

Fellows in science and outreach

School Introduction to the Terascale for Fellows and B.Sc. students



Fellows at CERN70 in Berlin helping as guides



Fellow Lukas: From internship to authorship ATLAS blog



Fellow Julia Els in panel discussion at CERN70 [LinkedIn](#)



Fellows invite prominent speakers for Ask the expert: Ranga Yogeshwar, Reinhard Genzel...

Urknall unterwegs

- ▶ Pop-up exhibition on particle physics
 - Tunnel: time travel through the history of the universe
 - Pavilion with games
- ▶ Target audience: general public, people with less affinity for science
- ▶ Goes to public places, pedestrian zone, shopping mall, festival, campus....



Urknall unterwegs

- ▶ 25+ places visited since 2022 ([photo gallery](#)), incl. Aachen, Bochum, Heidelberg, Siegen
- ▶ From now on located in Mainz, can be loan by institutes (transportation costs)
- ▶ No *tour manager**, due to funding cuts



More outreach: CERN70 week events

- ▶ 36 events at 18 sites (including Aachen, Bonn, Freiburg, Heidelberg, Siegen, ...)



© Uni Siegen

FAKULTÄT FÜR PHYSIK UND ASTRONOMIE
UNIVERSITÄT HEIDELBERG
ZUKUNFT SEIT 1386

KLEINE TEILCHEN – GROSSE CHANCEN

Das CERN wird 70 Jahre alt

Donnerstag, 19.09.2024
19.00 Uhr
SCIENCE PUB QUIZ

Freitag, 20.09.2024
19.00 Uhr
VORTÄGE UND PODIUMSDISKUSSION

Prof. Dr. Monica Dunford
Prof. Dr. Hans-Christian Schultz-Coussa
Prof. Dr. Ulrich Lohmeyer

Schottky-Institut für Physik
Neuenheimer Feld 227

CERN
70 YEARS / ANS CERN



Schüler-Wettbewerb

1954-2024
JAHRE CERN

Wann & Wo?
20. September 2024, 9:00-12:30 Uhr
Im Emmy-Noether-Campus
Saal ENC D-114

Was?
Präsentiert als Gruppe von bis zu vier
Personen ein Poster oder Kurzvideo über das CERN

Universität Siegen



© Oliver Pooth

70 Jahre CERN.

Feiern Sie mit uns.

70 YEARS / ANS CERN

Programm im September:

Samstag und Sonntag
14./15.09.2024 Vorführung „Whats the matter“ der Physikshow Bonn im
Wolfgang-Paul Hörsaal jeweils um 11:00

Montag
16.09.2024 Science-Slam „Particle-Poetry“ im
Wolfgang-Paul Hörsaal um 18:00

Freitag
20.09.2024 Geburtstagsfest mit öffentlichen
Vorträgen im Forschungs- und
Technologiezentrum Detektorphysik
ab 16:00

Alle Infos

Alle Interessierten sind herzlich eingeladen mitzufeiern und mehr
über die Errungenschaften und zukünftigen Pläne des
europäischen Forschungsinstituts CERN zu lernen.

TEILCHENWELT
UNIVERSITÄT BONN

You want to get (more) involved in outreach and promoting young talents?

- ▶ Become facilitator (Vermittler:in), guide Masterclasses, supervise high school students' research projects at institutes
- ▶ Attend onboarding event for new (PhD) students, every 3 months
 - Next event: 29.11.2024, 10:00, Onboarding in English [registration](#)
- ▶ Attend communication and outreach training (2.5 days)
 - Next workshop: [11.-13.11.2024 in Fulda](#) (in German)
- 👉 Meet local Netzwerk Teilchenwelt contact person at your university
- 👉 Register at www.teilchenwelt.de/aktuelles/newsletter/

Group leaders:

- ▶ Support your students to be active in outreach
- ▶ Involve the Fellows (young students) at your university

info table
@ coffee
break area

PROJEKTLEITUNG



PARTNER



SCHIRMHERRSCHAFT



FÖRDERER



GEFÖRDERT VOM



Bundesministerium
für Bildung
und Forschung