


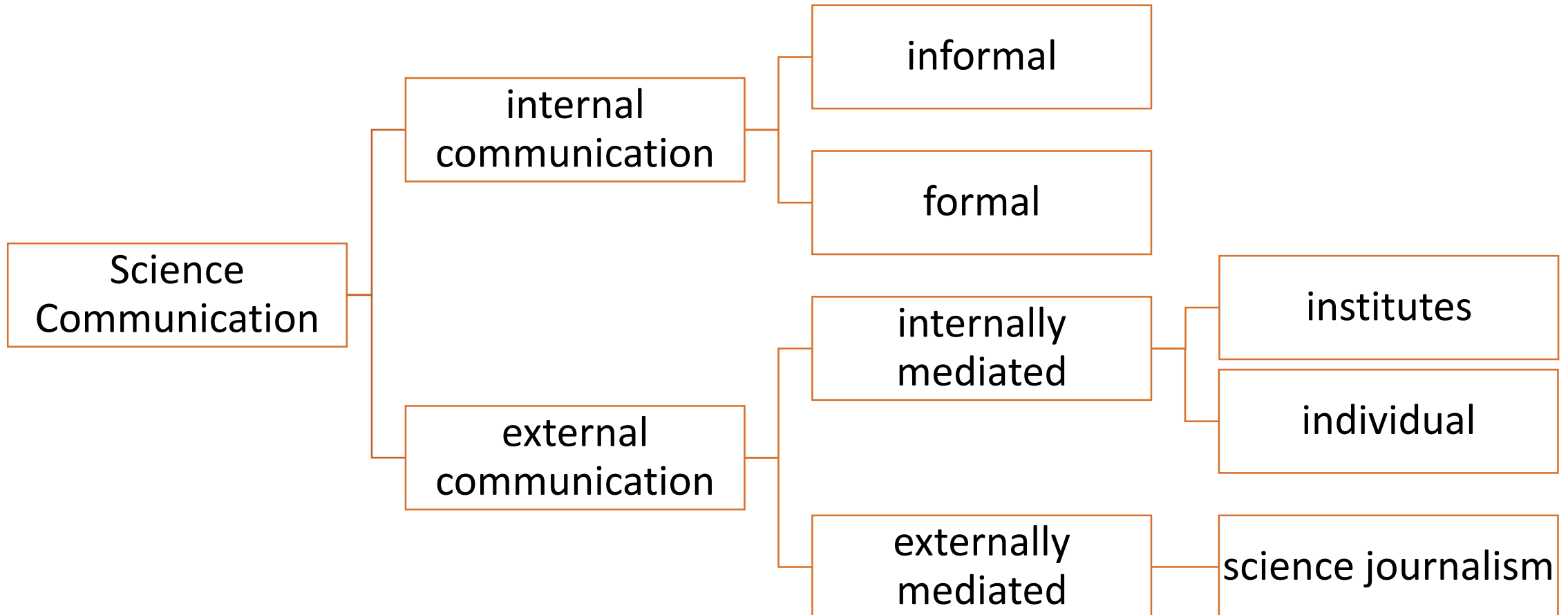
Science Communication & Outreach (for physicists)

The slide features two horizontal orange bars. The top bar is a solid, medium-thick line that spans the entire width of the slide. Below it, there is a second orange bar that is thinner and shorter, starting from the left edge and extending to approximately one-third of the slide's width.

Menu for today

- What is science communication & outreach?
- Why should we do it?
- How can you do it?
- What projects do exist & how can you use them?

Science Communication



Science communication is defined as

the use of appropriate

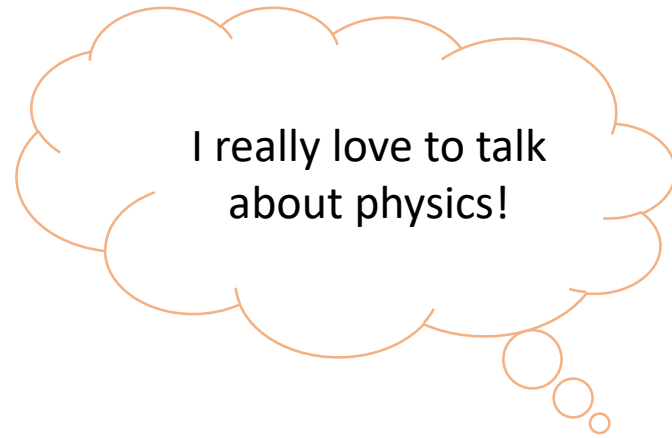
skills, media, activities, and dialogue

to produce one or more of the following personal responses to science:

awareness, enjoyment, interest, opinion forming, and understanding

*Burns, Terry W. et al. 2003.
Science communication: a contemporary definition
Public Understanding of Science, 12 183-202*

Why science communication?



Intrinsic
Motivation

Why science communication?

Explanation &
Legitimation

Intrinsic
Motivation

Explanation & Legitimation

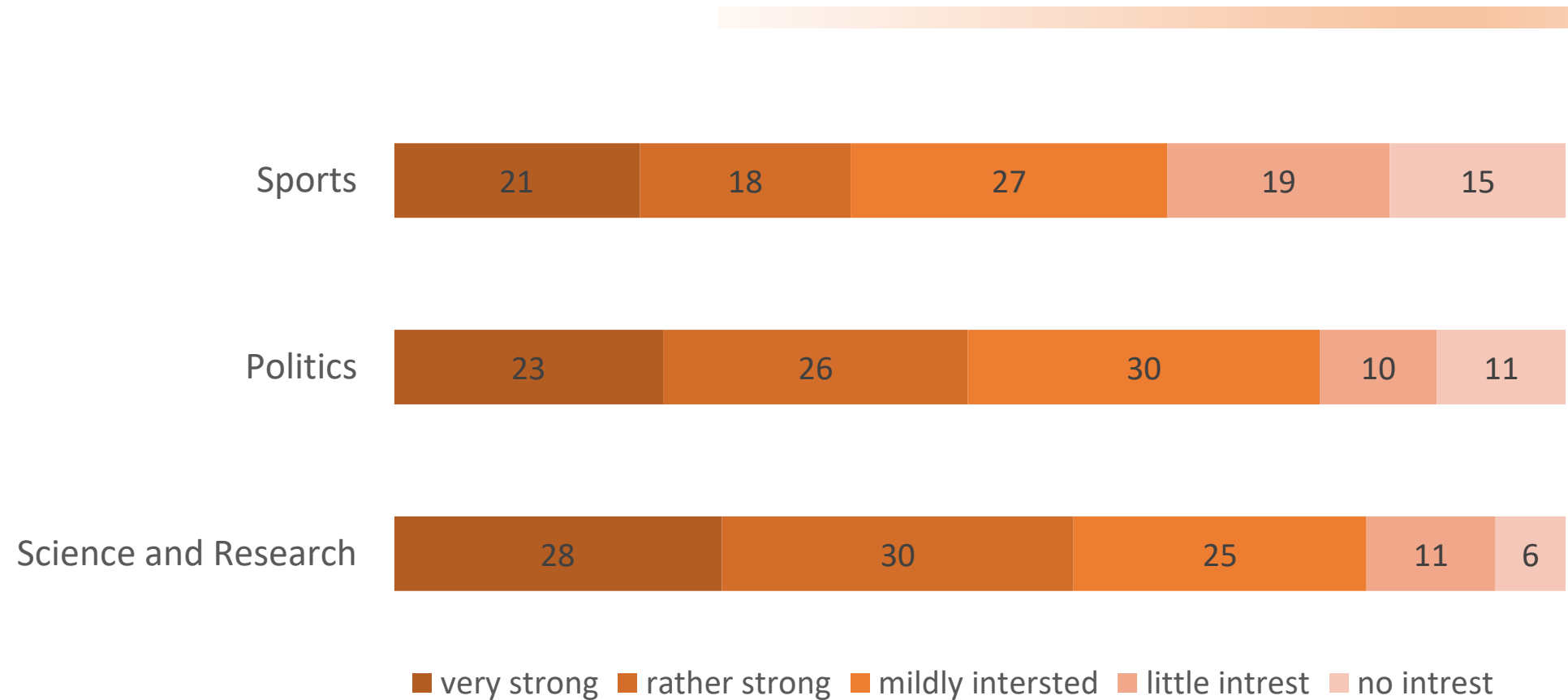
Sharing the excitement of scientific discoveries with the public is part of **our duty** as researchers.

Outreach and communication in particle physics should receive **adequate funding** and be recognized as a **central component** of the scientific activity.



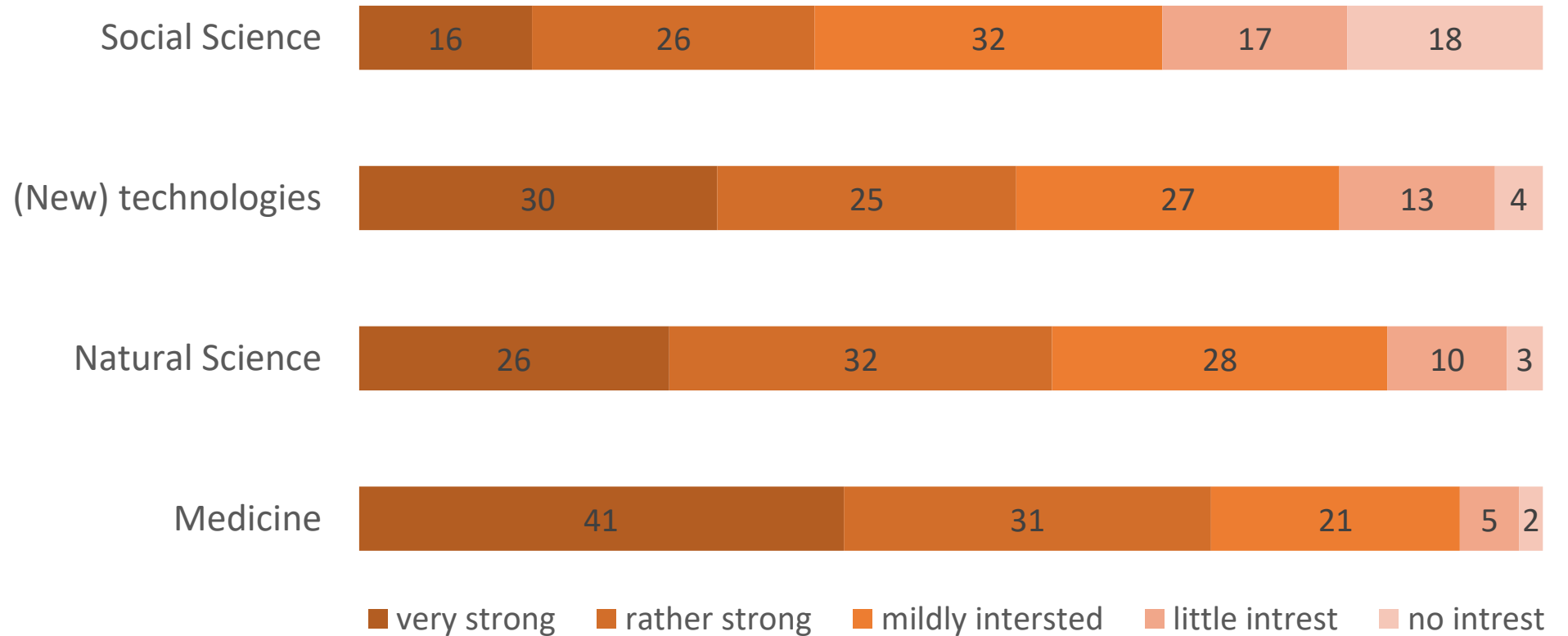
Explanation & Legitimation

„How strong is your interest in the following topics?“



Explanation & Legitimation

„How strong is your interest in the following science topics?“



Explanation & Legitimation

Packages that support the **interdisciplinary transfer** of results as well as economical usage are **explicitly included** in the support. This encounters also contributions **for information and inclusion of a wide public audience.**

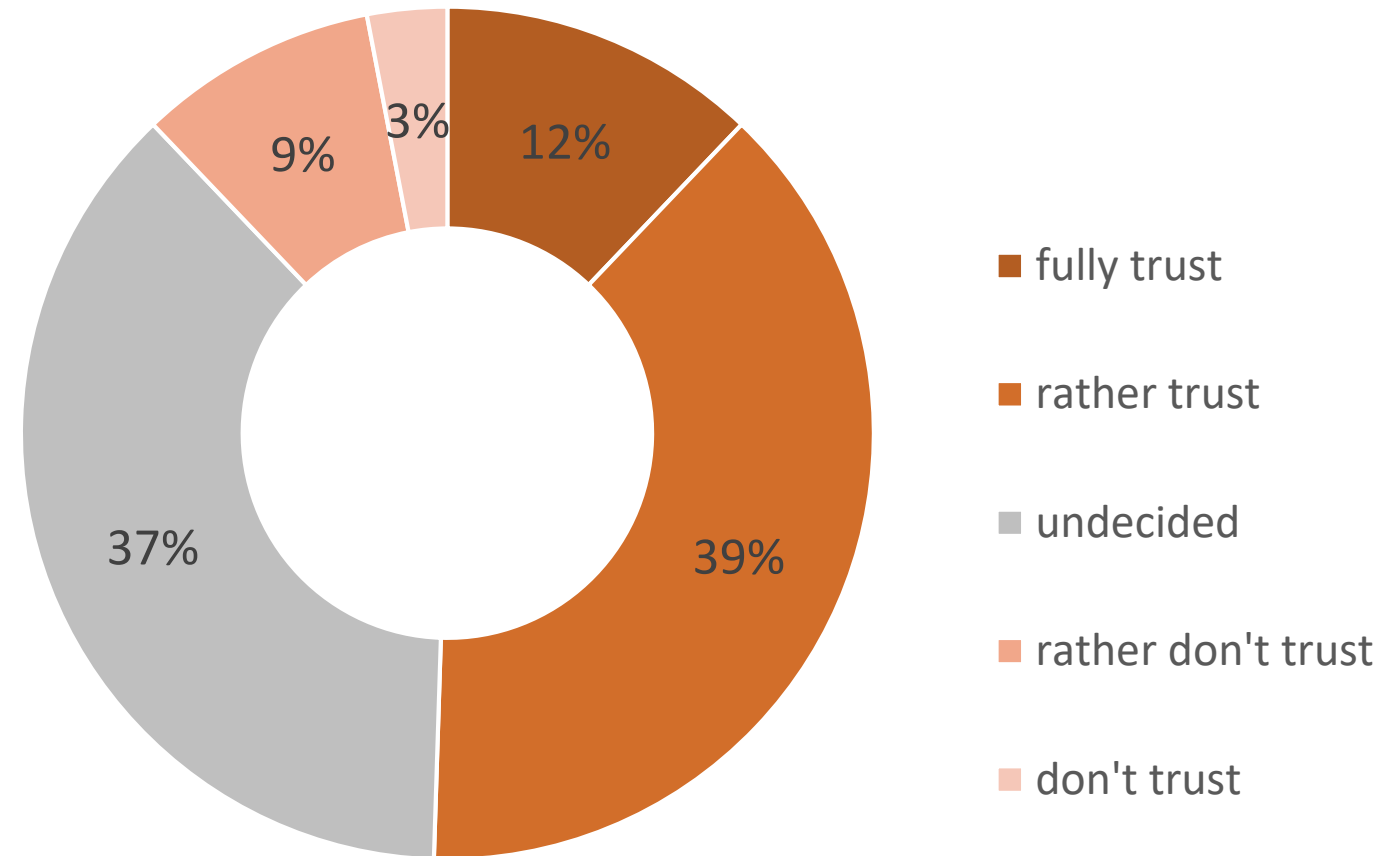


Why science communication?

Explanation &
Legitimation

Creating &
Receiving
trust in science

“How much do you
trust science and research?”

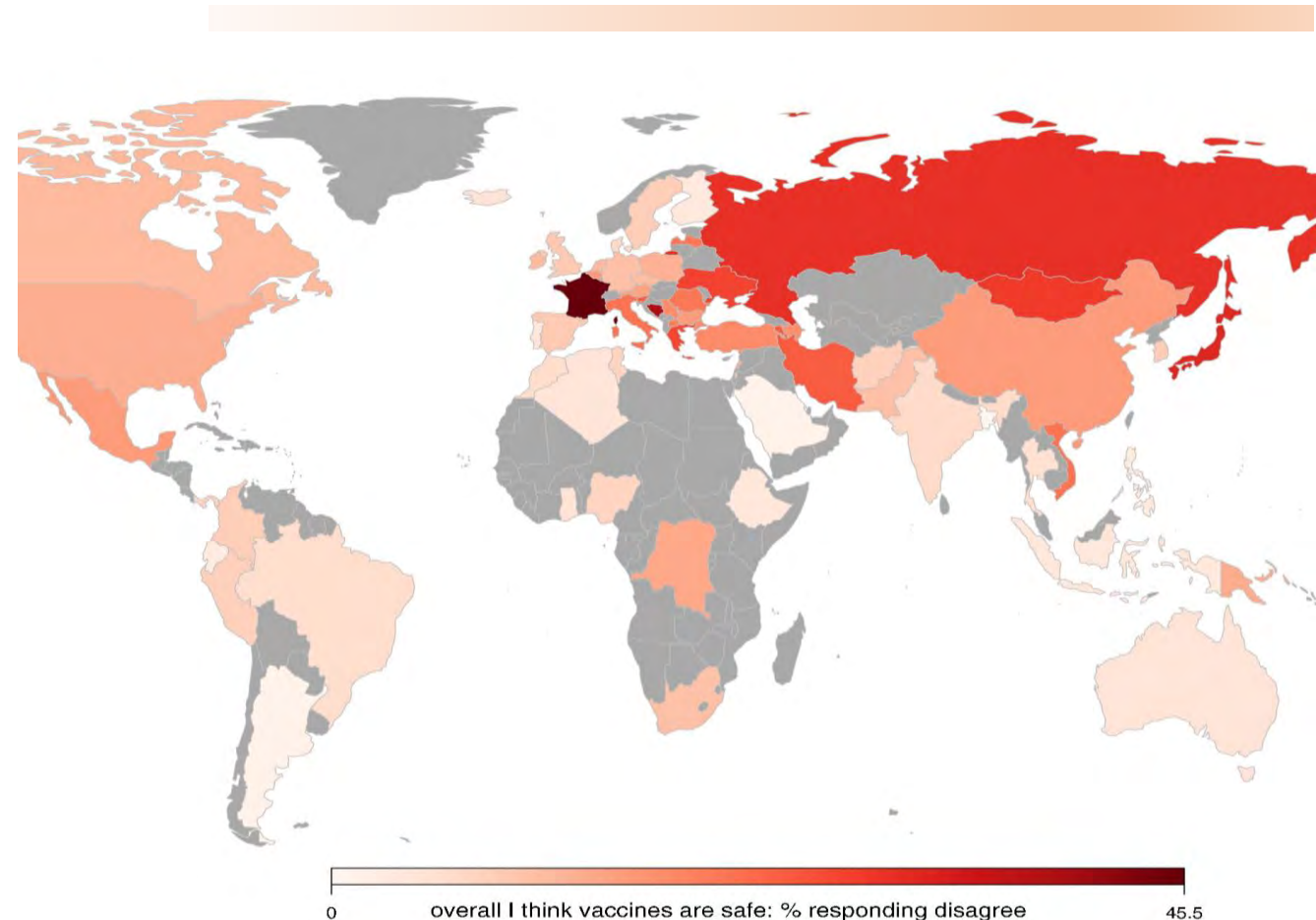


Creating & Receiving trust in science

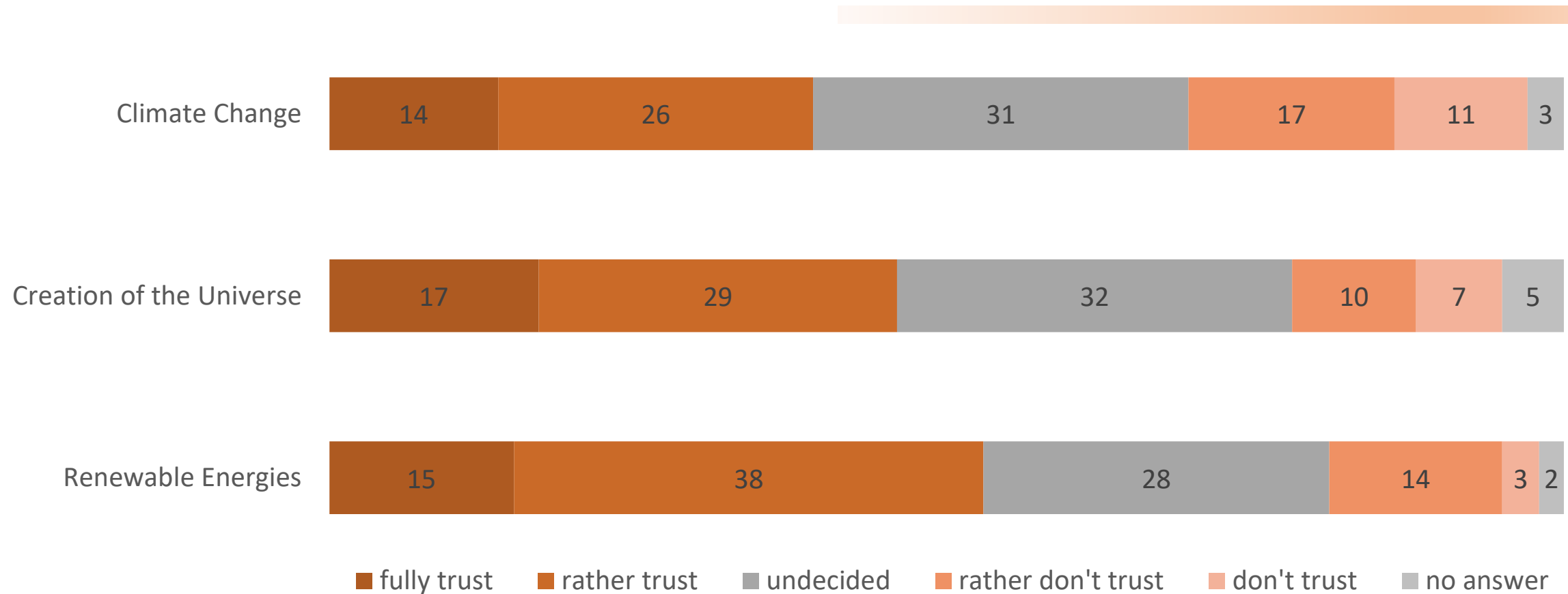


Creating & Receiving trust in science

- The European region has **the lowest confidence** in vaccine safety with France the least confident globally.
- **Bangladesh, Ecuador, and Iran** reported highest agreement that vaccines are important.
- Azerbaijan, Russia, and Italy reported most skepticism around vaccine importance.
- In **Germany 10.5%** of the population have no confidence in vaccinations
- **Education increases confidence in vaccine** importance and effectiveness but not safety.



Creating & Receiving trust in science



Why science communication?

Explanation &
Legitimation

Creating &
Receiving
trust in science

Additional education to
ensure responsible
citizens

Intrinsic
Motivation

Ensure responsible citizens



Why science communication?

Explanation &
Legitimation

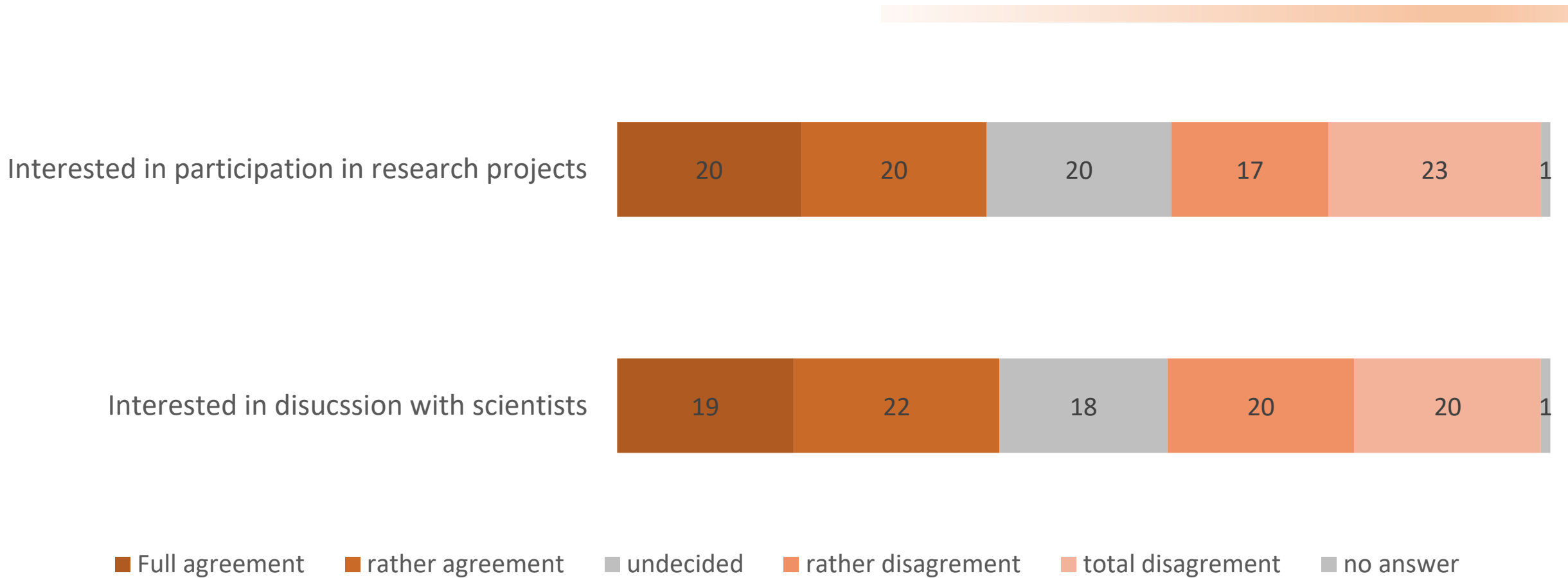
Creating &
Receiving
trust in science

Additional education to
ensure responsible
citizens

Inclusion of
citizens in
research

Intrinsic
Motivation

Inclusion of citizens in research



Why science communication?

Netzwerk Teilchenwelt: German high-school students at CERN

by Susanne Duhrkoop



Matteo Kumar, Jan Eckerlein, Tim Hebenstreit, Elisabeth Walter and Sophie Li during their two-week project at CERN. (Image: Susanne Duhrkoop/CERN)

Recruitment of
future scientists

Why science communication?

Explanation &
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Recruitment of
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Motivation

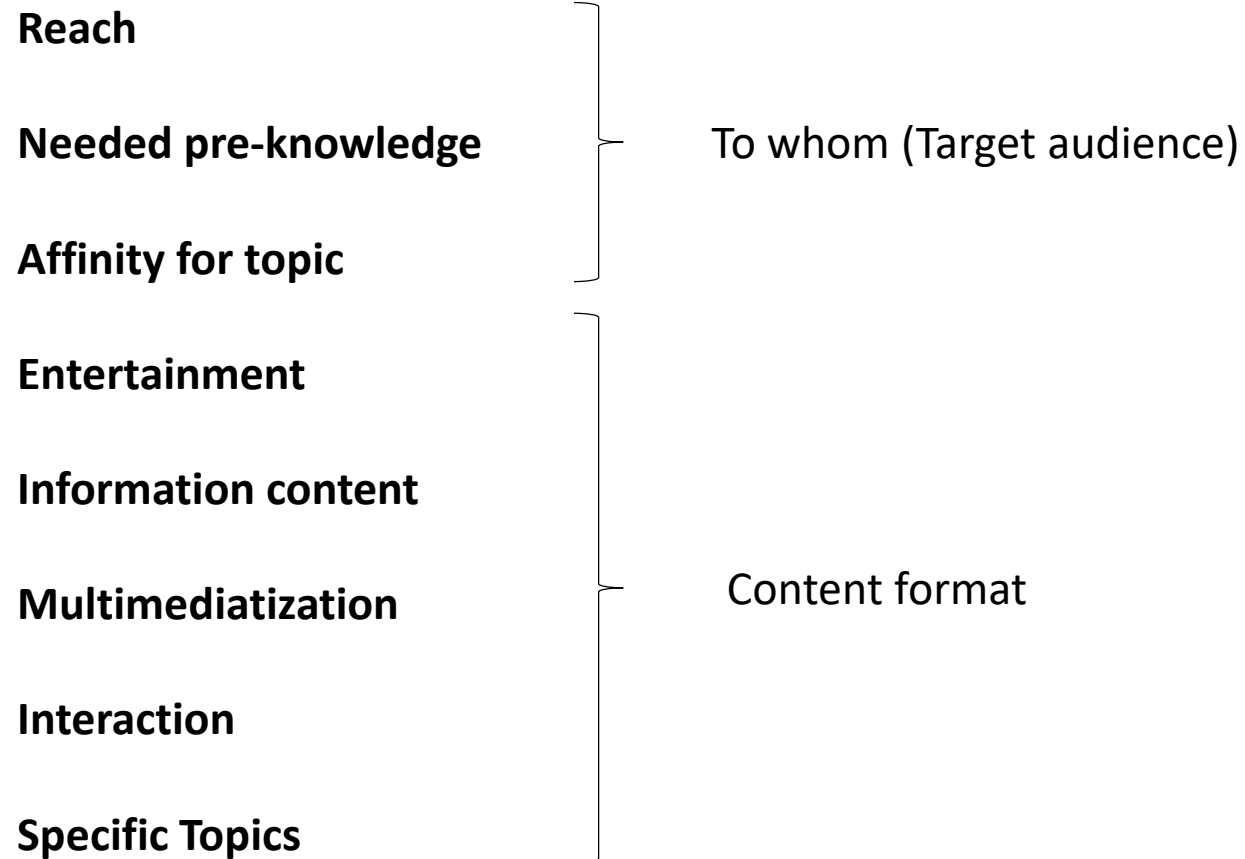


How to make outreach in 5 steps

- Define what you want to tell
- Define how and to whom you want to tell it
- Define what resources you have available
- Look for partners which already do outreach & collaborate
- Have fun

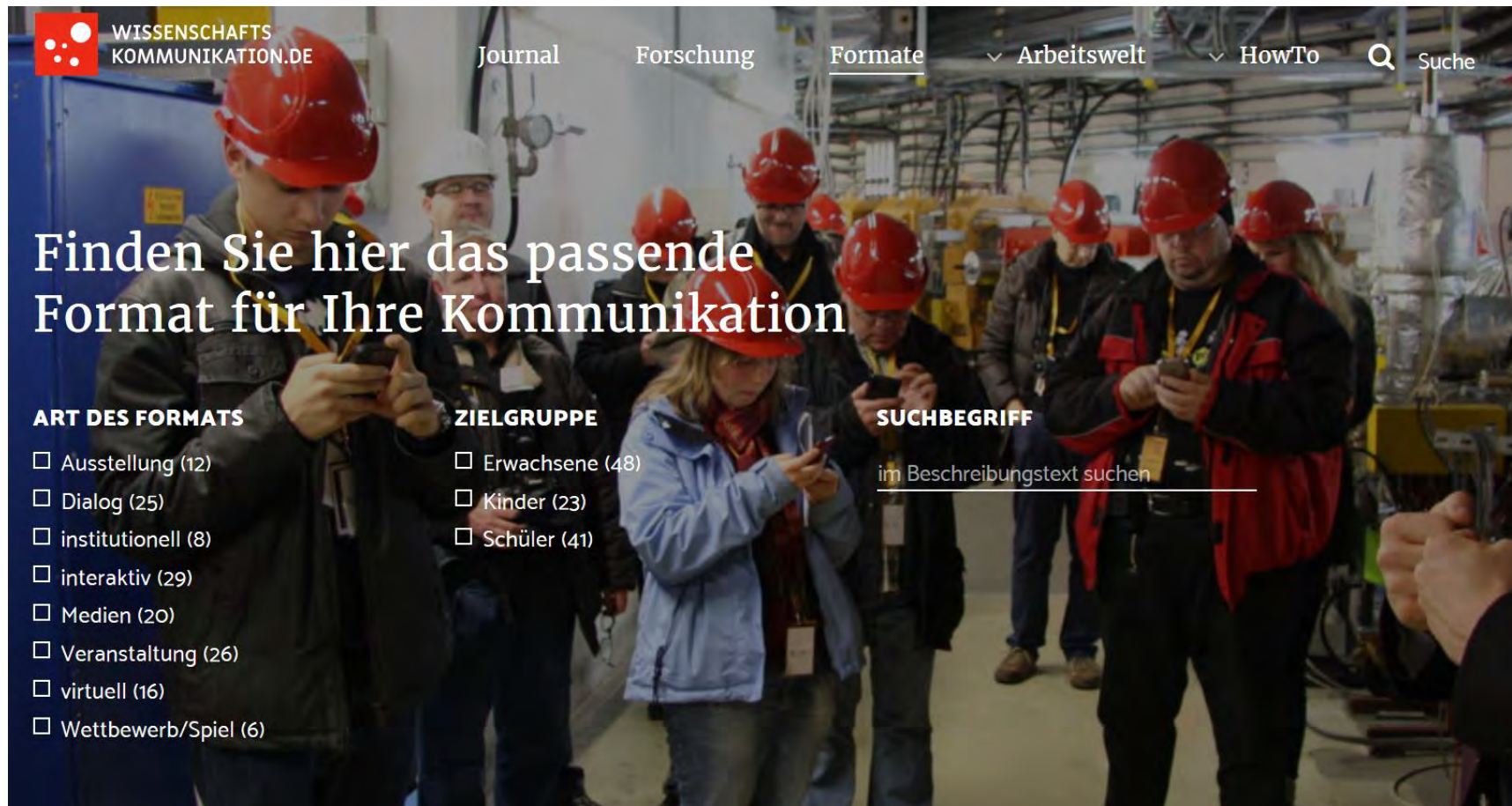
Factors & Resources

Factors & Resources



Factors & Resources

Wissenschaftskommunikation.de



The screenshot shows the website's interface. At the top left is the logo for 'WISSENSCHAFTS KOMMUNIKATION.DE'. The navigation menu includes 'Journal', 'Forschung', 'Formate', 'Arbeitswelt', and 'HowTo'. A search bar with a magnifying glass icon and the text 'Suche' is located at the top right. The main content area features a large background image of people in a factory setting wearing red hard hats. Overlaid on this image is the text 'Finden Sie hier das passende Format für Ihre Kommunikation'. Below this text are three filter sections: 'ART DES FORMATS', 'ZIELGRUPPE', and 'SUCHBEGRIFF'. The 'SUCHBEGRIFF' section includes a search input field with the placeholder text 'im Beschreibungstext suchen'.

WISSENSCHAFTS KOMMUNIKATION.DE

Journal Forschung Formate ▾ Arbeitswelt ▾ HowTo 🔍 Suche

Finden Sie hier das passende Format für Ihre Kommunikation

ART DES FORMATS

- Ausstellung (12)
- Dialog (25)
- institutionell (8)
- interaktiv (29)
- Medien (20)
- Veranstaltung (26)
- virtuell (16)
- Wettbewerb/Spiel (6)

ZIELGRUPPE

- Erwachsene (48)
- Kinder (23)
- Schüler (41)

SUCHBEGRIFF

What & how to communicate?

What you do?
Why it is important?
How does it impacts society?

Written

- News
- Results
- Records
- Awards
- ...
- Evergreens
- Physics
- Computing
- Methods
- ...

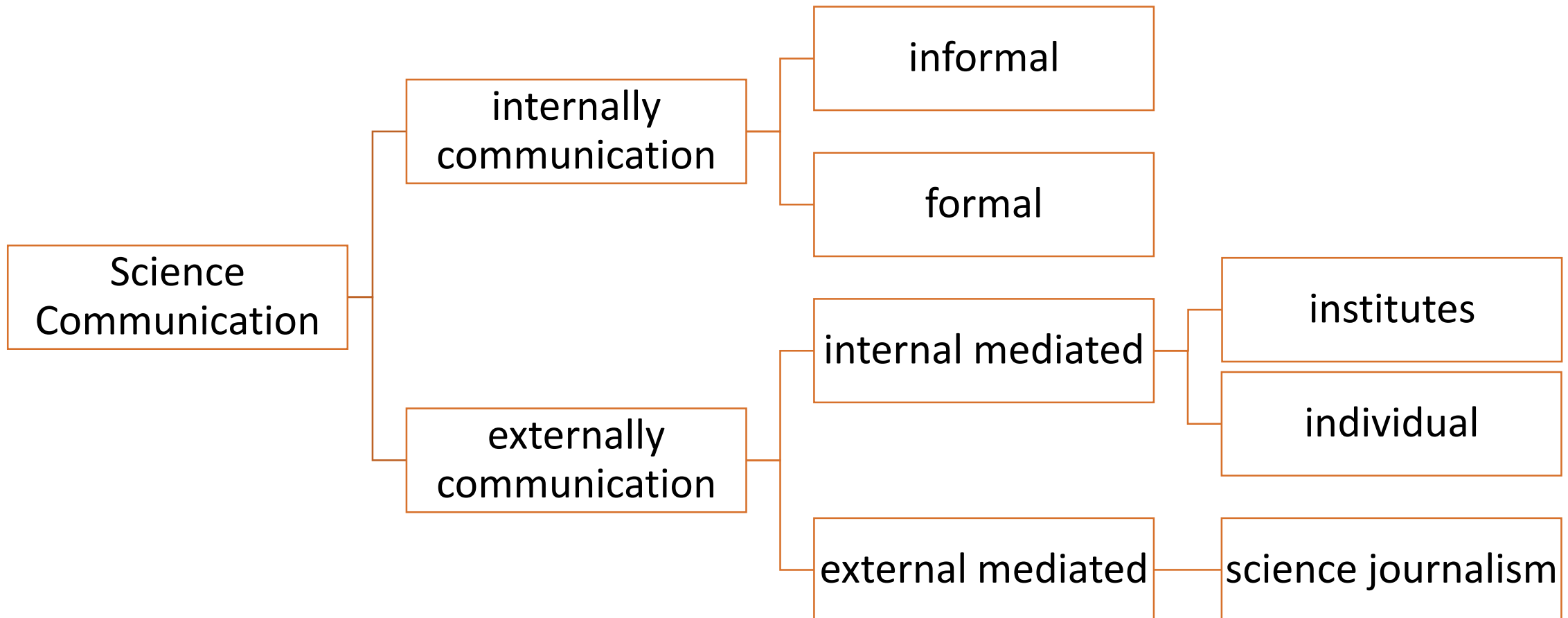
Multimedia

- Photographs
- Images, & GIFS
- Event displays
- Animations
- Videos
- Live Streaming
-

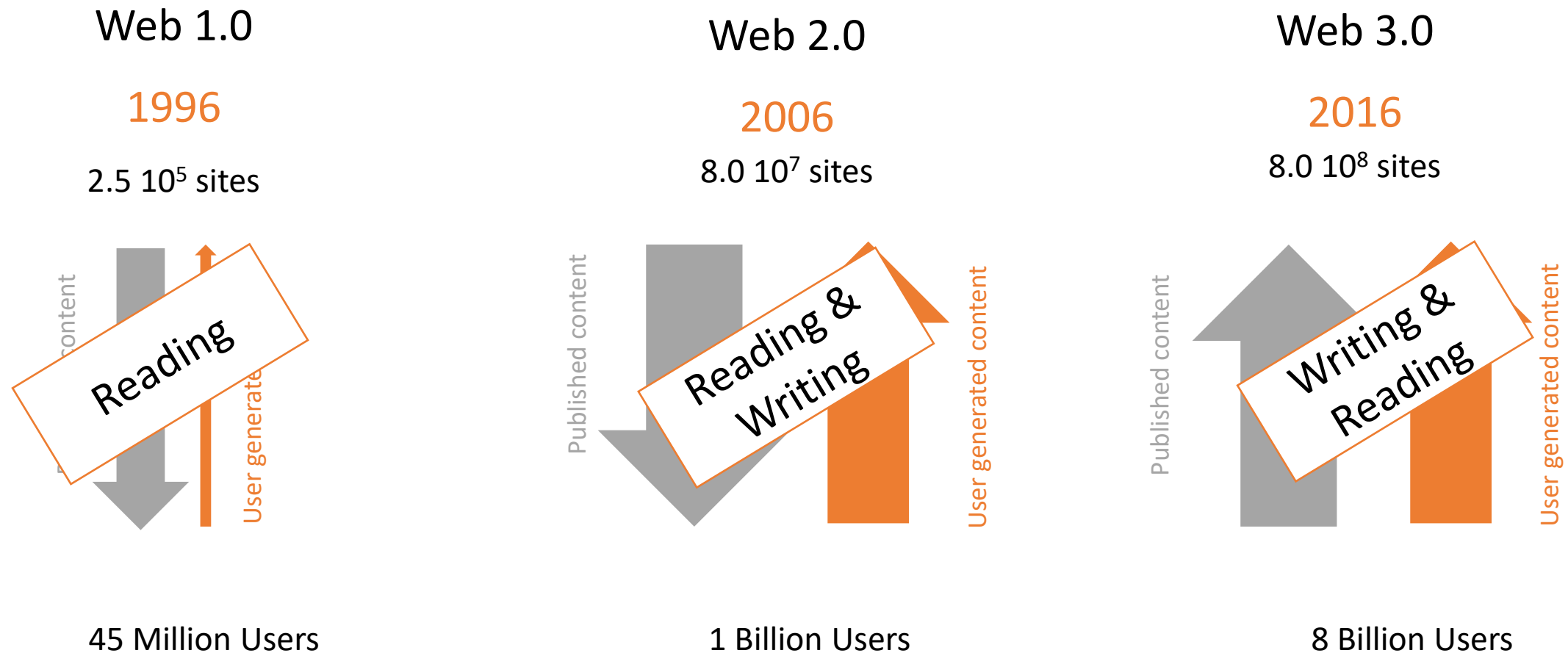
„Hands on“

- Open day
- Public talk
- Hands on data
- Citizen science

Science Communication



Science communication 2.0 = Web 2.0?



Science communication 2.0

Science communication 1.0:

classical publications via press releases, science journalists, public lectures, ...

→ Education of the public

Science communication 2.0:

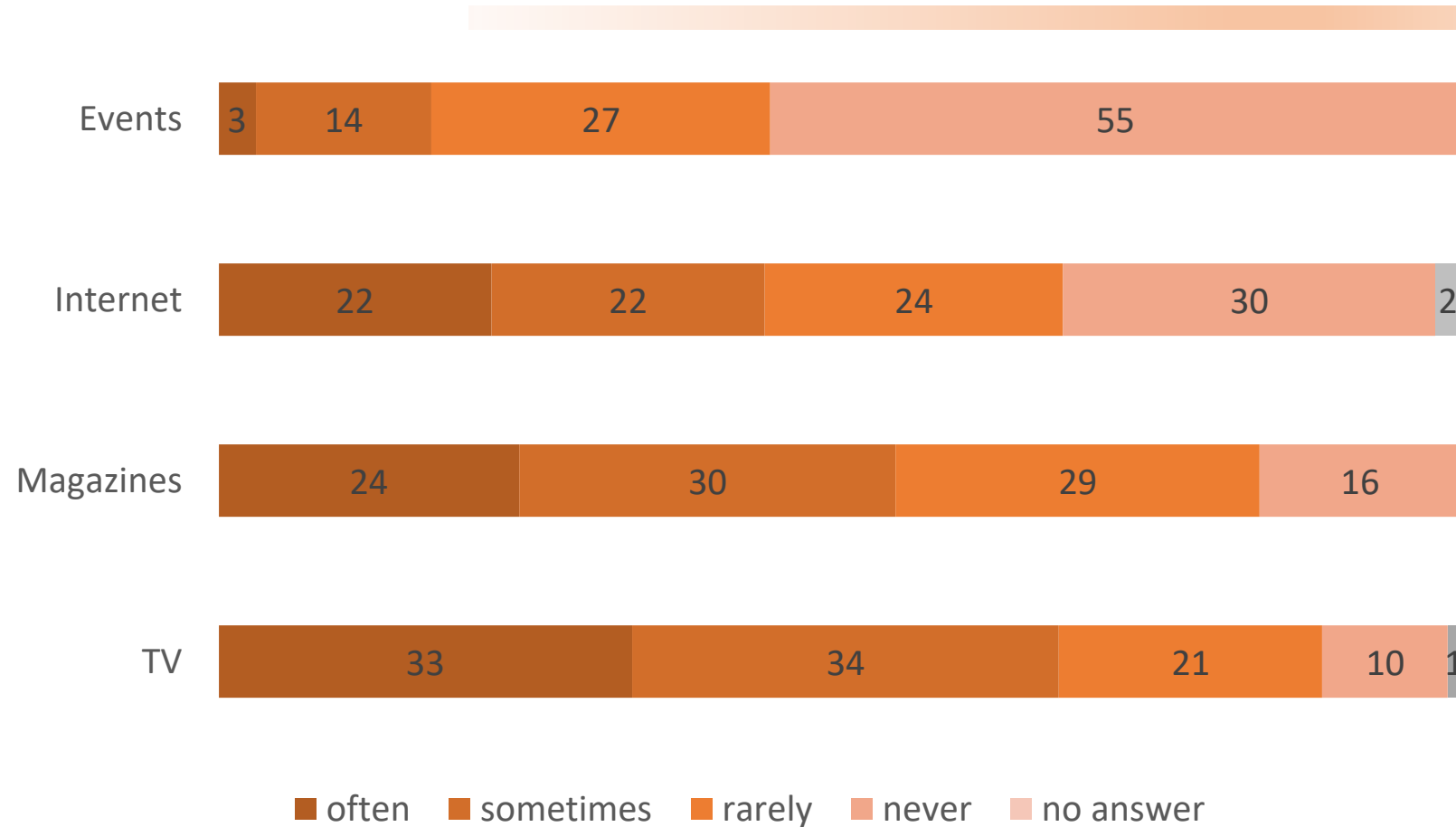
publications based on the web 2.0 strategies, hands-on

→ Dialog with the public

Science communication 2.0

Information sources:

How often do you use the following sources to inform yourself about science and research?



Target groups for selected formats

Explanation & Legitimation

Creating & Receiving trust in science

Additional education to ensure responsible citizens

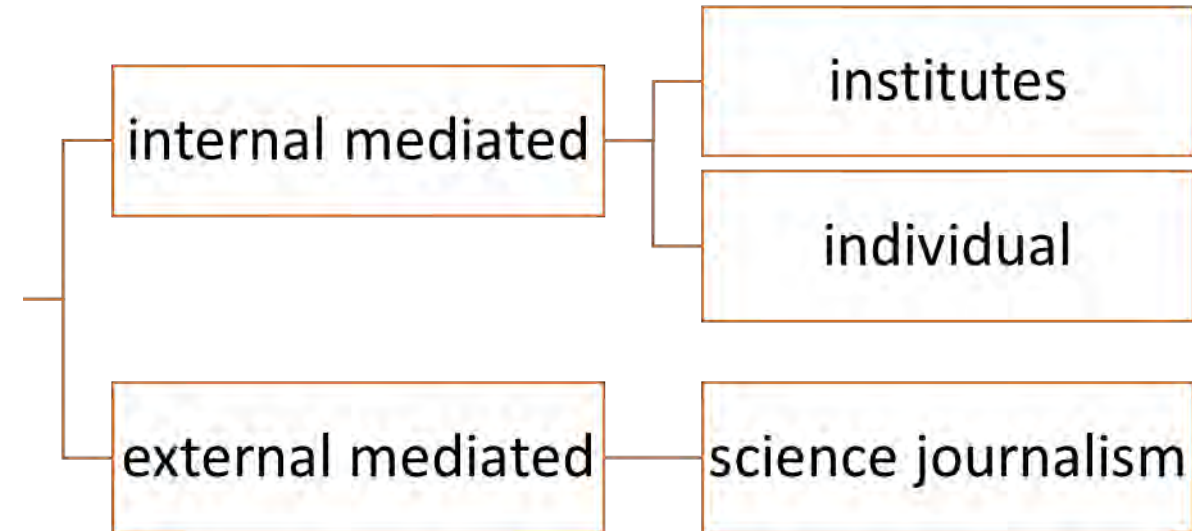
Inclusion of citizens in research

Recruitment of future scientists

Intrinsic Motivation

Press release

Social Media



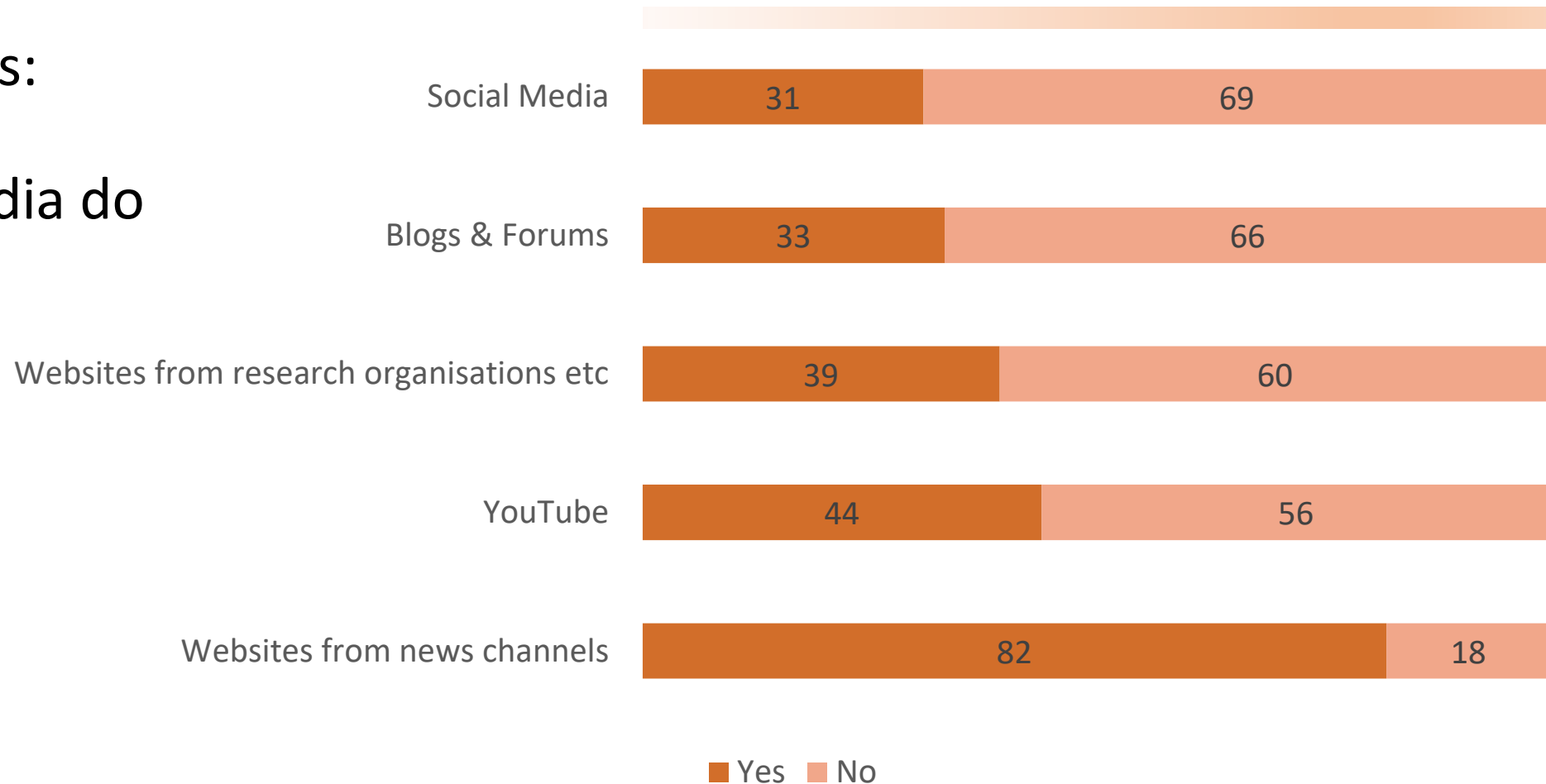
Web 2.0 = Social Media






Science communication 2.0

Information sources:

Which internet media do you use?



Web 2.0 = Social Media



| | What | Demographics* | Purpose | Best for | Down Side |
|-----------|--------------------------------|---------------------------------|---------------------------------|-------------------|---|
| Facebook | Texts, Pictures, Groups, Links | 1.8 Billion Users Age: 25-55 | Building Relationships | News, Links | Limited reach |
| Twitter | Texts, Links | 320 Million Users Age 20-29 | News & Articles Conversation | Discussions, News | 140 characters |
| Instagram | Pictures & Videos | 600 Million Users | Building Relationships | News | Limited interactions & content creation |

*August 2017

Target groups for selected formats

Explanation &
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citizens

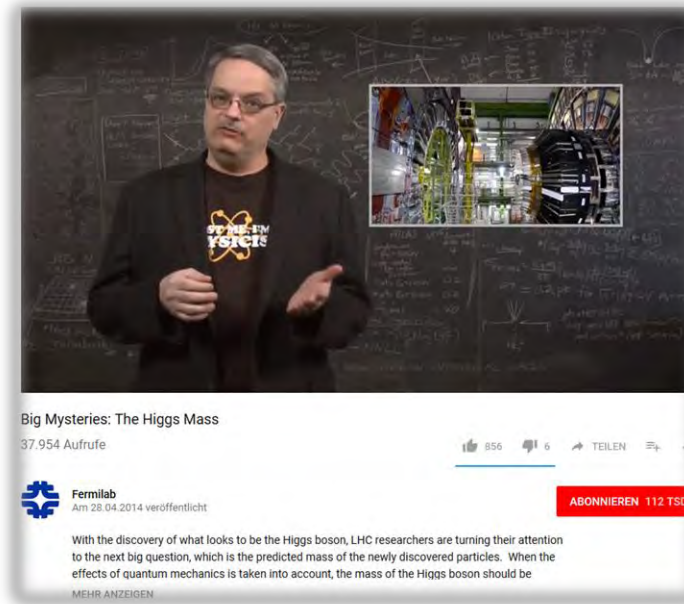
Inclusion of
citizens in
research

Recruitment of
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Intrinsic
Motivation

Press release

Social Media



Web 2.0 = Social Media

| | What | Demographics * | Purpose | Best for | Down Side | |
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|  | Instagram | Pictures & Videos | 600 Million Users Age <35 | Building Relationships Conversation | News | Limited interactions & content creation |
|  | YouTube | Videos | 1 Billion Users All Ages | Search „How-To“ | Explanations, Evergreens | Resource Intensive |
| | Blogs | Long Texts, Pictures | 200 Millions? Age 20-35 | News & Articles, “Diary” | Explanations, Evergreens | Resource Intensive & Limited Reach |

*August 2017

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Intrinsic
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Press release

Social Media

Open days

Open days – 2 success stories



- GSI Open day 2017:
 - 11.000 visitors



- Night of Science 2017:
 - 10.000 Visitors

Target groups for selected formats

Explanation & Legitimation

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Additional education to ensure responsible citizens

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Press release

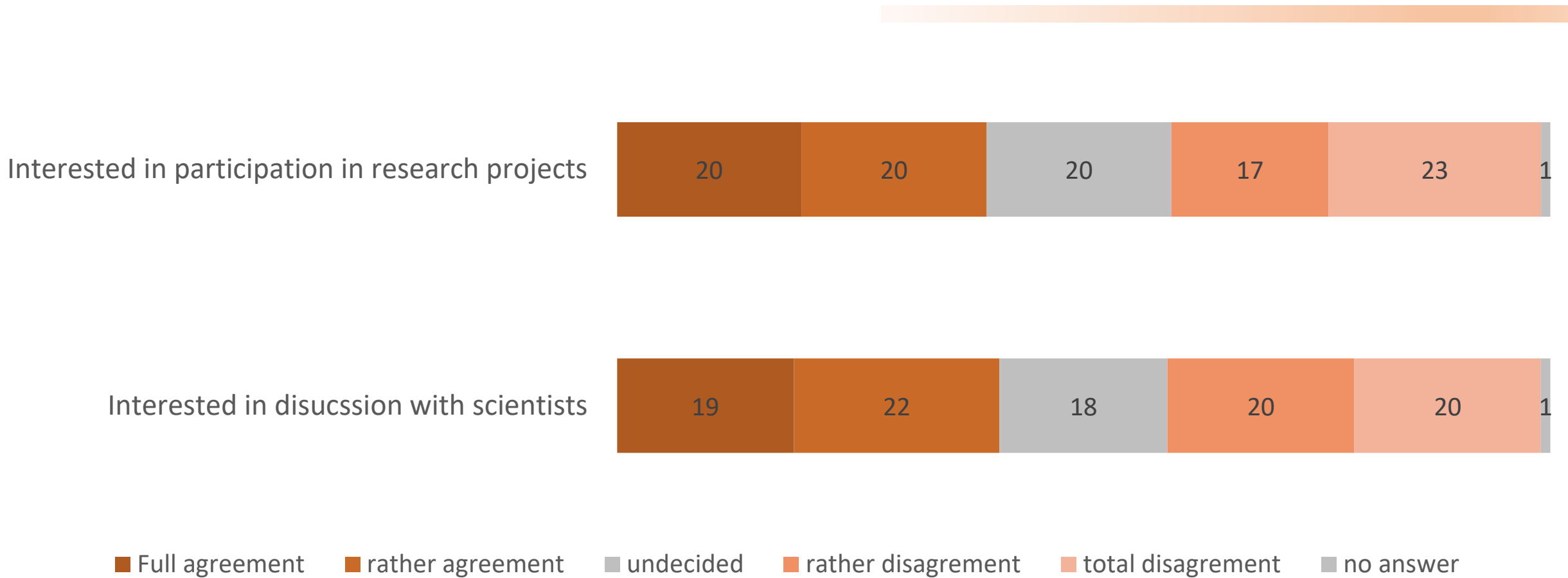
Social Media

Open days

Public talks

Citizen science

Inclusion of citizens in research

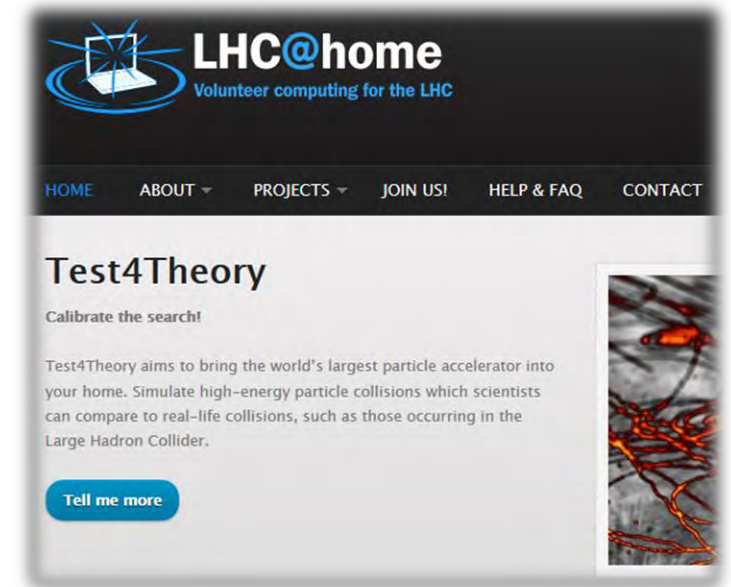


Citizen Science

scientific research conducted, in whole or in part, by amateur (or non-professional) scientists



www.LightningMaps.org



Target groups for selected formats

Explanation & Legitimation

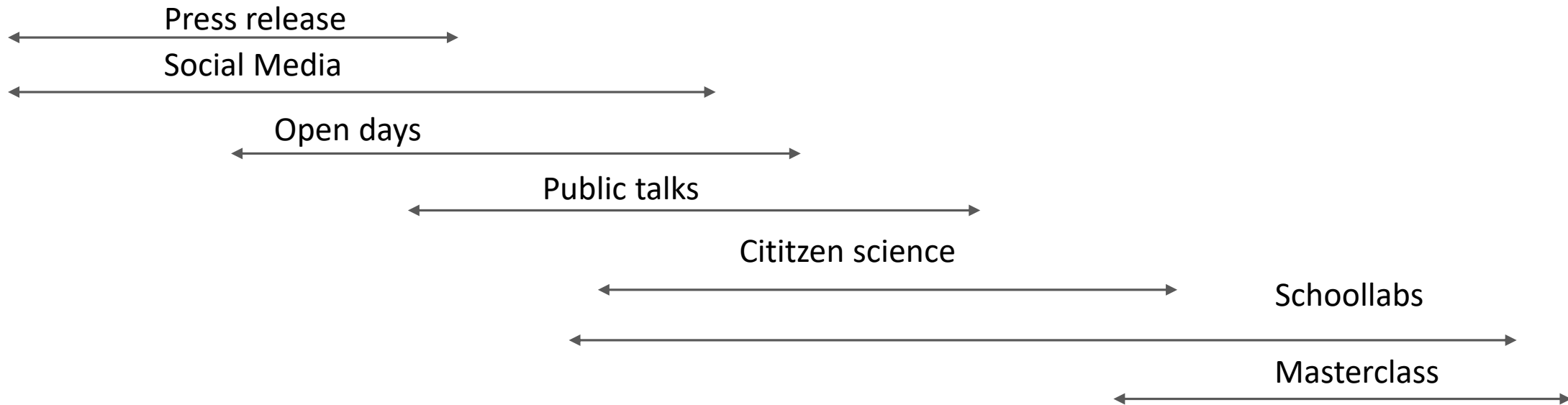
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And where is (nuclear) physics now?

■ Difficulties

- Complex Topic
- Not (really) part of school educations
- A lot of mathematics
- Unclear words
- Excessive usage of abbreviations

■ Advantages

- Fundamental questions
- State of the art technology
- Impressive instruments (experiments)

What structures exist for us?

- Local activities
 - Frankfurt Physikalischer Verein
 - GSI outreach activities
 - Night of Science
 - Grundschulprojekt
 - Hessen schafft Wissen (FIAS)
 - Science Birds



- Hessen schafft Wissen
 - Award Winning – Exhibition for (not only) school kids
 - Hessestag
 - Book Fair
- Public Talks
- Workshop
Interdisciplinary Science Communication



Picture: Hessisches Ministerium für Wissenschaft und Kunst

Science Birds



- Project from Sascha Vogel
- Based in Frankfurt
- Various outreach projects
 - Interactive program for (not only) school kids
 - Science shows
 - Science slam
 - ...



What structures exist for us?

- Local activities
 - Frankfurt Physikalischer Verein
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 - Hessen schafft Wissen (FIAS)
 - Grundschulprojekt
 - Science Birds
- Germany Wide activities
 - Wissenschaft im Dialog
 - Weltmaschine
 - FSP Pilotprojekt - Netzwerk Teilchenwelt
 - Highlights der Physik & Welt der Physik
- International activities
 - IPPOG

Weltmaschine Kommunikation

- The central information point for press and media
- Excellent contact for press and media releases
- Included in lab-Infrastruktur
 - DESY-Press office
 - Graphic designer
- Central Organisation of events
 - Journalistentage 2006+13, Pressesprechertag 2014
 - Tag der Weltmaschine
 - Media training for scientists
 - Mobile Exhibition



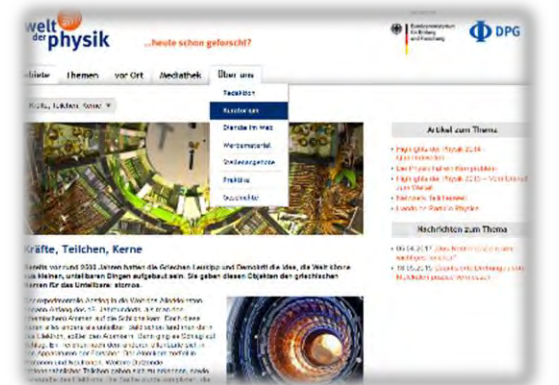
Highlights der Physik

- Annual science festival
- 2017 in Münster:
Structure & Symmetry



Welt der Physik

- Website & Calendar



FSP Pilotprojekt „Spitzenforschung, Erkenntnisvermittlung und Nachwuchsgewinnung“

- Research, knowledge transfer and und recruitment from a single source
- Project goals:
 - Experience the fascination of Astro-/Particle physics
 - Communicate about Science
 - Research on the spot and in school
 - Appreciation of gain in knowledge trough fundamental research



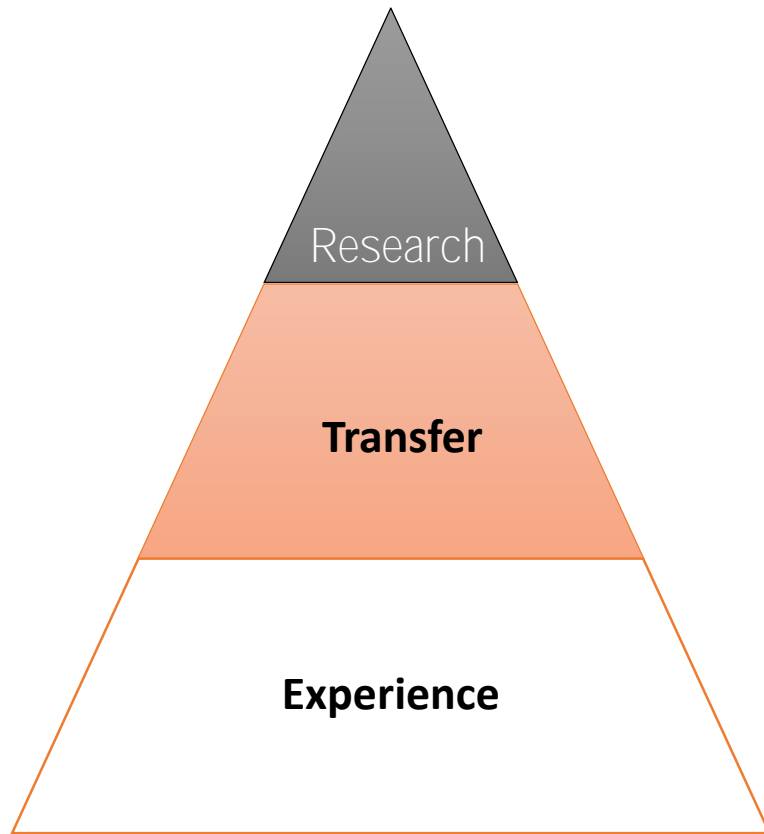
NETZWERK
TEILCHENWELT

FSP Pilotprojekt „Spitzenforschung, Erkenntnisvermittlung und Nachwuchsgewinnung“

- Based on the project Netzwerk Teilchenwelt
 - 29 Universities & Research Centers + CERN
- Since 02/17 Netzwerk Teilchenwelt is the outreach project for the FSPs
- Coordination of the project is in Dresden & DESY Zeuthen
 - 4 Employees in Dresden & 2 at DESY & 1 at CERN + Students
- Focus currently on high energy particle physics & astrophysics
 - Projects planned with Hadron Physics (f.e. BELLE)
 - Interest for future collaboration with connected topics & theory



The pyramid principle



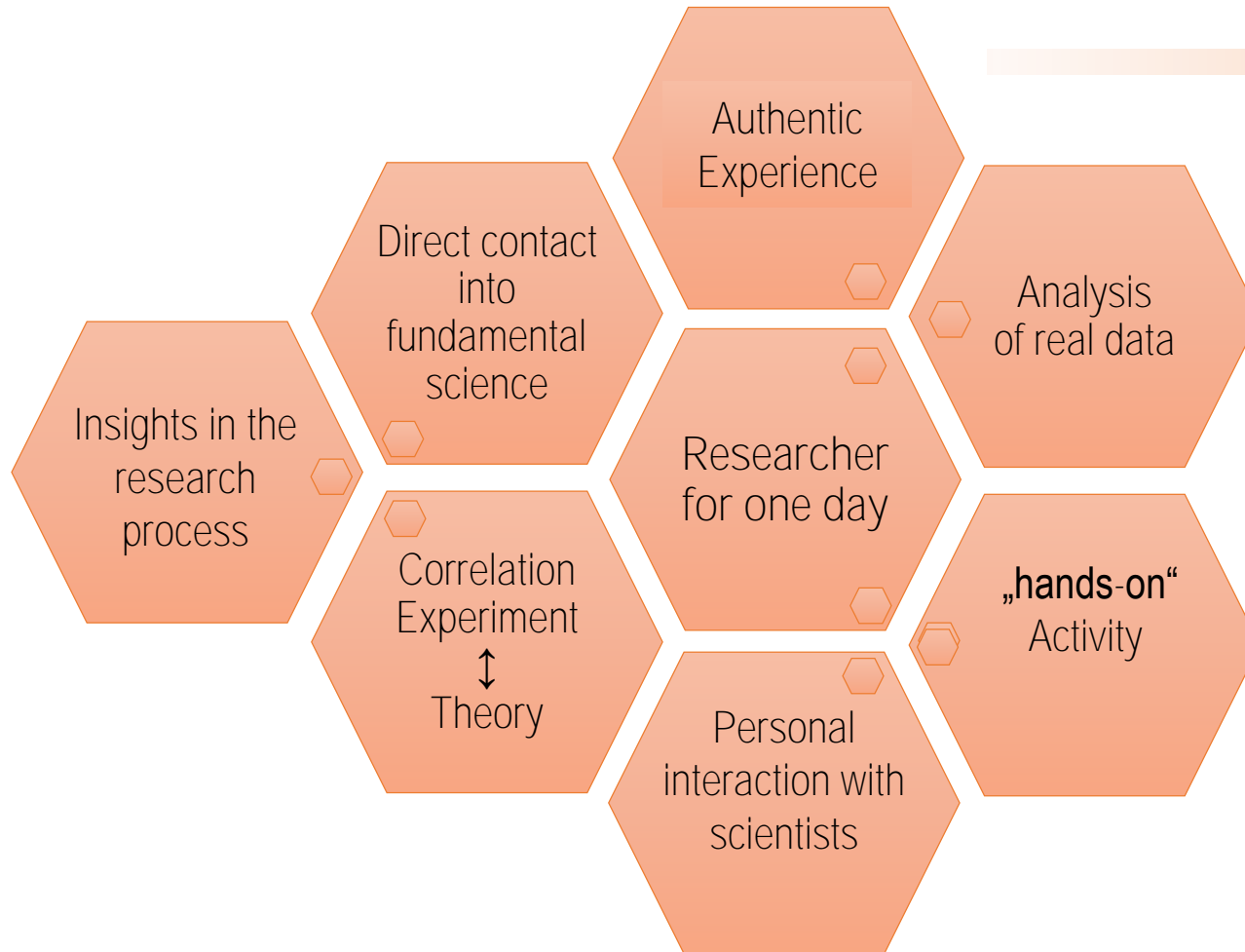
- Research program
- Qualification program
- Base program

Masterclass

- Baseline activity
 - “Hands-on particle physics”
 - Duration ~1/2 day
 - Each year 4000 youths in the age of 15-19 years
 - More than 700 Masterclasses have been organized
- School kids solve a data analysis based on
 - LHC experiments or
 - Astro particle experiments
- Master classes are performed by Master & PhD students
 - Those get their travel reimbursed and allowances
 - Workshop once a year for soft skills
 - Speaking German is required



The concept



IPPOG

- International Particle Physics Outreach Group
- Network of
 - Scientists, science educators, communication specialists
 - From 22 CERN members states
 - + Brazil, Australia, Ireland, Slovenia, South Africa, the USA
- Focus on informal science education and outreach for particle physics topics:
 - DESY
 - CERN & especially the LHC experiments
 - Belle II experiment



International Masterclass

- Baseline activity
 - “Hands on particle physics”
 - Duration ~1 day
 - Each year 13.000 high school students years from 52 countries
- School kids solve a data analysis based on
 - LHC experiments
 - Have a video conference where they compare their results with other countries
- Master classes are performed by Master & PhD students
 - Those get their travel reimbursed and allowances
 - Workshop one a year for soft skills
 - ~~German Speaking is required~~



Summary

Explanation &
Legitimation

Creating &
Receiving
trust in science

Additional education to
ensure responsible
citizens

Inclusion of
citizens in
research

Recruitment of
future scientists

Intrinsic
Motivation

*Education is the passport to the future,
for tomorrow belongs to those who prepare for it today.*

Malcolm X

Questions?

Thanks to:



PROJEKTLEITUNG



PARTNER



SCHIRMHERRSCHAFT



GEFÖRDERT VOM



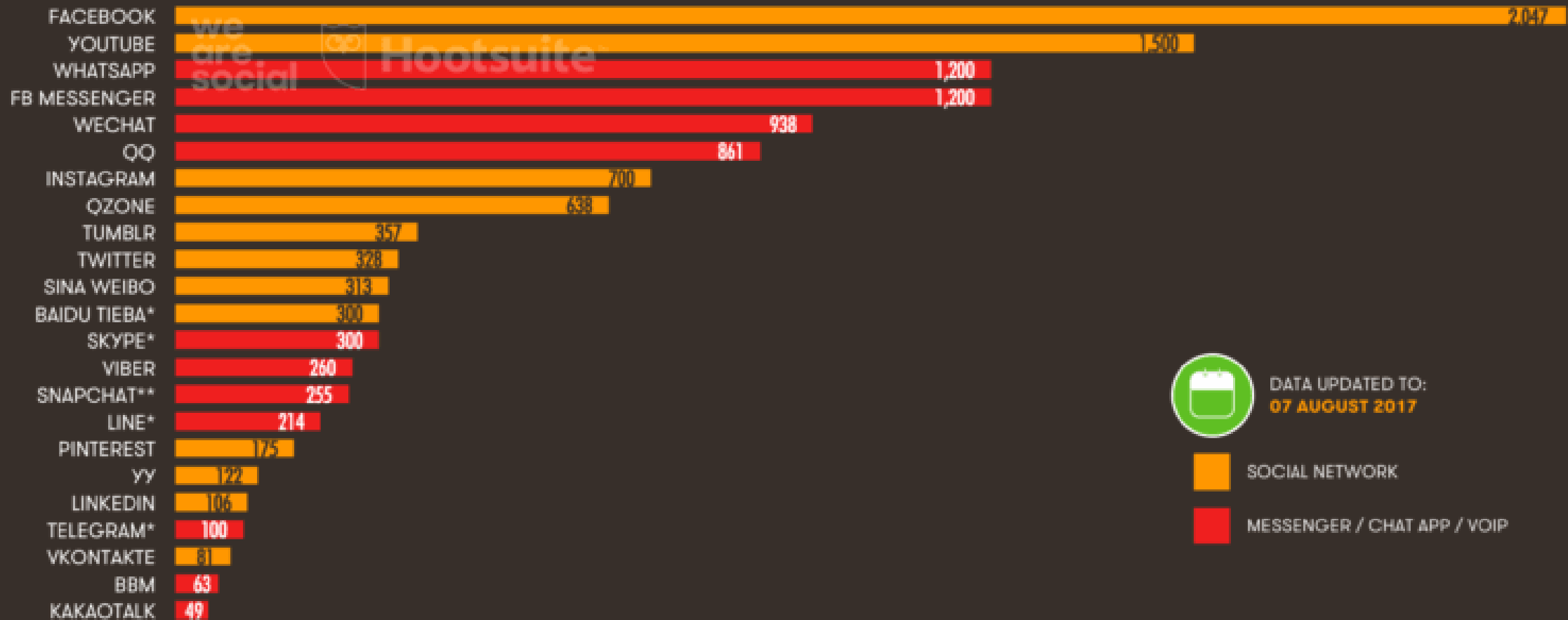
Bundesministerium
für Bildung
und Forschung



AUG
2017

ACTIVE USERS OF KEY GLOBAL SOCIAL PLATFORMS

BASED ON THE MOST RECENTLY PUBLISHED MONTHLY ACTIVE USER ACCOUNTS FOR EACH PLATFORM, IN MILLIONS



DATA UPDATED TO:
07 AUGUST 2017



SOCIAL NETWORK



MESSENGER / CHAT APP / VOIP

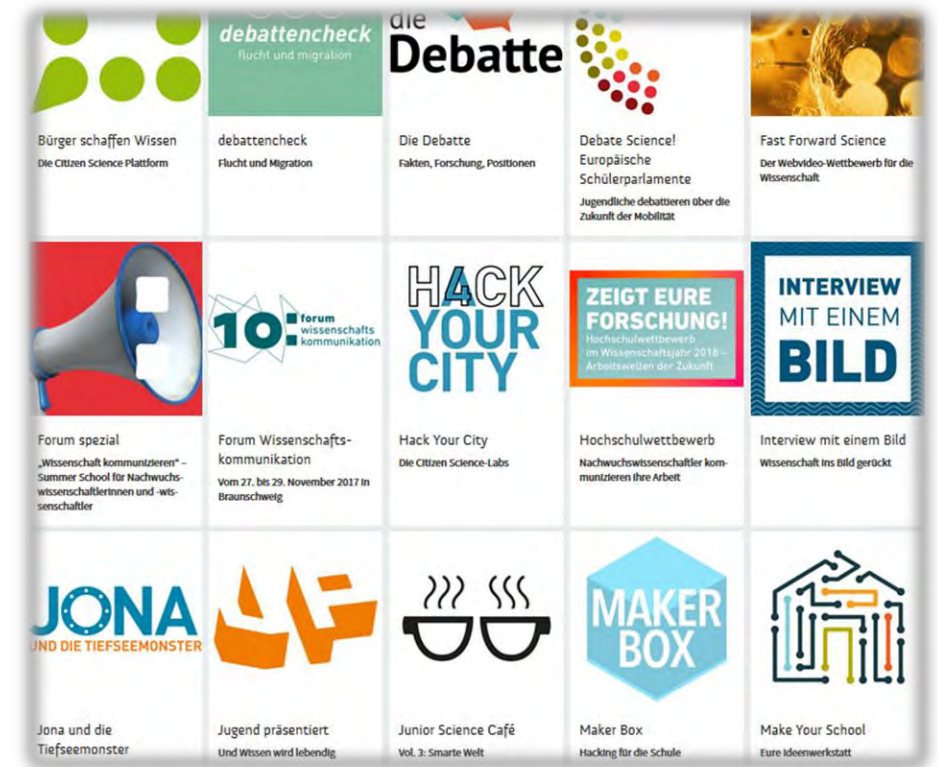


When press release

- New results
- Record
- Local events
- Effects many humans
- Importance for future
- Explainable
- Visual attractive
- Easy to understand

Wissenschaft im Dialog

- is the initiative for outreach in Germany
- Organizes & develops
 - seminars for scientists about outreach & communication
 - Various outreach projects



Factors & Resources

