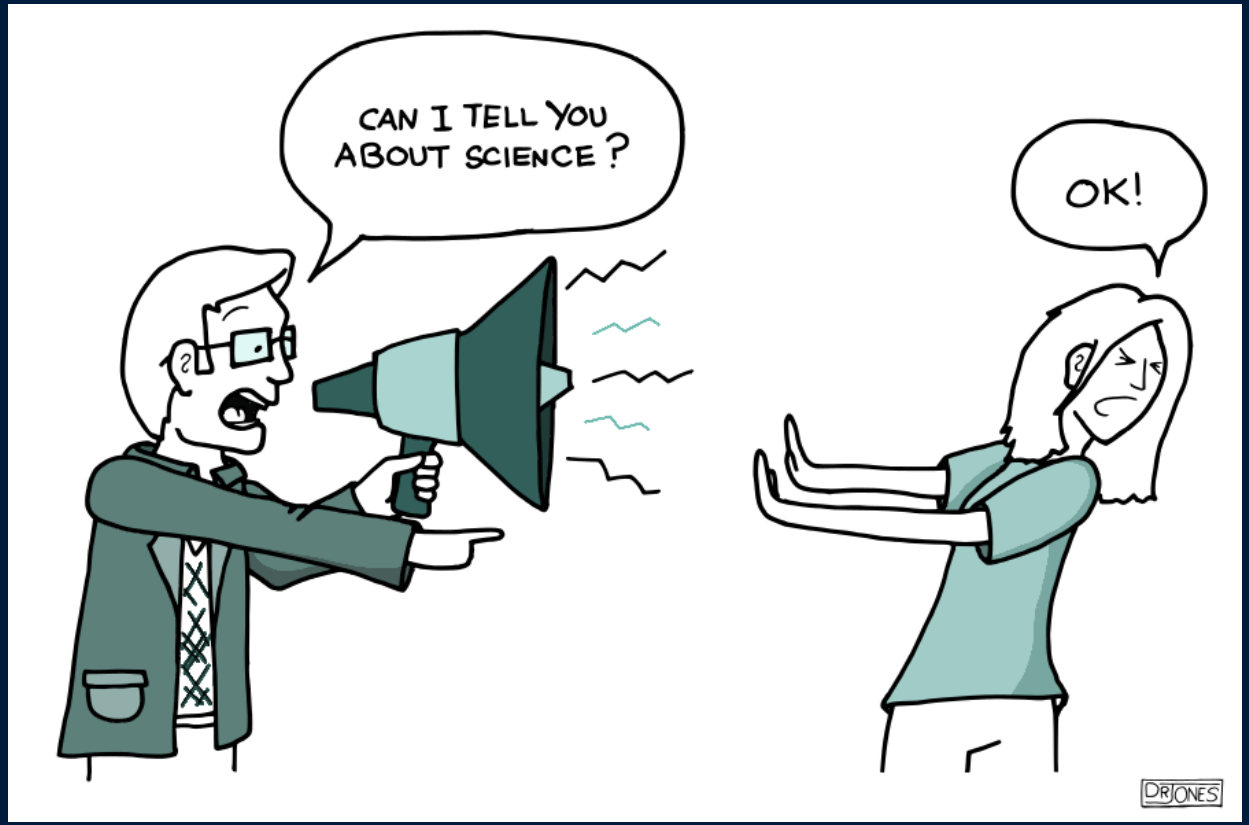


Sam Illingworth, 2014

Science Communication in 2026

Gravitational Waves & Fundamental Physics

Tim Hiert

24 February 2025

Maastricht University

Who?

Ok, so what is this thing?

“I only recently realized that the term ‘science communication’ is one of the most dangerous forms of jargon: it’s a word that makes different people think of different things.”

Ionica Smeets (full professor of Science Communication)
@ Dies Natalis Leiden University, Feb 2023

Recognize science communication

- Engagement
  - Public engagement
  - Societal engagement
- Outreach
  - Science popularisation
  - Vulgarisation
- Research communication (universities of applied sciences, some UM faculties)
- Public communication of science and technology (PCST)
  - Public Awareness of Science (PAS) / Public Understanding of Science (PUS)
- Participatory science
  - Citizen science
- Academic studies/science of science communication
  - STS: Science and technology studies; science, technology and society

Expert to non-expert

All types of research
(excuse my ‘science’)

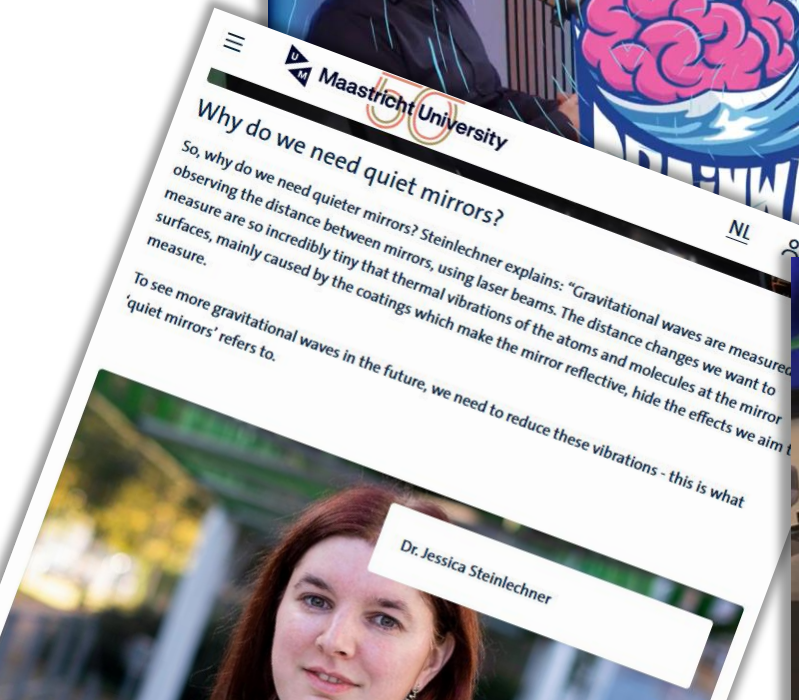
Another definition

2021: Science communication is…
“the social conversation around science”

1. Dissemination
2. Dialogue
3. Participation

Bucchi, M. and Trench, B. (2021). ‘Rethinking science communication as the social conversation around science’. JCOM 20 (03), Y01. https://doi.org/10.22323/2.20030401

Dissemination



Base model	Dissemination					Dialogue				Participation				
Sci-comm applications	Deficit	Defence	Promotion	Popularisation	Outreach	Engagement	Consultation	Interactivity	Deliberation	Chat	Play	Co-creation	Film & fiction	Art-science
Aspects of science	Findings: finished knowledge					Issues: applications and implications of knowledge				Processes: interpreting and (re-) constructing knowledge				
Public uses	Information, awareness, learning					Questioning, opinion, discussion				Sharing, creating, enjoyment, critique				
Social perspectives	Science literacy: scientism, technocracy					Science in society: Mode-2, post-normal, post-academic				Society in science: civic science, citizen science				
Orientation	Purposive Hierarchical Formal Closed									Non-purposive Participatory Informal Open				

Bucchi, M. and Trench, B. (2021). 'Rethinking science communication as the social conversation around science'. JCOM 20 (03), Y01. https://doi.org/10.22323/2.20030401

Dialogue as an academic? How do you feel about it?

Pixar studios, 2024 [Inside out 2]

Dialogue

https://www.rathenau.nl/nl/gezondheid/zo-denken-nederlanders-over-het-aanpassen-van-embryo-dna-0

Title: **"This is how Dutch people feel about changing DNA in embryos"**

"…helps policy makers and other interested parties to form their own opinion and make decisions."

DNA Dialogue: there's a manual!

DNA dialogue condition #5: **All participants in the dialogue are equal**

"…experts are also participants, who form their own opinions, and all participants have expertise in their own way." *(think of cultural knowledge, experiences, and so forth)*

"…this means experts (…) did answer technical questions about for instance DNA (…), but not as proponents who had to convince others of the benefits and necessity of [the technology]."

Translated from Verhoef, P., Pot, J., Grob, E., Van Woensel, M., Riedijk, S. & Gorter, E. (2021). Vliegende start voor dialogen: Tips van de DNA-dialoog.

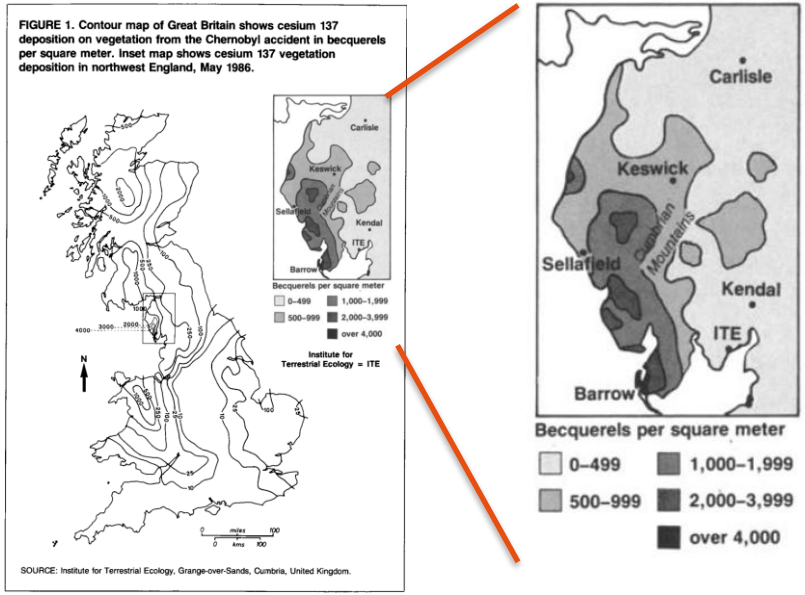
Base model	Dissemination	Dialogue	Participation
Sci-comm applications			
Aspects of science			
Public uses			

Meanwhile in the scicom field…

Bucchi, M. and Trench, B. (2021). 'Rethinking science communication as the social conversation around science'. JCOM 20 (03), Y01. https://doi.org/10.22323/2.20030401


https://wallpapers.com/images/high/lamb-2121-x-1414-picture-8675amvxyln5qjsa.webp

Classic case study: the hill sheep farmers of Cumbria

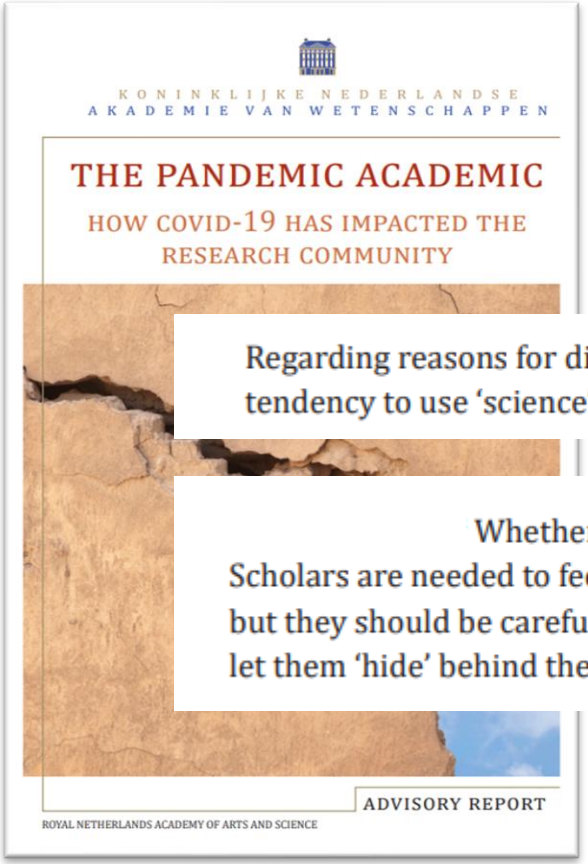


Brian Wynne (1989) Sheepfarming after Chernobyl: A Case Study in Communicating Scientific Information, Environment: Science and Policy for Sustainable Development, 31:2, 10-39, DOI: 10.1080/00139157.1989.9928930

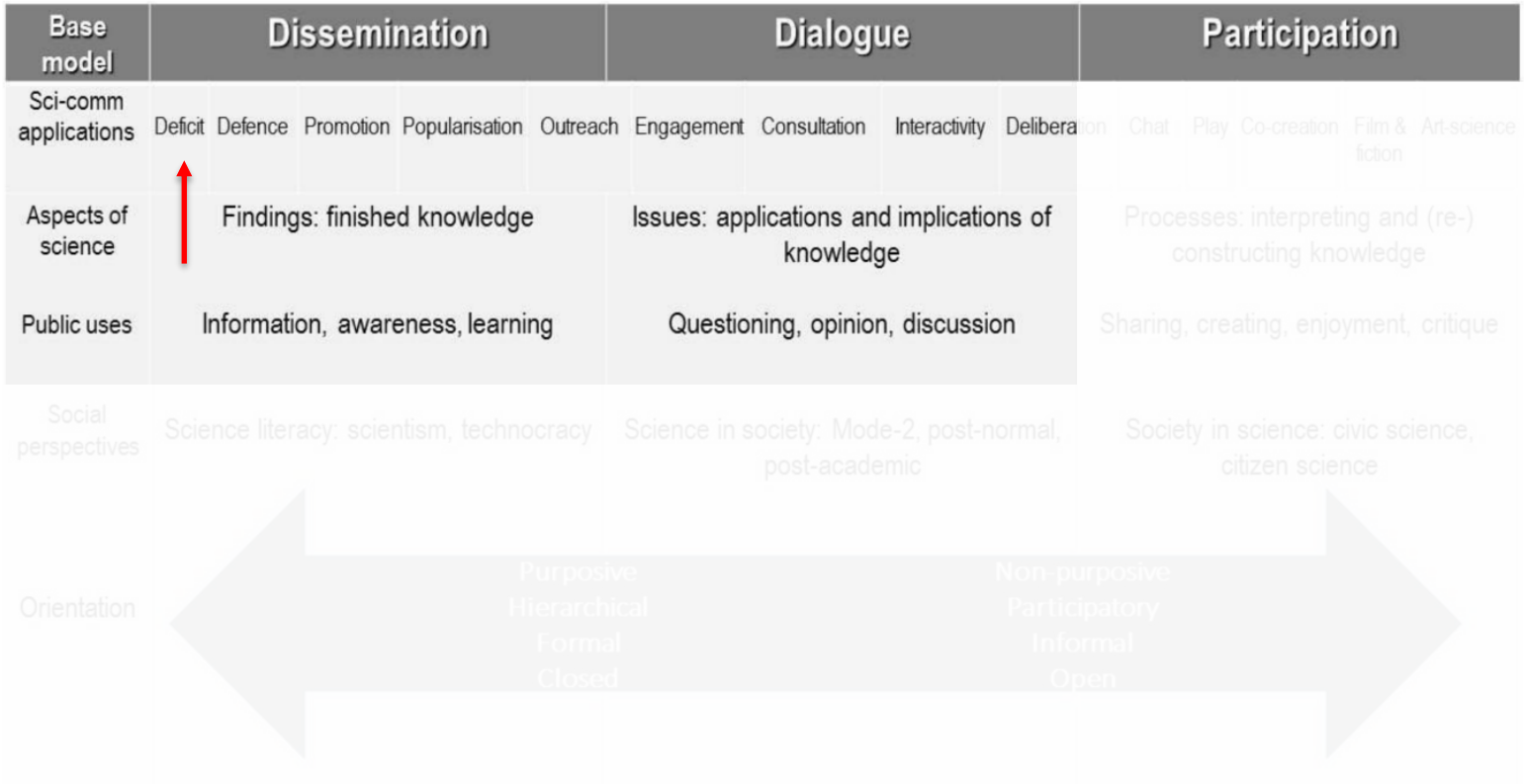
Classic case study: the hill sheep farmers of Cumbria

"Communication is not just an appendage to decision-making that provides post-hoc explanation and justification."

Brian Wynne (1989) Sheepfarming after Chernobyl: A Case Study in Communicating Scientific Information, Environment: Science and Policy for Sustainable Development, 31:2, 10-39, DOI: 10.1080/00139157.1989.9928930



KNAW (2022). The pandemic academic. How COVID-19 has impacted the research community, Amsterdam.



Bucchi, M. and Trench, B. (2021). 'Rethinking science communication as the social conversation around science'. JCOM 20 (03), Y01. https://doi.org/10.22323/2.20030401

Deficit?

The Information Deficit Model

Assumes a lack of knowledge as the main problem

If only people knew [this fact], they would be doing/feeling [your desired outcome] instead!

Let's try it!

The Information Deficit Model

Assumes a lack of knowledge as the main problem

If only science communicators knew that the deficit model is scientifically proven ineffective in many situations, they would stop relying on it without critically assessing if it does work for their project!

Let’s try it!

The Information Deficit Model

Assumes a lack of knowledge as the main problem

If only people knew the severity of the impact of climate change, they would take action to slow it down!

Empathy flexercise

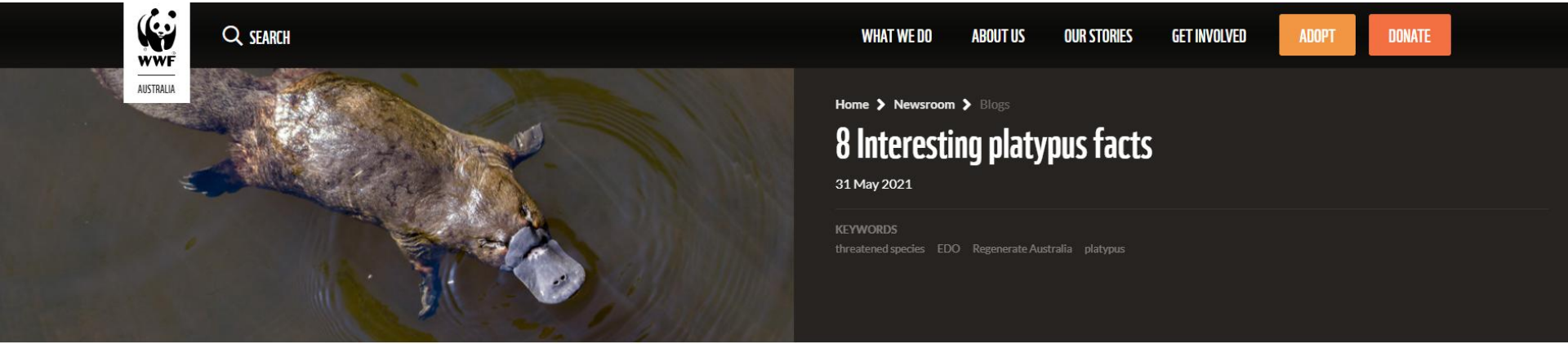
These are your basic facts. Science says:

- The climate is currently changing because of human behaviour
- Climate change will dramatically and negatively impact the lives of future generations on earth, and likely ours too

Building upon these facts (as is!) with additional fictional background stories & circumstances, find

- Narratives that explain someone changing their behaviour
- Narratives that explain someone not changing their behaviour

Dissemination or dialogue?



Platypus are facing a silent extinction. Take action now to protect them and their habitat!

ADOPT A PLATYPUS › FIND OUT MORE ABOUT OUR REWILDING WORK ›

Despite being a renowned recluse, the platypus is one of Australia's most recognised animals. With water-resistant fur, this semi-aquatic creature loves to frolic and play in the freshwater rivers and creeks it calls home. What an icon!

Here are 8 things you might not know about the platypus.

1. Platypuses are venomous.

They might look cute and cuddly, but come across a male platypus in mating season and you'll be in for a painful shock. Male platypuses have a hollow spur on each hind leg connected to a venom secreting gland, and while their venom *is* lethal, there are no recorded deaths from platypuses or from platypus stings.

Example influences in “sensemaking”

- Identity & worldview
  - Morals and values
  - Political preferences
  - Religion
  - Subcultures
  - Demographics
- Trust & experiences
  - Regarding the topic
  - Regarding the communicator
  - Regarding the situation
- Emotions
  - Positive, like enthusiasm, confidence and inspiration
  - Negative, like anxiety, anger and frustration
- Personal situation
  - Proximity to related events (time, timescale, physical distance)
  - Experiences and opinions of others
  - Knowledge capital
  - Barriers and opportunities

Study on sensemaking during the COVID-19 pandemic:
Virgil Rerimassie, Tessa Roedema, Lisa Augustijn, Amelie Schirmer & Frank Kupper. (2021). Making sense of the COVID-19 pandemic: An analysis of the dynamics of citizen sensemaking practices across Europe. Zenodo. https://doi.org/10.5281/zenodo.4507041

Some models on processing communication

- **7 principles of Sensemaking (Weick);** describes how people make sense of ambiguous, complex, or unexpected situations in order to act effectively. It's not about finding the absolute truth, but about creating a plausible narrative that makes reality manageable.
- **Elaboration Likely Hood Model**; Distinguishes between two routes of information processing: the central route (analytic attention and critical evaluation of arguments) and the peripheral route (experience-oriented processing based on heuristics).
- **Cognitive Dissonance:** Mental tension occurs when someone's beliefs, attitudes, or behaviors conflict. People have a strong need for internal consistency. They experience this "dissonance" as unpleasant and compels them to restore balance.
- **Cultural Cognition Model;** the theory that individuals' cultural values and group identities shape their perceptions of risk and fact, leading them to interpret information in ways that reinforce their existing worldviews
- **Psychological Reactance:** This mechanism occurs when people perceive a message as a threat to their freedom, leading to resistance and sometimes the adoption of an opposite attitude (a boomerang effect).

Summary on information transfer…

- The deficit model **can** be useful, but don't default to it without checking your assumptions
  - People's thinking is usually more complicated
  - (Scientific) knowledge is one of many factors underpinning decisions & opinions
  - But: a shared factual basis is crucial!
  - Big/important issue? Wealth of scientific literature available

- The deficit model is **not** popular in contemporary science communication circles ("old-fashioned"), so be careful when applying for funding from scicom-specific calls

Base model	Dissemination					Dialogue				Participation				
Sci-comm applications	Deficit	Defence	Promotion	Popularisation	Outreach	Engagement	Consultation	Interactivity	Deliberation	Chat	Play	Co-creation	Film & fiction	Art-science
Aspects of science	Findings: finished knowledge					Issues: applications and implications of knowledge				Processes: interpreting and (re-) constructing knowledge				
Public uses	Information, awareness, learning					Questioning, opinion, discussion				Sharing, creating, enjoyment, critique				
Social perspectives	Science literacy: scientism, technocracy					Science in society: Mode-2, post-normal, post-academic				Society in science: civic science, citizen science				
Orientation	Purposive Hierarchical Formal Closed									Non-purposive Participatory Informal Open				

Bucchi, M. and Trench, B. (2021). 'Rethinking science communication as the social conversation around science'. JCOM 20 (03), Y01. https://doi.org/10.22323/2.20030401

Participation in all stages of research

Formulating research questions

Gathering data

Analyzing data

Interpreting data

What is Exoplanet Watch?

Overview | Team | Stay in Touch | Community | Glossary | Background Information

Welcome to Exoplanet Watch! We're glad you're here!

Join Our Team!

Join our Slack to meet other Exoplanet Watch participants, ask questions, tro
problems, get updates on our biweekly full team meetings, and more. We're a

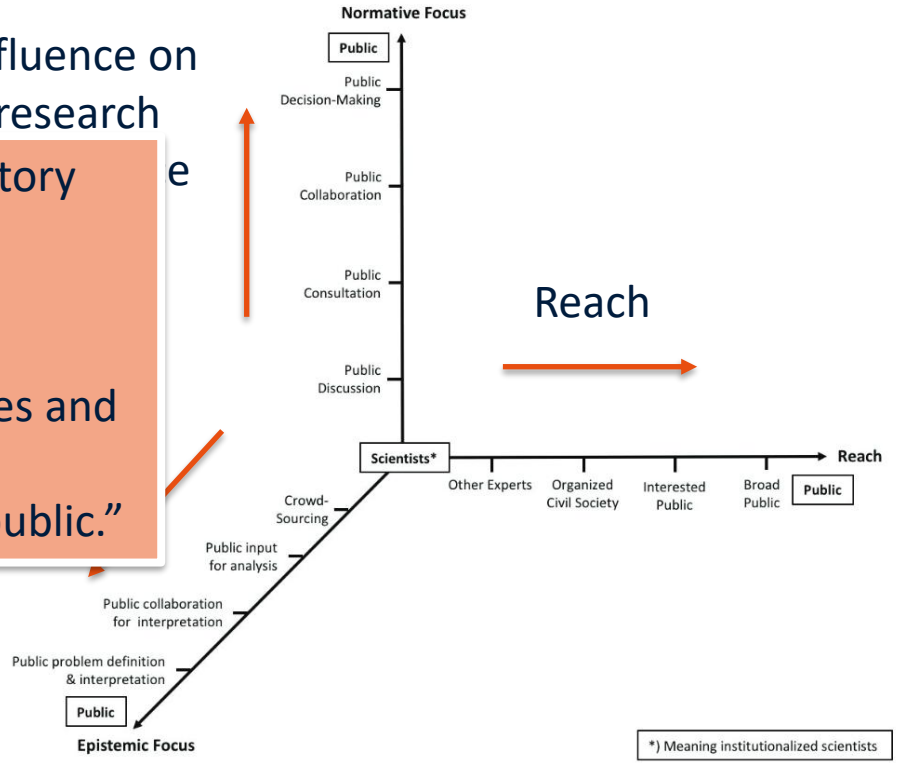
https://exoplanets.nasa.gov/exoplanet-watch/

Participation in all stages of research

Participation Cube

"There is no reason to push all participatory approaches to the outermost corner of maximum openness

As long as the purpose, design, guidelines and limits are transparent, fair and clearly communicated to participants and the public."



Schrögel, P. and Kolleck, A. (2019) "The Many Faces of Participation in Science: Literature Review and Proposal for a Three-Dimensional Framework", Science & Technology Studies, 32(2), pp. 77–99. doi: 10.23987/sts.59519.

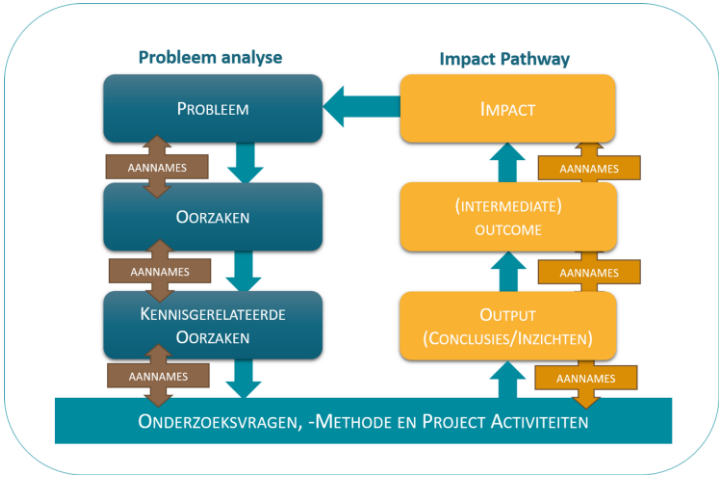
To summarize…

- Science communication is both a field of academic study and a field of practice
- Science communication can play a role in all phases of research
- All activities sit on a spectrum between dissemination, dialogue and participation – and see a ‘scientific expert’ in different roles
- Sharing your knowledge (dissemination) is a great start, but it doesn’t need to end there!

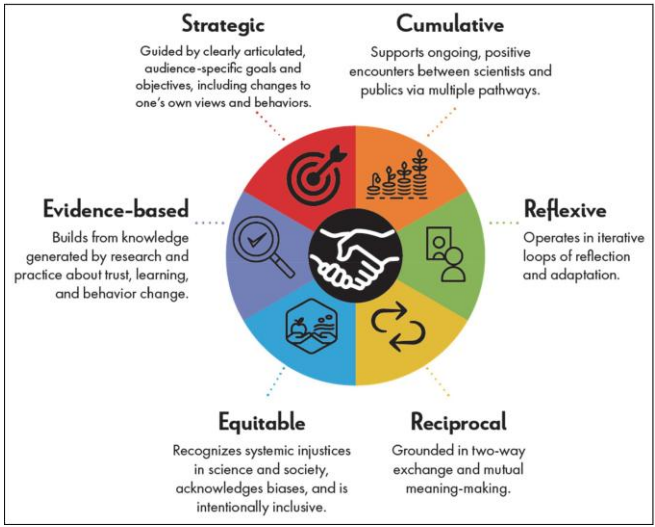
Science Communication Strategy

SMART

Theory of Change Model



SCRREE



Science Communication Incubator 2026 participants





Anna & Emma
(Gravitational Waves and Fundamental Physics)

Monica, Otti, Philippe , Pieter
(Department of Advanced Computing Sciences)

Emmy en Karin
(University College Venlo)

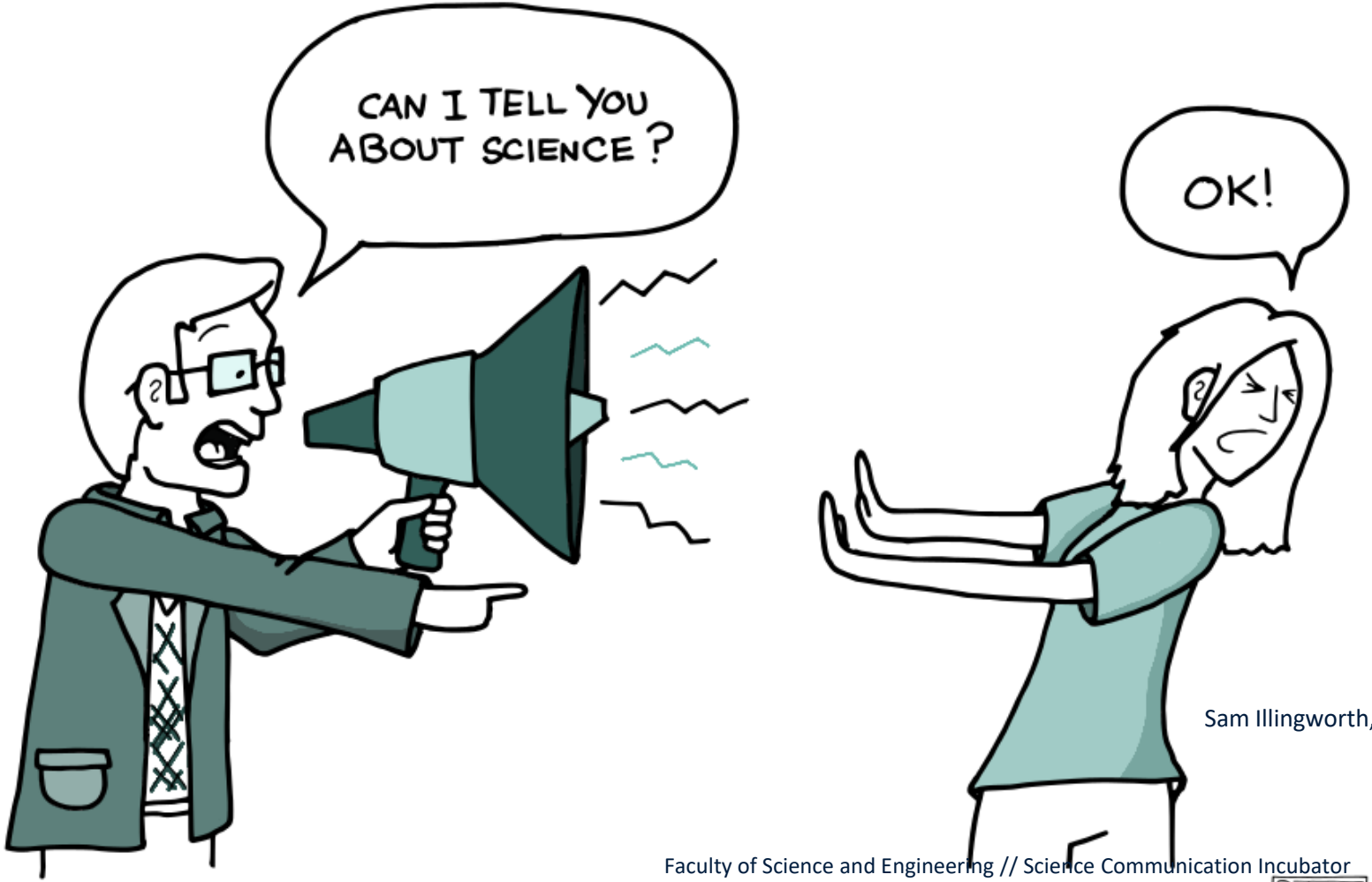
Cristina
(Aachen Maastricht Institue for Biobased Materials)

Kyle
(Maastricht Science Programme)

FSE Science Communication Support Office

removing barriers for FSE colleagues who want to strengthen their connections with society.

- **Training programmes;** to increase knowledge of FSE professional scicom
- **Strategic advice;** Scicom project, apply for funding, connect key partners
- **Identify opportunities;** projects and external visibility scicom successes
- **National & UM policy;** on national level part of the conversation on science communication as part of an academic career.
- **And…. What helps you to connect with society?**



Sam Illingworth, 2014