Citizen Science: What is it exactly and what are the challenges?

2. Dezember 2020

ZHAW DataLab Seminar

catta

Citizen Science &
Science Communication

Zürcher Hochschule
für Angewandte Wissenschaften

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Let me introduce myself

- Originally a **biotechnologist**
- 12 years of experience in **science communication** (PR Agency, NPO, science events, science writing, dialogue between science an public)
- 2014: Analysis about **citizen science** in Switzerland

-> foundation Swiss Citizen Science network „schweiz-forscht“

- 2019: **Start-up catta** to actively promote citizen science in Switzerland

https://www.linkedin.com/in/piaviviani/

Bürgerwissenschaft

Participatory science

Crowdsourcing

Citizen Science?

Science 2.0

DIY Science

Lay scientists

wikipedia

Citizen science

From Wikipedia, the free encyclopedia

Citizen science (**CS**; also known as **community science**, **crowd science**, **crowd-sourced science**, **civic science**, **volunteer monitoring**, or **online citizen science**) is scientific research conducted, in whole or in part, by amateur (or nonprofessional) scientists.[1] Citizen science is sometimes described as "public participation in scientific research," participatory monitoring, and participatory action research whose outcomes are often advancements in scientific research by improving the scientific communities capacity, as well as an increasing the public's understanding of science.[2][3][4] Based on Alexa rankings[5] iNaturalist is currently the most popular citizen science website[6] followed by eBird[7] and then Zooniverse[8] in second and third place respectively.[*needs update*]

Range of citizen science

Rick Bonney (2009)

- **Contributory projects**
  - Designed by scientists
  - Members of the public primarily contribute data
- **Collaborative projects**
  - Designed by scientists
  - Members of the public primarily contribute data, but also help to refine project design, analyze data, or disseminate findings
- **Co-created projects**
  - Designed by scientists and memebers of the public working together
  - At least some of the public participants are actively involved in most or all steps of the scientific process

https://files.eric.ed.gov/fulltext/ED519688.pdf

Range of citizen science

contributory | collaborative | co-created | collaborative | contributory

Snapshot Serengeti

https://www.zooniverse.org/projects/zooniverse/snapshot-serengeti/classify

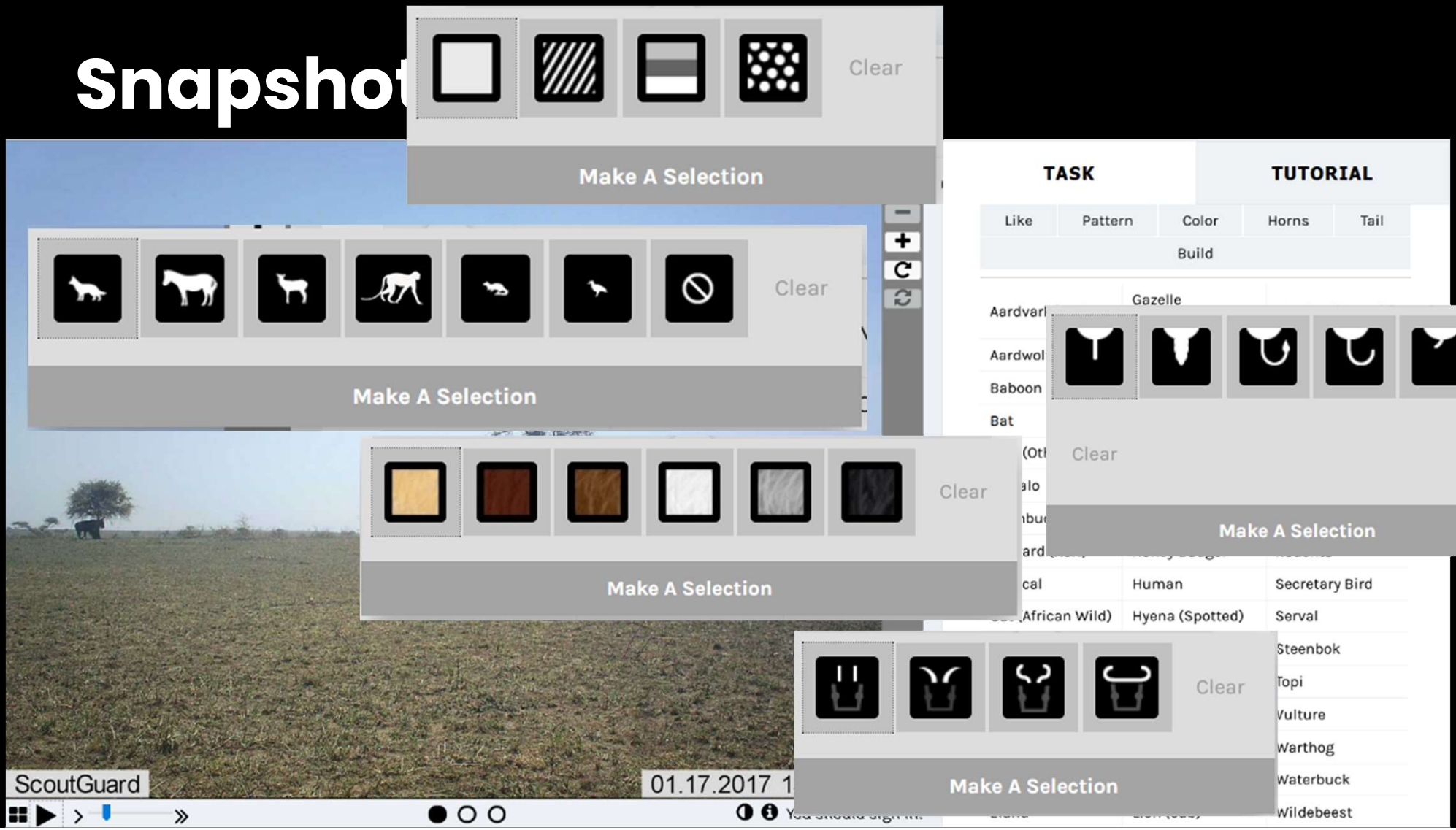
TASK | **TUTORIAL**

Like | Pattern | Color | Horns | Tail | Build

Aardvark/Antbear	Gazelle (Thomson's)	Monkey (Vervet)
Aardwolf	Genet	Ostrich
Baboon	Giraffe	Pangolin
Bat	Guinea Fowl	Porcupine
Bird (Other)	Hare	Reedbuck
Buffalo	Hartebeest	Reptiles/Amphibians
Bushbuck	Hippopotamus	Rhinoceros
Bustard (Kori)	Honey Badger	Rodents
Caracal	Human	Secretary Bird
Cat (African Wild)	Hyena (Spotted)	Serval
Cattle	Hyena (Striped)	Steenbok
Cheetah	Impala	Topi
Civet	Insect/Spider	Vulture
Dik-dik	Jackal	Warthog
Duiker	Leopard	Waterbuck
Eland	Lion (cub)	Wildebeest

https://www.zooniverse.org/projects/zooniverse/snapshot-serengeti/classify

Snapshot

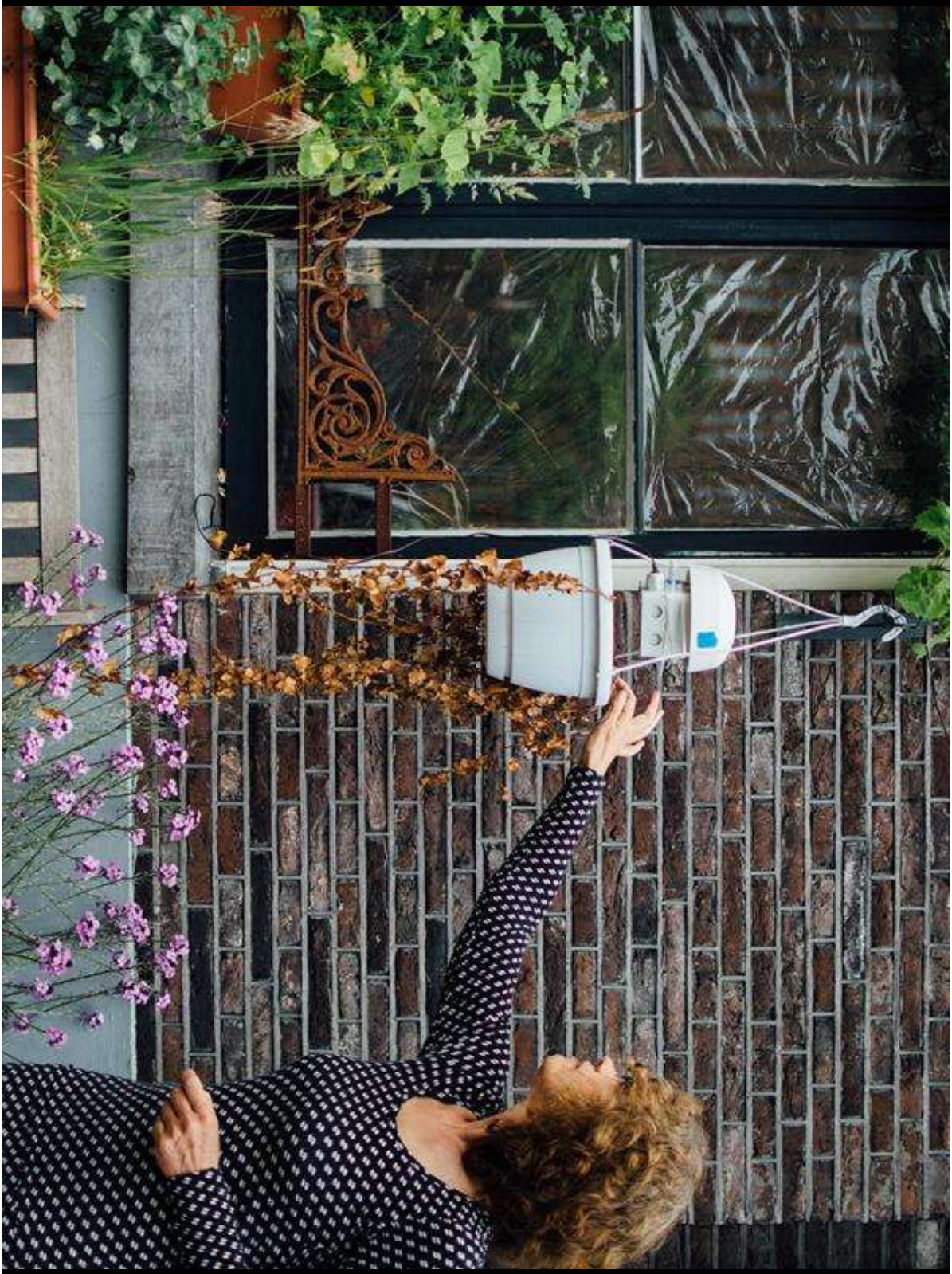


https://www.zooniverse.org

Beweisstück Unterhose

https://www.catta.ch/unterhose

https://waag.org/en/article/urban-airq-citizens-measuring-air-quality-themselves
https://www.weobserve.eu/



http://googlemapsmania.blogspot.com/2018/09/belgium-air-pollution.html

Zoek naar uw gemeente

MEER LEZEN

Groene kavels, rode wegen, zwarte kruispunten

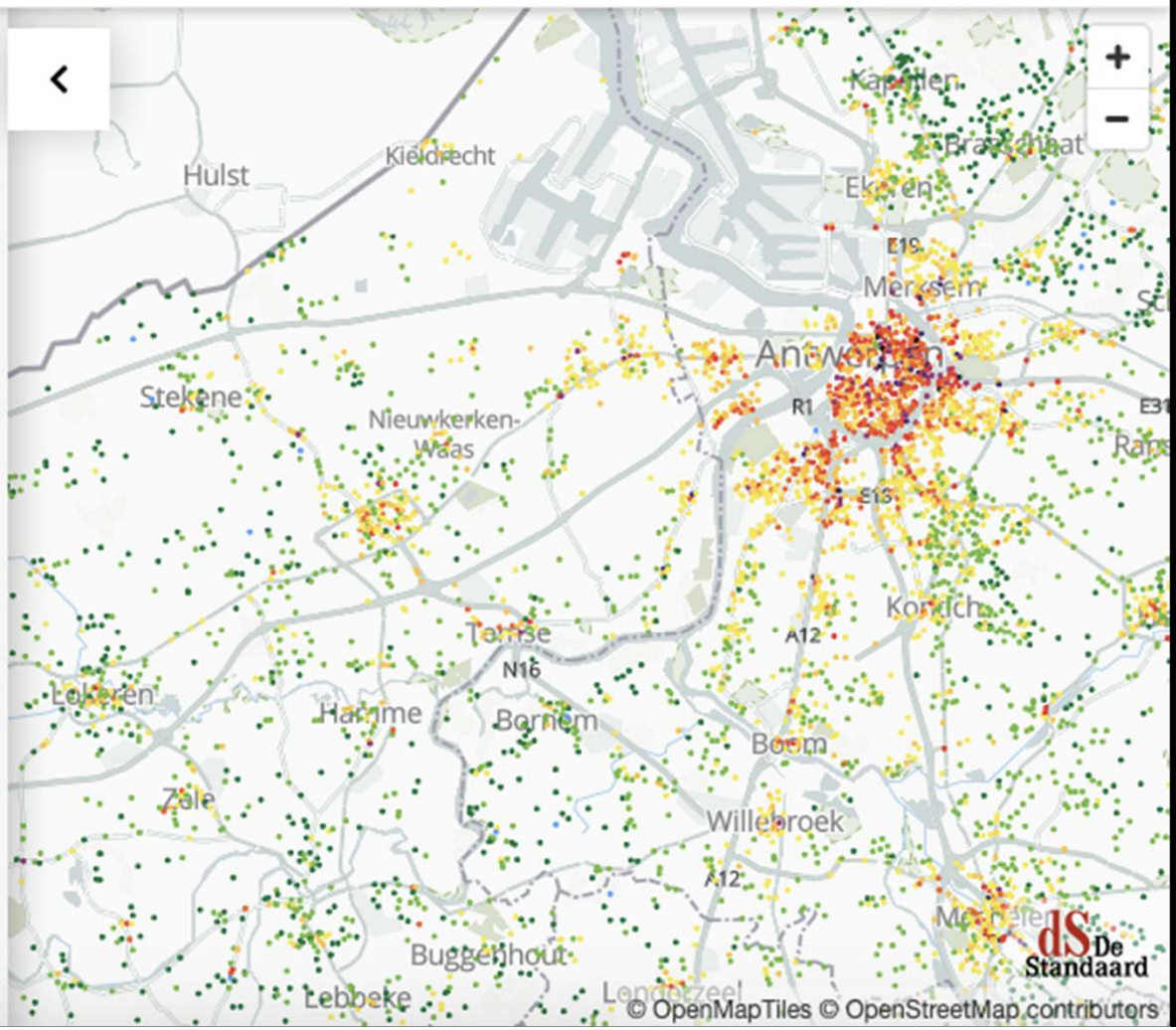
Wetenschappelijke toelichting

Waarom een groene bol niet beter is dan een rode

NO_2 - CONCENTRATIE (µg/m³)

0 20 40 60+

WAT MOET U WETEN OM DEZE KAART TE BEGRIJPEN?



https://waag.org/en/article/diy-measuring-air-quality

Odor pollution

Roadkill

Biodiversity

Safety on bike paths

Oil spills

Water quality

Radioactivity

Noise

Welcome to

OPEN CULTURE TECHNOLOGY

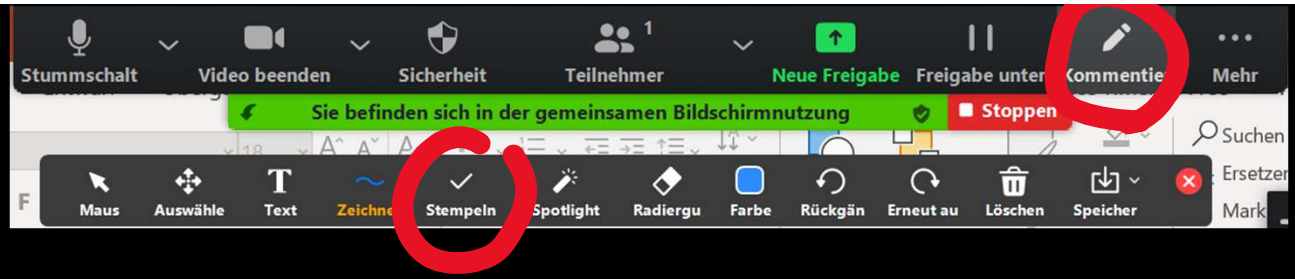
GaudiLabs

BLOG THE LAB PROJECTS TRANSFORMATIONS SHOP CONTACT

Generic Lab Equipement

To start up an independent and open lab it is crucial to get affordable lab equipment. Most of the tools we use are do it your self (DIY) and open source and are built from widely available and recycled parts found in consumer products such as DVD drives,

http://www.gaudi.ch/GaudiLabs/?page_id=19



Gaudilabs

Snapshot Serengeti

Evidence Panties

Air quality

Roles in citizen science

- Who is affected by our research question?
- What kind of knowledge do they have?
- What are their interests?

-> What role are they playing in our project?

Beweisstück Unterhose

Celebrities

catta

Farmers (organic and non-organic)

Private gardeners

Agroscope and University of Zurich

Federal and regional administration

Foundations

Media

https://www.catta.ch/unterhose

Bewe

Scientists:
- Learn more about the condition of Swiss soils
- Provide farmers & gardeners with a method to easily measure soil biodiversity
- Awareness for soil life the importance of soil

Communication department:
- Media presence and more sympathy for Agroscope

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Grad

Agroscope and University of Zurich

Federal and regional administration

Foundations

Media

https://www.catta.ch/unterhose

Beweisstü

- As much yield as possible
- As little effort as possible
- Know how to improve in a simple way
- Not to disclose too much data

Farmers (organic and non-organic)

Private gardeners

Federal and regional administration

Agroscope and University of Zurich

Foundations

Media

https://www.catta.ch/unterhose

- Fun
- Learn something new about their garden
- Tips on how to improve the soil
- Completely different language and terminology than farmers

terhose

ities

catta

Agroscope and University of Zurich

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Beweisstü se

- Do interesting projects
- Earn some money

catta

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University of Zurich

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Beweisstück Unterhose

Celebrities

catta

Farmers (organic and non-organic)

Private gardeners

- Something with (or without) underwear
- Celebrities

Agroscope and University of Zurich

Federal and regional administration

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Beweisstück Unterhose

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Beweisstück Unterhose

Celebrities

catta

Farmers (organic and org

- All important information summarized as briefly as possible
- Recommendations for action

garde

Agroscope and University of Zurich

Federal and regional administration

Foundations

Media

https://www.catta.ch/unterhose

Beweisstück Unterhose

Celebrities

Farmers (organic and non-organic)

Private gardeners

Federal and regional administration

- Diversely financed
- Value for science and for raising public awareness
- Addresses various topics of Agenda2030
- Participatory approach from beginning on

Agroscope and University of Zurich

Foundations

Media

https://www.catta.ch/unterhose

- Fun
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- Recom endations for action

Be seen with a sympathetic and meaningful project

- Something with (or without) underwear
- Celebrities

garde

Federal and regional administration

Foundations

Media

Agroscope and University of Zurich

https://www.catta.ch/unterhose

Citizen science is not only a method but also a culture.

Chances for citizen science?

Chances

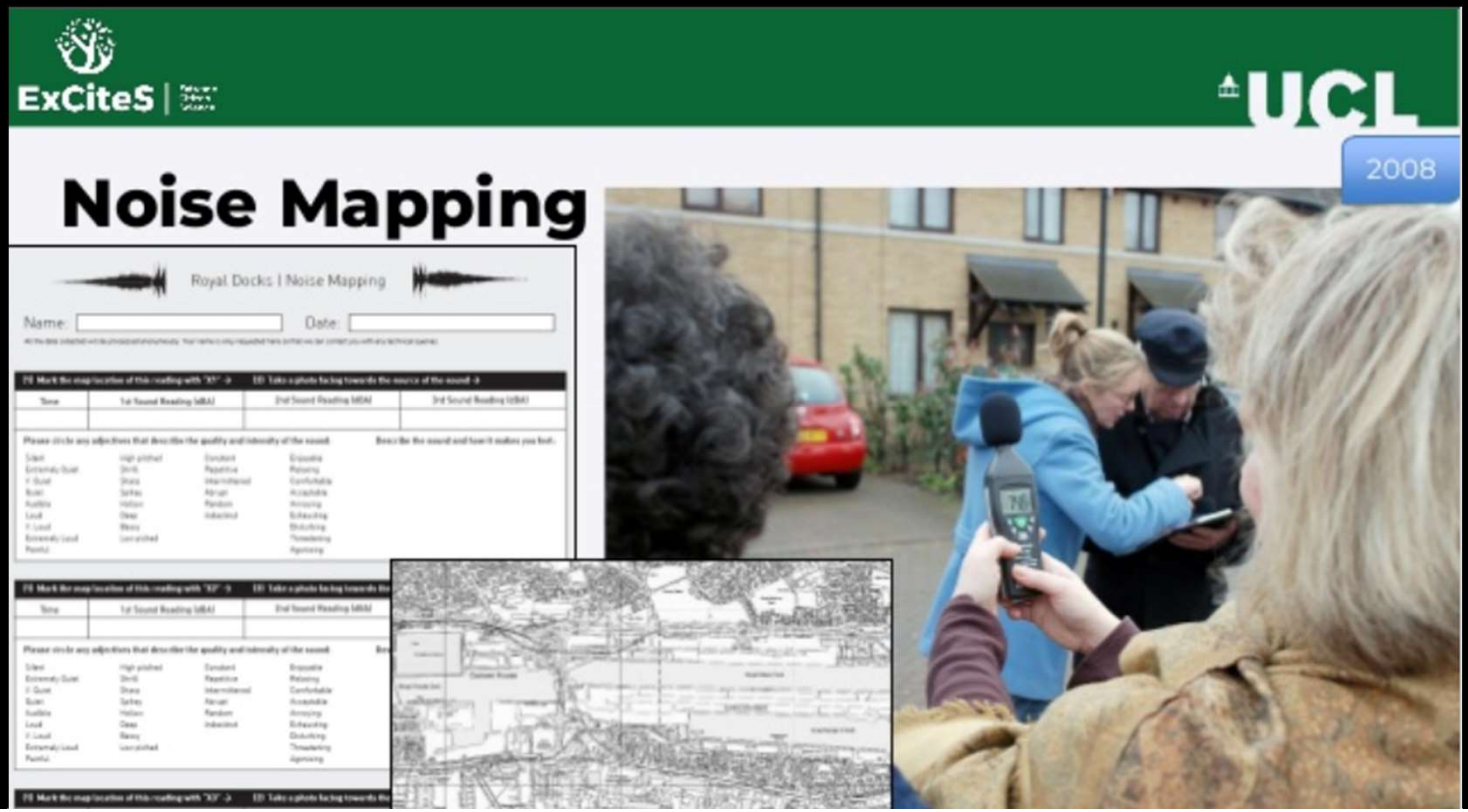
Which are the 3 main chances in you opinion?

Mark with any stamp

1. More acceptance and understanding of a problem
2. Bringing innovative ideas to science
3. Forms of knowledge from society
4. Science stepping down from the ivory tower
5. Critical questioning of scientific results
6. Better transfer of research results into practice
7. More transparency in research and development
8. Contribute local and practical knowledge
9. Change of perspective

Chances

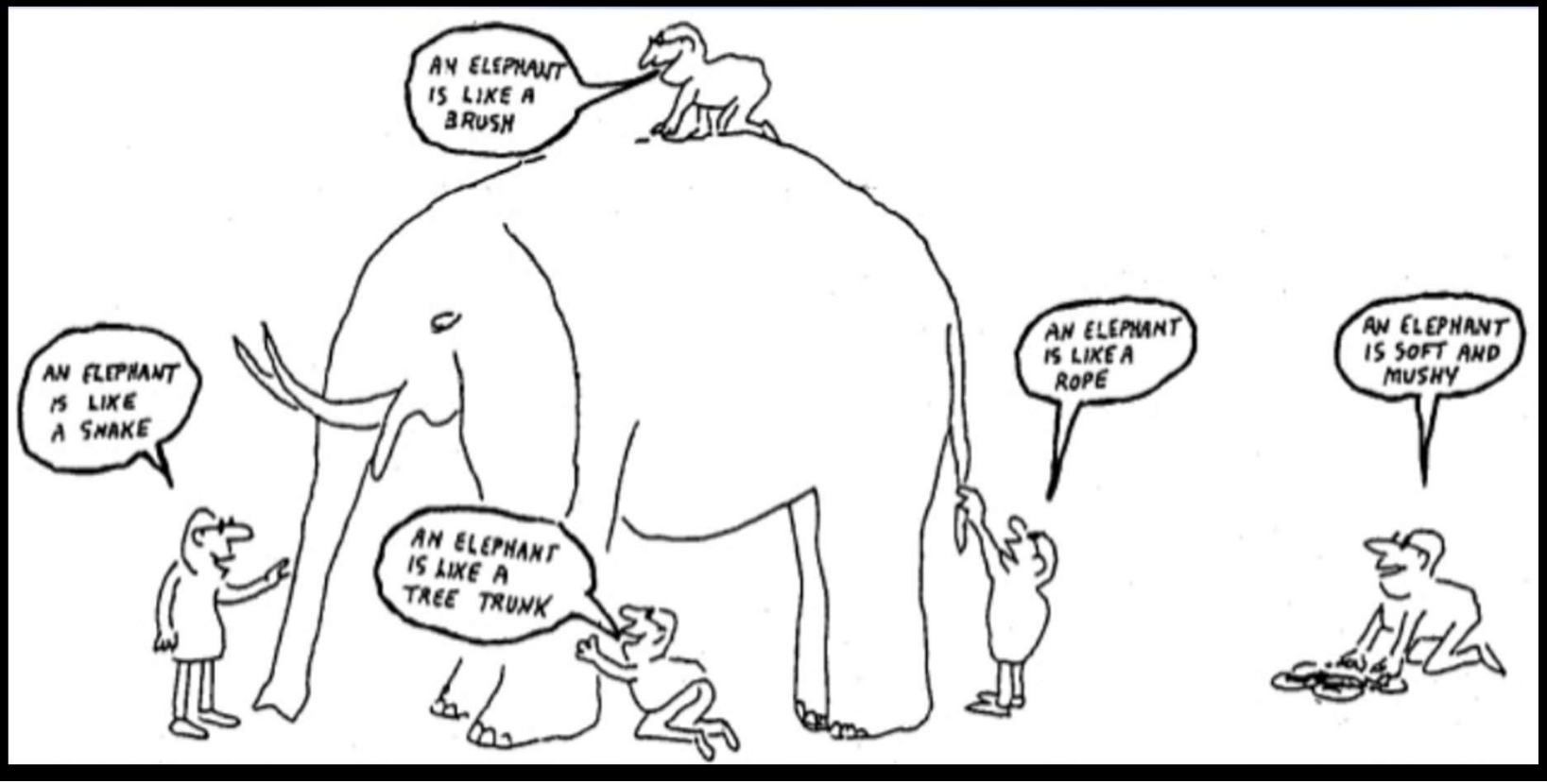
1. **More acceptance and understanding of a problem**



https://www.slideshare.net/mukih/open-science-and-citizen-science-researcher-participants-and-institutional-aspects

Chances

2. Bringing innovative ideas to science



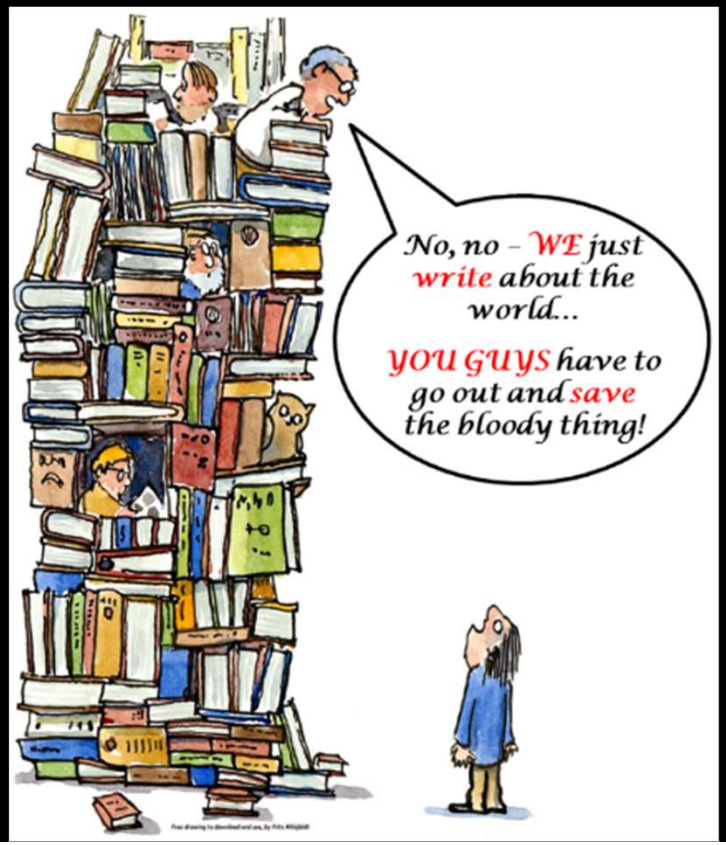
https://www.slideshare.net/hauma1/introduction-to-transdisciplinarity-ppt

Chances

3. Forms of knowledge from society

Chances

4. Science stepping down from the ivory tower



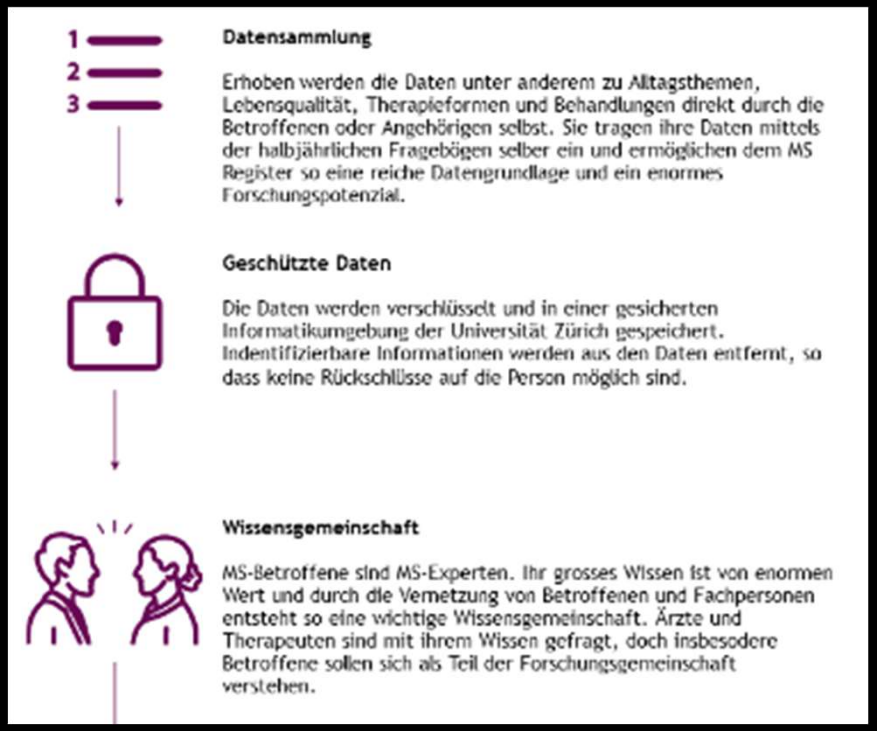
https://allthingslearning.files.wordpress.com/2012/06/ivory-tower-tg-version.png

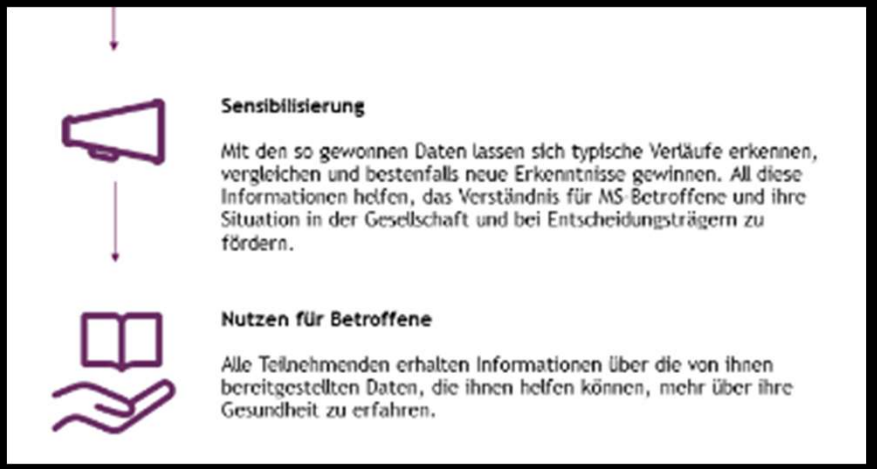
Chances

5. Critical questioning of scientific or other official results

Chances

6. Better transfer of research results into practice

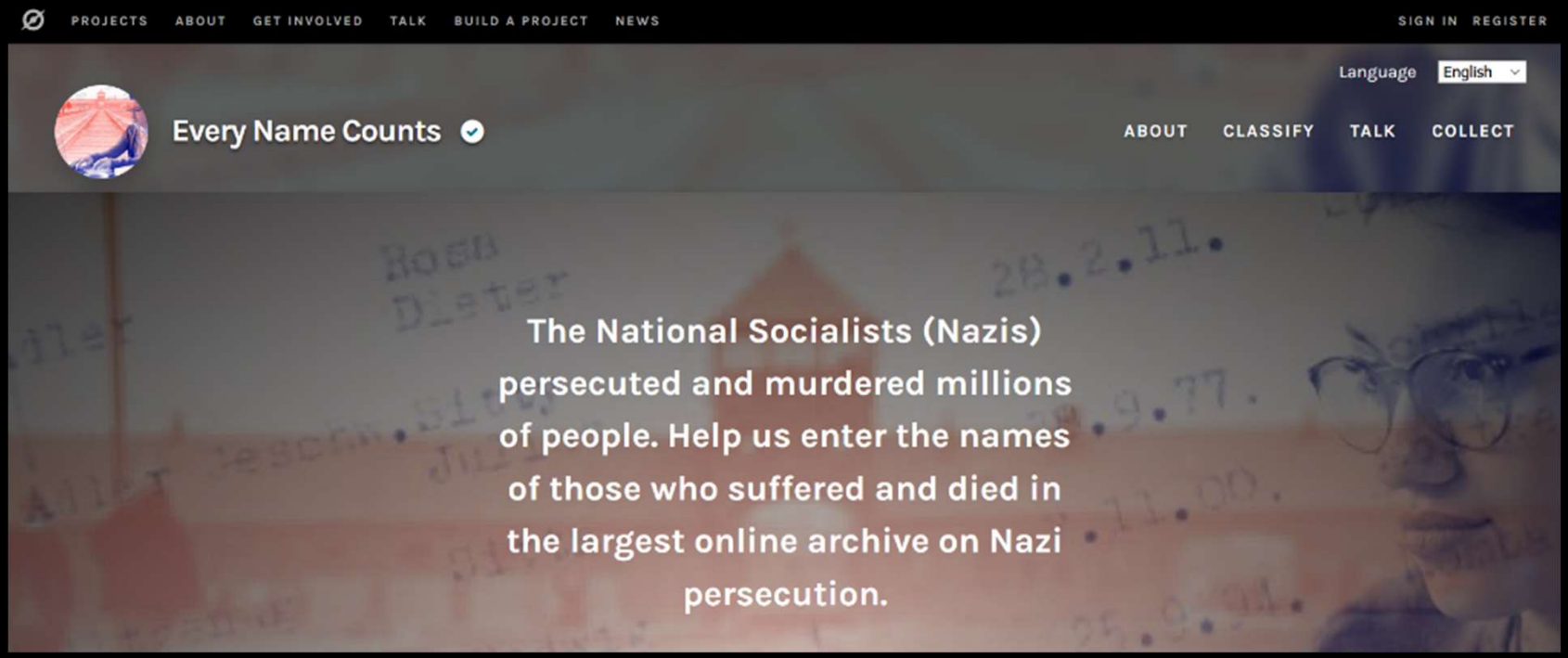




https://www.multiplesklerose.ch/de/das-schweizer-ms-register/

Chances

7. More transparency in research and development



https://www.zooniverse.org/projects/cseidenstuecker/every-name-counts

Chances

8. Contribute local and practical knowledge

https://crowdsourcing.onb.ac.at/oesterreich-aus-der-luft

Chances

9. Change of perspective

https://www.biovision.ch/en/news/the-sound-of-biodiversity/

Chances

1. More acceptance and understanding of a problem
2. Bringing innovative ideas to science
3. Forms of knowledge from society
4. Science stepping down from the ivory tower
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Challenges for citizen science?

Where do you see the biggest challenges?

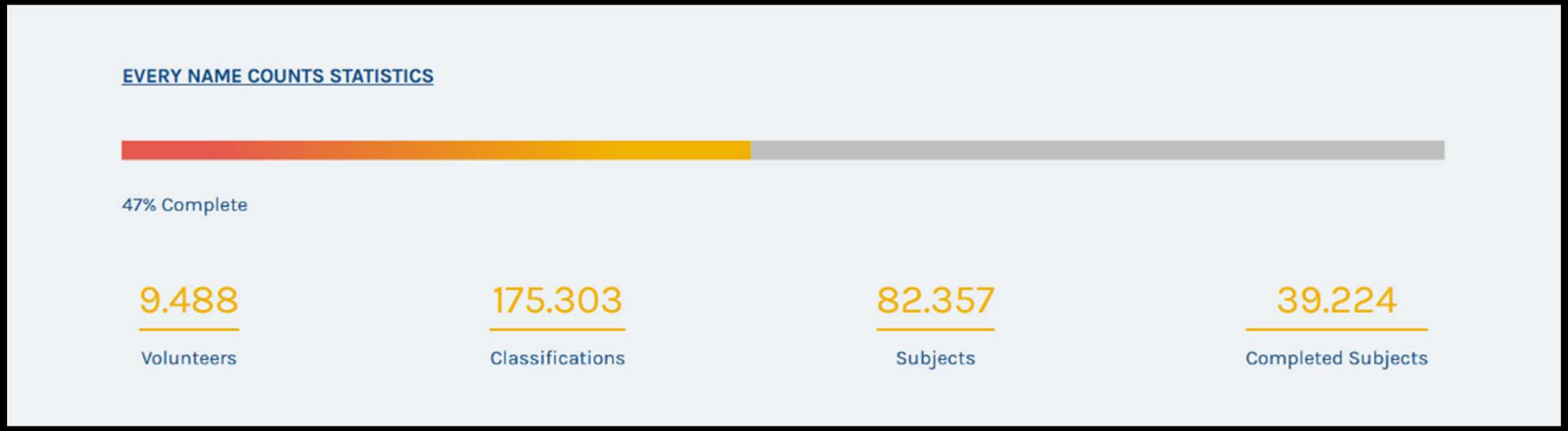
Write in the chat

Challenges

1. Quality requirements
2. Data protection and ethical aspects
3. Finding enough volunteers and keeping them in line
4. Recognition for amateur researchers
5. Time
6. Financing

Challenges

1. Quality requirements



Challenges

1. **Quality requirements**
   - Plan well: What exactly is the citizen scientists task?
   - Training and testing volunteers
   - Using standardized equipment
   - Having experts validate the data produced by volunteers
   - Having multiple volunteers make independent measurements of the same thing
   - Producing a large amount of data, to use statistics to increase data quality

Challenges

2. Data protection and ethical aspects

Challenges

3. Finding enough volunteers and keeping them in line

Challenges

4. Recognition for amateur researchers

https://www.researchgate.net/publication/337693475_Authorship_Protocols_Must_Change_to_Credit_Citizen_Scientists

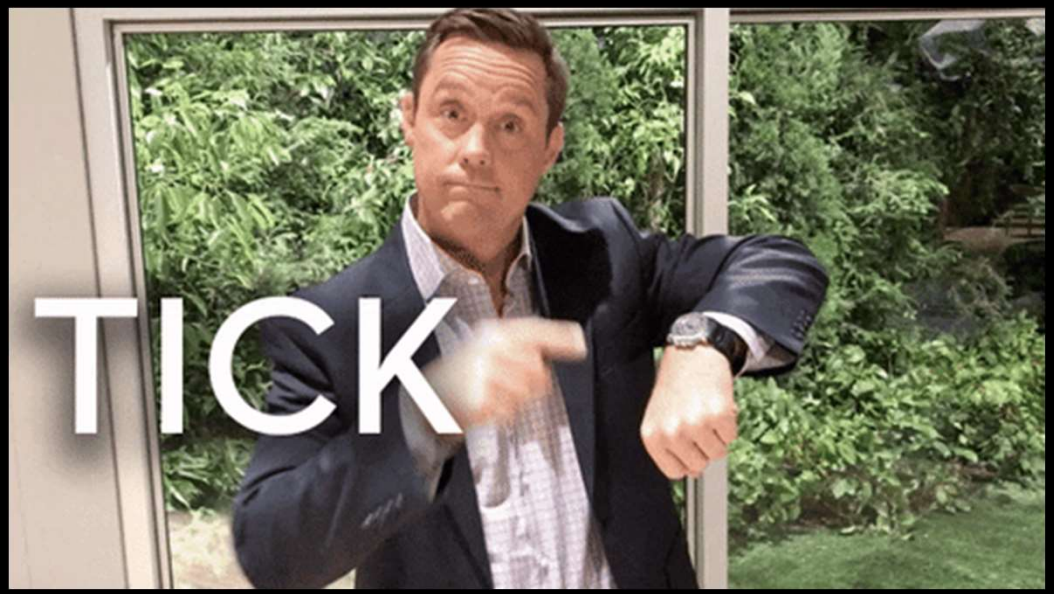
Authorship Protocols Must Change to Credit Citizen Scientists

Georgia Ward-Fear,[1,3,*] Gregory B. Pauly,[2,3,*] Jann E. Vendetti,[2] and Richard Shine[1]

The sociopolitical nature of research is changing and so must our protocols for authorship. Citizen scientists are often excluded from authorship because they cannot meet rigid journal criteria. To address this, we propose a new concept: allowing nonprofessional scientists to be credited as authors under a collective identity ('group coauthorship').

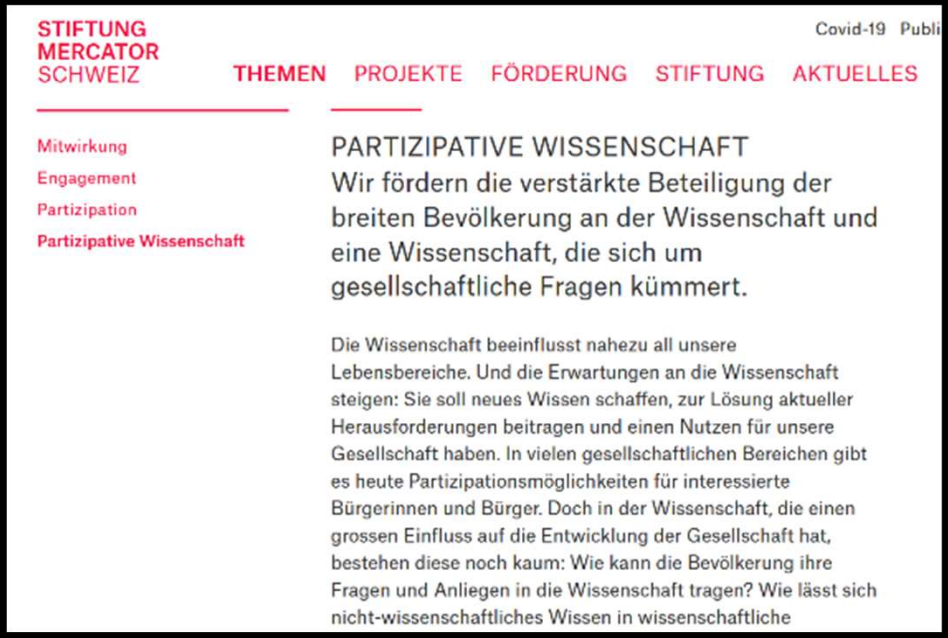
Challenges

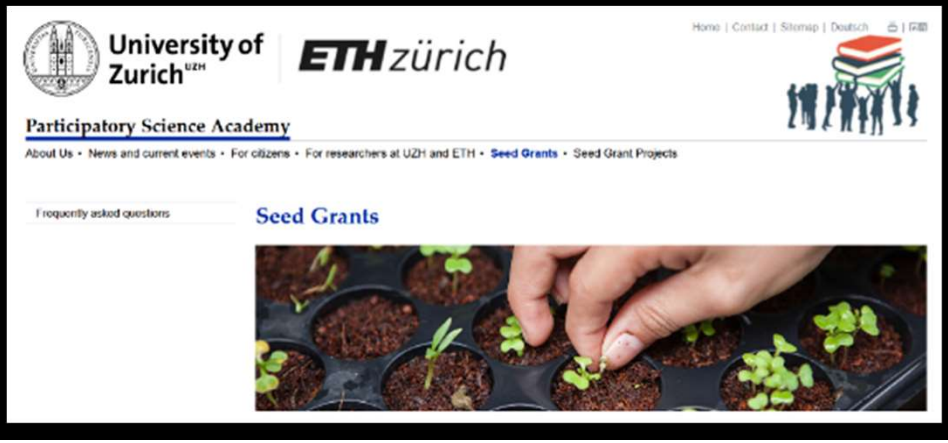
5. Time



Challenges

6. Financing





https://www.stiftung-mercator.ch
https://www.pwa.uzh.ch/en/seedgrants.html

Before you start, ask yourself:

- Is your project suited for citizen science at all?
- Are you open to other views/opinions?
- Who are the citizens you want to work with? Can you contact them? How many are there?
- Who to collabrate with?
- What roles/tasks does everyone have?
- Do you have time enough to set up your project in a participatory way?

Resources

Open source tool for analyzing data sets online with volunteers:
https://lab.citizenscience.ch/

Participatory science academy:
https://www.pwa.uzh.ch/en.html

10 principles of citizen science:
https://osf.io/ugy4t/

Citizen science project platforms:

Switzerland:
www.schweiz-forscht.ch
Germany:
www.buergerschaffenwissen.de
Austria:
www.citizen-science.at
EU:
eu-citizen.science
zooniverse:
www.zooniverse.org
USA nature:
www.inaturalist.org

Questions?

pia@catta.ch