



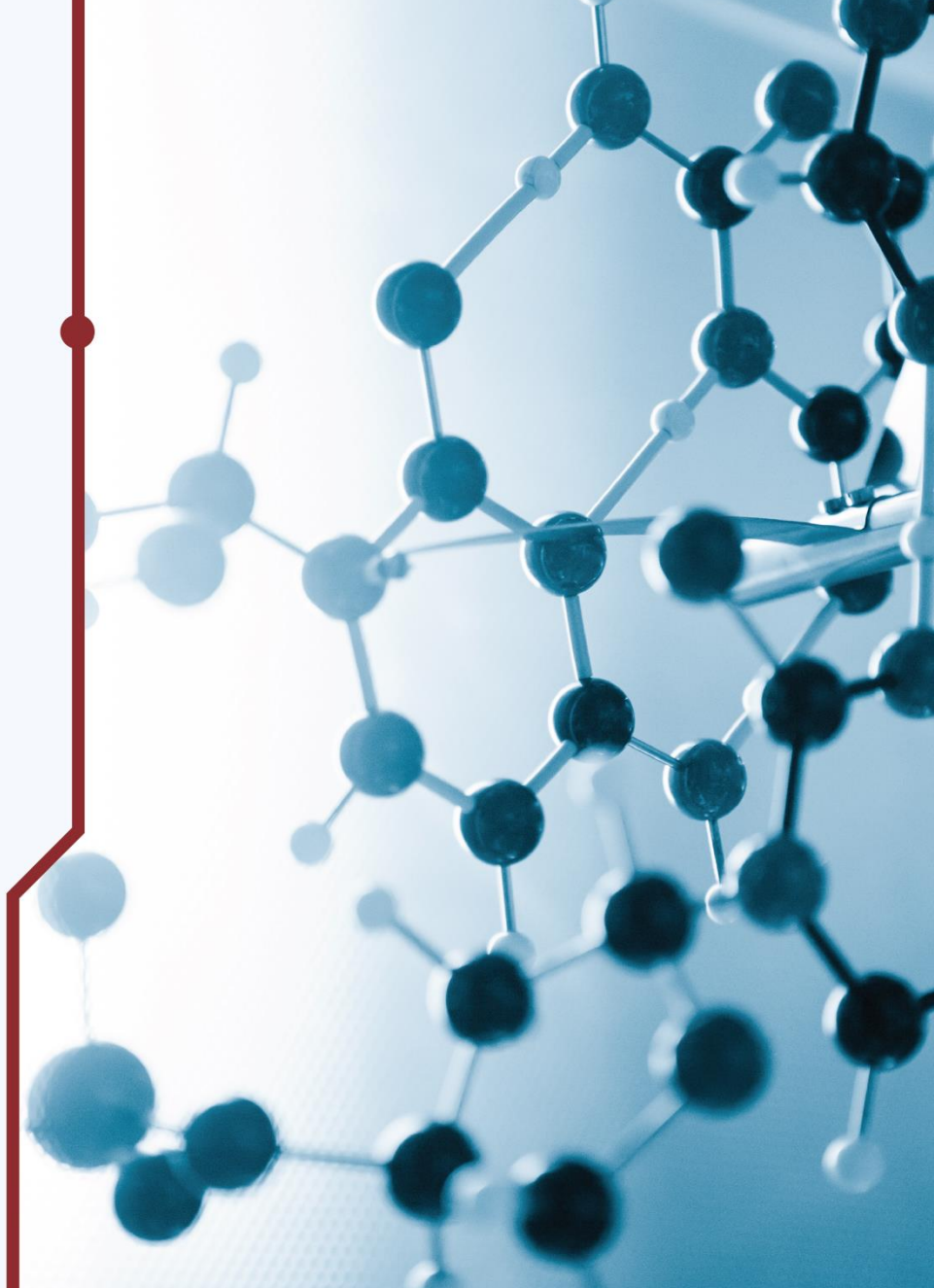
REINFORCE

REsearch INfrastructures FOR Citizens in Europe

Citizen Science Engagement Strategy

WEBINAR June 1, 2020, 11:00 AM CEST

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Research and Development Department,
Ellinogermaniki Agogi

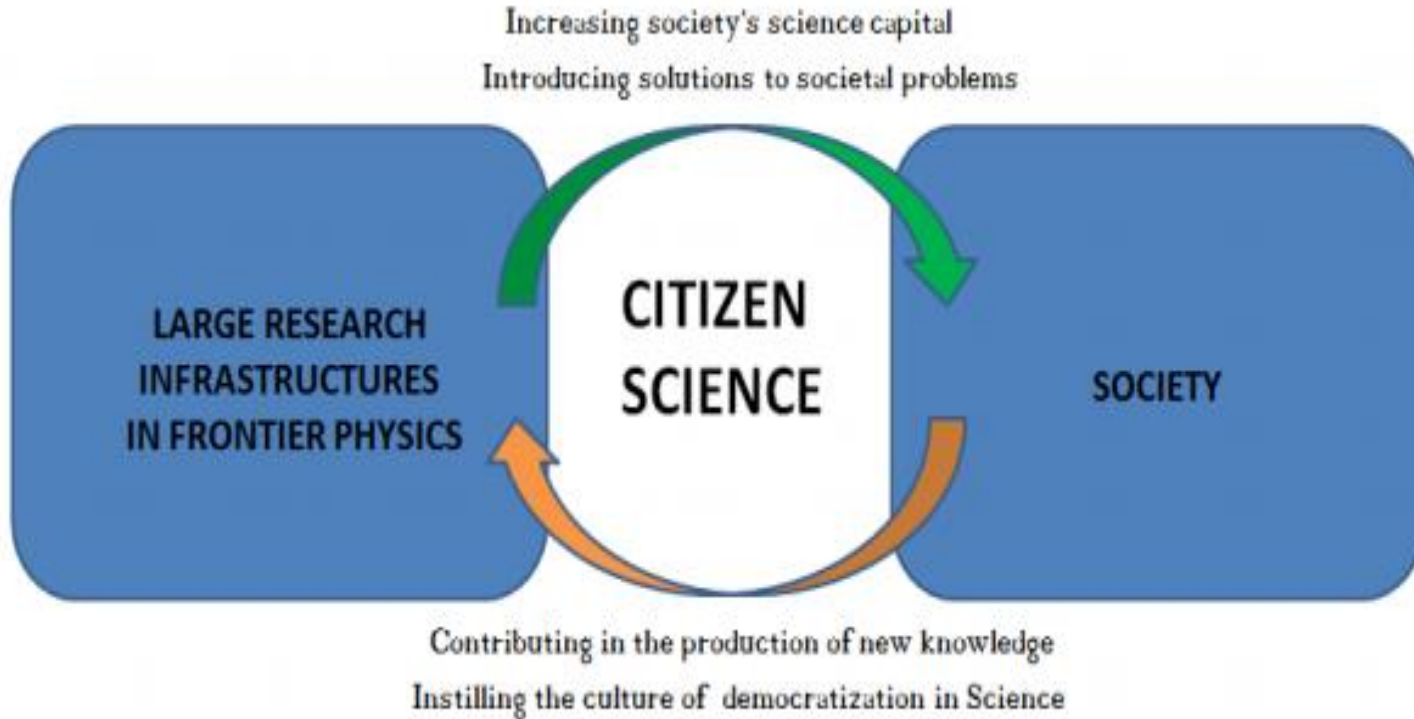
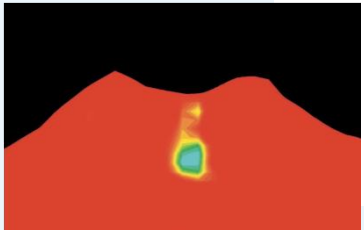
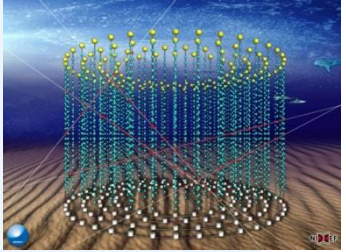


How can citizens contribute to frontier science?

How can frontier science contribute to the wellbeing of society?



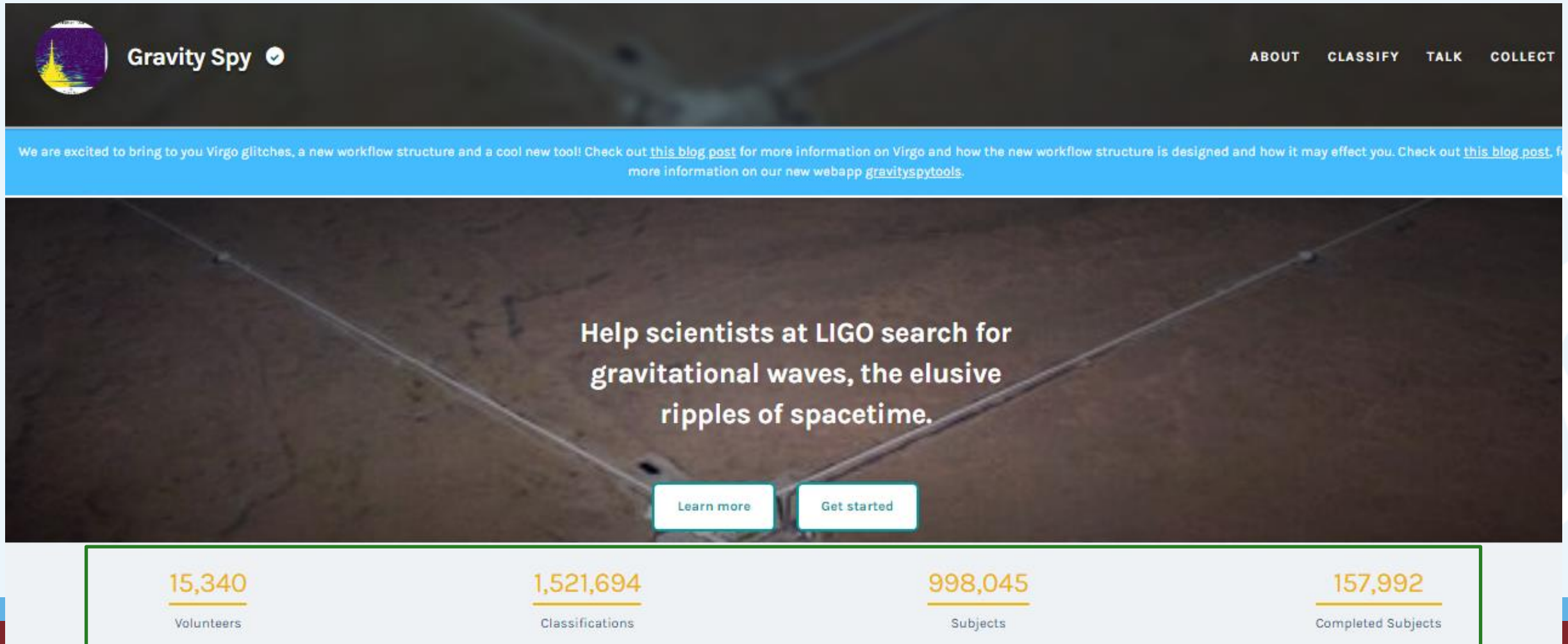
The interplay of large research infrastructures, citizen science and society in REINFORCE



Does this approach work?

CASE STUDY: GRAVITY SPY

<https://www.zooniverse.org/projects/zooniverse/gravity-spy>



Gravity Spy ✓

ABOUT CLASSIFY TALK COLLECT

We are excited to bring to you Virgo glitches, a new workflow structure and a cool new tool! Check out [this blog post](#) for more information on Virgo and how the new workflow structure is designed and how it may effect you. Check out [this blog post](#) for more information on our new webapp [gravityspytools](#).

Help scientists at LIGO search for gravitational waves, the elusive ripples of spacetime.

Learn more Get started

15,340	1,521,694	998,045	157,992
Volunteers	Classifications	Subjects	Completed Subjects



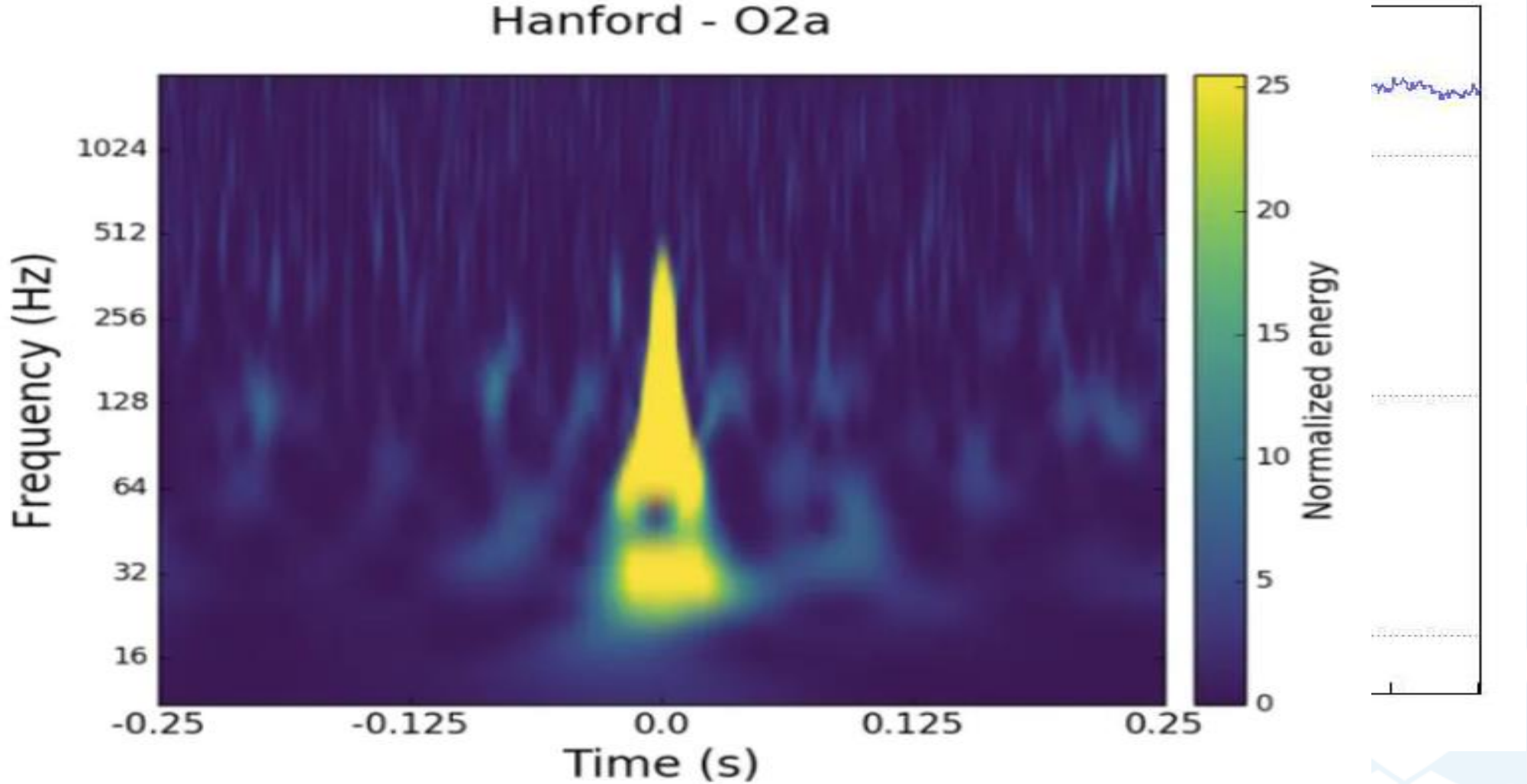
Mpc

How far in the Universe can a Gravitational Wave Detector "reach"

40

20

0



“This is a very cooperative community,” Barbara Téglás tells *Inverse*. “The participants help each other [via an online forum], teach each other, and solve problems together. Many of us read scientific publications and technical papers about the detectors. When the scientific team confirms something we’ve found out, it’s a success for the whole community.”

Téglás has been volunteering as a Gravity Spy since April 2016, and has spent a few hours almost every day since participating. A biotechnology engineer who has had a long, established passion for the sciences, Téglás, who was born in Hungary, logs on from her home in France to participate in multiple citizen scientists projects hosted on Zooniverse. With Gravity Spy, she gets to indulge her curiosity about astronomy and the galaxy, while interacting with a group of people she describes as “helpful, friendly, and intelligent.”

“I chose to participate because I realized it was a great opportunity to be a part of one of the most prominent scientific projects in the world,” says Téglás. “I thought that if I could do something for this, even the tiniest thing, it was worth it.”

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Reports until 09:30, Thursday 12 May 2016

A citizen scientist identified a new class of glitches and helped scientists optimize their detector against them, thus contributing in the optimization of a GW detector!

It's also not clear yet exactly how this couples in. These glitches do not look like scattering arches - they are too high in frequency, have no support at lower frequency, and also there's no top part of an arch. So it may be jitter, or clipping. The best prediction of the glitches is the pitch position of SR2 as seen by the OSEM. One kind of glitch happens at the maxima, and one at the minima. The final attachment shows this. But we haven't looked at all channels yet.

Further work can be done by looking at other times when this kind of glitch occurs (GravitySpy can provide those), looking for the cause of the BS motion, and trying to find which of the alignment channels is the best predictor of the exact glitch times.

<https://alog.ligo-wa.caltech.edu/aLOG/index.php?callRep=27138>

 **Citizen Science** in REINFORCE is perceived as a **participatory process**, an amalgam of “**contributory**” and “**co-created**” citizen science, in which **citizens** are **trained in frontier science** following a specialized training methodology, they are in **constant connection with researchers** through their communities of practice, they **provide their feedback**, they **voice their concerns** and they **explore the boundaries of knowledge**.



- ❖ Through the **use of Open Data** citizens go beyond tasks generated by researchers for the benefit of science and are able to perform their own inquiries with the guidance of experts in the respective fields.
- ❖ Beyond to its connection with scientific content, citizen science as it is envisioned by REINFORCE forges **interdisciplinary connections and supports critical thinking and social innovation.**



Through REINFORCE, citizens will be engaged with citizen science projects that go beyond the state of the art in the fields of frontier Physics.

They will be able to substantially **contribute to the development of new knowledge**, and **support the optimization of detectors**

We expect that **REINFORCE will contribute in the reinforcement of the society's science capital.**



In order to attract, engage, train and sustain citizens in the concept and activities of REINFORCE a specific methodology is needed:

This is the role of the
“Citizen Science Engagement Strategy”



Our Questions



Who are the potential citizen scientists that can be engaged in REINFORCE? How do we find them?



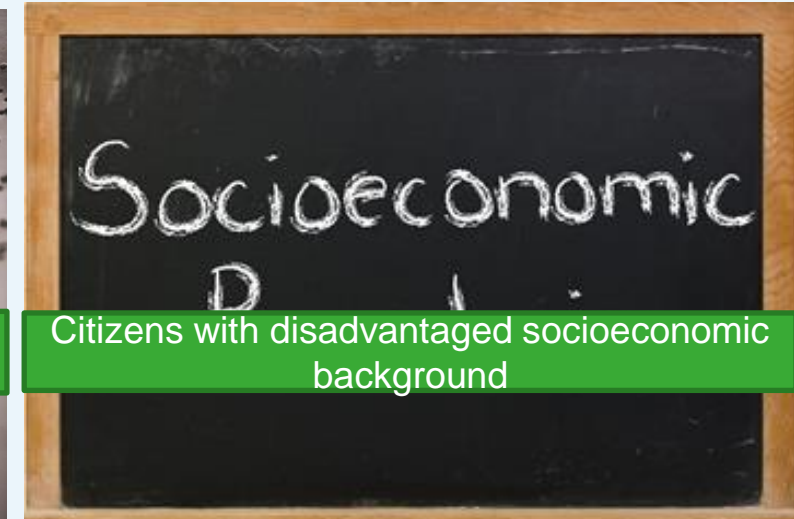
Do we design citizen science projects for an exclusive set of few interested citizens or we design for inclusion?



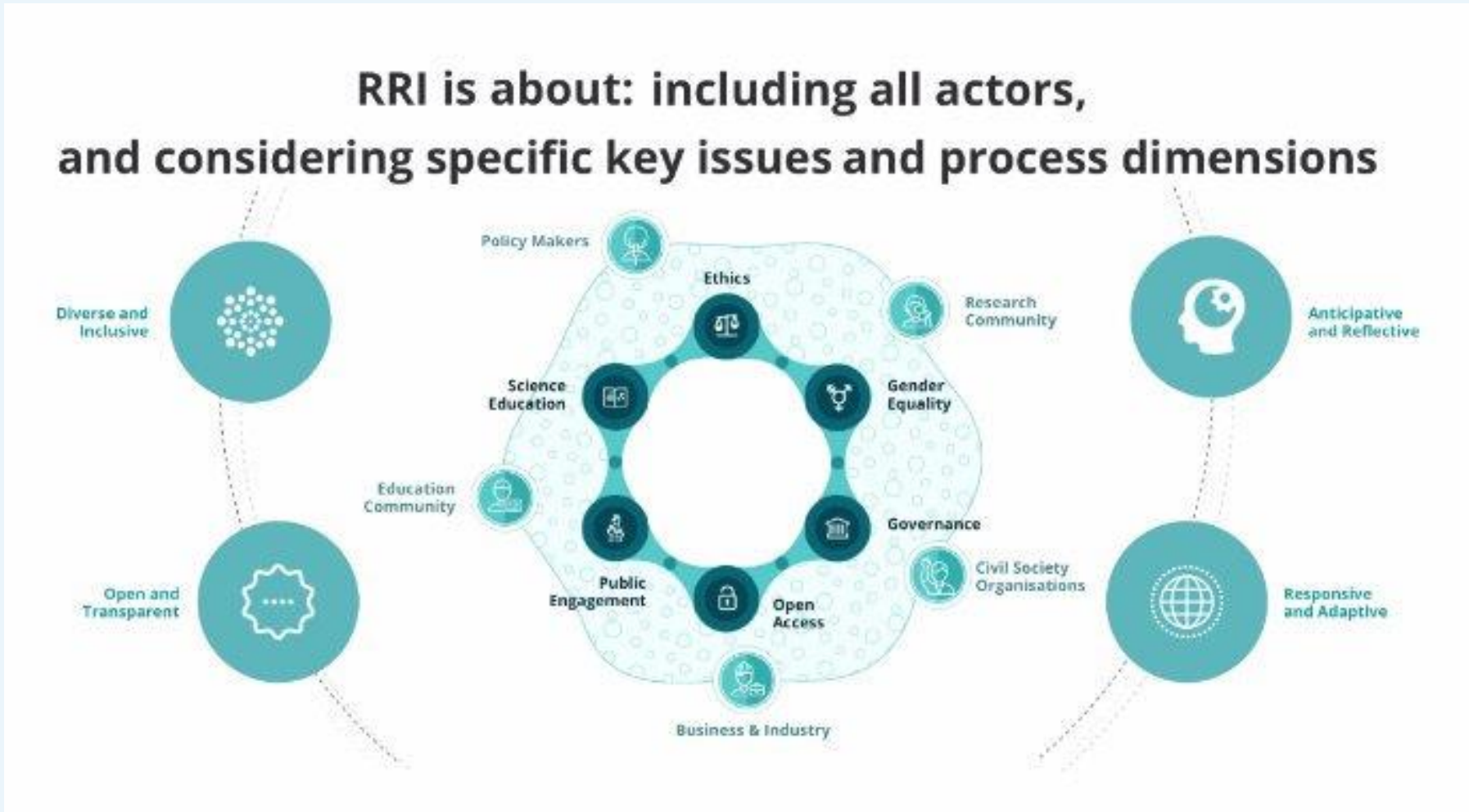
Can we balance scientific efficiency with an inclusive design of frontier citizen science projects?
What are the design characteristics necessary to achieve this balance?



How do we engage different target groups with different boundaries? Some examples..



How can we integrate Responsible Research and Innovation in the REINFORCE demonstrators for citizens in Europe?



Source: RRI Tools Project
<https://www.youtube.com/watch?v=nzHsd1ocnEs>

To address these questions, REINFORCE..

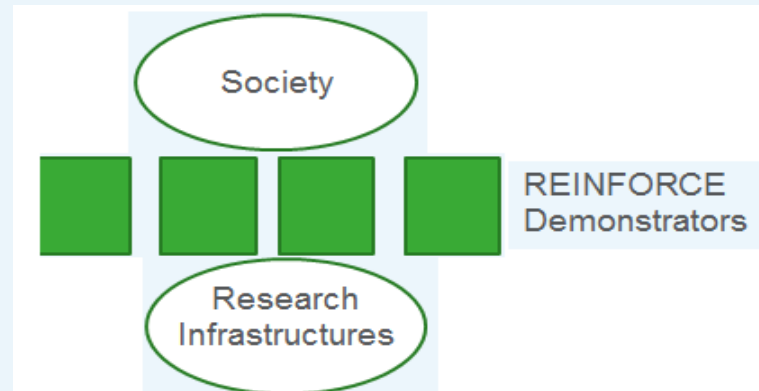
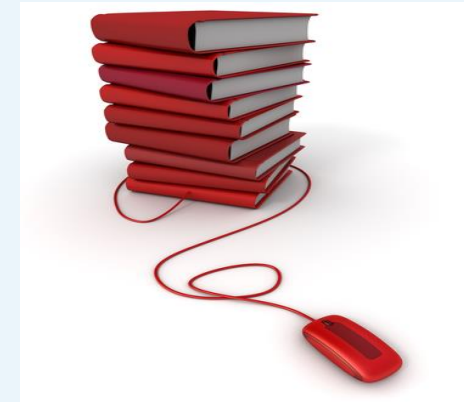
Organizes Visionary workshops for citizens



Organizes an online survey



Performs a desktop bibliographic research



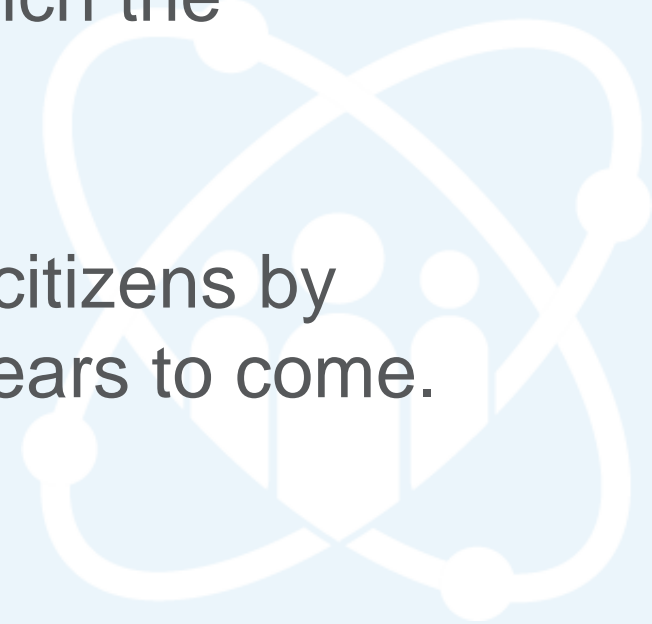
Performs a task analysis of the REINFORCE Demonstrators

- ❗ Will publish a citizen engagement strategy, considering the special characteristics of different target groups, their barriers and constraints, perceptions and biases, attitudes and knowledge regarding science. This strategy will provide the framework for the design and implementation of REINFORCE's demonstrators.
- ❗ Will Develop a set of requirements and offer recommendations to the demonstrator work packages in order to ensure the effective integration of RRI in the development of the REINFORCE demonstrators.



CONCLUSIONS

- 🧪 Citizens can actively contribute in new knowledge as it is pursued by large research infrastructures in the field of Physics.
- 🧪 Citizen Science can become the bridge through which the Science and Society gap can close.
- 🧪 REINFORCE aims to engage a broad audience of citizens by designing dedicated engagement activities in the years to come.
- 🧪 Stay tuned! We need your help!



Next steps



Following the production of the citizen engagement strategy, REINFORCE will..

- Set up the citizen communities which will engage with REINFORCE demonstrators. Form a practicing community extending from early-school classes to senior citizens.
- Coordinate the implementation of the REINFORCE demonstrators with more than 100K citizens: Engage and motivate citizens to dedicate effort in the project activities; provide training and support; provide opportunities to citizens to directly interact with scientists and decision makers.

Community Building

Creating the REINFORCE community: a hub of citizens, scientists, educators who will interact and engage with REINFORCE citizen science activities



Organizing Participatory engagement activities

Training Workshops

Science Café's



Exhibitions – Open Events



Examples of Participatory Engagement Activities



Webinars



Join us in this new fantastic journey!

