ID contributo: **620** Tipo: **Parallel Talk**

Report on REINFORCE EU-funded citizen's Science project (2019-2022)

sabato 9 luglio 2022 15:30 (20 minuti)

Abstract
Stavros Katsanevas
Director European Gravitational Observatory
Coordinator REINFORCE

I will report on REINFORCE (REsearch INfrastructures FOR Citizens in Europe, 2019-2022) coordinated by the European Gravitational Observatory (EGO) and supported by the European Union's Horizon 2020 SWAFS program. It has developed demonstrator projects in the leading citizen-science platform, Zooniverse, engaging citizens in four frontier-physics research domains. Citizen scientists participate in the analysis of:
a) transient-noise signals, known as 'glitches', which are mostly of environmental origin, in data from the Virgo gravitational-wave detector, concurrently participating in the improvement of the sensitivity of the detector through the follow-up of events that may have been caused by, for example, earthquakes, thunderstorms, electromagnetic and anthropogenic noise, and in the eventual discovery of potentially genuine events of cosmological origin;
b) bioluminescence and bioacoustic data from KM3NeT, in the context of neutrino astronomy, helping to optimise detection strategies for cosmic neutrinos, while in parallel participating in a study of marine life in the deep sea environment in the vicinity of the ORCA and ARCA detectors located in the Mediterranean sea;
c) high-energy physics data from the ATLAS experiment at CERN, contributing to the search for complex Higgs boson decays and for new long-lived particles, going beyond visual classification to sonification and comparisons with machine-learning methods;
d) and cosmic-ray data, exploring the connections across the fields of cosmic-ray physics, geology, volcanology and archaeology, through the use of data and simple experimental devices used as radiographic-exploratory and monitoring tools.

All four demonstrator projects interact transversally with an Inclusion work package, aimed at developing sonification techniques to not only provide access to the data to visually-impaired people, but also to increase the perceptual capabilities of general scientific efforts, investigating the ability to distinguish signal from background using the different senses. The citizen scientists'work is also used in conjunction with machine-learning algorithms, effectively mixing human and artificial intelligence.

Four further work packages cover engagement strategies, exploration and evaluation of the resilience of citizen-scientist endeavours over time (retention of which is a well known challenge for all citizen-science projects) and the preparation of a roadmap comparing analogous experiences in other large research infrastructures and augmenting the embedding of the experience in the social fabric through: a) the use of techniques avoiding the instrumentalization of citizens simply as 'classification machines'; b) multi-sensorial strategies; c) generalisation of the use of distributed sensors under the responsibility of citizen scientists; d) the use of new mobile applications; e) extension to senior and disabled citizens as well as traditional ecological knowledge users; f) the inclusion of critical thinking and art and science.

In short, REINFORCE attempts to increase the embedding of humanity in the four antique notions of cosmos: cosmos as Universe; cosmos as the geosphere that surrounds us; cosmos as society; and finally, cosmos as the internal world of sensorial representations.

In-person participation

Yes

Autore principale: Prof. KATSANEVAS, stavros (European Gravitational Observatory)

Relatore: Prof. KATSANEVAS, stavros (European Gravitational Observatory)

Classifica Sessioni: Education and Outreach

Classificazione della track: Education and Outreach