GCOS Workshop May 2021

Monday, 17 May 2021 - Friday, 21 May 2021

zoom

Scientific Programme

PRELIMINARY workshop programme

Objective of this brainstorming meeting is to collect ideas for the physics case and possible technical implementations of GCOS. This is the kick-off meeting of a process which should lead to a GCOS White Paper.

Session 1
We aim to have a series of invited talks about "*Physics lessons learned and to be learned until 2030*". These talks should review recent results and give an outlook on the next decade. (We do not want to duplicate conferences like the ICRC, we want to focus here on the physics case of an observatory after 2030).
- Telescope Array, lessons from cosmic rays, neutrinos, gamma rays
- Pierre Auger Observatory, lessons from cosmic rays, neutrinos, gamma rays
- The UHE Universe in the multi-messenger paradigm - lessons from neutrinos
- How will our knowledge advance in the next decade - an overview on upcoming projects and their implications
- Ultra-high-energy particles: **acceleration**, status theoretical understanding, open questions - What observations does theory need from GCOS in order to move on
- Ultra-high-energy particles: **propagation**, status theoretical understanding, open questions - What observations does theory need from GCOS in order to move on

Session 2
The physics case of GCOS. What do we want to achieve with GCOS? What has not been clarified until 2030?
- multi messenger, charged CRs, neutrinos, gamma rays, gravitational
waves.
- why do we want to build GCOS? <— input from theory, open questions
- what physics do we want to do? <— input from theory, open questions
Contributed talks. YOUR ideas for a GCOS physics case.
We will have a discussion with the goal to agree on a core science case of GCOS.

Session 3
Towards possible technological implementations. Where do we expect to be technologically in 2030.
- Lessons learned from TA/Auger, IceCube others technologically,
- what can be done (in terms of detectors) what did not work?
- what did we learn from R&D projects?
- where do we see potential?

We aim for a series of invited talks on different detector technologies and upcoming projects.

We aim to have a discussion on *Ground arrays vs space observations*. Pros and cons of both.

We also aim to have a critical discussion on the topic: *Do we want to build GCOS?* What can be done with charged cosmic rays, neutrinos, gamma rays at the highest energies after 2030?

Session 4
How do we want to build GCOS? What can be done with charged cosmic rays, neutrinos, gamma rays at the highest energies.

We invite *Contributed Talks* to hear YOUR view on possible technological implementations of GCOS.

Session 5
Discussion of possible scenarios for GCOS. We want to have a discussion session to discuss possible concrete implementations for GCOS.

Finally, we will discuss the next steps which are needed towards writing the GCOS White Paper.

Contributed talks
We also have reserved time for YOUR input. We welcome contributions on the subjects:

The physics case of GCOS

Towards possible technological implementations of GCOS