



Research Topic

# Astroparticle Experiments to Improve the Biological Risk Assessment of Exposure to Ionizing Radiation in the Exploratory Space Missions

The actual and next decade will be characterized by an exponential increase in the exploration of the Beyond Low Earth Orbit space (BLEO). Moreover, the firsts tentatives to create structures that will enable a permanent human presence in the BLEO are forecast.

In this context, a detailed space radiation field characterization will be crucial to optimize radioprotection strategies to assess the risk of the health hazard related to human space exploration and to reduce the damages potentially induced to astronauts from galactic cosmic radiation.

On the other side, since the beginning of the century, many astroparticle experiments aimed at investigating the unknown universe components (i.e., dark matter, antimatter, dark energy, ...) have been collecting enormous amounts of data regarding the cosmic rays (CR) components of the radiation in space.

Such experiments are actual cosmic ray observatories, and the collected data (cosmic ray events) cover a significant period and permit to have integrated not only information of CR fluxes but also their variations on time daily.

Further, the energy range is exciting since the detectors operate using instruments that allow measuring CR in a very high energy range, usually starting from the MeV scale up to the TeV, not usually covered by other space radiometric instruments.

Last is the possibility of acquiring knowledge in the full range of the CR components and their radiation quality.

The collected data contains valuable information that can enhance the space radiation field characterization and, consequently, improve the radiobiology issues concerning the human space exploration.

## Participating Journals

Frontiers in Astronomy and Space Science  
Astrobiology

Frontiers in Physics  
Radiation Detectors and Imaging

Frontiers in Public Health  
Radiation and Health

A new scientific language is needed to support the exploratory space missions because of the return of humans outside the Low Earth Orbit. The keywords are *Peacefully, Safely, Transparently*.

In that context, a priority is to keep the space exploration community secure and safe, and a crucial part is a detailed and accurate ionizing radiation health effects characterization.

Participate in creating part of this new language joining this interdisciplinary Frontiers Research Topic!

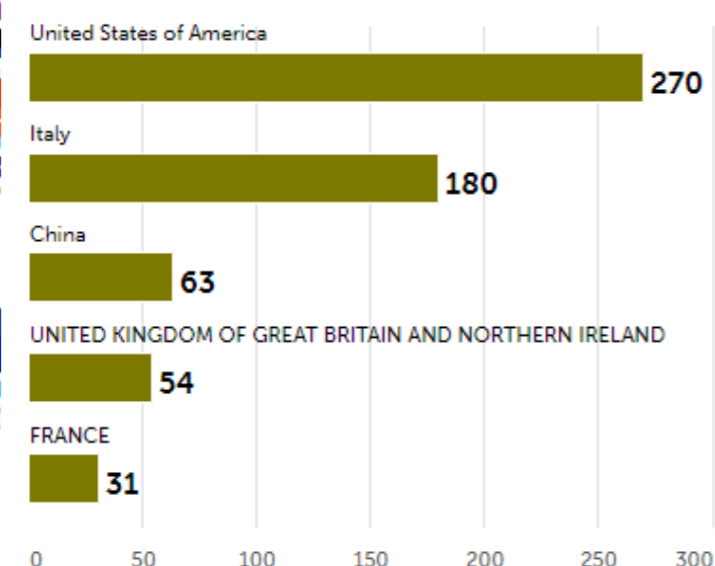
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The research topic initiative was launched in **November 2021**

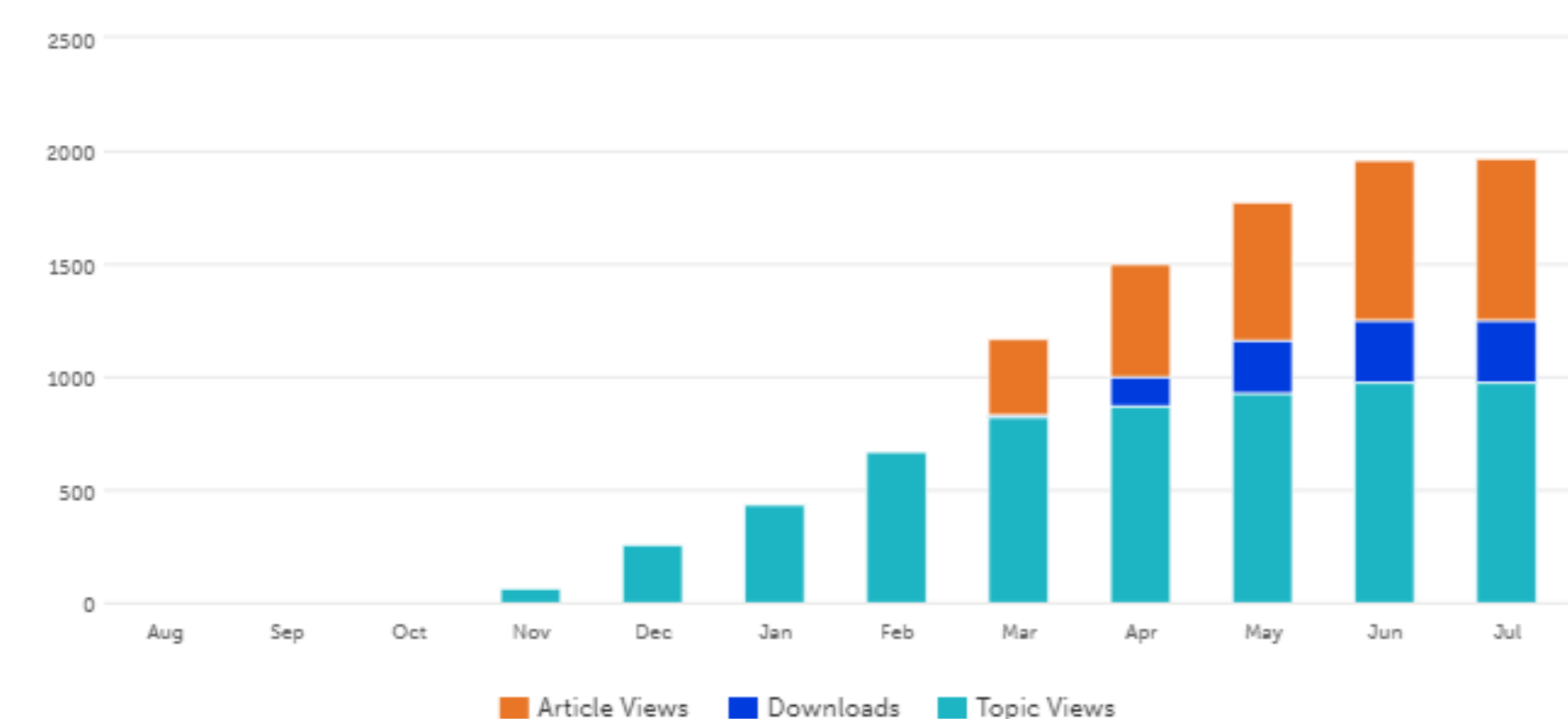
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- > 20 expected contributions
- > 5 abstracts received
- 1 published manuscript

**Open for articles submissions !**

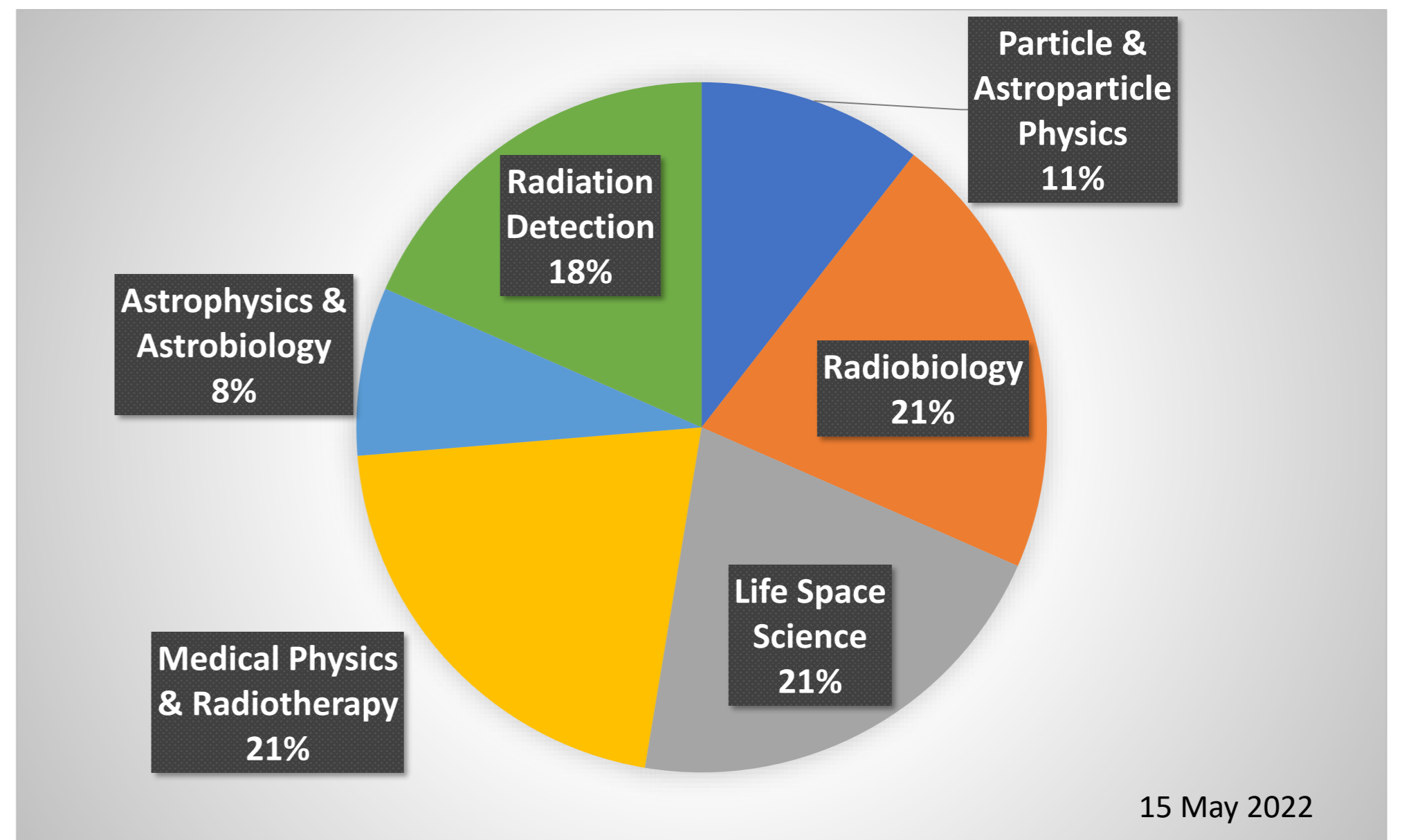


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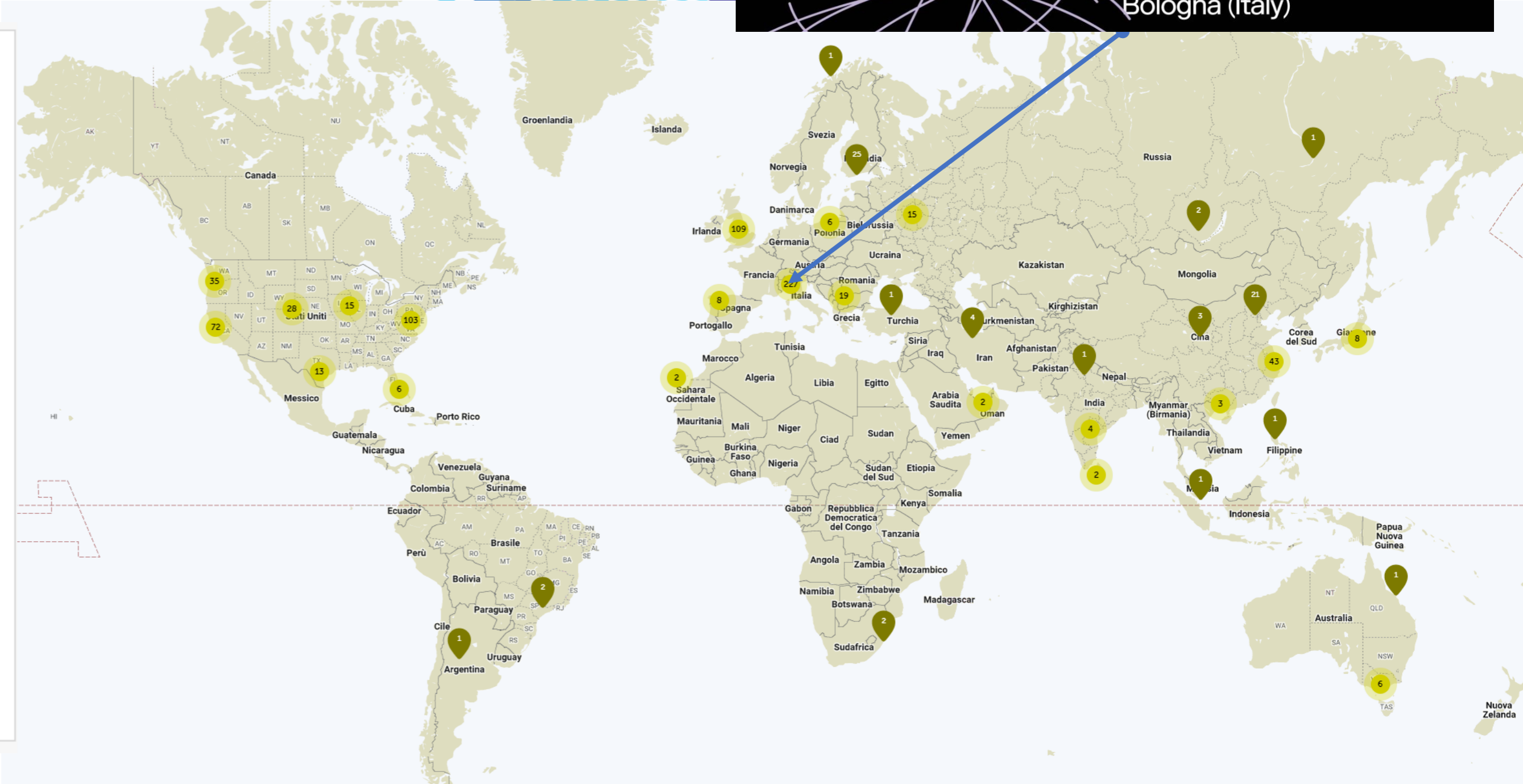


## Contributors from different research areas



15 May 2022

## Worldwide interest for the topic



ICHEP 2022 BOLOGNA  
XLI International Conference on High Energy Physics Bologna (Italy)

frontiers in Astronomy and Space Sciences  
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