I.FAST

Innovation Fostering in Accelerator Science and Technology

Horizon 2020 Research Infrastructures GA n° 101004730

MILESTONE REPORT

Definition of CBI scheme: proposed topic and organisation at ESI

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ABSTRACT

Task 2.3 of the I.FAST project aims at challenging young people to find new and innovative ideas on how accelerators and their related technologies could be used to address societal issues through an event called "I.FAST Challenge Based Innovation". We report here on the proposed topic and organisation of this event.

For more information on I.FAST, its partners and contributors please see https://ifast-project.eu/

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Delivery Slip

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1. Introduction

Sometimes taking a fresh look at an issue can help find new solutions. This is the idea underlying a Challenge Based Innovation (CBI) event called the I.FAST-CBI which is task 2.3 of the I.FAST project.

The I.FAST-CBI (hereafter called the challenge) stems from the historic collaboration between the European Scientific Institute (ESI - https://www.esi-archamps.eu/), CERN and others partners to run the Joint Universities Accelerator School. This new collaboration has been inspired by the success of CERN's IdeaSquare CBI program (https://www.cbi-course.com/) but with a much shorter duration. For this challenge, 24 students from different countries will spend nine days at ESI in Archamps near Geneva exploring ways in which accelerators and related technologies could be used to meet a societal challenge related to one of the Horizon Europe missions. The choice for the 2022 challenge is "Accelerators for the environment". These students will form strongly multidisciplinary teams with students coming from law, environmental studies and, of course, physics and engineering. Working together they will develop an innovative way to address the challenge using accelerators. At the end of the nine days, they will be invited to spend a day at CERN and present their work in front of a jury.

2. Challenge organisation and Topic for 2022

The challenge organization is overseen by a steering committee made of 6 members: Phil Burrows (U. Oxford), Bob Holland (ESI), Elias Metral (CERN), Louis Rinolfi (ESI), Maurizio Vretenar (CERN) and Nicolas Delerue (CNRS). For logistic matter this steering committee is assisted by the ESI team (Stephanie Denise Vandergooten and Mélanie Castelle).

To date the steering committee has met 12 times since the launch of the project.

To decide the topic of the 2022 challenge, the steering committee has called on expert from several institutions to form a "program committee". This program committee was made of the steering committee plus the following members: Giovanni Anelli (CERN), Sam Bayat (CHU Grenoble), Christine Darve (ESS), Robert Edgecock (STFC), Angeles Faus-Golfe (CNRS), Markus Nordberg (CERN), Tatiana Pieloni (EPFL), Karolos Potamianos(U. Oxford), Toms Torims (Riga Technical University and CERN) and Carsten P. Welsch (U. Liverpool).

The program committee reviewed several possible topics based on the Horizon Europe Missions (see https://ec.europa.eu/info/horizon-europe/missions-horizon-europe_en) and it found that the most interesting topic for 2022 was "Accelerators for the environment". Other topics were considered such as "Accelerators for food security" and "Accelerators against global pandemic".

3. Organisation of the challenge at ESI

3.1 PARTICIPANTS SELECTION AND TEAMS

A total of 187 applications were received, 85% of which were from I.FAST participant countries. The ESI network of universities has been key in getting so many applications.

Most of these applications were from engineering (39%) and physics (37%), but there were also 20 applications (11%) from environmental sciences and 9 from other scientific fields. There were 6 applications from law students, 5 from management/business students, 3 from humanities students and 2 from medicine students.

It was decided to form 4 teams of 6 students (3 physicists and engineers), 1 environmental scientist and 2 students from other fields.

Hence, in physics and engineering the selection rate was 8,5%, in environmental sciences it was 20% and in other fields it was 32%.

Regarding gender balance, 57% of the applicants were male, 40% female and 6% selected did not answer that question.

Two selection meetings were held in March (as well as many email exchanges) and 24 applicants have been selected.

Among physicist and engineers it was noted that there were several "accelerator experts" (student who have already had some experience with accelerators in their career) hence the final team composition will be 1 physicist, 1 engineer, 1 accelerator expert, 1 environmental scientist and 1 lawyer and 1 student from another field.

All students are studying within I.FAST partner countries. Gender balance is 12 male, 11 female and one student who did not say.

3.2 PROGRAM

The program of the challenge is being finalised.

There will be 4 online seminars before the challenge as well as two event to know each other (one with all participants and one per team).

It is expected to have 6 seminars during the challenge with experts either on accelerators or on the environment. Among the confirmed speakers one can note that the first seminar will be given by someone from the IAEA (International Atomic Energy Agency).

The program includes a half-day visit of CERN, one day to something different (Sunday), two mini-conferences during which each student will report on his finding so far and a full day for the final presentations and the award ceremony.

3.3 LOGISTIC

The challenge will take place at ESI from July 26th to August 4th 2022. ESI has a strong experience in hosting scientific schools. The ESI team is in charge of all logistic issues.

3.4 EXPECTED OUTCOME AND EVALUATION METRIC

Each team will be asked to prepare a report of 3 to 4 pages documenting an idea where some accelerator technologies are used to address a societal challenge (related to the environment). This report will gather contribution from each participant (based on his/her own training). It should look

at the problem from many different sides and propose a way forward for this idea. This report will be presented to the jury on the last day of the challenge.

For the awards, the jury will take into account both the report and the oral presentation, making sure that there is material from all academic fields present in the team, that the main strength and weakness of the proposal have been identified, that it is innovative and has a potential impact.

4. Outlook

This first edition of the challenge will be an opportunity to measure how students can suggest novel use of innovation coming from accelerators. The success of the call for applications has shown that there is a strong interest from students for such exercise and it has been an opportunity to raise awareness among the applicants on the applications of accelerators to the environment.

5. References

The website of the I.FAST CBI can be reached at http://www.ifast-cbi.particle-accelerators.eu/

An article about the I.FAST CBI has been published in Accelerating News: https://acceleratingnews.web.cern.ch/news/issue-38/ifast-ifa/accelerators-environment-announcing-ifast-challenge-based-innovation

An abstract has been accepted for poster presentation at the IPAC'22 conference and a paper will be written shortly.