Contribution ID: **30** Type: **Oral Presentation**

Building International Research Software Collaborations in Physics

Thursday, 23 March 2023 09:40 (40 minutes)

Building successful multi-national collaborations is challenging. The scientific communities in a range of physical sciences have been learning how to build collaborations that build upon regional capabilities and interests over decades, iteratively with each new generation of large scientific facilities required to advance their scientific knowledge. Much of this effort has naturally focused on collaborations for the construction of hardware and instrumentation. Software has however also become a critical element to design and maximize the physics discovery potential of large data intensive science projects. To fully realize their discovery potential a new generation of software algorithms and approaches is required. Building these research software collaborations is challenging and inherently international, matching the international nature of the experimental undertakings themselves. Initiatives such as the HEP Software Foundation have been instrumental in establishing international research software collaborations in high-energy physics, in particular between European and North American researchers.

This talk is about a new initiative, HSF-India, aiming to implement new and impactful research software collaborations between India, Europe and the U.S. The experimental scope of this project is relatively broad, aiming to bring together researchers across facilities with common problems in research. The research and development scope is on three primary topics: analysis software and integrated facilities for analysis; simulation techniques including generators and Artificial Intelligence based approaches; and enabling open science. By exploiting national capabilities and strengths, an immediate mutual benefit of the international collaboration will be a training network that enables early-career researchers to pursue impactful research software initiatives in ways that advance their careers in experimental data-intensive science. In this presentation, we will describe the scope of this initiative, its mechanisms for fostering new collaborations, and ways for interested research groups to get involved. We will also discuss thoughts towards broadening our initiative to foster more general collaborations in research software projects between Asian researchers and European/North American researchers who are already jointly pursuing "team-science" endeavors in research software for high-energy, nuclear and astro-particle physics.

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Session Classification: Keynote Speech III

Track Classification: Track 1: Physics and Engineering Applications