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Scientific Software and Computing in the HL-LHC, EIC, and Future Collider Era

Monday, 24 October 2022 12:00 (30 minutes)

A bright future awaits particle physics. The LHC Run 3 just started, characterised by the most energetic beams ever created by humankind and the most sophisticated detectors. In the next few years we will accomplish the most precise measurements to challenge our present understanding of nature that will, potentially, lead us to prestigious discoveries. However, Run 3 is just the beginning. A rich programme is ahead of us at the HL-LHC, the EIC, and at future colliders, like the FCC. These programs imply a large effort and substantial funding, for example to develop future detector and accelerator technologies, to construct new experiments and facilities, or expanding the scope of the existing ones. This contribution is about the software and computing that will lead us to the full exploitation of such infrastructure, the software and computing that will empower us to make important strides in humanity's understanding of the universe. The HL-LHC, EIC and FCC eras will be taken in consideration in this contribution. We will discuss the role of education, innovation and technology in our preparation for the future. We will also review the current state of the art, discuss ongoing technology evolutions, for instance in hardware and programming languages, and extrapolate most relevant trends into the next decades. Moreover, we'll identify the areas where our efforts could be focussed to boost the progression of particle physics software and computing, as well as the steps we can take to take advantage of veritable revolutions.

Experiment context, if any

References

Significance

Presenter: PIPARO, Danilo (CERN)

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