

## P5 Town Hall at SLAC



Contribution ID: 65

Type: Early Career Scientist

# Maximizing the US investment at the LHC and beyond through a precise understanding of theoretical effects (remote)

*Thursday, 4 May 2023 16:15 (5 minutes)*

Ambitious experimental programs at the LHC and future colliders rely on a precise understanding of theoretical QCD uncertainties, and require significant development to improve and validate the tools used to assess these effects. A better understanding of these uncertainties is already critical at the LHC, and will become increasingly important at the HL-LHC and at future colliders. This talk, following up on several abstracts and discussions at the last P5 Town Hall meeting, will highlight how progress on the central EF science drivers, including studies of the Higgs boson, searches for dark matter, and more, will elevate demands for understanding theory uncertainties covering a broad range of effects. I will motivate increased funding for efforts to encourage close cooperation between theorists and experimentalists, including improvements to Monte-Carlo predictions, parton distribution functions, higher-order calculations, and experimental tests of these developments. I will emphasize the importance of community-wide standards and culture for computational tool maintenance in the upcoming experiments. Finally, I will present several concrete proposals for how the collaboration between the theory and the experimental community can be improved for a broad range of existing and planned projects with the support of P5.

**Presenters:** ILTEN, Phil (CERN); ROLOFF, Jennifer (Brookhaven National Laboratory)

**Session Classification:** Contributed Remarks