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Fermilab Accelerator Division in 10 minutes

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The Fermilab accelerator division provides world class accelerator infrastructure that is key to many particle physics experiments at the intensity frontier. At Fermilab, the proton accelerator and the NuMI target system create the most intense neutrino beam in the world and are capable of handling 850 kW beam power now. NuMI beam power will gradually increase to 1 MW as several upgrades and studies are performed in the run-up to the Proton Improvement Plan-II (PIP-II). The accelerator facility also delivers muon beam to the Muon g-2 experiment that has recently published their first result strengthening evidence of new physics. The upcoming Mu2e experiment will be pivotal in searching for charged lepton flavor violation and the unique beamline is presently under construction. Moreover, the upgrades under PIP-II to the Fermilab accelerator complex will provide 1.2 MW proton beam to the long baseline neutrino experiments with the possibility of further doubling the beam power. For future multi-megawatt facilities, it is important to mitigate beam instabilities. New technologies, including the concept of optical stochastic cooling, are being developed at the FAST-IOTA facility to drive up beam intensities and increase the potential to search for rare physics phenomena. Research in the field of high-power targetry will develop more durable beam intercepting materials, and robotics for automated remote handling. Multi-megawatt level proton beams will also enable particle physics experiments to produce large datasets and development of machine learning and big data analysis techniques are underway. This talk will provide a brief summary of these various exciting projects supported by the Fermilab accelerator division.

Primary author: GANGULY, Sudeshna (Fermilab)

Presenter: GANGULY, Sudeshna (Fermilab)

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