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## Accelerator physics challenges for EIC

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The Electron Ion Collider optimizes electron and ion beams for high luminosity collisions. For electron/proton collisions, both beams are to be polarized. The accelerator physics challenges are therefore focused on obtaining and maintaining (A) high luminosity and (B) a high degree of polarization. High luminosity provides challenges for (A1) beam currents and for (A2) collision parameters, while polarization has challenges with regard to (B1) high-current polarized sources, and (B2) polarization transport and storage. The collision parameters provide challenges associated with (A2a) small emittances and with (A2b) the construction of high-luminosity interaction regions. Small emittances for the ion beams can be maintained by (A2ai) electron cooling, which provides its own set of challenges. This multitude of challenges will be addressed and approaches for meeting these challenges will be discussed.

**Orateur:** HOFFSTAETTER, Georg (Cornell)

**Classification de Session:** Accelerator R&D