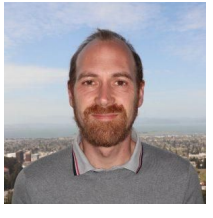
Electron identification in a muon collider with BIB

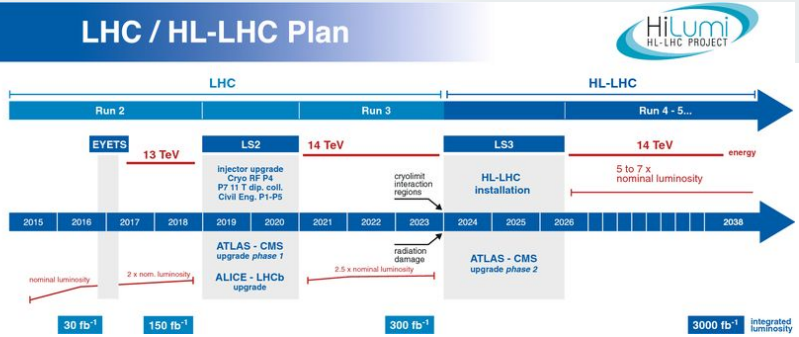
By Benjamin Kuchma

My fabulous mentors

- Sergo Jindariani - Fermilab
  - Research is focused on finding precise values for the electroweak portion of the standard model

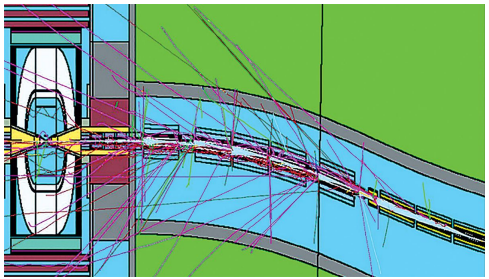


- Simone Pagan Griso - Lawrence Berkeley National Lab
  - His research is focused on rare phenomena and theoretical particle physics
- Karol Krizka - Lawrence Berkeley National Lab
  - Searches for dark matter and leads a group that looks for highly energetic Higgs bosons



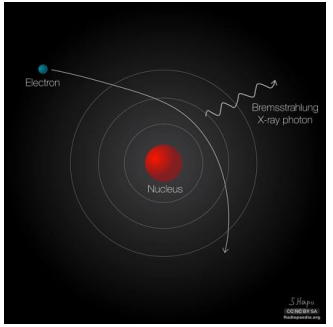
Project background

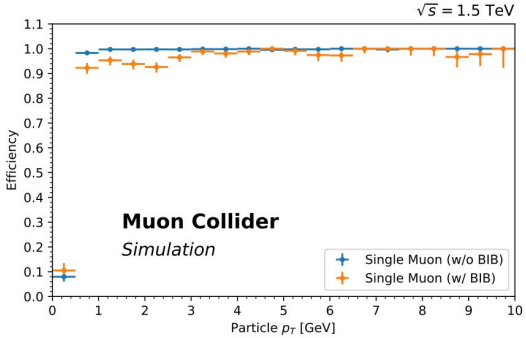
- The LHC will eventually collect all the data that it can collect
  - As a result, we need to construct a new collider to continue to collect more data at higher energies
  - Some new colliders, such as one that collides muons have proposed
- Muon colliders are harder to make due to challenges with muons
  - Due to how muons are formed, it is harder to form them into a tightly packed beam
  - Muons decay in the accelerator tube causing a lot of particles that are not from collisions to appear in the detector

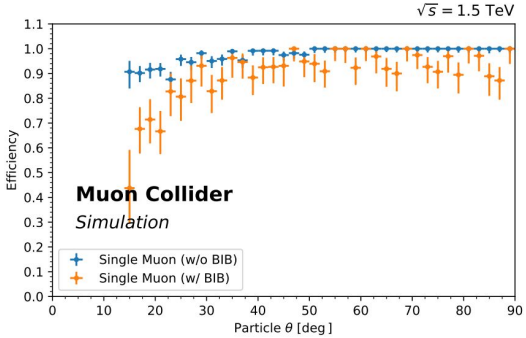


My project

- Electrons specifically undergo the effects of multiple scattering and bremsstrahlung, causing them to curve in ways that make them appear as other particles to traditional tracking softwares
- My job is to apply cuts on the particles by looking at their angle to the beam, transverse momenta, and arrival time to increase efficiency
- Additional code will be added to existing repositories as needed







Thanks for listening!