



# Accelerator-based Precision Physics

- Storage-ring proton-EDM experiment as part of probing the Strong CP-problem:  $10^{-29}$  e-cm, 3-4 orders of magnitude better in  $\theta_{QCD}$  and  $\sim 1$  PeV New Physics mass scale reach.
  - New hybrid ring lattice, eliminates B-field systematic errors.
  - SQUID-based beam position monitors with  $1\text{nm}/\sqrt{\text{Hz}}$
- Muon g-2 experiments at Fermilab/USA and J-PARC/Japan.
  - Systematic error studies using high-precision beam/spin dynamics simulations to challenge the Standard Model.
  - Apply RF-voltage on the electrostatic focusing quadrupoles to eliminate coherent betatron oscillations and minimize muon losses.
- Muon to electron conversion experiment at J-PARC/Japan.
  - Leading role in trigger system construction
  - Responsible for central trigger system development