



LABORATORY FOR ELEMENTARY-PARTICLE PHYSICS (LEPP)

# Joint Experimental and Theory Seminar in Particle Physics and Cosmology:

## BSM Opportunities at ep Colliders



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Deep Inelastic Scattering (DIS) at both fixed-target experiments and at HERA has been vital for our understanding of proton structure and performing measurements and BSM searches at the LHC. Future proposals for ep colliders envision an add-on to a primary pp machine (LHC or a future 100TeV collider) for roughly  $O(10\%)$  additional cost. The DIS data from such a facility would obviously be extremely valuable, but less understood is the potential of such a facility to probe BSM physics. Going beyond the BSM models which give large production cross sections at ep colliders, we argue that the clean experimental environment, without pile-up and much lower hadronic backgrounds, offers unique advantages in studying BSM signatures which look like hadronic noise at pp colliders. We demonstrate this by studying Long-Lived Particle signatures with short lifetimes and/or soft final states, like Higgsinos. Future ep colliders could probe lifetimes as short as a micron and are superior to the primary pp collider in probing large regions of parameter space. This lesson can likely be generalized to other BSM scenarios as well.

**Friday, November 3<sup>rd</sup> 2017**  
**1:00pm**  
**401 Physical Sciences Bldg.**