**Narrative Description:** Machine Learning Beyond Collider Physics

Machine learning tools (ML) have revolutionized many areas of industry. These techniques are also promising for advancing fundamental science. A surge of developments in high-energy physics (HEP) show that ML can be used to analyze high-dimensional data, accelerate simulations, and sidestep modeling limitations. These advances complement hardware innovations and reduce costs by increasing science reach for a fixed experimental size and run time.

The goal of the lecture is to communicate cutting edge techniques in ML to a mixed particle physics audience in order to identify new "killer applications" of ML in dark matter astrophysics, and new physics searches at smaller-scale experiments, and theoretical studies of high-dimensional parameter spaces.

The audience will include particle and astroparticle theory group at UC Riverside (PI Tanedo), the experimental high-energy physics group at UC Irvine (Co-PI Whiteson), and the data science neworks at each campus. The PIs have already initiated a novel application of ML to study theories of new physics. The lectureship will build this collaboration and help promote the research direction to the wider campus communities. In turn, this will encourage institutional support toward a longer cross-campus seminar series to grow the collaborative effort.