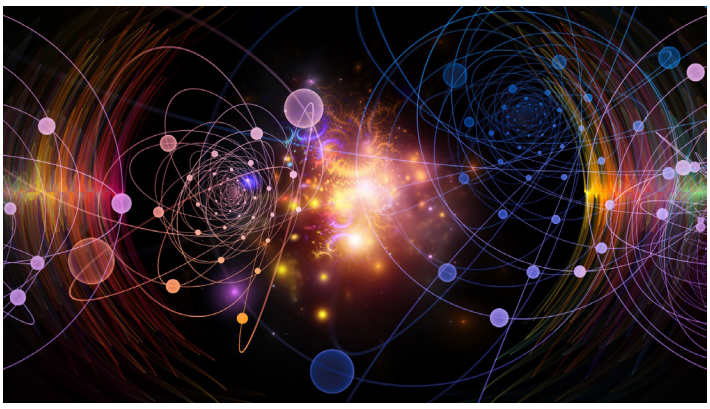
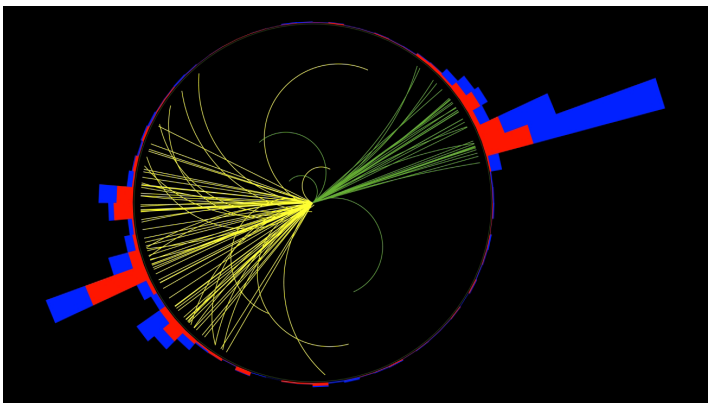
Developing new techniques for advancing discovery

Ian Moult
Assistant Professor

Ian Moult develops new theoretical frameworks and exploits theoretical advances to enable innovative new experimental strategies.

Moult was awarded the Wu-Ki Tung Award for Early-Career Research on Quantum Chromodynamics (QCD) for his "pioneering work on QCD energy correlators, including their all-orders factorization, multi-loop structure, phenomenological applications, and connections to conformal field theory". He was also awarded the 2017 J. J. and Noriko Sakurai Dissertation Award in Theoretical Particle Physics from the American Physical Society (APS).

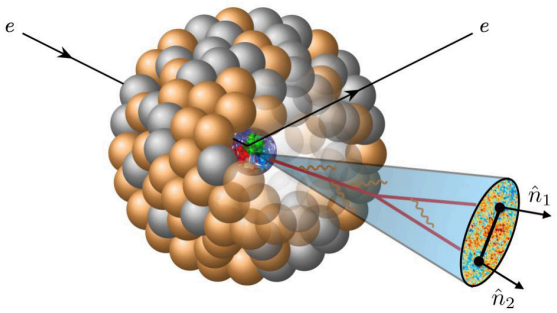


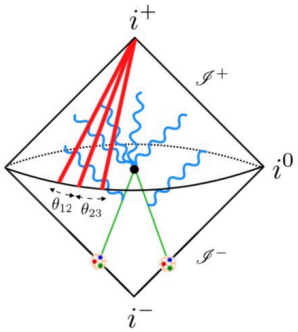


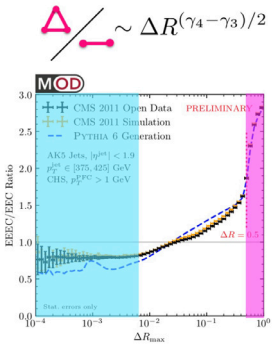
Quantum field theory

Ian Moult's research focuses on developing new techniques in quantum field theory for describing high-energy particle physics experiments, ranging from dark matter detection to the Large Hadron Collider (LHC). A common theme in his work is the use of effective field theories, which allow calculations relevant for complicated, real world experiments to be reduced to simpler, universal problems in quantum field theory.

Collider experiments and jet substructure







Moult has been developing new theoretical techniques to improve our understanding of real world collider experiments, with applications in particle and nuclear physics. He has played a leading role in the development of jet substructure, which takes advantage of subtle patterns in the structure of energy flow in collisions at the LHC to maximize the discovery potential for new physics and better understand the theory of the strong interaction.

A number of the approaches Moult introduced were first demonstrated in measurements by Wright Lab Relativistic Heavy Ion Group graduate students Andrew Tamis and Ananya Rai.