Abstract: Effective field theory (EFT) provides an efficient framework for describing physical systems using operator techniques and power expansions. In this talk I will discuss my development of several new EFT tools that have allowed for the description of systems which simultaneously involve dynamics at multiple scales, and the calculation of subleading power gauge theory cross sections for processes that do not admit a local operator product expansion. These advances have made an impact on the current high energy physics experimental program, where they have enabled innovative search techniques for new physics at the Large Hadron Collider, and a precise interpretation of searches for Dark Matter in the Galactic Center.

Ian Moult is a theoretical physicist who received his B.Sc. from the University of British Columbia in 2011 and his Ph.D. from the Massachusetts Institute of Technology in 2016. For his thesis work he was awarded the Andrew M. Lockett Memorial Award for Graduate Research at MIT and the J.J. and Noriko Sakurai Dissertation Award from the American Physical Society. He is currently a postdoctoral research associate at the University of California, Berkeley, and Lawrence Berkeley National Laboratory. He is an expert in the development of field theory techniques for answering questions of phenomenological importance in particle physics.