New Monte Carlo Event Generator Review

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- **Monte Carlo Event Generator:** programs that randomly generate events (observables) at the theoretical-level, i.e. before detector simulation
  - Examples: PYTHIA, HERWIG, ALPGEN, MC@NLO, MCFM, etc

- **Used ubiquitously in particle physics**
  - Detector design, detector commissioning, background estimation, signal modeling, etc, etc

- **Large field of research**

- **If RPP aims to provide a wide coverage of HEP, this review is an obvious addition**

- **Authors:**
  - **Paolo Nason** (INFN):
    - One of the main POWHEG authors
  - **Peter Skands** (CERN):
    - One of the main PYTHIA authors
- **Overseer:**
  - **Christian Bauer** (LBNL)
    - Leading author of GENEVA (future NLO event generator for the Large Hadron Collider)

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1. Introduction

- Plan to build upon the existing QCD review

2. Perturbative aspects of event generation

- Parton shower
- Fixed-order monte carlo (leading and next-to-leading order)
- Note: emphasize that both are correct extension of QCD

3. Phenomenological models

- Hadronization, underlying event, decays, etc

4. Tools

- Link existing programs with previously introduced concepts

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