

# Generators as a potential ECHP focus topic

- Relatively *self-contained code bases*, naturally helps to restrict our scope.
- **Not an oversubscribed area**, potential for real impact.
  - UK expertise in *Sherpa*, with *large ATLAS CPU draw for NLO* processes.
  - *Pythia*, used by *everyone* to differing extents. *Smaller yet wider reaching gains?*
    - More: MadGraph, Powheg, Herwig...
- **Review, extend/assist** with HSF's Generators WG.
  - Relative *generator performance & profiling, understanding bottlenecks*.
  - Look for areas to contribute directly: e.g. *efficiency of pseudo-random number generation*.
  - *Process-specific static builds* with additional *link time optimisations*.
  - **Deliverable: detailed performance breakdowns, write ups on obtained gains. Cost/benefit analysis of larger scale interventions.**
- **Collaborative** mechanisms for *sharing matrix element evaluation*.
- Generators for **HPC**: How do we hook developments here into our workflows?
- **Negative weights**. Closely coupled physics and software architecture. How do we move the field in the right direction?
- **Alternate architects / the future**. What is feasible, and at what cost?
  - **Where to focus effort here**, define **one or two concrete deliverables** derived from these topics.