Gavin Salam

PhD Cambridge $\xrightarrow{'96}$ Milan $\xrightarrow{'99}$ CERN $\xrightarrow{'01}$ Paris $\xrightarrow{'10}$ CERN$^{80\%}$ + Princeton$^{20\%}$

currently 100% CERN; on leave from LPTHE, Paris (CNRS) and from Princeton Univ.

Interests over the years: QCD & colliders

Small-x physics — saturation, NLO corrections, Monte Carlos, etc.

Event shapes, resummations, α_s fits, hadronisation, underlying event

Efficient DGLAP evolution, using NLO/NNLO in PDF fits

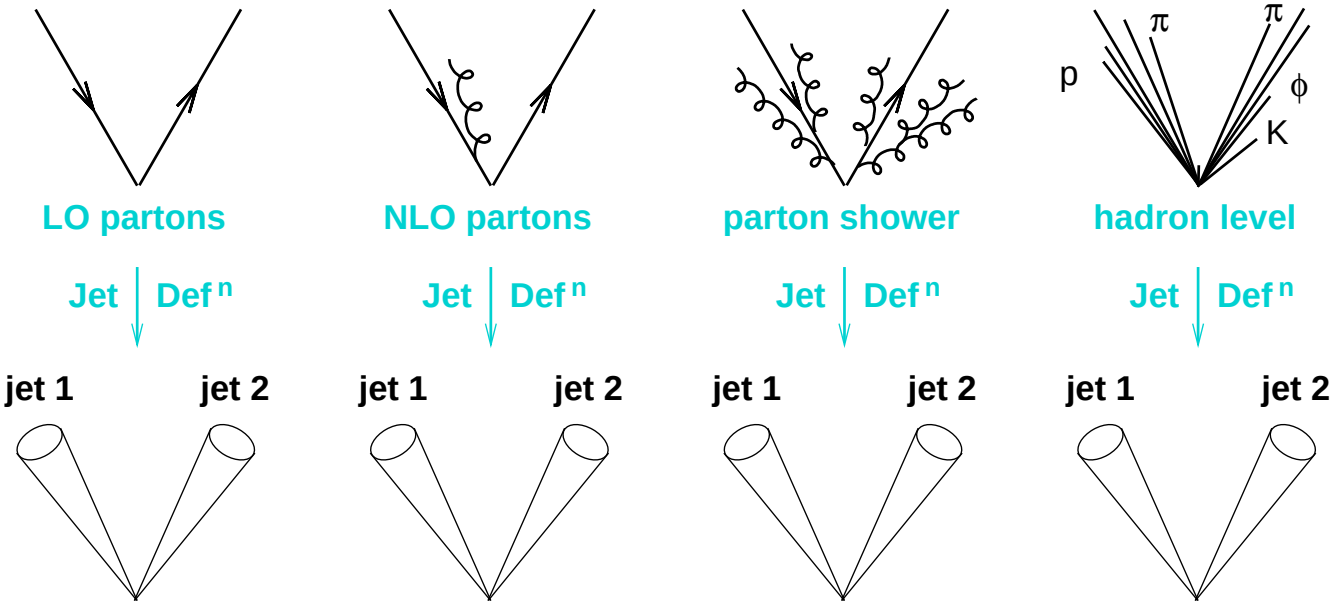
Jet algorithms, jet substructure, techniques for BSM searches & heavy-ions

Understanding & fixing bad behaviour of perturbation theory

@ most kinds of colliders: e^+e^-, DIS, $pp/p\bar{p}$, heavy ion

Jets

used by LHC in
$\sim$ 100 analyses



Main techniques used at LHC: "anti-k_t" algorithm + FastJet software, in Higgs, BSM, top, QCD, heavy-ions, . . . [developed with Cacciari & Soyez]

A current research question: is there more information hidden inside jets that can help us find (or exclude. . .) new physics?

[e.g. jet substructure & calculations to find ways of making it work better]

Why is perturbation theory so sick?

Can we trust it? Can we fix it? NB $\alpha_s \sim 0.1$

Higgs total cross section:

$$\sigma_{\mathrm{LO}} \times (1 + 10\alpha_s + 36\alpha_s^2 + \ldots)$$

Fraction of Higgses without (much) QCD radiation:

$$1 - 6\alpha_s + 26\alpha_s^2 + \cdots$$

Cross section for events with a Z boson and 1 TeV of hadronic energy

$$\sigma_{\mathrm{LO}} \times (1 + 400\alpha_s + 4000\alpha_s^2 + \cdots)$$