

Lattice Field Theory @ CERN

Team members

Martin Lüscher (staff)

Agostino Patella (staff)

Liam Keegan (fellow)

Just left CERN

John Bulava, Stefan Schaefer

Long-term guest

Philippe de Forcrand (ETH)



Agostino

Lattice QCD (John, Martin & Stefan)

- *Shed light on dynamical mechanisms*
- *Mass spectrum & hadron matrix elements*
- \Rightarrow *Precision tests of low-energy QCD*

Current challenges

- ★ *Continuum limit at physical quark masses*
- ★ *Multi-particle states in the inelastic region*
- ★ *Exponential signal-to-noise problem (baryons, non-zero density)*

See <http://cern.ch/luscher/> for lectures, talks and other material

QCD-like theories (Agostino & Liam)

- *Develop qualitative understanding of conformal and near-conformal theories*
- *Clarify role of the conformal anomaly*
- *Compute anomalous dimensions and couplings at long distances*

We are a small team

⇒ *"Industrial" lattice QCD is not an option*

⇒ *Focus on developing new concepts & techniques*

⇒ *Networking is important (ALPHA, CLS, ...)*

CLS, for example, recently won 110M core hours from PRACE, which will be used for some competitive simulations of 3-flavour QCD.

We provided the simulation code and will have access to the generated representative ensembles of field configurations.