



Contribution ID: 4

Type: **not specified**

## **How Lattice Gauge Theory solves Physics Riddles: Unravelling the mysteries of strong interaction with supercomputers**

*Friday, 9 March 2018 13:45 (30 minutes)*

This talk will introduce you to the challenges we face when pushing the boundaries of both today's physics and computing capabilities –more important for fundamental physics than ever. Quantum Chromodynamics (QCD) is the quantum field theory that describes one of the Standard Model interactions, the strong force, which is holding quarks and gluons together to form hadrons. In the low energy regime of QCD many phenomena are non-perturbative, and the way to study them from first principles is obtained if continuous space-time is replaced by Euclidean lattice. Thus the name of the field - Lattice QCD. The simulations in lattice QCD are computationally very demanding and require massive parallelization, powerful computers and constant algorithmic development. In this talk, I will provide an introductory presentation to this rapidly evolving field and demonstrate how supercomputers can be helpful in the determination of fundamental constants of nature and in the search for new laws of physics. The seminar is adopted to the larger public –join and participate with questions.

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**Session Classification:** Lectures by former students of the graduate school (I)