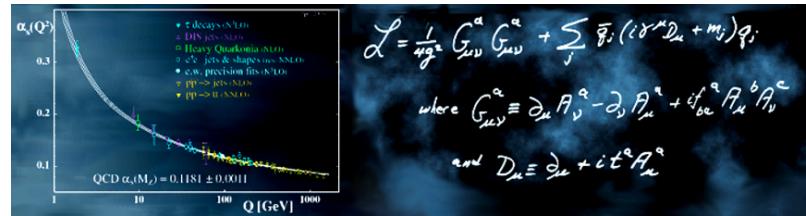


# alphas-2022: Workshop on precision measurements of the QCD coupling constant



Monday, 31 January 2022 - Friday, 4 February 2022

ECT\* Trento

## Scientific Programme

The strong coupling constant  $\alpha_S$  is the least well known of all constants of nature, which play a role in the Standard Model (SM) of particle physics and related fields such as cosmology and astrophysics. For many searches for new physics beyond the SM as well as for some important precision tests of the SM using collider data the uncertainty on the value of  $\alpha_S$  is a limiting factor. In recent years progress in theoretical predictions of Quantum Chromodynamics (QCD), and the availability of collider data at the highest energies has led to many improved determinations of  $\alpha_S$ . The current world average quotes an uncertainty of less than 1%. However, there are noticeable discrepancies between different categories of determinations of  $\alpha_S$ , which may limit the ultimate precision of future world averages. We plan to bring together in this workshop the leading experts on determinations of  $\alpha_S$  from theory and experiment and all important categories. With presentations of the latest results and intense discussion by all participants we will focus on a global view of advantages and problems of each method.

All talks will be plenary and of the same length (20' + 10' questions) with ample time for discussion.

The topics to discuss include:

Current status of the  $\alpha_S$  world average

Impact of  $\alpha_S$  on precision and BSM physics, and beyond

Lattice QCD results

$\alpha_S$  from hadronic tau decays

$\alpha_S$  from e-p deep inelastic scattering

$\alpha_S$  from  $e^+e^-$  hadronic final states

$\alpha_S$  from electroweak observables

$\alpha_S$  from pp collisions

New  $\alpha_S$  extraction approaches

PDG approach to  $\alpha_S$  world average and uncertainty estimation

A preliminary new average (?) and future of  $\alpha_S$