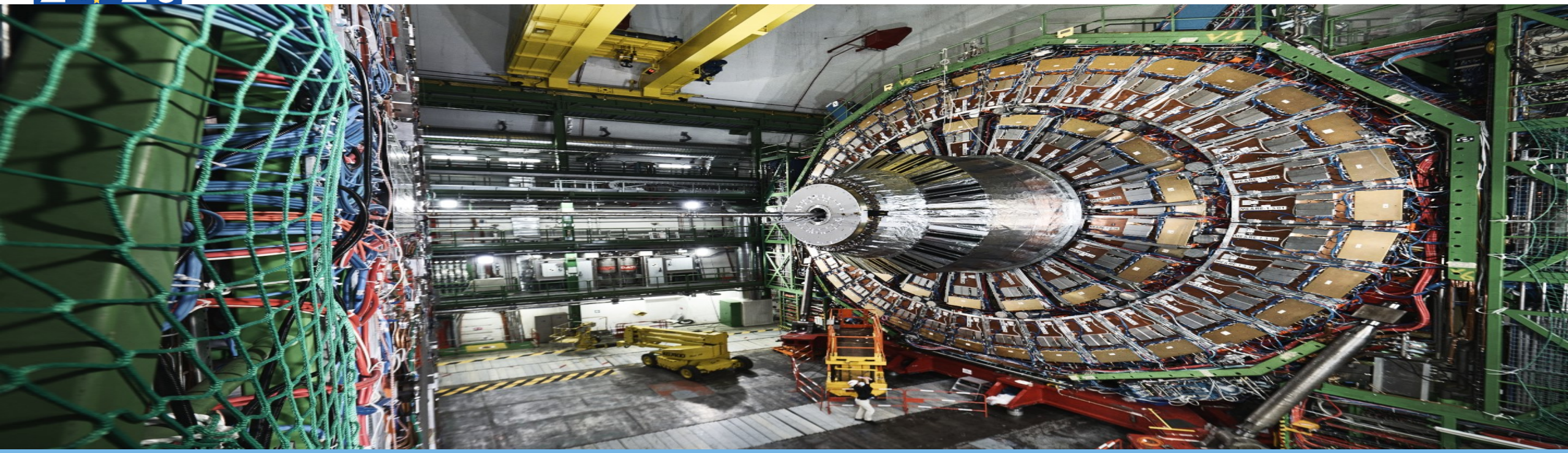


NA6 LatticeHadrons – progress update

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 824093

Overview

Goals of the LatticeHadrons network in STRONG-2020:

- to improve connections between researchers in lattice quantum field theory calculations across Europe via secondments and research exchange visits, emphasising training of young researchers.
- to develop existing and new connections with colleagues working in other domains in strong-interaction physics from both the theory and experimental perspective.
- to share expertise and resources in high-performance computing across the European research community in lattice field theory and develop connections with other domain expertise in HPC.

This plan has been seriously disrupted by the pandemic. Our hope is to use the resources to restart physical topical workshops, research exchanges and secondments as/when we emerge from the pandemic.

Tasks:

1. Co-ordinate research secondments, visits and exchanges
2. Arrange thematic workshops
3. Develop software, data sharing and analytic methodologies

- D17.1 Report on the status of research in hadron spectroscopy & structure from lattice QCD
- D17.2 Report on the status of research in hadrons under extreme conditions
- D17.3 Report on the status of research in precision QCD and searches for physics beyond the standard model
- D17.4 Report on the status of research into large-scale numerical simulation of lattice field theory
- D17.5 White paper – future challenges for lattice QCD and connections with large-scale numerical computing.

Progress to date

- Before the pandemic, successfully hosted an in-person event (Dublin, 5-6th March 2020) to develop a new forum to plan for community access to large-scale supercomputing resources in Europe (EuroHPC)
  - Forum discussions are continuing as new EuroHPC systems come online
- June 2021 – virtual mini-workshop on glueball hunting
  - Tightly focused topic for discussion, involving both lattice QCD, phenomenology and
  - 57 registered participants. Lively and interesting discussions!
- Sept 2021 – collaborated in hosting an ECT* virtual workshop on spectral properties of strongly-correlated systems

Core workshops – new timetable

Topic	Location	Proposed dates
QFT at finite temperature/density	GGI Firenze	**28th March – 1st April 2022**
Hadron structure & spectroscopy	Regensburg	Summer 2022 (satellite to Bonn)
BSM and precision QCD	Madrid	June 2023
Algorithms & HPC	Edinburgh	April 2023

- Deliverables **D17.1 … D17.4** are reports from these meetings, summarising future directions foreseen by the community based on input from the workshops. These deliverables will be written within 6 months of the physical meetings.
- Deliverable **D17.5:** white paper on future challenges and opportunities will be delivered in month 42.

ExaScale computing and HPC

- Dublin town-hall (March 2020): can the community co-ordinate its approach to access to ExaScale computing in Europe?
- PASC 2022 (Basel, 27th June 2022): proposal going forward for a mini-symposium at the (physical) meeting to review large-scale computing and the data analysis issues raised.

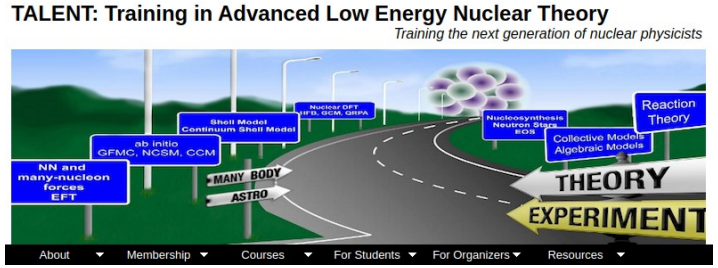
Online training

- **New** activity – developing our new-found expertise at delivering online teaching, tutorials, …

LaVA

Lattice Virtual Academy

- Starting pointing: co-ordinate existing activity and curate existing material and online resources.
- Develop new material in both “Core” methods along with more topical themes.
- Early-stage support from ECT* Trento.
- Taking inspiration and support from the TALENT programme: https://fribtheoryalliance.org/TALENT/



Summary

- Networking severely disrupted due to pandemic.
- New timetable for the four “Core” LatticeHadrons physical/hybrid workshops, starting early in 2022 (Firenze). Deliverables from the network (reports and white papers) will be completed within six months of the meetings.
- Dublin town-hall meeting started planning for co-ordination across European research institutions for a community approach to access to EuroHPC resources and the ExaScale
- Leverage our newly learned skills in online training to build an online resource for early-stage researcher training into lattice QCD – LaVA. Input and ideas very welcome!