
WG4: Prospective observables in QCD

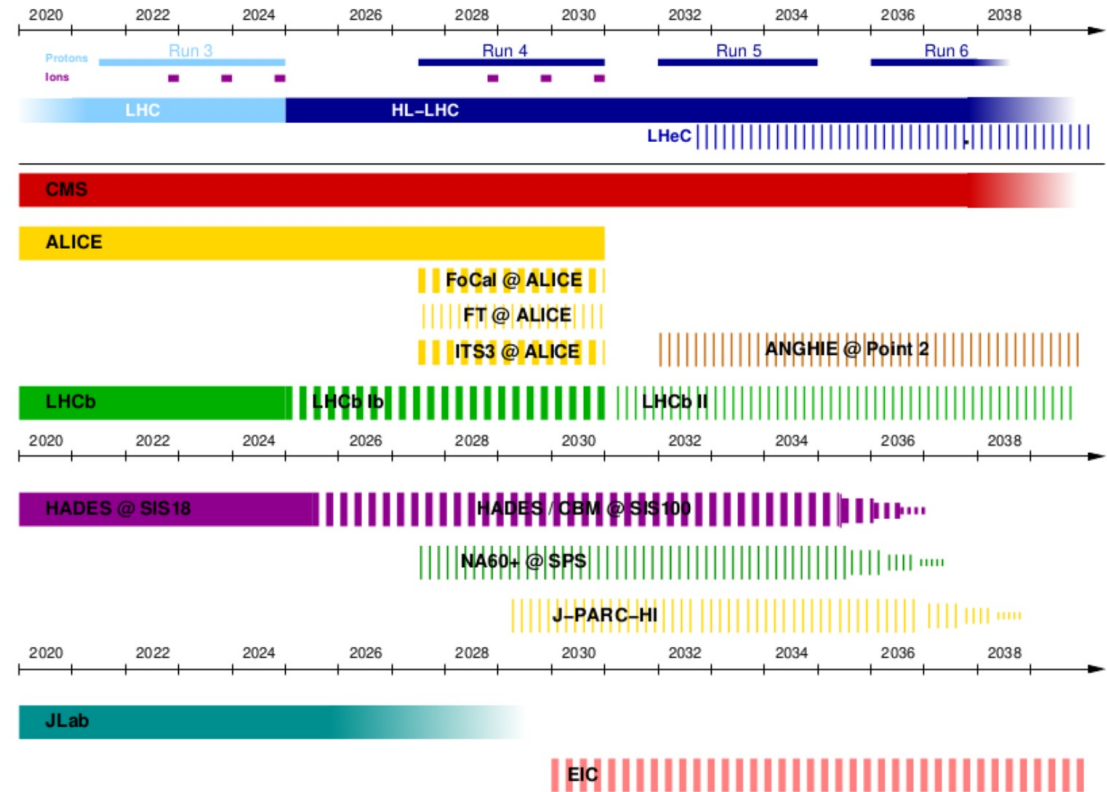
27th Sept 2023

Francesco Bossù (CEA-Irfu), Matthew Nguyen (LLR) (2023 -)
(- 2023)Emilie Maurice (LLR), Béatrice Ramstein (IJCLAB)

Perspectives: what and where

Science drivers :

- Understanding the origin of the proton mass
- Mapping the structure of nucleons and nuclei
- Understanding the deconfined state of quarks and gluons
- Establishing the equation of state of strong interactions
- ...



Exciting perspectives !

What do we want to do in WG4 ?

WG4 : Prospective **observables** in QCD

We want to :

- ❑ Focus on **probes** : dileptons, photons, jets, ...
- ❑ Explore the potential of the different experiments for measuring these probes
- ❑ Explore their scientific interest (theoreticians needed)

WG4 is cross-cutting to the thematic WGs

WG4 organization

~1 workshop per year focusing on a specific probe

→ Contact us if you want to propose a specific probe

We can also help to **organize discussions about observables**: contact us if

For **theorician** :

- ❑ You would like to **propose new observables**
- ❑ Looking for experimentalist to **evaluate the feasibility of your measurement**

For **experimentalist** :

- ❑ You can measure an observable
- ❑ Looking for theoreticians to **evaluate its scientific interest and make predictions**

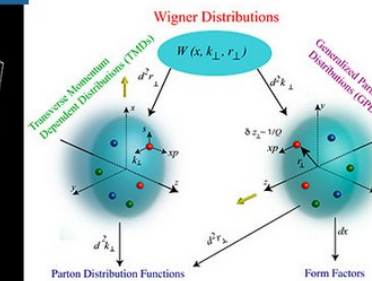


WG4 in 2021 : Focus on dileptons

Workshop in November dedicated to dileptons : <https://indico.in2p3.fr/event/25089/>

The banner for the workshop includes the following elements:

- Logos for CNRS and GDR (Groupement de recherche QCD Chromodynamique quantique).
- The title "Chromodynamique quantique" in large white letters on an orange background.
- The subtitle "Prospects on various aspects of the dilepton probe in hadronic physics".
- Event details: "25 November 2021", "IJClab", and "Europe/Paris timezone".
- A search bar with the placeholder text "Enter your search term".
- Four physics diagrams: a colorful particle distribution, a hadron structure model with quarks and gluons, a 3D lattice QCD visualization, and a diagram of Wigner Distributions.



What can we learn from dileptons measurements ?

- ✓ ~50 participants, mostly in person
- ✓ Bringing together different communities: Hadron structure, QGP, “cold QCD”, theory, ...

WG4 in 2022 : QCD in 2030s

2 days workshop in March dedicated to perspective in QCD in 2030 and beyond

- <https://indico.in2p3.fr/event/26055/>
- 58 participants, attendance mostly in person
- Focus on heavy flavours and quarkonia
- First day: theory perspectives
- Second day: experimental opportunities
- (CMS,LHCb, ALICE-3...)
- Extended time for round table discussions



The screenshot shows the Indico event page for "Prospectives en QCD au delà de 2030". The event is scheduled for 10-11 Mar 2022 at IJCLab (Orsay) in the Europe/Paris timezone. The page includes a search bar, a navigation menu with options like Overview, Timetable, Contribution List, Registration, Participant List, and Remote connection, and the GDR QCD logo (Groupement de recherche QCD Chromodynamique quantique). The event URL is <https://gdrqcd.in2p3.fr>. The description states that the GDR QCD organizes a discussion on perspectives in the field beyond 2030, with the event taking place at IJCLab (Orsay) on March 10 and 11, 2022. Registrations are currently open. The event starts on 10 Mar 2022 at 12:00 and ends on 11 Mar 2022 at 16:00. The location is IJCLab (Orsay), Auditorium Pierre Lehmann (Bât 200).

WG4: plans

- 2023: ... well, not much
- 2024
- Organization of one workshop.
 - Workshop on perspective 2030+, focus on EIC physics
- Under consideration: join, support and expand ongoing initiatives