

α_s (2024) introduction

α_s (2024) workshop

ECT* (Trento), 5th Feb.–9th Feb. 2024

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Stefan Kluth (MPP)

Giulia Zanderighi (MPP)

α_s workshop “series”

- This is the 5th workshop of a series devoted to high-precision studies of the QCD coupling constant:

α_s (2011), Munich: <https://inspirehep.net/literature/930305>

α_s (2015), CERN: <https://indico.cern.ch/e/alphas2015>

α_s (2019), ECT* Trento: <https://indico.cern.ch/e/alphas2019>

α_s (2022), ECT* Trento: <https://indico.cern.ch/e/alphas2022>

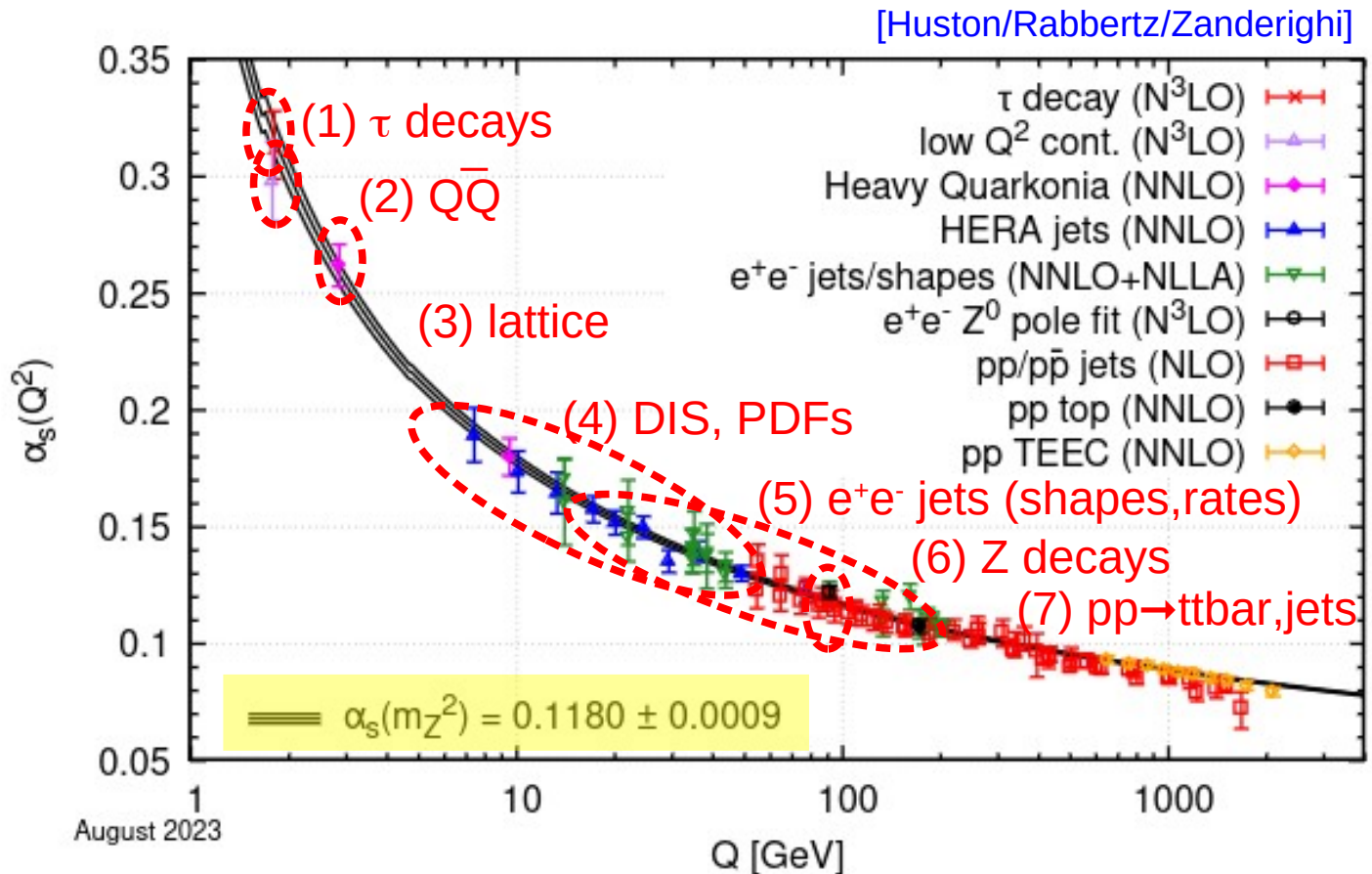
[Snowmass WhitePaper/Proceeds: [arXiv:2203.08271](https://arxiv.org/abs/2203.08271) [hep-ph], to appear in JPG]

α_s (2024), ECT* Trento: <http://indico.cern.ch/e/alphas2024>

*“The main scientific goals of this workshop are to **bring together the current best experts in α_s determination**, to critically **discuss and understand the relevant merits and problems** of each extraction method, and to **consider new α_s studies** and approaches. One important outcome should be to **assess the perspectives for systematic improvements of theoretical predictions and experimental methods** in order to **resolve discrepancies**, and improve the $\alpha_s(m_Z)$ world-average extraction.”*

World α_s determination (PDG 2023)

- Determined today by comparing 7 experimental observables to pQCD NNLO, N³LO predictions, plus global average at the Z pole scale:



Structure of the workshop

- ▶ Discuss latest developments & prospects in $\alpha_s(m_Z)$ determinations via:
 - (i) **Lattice QCD & Quarkonia**: Mo. afternoon
 - (ii) **DIS & global PDF analyses**: Tues. afternoon
 - (iii) Hadronic final states at the **LHC**: Tues./Wed. afternoon
 - (iv) Hadronic final states in **e^+e^-** : Wed./Thurs. afternoon
 - (v) Hadronic **tau** decays: Thurs. afternoon
- ▶ **PDG $\alpha_s(m_Z)$ averaging** discussion: Friday afternoon
- ▶ Interactions across participants:
 - All mornings (individual and/or team work)
 - Topical discussions at the end of each day (18:30-19:00)
 - Friday afternoon (if needed)
- ▶ **Each talk has an indicative 20'+10' allocated time**, but our goal is to have as lively & direct discussions as possible: **questions during presentations encouraged** (in the philosophy of a truly working-discussion meetg).
- ▶ **CERN-Mattermost** used to **keep minutes** of the presentations and to allow participants to **ask questions or post comments**. Use the "Reply" action (left-pointing arrow symbol) on the presentation's minutes.
- ▶ **No Proceedings** this time (unless requested by majority)

Technical corner (in-person participants)

- ▶ Please **sign up every day** the “presence book”/lunch/dinner **lists (desk)**
- ▶ **Lunches & coffee breaks** at ECT* Center (like today)
- ▶ **Dinners** at different places during the week:

Monday 6/02/2024 at 20:00: Green Tower <https://www.ristorantegreentower.com>

Tuesday 7/02/2024 at 20:00: Bouganville <https://www.bouganvilletrento.com>

Wednesday 8/02/2024 at 20:00: Orso Grigio <https://www.orso-grigio.it>

Thursday 9/02/2024 at 19:00: Trattoria Baracca <http://www.trattoriabaracca.it>

Backup slides