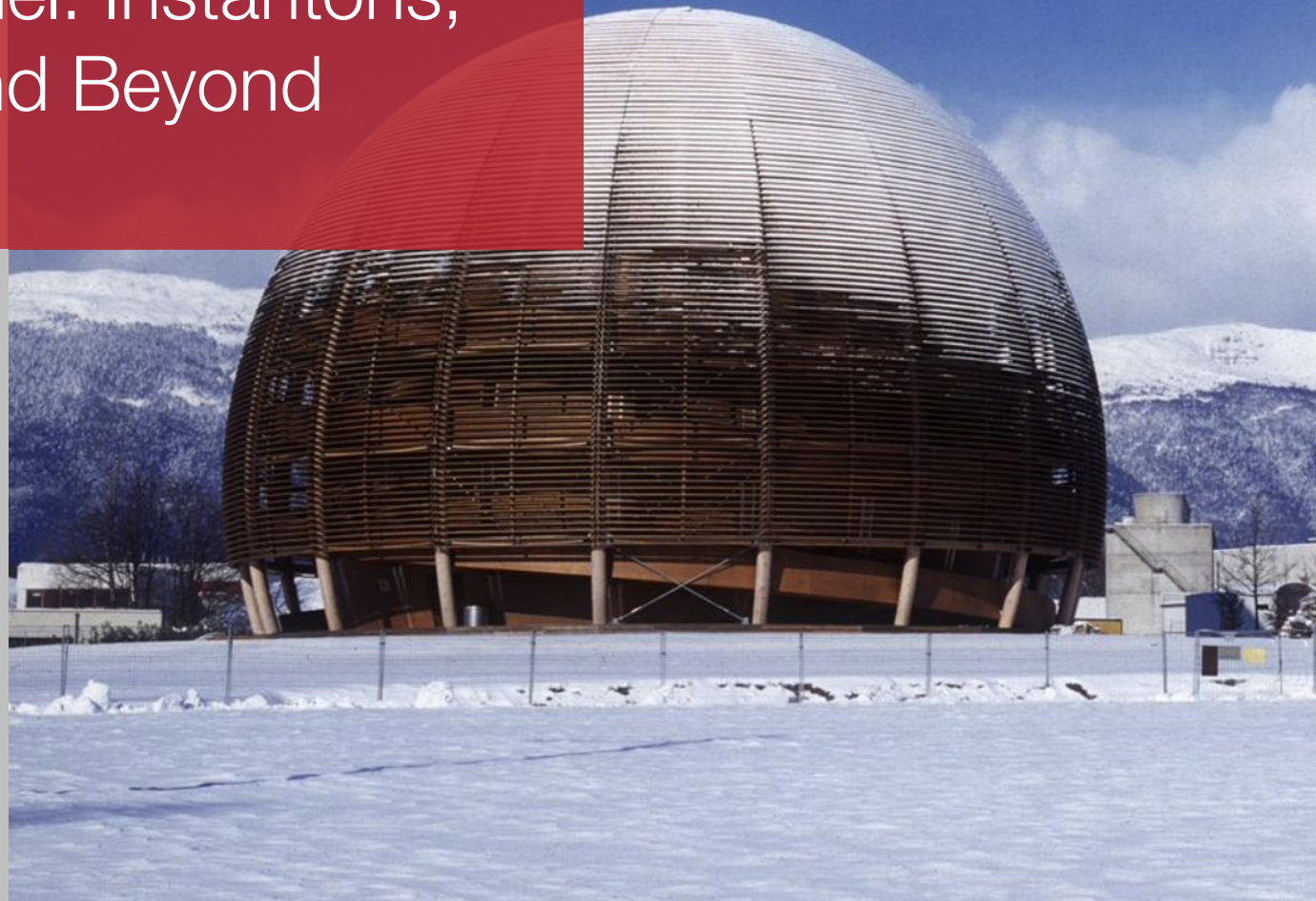
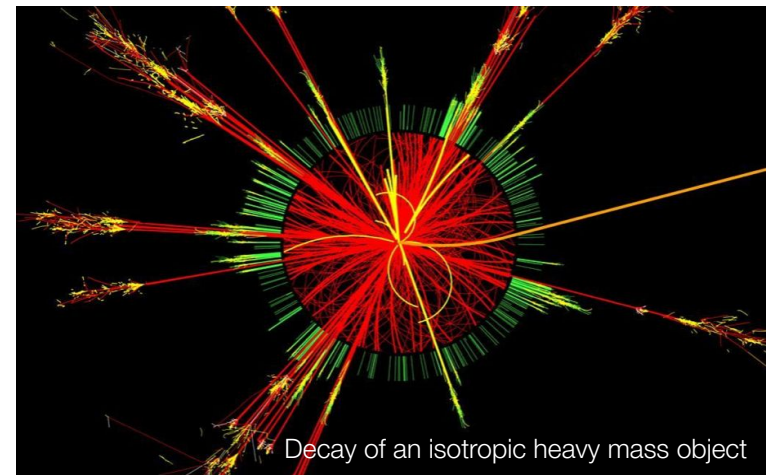
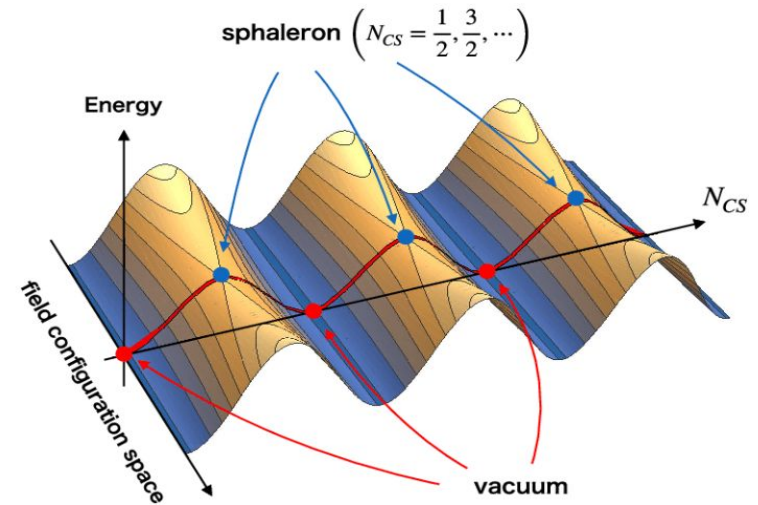


CERN Theory Workshop on
Topological Effects in the
Standard Model: Instantons,
Sphalerons and Beyond
at the LHC



Goals of the Workshop

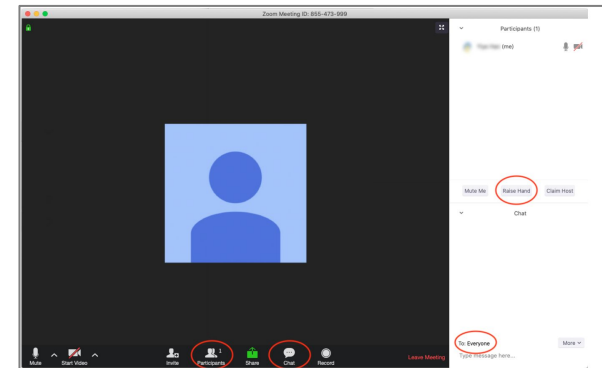
- While the existence of topological effects within the Standard Model, such as **QCD instantons** or **electroweak Sphaleron signatures** is well known, it is far from clear, if they can be experimentally observed
- We want to discuss the possibilities to such probe effects at the LHC.
 - How robust are the theoretical predictions and which uncertainties are associated
 - What are **potential signatures** at the LHC
 - Are there other means to find hints such topological processes
- Even though it is a CERN Theory workshop, **also many experimentalists** are joining... so keep this in mind during the discussions



How to Participate?

- We all would have preferred to meet in person and have lively discussions during the workshop, in the coffee breaks ...
 - Let's try to make the best of the current situation via ZOOM
- Speakers/discussion chairs should have the **video on during their talks/ sessions**
 - Please test your sound/video system as well as the slide-sharing before
- Discussion time directly after the talk are reserved for questions to the understanding of the talk.
- Longer comments and discussions should happen in the **dedicated round table discussions**

- How to ensure good discussions?
 - If you want to speak, **raise your Zoom-hand** – you will be called by the discussion leader.



- You can use the chat to inform the session chairs about the point you would like to make
- Please **speak only, when called** (and remember we can block participants who forget this too often) and don't forget to **unmute**
 - When speaking, it would be great if you could also turn on your camera.

Schedule and Workshop Photo

- Workshop times each day from 15:00 to 18:00, separated in two parts:
 - Part I: Introduction Talks
 - Part II: Round Table Discussion
- Wednesday: QCD Instantons
- Thursday: Electroweak Sphalerons
- Friday: Collider Signatures
- Virtual Workshop Photos will be taken now (Part I) and Friday afternoon (Part II)

| WEDNESDAY, 16 DECEMBER | |
|------------------------|---|
| 14:00 → 15:00 | Theory Colloquium: Instantons and sphalerons of electroweak theory and QCD Connection Details and the actual talk can be found on the Theory Colloquium Page. Speaker: Edward Shuryak Theory Colloquium |
| 15:00 → 15:10 | Introduction and Goals of the Workshop Speaker: Matthias Schott (CERN / University of Mainz) |
| 15:10 → 15:15 | Virtual Workshop Photo - Part I |
| 15:15 → 16:35 | QCD Instantons: Overview Talks |
| 15:15 | Calculations of QCD Instanton Processes at Hera (30+10) Speaker: Andreas Ringwald (Deutsches Elektronen-Synchrotron DESY) |
| 15:50 | New Calculations of QCD Instanton Processes at LHC (30+15) Speaker: Valentin V Khoze (Durham University) |
| 16:35 → 16:45 | Virtual Coffee Break |
| 16:45 → 18:00 | QCD Instantons: Round Discussion Table Conveners: Michelangelo Mangano (CERN), S. Moch (UHH) |
| 16:45 | Introduction to the discussion |
| 16:54 | Submitted Discussion Material An Inherent Uncertainty of the Instanton Cross Section Calculation for DIS Speaker: Fridger Schrempp (DESY) abstract_schrempp.pdf |

General Discussion on Friday and Follow Up

- General discussion at the end of the workshop with John Ellis and Edward Shuryak
 - come back to selected points of the sessions
 - summarize and discuss new points or make overall concluding remarks.
- We encourage all workshop participants to send us after the workshop their take-away message, follow-up points, future benchmarks etc.
 - If successful we plan to organize follow-up workshop to accompany further theory developments and the starting experimental searches at LHC.

Problems? The (virtual) local organizers will help

- If you have any questions or problems, do not hesitate to contact us



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