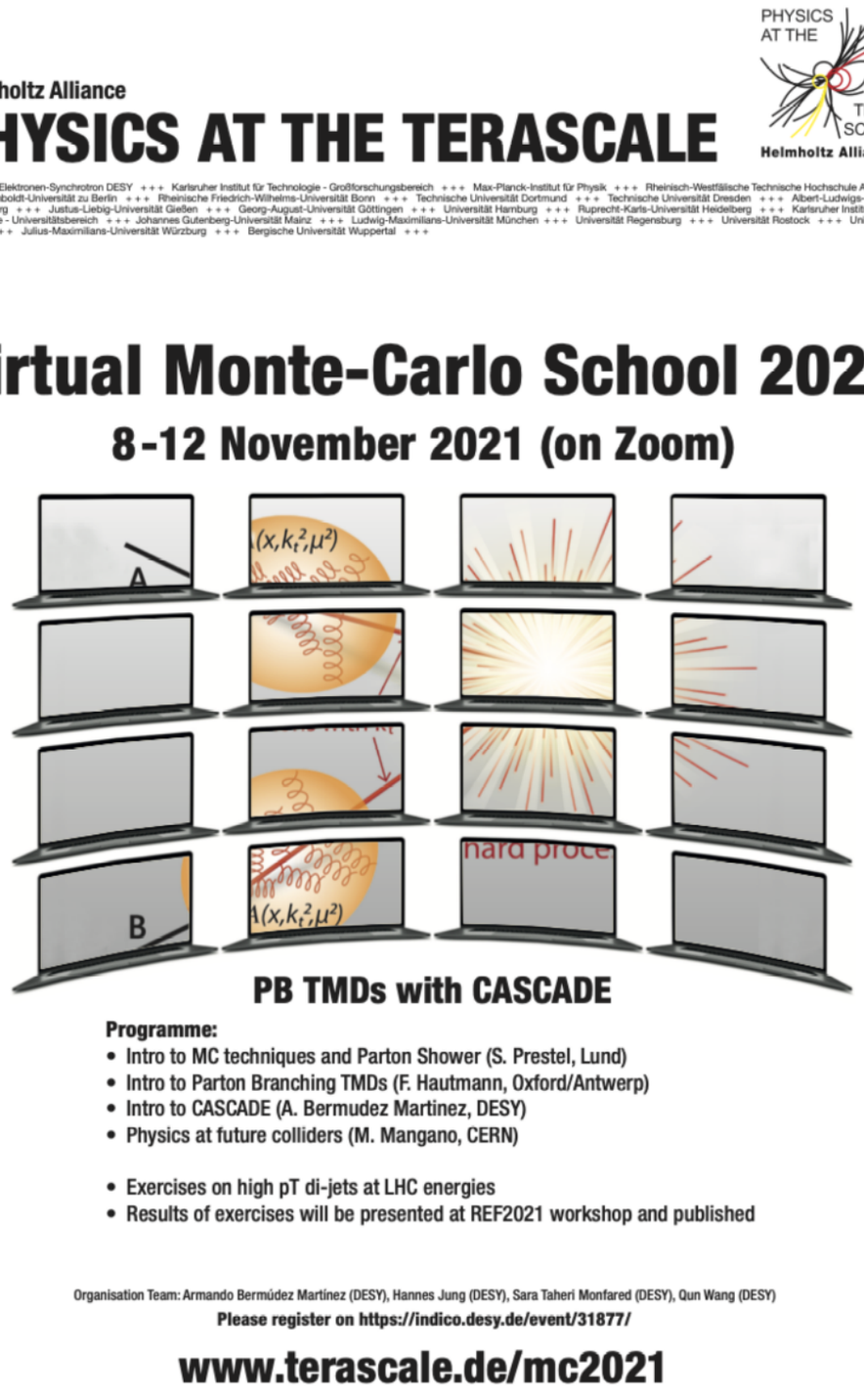
Cascade developer meeting

- Hope that you are all ok !

- Thousand thanks for all contributing to the first PB - TMD school.

PB TMD with CASCADE - Monte Carlo school



- MC school: PB TMDs with CASCADE
  - very positive resonance
    - > 60 registrants
    - > 20 in HandsOn Exercises
  - studies on high p_T dijet production
    - presented at REF 2021 by Qun
    - multijet merging presented by Armando

PB TMD with CASCADE - Monte Carlo school

Terascale Monte Carlo School: PB TMDs with CASCADE

from **Monday, 8 November 2021 (08:00)** to **Friday, 12 November 2021 (18:00)**

Monday, 8 November 2021	Tuesday, 9 November 2021	Wednesday, 10 November 2021	Thursday, 11 November 2021	Friday, 12 November 2021
		11:00 **Lecture: Intro to PB TMDs** - Francesco Hautmann (Ocford/Antwerpen)		
13:00 **Welcome** - Hannes Jung (DESY)	13:00 **Lecture: Intro to PB TMDs (po…**	13:00 **Exercises on Dijets at LHC**	13:00 **Exercises on Dijets at LHC**	13:00 **Summary - preparation of contribution**
13:05 **Lecture: Intro to Monte Carlo** - Stefan Prestel (DESY)	13:10 **Technical setup**			
	14:00 **Introduction to CASCADE** - Armando Bermudez Martinez (CMS (CMS Fachgruppe QCD))			15:00 **Multijet merging**
15:00 **Technical setup**	15:00 **PB TMDs** - Hannes Jung (DESY)		16:00 **Physics at future colliders** - Michelangelo Mangano (CERN)	
			17:30 **Science bridging Cultures and Nations (Science & Society Science4Peace seminar)** - Rolf Heuer (CERN)	

Thanks a lot, Stefan, Francesco, Armando, Michelangelo for the very nice lectures !

All slides and recordings are on indico

PB TMD with CASCADE - Monte Carlo school

- Exercises:
  - general intros, then breakout rooms
  - practical HandsOn exercises on DESY naf
  - results from exercises are uploaded on CERNbox https://cernbox.cern.ch/index.php/s/WXz6YEMIC71tzSV
    - passwd: cascade
  - 7 participants uploaded their results for checks

- Results from the MC school are now put into a paper draft, and should be published:
  - Goal is to present jet studies with PB – TMDs and to discuss region, where TMDs are important.
    - Will discuss paper draft later !
    - Everybody who participated in the school and is interested can join as author
  - Want to send it to participants on weekend !

What is our global picture ?

- PB TMDs + TMD shower with NLO calculation gives very good description of dijet angular correlations
  - uncertainties in calculation are dominated from scale uncertainties, TMD uncertainties are very small
  - dijet azimuthal correlations are dominated by TMD and TimeShower
  - 3jet and 4jet correlations are sensitive to SpaceShower from TMDs

- PB TMDs + … with off-shell ME agree with NLO calculation

- Comparison with other approaches - P8,

CASCADE – new developments

- Pending:
  - HepMC3 integration
- Publication on Z+jet (and comparison with multijet)
- Final state TMD shower ala Parton Branching
  - cooperate with Tehran group
- AOB ?