Snowmass 2021: EF06 working group: Kick-off meeting

Pavel Nadolsky, Huey-Wen Lin, Christophe Royon
SMU / MSU / University of Kansas

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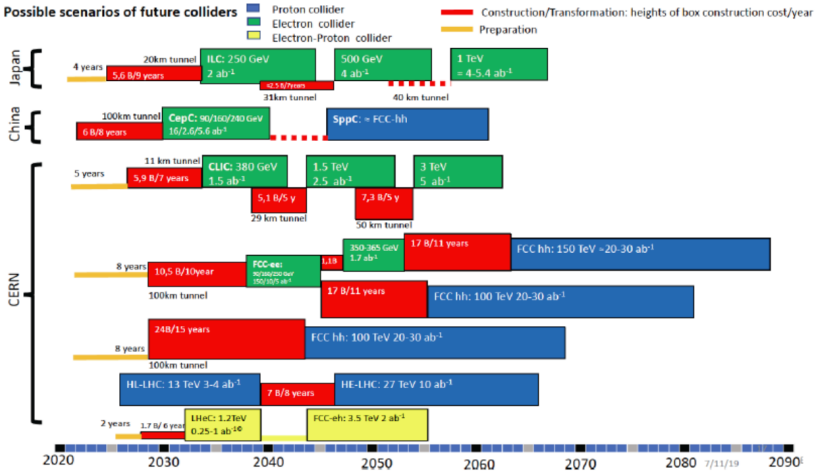
- General intro to Snowmass 2021
- EF06 WG
- Meeting dates and organization

Snowmass 2021: mission and organizational structure

- Snowmass 2021: Planning studies for the future particle physics in the US
- Various "Frontiers": Energy frontier, Neutrino Physics frontier, Rare processes and precision frontier, Cosmic frontier, Theory frontier, Accelerator frontier, Instrumentation frontier, Computational frontier, Underground facilities frontier, Community frontier
- Energy Frontier (EF) group explores highest energies in Earth-based experiments. The agenda includes understanding the heaviest particles of the Standard Model (SM), as well as exploring physics beyond the SM to discover new particles and interactions, including unraveling the mystery of dark matter
- EF groups will carry out detailed studies of Electroweak physics, QCD and strong interactions, and Beyond-Standard-Model physics under different future accelerator scenarios, including lepton-lepton, hadron-hadron, and lepton-hadron colliders
- More info at: https://snowmass21.org/start

Future colliders scenarii and timelines



The Electron-Ion Collider and future muon colliders are not shown

Snowmass Energy Frontier Organization

Topical Group	Co-Conveners		
EF01: EW Physics: Higgs Boson properties and couplings	Sally Dawson (BNL)	Andrey Korytov (U Florida)	Caterina Vernieri (SLAC)
EF02: EW Physics: Higgs Boson as a portal to new physics	Patrick Meade (Stony Brook)	Isobel Ojalvo (Princeton)	
EF03: EW Physics: Heavy flavor and top quark physics	Reinhard Schwienhorst (MSU)	Doreen Wackeroth (Buffalo)	
EF04: EW Physics: EW Precision Physics and constraining new physics	Alberto Belloni (Maryland)	Ayres Freitas (Pittsburgh)	Junping Tian (Tokyo)
EF05: QCD and strong interactions: Precision QCD	Michael Begel (BNL)	Stefan Hoeche (FNAL)	Michael Schmitt (Northwestern)
EF06: QCD and strong interactions: Hadronic structure and forward QCD	Huey-Wen Lin (MSU)	Pavel Nadolsky (SMU)	Christophe Royon (Kansas)
EF07: QCD and strong interactions: Heavy Ions	Yen-Jie Lee (MIT)	Swagato Mukherjee (BNL)	
EF08: BSM: Model specific explorations	Jim Hirschauer (FNAL)	Elliot Lipeles (UPenn)	Nausheen Shah (Wayne State)
EF09: BSM: More general explorations	Tulika Bose (U Wisconsin-Madison)	Zhen Liu (Maryland)	Simone Griso (LBL)
EF10: BSM: Dark Matter at colliders	Caterina Doglioni (Lund)	LianTao Wang (Chicago)	

Snowmass 2021 Energy Frontier: key dates

- May 21 2020: Kick-off meeting: https://indico.fnal.gov/event/24264/
- June 2020: First draft of Frontier summaries
- July 9-10 2020: EF workshop (video only unfortunately)
- November 4-6 2020: Community (all frontiers) in-person meeting at Fermilab
- January/February 2021: Progress meeting
- April 2021: APS meeting, general Snowmass meeting
- May-June 2021: Meeting to finalize Snowmass reports
- July 11-20 2021: Final Snowmass meeting in Seattle
- August 2021: First draft of Snowmass report
- October 2021: Final document of Snowmass report
- Additional meetings for EF06

Letters of Interest and Proceedings

- Period to submit Letters of Interest (LOI's): April 1, 2020 - August 31, 2020; Prepare the Snowmass Planning Meeting on November 4 - 6, 2020 at Fermilab
- Letters should give brief descriptions of the proposal and cite the relevant papers in less than 2 pages: see https://snowmass21.org/loi
- Authors of the letters are encouraged to submit a full write-up for their work as a contributed paper
- Authors can upload LOI's through Snowmass 2021 Wiki and Index of submitted LOI available at the same place
- Submission period for contributed papers:: April 1, 2020 - July 31, 2021; they will be part of the Snowmass proceedings (may include white papers, technical articles reasoned expressions of physics priorities...)

Energy Frontier Topical Group 06: Topics

- PDFs in proton and nuclei (collinear, TMDs, GPDs, (un)polarized, with EW contributions, nucleus, pion, kaon, photon?)
- Computations on the lattice
- QCD for high sqrt(s) and forward physics: BFKL, saturation, color glass condensate, ...
- PDFs and Monte-Carlos for forward physics
- QCD predictions for cosmic ray physics
- Diffraction (soft and hard)
- Transition to the nonperturbative QCD region at low Q
- Combined measurements of PDFs and SM parameters (alphas, quark masses, MW, ...)
- Hadron spectroscopy
- Final-state fragmentation
- Machine learning applications

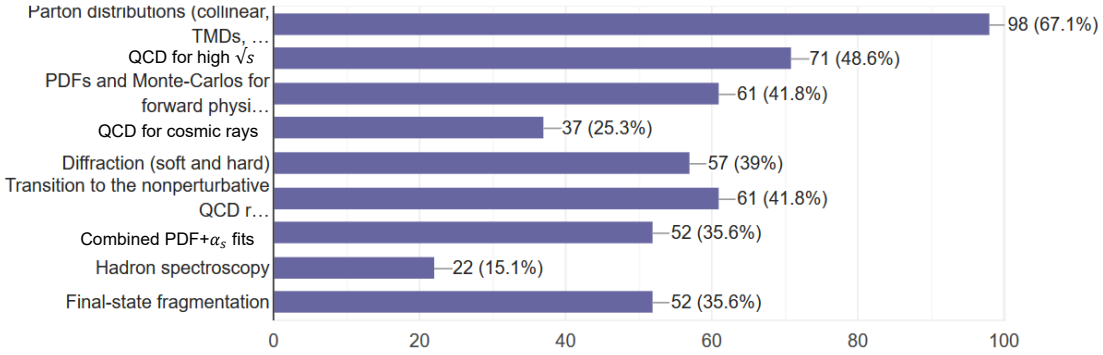
Relations with other Topical Groups and Frontiers

- EF05: QCD and Strong Interactions - Precision QCD: obvious link with our WG, we plan to have common meetings (frequency and date/time to be decided)
- Common topics with other WGs: EF03 (Heavy Flavors and Top Quark Physics), EF04 (Electroweak Physics), EF07 (QCD and strong interactions: Heavy Ions)
- Common topics with other frontiers: Cosmic frontier (understanding of cosmic rays and interactions with atmosphere, related to forward physics), theory frontier (NNNLO calculations, BFKL NLL developments, lattice QCD), computational frontier (advanced methods such as machine learning techniques, new methods to fit PDFs at high order...)

Relations with other WG outside US Snowmass

- The Snowmass process is organized by the American Physics Society (APS) and welcomes all divisions of APS, as well as our international partners, to contribute to the study of physics opportunities in particle physics and adjacent research domains in the global context. All participants from the US and abroad are welcome to take part in our effort and to contribute to the LOIs, papers and final write-up. The goal is physics that goes beyond countries and funding agencies even if the final document will be useful for future decisions in the US (P5 planning committee)
- We also welcome very much participants from the EIC user group, and we can have common papers between EIC and Snowmass: The EIC is a CD-0 approved project in the US by DOE NP and is definitely a priority, it will be obviously interesting by both HEP and NP communities

Repartition of different topics



EF06 proposal and organization

- EF06 meetings - every Wednesday at 9:00 am (US central time) for 1 to 2 hours
  - We propose to organize meetings into 3-week cycles according to the following topics:
    - PDFs, GPDs, TMDs
    - Forward physics and diffraction
    - Other topics including Monte Carlo, non-perturbative physics, soft physics lattice QCD, hadron spectroscopy, fragmentation
  - In addition, common sessions with EF05 (QCD and strong interactions) and may be with EF07 (Heavy ions)
- List of topics for our WG, LOIs, papers...
- Open to suggestions, comments, discussions...