2021 Snowmass Process: MPGD @ Instrumentation Frontier

The Snowmass Process is organized by the Division of Particles and Fields of the American Physical Society:
https://snowmass21.org

- Identify and document a vision for the future of particle physics (PP) in the US in a global context
- Communicate opportunities for discovery in PP to broader community and to the (US) government.
  → similar process in the US, as European Strategy Update in Europe (see remarks later)

Topical group IF5 ("MPGD") within the Snowmass Instrumentation Frontier:

✓ Co-conveners: Bernd Surrow, Temple University, surrow@temple.edu
Maxim Titov, CEA Saclay, maxim.titov@cea.fr
Sven Vahsen, University of Hawaii, sevahsen@hawaii.edu

You could reach all conveners: SNOWMASS-IF-05-MPGD-CONVENERS@fnal.gov

✓ MPGD wiki webpage: https://snowmass21.org/instrumentation/mpgd

We ***invite all MPGD groups*** to join this effort and to provide inputs:

✓ Subscribe to mailing list: SNOWMASS-IF-05-MPGD@FNAL.GOV (instructions: https://listserv.fnal.gov/users.asp)

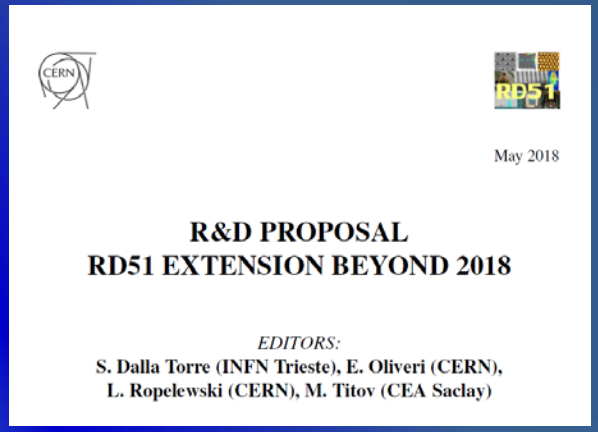
✓ Submit a 2-page Letter of Interest: https://snowmass21.org/loi ; submission period until August 31, 2020

✓ Submit a contributed paper: https://snowmass21.org/submissions/start ; submission period until July 31, 2021

RD51 Model-Recognized: Recent Documents

June 2018:

- ✓ R&D PROPOSAL: RD51 Extension beyond 2018"– Approved by the CERN Research Board until 2023 https://arxiv.org/abs/1806.09955



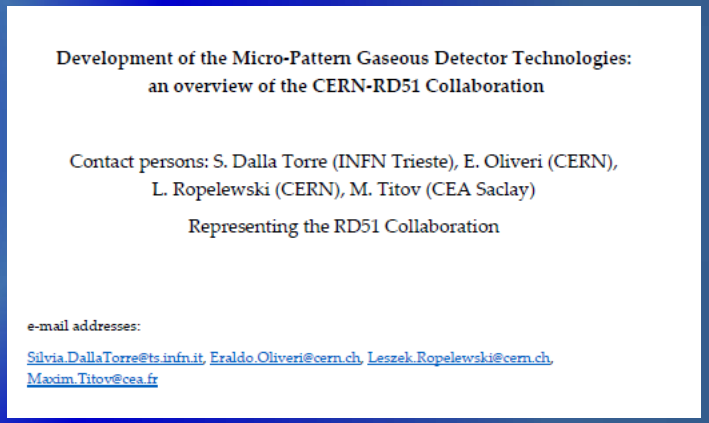
May 2018

R&D PROPOSAL
RD51 EXTENSION BEYOND 2018

EDITORS:
S. Dalla Torre (INFN Trieste), E. Oliveri (CERN),
L. Ropelewski (CERN), M. Titov (CEA Saclay)

December 2018 (Europe):

- ✓ Input for the EPPSUprocess: "Development of the MPGD Technologies: an overview of the CERN-RD51 Collaboration" https://indico.cern.ch/event/765096/contributions/3295721/



Development of the Micro-Pattern Gaseous Detector Technologies: an overview of the CERN-RD51 Collaboration

Contact persons: S. Dalla Torre (INFN Trieste), E. Oliveri (CERN), L. Ropelewski (CERN), M. Titov (CEA Saclay)

Representing the RD51 Collaboration

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Summer 2019 (USA):

- ✓ Document for the CPAD report "New Technologies For Discovery"

Progress of MPGDs and RD51 model https://arxiv.org/abs/1908.00194

Cornell University

arXiv.org > physics > arXiv:1908.00194

Physics > Instrumentation and Detectors

New Technologies for Discovery

Z. Ahmed, A. Apresyan, M. Artuso, P. Barry, E. Bielejec, F. Blaszczyk, T. Bose, D. Braga, S.A. Charlebois, A. Chatterjee, A. Chavarria, H.-M. Cho, S. Dalla Torre, M. Demarteau, D. Denisov, M. Diefenthaler, A. Dragone, F. Fahim, C. Gee, S. Habib, G. Haller, J. Hogan, B.J.P. Jones, M. Garcia-Sciveres, G. Giacomini, K. Gilmore, G.K. Giovanetti, D. Glenzinski, S. Gleyzer, A.H. Goldan, S. Gollapinni, C. Grace, R. Guenette, O. Gutsche, U. Heintz, S.A. Hertel, N. R. Hutzler, S. Kolkowitz, T. Kovachy, F. Leonard, R. Lipton, M. Liu, J.F. Low, P. Madigan, S. Malik, J. Mates, Y. Mei, P. Merkel, T. Mohayai, A. Nomerotski, E. Oliveri, K. Palladino, E. Pantic, A. Para, K. Perez, M. Pyle, P. Riedler, L. Ropelewski, R. Rusack, M. Schleier-Smith, I Shipsey, K. Scholberg, B. A. Schumm, A. Slosar, W. Smith, B. Surrow, A. O. Sushkov, A. Suzuki, M. Szydagis, D. Temples, J. Thom, M. Titov, L. Tvrznikova, E. Usai, R. Van Berg, V. Velan, L. Winslow, T. Wongjirad, Q. Xia J. Xie, Z.F. You, A. Zani, J. Zhang, R.Y. Zhu

(Submitted on 1 Aug 2019 (v1), last revised 10 Aug 2019 (this version, v2))

For the field of high energy physics to continue to have a bright future, priority within the field must be given to investments in the development of both evolutionary

2021 Snowmass Process: MPGD @ Instrumentation Frontier

This Snowmass 2021 IF5 (MPGD) topical group will document recent developments and identify future needs for Micro-Pattern Gaseous Detector (MPGD) technologies:

- ✓ Critical for growing US MPGD community to engage in Snowmass process to ensure future support
- ✓ Particularly important given that MPGDs not included in US Basic Research Needs (BRN) Report

Some (most popular) questions:

- ✓ Do we encourage nuclear physics community contributions? – YES !!! There is a strong synergy between HEP and NP MPGD's developments
- ✓ Do we encourage submissions from Europe/Asia – YES !!! For any future project world-wide realized in a global context and/or projects with US involvement

SNOWMASS PROCESS is a GLOBAL EFFORT:

- ✓ Input from non-US community is essential
- ✓ Input from recent international studies, for example HL-LHC, European Strategy Particle Physics Update (ESPPU), future colliders etc.

First virtual Snowmass Instrumentation Frontier workshop, June 19th, 2020: https://indico.fnal.gov/event/43730/

We plan to organize 1-day MPGD Snowmass workshop in Aug./Sep. 2020:
→ Coordinate LoI papers, and plan process towards Snowmass Planning Meeting on Nov. 4-6, 2020 (Fermilab)

Snowmass Summer Study Institute, July 21-30, 2021 (Seattle, USA) and Final Snowmass Report - Oct. 2021

2020 European Strategy Update for Particle Physics

✓ Update of the European Strategy for Particle Physics:
https://indico.cern.ch/event/931825/contributions/3915933/attachments/2061059/3457287/CERN-ESU-013.pdf

✓ Deliberation Document on the 2020 update of the European Strategy for Particle Physics:
https://indico.cern.ch/event/931825/contributions/3915933/attachments/2061059/3457286/CERN-ESU-014.pdf

The success of particle physics experiments relies on innovative instrumentation and state-of-the-art infrastructures. To prepare and realise future experimental research programmes, the community must maintain a strong focus on instrumentation. *Detector R&D programmes and associated infrastructures should be supported at CERN, national institutes, laboratories and universities. Synergies between the needs of different scientific fields and industry should be identified and exploited to boost efficiency in the development process and increase opportunities for more technology transfer benefiting society at large. Collaborative platforms and consortia must be adequately supported to provide coherence in these R&D activities. The community should define a global detector R&D roadmap that should be used to support proposals at the European and national levels.*

Strategy Document

Instrumentation R&D critical for present and future endeavours

- Delivering the near and long-term future research programme requires advances in instrumentation through focused and transformational R&D
- There is a clear need to strengthen existing R&D collaborative structures and to create new ones, and to foster an environment that stimulates innovation and collaboration with industry
- The National Laboratories and research institutes in Europe play a central role by providing access to dedicated infrastructures and test facilities, specialised expertise and user support
- A roadmap should be developed by the community (ECFA's role) taking into account progress with emerging technologies in adjacent fields

Deliberation Document