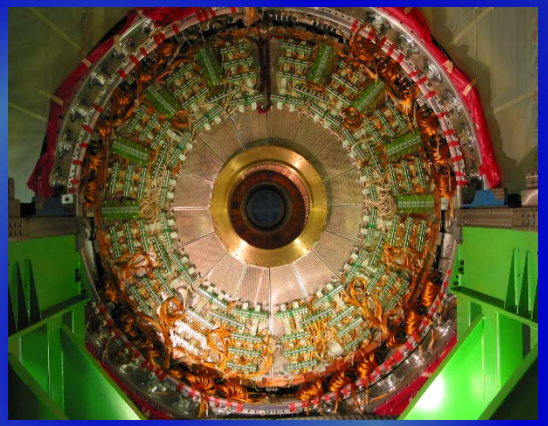
Farewell – TIPP2021 and Detector R&D Roadmaps

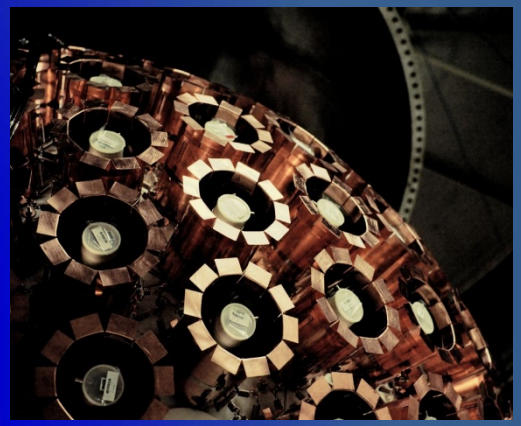
Maxim Titov, CEA Saclay, Irfu, France

(on behalf of the TIPP2021 Organizers & TIPP Steering Committee)

International Conference
on Technology and
Instrumentation
in Particle Physics

May 24-28, 2021 Online format

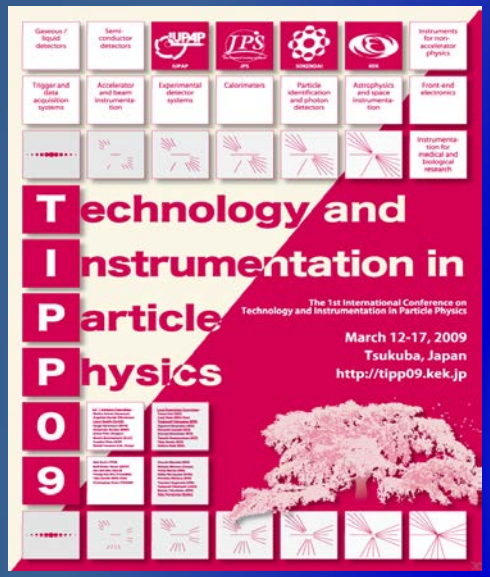




TIPP2021 Group Photo – Fri., May 28, 2021 in Gather.Town – Poster Session Room

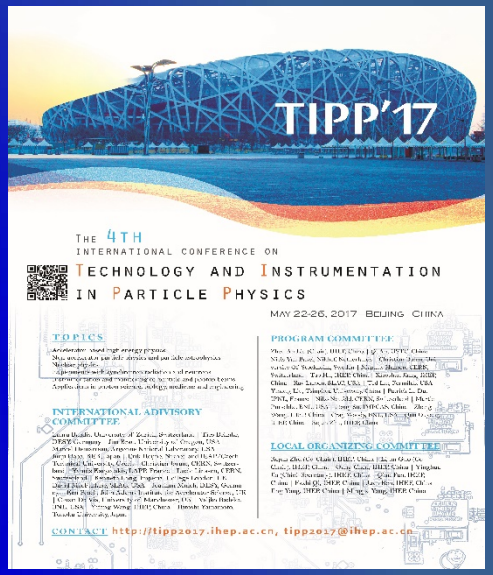
TIPP Conferences – Endorsed & Supported by IUPAP / C11

TIPP2009 Tsukuba, Japan
(https://tipp09.kek.jp)

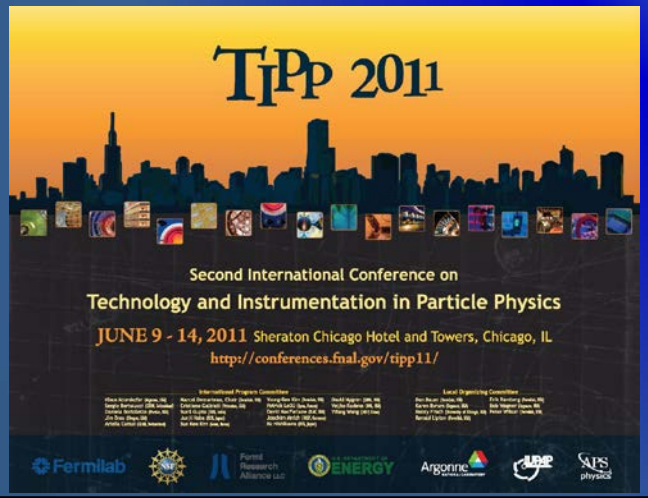


TIPP2014 Amsterdam, NL
(http://www.tipp2014.nl/)

TIPP2017 Beijing, China
(http://tipp2017.ihep.ac.cn/index.html)



TIPP2011 Chicago, USA
(https://conferences.fnal.gov/tipp11/)



TIPP 2021

International Conference on Technology and Instrumentation in Particle Physics

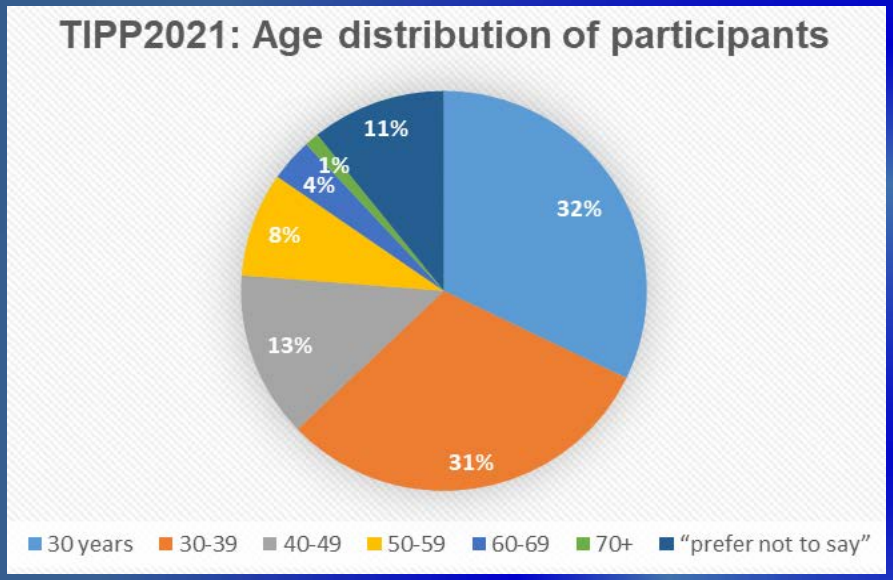
TIPP2020
(TRIUMF / Canada)

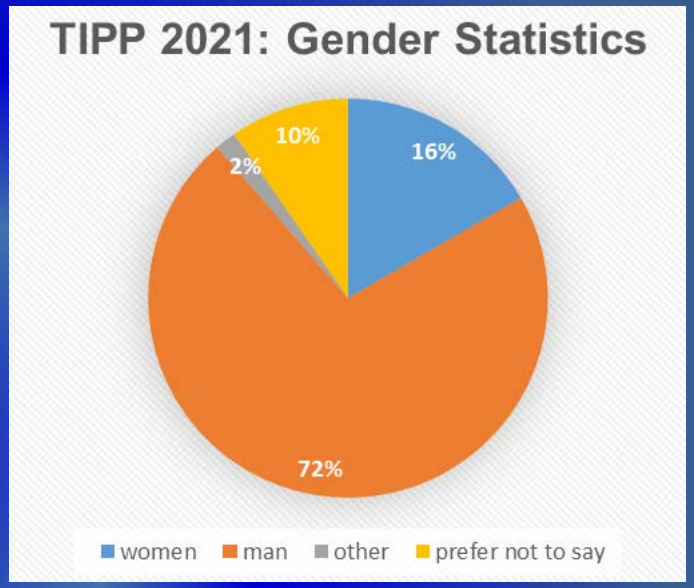
TIPP2021
(Hosted by TRIMPF, Online format)
https://tipp2021.triumf.ca/

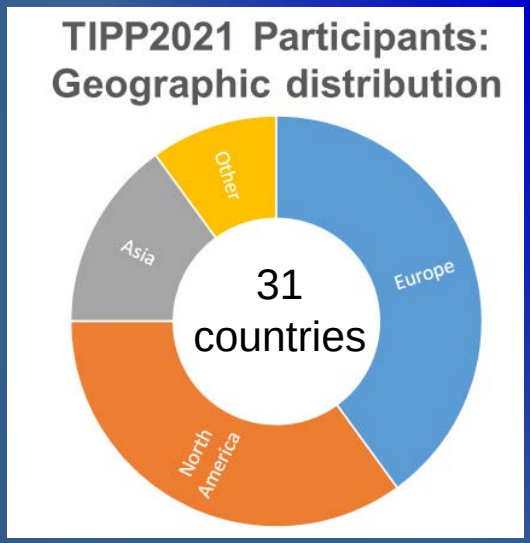
TIPP2021 Conference Statistics

I. Trigger
F. Retiere

- ✓ TIPP 2021 conference attendance: 529 registrants (167 students)
- ✓ Previous conferences: Tsukuba(440), Chicago (483), Amsterdam(448), Beijing (301)







- ✓ **TIPP 2021 was very successful – the largest conference (online format)**
- ✓ Plenary session on Monday:
  424 logins over 285 minutes, but peak attendance 160 – 170 participants
- ✓ Parallel sessions: typically, between 20 - 45 participants for most of them
- ✓ Poster session: over 70 people in Gather.Town for several sessions
- ✓ Organizers work hard on diversity:
  → Plenary speakers: 8 (female); 15 (male)
  → LOC is more than 50% female

TIPP2021: Diverse Plenary Session Program (I)

Current / Future Facilities:
(VEPP, KEKb/Belle, SCTF, CepC, ILC/CLIC, EiC, ALPHA-g, rare event searches,…)

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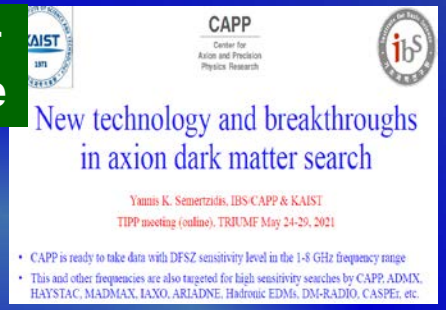
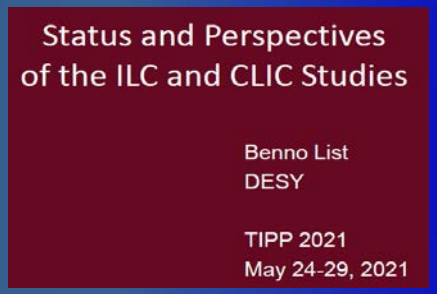
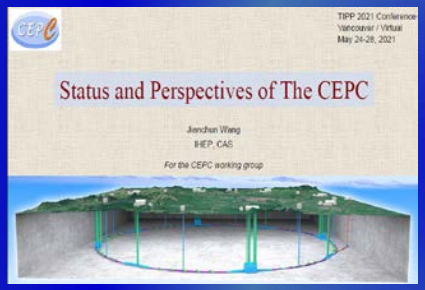
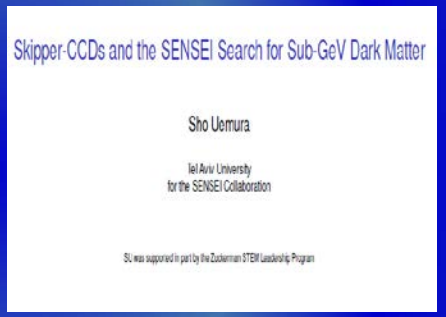
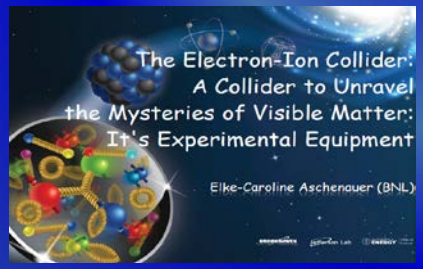
Dark Matter Technology Highlights:

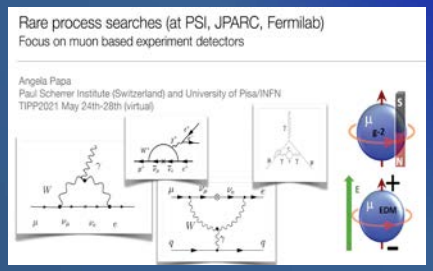












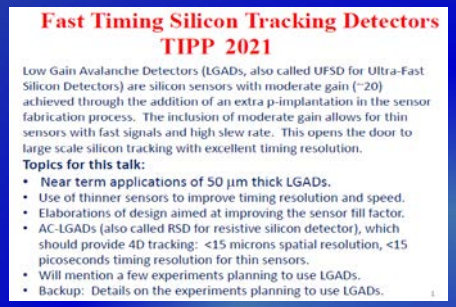
Neutrino Technologies:

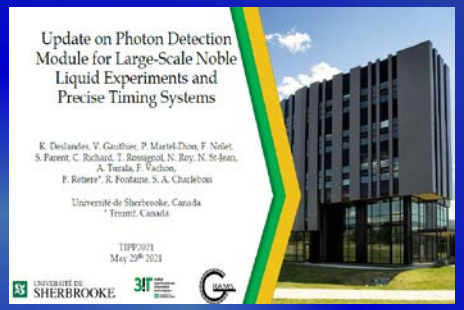
Space Instrum.:

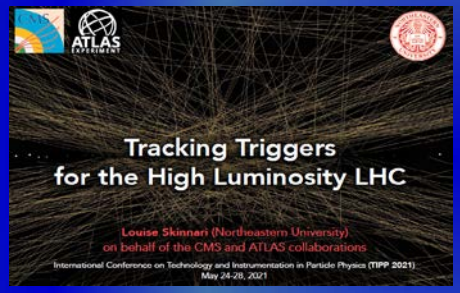
TIPP2021: Diverse Plenary / Parallel Sessions Program (II)

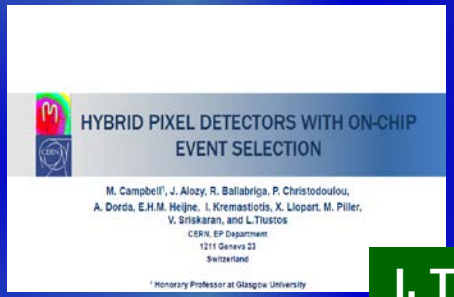
Enabling Technologies:

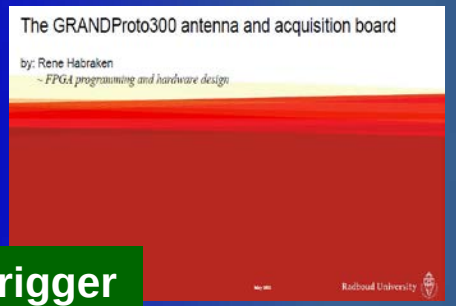
(CALICE / Pflow, RD51 / MPGD, Fast Timing, Digital SiPMs, Track-trigger, Electronics/DAQ, …)











I. Trigger
F. Retiere

Parallel and Poster Sessions Program:

Submitted > 400 abstracts; arranged as ~ 200 oral talks in 4-5 sessions in parallel (Tue-Thu) and ~ 200 posters

- Readout and Data Processing: FEE, Trigger and DAQ, Data Transfer Links and Networks;
- Experiments: Trackers, Calorimeters, High energy physics, Neutrino, Dark Matter Detectors, Space and particle astrophysics, Precision techniques at low energy
- Sensors: Light-based detectors, Photo-detectors, Emerging Technology, Solid-state position sensors Solid-state calorimeters, Noble liquid detectors, Gaseous Detectors
- Technology Transfer

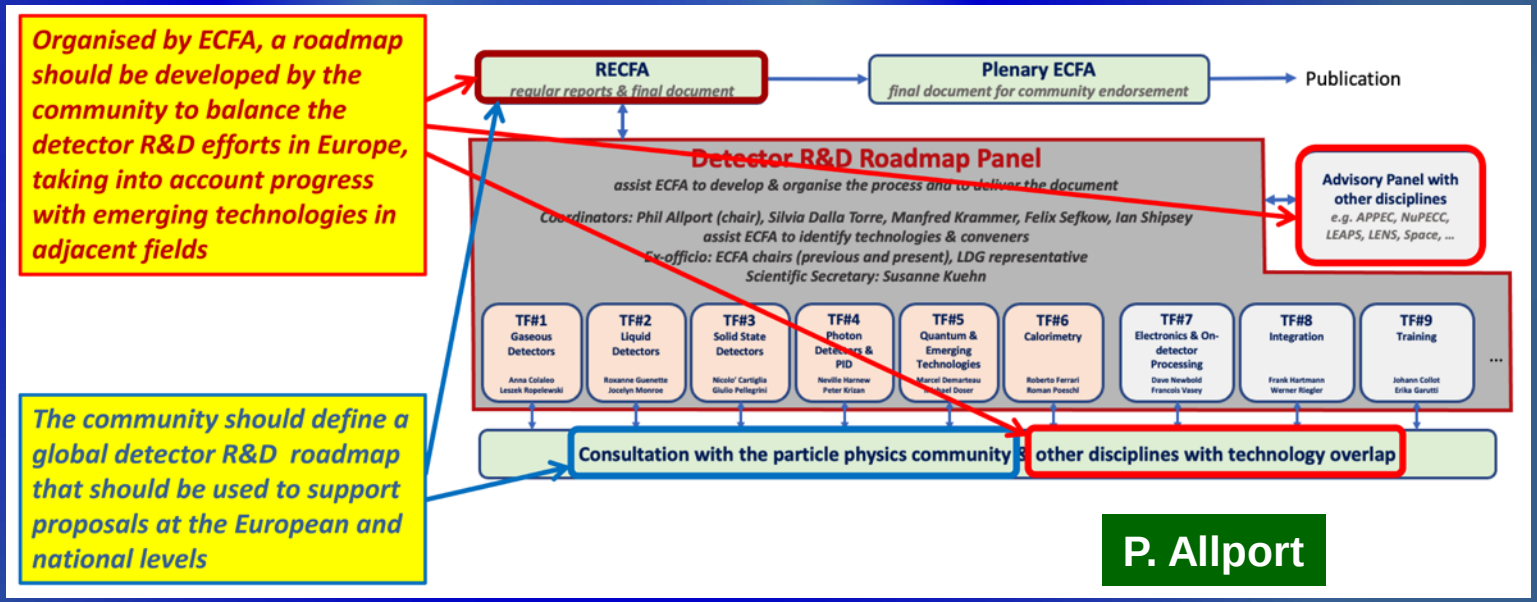
TIPP2021 proceedings will be published in the open access Journal of Physics: Conference Series → deadline June 25, 2021: https://tipp2021.iopconferenceseries.rivervalley.io/

ECFA Detector R&D Roadmap

ECFA
European Committee for Future Accelerators

- ✓ Focus on the technical aspects of detector R&D requirements given the 2020 EPPSU deliberation document listed "*High-priority future initiatives*" and "*Other essential scientific activities for particle physics*" as input and organise material by Task Force.
- ✓ Task Forces start from the future science programmes to identify main detector technology challenges to be met (both mandatory and highly desirable to optimise physics returns) to estimate the period over which the required detector R&D programmes may be expected to extend.
- ✓ Within each Task Force create a time-ordered technology requirements driven R&D roadmap in terms of capabilities not currently achievable.

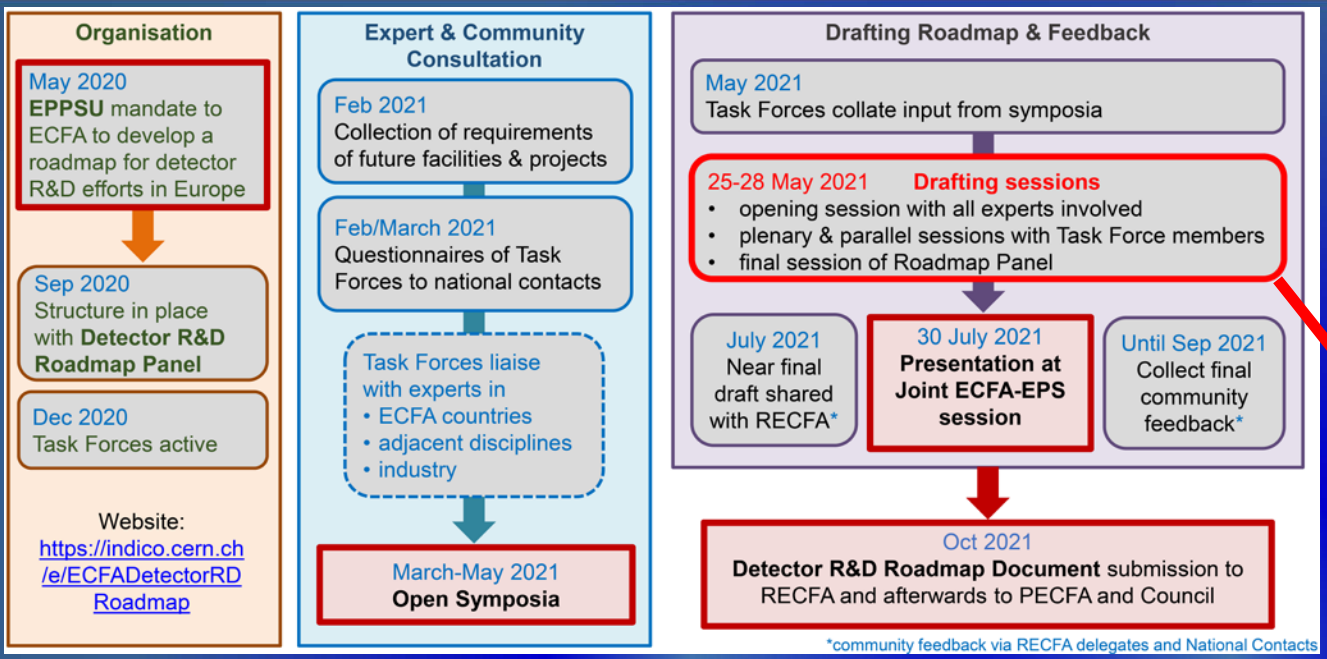
The roadmap should identify and describe diversified detector R&D portfolio that has the largest potential to enhance the performance of the particle physics programme in the near and long term."



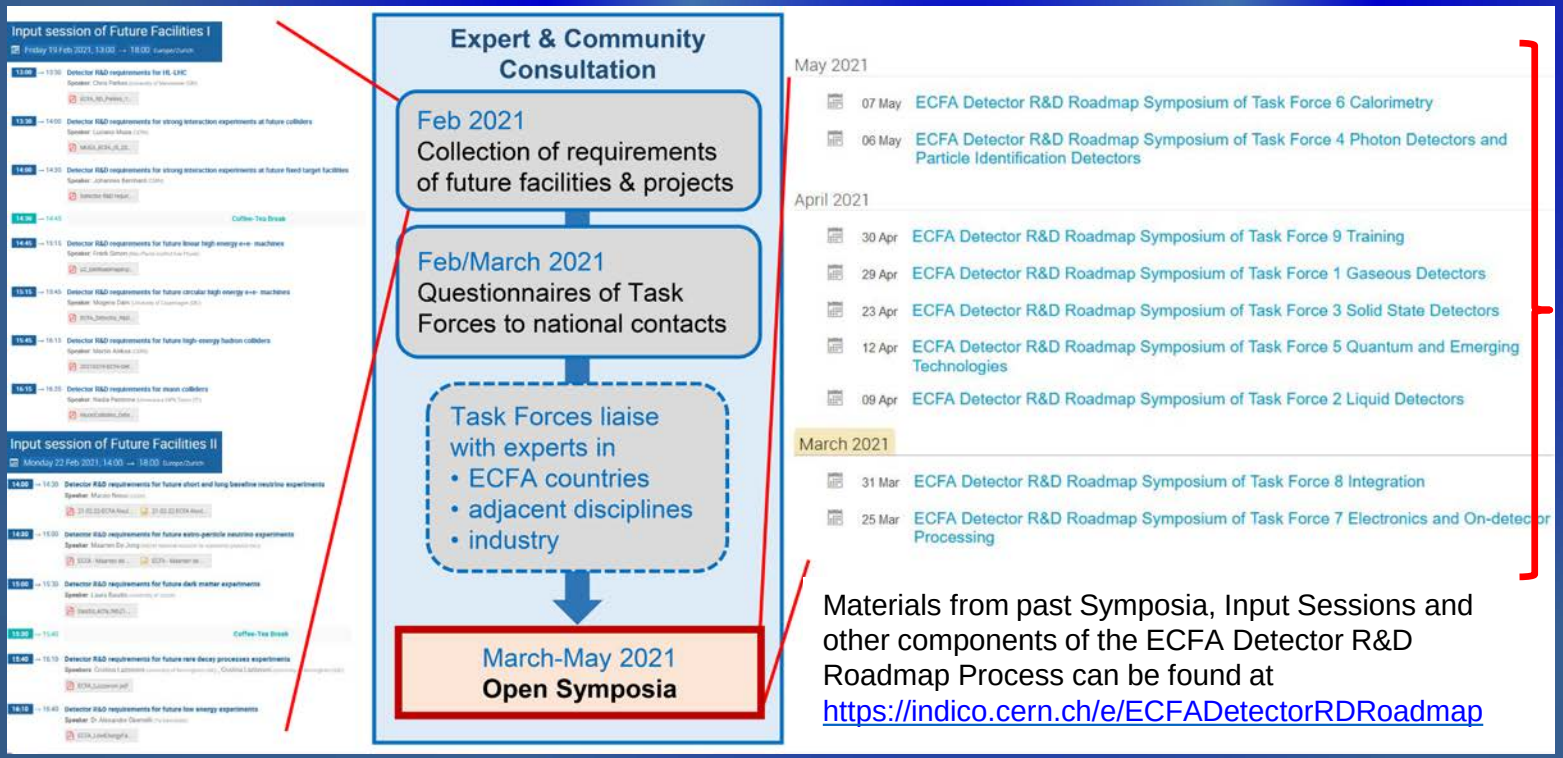
Useful links for Roadmap Process:

https://indico.cern.ch/e/ECFADetectorRDRoadmap
https://indico.cern.ch/event/957057/page/21633-mandate (Panel Mandate document)
https://arxiv.org/abs/1910.11775 (EPPSU Briefing Book)
https://ep-dep.web.cern.ch/rd-experimental-technologies (CERN EP R&D)
https://ecfa-dp.desy.de/public_documents/ (Some useful documents from the ECFA Detector Panel)

ECFA Detector R&D Process and Timeline:



May 25-28, 2021:
Drafting session (public part):
https://indico.cern.ch/event/1037113/



Common registration for the symposia had logged 1359 participants by the end of the last one.

Materials from past Symposia, Input Sessions and other components of the ECFA Detector R&D Roadmap Process can be found at https://indico.cern.ch/e/ECFADetectorRDRoadmap

P. Allport

From the 2020 EPSSU to the 2020-2022 Snowmass Process

The Snowmass Process is organized by the DPF 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

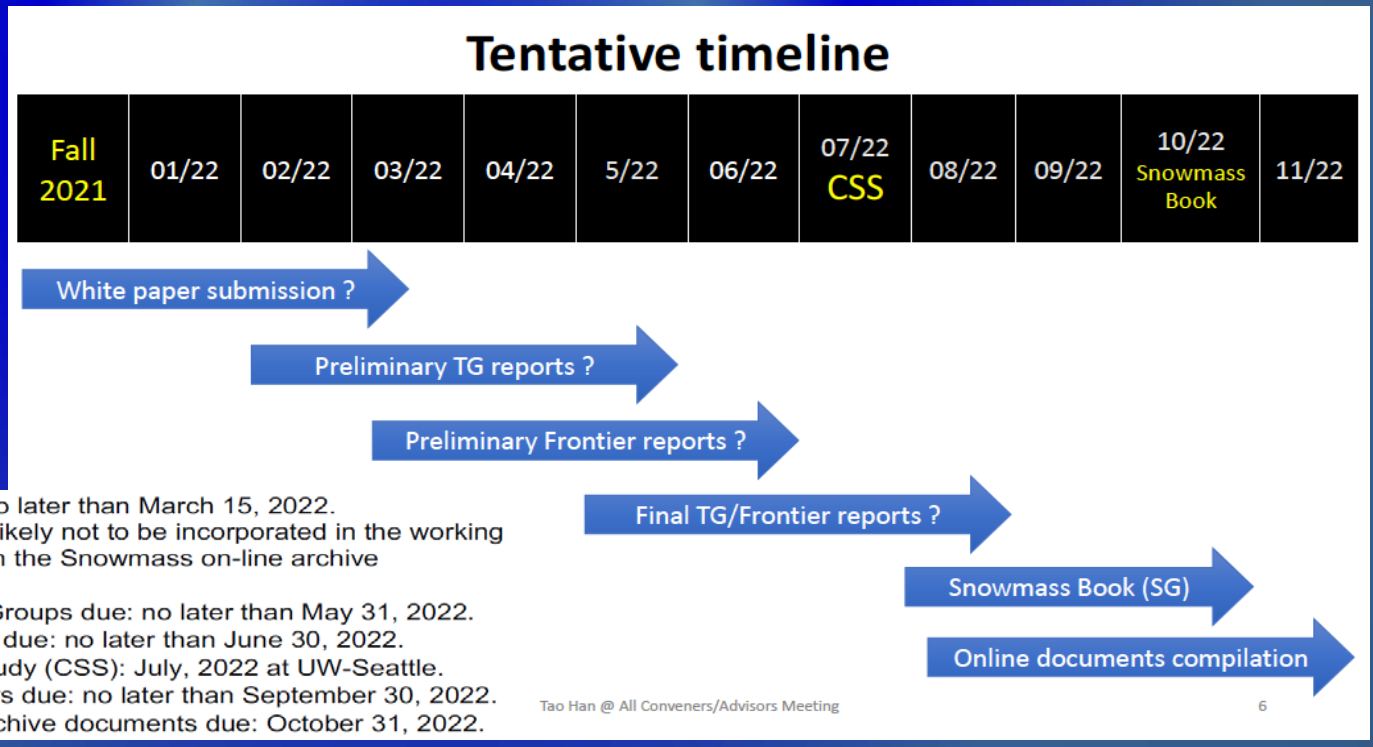
→ Communicate opportunities for discovery in PP to broader community and to the (US) government.

Major Snowmass Events in 2020 (selected links):

- ✓ Kick-off April APS meeting, Apr. 18, 2020: https://indico.fnal.gov/event/23601
- ✓ Instrumentation Frontier Workshop, Jun. 19, 2020: https://indico.fnal.gov/event/43730
- ✓ Submission of a 2-page Letter of Interest: https://snowmass21.org/loi ; deadline - August 31, 2020
- ✓ Community Planning Meeting, Oct. 5-9, 2020: https://indico.fnal.gov/event/44870

Because of the COVID-19 pandemic, the Snowmass Report and Community Summer Study meeting (CSS) has been delayed by one year until 2022

→ *Major Snowmass activities are on-hold from Feb. to Jul. 2021*

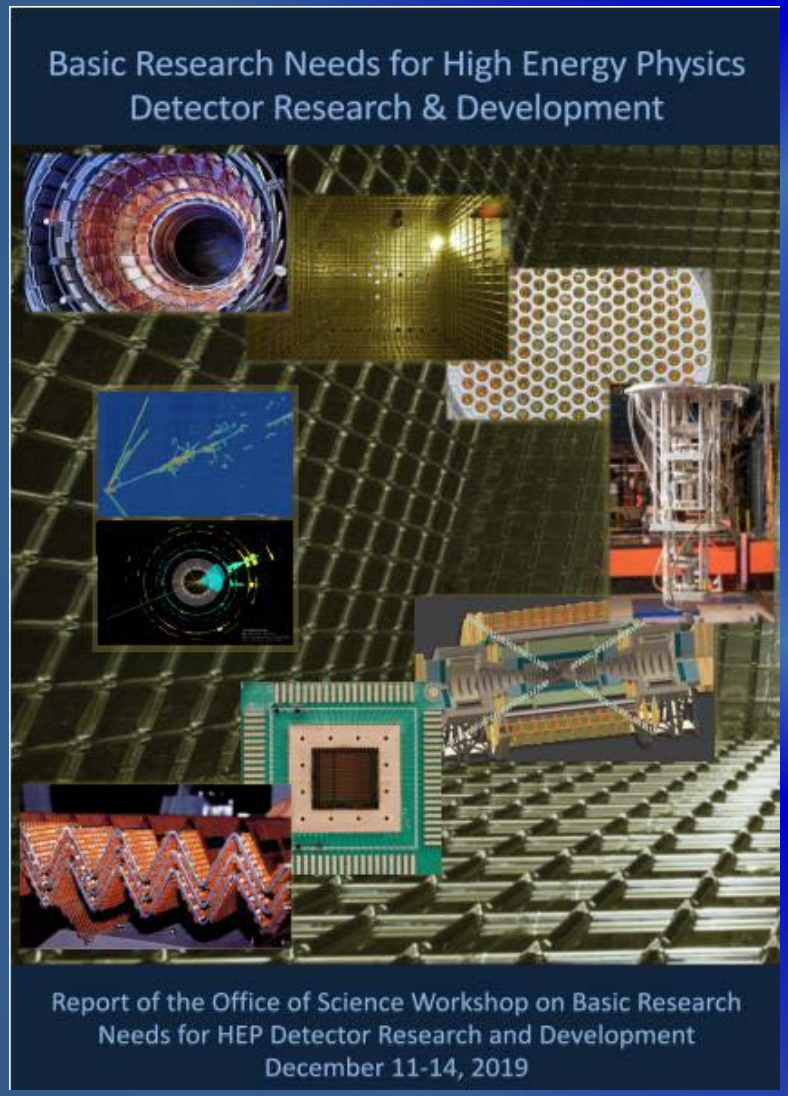


- White Paper submission to arXiv: no later than March 15, 2022. Late submissions and updates are likely not to be incorporated in the working group reports, but will be included in the Snowmass on-line archive documents.
- Preliminary reports by the Topical Groups due: no later than May 31, 2022.
- Preliminary reports by the Frontiers due: no later than June 30, 2022.
- Snowmass Community Summer Study (CSS): July, 2022 at UW-Seattle.
- All final reports by TGs and Frontiers due: no later than September 30, 2022.
- Snowmass Book and the on-line archive documents due: October 31, 2022.

US P5 Strategy Process starts by end of 2022; P5 final report – late 2023 / early 2024

US: Basic Research Needs Report & Snowmass Process

DOE-BRN Report published (Sep. 2020)
https://science.osti.gov/hep/Community-Resources/Reports



Snowmass Instrumentation Frontier:
https://snowmass21.org/instrumentation/start
Conveners: P. Barbeau, P. Merkel, J. Zhang

Snowmass Report « Community-Driven »:

- **Snowmass Summary for Public**
  - 2 pages
- **Snowmass Summary Report**
  - ~50 pages
  - Executive Summary: ~10 pages
  - Introduction
  - 10 Frontier Executive Summaries
  - Executive Summaries of Multi-Frontier Topics
  - Conclusion
- **Snowmass Book**
  - ~500 pages
  - Snowmass Summary Report (~50 pages)
  - Frontier Summaries (~400 pages with 10 Frontiers)
  - Multi-Frontier Topic Summaries (~50 pages)

IF Frontier Summary: 40 pages

- **Topical Group Reports**
  - Topical Group Reports: short reports

(Written by TG members including early careers)

- **Reports of Multi-Frontier Topics**
  - Multi-Frontier Topics spanning multiple Frontiers.
  - Each Multi-Frontier Topic Summary: ~10 page
- **Contributed Papers**
  = White Papers
  - References

(Written by the community including early careers)

CPAD Instrumentation Workshop (Mar. 18-22, 2021):
https://www.stonybrook.edu/cfns/cpad2021/index.html

P. Merkel

ICFA Instrumentation Awards

(by ICFA Instrumentation, Innovation and Development Panel)

Proposal to Establish the ICFA Instrumentation Awards

The ICFA IID Instrumentation Taskforce: Marcel Demarteau (ORNL), Kazunori Hanagaki (KEK), Petra Merkel (Fermilab), Fabrice Retière (TRIUMF), Ian Shipsey (Oxford)

https://icfa-iid.physics.ox.ac.uk/#prizes

On behalf of the ICFA IID Panel: Didier Contardo (Lyon), Bonnie Fleming (Yale), Marcel Demarteau (ORNL), Francesco Forti (Pisa), Gerardo Herrer Corral (CINVESTAV), Kazunori Hanagaki (KEK), Peter Krizan (Ljubljana/JSI), Gobinda Majumder (Tata, Mumbai), Petra Merkel (Fermilab), Eugenio Nappi (Bari), Inkyu Park (Seoul), Fabrice Retière (TRIUMF), Felix Sefkow (DESY), Ian Shipsey (Oxford), Yuriy Tikhonov (Budker, Novosibirsk), Hongbo Zhu (IHEP).

- **Process**
  - Nomination by September 2021
  - Review by committee
    - Completed in December 2021
  - Announcement January 2022
  - Award ceremony at the Vienna or Pisa advanced detector conferences in 2022

- **Yearly Award**
  (nomination valid for 3 years)
  - **The transformer**: a junior individual whose contribution to instrumentation is promising major advance
  - **The enabler**: and individual or team whose contribution to instrumentation is enabling major advances
  - **The Game changer**: a team having developed a game-changing technology for particle physics

F. Retiere

TIPP Series: Science-Driven Cross-Disciplinary Conference

- ✓ Established in 2009 by C11/IUPAP, originally conceived as the "Rochester conference in Instrumentation" → alternate with VIENNA, ELBA conference series; same year as INSTR

- ✓ Remarkable progress achieved during the last decade, still recognition of the conference is not yet at the level of ICHEP or Lepton-Photon in particle physics community
  → address how is the conference different from IEEE, industry participation, etc …

- ✓ The TIPP Steering Committee has been established in 2020 with a formal mandate from C11/IUPAP to set up a long-term leadership ensuring strategic view, continuity and tradition

TIPP Steering Committee	Membership (2021 - 2023)
Niels van Bakel	Nikhef, Amsterdam, NL
Ties Behnke	DESY Hamburg, Germany
Marcel Demarteau	ORNL, USA
Francesco Forti	INFN / University Pisa, Italy
Kazunori Hanagaki	KEK, Japan
Manfred Krammer	CERN, Switzerland
Petra Merkel	Fermilab, USA
Fabrice Retiere	TRIUMF, Canada
Yuri Tikhonov	BINP Novosibirsk, Russia
Maxim Titov	CEA Saclay, France
Yifang Wang	IHEP, Beijing, China

C11/IUPAP and TIPP SC Joint Meeting on May 25, 2021:

- ✓ 4 proposals for TIPP 2023 conference site has been reviewed → final decision based on C11 vote

- ✓ Preliminary discussion of TIPP SC functions, rotation of members, bylaws

If you have any inputs or suggestions, please contact: tipp-steer@desy.de

TIPP 2021 Local Organizing Committee

Thanks for a wonderful and stimulating conference and thank you for your generosity in organizing the conference.

F. Retière (TRIUMF)

I. Trigger (TRIUMF)

D. Giasson (TRIUMF) Website

J. Thomson (TRIUMF) Conference org./ proceedings

PA. Amaudruz (TRIUMF)

F. Corriveau (McGill/IPP)

C. David (York)

C. Hoehr (TRIUMF)

N. Ilic (Toronto/IPP)

A. Konaka (TRIUMF)

L. Kurchaninov (TRIUMF)

J. Mammei (Manitoba)

N. Park (Queen's)

L. Poley (SFU/TRIUMF)

JF Pratte (Sherbrooke)

S. Scorza (SNOLAB)

B. Stelzer (SFU)

S. Viel (Carleton)