

**Meenakshi Narain – a Leader
Memorial Symposium
Mar. 3, 2023**

Joel Butler
Fermilab/CMS/DPF



First Contact

- How I first met Meenakshi – or project management from a shopping bag
- Conclusion: This person will go far!

Leaders provide vision, convince people to join and to implement plans to achieve them, overcome challenges along the way, and nurture the people who must carry the program forward. The record speaks for itself!



Dialectics

- Meenakshi and I have had, over the years, many “animated” exchanges, which I would characterize as **dialectics**
 - A **Dialectic** is a discourse between two or more people holding different points of view about a subject but wishing to establish the truth through reasoned argumentation (From Wikipedia)
- We usually agreed on principles, but sometimes not on implementations or strategies
- Our media of choice was the phone and later SKYPE
 - Our calls often started in the early evening and went on for hours
 - We always arrived at a good point
 - I will miss them



Talk Outline

- LPC co-coordinator
- CMS Upgrade Performance Studies Coordinator
- US CMS CB chair
- Snowmass Energy Frontier Convener/P5 nominee
- Concluding remarks

- We have seen Meenakshi's physics contributions. Now we will recall her leadership, especially in the period after she joined CMS in ~2006. We will see examples of her vision, planning and organization, actions, and their successful outcomes, even in challenging times
- Apologies, many of these were done in collaboration between Meenakshi and others, but for today, the focus will be on Meenakshi.



LPC Coordinator

Jan 2013 – Dec 2016



What is the LPC?

From Sarah Eno's slides at uscms meeting at Princeton - 2004

An attempt to reproduce the benefits of being at the lab in our time zone, on our side of the Atlantic.

- a **critical mass** (clustering) of young people who are actively working on software (reconstruction, particle identification, physics analysis)
- one stop shopping for your analysis questions
- analysis tools such as large meeting rooms, video conferencing, large scale computing, “water cooler”
- virtual control room for active participation in the running and quality control of the experiment



LPC at 10





LPC Activities

- Variety of very successful activities
 - Events (CMSDAS, workshops, tutorials, ...)
 - Topic Of The Week (TOTW)
 - Physics Forum (PF)
 - Coffee Hour (CH)
- They are all very popular, very well attended
- Many initiated by members of the community or by one of the LPC committees





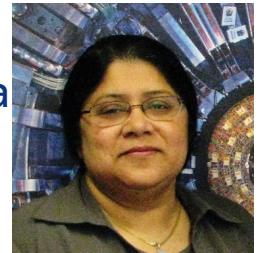
Snowmass (2013!) Activities

- The Snowmass meeting will shape the priorities for the US high energy physics program in the coming decade
 - it is important that CMS is well represented at this meeting.
 - We must ensure that the case is made for a strong investment into the energy frontier, and maintaining a cutting edge EF program in the US.
- The vibrant members of the LPC, especially but not exclusively its Fellows, are in a unique position to contribute to this effort and define the future vision
 - and in a relatively short time add significantly to their CV and their "fan club" (make a name among wider audience)
- LPC is taking the lead in
 - defining the tools for simulation & we had made quite an impact in shaping the dialogue.
 - Thanks to Lothar and the OSG crew, we now have an "opportunistic system" to generate large background samples for NP and other groups.
 - here both ATLAS and CMS/LPC members have made valuable contributions.



LPC-Related News Items...

- Deadline for applications for LPC Distinguished Researcher in 2017 is June 1
 - Apply and/or encourage your colleague(s) to apply
- **Meenakshi Narain will be stepping down as LPC co-Coordinator due to her new appointment in the CMS Upgrade Performance group**
 - Search for LPC co-Coordinator is undergoing...
 - On behalf of CMS, USCMS, and the LPC community - many, many thanks to Meena for doing an outstanding job for 4 years!!





Connection with CMS Upgrade Activities

- It is often difficult for students or even postdocs to experience all phases of a particle physics experiment.
 - Especially the experience with hardware may be lacking depending on their timing.
- The upgrade program can provide such experience and via the LPC connect with students (and their groups) to the hardware efforts.
 - For this purpose we plan to work with USCMS L2 project managers of the various upgrade efforts to identify areas that need additional manpower.
 - LS1 work has started but still there are efforts which are not well supported
- In view of the phase 2 upgrades it will be important to develop the motivation for the upgrades through example physics topics.



DPF2011 at Brown

Meeting of the Division of Particles & Fields of the American Physical Society

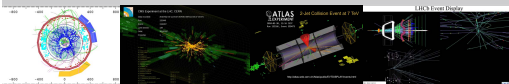
August 9-13, 2011, Providence, RI

at Brown University & Rhode Island Convention Center



<http://www.brown.edu/dpf2011>

CP-Violation
BSM Physics
Fields & String Theory
High-Energy Gamma-ray and Neutrino
Astrophysics
Early Universe & Cosmology
Astroparticle Physics and Cosmology
Dark Matter Searches
Hadron Spectroscopy
Perturbative and non-Perturbative QCD
Heavy Ion Physics
Neutrinos
Heavy Flavor Physics
Top Quark Physics
Electroweak Physics
Higgs Physics
Detector R&D
Lepton Collider Physics



Local Organizing Committee

David Cutts (co-chair)
Ulrich Heintz (co-chair)
Ian Delf Antonio
Richard Gaiskill
Gerald Guralnik
Anat Jevicki
Savvas Koushiappas
Greg Landsberg
Robert Lanco
David Lowe
Meenakshi Narain
Thomas Spear
Marcus Spradlin
Chung-I Tan
Gregory Tucker
Anastasia Volovich

Scientific Organizing Committee

Meenakshi Narain (chair)
Chip Brook
Claudio Campagnari
David Cutts
Dmitri Denisov
Ulrich Heintz
Kara Hoffman
Anat Jevicki
Boris Kayser
Greg Landsberg
Patricia McBride
Alexey Petrov
Jim Pflieger
Steve Ritz
Kate Scholberg



DPF 2011 was exciting because we were finally beginning to get large amounts of data from the LHC and many other great things were happening.


But a special highlight of this meeting was the New England style lobster bake, with all the lobster you could eat. The great food led to a relaxed climate and an excellent social and networking experience (reminding me of my summers along the north shore of Massachusetts)



CMS Upgrades and Upgrade Performance Studies Group (UPSG) Coordinator 2016- Aug. 2018




US CMS Tracker for HL-LHC Upgrade



USCMS Outer Tracker Workshop

Brown University
Thursday, 18 June - Friday, 19 June 2015
Barus & Holley Building, 182 Hope Str., Providence RI-02912



Organized by:

Meenakshi Narain (Brown University)
Ulrich Heintz (Brown University)
Ronald Lipton (Fermi National Accelerator Lab.)

Logistics: [Mary Ann Rotondo](#) and [Stefan Piperov](#)

Meenakshi Narain, *Brown University*

USCMS Meeting, July 10, 2015



7/10/2015

Brown OT workshop summary

1

- On the Tracker, Meenakshi asked: What is US CMS going to do and who will do it? She encouraged the US institutes to define their scope on the outer tracker and how the responsibilities would be distributed. She served as the L3 Manager for Module Assembly.
- As UPSG Convener, she helped push out the HL-LHC TDRs for all the sub-detectors



Yellow Report for European Strategy Group Dec 2018

- The executive summaries and the Yellow Reports are being submitted to the European Strategy group
- CMS contributed forefront results to all 5 working groups - both HL-LHC and HE-LHC (27 TeV) studies.
 - Executive summaries:
 - HL-LHC: <https://twiki.cern.ch/twiki/pub/LHCPhysics/HLHELHCWorkshop/report.pdf>
 - HE-LHC: <https://twiki.cern.ch/twiki/pub/LHCPhysics/HLHELHCWorkshop/HEreport.pdf>
 - WG1: <https://cds.cern.ch/record/2650160?ln=en>
 - WG2: <https://cds.cern.ch/record/2650162/>
 - WG3: <https://arxiv.org/abs/1812.07831>
 - WG4: <http://arxiv.org/abs/1812.07638>
 - WG5: <https://arxiv.org/abs/1812.07638>
- 33 PAses are public. Results included in the YR reports and executive summary
 - 8 more to go - will be included in the v2 (end of January)
 - USCMS statistics
 - ★ 11 PAS as contact authors (33%)
 - ★ 14 PAS as ARC chairs (42%)
 - ★ (many more authors and ARC members contributed!)
 - ★ 2 out of 5 working group conveners (Keith Ulmer, Yen Jie Lee)
- **Thank you to all members (analyzers, authors, ARCs)**
- **Thank you to Boaz Klima (pubcomm) & Physics Coordinators (Tulika Bose, Wolfgang Adam) !**

CONGRATULATIONS

25th Rencontre du Viet Nam Windows on the Universe- 2018



SCIENTIFIC PROGRAM COMMITTEE

Particle Physics Conference

Meenakshi **Narain** (Chair)
Brown University, Providence, USA





US CMS CB chairperson 2019 - 2022



US CMS CB Chair Candidacy Talk

- Joined CMS in 2007
- Service to the CMS Experiment:
 - ★ Sep'17-Aug'18 **Co-Chair CMS Diversity Office**
 - ★ 2016-Aug'18 **Co-Convenor Upgrade Physics and Performance Studies**
 - ★ Since 2016 **L3 manager for U.S.CMS HL-LHC Outer Tracker Modules**
 - ★ 2017 **Member, Management Board, LHC Physics Center, Fermilab**
 - ★ Jan'13-Dec'16 **Coordinator, LHC Physics Center, Fermilab**
 - ★ 2013-2015 **Member CMS Schools Committee**
 - ★ 2011-2012 **Co-convenor, CMS B-tagging and Vertexing (BTV) group**
 - ★ Sep 2009-2010 **Co-convenor, Resonances subgroup of CMS Exotica Group**
 - ★ Since 2010 **Member - CMS Tracker DAQ operations**
 - ★ 2007-2009 **Lepton+Jets+Missing ET physics group co-convenor at the LPC**
 - ★ 2007-2010 **CVo-coordinator for Hadron Calorimeter Databases**
 - ★ 2006-2007 **b-tagging group co-convenor at the LPC**
- HEP Community:
 - ★ Member, APS DPF Fellowship Selection Committee, 2018
 - ★ Member, APS DPF Panofsky Prize Selection Committee, 2017-2018
 - ★ Member, DPF Nominations Committee for Executive Committee, 2012-2014
 - ★ Fellow of the American Physical Society.
 - ★ Member, Board of Directors, Quy Nhon Science and Education Foundation
 - ★ Consultant, Particle Data Group (2002 – present) – Review of Particle Properties: Dynamical electroweak symmetry breaking (<http://pdg.lbl.gov/>)
 - ★ Reviewer of LSST operations, Belle II operations, ANL, NSF and DOE proposals for base grant and Early Career Awards including Panel Reviews.
- University:
 - ★ Oct 2016: Affiliate Faculty, Data Science Initiative
 - ★ Since Fall 2017: Member, Data Science Initiative Campus Advisory Board
 - ★ Since Fall 2017: Member Advisory Board GWiSE
 - ★ Since Oct. 2017: Member Advisory Board "Presidential Scholars Program"
- + more in CV...

Elected in 2017. Reelected in 2020 for two more years. Both times with Sara Eno as Vice-chair - **an outstanding team!**



Seeking Nominations for Snowmass Conveners

- **Nominations deadline: November 15, 2019.**

- **Convener Nomination:**

- We will solicit nominations of conveners for the working groups that will become the main organizing bodies for workshops, white papers, and the final summary paper.
- The DPF Executive Committee will select the co-conveners for the major topics from among the nominations. Our intention is to pair junior and senior career scientists, as well as appropriate representation of theory vs experiment.

- Snowmass topics

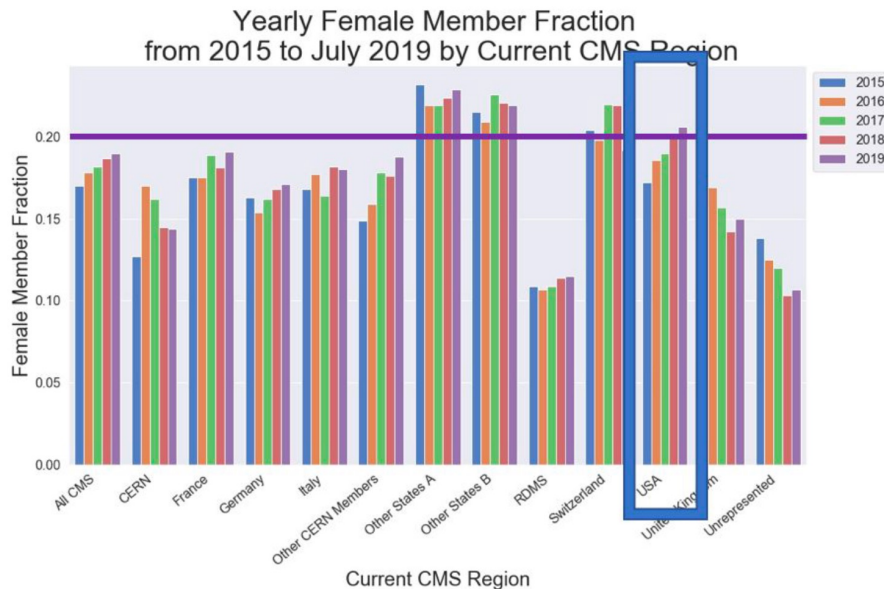
- Snowmass announcement

- the announcement has the details of the roles of the conveners and also estimated time commitment expected from the conveners
- We seek two conveners for each of the major categories.
- Nominations can be submitted for all conveners: physics frontier, enabling infrastructure, or one of the topics.



Representation 2019

- Trends in CMS membership by region, and gender





US CMS Constitution Revision

May 2019

- **Goal:**

Review the US CMS constitution and evolve it to make it commensurate with the needs of the collaboration.

Some examples of issues we may review:

- the roles of the IBs
- interactions of the collaboration with the Operations program, Phase-2, and Fermilab management.
- the mechanism for providing input from the collaboration
- advisory boards for operations, phase-2 and the research programs !

- **Committee Members:**

Kevin Black, Kevin Burkett, Joel Butler, Sridhara Dasu, Harvey Newman, Toyoko Orimoto, Nick Hadley (co-chair), Meenakshi Narain (co-chair),
ex-officio: Sarah Eno, Lothar Baudedick, Steve Nahn

- **A side effect:** I'd like to propose that we wait for next round of IB elections until we have a chance to review the constitution
 - in the regular schedule these would have to be conducted soon.



CMSDAS – Jan 13-17, 2020





APS Site visit to US CMS

Feb 2020

- We had contacted APS women in Physics committee for improving the climate for underrepresented groups to arrange a site visit.
(<https://www.aps.org/programs/women/sitevisits/index.cfm>)
 - Such visits have been useful in the past in helping community members find ways to encourage members of underrepresented groups.
 - US ATLAS organized such a visit in 2017
- **APS site visit to assess the climate for women in USCMS will be held on April 8 and 9, 2020 at Fermilab.**
 - **PLEASE SAVE THE DATE - And plan to travel to Fermilab!**
 - **This committee will meet with all constituencies (students, postdocs, scientists/faculty - both junior and senior levels) and is OPEN to all, and not only to female or female identifying members.**
- LPC has kindly agreed to help with hosting the event. Thank you!
- The APS committee will consist of 4 members.
- We have formed a USCMS team to help the APS committee to organize their visit [will confirm and announce it soon!]
 - we will need to do an internal assessment prior to their visit.
 - more info will be provided as we understand the schedule and the structure of the visit.



AAPI Support

May 2020

- In May we celebrate the multitude of diversity represented in the Asian, Asian American and Pacific Islander population.
- We highlight the awareness of
 - unity surrounding the heritage, and culture of our AAPI colleagues, friends and neighbors across the country, and the world.
 - to inequities still faced by AAPI community:
 - ★ the community has faced racial injustice [Chinese Exclusion Act of 1882; the internment of Japanese-Americans during World War II...]
 - ★ More recently amid the COVID-19 pandemic, there has been a tragic increase in anti-AAPI rhetoric and crimes.
- We acknowledge this an opportunity to learn about the social issues facing our AAPI Colleagues and friends and we take an active stand against acts of hate and racial inequities.
- We have invited a few colleagues to share with us their experiences navigating in USCMS, CMS, their universities, and the community at large, including how we can continue to support them.
 - Toyoko Orimoto, Xuan Chen, and Jess Wong.
- We will also hear from Harold Kim about AKPA and its activities.



Day of Reflection in support of Strike for Black Lives Matter June 10, 2020

- We hosted day of reflection in support of STRIKE FOR BLACK LIVES on June 10th. About 525 colleagues from LHC experiments attended
- Perspectives and Potential Steps Forward from the “Day of Reflection”
 - USCMS ED&I Committee reviewed the feedback collected from the event and summarized it in broad categories
- Framing the Discussion:
 - We can and should examine how the issue affects us all, as we are all entering the conversation at different points in our understanding & knowledge.
 - Response to racism needs to be a priority and “not just a hobby.”
 - A goal is to step out of our comfort zones, take risks, and push for much-needed change.
 - Statements from individual institutions are important as well.
- Structuring the Response
 - Frequency: We should be talking about antiracism more.
 - Suggestion was made to make this a regular topic in venues like working group meetings and group lunches.
 - Origin: Commitment to do better needs to be clear and evident from the top (leadership) down.
 - Boundaries: We need to find a way to establish the parameters of accountability for racist words/actions/etc.



COVID Impact July 2020

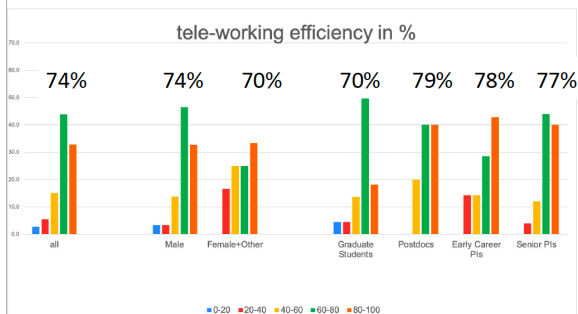
- As HEPAP members Mike Hildredth and Meenakshi Narain conducted a survey of the US HEP community to assess the impact of COVID-19 on research.
- Results were presented at the HEPAP meeting on July 9th:
[Link to slides](#)
- We have analyzed some results in the context of US CMS:
[numbers in %]

		visibility	peer	social	zoom
		negative	negative	negative	negative
All		50.0	29.5	56.0	53.3
Male	79.7	45.1	24.6	54.2	54.2
Female+Other	20.3	71.4	40.0	64.3	38.5
Graduate Students	29.7	38.1	30.8	75.0	78.3
Postdocs	20.3	47.1	38.9	56.3	47.1
Early Career PIs	9.5	66.7	30.0	57.1	50.0
Senior PIs	35.1	50.0	17.2	44.8	44.8

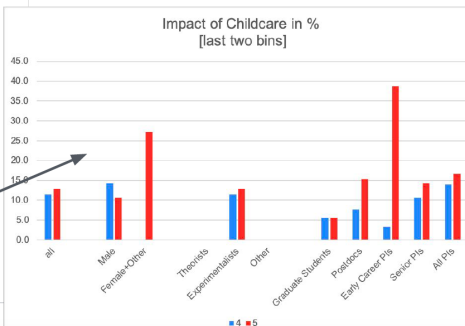
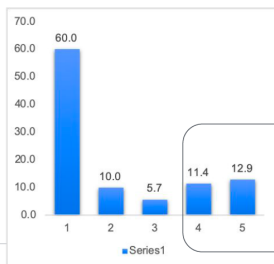
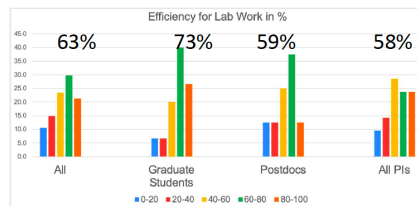


COVID Impacts - Efficiency

home-office efficiency [74%]



efficiency in lab [63%] [if lab open]





US CMS Constitution revision - Nov 2020



- The revisions to the US CMS Constitution have been approved by the US CMS CB. https://uscms.org/uscms_at_work/collaboration/constitution.shtml
- Thank you to all who voted and all those who commented and made the revisions better.
- Many thanks also to **John Conway** and **Kaori Maeshima** for organizing the voting for the ratification of the US-CMS Constitution
- We also thank the US CMS Constitution Review Committee for their extensive help with the major update over the 1.5 year long effort:
Sridhara Dasu, Lothar Bauerdick, Kevin Black, Kevin Burkett, Joel Butler, Sarah Eno, Nick Hadley, Steve Nahn, Narain, Harvey Newman and Toyoko Orimoto!
- Motivated by diminishing Research Program while science is getting harder. All US CMS Collaboration institutions are affected
 - Operations have become harder to support
 - ★ Relies on students/postdocs/scientists
 - Upgrades rely on un-costed labor
 - ★ Expectation is that un-costed labor is funded by the Research Program
- Updates strengthen US CMS elected offices, by sharpening their focus, so that they can help in the execution of both operations and upgrade projects



CMS DEI Task Force – Aug 2020

- The charge, and the D&I memo from 300+ collaboration members are available at <https://indico.cern.ch/event/939917/>.
- The VOTE on CMS Task Force on D&I in management appointments was open on Aug 17.
- The voting will close on Aug 31.
- The CMS CBI reps received the e-ballots
- We encourage all CBIs to vote for this task force.
- A supportive vote would be much appreciated by many of us in USCMS.



Advocating for Snowmass – June 2020

- The main snowmass twiki is <https://snowmass21.org/start>
 - email list: snowmass@fnal.gov [join via listserv subscription ,instructions on wiki]
 - Slack: <https://snowmass2021.slack.com/>
- And a few pages of interest below (there are 10 frontiers)
- Energy Frontier: <https://snowmass21.org/energy/start>
- Computational Frontier: <https://snowmass21.org/computational/start>
- Instrumentation Frontier: <https://snowmass21.org/instrumentation/start>
- Accelerator Frontier: <https://snowmass21.org/accelerator/start>
- Community Engagement: <https://snowmass21.org/community/start>
- Snowmass Calendar of meetings and workshops
 - <https://snowmass21.org/meetings/start>
- We encourage you to please sign up and engage in this process.
- Please join the mailing lists of your interests, as they are topical groups in each frontier, with their mailing lists and discussion channels on Slack
- **We will only be posting notifications for major workshops and meetings on cms-us-all mailing list.**
 - please note, we will not be posting eregular mails from all frontiers and their subgroups.



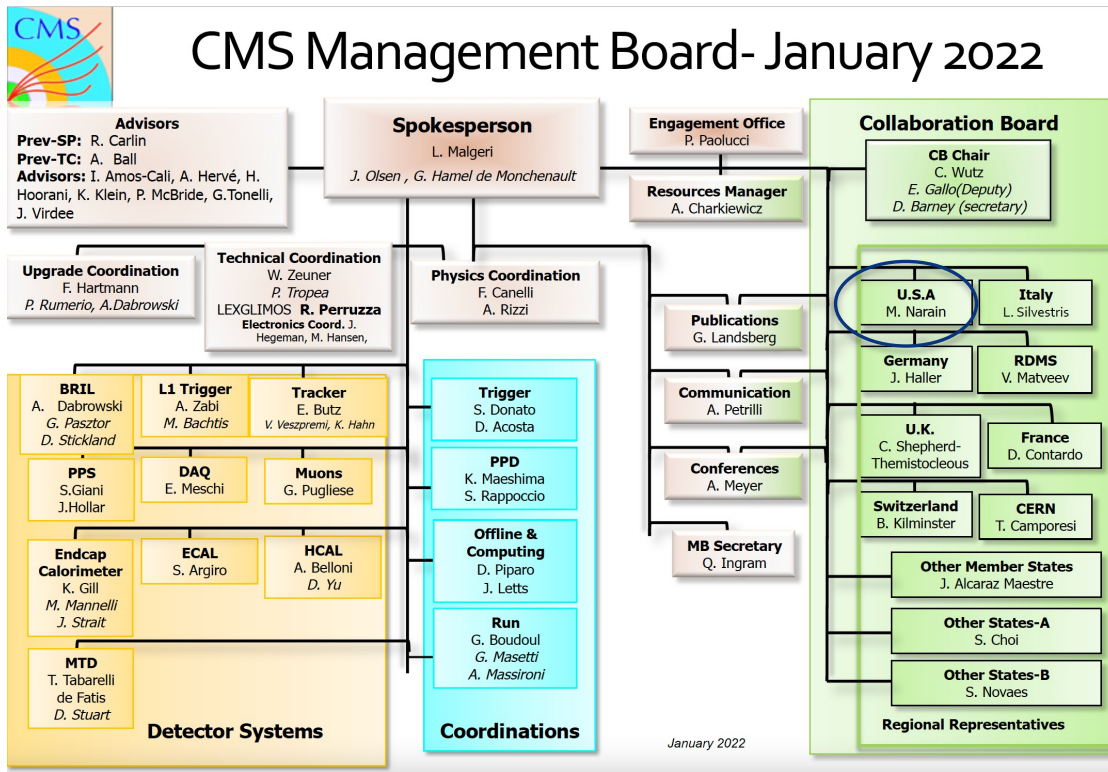
US CMS DEI Plan July 2021

- In the context of the NSF funding of USCMS operations, we were requested to develop a plan for Diversity, Equity and Inclusion.
- We formed a writing team [Ken Bloom, Julie Hogan, Narain and Farrah Simpson]
- The plan was vetted by
 - USCMS DEI Committee
 - USCMS Advisory Board
 - The feedback by them is much appreciated! Thank you
- The plan is posted at the link below and available for your review:

<https://drive.google.com/file/d/1cwtXUL2FS4momxXYHsPbvMYpbKUqrBEj/view?usp=sharing>



US Regional Representative on CMS MB





TFDI – Sept 2021

- Task Force on Diversity and Inclusion (TFDI) report
<https://cms-docdb.cern.ch/cgi-bin/DocDB/ShowDocument?docid=14276>
- High-Level Recommendations 1 – 4 and 6 – 8 were approved and the associated detailed recommendations were approved **as advisory** to the team charged with implementing the recommendations.
- No consensus on High-Level Recommendation 5 (HLR 5):
“A formal committee to provide oversight of diversity, equity and inclusion in management appointments and other activities shall be instituted.”
- When the CB fails to reach consensus on an issue, Article 2.10 of the CMS Constitution stipulates what must be done:
“If a situation should arise where a consensus cannot be reached, a time scale shall be set for the decision to be reached at a later date. The relevant arguments will be documented and distributed to the Collaboration Board. The matter will then be decided at a subsequent meeting of the Collaboration Board, by a vote if necessary. Usually a simple majority (i.e., the option receiving the most votes) of those present who are eligible to vote will decide the issue, ...”



Snowmass Agora – June 2022

- A series of events, intended for all colleagues across frontiers
- Discuss physics & technical aspects of different classes of colliders [both near and far future], that share similar concepts and to specifically address both physics and feasibility.

Wednesdays 3-5 p.m. CST.]

- Dec. 15, 2021 - Linear e+e- colliders
- Jan. 19, 2022 - Circular e+e- colliders
- **Feb. 16, 2022 - Muon colliders**
- Mar. 16, 2022 - Circular pp and ep
- Apr. 13, 2022 - Advanced colliders

A ``Collider discussion'' will be further organized during the Energy Frontier Meeting planned for the week of March 28.

- The events are organized by Energy and Accelerator frontiers, and hosted by the Future Collider initiative at Fermilab.
 - Program Committee:
 - EF conveners: Meenakshi Narain, Laura Reina, Alessandro Tricoli,
 - AF conveners: Steve Gourlay, Tor Raubenheimer, Vladimir Shiltsev
 - Fermilab Future Colliders group: Pushpa Bhat, Joel Butler



Mentorship Program – May 2021

- Mentorship program started in 2020
 - About 50 mentor/mentee pairs
 - Kickoff meeting in spring followed by ~monthly encouragement for pairs to meet virtually
 - Groups met through December 2020
- Restarting for summer 2021!
 - **Hope** for the same or more mentor/mentee pairs
 - **Hope** to do some in-person activities when we resume things like USCMS annual meetings!
 - **Ideas** for all-mentee or all-mentor meet-ups in late summer / fall
- [You can sign up now](#)
 - Also linked on our USCMS Mentorship TWiki
<https://twiki.cern.ch/twiki/bin/view/CMS/USCMSMentoring>
- Planning a kickoff Zoom meeting June 7 or 8



Demographics Database for US CMS – Feb 2022

- We have been working on database for U.S. CMS
 - derives basic information from CMS
 - please note that it does not bring over all information from the CMS
 - extends the CMS information for each member. Some examples are:
 - ★ Personal Identifiable Information
 - ★ professional level [higher granularity]
 - ★ USCMS operations activity areas
 - ★ USCMS HL-LHC activity areas
 - ★ residency location - CERN, LPC etc.
- Last few checks and validations being done.
- We will need everyone's cooperation in the USCMS collaboration to fill their Personal Identifiable Information individually.



Feb. 25, 2022

We strongly condemn the horrific events and the violation of fundamental human rights in Ukraine.

We stand in solidarity with our friends and colleagues from Ukraine





Snowmass/P5

Organization in Ten “Frontiers” -I

Accelerator



Steve Gourlay
(LBNL)



Tor Raubenheimer
(SLAC)



Vladimir Shiltsev
(FNAL)

Cosmic



Aaron Chou
(Fermilab)



Marcelle Soares-Santos
(U.Michigan)



Tim Tait
(UC Irvine)

Community Engagement



Kétévi Assamagan
(BNL)

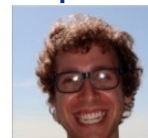


Breeze Quinn
(Mississippi)

Computing



Steven Gottlieb
(Indiana U.)



Ben Nachman
(LBNL)



Daniel Elvira
(FNAL)

Energy



Meenakshi Narain
(Brown U)

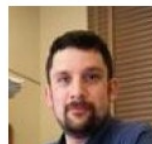


Laura Reina
(FSU)



Alessandro Tricoli
(BNL)

Instrumentation



Phil Barbeau
(Duke)



Petra Merkel
(FNAL)



Jinlong Zhang
(ANL)



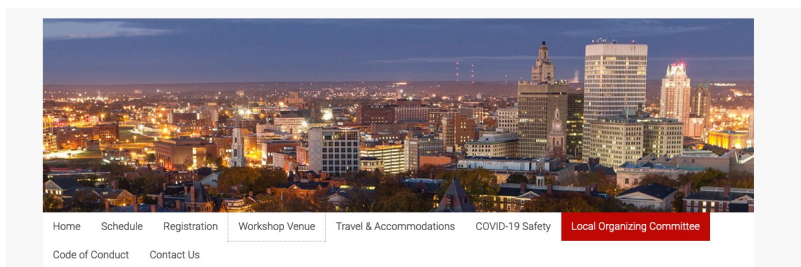
Ready, set, stop or pause or slowdown★

- Snowmass was off to a great start with a successful Community Planning Meeting in Nov 2020 at FNAL, already well into the COVID Pandemic
- By early 2021, it became clear that COVID would have a major impact on our ability to carry out the necessary work because of
 - Lack of face-to-face meetings reduced efficiency
 - Heavy burdens fell on our physicists, especially young physicists with children, who now needed to care for them all day and school them at home
- We agreed to delay Snowmass and P5 by one year, to 2022/23.
- We decided to take a ~7month pause/slowdown with the expectation that conditions would improve because of vaccines and mitigation measures
- The pause/slowdown began in January of 2021
- The startup dates varied among the frontiers, but by September everything was restarted and there was a **"Snowmass Day" on September 24, 2021**, to review the plans for completing the work in for the July 2022 meeting

The Energy Frontier argued for a flexible approach and implemented a "slowdown" from which they recovered very efficiently



Energy Frontier Community Study Workshop



Local Organizing Committee

Our local organizing committee consists of representatives from our faculty, graduate and undergraduate students, and physics staff.

Faculty and Staff Organizers



Meenakshi Narain
Professor of Physics
Chair



Jiji Fan
Professor of Physics
Co-Chair



Ulrich Heintz
Professor of Physics
Co-Chair



Jesse Tessier
Administrative Coordinator
Department of Physics



Pete Bilderback
Program Manager
Department of Physics

These were among the early (partially) in-person workshops and required special care from the organizers and commitment from the community to be safe

Snowmass Community Summer Study and Workshop



03/03/2023

Meenakshi Narain - a Leader



Community Summer Study Hybrid Workshop



12/8/22



For her efforts, the Report and the Summary Chapter

This volume is dedicated to the memory of
Meenakshi Narain (1964-2023),
in honor of her many contributions to
Snowmass 2021.

6

Energy Frontier

Frontier Conveners: Meenakshi Narain[†], Laura Reina, Alessandro Tricoli

Topical Group Conveners: Michael Begel, Alberto Belloni, Tulika Bose, Antonio Boveia, Sally Dawson, Caterina Doglioni, Ayres Freitas, James Hirschauer, Stefan Hoeche, Isobel Ojalvo, Yen-Jie Lee, Huey-Wen Lin, Zhen Liu, Elliot Lipeles, Patrick Meade, Swagato Mukherjee, Pavel Nadolsky, Simone Pagan Griso, Christophe Royon, Michael Schmitt, Reinhard Schwienhorst, Nausheen Shah, Junping Tian, Caterina Vernieri, Doreen Wackerroth, Lian-Tao Wang

Other Contributors: Dmitri Denisov, Sergey Gleyzer, Peter Onyisi, Manuel Franco Sevilla, Maksym Titov, Daniel Whiteson



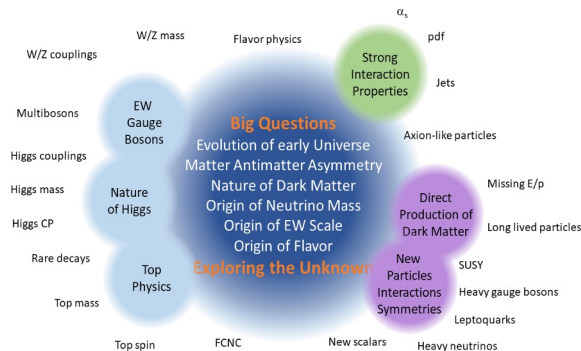
Comments from EF co-conveners

- Alessandro: She had an incredible knowledge of the people in the community, and she had a tremendous skill and experience at leading such large groups. She was always the person to go to for guidance and directions. I also found extremely comforting to have her backing in difficult discussions, in other words I was very happy to be on the same side of the table with her.
 - One concrete example of her unmatched skill in leading large groups and finding agreement among different views, I want to mention the back-to-back meetings that she insisted to arrange in order to start and then converge on the EF report and its vision. She very strongly suggested that we needed to have a meeting with all the TG convenors in a single room at FNAL on June 6-7, then one meeting with all proponents of the various projects, which we arranged at Stony Brook in June 13-15. She very firmly wanted only a limited number of people from each collaboration at the Stony Brook meeting, so she turned down offers from people to attend. ... we immediately realised when we got together that those meetings were essential.
 - Those meetings gave us the confidence of having the backing of all proponents for our vision, who we could present and defend in the Seattle meeting.
 - She worked relentlessly, and led by example: she encouraged all of us to keep being committed and motivated. She really cared about the future of our field and the future of young generations of scientists.
 - It is not an overstatement to say that the EF vision is her vision, which we all share. That is her most recent enduring legacy.
- Laura: She was a great scientist with a very broad view of the field, eager to share her experience but also very receptive of other people's ideas and always keen to promote young people's success. Her contribution to the work we did together for Snowmass 2021 has been immense, at all levels, from brainstorming about the future of the field, to getting people involved and supporting their work in building what has become the EF vision from Snowmass 2021. Among so many things I admired of Meenakshi was her passion and dedication to what she believed in as well as her passion for life, for people, for sharing good moments together.



Energy Frontier Summary

- Compared to Snowmass 2013 the physics landscape has significantly changed
 - The program of measuring the Higgs boson properties is well underway at the LHC with growing precision
 - A broad range of searches have explored multiple BSM scenarios without convincing evidence of new physics
 - The HL-LHC is an approved project
- Without a robust support for the HL-LHC and a clearly defined path towards a Higgs factory we leave critically important physics unchecked and crucial questions unanswered
- The EF community should be prepared to explore a broad range of BSM phenomena at the 10 TeV mass scale



The Energy Frontier community voices a strong support for

1. HL-LHC operations and 3 ab^{-1} physics program, including auxiliary experiments
2. The fastest path towards an e^+e^- Higgs factory (linear or circular) in a global partnership
3. A vigorous R&D program for a multi-TeV collider (hadron or muon collider)



The EF Vision fully supported by a 121-page report

For the five-year period starting in 2025:

1. Prioritize the HL-LHC physics program, including auxiliary experiments,
2. Establish a targeted e^+e^- Higgs factory detector R&D program,
3. Develop an initial design for a first stage TeV-scale Muon Collider in the US,
4. Support critical detector R&D towards EF multi-TeV colliders.

For the five-year period starting in 2030:

1. Continue strong support for the HL-LHC physics program,
2. Support construction of an e^+e^- Higgs factory,
3. Demonstrate principal risk mitigation for a first stage TeV-scale Muon Collider.

For the five-year period starting in 2025:

1. Continuing support of the HL-LHC physics program to the conclusion of archival measurements,
2. Support completing construction and establishing the physics program of the Higgs factory,
3. Demonstrate readiness to construct a first-stage TeV-scale Muon Collider,
4. Ramp up funding support for detector R&D for energy frontier multi-TeV colliders.



P5





Farewell: a Last Imagined Dialectic

Meenakshi was always on the side of peace and solving problems by reasoned debate. Is the next slide, which employs a military metaphor, appropriate?





Missing Pilot Formation

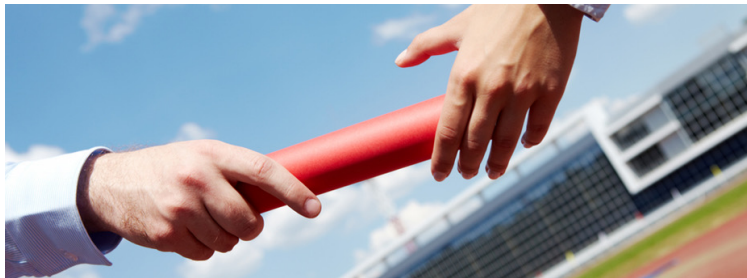


Rosemary Mariner, Pathbreaking Navy Pilot and Commander, Is Dead at 65. All four jets were, for the first time, flown by women pilots.



“... Men and women are not content to comfort themselves with tales of gods and giants, or to confine their thoughts to the daily affairs of life; they also build telescopes and satellites and accelerators, and sit at their desks for endless hours working out the meaning of the data they gather. The effort to understand the universe is one of the very few things that lifts human life ...”

Steven Weinberg, The First Three Minutes



The baton has been passed. Let us try to achieve Meenakshi's vision.

**Thanks to Boaz, Ulrich, Alessandro, and
Laura for contributing to this talk
and
Thank you for your attention!**

Backup Slides



Month/year	Location	Zone
June, 2019	CUA/DC	East
May, 2018	Minneapolis	Central
May, 2017	Wayne State	Central
May, 2016	Texas A&M	Central
May, 2015	Cornell	East
May, 2014	UC Davis	West
May, 2013	Vanderbilt	Central
May, 2012	Colorado	Central
May, 2011	Notre Dame	Central
May, 2010	Brown	East
May, 2009	Virginia	East
May, 2008	Puerto Rico	East
May, 2007	Caltech	West
April, 2006	Nebraska	Central
April, 2005	Fermilab	Central
April, 2004	Princeton	East
April, 2003	Santa Barbara	West



Energy Frontier Workshop

- **Date: March 28-April 1, 2022**
- Location: Brown University
- Planning for a “hybrid” meeting.
 - request pre-registration at the link [“pre-registration form”](#)
 - An in-person presence will be most appreciated.
 - ★ goal to have at least 50 in-person participants to make it viable
- Goal of the EF community workshop is to
 - regroup after the submissions of the contributed papers.
 - These contributed papers will serve as the basis of the discussion which will define the topical group reports
 - formulate our vision (and not priorities) for the Energy Frontier
 - discuss format of the final reports.



Dealing with the Unexpected

COVID-19 Safety

*Brown University abides by public health guidance and health and safety protocols to reduce the risk of transmission of COVID-19. Event attendees, including visitors and guests, must comply with all University policies and protocols in place at the time of the event, including **current University policy regarding face masks and coverings (see the University's COVID-19 Campus Activity Status page for the current policy for both vaccinated and unvaccinated individuals).***

The current policies are listed on the site "[Healthy Brown](#)". In particular for visitors, the policies are detailed on the page "[Visitors & Guests](#)". Our participants may fall into "**short term**" and "**limited duration visitors.**"

Proof of vaccinations, and masks will be required for attending the event in person and no exceptions will be made. As a proactive measure, the organizers of this event also require the participants to take a covid-19 test on their own before they come to campus. If you cannot test prior to arriving on campus, then please pickup a covid-19 rapid self test from Prof. Meenakshi Narain before attending the sessions.

We will keep the community informed if conditions change.

Short-term visitors are those who visit campus four full days or more over the course of a month. They are required to sign an on-line form for up to date vaccination attestation form. **The form will be provided to visitors after they register.** Requests for exemption from the vaccination requirement from short-term visitors will not be considered; if these visitors are not up to date with their vaccinations against COVID-19, they must engage with the University virtually. However, if the visitor is an individual with a disability, the individual may seek a reasonable accommodation (see the website on how to request it). Short-term visitors must abide by the [COVID-19 Campus Safety Policy](#).

Limited-duration visitors are those who visit campus three days per month or less. Limited-duration visitors are generally not required to sign an up to date vaccination attestation form; they must abide by the COVID-19 Campus Safety Policy and any requirements specific to the facility or program they are visiting (e.g., health care or medical research settings with indoor mask requirements). Limited-duration visitors must **comply with current University policy regarding face masks and coverings (see the University's COVID-19 Campus Activity Status page for the current policy for both vaccinated and unvaccinated individuals).**



US CMS Constitution Revision- Oct 2020

- The committee has reviewed the suggestions from the collaboration and incorporated many of them.
- The final updated version is posted at the link [“USCMS Constitution 2020”](#)
- According to our current constitution (https://uscms.org/pub/constitution/uscms_const_final_2009.pdf) section 7,
 - "the signatures of more than 20% of the Collaboration Board membership" is required to call for voting on the amendments.
 - the election committee should carry out the balloting.
- The required petition is at:
https://docs.google.com/spreadsheets/d/1SZ2zwQDxLe68Abo1Gd22yGpqN5_egkNc-1LRwMTgf9U/edit#gid=0
- The election committee has been informed and is working on the procedure and timeline.



A Day of Reflection

A day of reflection - hosted by USCMS (10 June 2020) - Indico

<https://indico.cern.ch/event/927707/>

A day of reflection - hosted by USCMS

📅 Wednesday 10 Jun 2020, 10:00 → 13:00 US/Central 📍 Lothar Bauerdick (FERMILAB) , Meenakshi Narain (Brown University (US)) , Sarah Eno (University of Maryland (US))

Description In support for "A STRIKE FOR BLACK LIVES" <https://www.particlesforjustice.org/>

A letter by Brian Nord, Co-signed and Co-edited by Chanda Prescod-Weinstein

<https://www.particlesforjustice.org/letter>

Times for the meeting are FNAL times. (central US).

This is a VIRTUAL meeting, please connect via Zoom Meeting: [direct link](#)

on cern.zoom.us Meeting ID: 914 9291 8012 Password: 061020

🔗 A letter from Brian ...

10:00 → 10:05 **Gathering on zoom** ⌚ 5m

10:05 → 10:10 **A day of reflection** ⌚ 5m

Speaker: Meenakshi Narain (Brown University (US))

🔗 A STRIKE FOR BLAC... 📄 STRIKE FOR BLACK ...

10:10 → 10:35 **History of Racism in America** ⌚ 25m

Bradley Graupner (Linguistic Anthropologist) will discuss how we can understand the contemporary context from a brief overview of the history relevant to this moment. That will include early colonialism, the emergence of whiteness as a concept and for what reasons, the colonial era developments and rebellions in how they shaped institutionalization of racial supremacy, the American colonies, the formation of the United States, and Slavery through Jim Crow. This will touch on the intersection of race and racism with class and inequality, ethnicity and nationalism, all vis-à-vis power and politics as the latter is generally considered. He will emphasize how historical structures and resistance adapts and changes vis-à-vis institutionalization to maintain power dynamics.

Graupner's training is in anti-colonial struggles via racism, land rights, civil rights, gender rights, sexual orientation rights, axiological and epistemological rights vis-à-vis history of the Black Liberation Movement, and Native American Religious Traditions. He has been engaged in anti-racism and anti-colonial struggles since 2003. Graupner is on the board of directors for the Chicago SNOC History Project which established the first Civil Rights archive in the world that is open to the public at the Carter G. Woodson regional library in the Vivian G. Harsh Collection of African American History. He assists with creating and curating an ongoing collection of oral histories from Civil Rights organizers for the archive. In 2016, he also created the decolonizing library at the Oost Sakowin camp for the Standing Rock Sioux Tribe when participating in their uprising against the violation of their treaty rights related to the Dakota Access Pipeline.

Speaker: Bradley Graupner

📄 CERN Fermilab #Sh...

10:40 → 11:05 **Addressing Structural Racism Underlying Protests** ⌚ 25m

P5



DPF

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SMC

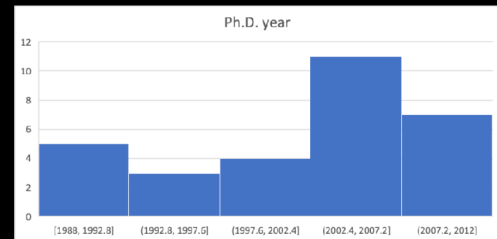
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SMC

DPF

Tulika Bose	Wisconsin
Kyle Cranmer	Wisconsin
Francis-Yan Cyr-Racine	New Mexico
Sarah Demers	Yale
Cameron Geddes	LBNL
Patrick Huber	Virginia Tech
Kendall Mahn	Michigan State
Rachel Mandelbaum	Carnegie Mellon
Jelena Maricic	Hawaii
Petra Merkel	Fermilab
Christopher Monahan	William-Mary Coll.
Meenakshi Narain	Brown
Peter Onyisi	Texas Austin
Mark Palmer	Brookhaven
Tor Raubenheimer	SLAC
Mayly Sanchez	Florida State
Richard Schnee	South Dakota School of Mines and Technology
Jesse Thaler	MIT
Abigail Viereg	Chicago
Amanda Weinstein	Iowa State
Lindley Winslow	MIT
Tien-Tien Yu	Oregon
Bob Zwaska	Fermilab
Beate Heinemann	DESY
Christos Touramanis	Liverpool
Shoji Asai	Tokyo
Karsten Heeger	Yale
JoAnne Hewett	SLAC
Hitoshi Murayama	UC Berkeley/LBNL

5 EPSCOR states
R2, RUI institutions
14 female, 15 male
7 labs, 21 universities, 1 both
Both DOE & NSF support
Nobody “older” than HM & JLH
Average Ph.D. year 2001



Chair: Hitoshi Murayama: Vice-chair: Karsten Heeger



CERN Restart May 2020

- CMS is taking a cautious and pro-active approach to re-start work
 - Safety is the highest priority
 - Re-start is in stages and well-thought through and documented **work packages**
 - will correct problems while we gain experience
- We appreciate the burden on our US community at CERN!
 - US groups in CMS have about 180 people stationed at CERN
 - Travel from US to CERN will not be possible/easy for a long time
- Remember, we currently ask for volunteers and only for work packages that were approved by Technical Coordination
 - Anybody who feels unsure or is not ready yet:
please say so, and we will find a solution
 - To work at CERN, US people will have to be “vetted” by US Ops managers
 - ★ Level2s in contact with Ops management
 - ★ Paul and I have discussed all “active” work packages with HCAL, EMU, BRIL, DAQ, Tracker
- You have to get approval from your supervisor at your institute
 - PIs should confirm that the proposed work is consistent with their institutions' policies
- Expect more broad lab work to start soon, too



COVID – March 2020

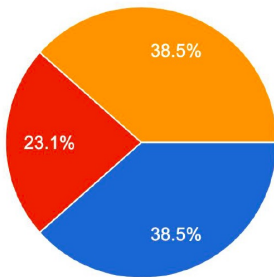
- **APS site visit to assess the climate for women in USCMS [originally scheduled for April 8 & 9]**
 - We had contacted APS women in Physics committee for improving the climate for underrepresented groups to arrange a site visit.
(<https://www.aps.org/programs/women/sitevisits/index.cfm>)
 - ★ Such visits have been useful in the past in helping community members find ways to encourage members of underrepresented groups.
- **USCMS+USLUA meeting has been postponed**
 - **discussing another date, potentially at the end of the summer or later, and we will keep everyone informed as we learn more.**
 - For the few people who have registered, the University of Wisconsin will refund your registration. Please contact Aimee Lefkow (lefkow@hep.wisc.edu) regarding the refund.
- **Location: University of Wisconsin-Madison**
- **Dates: ~~Wednesday May 13 to Friday May 15, 2020~~**
Agenda: <https://indico.cern.ch/event/853175/>



COVID April 2020

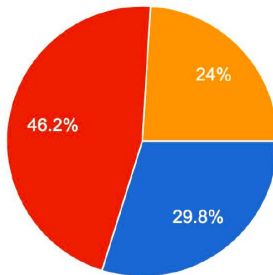
- Thank you for playing along with us and engage in 30 seconds of fun
- The full set of responses is available to view [send email to get link]
- Will send out another one during mid May - based on the responses.
- **We plan to collect some recipes to share!**
 - **A request for any suggestions on the best/easy way to do this, than just add files to a google folder/dropbox?**

- Student
- Junior member
- Senior member

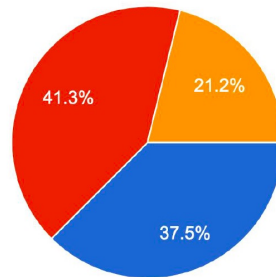


Tactile game or video game?

- Physical game all the way!
- Video games for sure!
- Games? who has time for games, I'm having fun with Physics!



Stress Baking??



- YES
- No
- Maybe



Organization in Ten "Frontiers" - II

Neutrino



Patrick Huber
Virginia Tech



Kate Scholberg
Duke University



Elizabeth Worcester
BNL



Marina Artuso
(Syracuse U.)



Alexey Petrov
(Wayne State U.)



Bob Bernstein
(FNAL)

Rare Processes & Precision Measurements

Theory



Nathaniel Craig
(UCSB)



Csaba Csaki
(Cornell)



Aida El-Khadra
(UIUC)

Underground Facilities and Infrastructure



Laura Baudis (U. Zurich)



Jeter Hall (SNOLAB)



Kevin Lesko (LBNL)



John Orrell (PNNL)

All frontiers have topical subgroups (details on Twiki)

Accelerator:	7	Instrumentation:	10
Cosmic:	7	Neutrino:	10
Community Engagement:	7	Rare Processes:	7
Computing:	7	Theory:	11
Energy:	10	Underground:	6

More than 1500 people have signed up to participate in Snowmass!



UPSG – CERN Yellow Report

- Goal: Yellow Report by end of 2018 (as input to European Strategy meetings in 2019)
- Structure of the YR:
 - 5 chapters (one per WG) to be submitted to arXiv individually and also to the European Strategy repository of submissions (provided the Strategy Preparatory Group keeps the same upload scheme as last time)
 - the physical YR as a book will be assembled once all is in place, and this usually takes a few months after the arXiv submissions, to deal with the internal (CERN) YR bureaucracy.
- Authorship
 - author list of each chapter starts with resp. WG convenors followed by the names of all contributors
 - YR front page: members of steering committee
 - Authors are active individuals, not collaborations, no formal review within experiments
- Approval procedures: it is the responsibility of the authors and WG conveners from the experiments to verify that all material from their experiment is endorsed by it.



Limited Authorship April 2021

From CB Chair Harrison Prosper's report at CMS CB meeting:

Limited Authorship Guidelines Group

- Currently discussing whether the collaboration should, or should not, impose restrictions on the use of CMS Open Data by CMS members. We welcome your opinions, and arguments, regarding this topic.
- Note – From the ATLAS implementation plan:
“The analysis software to process and analyse the released data (for example to apply systematic variations) is publicly available.... Use of the data and the software must be appropriately cited. ATLAS does not restrict the use of open data for ATLAS members.”

Please email the group at cms-lagg@cern.ch