



# Seattle Snowmass Summer Meeting 2022

## Sunday, 17 July 2022

### Afternoon Plenary: Planning US HEP - past present future - 130 (16:30 - 19:00)

-Conveners: R. Sekhar Chivukula; Joel Butler

time	[id] title	presenter
16:30	[114] Perspectives from Snowmass to P5 in 2013/2014	RITZ, Steve
16:50	[115] Perspectives from NSF	SHANK, James
17:15	[117] Perspectives from DOE	KUNG, Harriet
17:40	[116] Perspectives from Fermilab	MERMINGA, Lia
18:05	[118] Perspectives from HEPAP	HEWETT, JoAnne
18:30	[119] Questions/Comments	

# Monday, 18 July 2022

## Afternoon Plenary: AI/ML Modern Machine Learning for HEP - 220 (14:00 - 15:29)

-Conveners: Benjamin Nachman; Steven Gottlieb; Daniel Elvira

time	[id] title	presenter
14:00	[206] Introduction	NACHMAN, Benjamin ELVIRA, Daniel TERAO, Kazuhiro GOTTLIEB, Steven
14:05	[202] How is modern ML different from what has been done in the past?	WHITESON, Daniel
14:25	[276] Questions/Discussion	
14:33	[203] How can ML go beyond traditional project / frontier boundaries?	TRAN, Nhan
14:53	[277] Questions/Discussion	
15:01	[204] Places where ML could have a big impact, but where it has not been widely used traditionally	SHIH, David
15:21	[278] Questions/Discussion	

## Afternoon Plenary: A Tour of Underground Facilities & Science: Today and Tomorrow - 130 (14:00 - 15:30)

-Conveners: Jeter Hall

time	[id] title	presenter
14:00	[185] Introduction and overview of UF	HALL, Jeter
14:05	[186] SURF	HEISE, Jaret
14:35	[187] International Underground Laboratories	VIRTUE, Clarence
15:15	[188] Outline of UF activities at Snowmass	HALL, Jeter

## Afternoon Plenary: Lattice QCD - 220 (15:35 - 17:00)

-Conveners: Nathaniel Craig; Csaba Csaki; Aida El-Khadra

time	[id] title	presenter
15:35	[163] Enabling precision quark- and lepton-flavor physics with lattice QCD	KRONFELD, Andreas
16:05	[164] Uncovering new-physics signals in nucleons and nuclei with lattice QCD,	DAVOUDI, Zohreh
16:35	[165] Questions and discussion	

## Afternoon Plenary: In Search of Excellence and Equity in Physics - 130 (17:30 - 19:00)

-Conveners: Mu-Chun Chen; Ketevi Adikle Assamagan

time	[id] title	presenter
17:30	[315] Introduction	CHEN, Mu-Chun
17:40	[316] Panel Discussion	
18:40	[725] Q&A	

## Tuesday, 19 July 2022

### Afternoon Plenary: Panel: Careers and Training the Next Generations - 130 (14:00 - 15:23)

-Conveners: Sridhara Dasu; Petra Merkel; Steven Lund

time	[id] title	presenter
14:00	[537] Obstacles and Solutions to Careers in HEP	MALIK, Sudhir
14:30	[727] Careers and training in accelerator physics	LUND, Steven
14:40	[538] Career and Training Panel Discussion	FAHIM, Farah STARK, Giordon LOVE, Jeremy YOHAY, Rachel BERNSTEIN, Robert LUND, Steven TAIT, Tim

### Afternoon Plenary: Energy Frontier: Lepton Colliders - 130 (15:30 - 17:00)

-Conveners: Tor Raubenheimer; Steve Gourlay; Vladimir Shiltsev; Alessandro Tricoli; Meenakshi Narain; Laura Reina

time	[id] title	presenter
15:30	[616] Theoretical Overview on Lepton Colliders	MEADE, Patrick
15:50	[166] Lepton colliders - e+e- Collider Forum presentation	DASU, Sridhara
16:10	[167] Lepton Colliders - mu+mu- Collider Forum presentation	STRATAKIS, Diktys
16:30	[168] Questions and discussion	LI, Derun STRATAKIS, Diktys NANNI, Emilio MALTONI, Fabio MALTONI, Fabio POWER, John BLACK, Kevin CHAMIZO LLATAS, Maria MEADE, Patrick JINDARIANI, Sergo DASU, Sridhara WAGNER, Stefan WAGNER, Stephen HEINTZ, Ulrich

### Afternoon Plenary: Cosmic Frontier: Paths to Discovery - 120 (15:30 - 17:00)

-Conveners: Aaron Chou; Marcelle Soares-Santos; Tim Tait

time	[id] title	presenter
15:30	[170] The Path to Dark Matter	Prof. SLATYER, Tracy
16:00	[171] The Path to Dark Energy and Cosmic Acceleration	Prof. DAWSON, Kyle
16:30	[172] The Path to Cosmic Probes of Dark Matter	Prof. WECHSLER, Risa

### Afternoon Plenary: HEP Community Engagement: Is the HEP Community going to take responsibility for Engagement (or not)? - 130 (17:30 - 19:00)

**-Conveners: Breese Quinn; Ketevi Adikle Assamagan**

time	[id] title	presenter
17:30	[173] Community Engagement Frontier Introduction	ASSAMAGAN, Ketevi Adikle
17:40	[174] Selected Key CEF Recommendations (49 min: ~7 min per Topical Group)	
	- [1] Community marginalization and need improvement (CEF03)	CHEN, Mu-Chun
	- [2] Empowering marginalized communities through education (CEF04)	MALIK, Sudhir
	- [3] Structural changes for effective engagements toward marginalized communities (CEF05)	LINCOLN, Donald
	- [4] DEI impact on career pipelines, development and retention (CEF02)	HOGAN, Julie
	- [5] DEI in HEP-industry dynamics (CEF01)	FAHIM, Farah
	- [6] Policy implementations to improve DEI (CEF06)	SUTER, Louise
	- [7] DEI and Societal and environmental impacts	BLOOM, Ken
18:29	[175] Options for Implementing CEF Recommendations	QUINN, Breese
18:44	[176] Questions and discussion	QUINN, Breese ASSAMAGAN, Ketevi Adikle

# Wednesday, 20 July 2022

## Afternoon Plenary: Rare Processes and Precision measurement and AMO - 220 (14:00 - 15:30)

-Conveners: Marina Artuso; Alexey Petrov; Robert Bernstein

time	[id] title	presenter
14:00	[198] Understanding Dark Matter and Dark Sectors at RP Frontier	GORI, Stefania
14:45	[201] Roundtable: EDMs, atomic parity violation, and gravity signatures and synergies with the AMO physics program	SAFRONOVA, Marianna HUTZLER, Nick KIM, On BHATTACHARYA, Tanmoy

## Afternoon Plenary: Neutrino Frontier Connections, Progress, and Plans - 210 (14:00 - 15:30)

-Conveners: Kate Scholberg; Elizabeth Worcester; Patrick Huber

time	[id] title	presenter
14:00	[177] Neutrino Frontier Connections	
	- [1] Onbb and neutrino mass	FORMAGGIO, Joseph Formaggio
	- [2] Neutrino interactions	MAHN, Kendall
	- [3] Beams and instrumentation	KLEIN, Joshua KLEIN, Joshua
14:45	[178] Neutrino Frontier Connections, Progress, and Plans	
	- [1] Overview	LYKKEN, Joseph
	- [2] Panel/FAQs with invited panelists	BERTOLUCCI, Sergio RAY, Ronald MARUYAMA, Reina MERMINGA, Lia NEWBY, Jason OCHOA, J. Pedro LYKKEN, Joseph

## Afternoon Plenary: Detector Technologies for the Next Decades - 220 (15:40 - 17:13)

-Conveners: Phillip Barbeau; Jinlong Zhang; Petra Merkel

time	[id] title	presenter
15:40	[385] Advancing detector instrumentation over the next decades	FAST, James
15:50	[194] Detector needs for future collider experiments	WHITE, Andy
16:08	[195] Detector needs for future cosmic experiments	MARUYAMA, Reina
16:26	[196] Detector needs for future neutrino and intensity experiments	KETCHUM, Wesley
16:44	[197] Questions and discussion	

# Thursday, 21 July 2022

## **Afternoon Plenary: Rare Processes and Precision Measurements - 130 (14:00 - 15:30)**

-Conveners: Marina Artuso; Robert Bernstein; Alexey Petrov

time	[id] title	presenter
14:00	[207] How far the SM can go: examples from the RP Frontier	Prof. URQUIJO, Phillip
14:45	[210] Search for New Physics: the questions we can address with leptons and quarks	CIRIGLIANO, Vincenzo

## **Afternoon Plenary: Beams, Accelerator R&D and Future Facilities: Accelerator Frontier Vision - 130 (15:30 - 17:00)**

-Conveners: Vladimir Shiltsev; Tor Raubenheimer; Steve Gourlay

time	[id] title	presenter
15:30	[192] An accelerator R&D plan for the next 10 years	SHILTSEV, Vladimir
16:30	[193] Discussion/Panel	GOURLAY, Steve RAUBENHEIMER, Tor

## **Afternoon Plenary: Cosmic Probes of Fundamental Physics - 130 (17:30 - 19:00)**

-Conveners: Marcelle Soares-Santos; Aaron Chou; Tim Tait

time	[id] title	presenter
17:30	[211] Dark Matter	CHOU, Aaron
17:45	[212] Cosmic Acceleration	SOARES-SANTOS, Marcelle
18:00	[214] Panel Discussion: Cosmic Opportunities for Fundamental Physics	SONNENSCHNEIN, Andrew Prof. PRESCOD-WEINSTEIN, Chanda NEWMAN, Jeffrey CARLSTROM, John FANG, Ke MONZANI, Maria Elena LOVERDE, Marilena BALLMER, Stefan

## Friday, 22 July 2022

### Afternoon Plenary: Advancing Research at Underground Facilities (UF) - 130 (14:00 - 15:30)

-Conveners: Laura Baudis; Jeter Hall; John Orrell; Kevin Lesko

time	[id] title	presenter
14:00	[181] Underground needs for Neutrino & Cosmic Frontier science	HERTEL, Scott
14:22	[182] Supporting infrastructure and synergistic research	KAMAHA, Alvine
14:44	[183] A strategy for underground facilities and research	ORRELL, John
15:06	[184] Questions and discussion	

### Afternoon Plenary: Theory Frontier: A Vision for the Future - 130 (15:30 - 17:00)

-Conveners: Nathaniel Craig; Aida El-Khadra; Csaba Csaki

time	[id] title	presenter
15:30	[179] Recent developments and future vision for formal theory	KACHRU, Shamit
16:15	[180] Recent developments and future vision for particle theory	THALER, Jesse

### Afternoon Plenary: Big Picture Neutrino Science - 130 (17:30 - 19:00)

-Conveners: Elizabeth Worcester; Kate Scholberg; Patrick Huber

time	[id] title	presenter
17:30	[120] Oscillation Physics: Three flavors and Beyond	MESSIER, Mark
17:50	[122] BSM at Neutrino Experiments	DE GOUVEA, Andre
18:10	[121] Neutrinos and Astrophysics	SCHOLBERG, Kate
18:30	[123] Questions and discussion	



## Saturday, 23 July 2022

### Afternoon Plenary: Physics on the Energy Frontier - 130 (14:00 - 15:30)

-Conveners: Laura Reina; Meenakshi Narain; Alessandro Tricoli

time	[id] title	presenter
14:00	[617] Energy Frontier Vision Overview	TRICOLI, Alessandro
14:05	[215] The Physics case for Higgs Factories - When and Why	DAWSON, Sally
14:35	[216] The Physics case for Energy Frontier Multi-TeV colliders - When and Why	PAGAN GRISO, Simone
15:05	[217] Questions and discussion	

### Afternoon Plenary: The Future of Computing for HEP - 130 (15:30 - 17:00)

-Conveners: Steven Gottlieb; Daniel Elvira; Benjamin Nachman

time	[id] title	presenter
15:30	[218] Introduction	NACHMAN, Benjamin ELVIRA, Daniel GOTTLIEB, Steven
15:35	[219] Technology landscape	HABIB, Salman
15:55	[222] Questions/Discussion	
16:03	[220] Computing challenges and R&D to bridge the resource/need gap in the next 10-15 years	BLOOM, Ken
16:23	[279] Questions/Discussion	
16:31	[221] Collaborative initiatives across experiment boundaries	SEXTON-KENNEDY, Elizabeth
16:51	[280] Questions/Discussion	

### Afternoon Plenary: HEP/Quantum Science and Technology (QST) Intersections - 130 (17:30 - 19:10)

-Conveners: Maria Spiropulu; Martin Savage

time	[id] title	presenter
17:30	[325] HEP/QST Landscape	LYKKEN, Joseph
17:45	[326] HEP & the language of entanglement	PENINGTON, Geoffrey
18:00	[327] National Quantum Initiative (NQI): 2018 - now	DABBAR, Paul
18:10	[328] Panel Discussion	CHOU, Aaron GRASELLINO, Anna BAUER, Christian SVORE, Krysta SCHLEIER-SMITH, Monika DABBAR, Paul NAIK, Ravi YOO, Shinjae HUMBLE, Travis
19:00	[329] Closing Remarks	WILLIAMS, Carl

## Sunday, 24 July 2022

### Afternoon Plenary: Snowmass Early Career - 130 (14:00 - 15:30)

-Conveners: Jacob Zetlemoyer; Garvita Agarwal

time	[id] title	presenter
14:00	[503] Snowmass Early Career Core Initiatives	LEWIS, Tiffany
14:15	[500] SEC Survey: Introduction and Methods	CONLEY, Erin
14:33	[502] SEC Survey: Career Survey Findings	LEPETIC, Ivan
14:51	[501] SEC Survey: Physics Outlook Findings	BARROW, Joshua
15:04	[253] Early Career Organizations in HEP	PSIHAS OLMEDO, Fernanda

### Afternoon Plenary: Communicating Science to Everyone - 130 (15:35 - 17:00)

-Conveners: Kathryn Jepsen

time	[id] title	presenter
15:35	[262] Introduction	
15:37	[263] Remarks by Dr. Lucianne Walkowicz	
15:47	[264] Remarks by Dr. Jessica Esquivel	
15:57	[265] Remarks by Dr. Xinnan Du	
16:07	[261] Remarks by Dr. Desire Whitmore	
16:18	[266] Panel Discussion	

### Afternoon Plenary: CPAD: Careers and Collaborations in Detector Instrumentation - 120 (15:35 - 17:00)

-Conveners: Karsten Heeger; Petra Merkel

time	[id] title	presenter
15:35	[257] Development and production of high-performance water based liquid scintillators for particle physics experiments	YEH, Minfang
15:55	[258] Development of novel low-cost, large-area lithium-drifted silicon detectors	PEREZ, Kerstin
16:15	[259] MKID Development for Measurement of the Cosmic Microwave Background	DIBERT, Karia
16:25	[267] Development of Deep Junction Low Gain Avalanche Diodes for high Granularity Timing Detectors	ZHAO, Yuzhan
16:35	[260] Panel on workforce development, collaboration with industry and cross cutting technologies with outside HEP	DWYER, Dan CARINI, Gabriella MARSISKE, Helmut SHIPSEY, Ian ARTUSO, Marina MARUYAMA, Reina

### Afternoon Plenary: DOE Multiprogram Laboratories: their HEP programs and intersections with other disciplines". - 120 (17:30 - 19:10)

-Conveners: Chris Quigg

time	[id] title	presenter
17:30	[826] Introduction	QUIGG, Chris
17:40	[827] Report from Argonne National Laboratory	YOSHIDA, Rik
17:52	[828] Report from Brookhaven National Laboratory	DENISOV, Dmitri
18:04	[829] Report from Lawrence Berkeley National Laboratory	ROE, Natalie ROE, Natalie
18:16	[830] Report from SLAC National Accelerator Laboratory	HEWETT, JoAnne
18:28	[831] Perspective of DOE Nuclear Physics	SORENSEN, Paul
18:40	[832] Discussion	