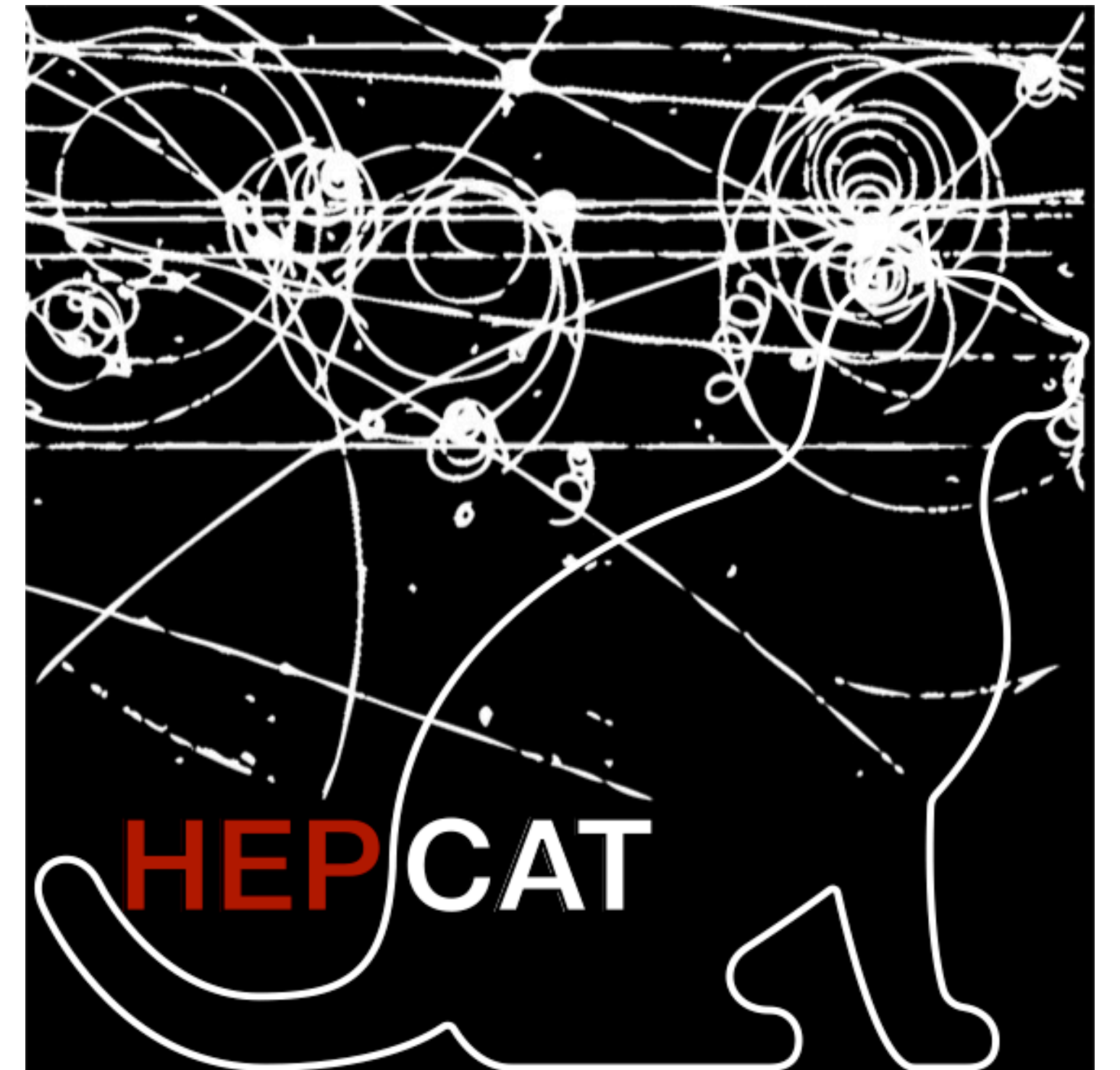


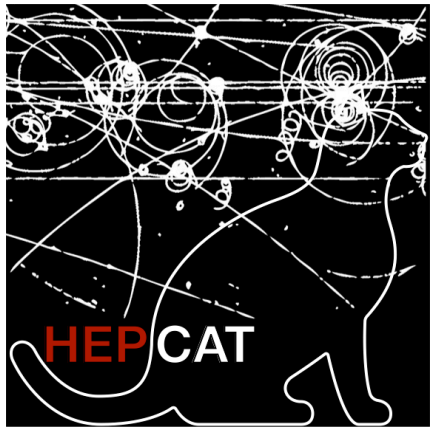
HEPCAT status, plans for 2025, and Renewal

M. Chertok, UC Davis

HEPCAT Annual Meeting, Nov. 1-2, 2024, LBNL



Goals for this meeting



Gain a clear picture of where we are, in year 4 of this grant

Fellows overview: technical progress, development, etc.

Review organizational structure: EC, TACC, PCC, DAC

Review 2024 Seminars; Summer School

Interact with External Advisory Board

Plan for 2025

Plan for Renewal

HEPCAT



Should start by thanking DOE!

70 members, 20 active fellows + 8 alumni



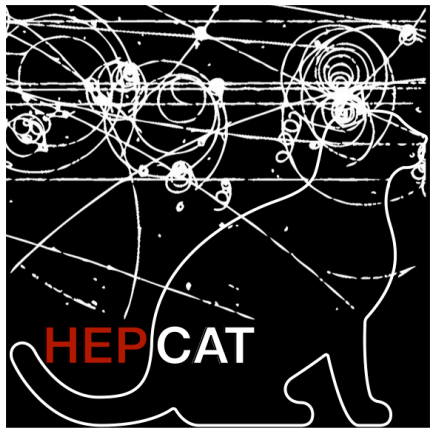
HEPCAT Fellows



Fellow		Institution	Mentor	TG
First Cohort - Spring 2022 (Alumni)				
Anthony	Aportela	San Diego	Duarte	7
Avila	Gael	UCLA	Bachtis	8
Corbin	Jason	Stanford	Irwin	4
Levine	Joseph	Davis	Tyson	4
Molnar	Adam	Santa Cruz	Schumm	6
Qi	Jianyang	San Diego	Ni, Xu (LLNL)	2
Sebastian	Jacob	Berkeley	Goldblum	5
Smith	Dylan	Irvine	Whiteson	7

Second Cohort - Winter 2023				
Almazan	Earl	Santa Cruz	Nielsen/Hanc	6
Borrel	Leo	Caltech	Hitlin	3
Gleason	Riley	Irvine	Taffard	8
Hood	Noah	San Diego	Yang	2
Kingston	Jimmy	Davis	Tripathi, Xu (L	2
Padilla	Rene	Santa Cruz	Schumm	1
Preins	Sean	Riverside	Arratia	5
Smith	Zoe	Stanford	Vernieri	4

HEPCAT Fellows



Third Cohort - Fall 2023				
Antonakis	Alex	Santa Barbara	Caratelli	2
Gibbons	Ryan	Berkeley	Manalaysay	2
McGuire	Zach	Berkeley	Goldblum	5
O'Dwyer	Rory	Stanford	Tomkins	8
Peck	Alec	Riverside	Westerdale	2
Sandoval	Brandon	Caltech	Golwala	4

Fourth Cohort - Fall 2024				
Johnson	Alyssa	San Diego	Arnold	4
Vassilev	Mirella	Stanford	Vernieri	8
Kelly	Samantha	Davis	Citron	5
Ancelin	Havyn	UCLA	Bachtis	8
Repond	Aras	Riverside	Westerdale	2
Milton	Ryan	Riverside	Arratia	3

HEPCAT Fellows



Fellows by campus and by TG:

In principle, should scale ~ # faculty...

Campus	#
Berkeley	3
Davis	3
Irvine	2
Los Angeles	2
Riverside	4
Santa Barbara	1
Santa Cruz	3
San Diego	4
CalTech	2
Stanford	4
TOTAL	28

Topical Group	#
1: Rad Hard	1
2: Noble Liq	7
3: Photosensors	2
4: Q Devices	5
5: Scintillators	4
6: Si Detectors	2
7: AI/ML	2
8: Electronics	5
TOTAL	28

Budget Highlights



Original plan was 34 fellows

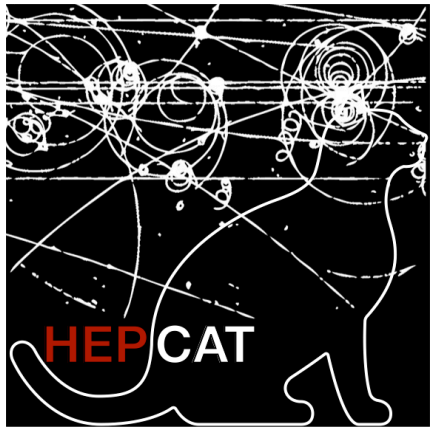
Student strikes: increased salary scales at UC

- ▶ ~ 25% GSR stipend increase

DOE urged us to do necessary to maximize the number of fellows supported

Final tally is 28

Topical Groups



	Topical Group	Lead	University Participants	Lab Participants
N/A	Fast Timing	Bachtis	Prebys(UCD), Schumm(UCSC), Spiropulu, Newman(Caltech), Ong, Bachtis(UCLA).	Grace (LBNL), Brubaker, Sweany (SNL), Smedley (LANL), Su, Schwartzman(SLAC)
TG3	UV and VUV Photo sensors	Zhu	Hitlin, Zhu(Caltech), Tripathi, Pantic(UCD), Ong(UCLA), Ni, Yang(UCSD).	Xu (LLNL), Manalaysay (LBNL)
TG2	Noble Liquid Detectors	Lesko (chair)	Lippincott (UCSB), Ni, Yang(UCSD), Pantic, Tripathi(UCD), Lesko(UCB)	Xu (LLNL), Manalaysay (LBNL), Akerib, Shutt, Tanaka(SLAC), Gollapinni (LANL)
TG5	Optical Scintillators/Crystals	Goldblum	Svoboda, Tripathi(UCD), Lesko, Goldblum(UCB), Zhu, Newman(Caltech), Ochoa-Ricoux (UCI), Nelson (UCSB)	Dazeley, Bowden (LLNL), Orebi Gann, (LBNL), Marleau, Sweany (SNL)
TG4	Quantum Devices	Tyson	Irwin(Stanford), Golwala, Spiropulu (Caltech), Tyson(UCD), Arnold(UCSD), Barish(UCR)	Carosi (LLNL)
TG7	Detector R&D focused AI/ML	Duarte	Whiteson, Bian(UCI), Erbacher(UCD), Spiropulu, Newman(Caltech), Duarte(UCSD)	Nachman (LBNL), Monzani, Kagan, Schwartzman (SLAC)
TG8	Programmable Electronics/Trigger/DAQ	Taffard	Mulhearn, Erbacher, Tripathi(UCD), Duarte(UCSD), Tompkins(Stanford), Spiropulu, Newman(Caltech), Taffard, Lankford(UCI), Bachtis (UCLA)	Grace (LBNL), Su, Bartoldus, Kagan, Kenny, Herbst(SLAC)
TG1	Radiation Hardness Studies	Conway	Prebys, Conway, Chertok, Erbacher(UCD), Nielsen(UCSC), Newman, Zhu(Caltech)	Wesley Frye(McClellan nuclear reactor, UCD)
TG6	Si Detectors	Nielsen	Ritz(UCSC), Tyson, Chertok, Tripathi(UCD), Nielsen (UCSC).	Brubaker, Sweany (SNL), Su, Nelson, Vernieri, Kagan, Kenney

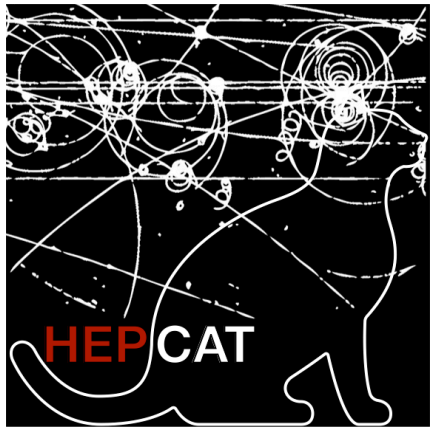
Curriculum



From our Proposal

- ▶ Advanced lab courses for fellows who did not take as UGs.
 - ▶ Did this occur? Experiences?
- ▶ Seminars
 - ▶ <https://hepcat.ucsd.edu/courses-seminars/>
 - ▶ 5 held in 2023; 5 held in 2024. How to enhance participation?
- ▶ Summer Schools
 - ▶ Held in 2022 (UCD not on website), 2023 (UCSD), 2024 (SLAC).
 - ▶ Generally favorable feedback; how to improve further?
 - ▶ 2025: planned for UCD. Idea: hold annual meeting in conjunction as it would be earlier in the year of grant renewal submission.

Curriculum, continued

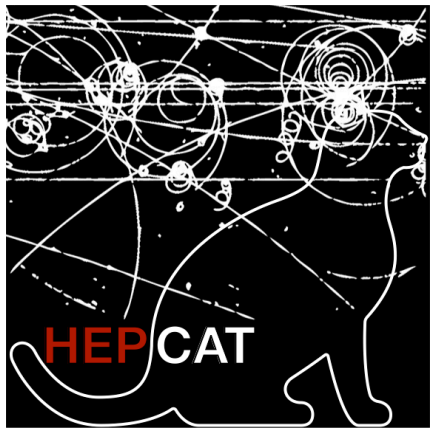


Courses

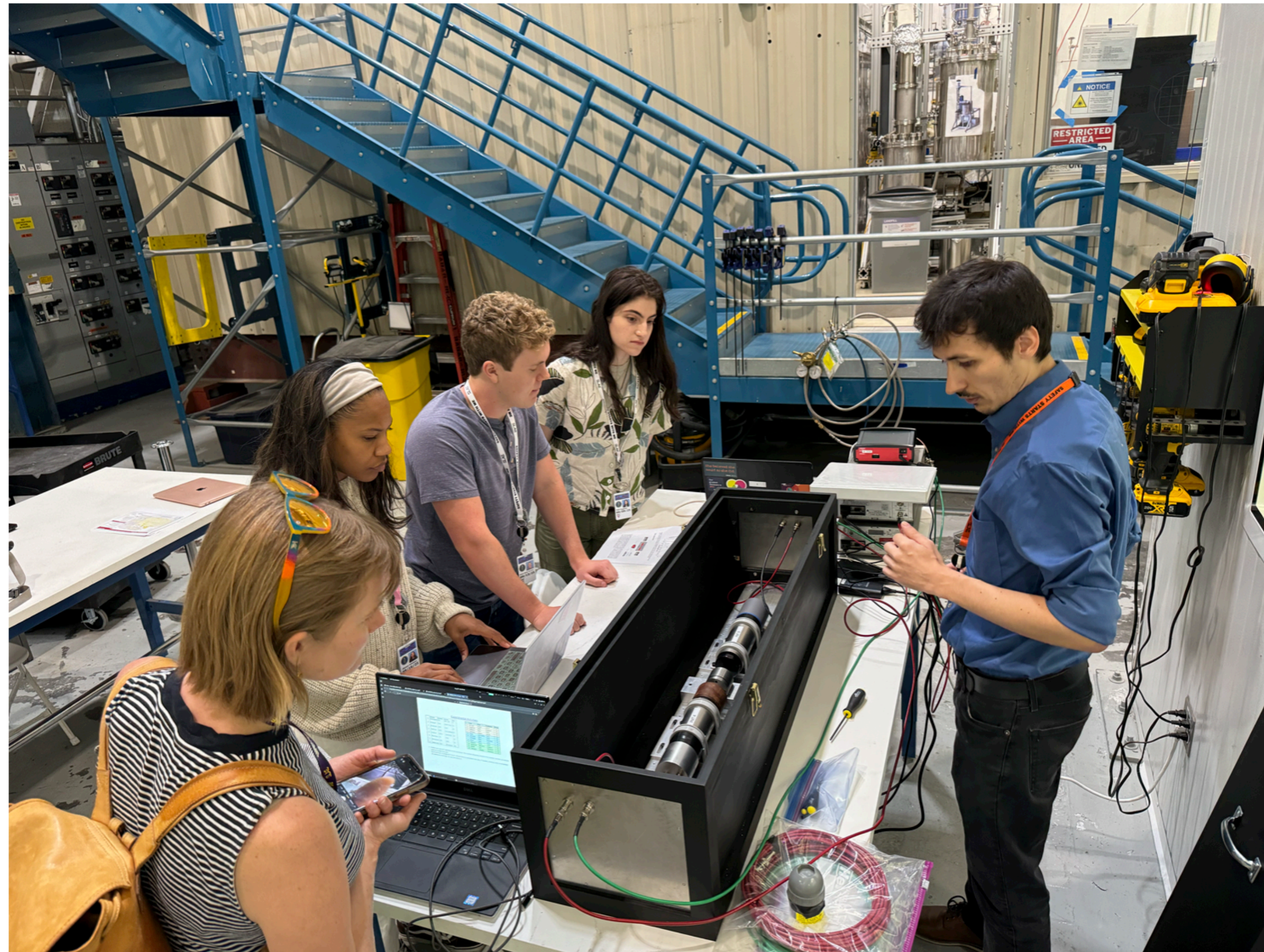
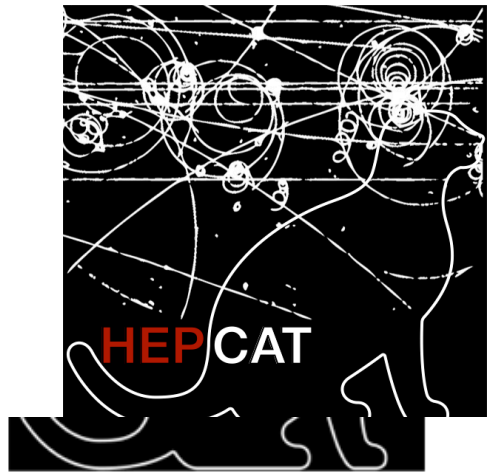
Relevant courses on HEP instrumentation offered by the mentors in the participating institutions are listed below. Students will have the opportunity to take cross-campus courses.

Discussion needed.

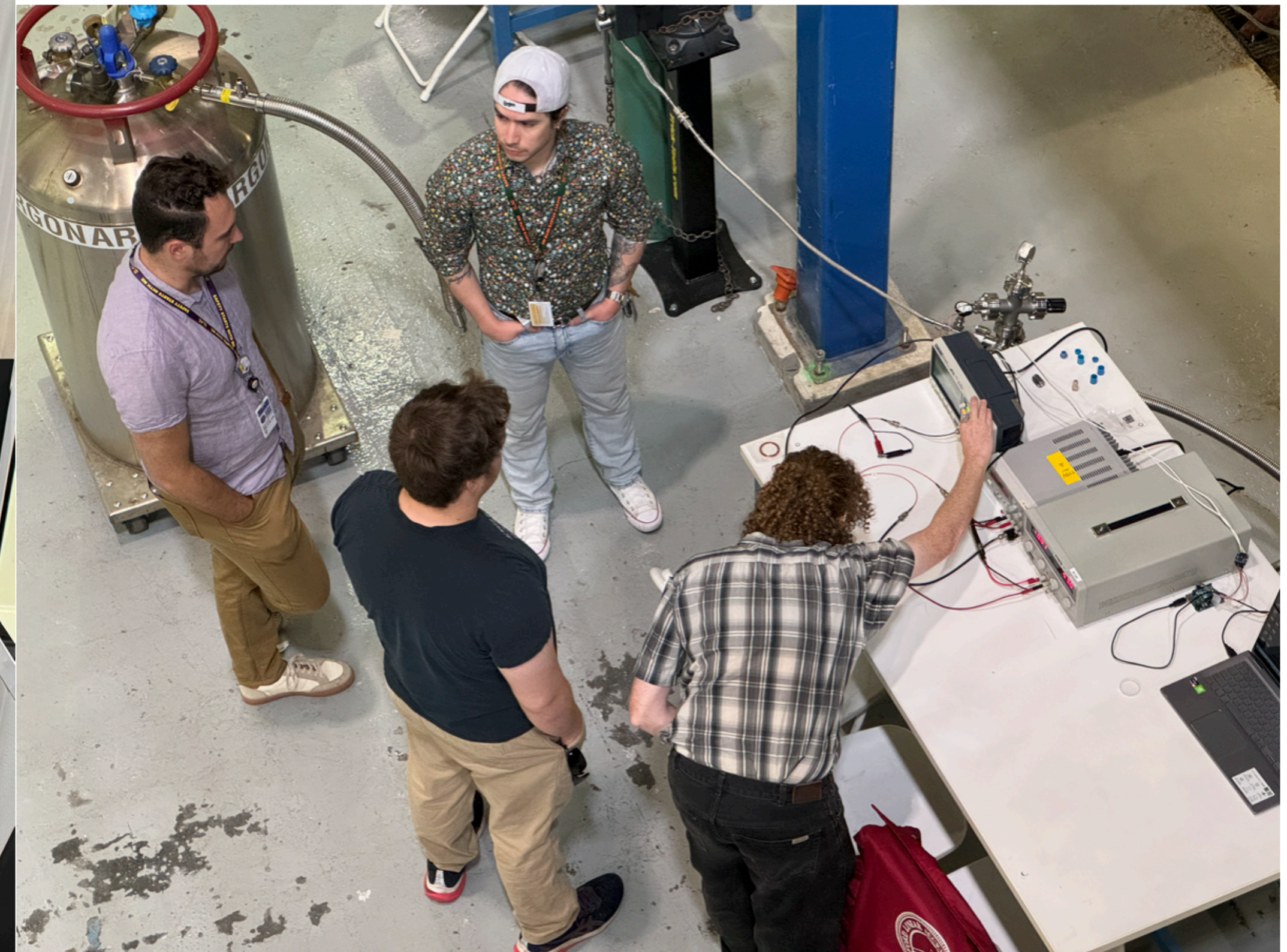
2024 Summer School @ SLAC



2024 Summer School @ SLAC



Ultrafast BaF



LAr SiPM

DEI and Assessment



Assessment must start now so results are included in renewal proposal next fall

- ▶ Thanks to Carl Grace for stepping up to chair this committee! We need to support this effort.

Outreach

- ▶ Can we expand HEPCAT to UC Merced? Can we link to CSU/CCC or bridge programs such as Calbridge?



Mentorship goals, from the proposal

Professional development

- How to give a research talk, how to network, proposal writing, etc.
- Talks at HEPCAT annual meetings provide good experience!

Mentoring program

- Pair fellow with senior member not in same research area

Mentoring workshops

- Annual mentorship workshop, best practices, etc.

Student Outreach

- Encourage fellows give talks at NSBP, SACNAS,...

Roundtable Discussions

- EC led meetings to discuss challenges, successes and failures

These are worthy and noble activities... Still not too late this round to do more?

Governance Document highlights:



Appointment and Roles of Director

- ▶ Responsible for financial solvency and periodic reports to DOE
- ▶ Nominate new Program Coord. Ctte. (PCC) and/or DEI and Assessment Ctte. (DAC) as necessary, to be ratified by EC
- ▶ Interact with Ext. Advisory Board (EAB) as needed

Exec. Ctte. (EC)

- ▶ Serve as main governing body of HEPCAT
- ▶ Duties: Define procedure for selection of fellows; work with Topical Group Coord. Ctte. (TACC) to ensure equitable award of fellowships; select fellows; oversight of director, PCC, DAC; determine location of annual summer school and meeting

Treasurer: originally Chertok

- ▶ Oversee distribution of funds, keep records, report to EC

PCC, DAC, Summer school Ctte. (SSC), TACC, EAB

- ▶ Roles defined

Propose we examine carefully and propose changes at time of renewal

Selected notes from EAB reports



EAB has shown strong support of HEPCAT

2022 comments

- ▶ Current program too modest, DOE should replicate at multiple sites
- ▶ Increase diversity even further by inclusion of CCC, CSU campuses
- ▶ SS TAs deserve a stipend
- ▶ Ensure SS materials persist online for reference
- ▶ Survey of students: wide array of suggestions to optimize SS, including bump up to 2 full weeks

2023 comments

- ▶ Notes lack of female scholars
- ▶ Mentions funding wrt higher costs after UC strikes
- ▶ Start conversation (@ DOE) to expand program to other areas such as QIS



Plan for 2025

Assessment & Outreach

- Very important

Mentorship activities (slide 14)

Activities to improve interactions among campuses and labs

- Consider scheduling lab tours for fellows? Need face-to-face interactions.

Seminars, other possible pedagogical elements

- Kaixuan Ni (UCSD) will offer detector course in spring quarter: test case for remote participation

Summer school

- Module development, possible improvements

Annual meeting (summer 2025) /Renewal writing

Work we do in 2025 on key elements of HEPCAT can benefit grant renewal

Comments on HEPCAT renewal



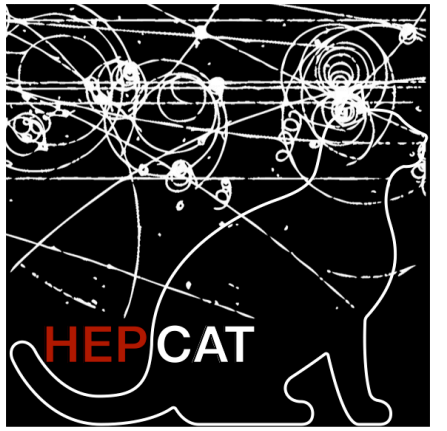
Confident we will review well; much to be proud of:

- ▶ Several cohorts of scholars trained in a critical area of HEP research
- ▶ Seminars
- ▶ Summer schools
- ▶ Dealt with Covid, student strikes/salary increases
- ▶ Value added to CA HEP community

Renewal to be submitted in 2025

- ▶ Highlight past successes
- ▶ Poll current members to gauge continued interest, recruit new members
- ▶ Explore topical group modifications and additions
- ▶ Seek commitments for next round summer school hosting
- ▶ Enhance seminars by, e.g., including problems for scholars to solve
- ▶ Follow up on EAB feedback: budgets, summer school details, etc.

HEPCAT Renewal



Should try to innovate, where appropriate

- It's been 5 years...

Define topical groups

- Cross-cutting themes: Rad Hardness, Fast Timing, AI/ML?
- Would fewer, broader TGs enhance collaboration?

Organize membership

- Include new faculty, new research faculty, new lab scientists

Consider expanding the “ask”

- Higher Fellow costs, Number of Fellows, Funding for greater interactions with the labs, etc.

Writing assignments

- Topical groups
- Summer school modules
- Program coordination
- DAC

Points for Discussion



Must get better buy-in from the consortium

- Mentors with HEPCAT fellows should be ready to actively participate to improve program

Need U groups to step up and offer to host summer schools

- Make 5 year plan and include in renewal?

Need better interaction between U groups and Labs

- Some did occur. What are the obstacles preventing more?
- Offer funding to enable funding for fellow travel/relocation?
- Scheduled lab tours? Other “mixers”. We need ideas.

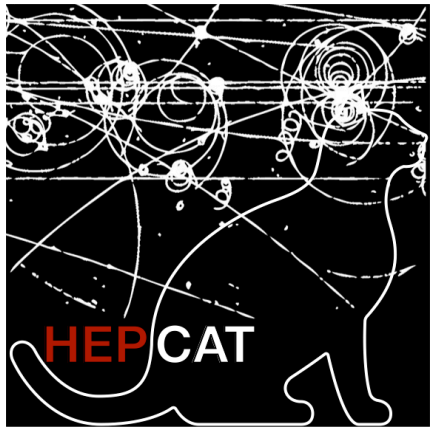
Did not create pan-HEPCAT instrumentation course

- Is this still a good idea?

We have been approached to enlarge this DOE program nationally

- What is the interest in pursuing this?

Thanks



Thanks to Mani, Andy, Bethany, EAB, Fellows, and all participants!
Thanks Helmut and DOE!