

Minutes
PEEC Research Subcommittee Meeting
2022 IEEE PES GM
Denver, CO, USA

Sunday, July 17th, 2:00 PM - 4:00 PM CDT, Majestic Ballroom

Zoom: <https://sdstate.zoom.us/j/92868838201>

1. Introduction

- Sara Eftekharnjad introduced the meeting
 - Starting in person, then remote attendees (list at end of meeting)

2. Approval of Minutes from 2021 Meeting

- Sukumar Brahma motion to approve, Tom Overbye seconded
- No objections, full approval of minutes.

3. Announcements of PESGM 2022

- Update from Sukumar Kamalsadan (given by Sara Eftekharnjad as Sukumar's flight was canceled):
 - 16 hours for PESGM2023, only request 2 hour blocks.
 - Bulk of panels go through Research Subcommittee.
 - Sukumar Kamalasadnan requests a more globally diverse list of panelists.
 - Education is an important component of the panels, include clearly education in the abstract.
 - Deadline for panel proposals is Aug. 30. Once we receive we will send to PEEC, notification will be by Sept. 30. PEEC website has link for panel proposal form to propose panel.
- Several panel sessions:
 - Research and Educational Experiences of NSF CAREER Awardees in Power Systems, Moderators: Aranya Chakraborty and Anil Pahwa, Tuesday, July 19, 2022, 8:00 – 10:00 AM, Plaza Court 7.
 - Aranya Chakraborty update: four CAREER winner presentations with a Q+A for future CAREER applicants. Encouraged Assistant Professors to attend.
 - Best Practices for Integrating Research and Education in Grid Forming Technologies, Moderators: Sairaj Dhople and Brian Johnson, Tuesday, July 19, 2022, 10:00 AM – 12:00 PM, Plaza Court 7.
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 - Latest Sensing Technologies for Inverter-Based Resource Integration, Moderators: Guohui Yuan and Henry Huang, Tuesday, July 19, 2022, 1:00 – 3:00 PM, Plaza Court 7.
 - Henry Huang update: inverter based resources. Combination of DOE participants from OE and EERE. Good place to understand how each office funds research in the area.
 - EMT Modeling of Inverter-based Resources: Education and R&D, Moderators: Brian Johnson and Lingling Fan, Tuesday, July 19, 2022, 3:00 – 5:00 PM, Plaza Court 7.
 - Brian Johnson update: Co-chairing EMT panel. Mixture of panelists from industry and academia.

- Simulation to Lab Demo to Field Demonstrations: Lessons Learned from International Research Collaborations between India and US Involving Utilities, Universities, National Laboratories and Other Partners, Moderators: Noel Schulz and Santanu Mishra, Wednesday, July 20, 2022, 8:00 – 10:00 AM, Governor's Square 9.
 - Noel Schulz update: DOE project with 15 India/15 US partners. 3 presentations each from India and US.
- New career opportunities in power engineering: How can recent graduates prepare for those jobs?, Moderators: Sara Eftekharnjad and Nanpeng Yu, Wednesday, July 20, 2022, 10:00 AM – 12:00 PM, Governor's Square 9.
 - Sara Eftekharnjad update: targeted towards recent graduates and how to prepare for career changes. What kind of skills/expectations are required?
- Innovative teaching methods for modern power and energy systems, Moderators: Panos Kotsampopoulos, Nikos Hatziaargyriou, Wednesday, July 20, 2022, 1:00 – 3:00 PM, Governor's Square 9.
- Hao Zhu update: future/recent graduates for how to prepare for startups/insights for students. Wednesday afternoon 3-5pm.
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- Student Poster Session: Tuesday, July 19, 7:00 - 9:30 AM, Plaza Ballroom ABC.
 - Sara Eftekharnjad gave update on the time of the poster session.
 - Update from Luke Dosiek.

4. NAPS

- Reports:
 - 53rd North American Power Symposium, 2021 (Texas A&M University).
 - Update from Tom Overbye (Kate Davis could not be here). Kate ran NAPS.
 - Awarded NAPS 53 at the NDSU NAPS 50
 - Gave thanks to ASU NAPS 52 for how to handle the hybrid/online conference
 - Held in-person Nov. 14 – 16 2021
 - 3 keynote speakers
 - 35 paper sessions
 - 152 papers
 - 229 attendees
 - Great success despite COVID uncertainty
 - Special thanks to Jerry Heydt for making it to every NAPS (except one?)
 - Thanks to the committee and volunteers
 - Especial thanks to Kate Davis for putting the NAPS together in the midst of health issues.
 - Updates from Kate (presented by Tom): Planning was challenging during COVID, all papers on IEEE Xplore. Went paperless.
 - Best paper award
 - SPARK award for best participation
 - IEEE Young Professionals Networking Lunch
 - Passing on Google Drive documents to future NAPS hosts
 - \$92,600 in expenses
 - \$21.5k travel awards

- Student hotel: \$15.1k
 - Venue/food: \$43.7k
 - Sunday trip: \$2k
 - TEES service fee: \$3k
 - AV support etc.: \$7.3k
- Funding
 - NSF: \$25,100
 - Registrations: \$18,800
 - IEEE PES PEEC: \$15k
 - PES Young Professionals (\$1k)
 - College Station City: \$7.5k
 - Industry Sponsors: \$9k
 - TAMU ECE/TEES Smart Grid Center: \$16,200 (slack bus)
 - Included local registration
- Hosting NAPS is becoming quite expensive; going forward PEEC should address NAPS expectations on student support and registration costs. For smaller universities, NAPS is a large commitment
- Spring regional conferences (TPEC, PECE, KPEC, etc.) are providing students with additional opportunities for students to present.
- 54th North American Power Symposium, 2022 (University of Utah).
 - Update from Mostafa Ardakani:
 - Received Google Drive from Texas A&M and it helped a lot
 - Oct. 9 – 11, 2022.
 - During fall break, less students expected on campus (do not expect a football game)
 - Venue: University Guest House and Conference Center (from Olympics site)
 - Lodging:
 - Faculty: Salt Lake City Marriott – University Park
 - Students: University Guest House and Conference Center
 - Expected Attendance: 180 students, 100 faculty/industry
 - Transportation: fly into SLC airport (Delta Hub), 15-20 minute drive to campus
 - Banquet: Natural History Museum of Utah
 - Co-Chairs: Mostafa and Dr. Mingxi Liu
 - Website and registration: University of Utah Conference and Event Management (event management, catering, food, shuttles, etc.)
 - Fundraising is ongoing
 - Submit proposal to NSF
 - Proposal to PEEC
 - Registration is open: naps2022.utah.edu
 - Paper deadline was July 15, 2022. 163 submissions. Internal reviews + send Utah reviews to external reviewers.
 - Q+A:
 - Late submission permission given to National Labs
 - Some discussion on lower number of submissions:
 - May be some conflicts with other conferences, future hosts should maybe check before choosing dates.

- No current numbers on undergraduate submissions. Plan to have a separate UG best paper award
 - Accepted transactions papers can be presented at PES sponsored conferences (one paper was allowed)
- 55th North American Power Symposium, 2023 (Western Carolina University).
 - Bora Karayaka update:
 - Dates: Oct. 15 – 17, 2023
 - Sponsorship plan: reached out to Duke Energy, Eaton Corp.
 - Conference venue: set Double Tree Hilton in Asheville, NC. Right next to a major tourism attraction in that part of state.
 - Meet every couple of months for NAPS updates for progress of conference
 - Advice from Tom Overbye: maybe increase registration fee as WCU is a small university.
 - Push for UG submissions. Short paper submissions (extended abstract submissions) for poster sessions. In planning. To increase # of submissions for UG authors.
 - Q+A:
 - Will short papers still be published in IEEE Xplore? Still looking into if they will be just for posters, regular presentations, etc.
 - When is IEEE IAS meeting? Oct. 29 – Nov. 3, should be fine
 - Short paper abstracts in PESGM are published in the PEEC website, but not in IEEE Xplore. Can model it after the general meeting student poster competition.
 - Discussion on requirement of full paper review for archival on IEEE Xplore for technical co-sponsorship through IEEE PES. Bring up two categories will be submitted, the abstracts that will not be on Xplore and others that are not.
 - Paras discussion about difficulty on getting UG students to write a full 6-page paper. Perhaps reduce length? No minimum, so can maybe just submit shorter papers.

5. Subcommittee Sponsored Activities for the 2022 GM

- Panel session proposals.
 - Aranya Chakraborty: NSF CAREER Panel will continue, renew in 2023 with new awardees from this year's winners.
 - Sara Eftekharijad: uncertainty quantification in power systems. Talk with experts/grant winners in academia on that topic. If anyone is interested, reach out to Sara.
 - Tom Overbye: Impact of weather on the electric grid (power flow point of view).
 - Comment from Sukumar Brahma to include education component.
 - Noel Schulz: National Lab/University partnerships. Opportunities for others to get involved with national labs. Sara Eftekharijad would like to co-organize.
 - Brian Johnson: HVDC transmission workforce development and education.
 - Paras Mandal: Best dissertation panel. Tim Hansen brought up a panel based on best/most impactful dissertation. Need a review panel, and then the top four or five would be invited to present in a panel.

- Noel Schulz said the student chapters were just discussing a best dissertation award, 3 minute dissertation presentation. Should coordinate with Noel to bring in the student chapters.
- Junbo Zhao: panel on training through software simulation (Opal-RT, RTDS, etc.); emerging topics/applications. Co-organize with Kumar Venayagamoorthy
- Aranya Chakraborty: perhaps a panel from the US-India ML/AI supplemental grant program through NSF



6. DOE SETO Research Opportunities: Guohui Yuan

- Organizational re-org:
 - Infrastructure Bill money
 - \$62B from bill
 - New offices:
 - Clean Energy Demonstration
 - Grid Deployment
 - Cybersecurity Office
 - State Energy Program Office
- EERE SETO – science innovation space, other side more on demonstrations
 - New emphasis on diversity. Minority institutions. Application pool and review pool.
 - Workforce development emphasis. Industry training, next generation workforce should submit papers. Collab with industry/nat'l labs with academia.
 - Big trend on technology development spectrum. Early stage research, moving to accelerated deployment. TRL1 – TRL9. Basic concept all the way to large-scale deployment.
 - Requires partnering between academics, industry, national labs, and manufacturing.
- SETO EERE under Office of Science
 - Five different programs:
 - Systems Integration of Solar
 - CSP: concentrated solar power including thermal energy storage
 - PTRB: materials side
 - Soft Cost: issues related to financing, access, workforce development, and other issues
 - Manufacturing Competitiveness: tech transfer, incubator, advanced manufacturing of US solar (panels, inverters, etc.)

7. Quick Update from NSF: Aranya Chakraborty

- NSF EPCN:
 - Aranya Chakraborty, NC State (power)
 - Eyad Abed, Maryland (Controls)
 - Donald Wunsch (machine learning and signal processing)
 - Mahesh Krishnamurthy, IIT (power electronics, electric machines, transportation)
- Nine NSF CAREER awards:
 - Sara Eftekharnjad (Syracuse)
 - Daniel Mohzan (GTech)
 - Dominic Gross (Wisconsin)
 - Mostafa Ardakani (University of Utah)
 - Anamitra Pal (ASU)
 - Mingxi Liu (University of Utah)

- Jianchiang Chen (University of Arizona)
- Hongyu Wu (KSU)
- Brian Johnson (Texas)
- Broad range of topics on DER modeling, control, grid data learning, grid following converters, PMU data analytics, energy storage, data-driven optimization, market design, cyber-security
- Solicitations:
 - ASCENT
 - CPS
 - Multiple awards made in power systems (cyber-security, ML, distributed controls)
 - New directorate in NSF: TIPP (translational research, bring technology into practice) will cover SBIR, STIR, convergence accelerator, PFI
 - Highly encouraged to work with industry to submit power proposals to this directorate
 - Sustainable Regional Systems (SRS)
 - Planning grant to Tom Overbye through this program
 - Bring urban/rural infrastructures closer together
 - Take a look as power and transportation are listed as topics on the urban side, may be of interest for PEEC/PES
 - Planning grant (\$250k), then towards larger grant of \$5M. Solicitation will come out soon. Let by CBET
 - CAS Climate DCL (regular EPCN proposals) – if writing an EPCN related to climate change solutions, you can put CAS as part of your proposal.
 - ERI – like a CAREER award, but \$150k for new assistant professors starting in R2 institutions and HBCUs
 - US-India supplemental grants in ML and AI: several supplements worth up to \$100k each
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 - S&CC no longer in ECCS, contact David Corman
- Infrastructure Grants:
 - Not research grants, focus on developing infrastructure, testbeds, construction, etc.
 - Three NSF MRI proposals in power/energy in FY22
 - Midscale Research Infrastructure 1 and 2: \$19M award to Arkansas for SiC testing facility; \$40M award on microgrids to UCSD
 - Midscale 1&2 workshops in ENG – DCL out, two selected for FY22, more for FY23
 - \$40k for workshop
 - Talk to Aranya for more details.
- Workshops and conferences sponsored:
 - TPEC – Adam Birchfield
 - NAPS'21 – Kate Davis
 - Mladen Kezunovic – NSF/PSERC Workshop on grid edge
 - PECL – Kiruba Haran
 - IEEE CSS workshop on control for societal-scale challenges – Anu Annaswamy
 - US-Africa workshop on power systems – James Momoh
- Next-generation power and energy:
 - NSF partnering with ERVA
 - AC leads the ENG working group on climate change solutions: ECCS, CMMI, CBET

- ECCS topic highlights: grid modernization, clean energy, electrified transportation (ASPIRE ERC at Utah State), human participation in grid operations, environmental resilience, and natural hazards. Role of power electronics – dynamics, controls, stability cyber-security
- Critical interest in workforce development, broadening participation, equity and fairness of education and outreach to underrepresented communities
- Other news:
 - ENG assistant director change: Linda Blevins stepped down, Don Millard interim, search is ongoing
 - Opening for ECCS Division Director, search is ongoing
 - Opening for EPCN Machine Learning PD – DCL is out, expertise in signal processing, ML, neural networks, neuro-science, computational intelligence.

8. NSF Mid-Scale Research Infrastructure – DERConnect (Jan Kleissl)

- Manasa Muralidharan presented on behalf of Jan Kleissl
 - Funded by NSF to build a test facility for distributed control of DERs. Large scale testbed that can be accessed remotely nationwide.
 - 2,500 actual devices, 2M simulated nodes
 - Small form factor DERs jointly serve the power grid
 - Integration of RES
 - Building control
 - EVs
 - Overview:
 - Grid islanding control
 - DERConnect CORE
 - SEL microgrid PowerMAX controller
 - Grid following/forming inverters
 - Power/Controller HIL (RTDS, Typhoon)
 - Realtime grid simulation
 - UCSD microgrid
 - Data will be stored/available/accessible.
 - Example use case on distributed control was shown
 - Energy Storage Innovation Lab
 - 250 kW to be upgraded to 2 MW
 - Directly interface with DERConnect
 - Participate in energy markets
 - Q+A:
 - The testbed will be able to run in completely islanded mode
 - Not available online yet, will be available 2025. Microgrid ready in 2024.
 - Have earlier users been identified to provide feedback? (Adil Khurram) Not yet, looking for potential users. Write a research grant to work with the DERConnect. Currently HVAC control systems. Can use this to help determine use fees.

9. Status of University Power Programs

- New Hires:
 - Di Shi is joining New Mexico State as an Assistant Professor
 - Meng Wu: new hire at ASU, Amar Ramapuram Mataralam, was a post-doc at Iowa State University.

- Brian Johnson joining University of Texas (From UWash) at interface between power systems and power electronics
- Started at UCSD in July: Yuanyuan Shi
- NCState: new assistant professor Aritra Mitra hired in distributed control/learning. Applications to power systems.
- Zongjie Wang started at UConn last year in electricity markets
- Yan Li: New hire at Penn State in power electronics
- Follow-up from Le Xie: Sivaranjani (Siva) Seetharaman hired at Purdue in power/controls in transportation. Bin Wang joined UTSA ECE department. Tong Huang after post-doc at MIT joining San Diego State.
- Open Positions:
 - Joydeep Mitra: new position in power at Mich. St. Ad out in fall, expecting to hire for Fall 2023.
 - Tom Overbye: open position at Texas A&M. Power systems + X (e.g., power electronics, machine learning). Closing date Sept. 15 with start of Fall 2023.
 - Noel Schultz: multiple positions in power systems at Washington State

10. Future Activities

- Noel Schulz: Wednesday night there is an informal meeting for women faculty (in the program)
- Sara Eftekharijad (on behalf of Sukumar Kamalasadana): PEEC Main Meeting on Tuesday, July 19 10am-12pm.
- Move to adjourn (Sara Eftekharijad) seconded by Tim Hansen

ATTENDANCE (in-person)

1. Tim Hansen, timothy.hansen@sdstate.edu
2. Sara Eftekharijad, seftekha@syr.edu
3. Meng Wu, mwu@asu.edu
4. Hao Zhu, haozhu@utexas.edu
5. Luke Dosiek, dosiekl@union.edu
6. Sanjay Hosur, hosurs@union.edu
7. Junbo Zhao, junbo@uconn.edu
8. Yan Li, yql5925@psu.edu
9. Manasa Muralidharan, m1murali@eng.ucsd.edu
10. Tom Overbye, overbye@tamu.edu
11. Alex Flueck, flueck@iit.edu
12. Jonathan Snodgrass, snodgrass@tamu.edu
13. Bora Karayaka, hbkarayaka@wcu.edu
14. Di Shi, di.shi@ieee.org
15. Mohammed Ben-Idris, m benidris@unr.edu
16. Lei Yang, ley@unr.edu
17. Yunchuan Liu, ycliu@nevada.unr.edu
18. Henry Huang, zhenyu.huang@pnnl.gov
19. Venkataramana Ajarapu, vaijarap@iastate.edu
20. Chanan Singh, singh@ece.tamu.edu
21. Paras Mandal, pmandal@utep.edu
22. Zongjie Wang, zongjie.wang@uconn.edu
23. Mingxi Liu, mingxi.liu@utah.edu
24. Mostafa Ardakani, Mostafa.ardakani@utah.edu
25. Noel Schulz, noel.schulz@wsu.edu
26. Anurag K Srivastava, Anurag.srivastava@mail.wvu.edu

27. Kumar Venayagamoorthy, gkumar@ieee.org
28. Sukumar Brahma, sbrahma@clermson.edu
29. Aranya Chakraborty, achakrab@nsf.gov
30. Brian K Johnson, bjohnson@idaho.edu
31. Joydeep Mitra, mitraj@msu.edu
32. Amarsagar Reddy, amar@iastate.edu
33. Alok Kumar Bharati, ak.bharati@pnnl.gov
34. Amar Ramapuram Mataralam, amar.sagar@asu.edu
35. Yuanyuan Shi, yyshi@eng.ucsd.edu

ATTENDANCE (online)

1. Mojdeh Khorsand Hedman, Arizona State University, Mojdeh.khorsand@asu.edu
2. David Gao, University of Denver; David.Gao@du.edu
3. Sumit Paudyal, Florida International University, spaudyal@fiu.edu
4. Hanif Livani, University of Nevada, Reno, hlivani@unr.edu
5. Irfan Khan, Texas A&M University, irfankhan@tamu.edu
6. Nga Nguyen - University of Wyoming - nga.nguyen@uwyo.edu
7. Adil Khurram, University of California San Diego, akhurram@ucsd.edu

Joined Middle of meeting:

1. Ali Mehrizi-Sani, Virginia Tech, mehrizi@vt.edu
2. Sanjeev Pannala, Washington State University, sanjeev.pannala@wsu.edu
3. Vedran Peric, TU-Munich, vedran.peric@tum.de
4. Lei Yang, University of Nevada, Reno, leiy@unr.edu
5. Le Xie, Texas A&M, le.xie@tamu.edu