SUPPLEMENTARY MATERIAL FOR
Face-to-face or face-to-screen: A quantitative comparison of conferences modalities

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This file contains:

- Statistics concerning collaboration formation by modality at Scialog and American Physical Society (APS) conferences
- Details on the APS March Meeting data
- Sample statement of conference objectives and conference process
- Sample schedules from:
  - Advanced Energy Storage (AES) (In-person conference, 2017)
  - Signatures of Life in the Universe (SLU) (Virtual conference, 2021)

Note: activities in the sample schedules are highlighted in colors corresponding to Figure 4 of the main text (blue: mini breakout session, red: breakout session, yellow: whole group formal interaction, purple (grey in the figure): informal interaction)

COLLABORATIONS BY MODALITY

We determined how often new collaborations were formed at the Scialog and APS March Meeting conferences, considering the conference modality and the interaction between participants. In table I, we consider pairs of Scialog participants who co-attended small-group sessions, as we have shown in the main text that small groups have a disproportionate effect on collaboration. In table II, we consider all formal interaction at the Scialog conferences, both small and medium-sized breakout sessions. The results are consistent in both cases, regardless of how we define formal interaction: a greater percentage of pairs who formed new collaborations had formally interacted during the virtual conference compared to the in-person conference.

Table I. New collaborations by modality (small group sessions)

Series	Conf.	Modality	Small-group Sessions	New collabs	Total pairs	Percent new collabs
Scialog	MCL	In-person	39	13	234	5.6%
Scialog	TDA	In-person	52	13	276	4.7%
Scialog	AES	In-person	80	25	240	10%
Scialog	CMC	In-person	68	29	196	15%
Scialog	NES	Virtual	80	34	240	14%
Scialog	MND	Virtual	68	30	228	13%
Scialog	ABI	Virtual	72	23	220	10%
Scialog	SLU	Virtual	72	9	218	4.1%
Scialog	MZT	Virtual	72	17	220	7.7%
Scialog	(avg)	In-person	59.8	20.0	236.5	8.8%
Scialog	(avg)	Virtual	72.8	22.6	225.2	9.8%
APS	2018	In-person	843	74	247,312	0.030%
APS	2019	In-person	921	76	262,154	0.029%
APS	2020	Cancelled				
APS	2021	Virtual	999	84	192,454	0.044%

The percentage of small-group pairwise meetings that resulted in new collaborations for each conference.

Table II. New collaborations by modality (total formal interaction)

Series	Conf.	Modality	Sessions	New collabs	Total pairs	Percent new collabs
Scialog	MCL	In-person	54	31	723	4.3%
Scialog	TDA	In-person	72	40	821	4.9%
Scialog	AES	In-person	104	53	1016	5.2%
Scialog	CMC	In-person	88	44	789	5.6%
Scialog	NES	Virtual	98	57	852	6.7%
Scialog	MND	Virtual	86	41	697	5.9%
Scialog	ABI	Virtual	90	36	694	5.2%
Scialog	SLU	Virtual	90	35	723	4.8%
Scialog	MZT	Virtual	90	36	717	5.0%
Scialog	(avg)	In-person	79.5	42.0	837.3	5.0%
Scialog	(avg)	Virtual	90.8	41.0	736.6	5.5%
APS	2018	In-person	843	74	247,312	0.030%
APS	2019	In-person	921	76	262,154	0.029%
APS	2020	Cancelled				
APS	2021	Virtual	999	84	192,454	0.044%

The percentage of small and medium-sized group pairwise meetings that resulted in new collaborations for each conference.

We computed the percentage of pairs who collaborated at Scialog conferences that formally interacted exclusively in small groups and in an both small and medium-sized groups. The results displayed in III show that on average, 4 out of every 10 pairs of collaborator interacted in a small-group session and over three quarters in any assigned group setting. These values are even higher for virtual conferences compared to in-person. The pairs who did not formally

interact in a session but collaborated may have formed the collaboration due to knowledge of one another prior to the conference, meeting in an informal setting during the conference (e.g. meals, coffee breaks), or a network effect of another participant introducing them.

Table III. Percentage of pairs who collaborated at Scialog conferences that formally interacted

Series	Conf.	Modality	Small-group sessions	Sessions	Total collabs	Percent small group interaction	Percent formal interaction
Scialog	MCL	In-person	39	54	46	28.26%	67.39%
Scialog	TDA	In-person	52	72	51	25.49%	78.43%
Scialog	AES	In-person	80	104	74	33.78%	71.62%
Scialog	CMC	In-person	68	88	56	51.79%	78.57%
Scialog	NES	Virtual	80	98	76	44.74%	75.0%
Scialog	MND	Virtual	68	86	49	61.22%	83.67%
Scialog	ABI	Virtual	72	90	44	52.27%	81.82%
Scialog	SLU	Virtual	72	90	48	18.75%	72.92%
Scialog	MZT	Virtual	72	90	45	37.78%	80.0%
Scialog	Average	In-person	59.8	85.8	54.3	39.3%	76.6%
Scialog	Average	Virtual	72.8	90.8	52.4	43%	78.7%

MORE ABOUT APS MARCH MEETING DATA

We extract data from APS March meeting online conference schedules. As of September 5, 2023, the URL is `https://meetings.aps.org/Meeting/MARXX`, where XX is replaced by the last two digits of the year of the meeting. From 2018-2021, the numbers of individuals who presented in any session of the meeting were: 10074 (2018 Los Angeles meeting), 10404 (2019 Boston meeting), (2020 meeting cancelled), 10717 (2021 virtual meeting).

To identify co-presenters who formed a new collaborations, we filtered the data in the following way:

1. Identify a presenter's co-authors and date of co-authorship from their arXiv publications dating back to 1999.
2. For each pair of co-presenters, check if they were co-authors.
3. If the co-presenters were never co-authors or were co-authors prior to the March Meeting, exclude the pair.
4. If the co-presenters were co-authors for the first time within a two year span after the end of the March Meeting, check if they were ever at the same institution. If yes, exclude the pair.[1]

The remaining pairs were considered to be the co-presenters who formed a collaboration at an APS March Meeting.

[1] This filtering was done to omit pairs of collaborators who very likely met outside of the March Meeting, such as advisors and their students or postdocs.

Conference Objectives

Engage in dialog with the goal of accelerating high-risk/high-reward research.

Identify and analyze bottlenecks in advancing time domain astrophysics and develop approaches for breakthroughs.

Build a creative, better-networked community that is more likely to produce breakthroughs.

Form teams to write proposals to seed novel projects based on highly innovative ideas that emerge at the conference.

Conference Process

Brainstorming is welcome; don't be afraid to say what comes to mind.

Consider the possibility of unorthodox or unusual ideas without immediately dismissing them.

Discuss, build upon and even constructively criticize each other's ideas – in a spirit of cooperative give and take.

Make comments concise to avoid monopolizing the dialog.

Scialog: Advanced Energy Storage

Conference Agenda
Westward Look Resort
November 2-5, 2017

Thursday, November 2

1:00 pm	**Registration Opens**	Lobby
1:00 - 5:00 pm	**Snacks & Informal Discussions**	Palm Room & Terrace
5:00 - 6:30 pm	**Poster Session & Reception**	Sonoran Ballroom
6:00 - 6:30 pm	**Meeting for Discussion Facilitators**	Ocotillo & Cholla
6:30 - 7:30 pm	**Dinner**	Ocotillo & Cholla
7:15 - 7:30 pm	**Welcome** Dan Linzer, *President, RCSA*	Ocotillo & Cholla
7:30 - 7:45 pm	**Conference Overview, Desired Outcomes & Guidelines for Collaborative Proposals** Richard Wiener, *Senior Program Director, RCSA*	Ocotillo & Cholla
7:45 - 8:30 pm	**Keynote Presentation** Héctor Abruña, *Cornell University*	Ocotillo & Cholla
8:30 - 11:00 pm	**AES Starlight Café** Snacks, conversations, etc.	Palm Room & Terrace

Friday, November 3

7:00 - 8:00 am	**Breakfast**	Palm Room & Terrace
8:00 - 9:00 am	**Introductions**	Ocotillo & Cholla
9:00 - 9:45 am	**Keynote Presentation** Karl Mueller, *Pacific Northwest National Laboratory*	Ocotillo & Cholla
9:45 - 10:15 am	**Conference Photo & Break**	Palm Terrace
10:15 - 10:30 am	**Breakout Sessions Overview**	Ocotillo & Cholla
10:30 - 11:30 am	**Breakout Session I**	Ocotillo & Cholla*
11:30 am - 12:00 pm	**Report Out**	Ocotillo & Cholla
12:00 - 12:30 pm	**Mini Breakout Session I**	Ocotillo & Cholla*
12:30 - 1:30 pm	**Lunch**	Palm Room & Terrace
1:30 - 2:15 pm	**Keynote Presentation** Amy Prieto, *Colorado State University*	Ocotillo & Cholla
2:15 - 3:15 pm	**Breakout Session II**	Ocotillo & Cholla*
3:15 - 3:30 pm	**Report Out**	Ocotillo & Cholla
3:30 - 4:00 pm	**Mini Breakout Session II**	Ocotillo & Cholla*
4:00 - 5:30 pm	**Afternoon Break**	
5:30 - 6:30 pm	**Poster Session & Reception**	Sonoran Ballroom
6:30 - 7:30 pm	**Dinner**	Ocotillo & Cholla
7:15 - 8:00 pm	**Panel Discussion: Opportunities for Scialog Fellows**	Ocotillo & Cholla
8:00 - 11:00 pm	**AES Starlight Café** Snacks, Conversations, etc.	Palm Room & Terrace

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Saturday, November 4

6:15 - 7:15 am	**Optional Guided Nature Walk**	WL Trails–Meet in Lobby
7:00 - 8:15 am	**Breakfast**	Palm Room & Terrace
8:15 - 9:15 am	**Breakout Session III**	Ocotillo & Cholla*
9:15 - 9:30 am	**Report Out**	Ocotillo & Cholla
9:30 - 10:00 am	**Mini Breakout Session III**	Ocotillo & Cholla*
10:00 - 10:30 am	**Morning Break**	
10:30 - 11:30 am	**Breakout Session IV**	Ocotillo & Cholla*
11:30 - 11:45 am	**Report Out**	Ocotillo & Cholla
11:45 am - 12:15 pm	**Mini Breakout Session IV**	Ocotillo & Cholla*
12:15 - 1:30 pm	**Lunch**	Palm Room & Terrace
1:30 - 6:00 pm	**Team Formation, Informal Discussion & Proposal Writing** Proposals due 7:00 am Sunday morning	
6:00 - 6:30 pm	**Reception**	Sonoran Ballroom
6:30 - 7:30 pm	**Dinner**	Ocotillo & Cholla
7:30 - 11:00 pm	**AES Starlight Café** Snacks, Conversations, etc.	Palm Room & Terrace

Sunday, November 5

7:00 - 8:00 am	**Breakfast**	Palm Room & Terrace
8:00 - 10:30 am	**Presentations of Proposal Ideas**	Ocotillo & Cholla
10:30 - 11:00 am	**Assessment Survey & Wrap-up**	Ocotillo & Cholla
11:00 am - 12:00 pm	**Lunch** Available to go	Saguaro Room

*Breakout Sessions will be held in Ocotillo & Cholla, Desert, Canyon, Mesa, and Saguaro meeting rooms. Fellows will first meet in Ocotillo and Cholla and then disperse to their discussion groups.

Scialog: SLU Conference Agenda (Optional activities in green)

Thursday, June 10 (times listed in Pacific Time Zone)

8:00 – 8:30 am	**Early login, informal dialog, BYO Breakfast/Lunch**	Zoom Main Room & Breakout Rooms
8:30 – 8:40 am	**Welcome** Dan Linzer, President, RCSA & Cyndi Atherton, Director, Science, Heising-Simons	Zoom Main Room
8:40 – 8:55 am	**Conference Overview & Desired Outcomes** Richard Wiener, RCSA	Zoom Main Room
8:55 – 9:30 am	**Small Group Ice Breakers**	Zoom Breakout Rooms
9:30 – 10:05 am	**Keynote Presentations & Discussion** Victoria Meadows, University of Washington Timothy Lyons, UC Riverside	Zoom Main Room
10:05 – 10:20 am	**Break**	
10:20 – 10:30 am	**Directions for Breakout Sessions**	Zoom Main Room
10:30 – 11:45 pm	**Breakout Session I**	Zoom Breakout Rooms
11:45 – 12:15 pm	**Report Out**	Zoom Main Room
12:15 – 12:30 pm	**Directions for Mini Breakout Sessions**	Zoom Main Room
12:30 – 1:30 pm	**Lunch**	Zoom Main Room
1:30 – 2:15 pm	**Mini Breakout Session I (Fellows only)**	Gather Rooms
2:15 – 2:30 pm	**Break**	
2:30 – 3:15 pm	**Mini Breakout Session II (Fellows only)**	Gather Rooms
3:15 – 5:00 pm	**Break**	
5:00 – 7:00 pm	**Social Mixer**	Gather Rooms

Friday, June 11 (times listed in Pacific Time Zone)

8:00 – 8:30 am	**Early login, informal dialog, BYO Breakfast/Lunch**	Zoom Main Room
8:30 – 8:40 am	**Check in regarding Thursday Sessions**	Zoom Main Room
8:40 – 9:00 am	**Proposal Writing and Team Formation**	Zoom Main Room
9:00 – 10:15 am	**Breakout Session II**	Zoom Breakout Rooms
10:15 – 10:45 pm	**Report Out**	Zoom Main Room
10:45 – 11:00 am	**Break**	
11:00 – 12:15 pm	**Breakout Session III**	Zoom Breakout Rooms
12:15 – 12:45 pm	**Report Out**	Zoom Main Room
12:45 – 1:00 pm	**Wrap-up**	Zoom Main Room
1:00 – 2:00 pm	**Lunch**	Zoom Main Room
2:00 – 2:45 pm	**Mini Breakout Session III (Fellows only)**	Gather Rooms
2:45 – 3:00 pm	**Break**	
3:00 – 3:45 pm	**Mini Breakout Session IV (Fellows only)**	Gather Rooms
3:45 – 5:00 pm	**Break**	
5:00 – 7:00 pm	**Social Mixer**	Gather Rooms

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