NASA TOPS Community Panel June...23 - Day 1 2023-06-14-12-03-46

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SPEAKERS

Fernando Perez, Pen-Yuan Hsing, Brian Nosek, Monica Granados, Justin Ballenger, Malvika Sharan, Chelle L. Gentemann, SherAaron Hurt, Ilona Serrao, Qiusheng Wu, Malcolm Glover, Jamaica Jones, Kevin Murphy, James Colliander, Holly Norton, Diana Ly

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Chelle L. Gentemann 00:01

We're turning on recording. And thank you all for joining the tops June 2023 Community panel. I am Dr. Sal ngadimin. And we also have members of the Topps team here. Do you want to go around and introduce yourself quickly?

Holly Norton 00:19

Sure. I'll start Dr. Holly Norton. I'm our tops content coordinator today.

Malcolm Glover 00:26

Welcome. Hi, everyone, Dr. Malcolm lover, Community Coordinator with Tufts.

Kevin Murphy 00:34

Hello, I'm Kevin Murphy. I'm the Chief Science state officer. Thank you.

Chelle L. Gentemann 00:40

Thank you. And we see people are joining, we're keeping track of people and making the panelists as they're joining, we already have a notification that a couple people are late. And I'm going to be troubleshooting on Slack. So if you're having trouble joining like Shane just

slapped me, I will be getting that link out to people. And Holly, do you want to go with the next slide? Sure. Thank you. So if you're on social media, we're encouraging people to use NASA Thompson I heart open science. And I'm gonna pass it the holy now. Thank you.

H Holly Norton 01:20

So just to go through what we're going to be discussing over the next three days, day one, today, we're going to be discussing a topic update, giving you a bit of a background and introduction there, and the creation of the curriculum. So we're gonna go through the introductions, and then discuss the update, go through a year of open science, then we'll have a break. And then we'll go through the module content development, and the MOOC development team. And then we're going to have time for discussion after that before we wrap up at 415. Now, just a brief overview of the next two days. Tomorrow, we're going to discuss the training of 20,000 scientists. That's our goal. And through that, we're going to take you through the attempts to update the Open Science, one on one certification, instructor training, and implementation, then we're going to have time midday for the community forum. And then after that, we're going to discuss the scaling of the curriculum up to 20,000 scientists. And then after that, we're gonna have time for discussion. And then on day three, we're going to go through the tops recruitment and outreach, we're going to discuss the 2024 engagement strategy, the HQ dei engagement strategy, and then we're going to go through a SWOT analysis activity to just identify all of our strengths, etc, and places that we could be improving our, our approach. And then there's time for discussion at the end before we wind down at 410 on the last day. Next up is going to be our Code of Conduct. You've only had a chance to review the slides prior to our panel, but just a brief overview. We just expect everyone to be treated with respect and consideration, valuing a diversity of views and opinions. We asked everybody to be considerate and treat others the way they would want to be treated. And if you notice any unacceptable behavior, please please let us know any harassment or intimidation like that, please let us know as soon as you experience it. And if you have any questions about reporting, unacceptable behavior, or anything like that, please contact shell shell gottman@nasa.gov. And with that, I'm going to switch over here we have a live IO tool that you can access by going to this QR code here. This is set up so that our attendees can provide questions and feedback real time during the panel throughout the next three days for our panelists to bring up in discussion times. And we're going to turn it back over to shell for introductions.

Chelle L. Gentemann 04:05

Thank you, Holly. Holly. shushing is on Slack. I was only able to get in by registering but you said you have a link for people who can just want to join so anyone can join and then we can elevate them to panelists. Is there a way that you could slack that to show sharing real quick are the panelists discussion

H Holly Norton 04:22

can try but the first thing I need to do is not up in the window? I don't know.

Chelle L. Gentemann 04:27

Oh, wait, I was saying is here if he's raised his hand. Oh, so I think we just need to make him a panel. That's what I'm here there.

H Holly Norton 04:37

That's what I was for the participants that's what we couldn't find.

Chelle L. Gentemann 04:56

So can you be the first thing One second, we'll work out. Right link for other people in the chat. Okay, thank you. So we're going to go through introductions now. Next slide, please. So thank you to all the community panelists. And this is being recorded, like we said before, many of them are able to attend right now. And we look forward to their participation both through the IO tool through chat here. And we're welcoming the public to comment and the IO tool as well. There'll be we'll show the agenda in just a minute. But I just want to really welcome the community panelists and give them all a second to say hello and introduce themselves real quick. And I think you should be most of you should be panelists, there's Fernando up there, Fernando Perez. And so if you're not a panelist, send us a message through the Slack channel. Otherwise, please go ahead and say hi.

J James Colliander 06:31

Hi, I'm Jim Caliendo.

Chelle L. Gentemann 06:33

Thanks, Jim.

F Fernando Perez 06:35

I think Fernando Perez from UC Berkeley I pronounce

J Justin Ballenger 06:43

Hello, I'm Justin balandra. from Morehouse College. I'm standing in for the Washington

B Brian Nosek 06:55

Hello, I'm Brian Nosek from the Center for Open Science in University of Virginia.

Chelle L. Gentemann 07:07

Great, and I see shell saying they're saying I think you were on mute when you spoke. Or no, pen. Sorry, there's pen. And I think you were on mute when you spoke.

P Pen-Yuan Hsing 07:17

Oh, hi, everyone. Glad to be here. My name is Penniman, Shane, you can call me panel. I am a researcher doing open science related research at the University of Bristol in the UK. I'm also associated with the gathering for open science hardware.

Chelle L. Gentemann 07:36

Thank you. So next slide, please.

H Holly Norton 07:43

Turn it over to Kevin Murphy. NASA's Chief Science Officer.

K Kevin Murphy 07:48

All right. Thank you. Thank you first, for everybody joining us today, both from the panelists. As well as the, you know, the participants online. We we really find our community forums as very valuable, you know, venues for us to discuss how we're moving NASA towards open science, and how we're supporting the transformative and science works, which will be the majority of our discussions today and the following days. So your contributions are incredibly important. And we take them very seriously. So thank you for supporting this, I know that, you know, everybody has to do work. And this could be just another activity to do. And you're choosing to do it with us. So just really thank you very much. I won't take too much time today. But I will be talking and listening in over the next couple of days as well in the team kind of run through the entire agenda. So a little bit of background on why NASA is doing open science, and why we think it is vital for what NASA does. Back in 2019, we published from the Science Mission Directorate within NASA Headquarters. The strategy for data management and computing. The vision for this strategy was primarily to develop capabilities that support the open access to the information that we collect and make publicly available. So what you may know about NASA or may not know about NASA is that we have a lot of data. We have a lot of publications. We have a lot of software, and that information is in the public domain. And we need to have programs that support making that available making it so anyone can discover new things and participate in the site. defect discovery process. So that was really the strategy for data management and computing. Last August OSTP, released a memo on ensuring free and immediate equitable access to federally funded research. That's another critical component to what we do. So you know, we are a public, we funded organization, and the results should be available to everyone. And finally, we've implemented policies within NASA Science Mission Directorate specifically to make sure that we're in adherence with both our strategy for data management, computing, and the OSTP man while ensuring free immediate and equitable access to federally funded research. So that's really the background of kind of why we have a program. Next slide, please. So the Chief Science Data office within the Science Mission Directorate is really responsibly

responsible for implementing the capabilities to achieve the activities on those former documents, right. Our first goal is really develop and implement capabilities to enable science. Second one is a recognition that we need modern Cyber Infrastructure computing infrastructure to enable people to collaborate together, especially on the petabytes of information that we have available. And that we want to do this with the community is goal three. And goal three is really relevant related to a lot of the topics or work that we're doing here. Next slide, please. Now, we've named our specific Open Science Initiative, open science activities, the open source Science Initiative. And that's really NASA's approach for putting open science into practice, right, we see science as an active, participatory endeavor, and being able to work with and collaborate with people both internal to NASA, but also, more importantly, external to NASA is critically important. So we have a dedicated program called the Open Source science initiative to do exactly that. Next slide, please. This program is built on four pillars. And these pillars interact together and complement one another, to really enable us to have an open source of Science Initiative Program, which enables open science across all of our communities. The first thing that we did when we began implementing our capabilities to do this is develop the correct policy guidance, and governance activities related to ensuring our public data, our public software and our public. Our public publications are all public Lee available. Um, the second thing we did is we recognize that the community in a lot of instances needs incentives to move towards that. So we have a variety of grants, cooperative agreement, notices, prizes, and challenges that that really kind of pushed the community our direction. We're developing core data and computing services, because we recognize that kind of the free flow of information and knowledge is incredibly important. And currently, the way that we do that is through our computing and data infrastructures, which allow us to process and collaborate, especially if hybrid or virtual scenarios. And finally, we recognize that the community really needs to be engaged to advance open science literacy across across the board. So you'll you'll hear a lot about costs. Next slide, please. One of the biggest things that we've done recently, and this was back in the fall of last year, was released. SPD dash 41. A is the best acronym ever. Um, it's got letters it got it's got numbers, it's got a dash. It's got, you know, capitals and lowercase. So NASA has really overachieved in this area. But it's basically the SMD policy directive 41 A. And you can go that QR code and see the specifics on it. But these are the guidelines we apply to our missions, our grant opportunities and other scientific activities within the Science Mission Directorate, which says that, you know, these are the rules you got to follow when you're releasing data when you're publishing papers, or or releasing software for scientific activities that are funded by SMP. We've presented this to over 1000 stakeholders since December. We've developed this over the course of the last couple of years. As with community input workshops and town halls, and we did RFIs, and all sorts of things. This is aligned with the White House memo, as I said before, multiple National Academy studies. And you can go there and take a look at it by visiting that QR code. I think the really important part though, is that it really says that NASA scientific data, and as a scientific software, and NASA as publications, funded pass r&d should be available without cost and and easily by the community so that they can participate in the scientific endeavor. So if you have any questions on that, please let us know there are links for people to access that information from the QR code and give us responses. Next slide, please. The next big component that we have just initiated, that is the core data and Computing Services Program. This program is really about increasing efficiency within our five science directorates in terms of their access to data and computing capabilities, and then making that available in ways that the specific scientific disciplines that use those products can access that information much more easily. Central to the development of these will be the ability to integrate new and existing or existing and new services. So that develop so that divisions can really develop capabilities that are cutting edge on these in the latest data science techniques, including things like AI and adult. So, you know, we're making sure that our services will support all of the requirements in SPD, 41 egg, as well as provide better access in

general. Next slide, please. Now, the first thing that we really thought we needed to do within services was make the 10s of 1000s of collections of data across all five SMD divisions easily discoverable. So we've developed in collaboration with the 35 or so archives of scientific information capability called the science discovery engine. So this is a one stop shop for you to discover the high level collections of information that we have at all 35 geographically distributed archive centers. The other thing that we're developing is called Science Explorer. And for those of you that are an astrophysics, you'll know it as the astrophysics data system, or potentially, even if you're in planetary science, and this is a way to access the information from journals in ways that really links things together pretty well. So if you haven't experienced the astrophysics data system, or science explorer, please do so. Because I think that's a critical component. And these will be integrated with the core data and computing infrastructure that we're currently developing plans for. Next slide, please. One of the critical things that we noticed when we initially started our our program is that the communities that develop open software, which are the critical software libraries and tools, and platforms that really enable science today, especially science on on larger and larger datasets in kind of community or network based science, didn't have sustained areas of funding. So one of the things that we did is we set up a funding mechanism by which these communities can apply for grants. And after an evaluation of their merits, can get some funding to really support those activities and to date. These are just some of the capabilities that we have funded through that program. Next slide. But those aren't the only types of funding opportunities. One second. Oh, it must. Okay. So we also have multiple other funding mechanisms. For those of you that don't know, NASA releases each February a thing called roses, which are research opportunities, and spaced in earth science. And in their, their various sections. The Section F has a lot of the things that we have within this program. In terms of funding opportunities. Some of these are rolling opportunities, where you can submit proposals throughout the year so Some of them have specific due dates. So I encourage you to look at those, here are just some of the opportunities that we currently have available, including the trapo, topical workshops, symposia, and conferences, or f2. And these really support one off events, including hackathons, or unconferences, or other things that we really want to promote, and can be community driven. f7 is our support for open software tools, frameworks and libraries. So you saw that on the previous page, can you actually go to the next slide, please? There we go. And, you know, we've awarded about $8.7 million. For those types of tools and libraries. Over the past year or so, we have supplemental open source Science Awards, we have transformed open science training activities. And we ordered about six and a half million this year, and that we have H POS or high priority open source science. Our announcements on that will be coming out soon. And you can see that that's a rolling deadline. So if you take a look at that, and it seems attractive to you, I would suggest that you submit a proposal. And finally, we have supplements for software platforms, which will be coming out soon. So thank you very much. I'll be around for a while. And listen in either online or in this room. And I'll pass it back to shell.

Chelle L. Gentemann 21:45

Great, thank you, Malcolm, there's a couple of Hamlet's that give you the names that need to be elevated, please. I seem Monica and Logan. You can slack us in that channel. If you see other people who need to be elevated who are panelists. But I think that's most of them. So thank you, we wanted to quickly go over sort of the structure, everyone. So what's going on at NASA headquarters. So there's the Chief Science Data Officer, office, sorry, and that office includes diversity community engagement. It also includes the open source science initiative. It includes earth science, data systems, and core services, which is working towards an open science infrastructure. So these are the four main groups within the Chief Science Data office,

within the open source Science Initiative. That's where the transform to open science or tops mission sits. And within tops, there are several different groups that you'll be hearing from. Over the next three days. We have the curriculum group, which is at Ames Research Center, led by Diana Lee, and that curriculum group is leading the effort to develop os 101, the introduction to open science that you'll hear more about. And there's also a program office at Marshall Space Flight Center, which is led by Paul Bremner, and the program office at Marshall is responsible for the project coordination and implementation of the curriculum. We also have center champions, so we have almost about 30 center champions. So across five different NASA centers, we have anywhere from four to six people at each center that are helping with the curriculum and other tops activities. Next slide, please. They saw the

H Holly Norton 23:33

volume dropped. Can you hear me? Is this clear?

Chelle L. Gentemann 23:41

Yeah, they're nodding. Okay. Thank you, okay.

H Holly Norton 23:44

Might have been the individual.

Chelle L. Gentemann 23:51

Okay, so within the tops headquarters team, and this is really now because we have the tops project office, we're really focused more on the year of open science and open science across the Chief Science Data office. And that's myself, Paige Martin, who is on leave right now. That's why she's not here today. But many of you are probably familiar with her. And Holly and Malcolm who have introduced themselves. We're really focused on enabling science communities transition to open science developing interagency, international and external collaborations around open science, and advancing broader participation in science. We're responsible for the programmatic design, concept development, strategic vision and reporting to the Chief Science Data Officer. We also I am the co chair for the OSTP sub Working Group on Europe open science, which is a sub working group for the Subcommittee on open science. And we I coach her that along with NOAA and NSF, and we'll hear a little bit more about the year of open science soon. One sec. Next slide please. We also have the Open Science 101 curriculum team. And they're going to be introducing themselves later as well. But here is an introduction to them. And next slide. Just to show you, we actually have expanded a lot since our last community panel. We have double one, we have the project office. So there's Paul, Shannon, Kyle, Amanda, Adam, Jacqueline, and Brian. At Marshall. They're again focused on trading 20,000 scientists, and they'll be starting present tomorrow. Next slide, please. So, the tops division is a future where new scientific discoveries and solutions are enabled by inclusive open science collaborations. And our mission is to inspire and empower scientists, researchers and communities to embrace open science as a catalyst for positive change, leading to a more equitable and impactful scientific ecosystem. And we really use those as our touch points for

everything that we do. Next slide, please. So we're a five year mission to accelerate the adoption of open science. I won't dwell on this, as many of you have seen this slide before. We have three key objectives, essentially, to increase the adoption of open science to broaden participation and to accelerate scientific discovery. And we're doing that through four areas. So the first area is through community engagement. The next is resources, like developing the Open Science one on one curriculum. And that is really what our focus has been on for the past sort of 12 to 18 months. Now, we're really shifting into incentives in coordination with the Europe open science and developing the incentives that we need to be in place as people move to open science. Next slide, please. The community engagement is the foundation of our open science process. We're doing online discussions, newsletters, websites, conferences, this community panel, other events. And you can see some of our open science success stories by scanning that QR code, I put the link to all the slides in the chat, and I'll do so again, but they are on Zenodo. And those are all clickable links. Next slide, please. So our core one of our core messages this year is to enroll to get your NASA open science certification. So if you haven't already enrolled, we really encourage you to scan the QR code Malko. Our Holly, if you could please put the QR code in the chat as well, that would be great. And we really encourage you to enroll. The course will be released this summer. You're gonna hear a lot more about it throughout the panel. And we're really appreciative. We have 86 participants on this call. So thank you everyone, for showing up. And I really encourage all of you to enroll. If you already know how to do open science, there will be a Fastpass option, there's going to be in person workshops, virtual cohorts, as well as an online MOOC that will have a Fastpass option so that you can get your NASA open science certification. And we really encourage everyone to do so to demonstrate your open science skills. So Thank you Next slide. One of our marquee events this year is a certain NASA workshop. This is part of this moving forward area of action. We are developing this open science summit with CERN. We've been working on it for about six to eight months now. And this is a workshop for agencies, larger institutions to advance and align open science planning. So that is we're asking individuals to do more open science, we make sure that the guidance that we're giving is consistent, that we're working together that we're communicating and moving forward these, you know, these policies together. This is open to all there is a hybrid option. The in person has prioritized individuals that are responsible for open science policies at their organization. And again, there will be there's links in the slides to this conference. Next slide, please. We have a lot going on with talks right now. And we wanted to just sort of give this quick update. There's a 2023 year of open science, which many of you have heard about, you can learn more@open.science.gov. There are 15 agencies. We have the curricula the project and the curriculum office, we have about 3400 enrolled already on our listserv. Our goal is 5000 We have 33 center champions. So we've really started expanding the top project to really support this movement towards open science and supporting the scientific community getting trained in open science. This open science 101 will be released in June or July the development and implementation you'll hear more about today and tomorrow. And our goal is for 1500 researchers to earn their open science certification in 2023. So by December 31. We also ran the tops T roses, where we still elected this is a NASA competitive NASA funding element. And we selected 6.5 million worth of proposals that this will support the Open Science 101 virtual cohort summer schools and science extensions. For events this year, we have 12 Priority meetings where we'll be holding Town Hall sessions, workshops and have booths. We have our marquee events. And we're going to be holding listening sessions that are going to be organized later this summer and fall to really better understand the barriers of entry for underrepresented communities into NASA Science. Next slide, please. And I know we ran over a little bit. So we have some of these discussion points today. And, Holly, do we have a printout of the agenda and where we're on it? I actually had it just up on here we are right on time for the Topps update that you just did 1230. Okay. And so, when did that end? At one, so we have a half hour. Okay, so we'd like to start sort of the discussion period. Our goal with this

community panel is to really hear from the panel and to have discussions. So later today, we're gonna have time to discuss the curriculum development, Thursday, we're gonna have time to discuss the 20k implementation and Friday, we're gonna have time to discuss engagement. But for now, we sort of wanted to hear from you, as community panelists, you've been involved with us for about a year and a half? And what do you feel like we're doing well, what do you feel like there's gaps or things that we could do better just in general, for the organization of this project within the Chief Science Data office. And I think you can all if you're a panelist, you can unmute yourself, and so feel free to maybe raise your hand and we can have a start a discussion?

M Monica Granados 32:01
Hearing hearing that, oh, oh,

S SherAaron Hurt 32:04
I'll go. Okay, go ahead. Hi, I'm Cher I am with the carpentries. And I'll say one of the thing that has done well, is the promotion of this, of what's happening, I've been in so many different spaces. I was in Argentina, at the CSV comp, and, you know, you hear NASA tops all over in all of the different spaces. So I want to say that the team is doing a bang up job and making sure that you know, the different spaces are aware of what's going on. It almost it's like, you know, NASA tops is almost a house. It's like a household name. So people know what's happening and what's going on. So that is definitely great to hear.

Chelle L. Gentemann 32:45
Thank you share, do you share? Do you feel like they they just know the name? Or do you feel like they know, details about the project? And what we're trying to do? Or what do you feel what message is resonating with the communities that you're hearing from?

S SherAaron Hurt 33:01
Yes. So I would say it's a bit of both. Some of the people that have talked about NASA TAs are people that are recipients or received funding. And so it's a little bit of the people that know about it, know about it, but those that are in those spaces that you know, it may be a conversation I do I am finding that I am having to explain a little bit about, you know, what the the ultimate mission of NASA tops is. So I definitely think that there could be more done with branding of what it actually is doing. But you know, the first part is making sure that people you know, you hear the name. And of course, when you hear NASA, you're like, Oh, wow. But I'm hearing the name initially and hearing. You know, some of the recipients that's a part of it is great. And then adding to that though, you know, what the ultimate goal is is the year of open science, and I don't think a lot of people truly understand that part.

Chelle L. Gentemann 33:58

Yeah, thank you. So we ll, I think that that's good to know. And using more communication about a year of open science and how we're using that to sort of build more excitement about Open Science across the federal agencies is a good point. So thank you. We'll take that word of mouth. Malpica Did you ever comment?

Malvika Sharan 34:19

Oh, Monica had to hand first so I'll go after her.

Chelle L. Gentemann 34:22

Monica. I can't I can't see the hands I'm sorry. No worries.

Monica Granados 34:29

No worries. You're just also eager to give positive praise. Good to see everybody I for on the positive side, just echoing what you mentioned, but also I really love what you did with the newsletter. I think it kind of centralizes so much of the excitement and energy that there is that is happening around open science right now. So it's really nice to have this like kind of go to place to find I find events, I think for a long time, the community has wanted like a calendar of events that are coming up, and people have tried it. And it's just hard to maintain. And I think this, this is a good way to, to have that. And if you were able to do it in like a calendar format, that would be interesting, because I know that's something that community has, has asked for, for a while, in terms of places to improve, I would love to have a little bit more public information for interested parties to know who to connect with, for what, you know, Shelley, you're such a, you're like, you know that you're the face and deservedly so of this program. But we're not sure if you're the right person to reach out with it with an idea for something or, you know, I have a very concrete example about a workshop that's coming up for the Ecological Society of America, you know, who do I talk to, about putting together a workshop for that, for example. And so, you know, you did a great job in this introduction, talking about all this, the staff and what what their roles are, if there was something more more public, where you know, if you've had questions, who to turn to, or if there was just like, and maybe it's just it goes to a general email, and then you do triage. But just having that a little bit more clear, I think would be helpful for people who want to engage with the program. Thank you, Monica.

Chelle L. Gentemann 36:24

We've actually been talking about just this. So this is a great comment to really help us move forward in that, when people are looking to engage, what would you say the main questions or categories that they might have that we should look to try and answer like, maybe just general tops questions, or who wants a workshop? Or a top speaker? Or what do you think are the main categories?

Monica Granados 36:50

Yeah, that's a great question. I feel like this sounds like a persona exercise or like, what would

be the personas that come to your, to your website? And I know, like, for example, you know, at pre review, we think about that, like, you know, who are like, who are the target groups that would be coming to it? So yeah, maybe we're thinking of like doing an exercise like that. So you can imagine, yeah, people who also want to know about the curriculum, I want to, you know, I want to enroll in the curriculum. How do I do that? Yeah, you might have partner organizations that want to be that want to sign up to the year of open science, people who want to put on workshops, as well. I mean, I know we're, I'm in that category. Maybe also someone who wants to partner with you that might have an idea of like, oh, we are goals are aligned, we have this event, speaking engagements. It may be worth, you know, expanding that list support to thinking about what are what are all the different kinds of personas that may come to to your website, and then figuring out how do they how do they engage with with you folks directly?

Chelle L. Gentemann 37:53
Great. Thank you. And I want to give credit to Amanda Adams and the rest of the comms team who've been really working hard on that newsletter, and especially this last month, it was in a format that had pictures.

Monica Granados 38:05
It look great. Yeah, looks great. So

Chelle L. Gentemann 38:10
kudos to Amanda and Jacqueline and Adam. And Brian. So I think

Malcolm Glover 38:17
Malavika James, that been more

Chelle L. Gentemann 38:20
Malavika Jas and pen, and then I think share has her hand up, or share, baby. Yeah. So melody.

Malvika Sharan 38:29
Yeah. I, I want to echo what chair said. I think since we have the last panel, I feel like I have been seeing all the panelists and large members from the NASA tops community in the places where I am. Stickers have been making places to different places. It's been really delightful to see how diverse the community has become in terms of who the who the participants and contributors are. Definitely, definitely kudos to the communication team for doing such a fantastic work. I also wanted to really take the time to appreciate the handbook that you all developed for the Topps partnership, I think that level of details have been really useful. I think

we might have lost it a bit. Maybe we should bring it back and update them. Because you definitely have done so much more compared to when it was launched. And maybe that's a place for getting community and the panels involved. If that's if that's something possible. Another point I wanted to make was around training. Definitely. I have seen so many already information out there that these things are happening. And I'm kind of curious what these workshops look like. Maybe we do not know enough because those those are not being recorded and for good reasons. And maybe you have put them out there in Zenodo that we haven't found, but I've definitely seen some materials and agree with them. Only God newsletters have been really good at collating these dispersed information. I'm also very excited about the CERN conference that that's happening very, very soon. Which is also reaching out in the European community and connecting with different members. I yeah, I don't know. Like, the things is that I don't know what the gaps are, because I don't even know how you all are doing the amount of work that's been happening. So really congratulations for, for putting so many resources out there. So many guidance out there, there has been so much transparency around who who got the funding what the process of review was. So yeah, thank you so much for for that maybe if there is any gap, we'll come up with that on day three.

Chelle L. Gentemann 40:45

Thank you. And I'll put a link to the Module One slides in the chat there on the tops there on the transform to open science and odo group. So we do try to post anything for our project within that community on Zenodo. And those are, we haven't been recording those, mostly because they keep that capability wasn't at the conferences that we were doing those workshops, but also they're just, you know, sort of experimental test workshops to get feedback. And there's a lot of over the summer that will be evolving. And you'll be hearing a lot more from that from Diana's team. But thank you and I wrote down about the handbook. Yeah, I think Isabella Martinez developed a lot of that for the project. And she's moved on now to do other great things. But we are so grateful to everything that she contributed to our project. So thank you Malika. And I'm going to lose track some alcohol. So let you call on people.

Malcolm Glover 41:41

No problem. James is next, followed by

James Colliander 41:44

Great, thank you for the opportunity to participate once again. So I have four quick points. My first is congratulations on I think improved mission vision slide in particular, I really think that brought the story together in a tight way. I also compliment NASA on the org chart and the funding structures under the various F designations that Kevin talked about. And I compliment NASA also on the proactive RFI for data and compute architecture to support open science. My second point is congratulations to everyone involved on the incredible unification of federal agencies around the year of open science. That's a massive win. And I believe that NASA is catalyzing a real transformation across the entire scope of the US government. My third point is I would like to see marquee events that unify say NSF and NASA or NIH and NASA around open science, it's fantastic that we'd have this summer that was served. But I'm hearing from some scientists say in the NSF ecosystem, that they know less about what this is all about. So it

seems like you've hit the mark at the top level of kind of OMB OSTP kind of structures. But getting that propagated down through the channels of the associated agencies seems to me to be a big challenge, and maybe through Chels, co chair relationship, there are opportunities to do that. And my last point is just some feedback that I'm hearing from scientists, a lot of scientists that I talked with say yeah, cool idea. I like this open science. But how do I actually do it? It looks like it's really hard. And there's a sense that there's friction in trying to move towards open workflows. So I'm hoping to learn more about the OS 101. And maybe answers to that question. Yeah, how do I actually do it? And then the last feedback is kind of some negative feedback from some scientists that I've heard, where it's kind of like, if you're a leading scientist, you know, maybe in the category of thinking you're going to win the Nobel Prize. Who are you as a bureaucrat to tell me how to do my science? I'm really good. Already. My collaboration styles are just fine. So I feel like the success stories and sort of soft, softer statements like knowledge mobilization, enable sharing, rather than trying to impose constraints on people around what they might resist his openness. And I'm not sure we've confronted those kinds of leading scientists. It may be that they're just the old Fuddy duddies and we're trying to transform the next generation. But that's just some observations that I've seen over the past few months.

Chelle L. Gentemann 44:30

Thank you for all that feedback. Jim. There are some there are things going on within so I use the what there's the White House listening session, NSF is actually organizing some additional sessions. And I think that one of the advantages that we have at NASA is we have a funded program to advance adoption of open science, and that gives us a little bit Have more momentum, and the ability to get things done around this issue. But the other agencies I know are there are people who are deeply passionate about this. And there I think is ours a lot that's going to come out over the summer and in the fall as they're really getting organized around more activities within their agencies and doing more outreach to their communities. But I will certainly pass that feedback along to them. So thank you. And who is our audience? Yeah. So the early career is who we're aiming the curriculum at. There's a lot in the policy that is going to affect the more senior scientists. And yes, we hear these stories as well. And we're trying to be very strategic at how we engage with that. So I want to make sure that we have more time to hear is we have 10 minutes, right. Okay, perfect. So next welcome.

Malcolm Glover 46:01

In yours,

Pen-Yuan Hsing 46:04

Oh, Hi. It's me. Okay, thank you, everyone. I'm really grateful to be here. And I just, we like to appreciate all of the passion and the incredible amount of work that NASA has clearly put into this. And it's been so exciting to hear all of these updates today. I'm particularly excited by some of the international connections that have been happening as well, I will closely follow the meeting with CERN next month, I know some of the people at CERN, who who do amazing open science work. And I'm really just interested to see what kind of sparks might come from this spirit meeting. And speaking of which, I also echo some of the comments from earlier about

how you know, how widely NASA tops have, you know, been seen across the world, at least within Europe, certainly, within my OpenStack circles, people are aware of the work by NASA tops, including the UK reproducibly reproducibility network, one of the founders that I work with today, on a day to day basis. Now, one of the great privileges of the work that I'm doing right now gives me that I get to talk to and actually interview researchers from across different disciplines. And one of them have told me that, that in their line of work, you know, when it comes to open science in the quote was, you know, if you want to be a successful researcher, you don't have time to do open science. And I think that is very telling about the current kind of research and academic culture. But I think this is something that NASA tufts can do so much to help change. Because I think, you know, not to touch this doing so much fundamental work to help engender cultural and institutional changes. This especially, you know, on the national level, such as your work with UNICEF, and as part of the year of open science. So what I will love to be able to see after, you know, all of this work has been done is that this has been done to national level in the US, uh, but so much, so many lessons are going to be learned from this. And I would love to see some lessons learned. That could be shared with other national agencies, for example, you know, I get to work with Ukri, which is the UK equivalent of the NSF. And I think, you know, at least the people that I get to work with, they will love to know, you know, what their American counterparts are learning from this process. And a couple of really quick things, which is, you know, again, like I said, there is somewhat wareness of natural Taapsee, my annual European circles, but for a lot of people, they are aware of it, but then they will also say that, Oh, but you know, this is a NASA thing, but you know, I don't do any kind of space related research. So it probably has very little to do with the research that I do. But obviously, you know, I think so much of the work that NASA tufts is doing is not limited to really space, you know, related researchers. So I think that might be a point where the outreach and engagement can can think more about by me, I might be jumping the gun but because this has something to do with the engagement topic, which I see as for Friday, and the other last thing is that again, I like to give a shout out to the newsletter. I think again, that's a great resource for people. It is also a communication channel that does not require any proprietary and closed So it's tools to access. And I think that is absolutely fantastic. And the very last thing is I like to echo I think it was Monica is coming from earlier, I'm sorry, if I miss remember, about, it'd be great to have a clear set of contexts where I can go there and see, okay, so for this thing, I can contact this person for the assessor. Other thing, I should contact another person. And I know this from personal experience, because we at the gathering Philippines as her work, we've been trying to reach out to NASA tops, because we're organizing a workshop on open source hardware for space related research. And I hate to, you know, just constantly spam shell if there is another person that you should contact instead, to help make this happen. So that's just a little bit of a personal anecdote there. But um, but that ties into my last comment about, you know, knowing clearly, who points of contacts or for what purpose. Sorry, that was a long piece of comment. But I will stop for now. Thank you.

Chelle L. Gentemann 51:06

Thank you. And I'm glad that you mentioned lessons learned, because that's actually what we talked about for the CERN open science Summit. We want everyone there to be working on something. Whether it's policy or and what we thought is one of the other one outcome of that meeting that might be really valuable is exactly what you propose this lessons learned. And it's hard, it's often hard to find the time to write things like that. And we thought, well, people are here in a group and working together in the afternoons. Maybe we can publish some posts on

lessons learned that would be helpful. Because you're right I do. The more that the more that we know, right? What's the same? There's more, you know, the more you know. Thank you. shushing Oh, shake your Give me? Yes, thank

Q Qiusheng Wu 51:58

you. Yeah, so I just want to echo some of the comments that other panelists have said, I just went to a conference in Oregon last week, the internet interagency conference, on watershed on resource in the water sets, I gave a workshop on leaf map over there. So debris from some other workshop presenters, they do mention like NASA tops. So from the USGS, EPA, they are aware, and they're also trying to push towards open science. So congratulations on the hot water NASA team have done. And I have a couple suggestions. So in terms of basically, are you trying to push for the Open Science, so we need to have given stakeholders, for example, in academia, in the industry, in the community, maybe and also in the federal agencies, so full on for my personal experiences in the academia. So I'm serving as the ad for editor for an international journal. And based on the manuscript they will receive, I would say, roughly maybe 10, maximum 20% of people actually provide the source code or the data set that they produce in the paper. So I always encourage the people, if you, for example, developing a deep learning algorithm using aqua, but you have provided us in the paper, and you will have no way to reproduce, they have to reinvent the wheel to implement. I was recommended, they need to have somehow mega data source code available. And I was wondering, like, if we don't want to push towards open science, can we increase for example, the reproducibility of this journal publications, or maybe 20% to 70 80%? Right? And that will be great. So in order to do that, I think it'd be useful if NASA tops have some kind of examples, like for example, when next time I even receive a general manager, they're doing some Listen, let me go to a deep learning algorithm. I'd like to point them to okay, you can look at some of the NASA tops, book examples. For example, if you want to do this the so called what are the best practices, what are some of the ways you can do that? And in terms of like, not just releasing the source code, producing the novel, they actually make things reproducible, and also makes it affordable, because most people focusing on study area is not really usable that area. So if they will use some kind of best practices, examples that are available that we can point people to they will be great. And the other suggestion will be so in the academia, for example, most of universities they have all kinds of invited talks, webinars, seminars. Is there some like a list of expos or even people from NASA Data are willing to maybe give a talk sometimes they are if you go the website okay, you can select what expert to maybe give a webinar somehow that you can promote NASA tops or promote up Then science, or maybe you can also have some kind of community like allow people to sign up there, oh, I'm available, like to teach people how to use open science. So in that way, we have some kind of community advocates, rather than like every single line or the NASA ops team, or if other people willing to do it, they will be taboo, make it much easier for people to become aware of work that NASA is doing and also moved. Yeah, so there's my comments.

Chelle L. Gentemann 55:29

Thank you. So I, I want to talk for a second about that last call. Because I think that's such a great idea that have these open science advocates. And we've talked a little bit about this in the past, and we've tried when we get when we get requests, when possible, we try to send them out to the open sciency community to we have the tops champions community, that

actually making that more open and public about how we do that, I think would be a really, really great service. So that we get have a more open, like, here are all the different people who can talk about these who would be willing to talk about these maybe at your center, and they volunteer to do so I think it's sort of building on, like, what share has at the carpentries, right, is you could put in a form and you can hold a workshop, or you can request a workshop, and they have these champions, or they have the instructors who you can send out a ping to see if anybody wants to participate. So maybe we don't even need to reinvent it. Maybe it already exists a little bit with some small pivots. So thank you very much, Fernando, and the last person will be low.

H Holly Norton 56:39

It's one o'clock. So should be what's the next thing up is the year of open science discussion with you in Jamaica? So do we want to have people submit their comments to the I O tool? And we can get it from there?

I Ilona Serrao 56:56

Yes. So are we going straight until user

H Holly Norton 57:00

after user strike? Okay,

Chelle L. Gentemann 57:02

so we see that a couple of more people have comments, but we're going to ask you to either submit those comments into the IO tool, or submit them to us via the slack panelists channel so that we can review them, because we want to move on to the year of open science discussion, which I think you'll be really excited to hear about. And I'm really happy to introduce Jamaica Jones. She is the transform to open science here of open science coordination leads. So Jamaica, do you want to introduce yourself?

J Jamaica Jones 57:35

I'm happy to thank you. First of all, can you all hear me? Yes. Wonderful. Great. Thank you, Michelle, for that introduction. And thank you, everybody, for giving me the opportunity to speak with you today. I'm really excited to tell you about the work that cops and its interagency partners are doing to advance open science practice principles and practices across federal funding agencies. Shelters gave me a nice introduction. I am indeed Jamaica Jones. I'm the transform to open science interagency coordination lead, working with Shankman on a year of open science. And that's actually an initiative that got it started about a year ago. My plan in the short segment is to briefly introduce you to our work and then open the floor to some more discussion. We really want to hear from you about where you think we're planning well, and where you think we can build out our efforts. Next slide. Next slide please. Thank you. As you

may already know, and as I've already alluded, the year of open science is an interagency effort. I'd like to open this presentation with a quick review of what this actually means. Next slide. Okay, so often agencies will deploy their legal counsels to draft formal interagency agreements. These are detailed and binding agreements that that outline exactly what an agency must do as a partner in the agreement. The agreements are complicated and they can take a lot of time to develop. Next slide, please. Ultimately, agencies can work together more nimbly in informal committees of the willing in collaborative subgroups and working groups that are motivated by mission and purpose. Next slide. Sorry, they're so they're short flights. OSTP subcommittees provide a primary conduit for these collaborative efforts. OSTP or the White House Office of Science and Technology Policy is part of the White House Science and Technology Advisory structure. Working as part of the National Science and Technology Council are NSTC and in concert with P cast the President's Council of Advisors on Science and Technology. Next slide. It's within this structure that the NSTC Subcommittee on open science meets monthly convening over 40 agency representatives in discussion and advancement of open science principles and practices. SOS is comprised of multiple subgroups, including those Exploring open science infrastructure, effective data management, and of course the year on open science the your times. Next slide. Without formal agreements outlined by attorneys, there are no sticks involved in this kind of collaborative work. It's all carrot or a coalition of advocates for change. Next slide. I'm here today to talk with you specifically about the SOS subgroup on the year of open science, which we often refer to as Psyops or site use. The subgroup is co chaired by NASA, NSF and NOAA and is proud to now include 15 participating agencies that together represent over $90 billion in federal science funding. Next slide. Thank you for that tooting horn. You can get a sense of the breadth of our participating agencies here on this slide. One of the things that I like so much about this slide is that the list is extending off the bottom of it, and will continue to get a little bit longer in the future. We hope you can move on to the next slide, please. Cya started meeting last name. And since we've accomplished quite a bit, including the drafting and release of the federal definition of open science, and of course, securing the formal recognition, White House recognition of 2023 as a year of open science, to support agencies and participating in the era of open science and to support them further and advancing, advancing enduring open science practices across their communities. The subgroup has also drafted four goals for the year of open science. Next slide. These include establishing strategic approaches for advancing open science, engaging underrepresented communities in open science and research, incentivizing open science activities in review, reviews and recognition and increasing openness and transparency in review processes. Next slide. As I mentioned, these, these goals were drafted to help guide agencies and implementing open science practices and policies across their broader communities. I wanted to take a minute to celebrate some of the ways this is taking shape to start and as, as has already been addressed by shell just a few minutes ago. Throughout the end of May, and the first few weeks of June OSTP held a series of four listening sessions designed to invite feedback from early career researchers on the possibilities of open science. A total of four sessions were held engaging hundreds of early career researchers from around the globe and reflecting on barriers to access and emerging research institutions, reflecting as well on the incentive structure affecting career progression and the ways in which research research support professionals including trainers, librarians, and administrators can support the early career research community in building capacity for open science. Meanwhile, at NSF, they've launched a new funding program called the Fair open science research coordination networks program or Pharos, RCN for short, which in its inaugural cohort is supporting 10 projects comprised of 28 individual grants and totaling over $12 million in grant funding. These projects were selected due to the promise they hold for helping to communicate and develop coordinate and standardized research practices, training and educational activities to achieve the goals of open science. Year of open science activities also include long standing programs, like the US

Geological Surveys community for data integration, a community of practice working to cultivate USGS has knowledge and capacity in scientific data and information management. Next slide, please. Closer to home at NASA, the tops in our society teams have been working to strategically align planning and programming with the four goals of the year of open science. For instance, and in support of goal one, NASA is CO hosting a workshop with with CERN in July. This is the same one that Sean mentioned a few moments ago. The workshop will provide an opportunity to convene the international open science community and a discussion of best practices in the development of open science access plans. We're also exploring a series of workshops to organize and support external organizations who wish to participate in the Arab open science. And through our leadership and science. We're working more broadly to support alignment across federal goals. towards goal two, we look forward to studying barriers and biases in NASA Science engagement with underrepresented communities with an eye towards better understanding what barriers to submitting proposals might be encountered across these communities. We also hope to develop co lead initiatives with other NASA organizations to engage representatives from underrepresented groups in data in terms of research. Next slide please. Recognizing that transforming incentive structures is key to sustaining a future of open science. NASA is working to support goal three by exploring options for Open Science Awards and incorporating open science activities into existing honors evaluations. We also plan to develop guidance that might help philanthropic philanthropic organizations recognize open science activities in their award review And finally, go for affords us the opportunity to walk the walk as it were advancing openness and transparency in the review process by for instance, publishing anonymized proposal, demographic data, and supporting the development of a set of review of review best practices, providing guidance on how to provide kind and fair reviews when participating on a NASA review panel. This brings me just about to the close of the formal portion of my presentation. But before I open the floor to discussion, I wanted to share two additional slides. If you could move on to the next please. Thank you, at this slide features another QR QR code that if you're interested, you can use to find your way to the tops announcement on the year of open science, we can leave this up for a sec, for those of you who'd like to follow the link. As it's already been mentioned, you should either already you do have a copy of the slides and the link, and they'll probably be forthcoming after today's presentation as well. So now isn't your only chance. Next slide please. I did also want to provide a brief review of the many accomplishments of the year of open science thus far in collaboration with 14 other participating agencies, we've secured official White House recognition of 2023 as the year of open science, guided by a federal definition of open science that we introduce early on, we've drafted an options paper that serves as a guide for agencies eager to participate in the year of open science, and have set forth for ambitious goals for this year, each themselves designed to pave the way towards a sustainable and equitable future of open science. Next slide, please. So in closing, we are eager to hear from you about what you think of the year of open sciences advances here at what is effectively the midpoint of the year. We're equally grateful for feedback you have on where we can improve, particularly as it might pertain to advancing that open up that future of open science that we've all been working towards. I'm going to reposition my desktop and open the floor to discussion. Thank you so much, everybody for your time and your attention. I also may not go ahead. I was just gonna say I may not have the ability to see all the hands on stare raised.

Chelle L. Gentemann 1:07:18

I'm gonna ask Malcolm to triage the hands, please. Again, thank you, Jamaica, hinted at this. But we have 15 agencies with $90 billion in federal science funding. And look for another announcement soon because both those numbers will be changing in a good way. The

president so no hands. There was one comment in the chat about whether or not we could release the options paper. The options paper at this time is it basically goes through those goals and discusses different ways that federal agencies might think about doing some work in that area, or aligning existing work in those areas. At this time, that is internal to the federal agencies that are part of the Subcommittee on open science. But we do encourage other groups or organizations because we think that those options papers, there could be options for universities, options for philanthropic groups, options for nonprofits. And we encourage them to develop their own options papers for those communities, and we're happy to help facilitate

I Ilona Serrao 1:08:36

that. To them, James,

Chelle L. Gentemann 1:08:39

I see you have your hand up, or Belkin told me that your hand is actually

J James Colliander 1:08:44

yes, I do. So thank you very much for your presentation, Jamaica, it's nice to meet you. I wanted to highlight the ways that open science may be changing the speed or outcome of science. And through inter agency cooperation, I think there are some striking opportunities. So one example of an organization that I think leans a little bit into open science is called Cairo, the cooperative Institute for research to operations in hydrology that was recently funded by NOAA and it's operated by the Alabama Water Institute. This is a multi stakeholder community that brings researchers as well as policymakers and first emergency responders looking at risks around flood or risks around water quality, just the the entire water resource of the continent. And I feel like there may be opportunities to bring other academic scholarly communities into contact with policymakers and people that are looking to get benefits from scientific research. It's not just about our H index as scientists it's also about the way that our Ideas transform and benefit society. And I feel like this interagency cooperation may allow for the government to set challenges in front of the scientific community that go beyond our traditional incentives within the university structure, and really bring forth the benefits that science can bring to society. I posted a link in the chat pointing to a talk shortly after the appointment of OSTP director, pro Bakker. And I think that that talk really has some calls to action for scientists to think beyond our traditional incentive systems. And imagine the ways that we can confront things like climate change, misinformation and other challenges by working together differently. Thank you, James.

J Jamaica Jones 1:10:49

I appreciate your observations, especially around interagency collaboration and the needed reforms to incentive changing the incentive structures. I'm actually, when I'm wearing a different hat, still a PhD student and the nature of incentive structures will is forming the basis of my dissertation. So this is something that's very near and dear to my heart, it's also something that is coming up in every conversation, and in every listening session that was held

by OSTP repeatedly, in so many variants, and so many, from so many different directions and perspectives, it is clearly the emerging or an emerging priority. And, and one that is a that is very much on our radar, as we're working together in supporting agencies and advancing open access across their respective communities. Um, shall do you have anything else that you'd like to add with respect to incentives or the the promises inherent in collaboration? And yeah,

Chelle L. Gentemann 1:11:57

incentives are tricky, right. So as a federal agency, we can we're all carrot, you know, essentially, we can create the rules around or the guidance about who gets funding from us, and what rules what policies they must comply to. But most, and so that can slowly maybe over a decade, change career incentives, right, because who gets federal funding? You know, some war leads to career advancement. So it takes time for those incentives at the federal level, to trickle down into the research community, all of the different organizations that scientists exist in on a day to day basis. And I think we really heard in the White House listening session, how vulnerable people feel about this sort of gap in incentive structures, and that the gaps aren't the incentives aren't quite inflation. So we are working really hard, at least, to see what kind of levers we have to improve the incentive structure. And, you know, I think, I think, a year of open science, we hope that other institutions, you know, Helios has joined and we put a link to there's many other organizations. So Helios is a group of over 90 universities, that's working to advance open science, and other organizations that are joining a year of open science. And we're really hoping that they embrace this idea as well, because they're the ones who can change their policies. And they're often the places where most science is getting done. So we really would like to see this incentivization and this reform of that structure throughout science because I do think it will make science better when we're less focused on just a publication and more focused on how someone's doing science. And Monica, Vika balcom tells me yeah,

Malvika Sharan 1:13:56

yes, I am. I, I wrecked me teach America amazing presentation. And I love to get us in there. Sneak then we want to really talk about two parts. One, which you highlight really, really beautifully about interagency collaboration, the year of open science working with different federal organization, because I don't live in the US I can talk from my perspective living in Europe. This is definitely very encouraging for open science champions all around the world who are trying to put been trying to make case for why institutional buy in and national buy in of open sciences required. So we definitely look up for you know, the work that you're doing and how we can replicate that framework in our own context, as well as how can we connect previous national organization and I think that's what that's what I wanted to come to is that we've had a separate conversation public meeting where I had the chance to sit with Shell and Kevin In a lot of different stakeholders from around the world, and what we don't really talk about is that it has taken so many years of team to arrive to this place where this momentum has really taken off. So many years of policy building and data management plan and all the things that you have done, it was really important to have that conversation to put it out there in the world that this isn't just happening today. And there has been so much work that has gone in that work in that process. So I really applaud that. I want to also bring the international collaboration you've already done so much international collaboration, I want to be work to the craft, grassroots engagement, that has also happened, not just International, high ranking organization. But personally, I have experienced this with the funding calls that happened. I

work in the communities, which are the touring way and open lifespans, and a lot of our community members were reviewers and applicants of these funding calls. And they are based all around the world. And they absolutely admired the process. And they were really excited by the things that they got to experience and be part of that decision making process. So this is really, really important to acknowledge that although of course you are working in the US framework, you have done a lot in engaging with the broader community of open science practitioners. We've already seen that in the previous calls, previous panels that you involved a lot of grassroots community in building the resources that you're doing. And there's that Ito, I really, really appreciate. There have also been perfect word on lingual diversity. So we have a colleague in the audience today, Laura Seon, who is one of the receivers of the grant, where they are going to develop virtual training. And I think we're going to talk about training tomorrow. But it's really important to mention that the diversity doesn't just stop in like international diversity, there is lingual diversity that we are seeing. And I'm really excited about that. Because we had been to one of the meetings that Cher was mentioning it in May in Argentina. And we are really looking towards localization of resources in languages that people can take it and thinking about accessibility requirements from that perspective. Very much echoing what Jim said, Open Science movement has changed. And it's been changing a lot. And most importantly, it's changing because of our experience with pandemic. And we've learned a lot that during pandemic, people have accelerated interdisciplinarity, because they trust their discipline, and their experts to do the work really well. And that cross disciplinarity is not just with the National spectrum, but because Open Science allows cross boundary and cross national. Well, people have really built on that open science strand. And I definitely see that that is happening a lot with NASA tops, I'm gonna go back to the point of assessment and matrix and impact. I think it's very important to build the metric of success that embeds that what is the roadmap we're looking into, which is engaging communities all around the world? what success looks like, who are we not engaged with in the year one, can we engage with the year two or year three? Like, I think it would be really great to see a roadmap that everybody can see so they can understand where we're going? What is the metric of success, I think assessment point we already discussed. So I'll not bring that back. Final point, which I'll close with is, I think, we I work in a Data Science Institute, the Alan Turing Institute. And one thing that has become really clear to my work in the Turing way that it's not that we're trying to teach everyone how to code but we want to make them digital, digitally competent, to make them understand where data science is going, where AI is going. Although they might not use NASA data, they should know what that data can do what that data can become for their own community. And I think the the next step of open science, one is exactly that. Making sure that people understand what is the strength of data science in building up their own community.

Jamaica Jones 1:19:22

Thank you for all of that. I agree, personally, very strongly with that, with that latter comment about data science literacy. Regarding your, the one of the points, where you started regarding diversity, not only I mean, you mentioned a breadth of just diversity. You mentioned disciplinary diversity, linguistic diversity of outputs. It's honoring and making space for and finding a way to not finding a way but providing the incentive structure to value all of those outputs and those various ways of engaging cheering, that is, I think, at the forefront of what is also next for open science efforts. And I think it's also one of the areas where there's a lot of potential in inherent in the subgroup on the year of open science precisely because it is so interdisciplinary. We have representatives from the humanities, we have, we have a representative from, from the museum, the library and museum communities, we have representatives, spanning the breadth of the research endeavor, and therefore also

encompassing various communities, various reached researcher communities, languages, diversity of output. It's just, I suppose where this is headed is just underscoring the value of collaboration, which is, again, where you started it, to the extent that that could be extended internationally would only benefit us.

Malvika Sharan 1:21:02

quickly respond to that? I absolutely agree. I think when I said that we look up at this initiative internationally, I feel that this pace is so important that if you can change the director for what assessment looks like or what you're reporting, and what you're valuing where you're agriculture, recognizing people where you're bringing them in, even from international contexts where, you know, I think it's a huge example that there will be built for other organizations to implement. I think to that, I also want to acknowledge there have been other countries and organizations who have done that implementation. And I applaud that Shell has been building those connection. And that's also a really big honoring of what has happened before, and what are we building on?

Chelle L. Gentemann 1:21:51

Thank you. And I'm putting the link to Cara in the chat right now. Because I think that's an important link to add. And I think, Monica, thank you.

Monica Granados 1:22:03

I'll try to be brief. Since there's two other people waiting to speak, I'm just echoing the need to have the alignment of reward and incentives, I cannot imagine a future where open science will be the default. If we do not have incentives that align with those practices, you'll just you will you will always hear that from researchers. And the second, it's so great to see that alignment between the different agencies, specifically on the question that you have for equitable and open science. And this might be outside the purview of your subgroup or your sub sub group. But as policies are being developed and implemented as a result of the Nelson demo, has there been consideration about the type of an LT just open access, because that's a little bit more of my area of expertise, the type of open access route that you will encourage with the idea that publisher provided open access that have high article processing charges may not lead us to the equitable future we want around open access.

Chelle L. Gentemann 1:23:15

Yeah, thank you, Monica, for bringing that up, I want to add a little bit of clarity of language, the White House is regarding public access. And that's, that's a little bit different than open access. So this is public access. And a green publication model is perfectly acceptable, where you may be in a close journal, but you're making the preprint publicly available. So there is no requirement to pay open access fees. So many of the federal agencies are stating within their plans that they are now going live. So they're, they're creating their first public access plants. And so many of those plans are including that they will support paying those. But that isn't the only option for publishing research. And we really want to encourage, especially you see, this, I

think more with a lot of early career researchers is that they're finding other ways to create impactful science and impactful products through blogs through other mediums, publishing executable notebooks. I mean, I think we can look at Shane here on this panel as an example of having an incredible impact. And he does publish in, you know, journals with with page charges that he also has seen on his YouTube channel and other ways that he is reaching and how the impact with his science that is just incredibly enormous. So yeah, I just wanted to clarify that public access. Let's not conflate that necessarily with open access, because I do think oh

Monica Granados 1:24:50

yeah, no, but I think what ends up happening though, is that it does get completed but specifically with like article processing charges and and I think if the agency support article processing charges, then that will become the norm. And that works well when you are well funded. organization founded, you know, funder in the United States, but does not work very well outside of that context. And so it's setting a precedent when when that becomes sort of the default, recognizing very clearly that we do need to disentangle that that completion, that open access, or public access needs to cost a lot of money. And we lose a lot of our audience, a lot of our researchers, and I spend a lot actually of my career trying to, to break down myths about open access. And I do worry that if, you know, that becomes the default as these article processing charges, that it's going to be a lot more difficult to get people on board.

Chelle L. Gentemann 1:25:51

I think that, you know, we've already seen some statements from the European Union on this. There's, I think that this is an area that is really going to develop in the next couple of years, because the White House doesn't say just open science, they say equitable, open science. And I think that we all really, at least within our mission, and I think many of the federal agencies on those committees have really taken that to heart to really try. We're not, we can't do everything at once. But everyone is very thinking very hard about some of the consequences of these act, you know, policies and how we can help to mitigate their burden you're doing well. Okay, I think we have one time for one more question. And then we it's wondering now, but Okay, so let's do one more quick question, because I think Fernando had his hand up last time, too. So.

Fernando Perez 1:26:48

Thank you, I'll be brief. So one of the it was an excellent presentation, we're all extremely excited to see Jamaica, the work you're doing precisely across agencies. And one point that has come up recently for me, and I think Jim calling had already kind of raised it was kind of the these conversations we're probably many of us are having with people who are either skeptical or fearful, or I'll do open science after I get the Nobel Prize kind of thing. And so how I was thinking that's something that could be very valuable for the tufts program at large, but specifically, in this context of multi agency coordination would be to have something like an FAQ type of thing. And I've looked a little bit at the though the wide open signs, documents, both on the main NASA side, and on the tops specific side, and they address some of that, but something that is a little bit more in the sense of, these are my concerns. And these are the answers. And that are short, to the point kind of like open science for skeptics, if you will,

maybe not addressed in a slightly more positive vibe. But that's what I mean, right. And specifically, to your role, Jamaica, in a web app, perhaps also has a little bit of a sub tree of ama USGS person, this is what this looks in my domain, because the concerns of somebody who's funded any funding agencies and a little bit of a, in a little in circumstance defined communities, right, people tend to go, the people who apply for funding at the NIH tend not to be the people who apply for funding to the National Endowment for the Humanities, for example, right. And so something that also addresses first, the high level and then maybe hierarchically the, what does this look like? For me, if I am a concerned scientist, because there was already in the chat, somebody raised the point that all people are wary of this is going to become yet another bureaucratic layer of things, more things I have to add to my proposals or to my blah, blah, blah, and I'm too busy. So addressing these points in the current way that you're describing it, these are the benefits and backed by research, I've had a couple of conversations where I've had to tell people look, I know people have done the research on this specific issue of how early release in collaboration with blueprints leads to good outcomes. But most of the time, I am kind of citing from my random jumbled memory. And I don't have a citation to back that up on the spot. But being able to point people to look in the biomedical field, here are concrete examples of how that has actually benefited and advanced few of them in physics and cosmology and the humanities and so on and so forth. Structuring that information in a way that helps people across these fields address this in a positive, welcoming, let's move forward science way. But that kind of nags at the skepticism that arises. Advent in various ways, I think would be tremendously valuable in this context. So thank you again for the fantastic work you're doing.

Chelle L. Gentemann 1:29:47

Thank you, Fernando. I think that gives a great I think that gives a great task for Jamaica to continue working on. To make a great season he

Jamaica Jones 1:29:59

was just I'm also going to say thank you, I also acknowledge that that's an it's an excellent recommendation and something that we would love to pursue, if possible. And also make a note that we are working on some efforts to gather stories of open science in action, open science projects that have been particularly successful or successful in moving the needle. So some of that is already underway. But your your recommendations are, I think, right on point and very much appreciated. Thank you.

Chelle L. Gentemann 1:30:36

Great, thank you so much. And, Holly. Yes, we have our coffee break now. We it is scheduled to be 15 minutes. So we'll be back at 115. Perfect. We'll be back at one. We'll be back in 15 minutes, whatever your test set every year. So thank you very much. We're going to turn off video and mute ourselves. And we'll be back in 15 minutes. Thank you. Hi, everyone. Thank you and welcome back. We are excited to have Diana Lee, our lead for the curriculum team to talk about the content development. Before she comes on. I'm going to see I can showcase. I've

got glitter stickers. Now. They're like the tops pride, but also glitter stickers. I was having a sad moment and there was an online sale. So feel free to contact me if you would like what? But Diana, take it away.

H Holly Norton 1:32:24

Dan, I don't think we're hearing you yet. I

Chelle L. Gentemann 1:32:33

think it might have been an internet connection issue. Yeah, she dropped she might be coming back. So we think she might have had an internet connection issue. So she's probably going to come right back. Malcolm, do you wanna monitor her English she joins as a participant instead of a panelist. Oh, she's saying she's having audio issues. She's gonna walk back in and join again. Okay. And I know that

K Kevin Murphy 1:33:08

seeing what the screen

Chelle L. Gentemann 1:33:10

is there a question from the IO tool that we might want to answer while we're waiting for her to rejoin.

M Malcolm Glover 1:33:17

So, one of the questions was this, most of the Open Science examples that I've seen highlighted are earth science oriented, where stakeholders include local communities that can use data being collected. Can you point to some examples from other directories such as heliophysics, or pasture over the seas?

Chelle L. Gentemann 1:33:39

Yes. So we actually have these, we're collecting these sort of one slide examples of really impactful open science scientific results, and using them to tell these stories about open science. We actually have collected those from across the different NASA Science divisions, the directorates, the Helio Astro planetary bps, and Earth. So we do have more of those examples. I will look to see, we'll post those on Zenodo and put it in our next newsletter. So that those examples are more broad. We've also been working to collect those from different areas of science from outside of just the NASA Science divisions because, of course, NASA science is international and science is interdisciplinary. So we are looking to collect those type of one slide stories, and we'll highlight that in our next newsletter, I think so look for something about

that. And I'll work with Amanda's team to try to provide some links so that people could submit those questions. And we can also highlight the ones that we already have for people to use. And we have Diana, and I believe we have Diana, Diana, can we hear you?

D Diana Ly 1:34:48

You hear me now? Of course Murphy's Law, I could hear everything this morning and then when it was my turn to present, I couldn't hear anything. I could hear everyone's mouths moving And I'm like, I need to just log back out and log in. So my grand Introduction Hello, everyone. This is my first time at this community forum. I am so excited to be here today. I am the Open Science one on one project manager. I and I have been leading the curriculum development team since about February this year. And we have been moving at lightning speed. So I would like to give you an update today and hear more from the panel. So next slide, please. All right, you saw this. Oh, yep. Thank you. You saw this slide earlier in Shell's presentation. And this is the Open Science 101 curriculum and development team. We are based here out of Ames Research Center in Silicon Valley. And in funding alone is my deputy project manager. I've got three project scientists Natasha batalla kisi Connolly, and Pamela Markham. And then I've got a great team of Project Support books. So we have Catherine Blanchett, we have Caroline Dang, we have Sarah Edwards, we have Portia Parker and Christina episome. So next slide knees. Actually, for the next three slides, you'll see the 32 leads and champions that we have across the five NASA centers. We have representatives from Ames, Goddard, Langley, Marshall and JPL. And these folks have been on boarded in the last couple months here. And they've been working furiously through the content, putting it together and making sure we have the instructor led training slides that you'll hear more about later, as well as working with our move developers. And you'll hear from Ilona later today. Next slide, please. And I would love pictures from all my leads and champions so that you can see their faces and put a face to the name. And I can't go without giving a huge thanks to the open sciency team, because they've worked really hard over the last year to put the content together that we've pulled a lot of the information from. And I've put a link here to the team. And there's about 40 members on that team. So huge thanks to them. Next slide, please. Okay, and many of you may have seen this before, maybe not in this color palette. But it is very similar to what you've seen before. So open science 101 comprises of five modules, there's the ethos of open science, open tools and resources, open data, open software and open results. The idea is you take each of these modules, and you'll get a micro badge. And once you complete all five modules, you'll get a top open science badge. And you'll hear more about each of these individual modules and what each contain. So move to the next slide. This is a very high level overview of the milestones that we've completed in just a few short months, we've had our kickoff with a subset of the leads and champions back in February. We had individual module kickoffs with the module teams in the March timeframe. And then we had the full team just at the start of April. So that's been about you know, just a little bit over two months, and the teams have accomplished so much in the last two months. And so I just want to give a huge shout out to all the members all the leads all the champions, my Open Science 101 team, and then of course, working with the Marshall Project Office as well. Next slide. All right, so here we are, here we are at the ethos of open science. So this is the first module that opens up the scene of what open science is really all about. This is the one module that we do recommend folks take as an in person, or instructor led training, either in person or virtual. But this really lays the foundation and it gives concrete examples of benefits of open science. And, you know, it includes the best practices for building open science communication, the increasing collaboration, and introducing open principles to project design as well as an overview of open science norms. So this talks about some of the things that we heard from the community panel members right on what is open

science and how to do open science. And this also gives some examples of how close how we did science in a closed manner and really that this opens By it really accelerates the data that we produce. And so there are some key terms here at the bottom at the end of this lesson, this is what you will learn more about, and the learning outcomes that I just spoke about. So next slide. So Module two is open tools and resources. And this is one module that we've been rethinking a bit. Because the next three modules, as you'll see, with open data, software, and results, those really are the practical information that you need to move forward. And so open tools really is the one that overarching those three. And so we're taking a little bit of a different approach with module two. And at the end of this module, the learner will have a hands on experience working with open science tools, databases, data sets and policies, and then also introduced to open science communications within their fields of study. So for open science 101, we won't go into each of the various fields. That's what we'll have science core four. And science core is one of the items that the tops T trainers will be focusing on. Next slide. Right, we have open data next. And by the end of this module, learners should feel comfortable creating a data management plan that follows fair principles. And so this is the findable, Accessible, Interoperable and reproducible principles and making sure that you know how to assign a license or copyright, metadata tagging and assigning PIDs B IDs. And so also, by the end of this module, learners should feel comfortable utilizing and assigning metadata. And one of the themes that we have for the open data, open software and open results, modules is a news made share theme. And this is something you'll see across those three models. How do we use data? How do we make data? How do we share data. And so that's what you'll see in this particular module. Next line. Right, next is open software. And by the end of this module, you understand the impact of open source code, have hands on practice with choosing a license, creating a readme file, uploading code to GitHub and get lab. And so with this, again, that use make share theme, right, you'll learn how to use software, makes software and then share software. And in the end, you'll also discuss the impact of open source software on open science, and that's seeing equity in scientific fields. Next slide, please. The last of the five modules is open results. And here, you'll get an in depth understanding of how open science principles help with increasing the reproducibility and replicability of research, as well as guidelines to which to choose the best location to publish their research. Again, with the news make share theme, you'll learn how to use results, make results and share results. And so for the flow of these five different modules, we again recommend that of course, you take the first one as an instructor led training. And then with the other four, it can either be through IoT or e learning. And next slide, please. This is where you'll see the upcoming milestones. So we're very excited to have some dates here on when the community will be able to review both the IoT and in learning elearning. At the end of this month, you will see module one coming online for both review and comments. And then we'll have the final delivery of module one on 629. And this will be ready for beta test because we understand that even with module one, we've been beta testing the original content. And now we'll have an updated version for beta testing. And we envision the beta testing period to take about six months. So by the end of the year, we'll have something more concrete and final. And then shortly after that, we'll have modules 234, and five, the dates are going to change slightly between the modules. But by the end of July, we expect to have all five modules up and running. Right, next slide. And this is where you'll be able to find the instructor led training on GitHub. That's where we will be posting the slides for our community review. And then the MOOC for the in Learning elearning will be available on on Open edX once completed. And next slide please. That's all I have. And I will turn it over to Ilona, I know we are ahead of time. And I'm gonna let her talk more about the loop development and then we can go into the community discussion. Thank you.

Ilona Serrao 1:45:27

Hi, everybody, my name is Ilona. I'm working with Diana and all of the champions to help convert the instructor led training into the online MOOC format. And if you can go to the next slide, I will show you who else on the team is helping us with that. So we, myself and George come from an organization called Mount tam innovations. And we're in been in the learning business for many years. And Olga and Irene are from raccoon gang, and there are developers. So the collection of us and we have many more people behind us working on this effort to convert all of the great work that the Open Science 101 People have been developing and putting it and making it available in an online format. So what I'm going to do today is I have two short slides that just give you a visual and set some give you a description of what that online experience is going to look like. So if you can go to the next slide. So first of all, with the online option, the idea is that it is going to be an alternative to Diana's point to the instructor led training. So the intent is not to add different content or anything of that nature, it's just to provide the exact same content, but in a different experience. What when we look at the content breakdown, it's going to be pretty standard, I'm sure everybody has taken online learning in one, you know, one way or another, no different here, you're gonna have lectures in the form of text, and I forgot the word graphics there. So we have the option to put in the platform, text, graphics. X and automations. And even audio files, podcast type will have including interactions such as drag and drop. So we may put in depending on the complexity of the type of the topic or trying to get the students to break up the monotony of listening to the or reading the text or watching a video, we will include interactions such as drag and drop, multiple choice, ask them to go look at links for information. Getting their orchid, Apple, you know, that sort of thing. And then, as with all elearning, we'll have knowledge checks. So knowledge checks will be strategically just interspersed in the content. When we feel like it's appropriate for the student to double check their knowledge and see if they understood what indeed they were supposed to understand from that lecture. From a user experience perspective, a little bit different than instructor led training, meaning the students will have choice. So we will have the recommended curriculum flow for all the modules, of course, on the web on the website, but the students will have a choice depending on their background, depending on their emphasis areas on where they want to go. So it will not be a restricted platform, they will have the freedom to choose where they which module they want to go to and in which order. So they can use the recommended order, or they can jump around. In addition. When they're in or less in a module, they will have the same choice, they will be able to choose to take the content in the linear format that's been recommended, or they will be able to jump around again, based on their interest. Let's say they go through the class the module one time, and they want to go back and review. You know the use lesson, they will be able to easily go in there and jump around and skip around as needed. With the platform that we're using, the students will have two levels of completion tracking. So we will be tracking their completion at the module level, how you know, of the five lessons in the module, how far have you gone, we will also be tracking at the lesson level. Again, because people can skip around, they will be able to see oh, I've done you know, I've gone through 75% of less than one. I'm going to jump down and I'm seeing I just went through 10% of lesson two and so on. So we'll have that two layers of tracking. So the student can self guide where they want to go next in their approach to a competency in the training. With the knowledge checks, there's no restriction on how often they can take a knowledge check. So if they go in and they miss a drag and drop in terms of how they answer it and they want to do it again. There's certainly going to be Welcome to do that. It's a very small image here on the right hand side. But what you're seeing there is the layout of the of the lesson page. So you'll have a left nav on the lessons that you are have available to you for that module. And then in the middle to the right, you will have your, you know, your working space, where your lectures, your knowledge checks and your interactions are going to be. Next slide, please. This is a high level on a learning flow. So again,

the students can jump around, but this is the flow we would like them to go to and use. When they get into a module, they'll have a welcome page, that module is going to have information about what that module is about. And they will have also the directory of all the lessons in that module, the student will be able to select through the directory below the description on where they want to start, or they can click on Start module. And it'll take them to a listing of all the lessons and then they that's where you get your layout your left navigation bar. And then in there, it's just a matter of choosing the lesson. And then once during the lesson, it's a scrolling exercise. So there'll be scrolling down for the lesson. And in that lesson, like I said, we'll have combination of lecture in the form of written text of bullets, that will have strategically placed images, which again, have all been derived from the instructor led training. So again, this is not to be, we're not going to, it may look different when the student sees the elearning. But it is the same content that shell and the other champions have created, we've just put it in a flow that's a little bit easier to consume in an online format. As they go through the lectures, strategically placed, again will be check your knowledge is and the check your knowledge or knowledge check treatments can vary. It can be things like dropping, drag and drop multiple choice, you know, I answer this question I like and things of that nature, some stuff that, you know, functionality that we can do on the platform. In addition, for some of the hands on work that Diana had mentioned, we can push the students, you know, off platform without losing the place. So if they click on a link to say, go get an orchid ID, you know, or go look at something and denodo will be able to push have them click on the link, it will open up in a new screen. But they will not have lost their place in the platform so they can come back after they do that. And with all of this, they can always go back and forth. So we would expect that students are not going to run through this one time, we would expect that students will come in, we hope often to get reminders to get clarifications, as we're appropriate in the training, and therefore they'll be able to use the navigation bar on the left to go ahead and do that. And that's all I really wanted to show with where what we're working on for the online experience. So with that, Diana, I'll turn it back to you and Holly.

D Diana Ly 1:53:22

Yeah, I know, this was just about, you know, 25 minutes or half an hour of information. And we really wanted to leave it open for discussion. So if you go to the next slide, I think this is where we have the committee discussion, panels, questions, the discussion questions.

Chelle L. Gentemann 1:53:47

So you will you want us to move into the open discussion section? Is that what you're?

D Diana Ly 1:53:52

Yes, yes. Because they had the question specifically about the curriculum, correct? Yeah. Yes, yes. Yeah, perfect. And, Malcolm, if you could also help with the hand raising? I don't know what order they come in. No prob greatly appreciate that.

M Malcolm Glover 1:54:10

Happy to do it. We do have a question from Rebecca in the chat. When will the final version of

each group of lessons be released? Not the beta version?

D Diana Ly 1:54:18

Yes. So this is where we're anticipating by the end of the calendar year, December timeframe after the beta test, period.

M Malcolm Glover 1:54:30

Thanks so much. We have a question from Fernando. Nice.

F Fernando Perez 1:54:35

Yes. Thank you for that great presentation. I look forward to seeing this this kind of inaction. I was curious. You spoke a little bit about it. But if you could dig for me a little bit into more of the details of the authorship experienced rather than the workflow for the consumer, the student if you will, the learner in the sense of how much of the authoring has to be done in side of the MOOC environment versus, or is it possible to develop, say, the material in, in, say, a standalone folder, standalone repository, etc, with open tools that gets consumed and rendered by the platform, but that the author could say, I'm going to also turn this into a static website, even if it doesn't obviously have the mood features. But can you give us a little bit of more detail on how the authoring experience works and workflow is for the content creators?

D Diana Ly 1:55:30

Right? So right now, the authors are working in Microsoft slides PowerPoints, right? And that's how they're curating the content. And our vision is those slides are for the instructor led training, but that will be housed on carpentries. And that way, any carpentries instructor could take the content and further, you know, either develop it or further develop it for their own particular science community. And so that's one of the repositories that these slides will be living on. In addition, we'll have our copies on Zenodo through the tops site that we currently have. And for the most developed by part, Ilona, if you could take that portion.

I Ilona Serrao 1:56:25

Sure. So what we do is leverage exactly what Diana said, we did leverage the slides with the instructor notes. So we don't adopt all the instructor notes. But the instructor notes give us if we feel like the slide needs more explanation. But the process is we take the slides, and then the developers decouple them, so you're never going to see the slide, the packaging of the content is not the same as a side we deconstruct the slide, and we break out the lecture piece, which could already be in the slide, or we'll have to capture it from the instructor notes, and then any visuals that go with it. In terms of the student, the instructors, editing the work, the authorship part that you talked about, we would expect that there's going to be an iteration scheduled for the official for any official changes. So there, it's not something where the author

can randomly change on the official material. I'm not talking about carpentries. But in the official material, it's not. It's not going to be doable to have the authors randomly make modifications, and then have those ported in in real time into the platform. And there's actually programmatic reasons why that would be a bad idea. Because of the badging for example, right? You want to have static content for a certain period of time, because students, if they're midway through studying, in anticipation of preparing for the assessment to get the badge, if you start changing content, in the middle of them studying, there's going to be, you know, a frustration component, and then they're going to get concerned about they're not going to be able to pass their assessment in order to get their badge. So we would expect that there's going to be, you know, fixed iterator, even during the beta cycle, some sort of fixed iterative schedule. And then it would always be changed in the instructor led training. First, we will take that, and then we will convert it to the Moog.

F **Fernando Perez** 1:58:22

God, I understand Thank you for clarifying that. I, I, even though, with my students, those who are in front of me, I often will make changes to the class repository in 30 seconds before I walk into the classroom, they just have to, they have to deal. But I completely understand that point. From broad and programmatic perspective, I think that that's entirely justified, I think what I had in mind, and it's perhaps something for the team to consider is whether as as an author, it would be possible for someone to have content which is say structured as a collection of say, markdown files, or tech files or other another format, a collection of markdown files and Jupiter executable notebooks where they structure a course content, right that contains both the narrative and potentially materials that they want to give the students to execute and whatnot. And they can define that as a standalone unit that they control. And there is a way to render that now it's possible to decouple the programmatic question of editorial review and checkpoints and gating the the flow into the platform, which I fully understand from the question of authorship in a portable, reproducible, kind of tool independent format. And so it's I think it's something that I want to just put out to the team and to the broader Topps team, in kind of in the spirit of the kind of pool chains and workflows that we're building. I think it's an important consideration, but I don't want to monopolize the conversation. So I'll leave it at that.

D **Diana Ly** 1:59:57

No, thank you. That's definitely something for us to consider. So thank you for bringing that up. Really appreciate that. That's Fernando, we have

P **Pen-Yuan Hsing** 2:00:09

Yes, thank you. Um, it's really exciting to hear about these developments, you know, we've been hearing about over the past year and a half. And I'm really excited to see where it is right now and where it's going. So, first of all, one thing that really stood out to me is that I really appreciate that specialists have been brought in from Mountain and Bakun gang to, you know, really developed the learning experience here. I've seen so many other open science curriculums being developed, right, and there are the scientists developing it. And they don't necessarily have the pedagogical and presentation experience to to do the work of actually showing it to the learners. So I think that's a that's a wonderful part of how it has been done. In

this case. I have two questions. But the first one was actually covered by Fernando. So thank you, Fernando, I was supposed to ask exactly about the same thing you were talking about. So I'll just end that with by saying, previously, we did talk about whether all of the content that's developed could eventually be managed and published, you know, in Git repositories, that people can be produced and fork if they want to make changes. And even in that case, you know, the official instance of you know, the ethics course, that's hosted can still be the only source of you know, the official badges. My second question also relates to, you know, watching this develop last year, and that's I do remember, in our previous meeting, we had a very important and I think, valuable discussion about around softer tensions that developed between, you know, some of the courts and content creators, versus you know, how this entire process is managed in terms of the credited attribution to them. And all of those things. I remember, we had a really long conversation about this last year. And and I'm really sorry, if I missed that. But I'm wondering if there are any process kind of management or kind of lessons learned from those issues last year, then whether, you know, the process have been proved somehow, by now and whether during the important lessons learned that could be passed on? Thank you.

M Monica Granados 2:02:32
Diane, is it okay, if I jump in?

D Diana Ly 2:02:34
Please do. Yes.

Chelle L. Gentemann 2:02:37
Diana wasn't on boarded at that time. So I think I probably better if I address that. Yeah, so we've made I think that there's a lot of lessons learned. And the first of all, is, again, to thank the open sciency community and who have continued to work on the curriculum that you saw sort of last May and have now I think there's some links to it in the chat. They've now created a Sphinx, you know, website that you can go to and look at all of the curriculum, and they've continued developing that. And it's just an amazing resource for open science. And it is a lot of the foundation from which the Diana's group is continuing to build on as well. We've asked part of the just the, you know, one of the simplest lessons learned is, you know, we've asked Diana for clear governance, on the content. Because that was one of the primary issues last time was that there wasn't clear communication of how comments would be included, who would be responsible for making decisions about what was included and what wasn't included, how the process was being handled. In the interests of the sort of trying to get this done during the year of open science. Diana's team has been working on adapting those slides. And as we brought in the pedagogical experts, things have been moving quickly. But we've also been, you know, and I, Diana can probably address this question, you know, so we're, one of the main lessons learned was about governance. The other was, you know, trying to ensure that we're partnering with team members who have a background and a history in open science that I think Diana is part of the Eames team at did it's the Diana and I'm completely blanking on the name. It's Jean Lau, now it's back. My brain is back. They have this incredible record Penn of doing a lot of the International Space Station Science in this open and inclusive way. And I think that they make

for really powerful partners to help us organize the curriculum because of that, you know, that background and sort of intentionality around open science that we're very appreciative of, and that they really have been. have expertise in that. And so then I think Diana can probably talk more about what's the process for opening up the curriculum and betta testing and bringing the governance and the bringing in of the comments and how all of that will be handled. Thank you.

D Diana Ly 2:05:34

Yes, thank you, Michelle. That's exactly where I was gonna go with the lessons learned one of the I wasn't here last year, but I've heard and the governance plan is something that my team has been working on. And that's currently in the review cycle. And we hope to have that finalized and released to be for our IoT and elearning here are going to be released at the end of the month. And so those will go hand in hand. And you'll see the process on how we will disposition, both community feedback and comments and where all that will be laid out. I gave some reference to that, you know, GitHub is where we'll be releasing our information for community feedback. And then with the MOOC developers on Open edX. And so that's where we'll also point the community back to the GitHub for feedback and comment review. And yeah, and then also, with the beta testing, we know that there there's going to be iteration. And so we wanted to get this out to the community during the year of open science for the various summer schools and virtual cohorts that are going to be happening here in the next couple months, and then get the feedback from these groups right from the learners and how to improve the both the IoT and elearning. Since we know we're probably going to miss some things in the first round. So we definitely have a period for beta testing and making sure that we incorporate that those comments and feedback as well.

M Malcolm Glover 2:07:22

Do I know that we had a quick point on the island tool, as some of the virtual cohorts will happen in Spanish and may be recommendable to have the modules translated? Or translations to Spanish considered in the milestone?

D Diana Ly 2:07:35

Yes, there is actually a Topps T group that was actually just referenced earlier with Barajas group that will be translating it to Spanish. Awesome. Thank you for that.

J James Colliander 2:07:49

Thank you very much. I had some questions about the beta testing strategy. One thing that I noticed when I was listening to the presentations today is the 20,000 goal. The audience, there's characterized as scientists, if I understood correctly, and the ontology that was used in the recent presentation, talks about students. And I can imagine some say mid career scientists not feeling like their students, even though they're lifelong learners. And so the participants in

the course, in part of the beta testing, I think, want to align with however you want to label those. And then my sort of second question is, will there be a path to earn a badge without having to click through them? Nope.

D Diana Ly 2:08:40

Yes, so there is Okay, so let's answer that question. First, there is the Fast Pass option. So you won't have to sit through all two and a half hours or whatever pace, you know, you're taking the elearning the MOOC at an so if you are an expert in open data, there will be assessment questions that you can take. And you can pass pass through that particular module and get your micro badge. Let's say you're an expert in open science, open data, open software and open results, then you could fast pass through all three modules. So there's definitely an option to pass pass on the ontology for students versus learners versus participants. We definitely took that into consideration. And for our MOOC, we're calling our learners participants, not just students. So thank you for that.

M Malcolm Glover 2:09:30

We have now the good

M Malvika Sharan 2:09:35

Jim has definitely asked the question that I wanted to ask one of them. I think one other point that I wanted to ask about is the initial engagement with already practitioners in the network, NASA network. How do you want to engage them at the testing phase, so although they would like to Fast Pass, maybe they are the right testers rather than someone who hasn't really learned it? We definitely talked about in previous panels, because a lot of us were not there. I'm going to bring that back again. You know, there's a question around community engagement, I feel like in the initial phase, you would definitely get people who already know open science are practitioners want to be recognized want to be batched, and may want to be engaged as instructors? Is the carpentries instructor training something that they will be going through in order to teach? Great, I see the the nodding, that makes sense. And how do you aim to keep these people who go to the morgue engaged in the community, because that's where the momentum builds. And I was wondering if you've thought about, for example, implementing project based partnerships within the NASA network folks who are already doing open source? Would you want to engage them in onboarding? If you're engaging with early career researchers, they might want to work on an already open source project. But if there are more senior members, how would you engage them? There is also one question around, are we thinking about fellowship program or champion network program post training, which is, again, to build a lot more community interest in being involved in the implementation of the tops training?

D Diana Ly 2:11:26

All right, so I'll start with training first. And so you saw me nodding my head, you'll hear more about it tomorrow, but it's definitely through carpentries as an instructor, and then you'll have the content workshop training, where you'll learn more about the five modules, and then from

the content workshop training, where you'll learn more about the five modules, and then from there, you'll be certified as a top trainer. And you can go into your respective science communities and teach the contents. And then on the engagement piece, this is where a lot of our leads, and champions come from those communities in the NASA world. So they are from the various science fields, whether it's heliophysics, or biological and physical science or earth science. And those really are champions to get the communities engaged at the NASA level. And this is and then on the community engagement. Right. This is where we would love to hear more from you on how we get those respective communities, in the public or in at the universities and at other institutions to be involved.

Chelle L. Gentemann 2:12:34

We have Monica, I don't know why. Maybe we can just do a quick follow up on that. Because I think we have so many. I think we have so many experts at building community on the panel. Would anybody like to you know, maybe provide some answers to Diana's question back to the panelists. Maybe just jump in, instead of raise your hand since we have raised the hand or like we will have a hierarchy of hands?

Diana Ly 2:13:06

Well, we go, would you like to start since since you brought it up? I think you're about to speak earlier? Yeah, yeah,

Malvika Sharan 2:13:12

I think the reason I'm bringing back the champions network or fellowship program, is because we already have seen them work really well. For example, I work in the UK, and there is a software Sustainability Institute, and recently, a US version of software Sustainability Institute have been launched, who are building these network of people who are largely open scientist and sort of open science activist and software development and practices. And I think it would make sense to tap into that network. But also, I think, fellowship programs are always useful if, let's say, researchers who are going through the program to prove that they are really committed, however, they don't have financial or leadership support to do these kinds of work. Or at least it doesn't fall into the goals of their pre committed program that they're working on. How can they engage? I think there's a lot of cultural barriers that they cannot overcome by taking this training. I think that's a very long term problem. So you need to think about that you're engaging them building them up, but they cannot really implement it because their environment isn't allowing them to do so really thinking about how do we elevate them? Can we provide them financial support? Can we actually build community managers into the network of NASA tops, not just NASA tops were like a distributed framework where different community champions are taking that engagement and championship championship role. And then the point that I made about implementing project based partnership is something that we can learn from Google Summer of Code or our outreach internship, which I've worked a lot in, in building up members from minor minority communities who are not working in open source but giving them opportunity because someone else is interested in mentoring them. So This is really something we can really learn from existing framework and very happy to put that in, in our recommendation post panel.

Diana Ly 2:15:10

Yes, please. I would love to hear more and see more about that.

Chelle L. Gentemann 2:15:15

Those are great recommendations now Vika Thank you. Thank you. Anybody else from the panel have more comments about this?

Monica Granados 2:15:23

I was gonna go a little bit of what Melba said and then it's this probably like intertwine my specific suggestion was going to be to develop some kind of like alumni network from, like, the both the trainers, but also the trained up trainees that go through the program, you are going to be in a really unique position that I think a lot of us on this panel that try to engage communities and build up communities wish they had, and that is like, you are going to have sort of an embarrassment of riches of people to build this community. One, of course, your name recognition, but you just have so such a big pool to draw from, because all of these people will be taking the course but also like your trainers. And what I suggest to you is to like have a very, like explicit and drawn out strategy of what you're going to do with all these potential community members. So I don't want to I don't want you to be caught off guard, when you have all of these people who want to contribute to this community, be a part of this community. And you have, you're not ready for that excitement and that energy, a take advantage of this opportunity, you know, in the programs that I work with, you know, I wish I had, that, that pool of human like human resources that you folks are going to have. So have a I would have a think really hard about the strategy and like, how are you going to try to maintain that community both while they're taking the program as as mica mentioned, but also how do you retain them? And like, what's that? What's that strategy? Because it can be really powerful community that you're that you're that you're building big, the community.

Chelle L. Gentemann 2:17:15

Thank you, Monica. Yeah, I think this is something that Amanda Adams, communications strategist with the project office has been thinking a lot about, because you're right, we, and someone in some ways is the focus is on the community that we have, because the committee that we have is already so big, and it's just going to keep getting bigger is retaining and being able to really communicate intentionally with the existing community, as that keeps expanding and expanding and expanding. And that's part of why that part of that project office that you'll hear about more tomorrow, is really focused on you know, we have the communication strategist and a communications team, and what you've already seen from the newsletter. They're doing a great job. And I think that's something that they've been thinking quite a bit about. But thank you for bringing him in. Any other comments on this topic? Or should we move on to the raise? Next raise hands? Nobody stands up. Oh, we have no raised hands. We've wiped them clean. So Diana, did you have any outstanding questions about the curriculum development? Because this, you know, the panelists here that we have here today? How many

of them have been involved in curriculum development and rolling out curriculum? In deploying that, and and some of the steps involved in creating that curriculum? Do you have specific more specific questions for the panelists?

Diana Ly 2:18:55

No, not that I can think of at the moment. But just know that the teams are so excited to get this out, working with these very aggressive timelines, but we hear the excitement from the community. And so we want to get it out even though it may not be perfect at the first round. We want to get it out there so that you can see what we've been working on what the open sciency team has been working on, and what everyone has been working on. Right and making sure that it's available for community feedback and review. as well. Will note, do you have any specifics while you're working hand in hand with the module teams?

Ilona Serrao 2:19:39

Not so much a question as much as requested or was in the previous presentation, a reference to example, somebody had asked about other examples out of other areas that show the success of open science? Excuse me, we would love to get a couple of those additional examples and put them into the content. So, I don't know, Jim, you may have been one person who had mentioned it. I took notes, but I have I don't remember exactly who mentioned it. So that not so much a question, Diana, but just if you've got a rock solid, really cool success story, Amy, I think I need to talk to you, I put your name down as well, that we can give visibility to in the training, we'd love to do that.

Chelle L. Gentemann 2:20:28

And I think Alana, what we, I think what we said we'd do is we would have launched the existing ones that we have on the nodo. And we can send a link out to everyone who's registered for the meeting to sort of show those examples. And then work with Amanda on the comms team. So that the next newsletter, we have a call that maybe when people place for people to contribute their slides or their stories.

Ilona Serrao 2:20:53

That'd be awesome. Thanks.

Chelle L. Gentemann 2:20:56

And Fernando has a question.

Fernando Perez 2:20:58

Yes, we have a bit of space. And when shall use the word deployment, one thing occurred to

me. Now, I don't know how much of this is currently being put into the content. Since I haven't looked in detail at the curriculum, but I'm going to, I'm going to guess that at some point, some of the content that would be of interest to learners might require computation. I mean, once you go from like consuming PowerPoint level information about at a high level to specifically I want to learn how to do this in my field, and I want to learn how to use Earth data, Earth data, login services, and so on and so forth. The question of deployment infrastructure for how that MOOC, the learners of that MOOC are going to actually execute code. Well, both how are the author is going to provide code to the learners? And how are and I'm using the word learner in deference to Jim's points, right? And also, how are those murderers going to consume execute potentially save those outputs? After that, I mean, there's kind of a whole lifecycle of the deployment infrastructure in there. And obviously, I know NASA tops is already funding more than a NASA is funding more than one piece of infrastructure. But training that coupled to a MOOC that is potentially a worldwide endeavor, and that could be at scale has more than a few quirks to consider. So at least I wanted to put that on the radar of the team.

Chelle L. Gentemann 2:22:24

Yeah, Fernando, I'll be honest, we've kicked that bucket down the path a little bit. Right, we were putting out the immediate viruses that is part of Science Core. And that is the vision for science core is eventually this, these new notebooks that will be developed that demonstrate some of these incredible science stories will be executable as science notebooks, and the details of that we're still figuring out.

Fernando Perez 2:22:52

So I want to very quickly at least put on the radar. Because shell, you have such a large team, somebody might be able to bite on this, there's a new kid on on the block in that scene that may be extremely relevant to this problem, which is the machinery around Jupiter light has made. So for those of you who don't know, Jupiter light is a in browser way of deploying the entire scientific Jupiter stack, so that it runs in the browser entirely. But it's the same experience. And the reason why that's important it because it means for certain use cases, and it won't do everything, it completely bypasses and eliminates the cover cloud costs, the deployment infrastructure needs, et cetera, et cetera. So for users at scale, it may be worth taking a look at that. And shell I fully understand kicking this particular can down the road, especially if you're thinking about hosting and whatnot is definitely the right thing to do. But it might be possible with these new web technologies, like Jupiter like to say, Wow, we might be able to bite the interlayer of that bite that off effectively for free, right? Because you're really putting that on the user's laptops, personal machine, kind of the cost. So just wanted to leave that out there. In case it's useful.

Chelle L. Gentemann 2:24:06

Thank you, Fernando. I think that Paul Bremner team is sort of in charge, they're there doing the onboarding and interacting with the tops, T funded groups. And initially, they're focusing on the groups that will be doing the virtual cohorts, their workshops, the summer schools, but the next part of that is for them to start thinking about how they're going to and part of that is talking more to that tops T the science core team and understanding what their requirements

and needs are so that they can start to develop that sort of capabilities. But this was great. So thank you for pointing us that way. And Shang has shared a leaf map Jupiter light demo of course you have shochet it doesn't surprise me at all. So thank you and thank you, Fernando for the read the docs for Jupiter light. And yeah, and so other people are commenting On this, we'd love to see more here I hear about some new resources, I feel like every couple of weeks, we want to make sure that it's a community accepted resource. Of course, that's open source that will eventually be using. But the project office is going to be researching that. And then I think my guess is they'll present some different options. And maybe that will be a topic for the Fall handle. Pen, do you have a question?

P **Pen-Yuan Hsing** 2:25:29

Yes, thank you. Um, yeah, just two points. One is about the content of the curriculum, I'm just recalling that in some of my experience developing this kind of stuff, in addition to telling people about best practices and what to do, it can pedagogically also be super useful to have a nun working example examples for people to fix and improve. I mean, I suspect, almost everyone will know this, but I just really liked this particular way of teaching. So whether it's code that doesn't work, you have to fix with a really messy piece of data that you can critique and explain why you think this data is not useful, why this documentation is badly documented, and so on, and so on. I think having these kinds of examples for people to work on is really useful. The second point is, I love the idea of gathering amazing successes, and amazing case studies to present and highlight. Conversely, I think there is the potential for a kind of cases of failure, and, you know, things that didn't work out to also be very valuable and informative. Now, since we're talking about failure, and my NLB is really sensitive and personal thing that people might be slightly less willing to share. But I've certainly heard of, you know, very good examples of where a problems that happened in science and research were, you know, if we only did things in a more open saliency way, then maybe the problem could have been solved were alleviated. So I think in addition to collecting successes, I think collecting failures could also be a valuable thing to do, and highlight them. Right. And I think can be present as opportunities and motivations. Word, doing open science.

Chelle L. Gentemann 2:27:36

As an editor, I have this dream of presenting data citations and having everyone correct what's wrong with them and making every editors job more easy. Right, because that's what a lot of what editors end up doing is trying to figure out the right citations. And I do. Yeah, I agree. I think that can be incredibly useful. Ben. Ilona, Diana, do you have any comments on this?

D **Diana Ly** 2:28:03

Yeah, no, that's definitely the route that we were taking. It's not all only about successes, but also, you know, some of the failures that you mentioned. And if anyone has seen the ethos of open science, we do talk about one of those situations in science where, you know, had this been shared in an open way early on, you know, we may not be where we are today with climate change. And so it's it's one of these things that we know, it's a different way of analyzing and revealing data. And so making sure that we do talk about some of the close science scenarios. Also.

Chelle L. Gentemann 2:28:47

I also, I know, you're talking about sort of failures of close science to sort of highlight how open science can solve some of these issues. But we had an interesting discussion this morning at headquarters about just sharing failures in general, and how important that can be to make it less intimidating for others to join science to make it more accessible. Because you, you look at senior researchers, and you see that they're sharing things easily. And it all just seems like this magical process, but it's actually you know, decades of wrong doors that they've knocked on to figure out how to do this. And being able to tell those stories and emphasize that, you know, like science is, at least for me, science is about failure to find those successes, and really sort of telling that story to make science more inclusive and open. A gym and then Fernando.

James Colliander 2:29:51

I want to compliment the tops leadership for navigating challenging situations that Penn acknowledged in the JPL meeting. What I see here is a transformation in the way the open core will be delivered, I see that you've taken our feedback about federating the approach through a fast track process. And I also see the way that you've acknowledged the SMEs, that have contributed and are now being recognized as the open sciency. Team. So thank you for taking our feedback to heart and working to find a smooth path to make sure that this curriculum is deployed, and flexible and accessible in different ways.

Chelle L. Gentemann 2:30:35

Thank you, Jim. Thank you very much.

Fernando Perez 2:30:43

Um, I know I know that inshallah the past your team has discussed kind of areas where you acknowledge the limitation to openness, but I would really encourage on this curriculum that is put, is given kind of a fair shake, so precisely to address in a serious way, when people say, wait a minute, not everything is open, my world is not so simple, because there's the people who work with biomedical data have many reasons, valid reasons for it, not everything can and should be open, right? Whether it's HIPAA compliance, or ethical concerns about individually identifiable data, there are national security concerns that are actually legitimate, right, and that we need to acknowledge, there are relationships with industry that also have a role, many of our federal funding agencies have an economic, like, the economy of the United States is one of their missions that they have to acknowledge that and they have to acknowledge commercial concerns. And so giving those concerns kind of a fair shake and explicitly putting them up there, not simply dismissing them, I think some of it and I'll be the first to admit that sometimes I am a little bit rah rah on the Open Science and I come in, I can come across a little bit as partisan on on just going all in. And that actually can backfire. And it has happened to me in the past. So I want to make sure that as you develop that by giving those concerns a fair shake and the right space for them, the people who have those concerns can feel heard, they can find answers good answers to their concerns, and therefore hopefully buy in to the places

where open science principles will make a difference and kind of move forward. So I just wanted to put that on the radar. I know you haven't ignored that. I'm not planning you've ignored it, but I just wanted to raise it.

D Diana Ly 2:32:30

No, and thank you for bringing that up. We actually we definitely do talk about that in one of the modules, you know, open but secure and close as needed. Right. It's it's definitely a part of the curriculum.

Chelle L. Gentemann 2:32:44

I also I'm putting it in the chat right now. We, this was in Jamaica as backup slides. But I wanted to point, you know, Fernando, we've been thinking a lot about how to present this because a few years ago, it was always this, like you said it was as open as possible, as close as necessary. And in some ways that glossed over the complexity, the very, very real complexities that people encounter, both at data software level and incident institutional and as a funding agency level. And so I wanted to put this in the chat, which is open science is the principle and practice of making research products and processes available to all while respecting diverse cultures, maintaining security and privacy, and fostering collaborations reproducibility and equity. And if you zoom in on that center part, that's where we're trying to acknowledge, like, there are cultural issues with whether or not so it's not just that everything should be shared. One of the first questions that we've talked about in these modules is, you know, first you talk about how you consume open data. And then when you talk about sharing data, one of the first questions that you have to ask yourself is, should I share this? And you need to have a very real conversation about what is the data? Are their privacy concerns or their HIPAA concerns? Are there pictures of children concerns? Are their export control national security concerns? Are their cultural concerns was this data collected on certain communities that may not want it to be open. And once you've addressed all of those that that is really the first step and thinking about being open. And if you've addressed all of those, then go to the next step, which is, you know, looking at your what your Grant says, what your institution says about being open, and being very careful and intentional. And, of course, part of the module is thinking about this all at the very beginning of your research product project so that you're not surprised at the very end by things that you might want to have considered at the beginning. So the idea is, is that if we can start thinking about these early and we can start making these part of the norm of how we do science is to actually plan for openness in a very intentional and thoughtful way, at the, at the proposal level, you know, at the time that we're writing the proposal, so it does get to be part of the peer review. And you're gonna get comments and feedback on what you've done right and wrong. We hope. So like I yeah, I think that that's such a critical part of being open, as you know, being open intentionally and safely. Thank you. Are there any other hands? Great. So I think we can move to our breakfast, or lunch, I think we have a break. But we have, we've had quite a bit of discussion. So we may end up being able to just end up a little we put in a lot of flexibility into the agenda to just sort of allow for discussions. So maybe we can take a vote from the panel. We have two more days of presentations and discussions ahead of us. Would you all like to have a break? And then continue discussions? Or would you like to call it a day, since we've had an excellent discussion, and then can pick it up tomorrow? So how about you raise your hand if you want to end it, Jimmy or Donnie? Raise your hand if you're good for today. And you'd like to pick it up tomorrow. And we'll do a count of hands about whether so

raise your hand if you're good with discussions. And I see a lot of hands. So I think we're good. So the I just I want to thank all of the online participants. We have an IO tool. We'll look at going through after this meeting before tomorrow and answering some of those questions in the moderation tool. Those questions will also be used to generate some of the during the there's a one hour q&a tomorrow that will be answering a lot of those questions. And I did answer a couple of them in chat that were about funding elements for open tools. So please feel free to join us again tomorrow. Same whatever your local time is. And we have the leaks. We'll also post some things online. And once we get this recording done, we'll post that on the GitHub. So thank you, everyone for joining us. We really appreciate all the feedback and your time and your energy and your expertise. Thank you