NASA Transform to Open Science Community Panel 2022-05-19-09...

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SPEAKERS

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K **Karla Mastracchio** 00:00

Good afternoon and welcome to day three of our community panel. Everyone had a great time last few days and we're looking forward to great day three. So let's get started all right, as always, check snowing would really encourage you to post on Twitter. We have hashtag NASA tops and hashtag art open science. If you would like graphic, just send me a message and I'll send you one.

chelle gentemann 00:38

And as always, we have our Code of Conduct So

K **Karla Mastracchio** 00:40

participants, you know, when you will be treated with respect and consideration that will be a diversity of views and opinions. You're expected to be considerate, respectful and collaborative, communicate openly have respect for others, and also as ideas rather than individuals that's important when avoid personal attacks directed towards other participants. Of course, being minded, mindful of your digital space that you take up and your surroundings and your fellow participants. If you notice a dangerous situation or someone in distress, please notify a host and of course harassment, intimidation, discrimination of any form will not be tolerated. Physical abuse or verbal abuse, anytime will not be tolerated and examples include, but are not limited to anything related to race, class, gender, sexual orientation, physical appearance of religion, etc, will not be tolerated. And, of course, don't disrupt proceedings panels discussions and or lightning talks. Okay, so any any requested stop unacceptable behavior is expected to comply immediately. No ifs, ands or buts. And hosts may take any action deemed necessary or

appropriate, including removing you leave it leave without worrying. So in terms of reporting of acceptable behavior, like I said yesterday, the day before, if you are the subject of an acceptable behavior, or have witnessed any such behavior, please immediately notify a meeting hosts and anyone experiencing or witnessing behavior that constitutes an immediate or serious threat to public safety is advised to contact 911 or your local emergency department. And of course, we have our QR code. I will drop the link to that in the chat. But you just know that your inputs are essential to the success of our mission. Throughout this week. You can submit questions via the website and you get to the website. If you have a QR code. We're here. I will turn it over to Dr. Chelle gentemann.

chelle gentemann 02:44

Thanks. Thank you everyone for showing up for our third day. We are super excited to see you. Today we are going to have Steve Krug talking about NASA's open science policies. We have Greg Tannenbaum talking about the alignment of incentives for open science. And then we have Yvonne IV, talking about community engagement plans for the transformative open science project. i Please, lots of time for discussion, as usual. So I wanted to take a minute. This shows some of NASA's Earth fleet. Of course, there's a lot of other missions going to other planets. Today this morning, at 5am. Pacific time, we briefed Steve Kevin fee myself, Katie Baines, and Caitlin Buckley, we briefed the science Management Advisory Council at NASA. This is a comp smack. It's a strategic discussion with representatives from NASA Science Leadership. Every division director and deputy director is on this call representing the astrophysics heliophysics biological and physical sciences, planetary sciences and earth sciences. And we briefed them quarterly on the open source Science Initiative. During this call, you know, this is the way a lot of NASA science works and NASA Science get organized is through these high level calls. And one thing that Steve Crawford highlighted during this call was, and it really resonated with me, it he highlighted, this is a panel that we're holding openly. And traditionally, there's a lot of things that happen at NASA and other federal agencies that are all behind closed doors. And Fernando was tweeting a little bit about this yesterday about how this panel is being held openly. And I want to sort of emphasize that a lot of the things that when I started to have questions about open science, it was great. I can go to Google and I could find all of these projects that were open science, and they would be developed they would be discussing how they learn things, how they made decisions, and it was that open In this it was just halftime, I didn't have to search for an answer or dial a friend, it was just there, it was documented because the discussions were happening on GitHub or within Git or discourse. And we're trying to follow that model, we're holding the panel openly. And we have, it looks like the last couple of days, we've had almost 100 people attending and listening. And today, we seem to have about 56 people already logged on and listening. And this is really big, this is a big deal. Because it's not often that maybe people who are new to NASA get an opportunity to see how these teams were happy to see us having discussions with each other, and be able to comment on it and ask questions and engage with NASA scientists. And this is part of broadening who's participating. And so these are going to go up on YouTube, and anybody can watch them at any time. And then come to the GitHub and submit even more questions. We really hope that this is the way that opening up science in this way, opens up science in the future. And Steve was one of the people that initially Honestly, I was a little nervous and scared to open this up. I said, Well, what if they don't like what we're doing, and they're really critical. But then we thought, No, this is the right thing to do. And Steve really pushed me on this. And so we agreed that we're going to have this meeting openly. So I'm really happy to introduce Steve Cropper, the program executive for the open source Science Initiative.

S steve crawford 06:31

Thanks, thank you so much well, and and even with doing this openly and having these discussions, it, we aren't doing this without you and and including this in as part of our group here. And so I really want to thank the panelists who've been participating. I've been following along as much as I can, and with the discussions, which I think have been incredibly helpful. And also everyone who's following along and participating in the chat. I think that the really active chat discussion has been fantastic as well. And so let me start this off with a very big thank you to everyone who has been participating along to the tops team, and our colleagues from the HU, who've been putting all this work together, I know you've been doing a huge amount of work to put this together. And so really, thank you for everyone. And yeah, definitely, please let us know how this is going. Because, you know, is this something that we're going to do in the future, and we are always looking to improve things. And so I'm really happy to be joining here today. And he will talk about the overall open source Science Initiative. My name is Steve Crawford. My background is as an astronomer, I previously worked at the Space Telescope Science Institute, where I was helping with the calibration software for the Hubble Space Telescope and the James Webb Space Telescope. And then have also been previously involved with the Astro Pi project. And so really excited about all of our work that we're doing with the open open sciences, and really happy to be able to share with you some of the other work that we're doing, hopefully to help put tops into the context of our other activities and also how they can also help support each other. And so if we go to the next slide and, you know, going back to, to our core principles on on, you know, science should be transparent, the scientific process and results should be visible, accessible and understandable, accessible, that our data tools, software, documentation and publications should be accessible to all and looking at fair, findable, Accessible, Interoperable and reusable, that we're our that our science is reproducible and reproducible by members of the community. And that our science is inclusive that these processes and participants should welcome participation by and collaboration with diverse people and organizations. These are some of our key principles. And so if you go to the next slide that you know, we have been developing not just our open science, but also looking at taking that the next step further. And so when looking at not only just open science, but open source science is NASA, NASA's method to put open science into practice. We're really looking to open the entirety of the scientific process from start to finish, broad and community involvement in the scientific process. increased accessibility of data, software and publications and facil rotate inclusion, transparency and reproducibility of science. Next slide. And from these principles we, you know, I think that has been highlighted before. In 2019, NASA released the strategy for data management and computing for groundbreaking science, which really set an ambitious vision for open science. And through from that initial strategy has grown the open source Science Initiative, looking really to unlock the full potential of a more equitable, impactful, efficient scientific future. And from the open source Science Initiative, we really have four areas that we're actually to help actually develop and implement this really ambitious plan. That includes policy development, education and compliance tools. And so updating NASA policies on scientific information to better enable the activation of open science, core services for science discovery, developing core data and computing surfaces to enable open science, Rose's elements, supporting open science, software tools, frameworks, and libraries and platforms, and also training with over $5 million in research grants, and community building partnerships, the transform to open science will help accelerate open adopting of open science. And what the one aspect that we're very much focused on and have been speaking about during this panel. But also to help put that in context. Throughout this talk, I'll be giving some of the examples of the development that we're doing in the other areas

as well, along with also the further community building and partnerships that we're additionally doing, in addition to the main work and training with tops, and soy. And roses stands for research opportunities. And actually, I forget the rest of it. And so hopefully, someone can actually look up the the full acronym there. But it's our, basically our main mechanism for advertising and soliciting scientific grants. And thank you for the chat following me up there. And so if we go to the next slide, we can jump into one of our first main areas, which is actually developing policies to help support open science. That was one of the main first aspects of coming out of the strategy was actually producing coherent, and strategies that apply across all SMD in our five different divisions. And so advancing science requires the sharing of information. And so what has been developed is the what's the science policy directive, or SPD 41, which is the NASA snd Information Policy. This brings together existing the NASA and federal guidance that actually is related to how we share our information. The first version that was released in August of last year, basically includes what are the current policies that basically NASA already has in place either through NASA policies or federal guidance, it does apply to all SMD funded activities related to producing scientific information. But I will actually mention that it does include the applicability, especially to restricted information. And so things like either things which are actually covered by intellectual property roles. security concerns, export control, or ITAR control information are excluded from the policy because we do want to actually keep our information that does need to be kept secure, to keep that information protected. But for information that does not have those restrictions, we want to make that information as open as possible. And so with the policy was released in August of last year, and there's also the Science Information Policy website where you can actually see more information about the policy. The in November, we released a draft version with proposed enhancements to SPD 41 And this is SPD 41. A. And I'll talk you through some of the differences between the two of them. That was released in November of last year, and along with that released a request for information that closed in March 4 of 2022. And we did actually received 61 submissions to that request for information which we're currently currently processing and that we'll use to revise SPD 41 and look to actually adopt an updated version of SPD 41 A Ain't no earlier than June of 2022. And so if we go to the next slide, I can share some of the examples which are actually appearing in the current policy. And so, we do have for our scientific data that shall be made publicly available with clear, open and accessible data license no later than the publication of the research, that our mission data shall be openly available with no period of exclusive access, that our software our research software should be publicly available no later than the publication of the research and assigned permissive software license. And that our publications, manuscripts versions of as accepted manuscripts shall be deposited in a NASA repository and made publicly available within 12 months, our mission publication shall additionally be made publicly available at the time of their publication. And so if we go to the next slide, we can also see what are the new or proposed changes. And so building on just actually releasing and making our scientific data available, we also want to make our Data Fair, findable, Accessible, Interoperable, and reusable. We also want to make sure that our scientific data is sizable. We'd really like to actually move to where our research software shall be publicly available no later than the time of publication. And not just that it is a best practice. But it is actually a requirement. And we want to move to having our mission software, the software, that is for our missions, which is related to our scientific activities, and that is not restricted. But that software that can be shared openly, not only just to be shared openly, but to be developed openly, and publicly accessible version control platforms that allow for contributions and engagement from the community, our publications, we want to not just make sure that they are open and accessible within that 12 month period. But that to encourage our our proposers and our awardees to publish as open access, this is a, this is an allowable cost in in grant proposals, and under the budget, and also the encourage the use of preprints as well, to actually make the manuscripts as openly available as possible. We're also

and this is an example of that is having our science workshops and meetings shall be open to broad participation, and documented in public repositories. And we're trying to actually lead by example here. And, and but this is also something which is new as we're understanding how best to do this. In the future. We want open science activities will be considered in reviews of proposals. And one of the thing that's not mentioned here is that we want our open our peer reviewed data and software to also be considered can commiserate with our our peer reviewed publications and to receive equal credit for producing those for the authors who are producing software and data that are important to our scientific communities. So if we go to the next slide. So just to highlight some of the next steps for the policy and the development. We are currently in the view of processing and reviewing the responses to the RFI and revising SPD 41. A. And probably actually looking at the most recent updates that we actually probably not expected to release an updated adoption until July 2022. Once adopted, it will be incorporated into res 23. So will not start before roses 23. Any updates that we do? SPD 41 is fully incorporated into vs 22. And with both policies, it is very much a floor looking aspect that we're taking for it. We're looking to apply it to grants and missions going forward. We know that there is a lot of existing missions and existing grants and we hope that they can meet the policies to the best of our ability within their resources, but we're very much going to be more looking at making sure it applies to things going forward. Each division is also releasing guidance related to scientific information policy. In February the heel is physics data policy was released. And this actually provides more context more information. And it's also aimed at the communities and so it it really is taking this very broad policy which was applied to all the SMD direct records and applying it to the different divisions. So today's goal is to minimize the burden and making our information as open as possible. Can you just pause one sec Sorry for that. Hopefully my dog taiko will be quiet now. And at least a little bit more calm. He's very excited about open science as well. SMD goal is to minimize the burden and making our information as open as possible, we really want to make it as easy and as natural to be as open as possible, and to only, you know, as restricted as necessary. And so we're providing for the services that support open science, improving policy and processes related to open science. One thing I mentioned, that is important to a lot of people working at NASA centers, is that we are currently working to improve the NASA software release process policies and processes, particularly npr 2210, which I'm actively engaged with the Office of General Counsel and the Office of Chief Engineer to improve and update that policy. And then we're also working on obviously, this efforts and training in open science. And some of the issues especially particularly important for the policy is things related to standards related to data and metadata, and open source software processes and intellectual property for software. These are areas where, you know, especially on intellectual property, areas where many scientists, at least in their professional training, do you actually do not get any professional training for this. And so are important things for people to understand at least when they should be collaborating with experts in those areas. And if you go to the next slide. And so I wanted to give an example of how we're trying to make this easier. And one of the things that the NASA STI the scientific science and technical information division has done is sign an agreement with chorus, which is the clearinghouse for open research of United States. It's a collection of publishers, and publishing groups that provide information about an MI make, through that collection make their papers openly accessible within that 12 month period, in accordance with federal policy. NASA, with the scientists scream at NASA researchers who publish and worse member generals will automatically satisfy the open access requirements for SMD publications. And we'll be releasing more information on this and this was only signed in the last month. But I won't give an example of how we're going to try to actually make things easier. And that is going to be our priority in implementation of the policy. The good news is that the course agreement, rd I believe covers about 90% of relevant publications. And, and so I'll just actually move through some more of the examples. And so if we go to the next slide. So as mentioned, we also have the core services. And these

are actually going to be directorate, common directorate capabilities to develop core services, which are useful for all the different divisions. And we hope to have these completed within a three year timescale. And so these will hopefully help meet the open source science goals of the data and computing strategy for SMD. They'll reduce the cloud environment and duplicate barriers and improve computer and infrastructure. And I want to give a couple of examples of these. And so if we go to the next slide, one of the areas that we're currently actively working on is the SMD science discovery engine. This is to create an SMD discovery capability to enable open source science by providing search across the five divisions and providing search for different data types and different data catalogues across our different divisions and providing the contextual information such as software documentation, and publications, along with that data. And this is something that we're hoping to actually provide public access to later this year as it's as we actually incorporate data and information from our different divisions. Another example, is in the next slide with expansion of the astrophysics data service and access to SMD publications. We do have this mandate for open access and preservation of reliability of our peer reviewed publications. I've mentioned our policies for open access and encouraging preprint service as well as chorus but also to help make this more discoverable ATS. We've funded abs to expand its holdings and head of physics and planetary science to provide even greater search and discovery discoverability of the publications. If we go to the next slide we're also and so this is start Now getting into the research opportunities in space and Earth Science, roses, the supporting open source software is one of our first grants that we've administered, administered. And so that was advertised in 2020 with the open source tools, frameworks and libraries. This we had over 60 proposals submitted to this program, and we selected eight proposals, supporting 5014 different projects. And you can see some of the examples here like NumPy senpai Scikit, learn Astro pi pandas matplotlib. Archive is also another group that we supported under this activity. We also have currently open the roses 22 f8 opportunity, which is a supplement for open source software awards. These are for current grant holders who would like funding to help modernize their software and release it as open source. If we go to the next slide, we have some more examples of our another element which is currently open is under our cross divisional topical workshops, seminars and conferences we have now with the roses 22 release of this and it is currently accepting proposals, we are welcoming proposals which are relevant to the open source Science Initiative and the transform to open science activities. And these include events which are focused on SMD data software or open science practices, hackathons, unconferences, and challenges that build open science skills and training in open science. And so this is currently open and accepting proposals. And so for people who are interested in any of those type of activities, we welcome the proposals that the open source science initiative can help support. And if we go to the next slide, I can highlight some of the upcoming roses, solicitations. And so these are to be released, we have actually, we have them pre announced to let people know that we are planning to release them this year. But we're still finalizing the details. And so they are not yet released. And this includes one which is going to be helping directly supporting transfer to open science focused on training. And so this is actually further development of the training material, beyond the the core, open science areas, and also execution of events in it to help actually support and advance open science literature, literacy, we have hyper priority open source science. And this is also going to be helped advancing the goals of tops and OSI through supporting open science projects, and supplement for a scientific supplement for software platforms, which is actually aimed to supplement and support existing awards to actually adopt and use software platforms for their their analysis. And so this could be using cloud environments, or other scientific analysis environments, which are hosted in cloud or or high performance computing environments. These are not yet released yet. And so they will, but we do hope to release the full text to actually make them available for the public. And I think I have one more highlight before closing off and getting into the discussion. And you know, one other thing that we are doing and we're working with is

making our data even more accessible. And what we have a space act agreement with Amazon Web Services. And as part of that space, our agreement SFD they've made five petabytes of storage available to make SMD datasets available as AWS public datasets. And so these will be actually cloud hosted and then freely available for people to actually use. And we this is an example of also our hope for further partnerships with other groups. And so, we do actually hope to actually, we do have other existing space act agreements and we're also looking to actually further engage whether or not through space act agreements or memorandums of understanding or other opportunities to actually explore how we can actually partner with other groups on advancing open science. And so, I wanted to actually give those as a range of different highlights. And I think the last slide is a just a summary of the results going on. And you know, hopefully, you know, we can have plenty of time for for discussion here. Especially actually have any questions which are actually related about, you know, if there is aspects really which are actually important for tops on terms of what other activities are needed to support tops, and what training does tops need to help prioritize and support the OSI goals. And so thank you, everyone for for listening along and really happy to jump into the discussion and questions right now.

chelle gentemann 30:29

And we can discuss, Oh, you did? Was I not? Okay. Thank you, everyone. We're going to take the slides down and bring the panelists back up so that we can have some discussion. Steve really presented sort of in detail, I think a lot of the questions that some of you had maybe over the last couple days about NASA's vision and some of the details of how this is all working. But do you want to do you have questions? So Pam Yun asked in the chat is roses have only available for us based applicants. This was actually a question that came up last week during our community forum as well. And it's a frequently asked question, Rose's NASA funding is around the individual around the institution, not the individual. So it's available for US institutions. But if you're funded by a US based institution, through rose roses, your sense of ship doesn't matter. And for most roses, there's a frequently asked question about that, though, and I'll post that in the channel and the US base, I think that's our peer institution.

steve crawford 31:44

And I think we have some hands up, but I also want to just take the opportunity, I know one of the top voted questions is related to how we make our products of our research immutable and unassailable and interoperable and reproducible at the same time, especially as we are concerned about data and information security. And, you know, we know this, you know, NASA has very high security requirements. We are, you know, a organization, which is both producing a lot of protected information, and also often targeted as well. And so security and risk there. And we also want to make sure that the data products that we're producing are of highest reliability as well, we want people to, you know, basically one of the things with lot of the aspects here is that we want to make sure that we trust what we're doing, and that we trust the science that we're doing. And so these are incredibly important questions. You know, and this is why we are partnering, especially also within within NASA and with our other groups, which are export experts in this area in terms of security, and legal requirements. And working as part of the overall open source Science Initiative. Because we we do want to actually be very clear on there is going to be certain aspects where, you know, security is going to be the primary concern. And that's information that we need to to cover. But it's also aspects when that's not

the primary concern, and that openness is going to be the most important aspect. And it is going to be a continuing conversation. And part of the reason we're doing the training as well is to help further educate about where is the important minds there. And so, but this is always going to be a continuing work in progress. And as Shell has been saying, we do need everyone. And that includes our colleagues and friends who are working in experts in security, you know, and, and legal aspects as well. And I will also say they've been incredibly helpful as we try and navigate these difficult policy discussions and develop further material.

chelle gentemann 34:19

Thanks, Steve. So I see Jim and then Monica.

J Jim Colliander 34:25

So thank you, Steve, that that that was fabulous. And I'm really excited about the way the policies are starting to provide granular descriptions of maybe the vagueness of openness. So that's really helpful. I especially liked the way that you set things up. So the information and the sharing of information is kind of the key activity. That's a kind of universal activity in enterprise of science. And that's something that I also believe in, I really liked that framing. So I wanted to push you just a little bit further on the Ask aspect of what I still think is somewhat vague in the conversation so far. And that's about reproducibility. So reproducible science products should be composable. So that next generation scientists can build easily on the work of others. But to make that happen, I think there are additional policy features that you might want to explore. So there should be no black boxes, because I want to be able to probe how the previous scientists did all of the work that led to that conclusion. So we have to eliminate black boxes. And related to that there needs to be an expectation that computing tools are kind of commoditized. So we have to find a way to avoid vendor lock in and make it so that the only way you can do this science is stay on top of AWS using proprietary AWS stuff. There's risk associated with that, especially over the long term. So this means also that people who want to validate may need access to tool chains. So the tools are also a component of the kind of reproducibility ecosystem. And then the last thing I wanted to mention on this is, if someone does the work of reproducing someone else's work, oftentimes, they just kind of nod and say, Well, I guess they're right. But I think we should explore ways to set up incentives for people to report on successful reproduction of prior work, because that adds to a really important return on all of this openness, effort, which I think is understated in everything that we're discussing. And that's the potential for improving trustworthiness of the science products that an open community builds relative to a single hero pie that claims this or that. So this overall improvement and trust is really advanced through all of these efforts. Despite those criticisms, I want to echo what I said at the top. I think it's fabulous, that work that you've done to define these policies. And there's a real inspiration here. So thanks for that.

S steve crawford 37:02

I think those are great points, James, and thank you for making them. I think reuse is going to be is an important, very important aspect for us. But I think there is actually there's not but there's a and a important conversation to have about the best ways to enable that. And so thank you for the comments.

chelle gentemann 37:24

Thanks. Do you think Jim, I think Monica was next on one hand, and then I think we have some questions in the chat that will address that.

Monica Granados 37:33

Yeah, thanks so much for that presentation. Siva, it's great to see the the policy and I have a lot of questions about the policy itself, and like, who approves it and stuff, but I won't get into the the nerdy science policy details. So I'll just have three things for you to think to consider. The first is, and I think it's actually asked in the chat too, is if you've thought about, you have a 12 month embargo period, whether you've thought about, you know, for the next iteration of the policy, potentially putting in a place for zero embargo, using a lot of the sort of innovations or things that are that the open spaces is looking at with using author accepted manuscripts and rights retention, to allow the deposition of a of a version and accepted version of the manuscript immediately after acceptance. So, you know, we're thinking about that, for the next iteration. I'm wondering if you've also thought about compliance? Are you going to be measuring compliance? We know we've seen that compliance often, there's some work that's been done. But I've been talking about the VA at the University of Montreal who did like an assessment of the tri agency here in, in Canada and saw that like, compliance actually was really, really bad, even though, you know, the tri the tri Council, which is like the Funding Agency of Canada, you know, how to policy for, you know, 12 months open access, as well. So, I think having a way to track compliance, and then having sort of, what are ways that we can incentivize compliance is is important. And then the last part that I have here is to think about making sure that you let scientists and award holders know about the policy. In my experience, I when, when working at a federal government, the policy and the scientists are like really separate. And so we'll come up with a policy and we're like, Great, this great open science policy, or this, you know, this action and the scientists just have no idea about it. They're just kind of doing their own thing. And because they're just like, I'm here to do science, I'm not worried about policies. And so if there is a way for you to have like targeted training, or at least targeted communication, about the about the policy, like here's our new policy, you know, read it if you have questions, here's a training, you know, a seminar or you know, whatever.

steve crawford 39:54

Yeah, let me let me see if I can go and reverse and all that last question. I think it's a great one and very relevant for our conversation here. And it would be great to get your feedback on how, how best to to integrate information in the policy into our training that we're doing. And so that would be fantastic to learn more about your thoughts on that. On the go, now, I forgot what your second

Monica Granados 40:24

question clients was the second,

steve crawford 40:26

yes, compliance, we've thought about that. I and it is going to be an ongoing conversation. We're not thinking of having any compliance mechanisms put in place right away, that is not our priority. You know, to give you an example, the pub space compliance, our compliance requirement with our open access to publications, prior to signing the course agreement, that was at 5%, after signing the chorus agreement that's at 95%. And so our priority is actually similar activities like that, where we make it automatic for the scientist, you know, and so that's working. So that's part of the scientific process, but just by going through your normal scientific process, you're going to end up being compliant. And that's really our priority, but we will be looking at other mechanisms and and looking and continuing that discussion. But that's not our immediate priority. And then the third question, or the first question about the longer term, open access, we have currently no plans to change that 12 month embargo. But we do want to incentivize, and encourage people to publish as open access. And so that is an allowable budget expense, we also encourage people to post as preprints. And making sure that our authors are able to do that, as part of of what they're doing, you know, is important to us. But we have no plans right now to change the 12 month embargo period. And thanks for that.

chelle gentemann 42:09

I think Hans had a question that

Moritz Gunther 42:13

I have the impression that NASA has made really great strides in this, like openness and requirements for openness in the last couple of years, like compared to the decade before, the decades before, I think the last few years have have been more have been much bigger steps. So first of all, I think that's very good direction you guys are doing, doing good work that after I want to stress that I need to like this, for example, this chorus requirement, I think it's a fantastic idea. Like from my own experience, I've previously added grant found like somewhere buried on page 15 of the requirements that all publications have to be sent to NASA. So I contacted the ground officer who told me they don't know what they'll ask around, and eventually told me eventually and please download a PDF from the journal and then you can email it to the library librarian over that. And so it's not I'm sure I have not complied. Except for this one example, I have not complied with our requirements, because it's really hard and seems really pointless. The article is on the nose and Astro pH anyway, on archive. And so like things like cars, I think that's a very good direction to go. Because in my experience, like then my own research isn't far doesn't follow fair. It's not usually because I don't want it. It's because it's unnecessarily hard. And so any way any tools, any, any workflow, there are things that we do make automatic compliance automatic or easy, are going to be I think, a lot more helpful than the carrot, I think it's a lot more helpful than swinging the stick and saying you won't get another grant if you don't do this, or don't do if you don't tick that box. So I I've started thinking about things you're talking, I don't have a concrete like you should do that next. But the thing that's, that's a direction that I would encourage to think about hard.

steve crawford 44:07

Thanks for it. And I will just follow up. The one thing I do always love to mention is that in the

original NASA Authorization from 1959, NASA does have a mandate to share our information with the world. And so open science is actually in the original NASA Authorization. But I will also admit that we've and, pat you know, NASA has open Earth eight data policies from the 80s then the Hubble space telescope data has been open since the 90s. But also meant that we've been making great progress in the last few years to further advance that and that, you know, progress does progress. We make progress on different timescales at different periods. But I do always love to highlight NASA has been open since or NASA has had a mandate for openness. Since our since our start.

chelle gentemann 45:07

Things I see in the eye will also double down on what you said. Because part of why we're able to do this open source science initiative right now is because so many of the barriers are being reduced. It used to be harder to do open science and asking scientists to do open science to be open about their data, their software, their research their applications. There's just a lot of barriers replaced. And there still are, we have there's been a session about policy in the chat. But for scientists, a lot of those barriers are being reduced through efforts like this. So it is, it is getting easier. And that's a great thing for science. There's a comment in the chat about reproducibility hackathons for students are a really great way to ensure they understand the process the value of good data management and can begin to celebrate community element there. And yes, I completely agree. And I wanted to point out that Steve talks about this opportunity to topical workshops, seminars and conferences, where there is funding for people to propose the whole hackathons like this. And this is a great idea. I think it happened on around reproducibility, it would be wonderful. And I think the next person that had a comment, I think MonaVie Oh, good. You took your handout. I think it was, is Logan. And then I think Pena

Logan Kilpatrick 46:39

Yeah, I'd love to see him just learn a little bit more about the you mentioned, this scientific discovery engine that NASA is putting together. And I think they're just internally at NAMM focus. We've been in conversations with I think IBM and some other organizations about a really similar idea, basically, sort of opening up some of the cool stuff. That's that's happening. I'm wondering if you can share any more details on that if that's like an active live thing that's happening right now? Or if that's something that's more planned into the future?

steve crawford 47:07

So we there was a, as part of the meeting this morning that chelle mentioned Kaylin Bugbee, who is at Minister Marshall, who is our lead for this activities did demonstrate it? And was doing a use case of a biological scientist who's working on the space station but needs solar wind data, you know, and and can they use this to find the datasets that you need to determine whether or not there has been an energetic solar activity that might affect their experiment. And, yeah, and you basically did actually go through as as a, as a prototype, to kind of demonstrate and be able to discover what datasets that researcher would need to find. I'm, you know, you know, I mentioned as kind of demonstrating the capabilities of it, we're still very much in internal kind of testing and development and still, inputting all the different datasets, you can imagine there is a lot of different data in it. And at the same time, this won't provide

direct temporal or spatial search. But it will allow you to discover the datasets that you need to then pull out the information that you need. And as I mentioned, we're looking for a public release toward the end of the year, to make it available to during the year of open science. And if it is actually something you're interested in more detail, I'd be happy to connect you with Kailyn, who would probably be be happy to talk about it. But it is still very much in a very early stage of internal testing and internal development. So

L Logan Kilpatrick 48:55

yeah, it'd be really an of course, I know, there's all this stuff is already scoped out, and I'm sure in the works, but it'd be it'd be really cool to see this, like, more broadly, I feel like my assumption right now is that it's like just NASA data that's available through this. And it'd be really cool to other researchers to be able to have their stuff available there. And I think that supports NASA and sort of the idea of them getting access to the stuff that they need to solve these problems, but also, broadly, researchers in the open science community, getting access to all the data that they might need. So I'd love to talk about

S steve crawford 49:26

it. And I think that's something I'm very aware about is that, you know, just NASA data is not helpful to a researcher. What's very, you know, as a scientist, I don't, you know, I don't care about who produced the data, I want access to all the data, and you know, as we and that's definitely in our thoughts, but there's also this is also a five year project. So you you were at the start of it.

chelle gentemann 49:55

And Logan there's been some funding opportunities in the past to sort of develop new To search algorithms and data, because it's like Steve was mentioning, it's, most people don't go to a NASA Data Archive, you know, they're not even certain that those exists, right? If you if you're new to science, or even should go to your somebody that you know, that maybe have that science data before talk to your advisor or somebody at school, but a lot of people just go to a search algorithm, and then they type in the data, and then they get this huge number of response. And it's really difficult to find this is the data that I trust, how do I decide whether or not to trust this data? Where is this data, and I think that there's going to be a lot of opportunities in the next couple of years, as NASA and other agencies are moving their data onto the cloud. And the data has all the metadata along with it, how we search for data is going to fundamentally change. And it's going to be a lot easier to not just, I think, well, I have to say something easier to find the data, because there's gonna be a lot more data and a lot more places. So that's going to present a new problem. But if you can find the data, it's gonna be a lot easier to access to remove that barrier to downloading. So there's just a lot changing in this world. And it's going to be really important for science to continue development in this area. And then Pinyon, I think, the next question.

P Pen-Yuan Hsing 51:25

Thank you. Yeah, um, well, first of all, my internet connection is a little unstable today. So I do

Thank you. Yeah, um, well, first of all, my internet connection is a little unstable today. So I do apologize if you've already addressed this, and I missed it. But I think it's, it's amazing, the work that NASA has already done. So I'm even more excited about what's going to happen in the next five years. And with all of the success and the things that you plan to do, um, I know that we've talked about how, you know, through the grants, and, you know, funding that NASA where it's, that's one way of effecting change in open source best practices and disseminating that to researchers. But outside of that, as you're developing these policies, you know, and thinking about how to do better open science, have you encountered any challenges to this in terms of policy and the legal environment, on both the national and international levels? And is there any way or leverage for NASA to actually affect policy and, you know, legal changes outside of NASA, right, whether, you know, that's for the US government or some other, you know, kind of policy, it says something we've thought about and maybe tried to do, if there are indeed barriers in the legal environment.

S **steve crawford** 52:47

There are, and I think, you know, where they become most complicated is around software, especially, you know, things like licensing of software, there's a wide range of different licenses, there's a range of different ways people interact with licenses. And, and that is probably the most complicated area, the same thing does come up in data as well. Data, we've at least have a more clear suggestion. There's also a lot of difficulties around when you get on whether it's produced by civil servant, a contractor, a grantee, and all have slightly different implications. And there's also a lot of rules around patents as well like the the act, and your patents are a way for people to make things open. And so we support that as well. And so, the one thing and my, as I said, my initial background is, as an astronomer, these are very, very complicated matters. And we do actually have legal counsel at NASA who do help us navigate these issues. One of the things and this is where we, you know, I want to give us an example, in the policy and the one we released in SPD 41 says, data must be released with a license. We, as it turns out, there's no actual guidance on what licenses that should be. In 2018, the open the Congress did release the Open Data act, work by civils. And within that actually provided some actual very clear guidance on what the qualities of the license should be, basically, that the data should be completely unrestricted, that people can can do what they want with the data. And so with involve conversations with our lawyers, we did actually determine that the best license for this to provide the most clear guidance was a Creative Commons. Your license. And so we actually will, you know, our updated guidance is that SMD funded data, unless there's other restrictions, like you might incorporate copyrighted material into it, or you might incorporate data that has a other copy protections in it. But if you don't have that, if you're a civil servant who's producing data, or it's there's no other restrictions on the data, that data should be released with a Creative Commons, zero license. And that is going to be in our updated guidance. It is actually currently on the scientific information webpage, with that guidance. But it is complicated issues with a lot of details to work out. And so this is where we do work closely with our our colleagues in the OGC. And we've been having fantastic conversations to work these through. But these do take time. And there is ways where we can elevate issues that need guidance, which is beyond NASA, as well, through mechanisms mechanisms, like the OSTP and subcommittee on open science, that that do need further discussions or discussions among different agencies.

chelle gentemann 56:15

Thanks, do you think we have time for just one more question? So Fernando?

F Fernando Perez 56:24

Thank you, I wanted to flag when when Steve was talking about the fact that he come from the Space Telescope. And Hubble is probably that even though we're looking at the future. I don't know, Steve, if you were involved with this, but a lot of there's ways in which what NASA has already done, has made open science possible. Today, there's a little bit of an anecdote that I wanted to reflect back to you, if you don't know that, for most of you who use Python in your work, import NumPy is what you do. And that feels natural. And it's kind of the foundation of computing today in science. But back in 2004, the our community that was fledgling and small, was at a really painful crossroads between two packages that existed an older package called numeric, which was the predecessor to NumPy and NumPy array, which was a package developed at the Hubble Space Telescope Institute to address some of the limitations of numeric. It targeted astronomical image data analysis. And it was fantastic. But it had some performance issues that created a very problematic split in the community where two packages were kind of competing and kind of doing the same thing, but neither will replace the other. And the ground was kind of splitting between our legs in a very, very problematic way. And there was a lot of angst in the community. And there was a meeting at Berkeley, the first time I came here, that led to years later, me getting a job here that was organized to write an open science neuroscience grant about things. But with funds from that meeting, we invited Travis Oliphant, who was at the time the maintainer, numeric and per Greenfield from the Space Telescope. And the two of them got together with one Rawsome here, basically funded on the side with NIH funding, and agreed on both a technical and a social plan to move forward in a merger that would lead eventually to the creation of NumPy. And the reason why I told this story is because there was an important element of how Peregrine filled and the Space Telescope was basically willing to say, and they worked out both the technical aspects and the credit to the team. How do we acknowledge that the NASA team did all this work, but we effectively relinquish the name of the project and kind of the visibility of the agency in the sense in order to actually make the scientific advancement possible, it was a really early and probably for many people, completely unknown anecdote. But that was absolutely critical to the birth of what is possible today in the entire universe of scientific Python, all across the board. And that led to NumPy being created, taking many of the design constraints and ideas and features from numpy array. And a few years later, we have we unified that ecosystem. And the agency was willing to do this. I'm sure there was a lot of internal work. I don't know if you were part of those conversations. But it was extremely important. And so NASA, yes, I'm excited to see the future that we're heading towards. But I want to credit that we're here already, thanks to NASA and some pretty important ways. And you also played a role a role of the birth of matplotlib as well, in so from the same people, not focus because those same people led to funding we we co founded on focus in 2012. With Peregrine?

S steve crawford 59:38

Yeah, I think that's a very fantastic story. You know, I wish I was involved. I was still I well, I was still using I think Perl and C at that time. So it's only a few years later when I discovered Python, but there's a similar story for Astro Pi now. And, you know, these are things that we actually want to further enable and support that are are sent jurors and our, our researchers and our grantees are encouraged and are participating in the wider community. And that we're doing this, collectively. But thank you so much for sharing that story.

Fernando Perez 1:00:13

And that also opens. Just one quick comment, because I know we've been talking about the difficulties of licensing and sharing and whatnot. That was, I don't know if it played a role in that particular event. One mechanism we've used a few times is, in order to make it easier to share things openly, to share on top of existing projects, and then different the new, the new team can just contribute to something that's already licensed. And then that mechanism can sometimes bypass some of these internal barriers. And in this case, well, numeric, and then NumPy was external, but the NASA team kept contributing. And that may be illegal, a little bit of legal legal ninja tricks. But that can also help. If if the agency and the team has the technical and social willingness to do it, it can help on the legal side. Thank you for having done that a long time ago.

chelle gentemann 1:01:07

Thanks so much. So we are on break. And thank you, Steve, for being with us. We're on break for eight minutes now. So we'll rejoin in eight minutes and and hear from Greg gamma. Thanks, everyone.

Greg Tananbaum 1:01:27

And work on tools and policies and guidance that can address those barriers. The round table has been around for about three years, we're entering what we're calling phase two of our work, we've just been renewed for a second three year cycle. And the first the first part of our efforts really focus as you can see on the timeline portion of the of the screen focused on first, having lots of consultations talking to the community trying to understand different perspectives and different interests. And using that in a by a working group structure to develop specific resources designed to make the house and the Watson the whys of open sharing, just clear for all parties. We over the course of this, this first phase of the roundtable developed an open science Toolkit, which is freely available on the National Academy site. And I can put the link in the chat. In just a few minutes. I'm really trying to look at specific aspects from guidance on language that can be used by by funders, or by hiring committees or by tenure promotion committees to review open open research practices, a rubric to evaluate the responses that folks give, when asked questions about how they how they're making their resources available, and the impact that that's had a database of open science success stories that's curated by the National Academies, but is, is crowdsource good practice primers on on policy development and a range range of other resources. We've now moved in the next phase of the roundtable into into scaling and coalition coalition building and coordination. So we're really talking about as a group, how we how we can affect systems level change. And just to give a sense of who's involved in the roundtable, these are the organizations that are that are represented. In our work, we're able to co chaired by Keith Yamamoto, from University of California, San Francisco, and Tom Kalil, from Schmidt futures. And we have, as you can see representatives from from a wide variety of organizations, the roundtable that the consultations that I talked about, and the engagement with the community really allowed us to talk to a lot of researchers, a lot of scholars, a lot of different participants in the research ecosystem, and we really heard consistently. I don't think this will come as a surprise to the folks that are participating in this call. But that researchers work is often motivated by values like

transparency, and replicability and reprove reproducibility, and an accelerate trying to accelerate the pace of discovery. And in general, researchers would like to engage in open practices like FAIR data sharing, like making their papers available, like pre registration, because these are these are activities that align with those values. The other piece of this though, that we've heard is that this alignment would be would be substantially easier to actualize if reward structures like funding and like tenure promotion like hiring provided clear, unambiguous incentives. For those for those behaviors, and so that's, that's really what we're working on with the roundtables trying to get consistent alignment across these incentive structures to make it both easier and more rewarding for individual researchers to engage in open scholarship practices that might dig into some of the specifics of this and over the next few minutes, but I do want to note, you can see the government agencies are kind of on a on a diet dotted line in that, in that mutually reinforcing factors diagram. This is a piece the engagement of federal agencies is a piece that we're, we really hope to increasingly bring into the collaborative conversation, you'll see as I talk we've made progress with with many of these other vectors with the hope that we will be able to, to bring government agencies into the discussion via like minded actors like like NASA and tops. So really, if I were to summarize with the roundtable and where we're at right now, in the work we're focused on, we're focused on on harmonizing, accelerating and scaling. So we want to continue to use the power of the National Academies to bring the various sectors and perspectives to the table into the discussion. We want to provide both leadership and support across those those sectors, we want to try and identify crosswalks between and among those groups. And we really also want to try and develop new but also amplify existing resources and infrastructure that can accelerate these efforts. So that's, that's what we're focusing on at a very high level. Specifically, we're doing some some some real thing. This isn't just sort of all on the ether. So one of our our core initiatives is something called Helios, the Higher Education Leadership Initiative for open scholarship. And I should mention just a note on terminology here, the roundtables, the roundtable on open sciences, on aligning incentives for open science. We heard over the course of these consultations, pretty consistently that unintentionally, that that can be excluding folks from the conversation, particularly people in the humanities and the arts, even to some extent the social sciences. And so we're really, we're keen to ensure that we're being inclusive. So we're trying to use open scholarship as a as an umbrella term encompassing open science and these other disciplines. With that aside, so Helios, is intended to be a cohort of colleges and universities who are committed to collective action to advance open scholarship, both within and across campuses. And it's really predicated on the hypothesis that it'll be easier and more effective to align research practices and values and incentives by by working together rather than by doing this as a series of one act one off activities. foundationally, we recognize that success is going to look different for different participants in Helios, not everyone is starting from the same place not everyone's going to end up in the same place. And that's, that's intentional, that's a feature rather than a bug. We really see the purpose of Helios is not to lay down lines in the sand or create purity tests. It's really just to encourage each member to take steps that are appropriate for for their campus in their community. Here's really their three core prerequisites for participation. They're articulated on the screen there. We want to make sure that this is elevated as a strategic priority for for the institution, that there's work going on with with relevant campus units and actors to develop coordinated activities on campus, and also that there's coordination across institutions. So we meet regularly, across across the membership to identify, identify areas of shared interest in collaboration. We, we've started this, we launched this formally on the last day of March, we have 65 institutions committed to participate, we have 76. So that's some good early signal that we're growing and we're growing rapidly. You can see that it's a heterogeneous mix of institutions that are that are participating. And we you know, we hope to grow the coalition as as we continue the work that we're doing. We're really ably led we're very, very lucky to be co chaired by three members of the

Roundtable, the presidents of Arizona State and benefited college and and Johns Hopkins University. We also are again very lucky that we have seconded Geeta Swamy, who's the Associate VP for research and the vice dean for scientific integrity at Duke and she's providing strategic leadership to Helios as well. You know, in terms of of what We're actually doing this is this sort of slide really is a high level synopsis of our approach, right? So we want to figure out, what are the members interested in working on together? What are they see as, as areas for possible collaboration? And how can we develop a theory of change and then test that in the field and adapt based on what we're learning, and then hopefully propagate out through the wider higher education community. One of the things that's really important, noting the penultimate bullet here is, we want to create a real community of practice model where members can talk to one another one another, we tried this, it didn't work, here's some things we ran into that were problematic, oh, this is a great way to socialize among department chairs, or you know, or provost, being able to just have that, that peer to peer relationship is really, really valuable. And then the last piece, and obviously, this is relevant to the conversation we're having today is we really want to engage with with other sectors to harmonize activities. So in terms of the work that's actually being done, we heard from our members via pre meeting surveys via the first kickoff meeting, we had via post meeting discussions, that there are a number of priorities that seem to be shared by significant subsets of the group. And they're listed this listed here on the screen. You know, we really we want to, we want to explore these articulate priorities in a way that allows us to, to identify tangibly what we can do to move the needle in each of these, you know, each of these areas. What is it, that makes us not just a place to come and commiserate and talk about problems, but to identify solutions and to implement solutions? So we're very much action oriented, we're going to launch we are launching working groups, and each of these four areas, they actually kick off next week. And we're starting to think about, what would it look like, within a period of months to be able to deliver some outputs that would be valuable, potentially, for the community. And so obviously, much more to report on that as we move forward. But again, getting back to this idea of mutually reinforcing vectors, it's not just this is not just a university consideration, right, which is going to be more effective before getting alignment across these, these, these, these sectors. And so another critical area is, is professional societies. And they're important for a lot of reasons, but but one is they really help to, they can identify, and they can socialize appropriate norms and practices for their specific disciplines. So one of the things we heard consistently in the consultations we had with individual researchers, is they needed not just guidance from the institution, but they needed guidance from within their discipline to understand what, what what good practice looks like. And there were very, very real and very compelling reasons for this. So one thing we heard is, you know, look, I'm the department chair of Psychology at university x and, and I'm in favor of open scholarship. But But one thing I don't want to do is is require our graduate students require early career researchers to pre register and to share their data and to pre print and then you know, have them go on the on the market and look for, you know, look for jobs for tenure, and be applying and other institutions that don't value those things. Because ultimately, I'm going to be disadvantaging my people, and I really don't want to do that. And I think that's it, you know, it's a really good point, there's a, there's a Do No Harm component to this work that we really need to be cognizant of. So that's, you know, that's one area, it's not the only area, but that's one area where professional societies can can play a role, you know, they x if they if they articulate expectations for good open scholarship practices in their particular fields, that's going to be really, really helpful. So we we've started this discussion with the 12 professional societies that are on this screen. And and were engaged with with this group for a number of reasons. Some of these societies have have have already been very engaged in open scholarship issues. Others are really pushing the needle in, in specific disciplines where there's significant grassroots, open activity, and others have been really vocal about wanting to be more assertive, be more progressive in the open

space. The cohort is is is relatively small at the start, and that's intentional. We really want to have some some controlled discussions and figure out what what this looks like before we sort of open the doors and and allow lots of lots of participants in lots of different societies to engage. But that'll happen in relatively short order. I'll also mention that, you know, I talked about under Helios that elevating to a strategic priority within the organization was key, similar here. So each of these these organizations is represented by either the chief executive or very high level designee. So, you know, what are we doing? Well, we've started talking, and much like with Helios, we're trying to identify what are the areas where, you know, shared, shared interest exists, and shared engagement is possible. And these are, you know, these are four areas that have been talked about within the group, I think you'll notice there's some overlap some some significant overlap with, you know, with what we saw in the Helios work as well. One thing that's really interesting and really promising is this idea of a statement to action model. And this was suggested by a number of the participants in our early conversations. So to be able to say, you know, we, we believe in the following values, we, you know, we believe in this type of research culture, and as a consequence, we want to support the following open open science, open scholarship actions. That's, that's a really a good, you know, a good promising approach. The thing that's really important within that is to figure out you can see on the screen, we affirm our support for the principles of ABC, we want to support the following actions, and there's an ellipsis, the ABCs, and the ellipsis. Matter, right, so we need to figure out what what those are, we're starting to do that as a group, we put together sort of a straw man document that we're in the process of editing as a group. And the hope is, we're going to try and get a clear sense, within a period of weeks of how granular or how progressive we want to make the statements and the actions. Um, you know, one of the things that's that's I want to note about this approach is, we think it's important to have a public reporting component, right? So if a society commits to providing, you know, good practice guidance on on pre registration, or unfair data sharing as examples, we really want to make it we want to make it clear that they should share out a progress report periodically saying, Well, you know, this is how we intend to do that. This is how we're doing it. This is what we've learned along the way. And this is how we're course correcting. We think that you know, that's a way to really make sure that the actions build upon actions on that there's a sort of scaffolding in place. I'll also just say that the 12 societies we've engaged with have really been terrific. This is not necessarily an area of comfort for some or all of them. But they've really been just great about, you know, going out on a ledge to discuss these topics. And we're really excited with where that work is going. The last cohort I mentioned is the funders, right? So if we think about these, these reinforcing vectors, these mutually reinforcing vectors, funders are a critical component as well. And a few weeks ago, this, the leaders from the five organizations that are on the screen here, sent out a Dear Colleague letter to other organizations, grant making organizations saying, Let's get together and let's talk about this. Let's talk about how we can take this as a as a collective action opportunity. It's really, really exciting again, and gratifying to see that we're getting great response. So as of earlier this week, we had about 50 funders that have answered the call and said, Yeah, we want to be a part of this discussion. This group, I think, will will continue to grow over time. But it's really great. You'll see a diversity again in subject matter, focus and size of organization, geography and so forth. And we're going to get together in in June, June 15, specifically, and we're going to I think, do some hopefully some interesting things. You know, the idea is that I think is coming to you know, coming into stark relief for us is we're starting to see some some luck, replicable patterns across these, these different cohorts, right. So getting a convening together where these are, these issues are elevated to strategic priorities within the organization's getting, getting folks to, from from from the bottom up to identify what shared priorities look like trying to understand what role the National Academies roundtable and some of these other durable structures that we've stood up can play in, in in catalyzing and coordinating activity. He's across the different stakeholder

groups, and really trying to create a bias for action. Those are, you know, those are really areas that we're focusing on. As we talk, and I'm going to stop sharing my screen in just a second. There are I know, I'm assuming there are questions that are stacking up, that I'll take a look at momentarily. But there are things that we're interested in, right. So so how the round table can incorporate what what tops is, is learning and what tops is doing into the various cohorts that I've just shared with you. And vice versa? How can how can we inform each other? And then how do we use those combined efforts to to drive change at other federal agencies? Right, so So NASA is is really leading the charge here. There's there's obviously significant interest from from other federal agencies to figure out how to operationalize this work, too. So how do we work to make it easier for them? How do we, you know, how do we talk to communities? How do we talk to individual researchers I saw on the chat and I wholeheartedly agree, this notion of how do we make it easier for researchers to figure out what the heck to do? There's a lot more work that needs to go into that. And then this last piece, you know, what are we learning about incentives that can really move the needle on systems change? So, you know, there are pieces of the puzzle that that are under the purview of the funders under the purview of the universities and colleges under the purview of the society's under the purview of the federal agencies? How do we put those together in a way that creates, you know, a complete picture. There's a lot of work that remains to be done here, for sure. But but we've made significant progress, and we're starting to align, you know, I'm not in any way, shape, or form declaring victory, because I think we're only now reaching the starting line. But I recognize that a lot of effort has gone into that. And it's exciting to see the progress we've made. So I think with that I will stop sharing, if I can figure out how to do that. And then I think I'm back is that. There we go.

Y Yvonne Ivey 1:22:08

Thank you so much, Greg, but that was excellent. Slide Presentation. I think right now we'll move into the session with our panelists.

chelle gentemann 1:22:23

So I'm gonna I also invited Charlie Stoll to her camera on and join in the discussion. Right. Are you able to stay the complete half an hour? Or? Yeah, I think. Oh, great. Okay. Thank you. So we're all available to have discussions? I'm not seeing any hands up? Yes. But does somebody anybody have questions or I can go to some of the questions in the chat,

G Greg Tananbaum 1:22:51

I see Fernando, but one, I just want to acknowledge one thing. So combined, put put something in the in the chat about datasphere. This is something I neglected to mention is as we're, as we're doing this work, there will be some resources that we need to create. But the beauty of where we're at with open science and open scholarship is there's a ton of work that's already happening. And so curation and elevation is a core component of this, right? So if there's stuff that's out there that's working, and it just needs greater visibility. Gosh, darn it, let's let's talk about that, too.

Fernando Perez 1:23:27

I had a quick question that actually kind of cuts between your efforts in the prior NASA policy discussion, it's kind of about manuscripts. Some journals have this rather annoying policy that says that the version of the manuscript that has the edits that came up in peer review or whatever, like last little Tinker, they do, you're not allowed to post any of that they claim, kind of the claim file copyright on that little delta at the end. And I find that incredibly annoying, because then it's like, you can post a preprint. But it's quite the same article. And it's fine. If they say the camera already version of the PDF, which has their visual formatting, you can post Okay, that's a separate debate, but at least the content and if, if a combination of the agencies and the funders could put an end to that stupid policy on that delta, I would love it. So anyway, I don't know if it's possible for you folks to kind of help on that front. Duly noted, thank you.

Qiusheng Wu 1:24:30

Yeah, I cannot Can you hear me? Yes, yeah, I can also echo a wall. Fernando just said, I can share some personal experiences that resource gate. I'm sure many of you are aware of the site we saw today that people can share the publication's the whatever resource on the site. And so I a real story that one of my colleague actually has The account was closed by ResearchGate. Because we're Pub is a switch now to Research Gate because people see the publications on the site, because their copyright, so they have to take down they broke, basically block the accounts of those people. And so now I used to do similar thing I say I say, if the, if the publicity chase me down, I can just answer your steady private by looks like is not the case though the party book publisher will not chase you down, they just face now, resource gate and then block your account. So now I just take everything private, is this.

Greg Tananbaum 1:25:37

I mean, so both of these comments speak to something, again, what I said before, which is we have to make this so much easier, right? Like who? Your your researchers, right? You're trying to do big, big, important scientific things, you're not copyright lawyers, and you're not, you know, Forensic analysts looking at this version versus that version. That's not a productive use of your time. And so first of all, by all means, we should respect copyright, whatever that copyright is. But second of all, this just has to be much easier for the individual researcher who, again, I think generally is inclined to to want to share. But we've put up all these these barriers, some of which are of our own making, and we need to start picking it up.

chelle gentemann 1:26:24

Yeah, I think also, Steve's conversation about the new NASA Science Data Information Policy is relevant here in that as a federal agency, we can publish in an open access is supported with budgets, so that we can at least say we want you know, the research that we fund should be open access, and posting preprints is encouraged. We're careful about the language, right? So we have to give the publishers time to adapt, we have to, I wish we could just turn a flip, and make it all open tomorrow. But we have to give everyone time to sort of respond and adapt and provide comments. And we are moving in that direction. So this is our first step towards that, at least within NASA. And I think other federal agencies are moving in the same direction. So at least on a federal agency, policy, the funded the research that's funded will be published open

access, and that will help with some of that, and hopefully push towards this new publication model. And I like that. In the chat, someone's talking about executable papers already, right? So there's publishing is changing. It's changing a lot right now. And the publishers that are looking to the future are looking at executable papers that are open access with reproducible science, like Jim was talking about earlier. And so this ties this all together. And I see, Monica, has her hand up, unless someone else had a comment on that topic. Other Steve?

steve crawford 1:28:05

Yeah. And I was just gonna say, noted, as well. And these are we, I think it's important to have communication with all the different groups. And I think, you know, having publishers as part of this communication, and as, as part of our conversation, to determine what's needed is is important.

Monica Granados 1:28:28

Actually had a comment on this topic, which was just to go back, actually, to the previous conversations that we were having about training, is that I think one component that that you should think about for training of scientists within NASA, like within your agency is on copyright. They don't have to become copyright experts. But it but many just sign away the copyright. And I don't know what the specific cases for NASA, but I will tell you from from the Canadian government perspective, for example, the they can't like scientists cannot sign away that copyright, you know, the current belongs to the crown. There's probably like, there's probably something similar in in federal agencies as well. And so that distinction might be important to sign like the responsibility that you can't sign away copyright. And I think that opens up a couple of doors around again, the rights retention strategy, which would allow you to keep that delta change in an author accepted manuscript, but allowing the like version of record to be, you know, owned by the publisher, but the peer reviewed version that is has been accepted to still belong to the author and then potentially posted somewhere that is, like, like a repository, which is a little bit different than ResearchGate. Because the issue with ResearchGate was that you were posting are like the version of record, so the like, formatted version of the article whose copyright belongs to the publisher. So you're right. These are like details that scientists don't need. didn't necessarily know. But but you know, what, what is the like? What are the important elements like, Don't sign away your copyright, or you can't sign away your copyright? It really depends on like, what the federal agencies like rules are, which I'm just not familiar with the specifics for for NASA, but something to think about in your training.

steve crawford 1:30:20

Yeah, and I think that's the I was just gonna say. I was gonna say, I think that's a great point, NASA does have its rules and regulations around copyright, especially for civil servants. And, and I do think that is an area like, you know, when I was a practicing scientist, you know, and at every institute, every agency, every university have their roles around actually the intellectual property an employee produces. And previously, when I was an employee, I have to admit, I do not know what those were. And they do actually come into important when you, you do actually talk about different areas. So having some familiarity, not necessarily being an expert, but at least knowing when you need an expert, is an important topic.

Monica Granados 1:31:14

Yeah, yeah. And as a scientist, you don't really hear like finest was published. Here, take my dog, and, you know, Bataar, it's gonna get published in, you know, one of the big three, amazing, I don't care. But we need to highlight why that is, why it's important, downstream.

chelle gentemann 1:31:34

I certainly agree with you, Monica, and Steve. And I also want to recognize that this is a very hard sell for scientists who are already somewhat pushing back against, it's, it's, I think that this is going to be one of the challenges for the open court, this is something that we clearly need to include is this discussion, because there are many people operating in under the, I'm just not going to pay attention to this, and then it won't impact me, I'm just gonna post some code. And they may not even be aware of copyright and patent of software release authorities, because it's probably one of like, 3000 documents that you signed the day that you start, and they give you a bunch of other stuff, too. And I certainly wasn't aware of this until quite recently, and I've been inactive scientists for two decades. So this is something that we're going to have to work in to open court in a way that makes it fun and interesting. I mean, shall I will ask Monica for help.

Greg Tananbaum 1:32:34

I don't I don't disagree with that. But I would say that if, you know, if you as an agency, say this matters to us. And you're you know, we're going to, we're going to make sure that you know in our in our funding and in our compliance, checking that you know that this is a component. And if universities say in their in their hiring and a review and their tenure, promotion matters to them, and it's going to be reflected in those processes and under, say, philanthropy say it matters to us and our grantmaking is going to include components of this, it'll matter a lot more to the individual researcher, right. It's not to say that that's all we need to do is have these characteristics, we need to make it as Brian has beat this drum for a decade, we need to make this much easier, right for individual researchers and make it clear what you're supposed to do. But but it is we do have a role, right? It's not top down. But we do have a role to play here. Certainly.

chelle gentemann 1:33:35

Yeah, and I think that's part of the discussion that we're looking to have today is we've sort of come to the panel as a federal agency sort of trying to design this program around cultural change. And this is why we've had policy to Steve talk about what is a federal agency, the policy options that we have to enable open science and how we're working to do that. But also now having Greg talk about sort of the partnership between researchers, universities, publications, the whole framework that science is accomplished, and, and we really do have to start to I love that, you know, NASA is putting money and people and trying to have this initiative and transformed open science, and it's a great effort. And we really do need to expand beyond NASA, and include, especially aligning the incentives within the research frame, which normally often is universities, institutions.

F Fernando Perez 1:34:47

I have a quick question, if I may, where I'd like. I was wondering if, and I don't know if I misunderstood, Steve, when you were talking about data a little bit earlier. And you mentioned that You were suggesting, from the NASA perspective, cc zero on data. And I was perhaps under the mistaken impression as somebody who has no clue as we were saying about like, I'm not educated in copyright issues really other than, like Wikipedia level. I thought that in the US, data itself couldn't be copyrighted. And there were differences between the US and Europe, but then the US raw data can be copyrighted, and only other levels of products could be copyrighted as a cc zero. Does does that rely on copyright or not? Or? Or maybe Monica can clarify like, I'm just confused. Right? I would appreciate understanding.

S steve crawford 1:35:40

Yeah, and yeah, that's definitely happy for Marcus. But the reason we chose CC zero, because basically, it states there is no copyright. And so that's why we also couldn't choose another one, because that would imply that was using copyright or that license to using copyright for that license. Whereas CC zero is a common community standard, or community recognized license for record for an internationally recognized for indicating there is no copyright. And that also giving the terms and conditions of being free to use this for whatever you want, essentially, see the full license for all the details? And everything I glossed over there? Yeah.

M Monica Granados 1:36:26

Yeah, that's right. So and that's the recommendation. Creative Commons for for data is to put a cc zero, which is basically dedicated into the public domain. So and there's a lot of, there's some links in the in the chats that people are posting about, like more details, but that's it's consistent with what creative commons would recommend.

chelle gentemann 1:36:49

It think Brian has a compass.

B Brian Nosek 1:36:53

Thanks for this great discussion. And I just wanted to follow up on something that chelle said about the work of this group and activity, particularly on the on focusing on behavior change. And oversimplifying. There are two routes to change, you win hearts and minds give people the knowledge that they need, and shape their attitudes towards that direction. And then they adopt the behaviors. And the other is you change the system around them create workflows where the behavior was natural, and their attitudes follow. And it turns out that it's almost always easier to do the second than it is the first is changing their behavior first, and then their attitudes rather than changing people's attitudes, and knowledge to provoke the behavior, primarily because the system constraints are so strong. In driving a lot of this, I think a lot of

what Greg is describing in that work of how do we get all the system components to align with what values we already have. We don't know how to translate those into practices, individual researchers, but we can bring them along if those system changes get in place. And so I think if we're, we're considering both of those, and whatever coaches we do for community engagement, will end up being a lot more effective. Sometimes you have to get people on board conceptually. Other times, you just say this is how it's done. Insert it right into the workflow.

chelle gentemann 1:38:19

And think, Brian, it's a really interesting point that you make because Fernando earlier, I think it day one, or maybe it's just Fernando and I have talked about this, but open science has been done for decades, and people have been promoting it. But it hasn't really gotten that uptake. It hasn't converted most of the community over to this way. And I think that you have a really excellent point. And now that's what we're starting to see, which is agencies coming in and providing the structure changing the framework that scientists being done, and, and the background, you know, the cultural shift sort of has begun over the last few decades. But it was done in this framework that didn't allow it to blossom. And now we're trying to change the framework together. And I think Sharon had a really good question in the chat about what are the plan for collaborating across these different groups. And Sharon, that's part of what Topps is trying to do. Because I think that there has been a lot of individual efforts and people doing really wonderful work. And this is why we've invited Greg to talk here today. And we're doing outreach to other groups. And part of the funding that we have from NASA. And the mandate that we have is to do this outreach to do these connections. And also we have AGU here who is working in the same way to again reach across societies. So we have a lot of the players now here at the table. And I think Brian, I know you had another comment or your hand is still up, which is like the special WebEx way of your system. But I think Hans had a question Comment.

Moritz Gunther 1:40:02

You said that that's a direct response to you saying that science hasn't happened in the past, a V visa T on the first day that open science is continuing on to via moving forward. But people have shared data. Like since before the internet was invented, people have Keppler use the data that Tyco brought into that so bad, but it wasn't available to people to everybody else where it's been moving along that we're moving along that continuum. I think that's in terms of changing the hearts and minds, it's important to keep in mind that it's not anything new if you just want people to do a little bit more of it. Because most of them are doing it to some degree already. It's maybe not quite where we wanted. But it's a lot easier to tell people that they're already doing great. We just want to do a little better than to tell them that they need to do something entirely new. And we've said that before. And I know you just wanted to make Najin that.

chelle gentemann 1:40:59

Yeah, thank you. That's a great point. Are there any other comments or discussion from the panel?

Fernando Perez 1:41:11

Perhaps perhaps a quick comment kind of on this idea of workflows that I that I completely agree with. And I think what we're seeing is this problem is really moving towards the institutional part of the of the workflow, which is an important one that's kind of the universe were embedded in, that I wanted to reflect on, on little kind of piece of the history of binder. And it's the next week for questions in the chat on executable papers. One of the reasons I think why binder has been adopted, for those of you who don't know, a binder is a piece of Jupiter that makes it easy to spin up a Docker container anonymously in the cloud connected to a git repository that has your code. And then it'll give an environment that's live executable for the contents of that repository. And one thing that has made minor so successful is that for what we've tried to do is make it as easy as possible for someone to, as long as they prepare their work kind of in the right way, meaning they follow minimal good practices of having their dependencies listed, and having their code in a Git repo binder just works, you can even open a link on binder to a repo that wasn't explicitly prepared for binder when the author didn't explicitly add a little binder button. But as long as the repo is sort of doing the right thing, doing like something basically clean, it'll just work. And that has led to an explosive growth and very widespread usage. And so the more we do things where we just, we pave the easy path and doing doing the right things to easy thing, people will adopt these things. And that has an infectious effect on the community. And you folks are doing kind of the other side, which is the kind of the institutional boundary conditions around that. But But I think it's an important we actually start taking that lesson to heart from seeing the impact it had in the community through binder.

chelle gentemann 1:43:07

Yeah, I think, Fernando, I, I completely agree with you. And I think the other thing that my minor does, is it provides universal access the cloud, and maybe it's not a giant machine. But when we talk about doing open science, and we talk about increasing accessibility, that was how before I ever had access to Jupiter hub, or access to the commercial cloud that I was really aware of, I was using it through my router. And sometimes I would just click on any my binder length that I could find and then I would code and then quickly download and then code and quickly download because it was just too intimidating to set up my own Jupiter hub until the mini Jupiter hub was published by UV panda and then I set that up. But it that at my minor that's another really important part of open science is thinking about how we increase accessibility to these resources in a way that's equitable, no matter who you are, where you are, or who you know.

Qiusheng Wu 1:44:16

Yeah, just quick Fernando's common without binder. So there's also sometimes I'm not sure if we can call it a downside of doing open sides is they sometimes people abuse open science platform, for example. NGO used to also have a binder, but because I think last year sometimes it was abused by crypto Viners that use those binders, actually to mine crypto. And so increase the use the view of the NGO platform so eventually was sought out and that the instant was for the open day. In a repository of fig share, I'm not sure if you just some of you probably already use the fig share.com. And so we also used to see a lot of data when a publication they uploaded data, they're used by nature and a lot of publishers. And it was also abused by people

just use that to store movies, other stuff that you legal, they put there and then but they will quickly took the action to remove those. But those are some things that are potentially we also need to pay attention to that. We need to make sure that these perform whatever they whatever Oh, wish there will not be abused by others. And if it happens, then what kind of actions we can take to prevent this from happening again, because it's eventually going to affect us, because I used to use our pens to buy the lot. Because the my mind, Vida is a little bit slow compared to NGO, but now it because shutdown, so I have to stick to one source. So yeah, those just kind of the personal story.

chelle gentemann 1:46:02

Yeah, thank you. So I totally agree. And I think people in the chat. i It was really nice to have access to those larger machines for the brief period that we did. And I think that does anyone know like, did they find I forget whether or not they found a solution to that because there were several different groups that were attacked by sort of crypto miners. And it's, it's still, though, I think possible, I think that with my binder, they didn't attack my binder because it was too small for them. So that is still an option. And there may be a way to provide this in a way in the future where it's not so susceptible to that type of behavior. But I also want to highlight, you know, there's another discussion in the chat about the funding for my binder, which is, I think they have 100,000 users weekly, and they've had trouble maintaining it, they have these calls that go out once a year for funding loans. And I think you've called this out in the chat. And so one solution that they have is they have different institutions that are sort of giving access to compute. And so if anybody has access, you know, that's an option. We need to think about that as a, as a scientific community, how do we really ensure that something like that available to create equitable access and ensure that it's there, and we're at our break, I think we're gonna put the slide up, we're at a 10 minute break and I want to thank everybody for their comments and their participation. And we'll be back in 10 minutes Thank you.

Yvonne Ivey 1:48:38

All right, we are coming back from the break.

chelle gentemann 1:48:50

Thanks, everyone. We're back from the break. chosing, I want to note that you still have your hand up, which I believe is probably leftover from the last discussion. Thank you. And I want to introduce the map the last few days, but just in case, you're new today. You're on IV. She is the program manager for the transformed open science and she's here to talk to us about community engagement plans, and then we'll have another discussion and then wrap up. Thank you.

Yvonne Ivey 1:49:22

Thanks, so Alright, so right now we're going to begin jumping into our transform to open science community engagement plans. And so I think many of you have seen this slide a couple of times at this point. But I really want to spend some time this afternoon going over our multi

prong approach to address our third key objective and honestly key performance indicator for tops which is definitely participation in science by traditionally excluded communities and so many of your So what does that actually mean? What is NASA actually doing through the transformed open science mission to better engage with traditionally excluded communities. And so a lot of the focus of our work over the next seven months is threatening us for to be ready for the year of open science. And so there's a need for researchers to effectively communicate and engage with the public around science and ensuring that our communications are clear. And so a lot of our focus right now is really putting together those building blocks for us to be successful and engaging with various communities. And so we recognize that in order to truly develop and deliver more equitable opportunities that will exist across these five areas of action in our capacity sharing, is to ensure that we truly meet the challenge and the need for our not only our practitioners of science, but also those who have been left out of our solicitation opportunities, our professional proposal development opportunities, as well as our more crowdsourcing fun, hackathons, Space Apps, prizes and challenges. And so we recognize that we, not every organization out there that would benefit from open science has the resources and infrastructure to work with NASA. And so we've had been spending several hours truly having conversations with various communities recognizing and listening to the differences and trying to do a better job of developing targeted outreach strategies to increase engagement with traditionally excluded communities, and then focusing our efforts from a more internal external space within NASA. And so over the next couple of slides, I'll dive into what we're actually doing around our internal and external strategies and tactics as we prepare for the year of open science. And so in this slide, you'll see we are focused around for the year broken science using and ensuring that we have a train the trainer model, where we have scientists coming on board to help teach our modules at all of the upcoming conferences and meetings in 2023. And so we need domain experts to be trained on our modules to really act as champions within their communities. So I'm looking at our panelists here, but also folks who are on the call, or might not have been connected with us yet, in order to be successful around our open core curriculum, we truly need champions, who are knowledgeable of open science, practices and principles to come on board and work with us to truly, really evangelize the community. So around specifically, our cohorts. So during the year open science, we're going to be, as I mentioned, really putting all of our effort around our open core curriculum. And so having cohorts of people to come on board, and engage through whether it's virtual or in person, but really increasing those who are having the Open Science badge achievement. And so what we're looking for are folks to come on board and take one or more of our modules, and then really engage with the learners who are in your cohort to truly, really build that community. But we're also hoping to take those cohorts and have them truly advocate open science. So another opportunity that we're excited to really focus on building upon in support of that open core is our summer schools. And so we're looking for institutions to be selected to run roughly six weeks of training for our five modules. We're looking at sort of two various avenues for that, whether it's our science team meetings, for teaching on the open core in the morning, or maybe we just have one day where our science teams across NASA funded research. come on board to truly push out the trainings, but also having open competitive MSI representation. So working through various avenues within NASA, but also, for folks on the call who are part of and serve on minority serving institutions, we would love to work with you and partner with you to teach our open core. Whether it's June, July school or July, August or August, September, we can truly be flexible in the timeframe. Um, so I don't want to get caught up on the term summer school. So I recognize that this summer is different depending on where you are. But we really want to leverage and build upon summer schools to teach the open core curriculum. And then next are really sort of thinking forward. You know, during the year, open science will have this open core curriculum and all of our workshops, but we need to be thinking beyond the year of open science. And so Steve Crawford mentioned

earlier, sort of expanding upon funding opportunities, where we have folks actually develop, create and leverage the discipline specific modules for our open core. And so I do want to note that open floor is really sort of our baseline, Shelly spoke yesterday about really being our minimal viable product as we move forward. But we realized that we need to align our open core curriculum with our science specific modules. And so putting that and making that available on our open, open edX talks platform. And so we need folks to volunteer and support through upcoming resist solicitations, to further develop our curriculum. And then, lastly, our hackathons I shared earlier the week, these are my favorite types of engagement opportunities, where we're aiming to host multiple hackathons. And some of them will be discipline specific, we recognize that there's lots of data out there. And we want to get the public involved and engage in this type of space. And so looking to either have discipline specific hackathons or more broader creative, I'm hackathon. So you know, the the tops team submitted for, you know, NASA Space Apps Challenge. So that's coming up in October, I will be sure to push that information out. And that's a global hackathon. But we're really looking to attract a wider range of folks who are traditionally not a part of our hackathons and prizes and challenges, but really using them to really broaden up participation in science. And then lastly, I'll sort of note, our engagement with minority serving institutions. This is really one of the the our bigger focus areas to meet our third objective of broadening that participation. And so we are working closely internal to NASA with various programs. And I have a few on this slide. And I want to note that we know that they are far more than just these three, but these are sort of our focus activities right now. So engaging with NASA's minority University Research and Education Project, which is well known as Europe. So we are working in partnering with mirror Apps team to really push forward various opportunities that will be solicitations, but targeted solicitations, with minority serving institutions, HBCUs tribal colleges and universities as well as predominantly black institutions. So be on the lookout, we will be sharing all of these solicitations and open public engagement opportunities via our tops listserv. But I also want to note that the science activation program as well as the SMD Science Mission Directorate, Bridge Program are two programs that we had several people in the chat yesterday mentioning that they support science activation, also known as sigh act. But we are partnering with these two programs to really do a better job of listening, learning and creating this opportunity to participate with minority serving institutions and their adjacent communities to push out open science. And so with that, I kind of want to jump us into a Um, our discussion area, you know, we've we've talked a lot about our, our big, you know, moonshot goals and plans around transformative open science. But we want to listen and hear from you like, I have some prompting questions on the slide for the panelists if they want to jump in and pick one. But also, I do want to pay attention to the chat, as well, and try to answer some of those questions that or thoughts and suggestions that come in on that thread. So with that, if I could have the panelists.

chelle gentemann 2:00:41

I think Logan had his hand up.

Logan Kilpatrick 2:00:43

Excellent. Thank you, Chef. Yeah, just a cow. One of the things that was talked about over the last couple of days, is that there's funding and the like to support, things like the hackathon and some of these other initiatives available that folks can actually apply through NASA. And

just questioning sort of, in general, sort of the accessibility of that entire process, like if the goal is to improve accessibility and get some of these organizations and groups and people who are traditionally underrepresented. And then you have to go and through this arduous NASA funding proposal process, like it's likely that those groups aren't going to end up getting access, if, if that's the process that has to be has to be gone through. So I don't know if there's any resources in the like that the tops team can provide to those organizations specifically to help with the application process and things like that.

Yvonne Ivey 2:01:36

So that's, thank you. So I do want to clarify, and I think I'll make an amendment to our slide deck so that it is very clear across some of our upcoming plans to engage with MSI, so we have sort of the NASA funded opportunities. And those are just kind of set in stone, you know, our roses solicitation, every February 14 that comes out, we're really taking time and working with NASA Science, inclusion, diversity, equity and accessibility Working Group team. So they're our idea Working Group team that's focused on how do we go into minority serving institutions, and have what we're calling listening sessions, and learn where those barriers are. So whether it's getting improving our listservs and getting those professors on our listserv, so whether we're pushing out information, um, but also looking into our proposal writing workshops. We're looking into those success stories, but also, how do we improve them and embed lessons learned into that process so that when we are actually reviewing the folks who are actively participating, where those barriers of entry for those who aren't kind of getting their foot in the door, ask for our prizes and challenges, which the federal government sort of that's the overarching so you can think of any of the crowdsourcing hackathon opportunities, we are actually looking to push that out, I'm in a different mechanism and using our listservs, to really sort of have easy application processes that exist so that we remove those barriers. You know, as our team was meeting earlier, that we were looking at a lot of our sort of forms, obviously, we have to stick to federal regulations around application processes, but also, are there areas in ways where we can sort of streamline the questions, so that it's not a three hour application process? And maybe it's five minutes? Like where are there areas for us to break down those barriers of folks being able to apply? Because, you know, as a library of surveys where, you know, the bane of my existence for many years, and we looked at how do we create survey mechanisms that really get to what we're asking for, and remove sort of the the lack of folks kind of what's zoom fatigue, and all that aspects of wanting to log on and do another survey. And so we're really trying to do a better job of looking at the active funding mechanisms through our solicitations that are crowdsourcing activities, how do we get more folks in the door? And so whether that's partnering with other institutions, or nonprofits, or other federal agencies who are really doing a great job and our gold standard, or brilliant partners to help us improve? We're trying to take this and look at this from different levels. And,

chelle gentemann 2:04:41

yeah, I'm going to add quickly onto that. Logan, I think that you're entirely right. And I was on a discussion with the program officers just the other day where they were bringing up that, you know, when you land on the end spires roses site, it's sort of a list of a table Okay, so you're smiling because you've seen the lovely UI UX for the site. And it's basically a list of links. And if you don't know that you're supposed to click on the link, and then that link gives you to another list of links. And embedded within that there's a table on the right, there's one link that has the

information that you need to write the proposal. But then you need to go to other link like it's yes. And we're working on improving that. One of the ways that we've thought that we can work with in the existing system for tops is we can create a there are several resources that have workshops to do proposal development. These have been taught at Big Society meetings like a Gu. So we want to work with those teams that already have prepared this content to actually put it up on the Open edX platform as another supplemental module. And then it's not just if you're able to attend and pay to attend an adu conference, or an AMS conference or a triple A s conference, this will be actually available to anyone, and we openly license. So that's one pathway. And then we can teach that virtually, we can work with people who reach out to us to develop those proposals. I do want to note that the hackathon proposals are only five pages. So hopefully that reduces some of the overhead. And we're looking at ways that we can directly support people who have traditionally not been proposing to NASA by providing more information. And that includes advocating for researchers to publish their proposals that were funded online as examples for other people to use as templates. We found that even more than well, people really like reading other people's proposals as the templates that have been really helpful for people who are first time proposers and checklists. So we're working to develop those and post them on tops. And I think the other really nice thing about Ops is we have this GitHub site. So anybody who wants to propose, or has questions, and actually engage directly with NASA in an open forum, so often as a Program Officer, we can't communicate about certain things with individuals, because that would be privileged information. But anything that we if you asked a question on the GitHub site, we can answer it publicly, and reduce barriers for everyone in following sort of open science principles. So yeah, thank you, Monica, I think you have your hand up, go ahead.

L Logan Kilpatrick 2:07:29

Really, really quickly. Just want to say I think another piece of it, too, is making sure that just the knowledge that people can actually ask these questions is also accessible, because I don't think like I was looking at the roses side. And it was not clear to me at all in any way that there was some other forum in which I could ask questions or clarification or things like that. So I think it needs to be hand in hand with generally where the information is stored. And I think you're muted right now.

chelle gentemann 2:08:03

It was probably, it probably was a decade before I realized that the PII on proposals that you know, that they were actually calling program officers and asking questions and talking to them, and that it's okay to do that. And it's actually encouraged. You need to reach out to program officers and talk to them. And we can't share privileged information, but we can talk about things with people. And that is really helpful. But it's also this hidden knowledge. So documenting that, and talking about it publicly is really important. And having a skin hub where we can just do that, so that it's not just a conversation over email between 2pm But it's actually documented and as part of our community. Monica,

M Monica Granados 2:08:46

I just wanted to point you to a resource or maybe connect you to actually, Greg Tenenbaums group, the open research funders group is also doing some work to evaluate more equitable

methodology for grant proposals and like a grant and awarding grants. And so one of the outputs of that work is going to be like primers for things to consider in like the grant making process. So they're working with a couple of open research funders groups that I think he like Greg also mentioned, like the Wellcome Trust and Gates Foundation, etc. So So I think we should, you should think about perhaps connecting with with the open research funders group and that work, pre review was working with them as are with with that project as well, where we're, we're doing some work on on bringing sort of that like the training element of like, how do we train the evaluators and the people doing the the evaluation of grant grant reviews from what we've learned through our peer review process with I'm thinking about having equity at the center of that work. So I'm just bringing to your attention that work. And just because Yvonne mentioned that, like, you know, these are sort of considerations that we can make, I think it would be helpful to bring in some of the work that that group has been doing.

chelle gentemann 2:10:17

Thank you. And I do want to point out that, as a has been doing dapper reveals, is I do anonymous peer reviews, not for all programs, but for many programs. And part of the reason for doing this is so that it's more equitable. So your name is not associated with the proposal. So if you're someone who's new, you're not at a disadvantage to someone who's done it before, who may be well known by the review panel or the program officer. So NASA is also trying to create a structural system, right? So they're changing the system that the reviews are done within to make it more equitable. And we're, and I think that Vika, and then Sharon, and then James, and then Hans.

Malvika Sharan 2:11:01

So I will start by asking, who are doing these all work, because it sounds like there's a lot to deliver. And there's a lot of people involved from the volunteer capacity. And from my experience working at the National Institute for data science, we've learned that it's really, really hard to push for culture change, no matter how much you tell people, they would never make time for these. And therefore, there needs to be actually paid position for people who are coordinating these tasks. For example, stablishing, Community Managers network within the organization or outside not just you know, not just counting on champions who get fellowship for a small period of time, people who are actually paid to work 100% of time to coordinate these efforts. Then we also have recent software engineer movement at the moment in in the UK, but then I know that it's catching up in the United States as well. And these results, software engineers can actually spend time building toolkits for people who may not have actual experience working with computational skills, because in open science at the moment, we are really focusing on data science. But obviously, there are lots of researchers were not working in data science, and that would include humanities, and I'm not very sure how much of humanities and social science work does NASA do. But I would imagine there are quite a lot of communities who might be working on it. So yeah, the thing that I thought was missing is really, I feel like the team of dots, all of them will be working 24 hours and wouldn't be able to deliver if we don't start hiring people in full time position to do this.

chelle gentemann 2:12:49

Thank you. We spent yesterday afternoon outlining all of the roles and responsibilities for all

Thank you. We spent yesterday afternoon outlining all of the roles and responsibilities for all the different things that we're trying to do to do exactly that. Right now, we have four full time people at headquarters working on this project. And we also have the AGU team working on this project. So we're starting to get a lot of people actually working full time on this project. And we are going he got a job announcement right now. And we will be having more in the future to expand this team to the roles that you mentioned are exactly the ones that we identified that we need to find in support. So thank you for validating our work in the afternoon. Yes. And,

Y Yvonne Ivey 2:13:34

but I will also note that a lot of the things we know we need to be successful folks are already doing it. And so it's looking to formalize partnerships with organizations that are doing this work so that we can bring them on board and not have to reinvent the wheel, but also amplify and lift them up. And so I think, you know, these types of conversations are really I feel like, almost every week, we sort of look at each other and say, Wow, we need this person on our team. Wow, they're like, we didn't even know this, this resource existed. And so, you know, we're doing this in the open. And I think these types of conversations are really helpful because I, you know, when organizations and projects are set up, I think it's often you know, building the plane and putting the wheels on and flying all at the same time. And it's not until you really have these honest conversations about the need to truly manage projects more efficiently by having equitable and efficient resources. I feel like we need to do that more and be more transparent about that.

M Malvika Sharan 2:14:46

Just to add to that, that no matter how much you can identify these people who are already already doing this task they are doing above their capacity, so you'll have to help them hire people in their teams. I think the problem and current open science climate is that, you know, so far we run on volunteer capacity. And at this point, like there's huge burnout. And we need to acknowledge that open science comes with large responsibility and work and people who are actually in here for three hours, I'm sure they have eight hours of work plus three hours of this interesting conversation that I'm listening to that I'm interested in. So I really think that there needs to be lots of investment on humans, acknowledging where technology cannot solve everything.

chelle gentemann 2:15:34

For the federal government, and we're here to help. Yeah, I think I think that's really hard. Right. So how do you we've been thinking a lot and having conversations about how do you interact with the community that has mostly been volunteer? Because there is this problem with burnout? So if you go in and you start paying one person salary full time, what does that say to the other volunteers on this project?

M Malvika Sharan 2:16:03

I can actually tell. I can tell you actually. I know Daniella salaries also posting. And I think a lot

of a lot of organizations that we work with all the people, if even if one can transition to a full time paid position, it really reduces the volunteer work that other people need to do, because this person is fully dedicated to the job. So when position fully paid is already a huge relief. And I understand that, were you saying that, you know, it might look like an unfair thing to do to rest of the volunteers, but it really allows the organization to think what their sustainability pathways. So I really think that it isn't about like, paying all the volunteers were really, you know, doing some sort of sustainability. I know, it's a bit of derailing of discussion. But I really, really appreciate all the all the plans, you have agreed for people here. That's why I feel like we need to acknowledge that there needs to be more people working with you.

chelle gentemann 2:17:10

Thank you, and we love to have people working with us. And I want to skip, we have so many hands up. So Sharon, and then Jim. Hi, Logan.

SherAaron Hurt 2:17:22

Thank you, I'm actually gonna jump in real quick. As it relates to our volunteers and burnout. Malvika was an is a volunteer in the carpentries community. And this is an issue that we're I'm facing constantly right now. We have people that come to the carpentries and request workshops. And we are not able to provide volunteers at this point, pre COVID, there was incentives, the incentive was, you know, going to teach a carpentry workshop, while you may not get paid physically, you're getting a free trip out of it. And it's networking. And now that everything is in part, you know, is is virtuous, like where does the incentive come from? are, you know, for our instructor, so I'm definitely when we talk about incentives, I'm definitely all ears and engaged because this is an area that we are struggling with, with the carpet juries and open science, you know, we have the the everyone is requesting it. So the demand is there, but we just can't supply with the instructors. But to go back to the question of you know, how do we reach those underrepresented participants? In the conference rooms, we have a phrase, if you will, is never teach alone, teach in pairs. And that also aligns with, you know, recruiting people to get involved, try to recruit in pairs and groups rather than, you know, singling out one person, especially when you think about if this is new for this is a new environment, you know, I'm getting ready to get involved in this open science, but I don't know what this is about. So at least if I have a buddy, or you know, someone that I know, is coming into this with me, it's not. It's as if I'm not going through it alone, but I have someone who I could bounce ideas off of or ask those questions, because there are times in which you know, you're in a brand new you're in a foreign territory. And, you know, it's like, I'm scared to ask those questions, because it might be a silly question or, you know, so having I really would recommend using the, you know, recruiting and encouraging people to get involved in pairs or in groups, versus singling out people.

chelle gentemann 2:19:37

Thank you for that. That's a great point. The gentleman Honson love it.

Jim Colliander 2:19:45

Thanks. I wanted to make observations about community engagement and the possibility of cultural change within my field of research. So I'm a pure mathematician, and mathematicians like to write theorems and theorems require proofs. And it's really, really hard to find the proof of a theorem. So by and large, these folks are pretty conservative. They don't want to tell you about what they're thinking about, we don't want to tell you about where we think the field is going, we're here to tell you when we come to visit for the seminar, about what we've proved, and then we're kind of tight lipped. So the impact of that really affects I think, the openness strategy, at least in my field. So what happens is Big Shot visits your university, other big shots sit in the front row of the seminar. And then after the end of the seminar, there's a scrum at the blackboard. And research discussions take place at the blackboard. And then afterwards, there's a dinner party, or maybe somebody goes out for drinks. And then finally, the person starts to tell you about the long term plan. And the people that happen to be at that table, learn about the direction of research and get to engage in the development of research. So after the murder of George Floyd, I, in many scholars spent some time reading reports from black scholars, and I read the thesis of Piper heron, who was a mathematician from Princeton. And she wrote this very interesting thesis that that had sort of a theme about her own research, but also her experience being a woman of color at Princeton. And it floored me, because I saw the privilege that I felt where I could go to the front at that Scrum and participate in the conversations at the blackboard. And I had the freedom given my privilege to go to the bar and hear what the researcher wanted to do next. And I began to appreciate by reading her work, how there are these ways of exclusion, that are implicit in the hierarchy of the way that we do science in my field. So going back to yesterday, I encourage the hiring of these SMEs as part of open core to really adapt the open core to the context of the way that science is done within each of these communities. And some discussion about how these like really delicate moments of interaction that are the precursors to research breakthroughs have to be opened up as well.

Yvonne Ivey 2:22:20

Thank you, Tim. For that, I believe next step we have

Moritz Gunther 2:22:30

an MIT right, I'm clearly at a big institution that is used to have a NASA grants and applying to NASA things. And if I if I need to apply to sub NASA program, then I can go and find somebody who did that last year. And I'm probably got like three templates I can start writing from, before I came to MIT I was at the Smithsonian was not as long as it used either. And I've worked the same way. But people who are not at institutions, that their field that doesn't that doesn't need to necessarily have to be small institution, it can just be an institution that focuses on other things, where their field is big enough that they that they have that call, colleagues, coworkers, people they can informally ask about these things have that have that a lot harder. And so I think that NASA's policy, the policy of the dual anonymous peer review, is great for the second step, and like for the proposals that are submitted, but there's potentially a lot of proposals that aren't even submitted. And you talked about, some people talked about that, that you just don't know, to contact your program officer, when you have a question. I think one of the relatively easy things people could do is if we don't just share the abstract, if you share the proposal so that anyone can look for previous proposals look like then then anybody could could look at our previous proposals looked like and even if NASA can mandate that there's a

number of people who do that. The problem is that they're hard to find like they're often hidden in a in some GitHub repository, or somebody posted a I just looked at what astropay did, right? I'm here to speak faster paid today, when he got that NASA grant that Steve talked about 30. Yet we have we have an issue in a project repository that links to a Google has a Google Drive link. We want to make it open. But I really doubt that anybody who is not already in Africa is going to find that to help them writing it next time. So maybe if NASA crutches, or if somebody who has enough visibility and NASA is that could either mandate proposals being open, or could at least collect examples from people who are voluntarily making them open. So that it's not just one you don't want to cherry pick and say is this is this successful proposal, right? But if you find a number of them, I think that that'd be like a verb. That's a small step, but a very concrete step that can probably be done and might be significant and helpful for people for some people. Not not going to make all signs up. And but it's going to be a step and a step that doesn't take billions of dollars in investment.

Y Yvonne Ivey 2:25:07

I think one, I mean, you bring up an excellent point. And I think a lot of our conversations early on, between her sort of core team was shell, posting her proposal online. And I believe she dropped the link in the chat. But also, we were in a meeting last week talking about sort of the need to have a proposal development workshop, and chelle shared on the call with our our partners, that she put templates, and that people were literally reaching out saying thank you for putting these templates online and making them available on medium. And we immediately realized in that moment that we have to start asking folks to lean in and making these things open available. And we're really hoping to kind of use our GitHub repo as sort of a early repository for that where folks can sort of share and discuss and we can get conversations going. And I'm sorry, I got distracted from the chat. Yes, but we want to do this because we realized that we have to make this equal playing field.

chelle gentemann 2:26:29

Yeah, so thanks, everybody. I think there was somebody else who shared a proposal in the chat than this, oh, grants website, I think is phenomenal. And I don't think a lot of people know about it. So if you can give more visibility to this existing site, it's really easy. It's just a GitHub pull request. And you can post your proposal there. And we can try to get more visibility to that, because it's but to give honest comment, I was super excited because this young Latina woman came up and told me oh, well, thank you. Thank you so much. And I was like, oh, did the proposal help? Or did the medium? She's like, No, no,

K Karla Mastracchio 2:27:05

it was the templates. Okay,

chelle gentemann 2:27:08

so there's really a call for these templates that, I think give people an idea of where to start. And that's really helpful for first step. And Hans, I really, I had the exact same experience that you had, which is why I posted my proposal, because I felt like there was a huge advantage

you had, which is why I posted my proposal, because I felt like there was a huge advantage given and I was writing this big proposal by just having a template to go from being able to see other successful proposals. So the more that we can do that, and thanks, I think, I think we've had at least the also volunteer to co sponsor a proposal development workshop. So this is great. We would really like to see a lot more of this because we do want proposals from a larger audience. So thank you. I think Logan was neck. Yeah. Okay.

L Logan Kilpatrick 2:27:58

Yeah, just wanted to loop back in this conversation has been has been so awesome. I wish I'm looking at the time, like only 11 more minutes of this discussion, which is sad. But just going back to the community involvement and engagement piece and thinking about I don't know what the plans are like, right now. There's, there's this top panel and sort of advising from a community perspective, but longer term, like, what is the plan for how to keep the community engaged in this discussion, because I feel like the discussion the entire process, because I feel like after this first year is over, there'll be people who are maintaining stuff, and there'll be the full time employees at NASA and AGU sort of doing things. But I think that it's possible that like, as I don't know that maybe the community momentum fizzles out over time, like there's it just becomes very sort of disparaged if there's no sort of core structure of governance from a community standpoint. So I'm interested to know sort of processes or the light that can be put in place to sort of help the long term sustainability of the of the entire momentum and project. And you're muted right now.

chelle gentemann 2:29:14

Thanks, Logan. That's a great question. And it's perfect for the timing of the panel. So we have a governance statement that we're developing based on a it's based on several different open source projects, governance models. We're working to develop that publish it on our GitHub, it'll of course, be open for comments. And our plan is to continue to develop it will have these panels every year 15 people, so you have a one year appointment, and then we'll continue every year with another 15 people. We have the tops champions programs, which we're developing. Essentially, initially, we're working with internal already funded NASA scientists to sort of get that off Round. And next year, we plan on having completed announcements for people to apply for funding to start developing this community, the goal has been from the very beginning to be a five year project that ends at five years, we put that timeframe in there because we thought that gave us enough time to build community so that this does become a sustaining initiative beyond just this five year project. And a lot of the development that we see happening in the future is all organized around developing community, developing champions, developing participants, and partners. So that this will keep going. I think we have one or two last slides that I think we're gonna move to now. And thank you so much everyone for participating in a panel, this was really it's a little scary when you have all these big discussion periods. And you're worried that no one's going to say anything, or what's going to happen in the Free For All right. But this was just really great conversation. And thank you everyone for participating. The next steps for this. So we will be providing, I believe, on Monday or Tuesday, this summary. So it'll be just a short summary of sort of what happened each day with links to the slides, links to the recordings, will also have transcripts of all the chat questions and conversations and transcripts, a copy of all the questions submitted to the IO tool, we'll try to organize it a little bit for you. So it's not just a giant download, or a dump. So we'll provide in this Google Doc and then what we're looking for is for the panel to provide written feedback in

the Google document. And that can be just going to each section and providing comments underneath. What we would really like to see is a set of these individual sort of comments and reviews, as the month develops to sort of synthesize those into constructive feedback on that sort of organized under each section. And we're happy to help organize calls or additional chat opportunities, you all are part of a Slack channel to discuss and continue discussions in that slack channel. And if you need anything from us, you can reach directly out to us through that slack channel. And suggest other ways that you want to work together or other things that you'd like to contribute, are next. So does that Does that all make sense is everybody on board,

Yvonne Ivey 2:32:53

we will send an email out with all of this information. So notes, you don't have to memorize it, memorize it all, but will provide guide guidance and instructions.

chelle gentemann 2:33:04

And thank you. There'll be another talks community panel in October 2022. While most NASA review panels are going virtual, this one we're hoping will be in person. And we are working to organize that in the next couple of months. And we will try to schedule that far, far more advanced than we scheduled this one. So that you'll be able to plan for it. And we're really, I think, especially even though this virtual panel, I think works excellent. There's always a value to in person events as well. So we'll try to make that happen. And we will be having our next monthly community forum on June 9. And we will be will be sending out an agenda for that probably a week in advance.

Yvonne Ivey 2:33:55

To your question earlier logging, were really sort of looking at a governance framework, and how to really keep the momentum going on, we realized that this is an additional ask on on our community. And so we want to be as transparent and open and flexible as possible around getting these types of discussions with not only the 15 of y'all, but also the broader community, and really looking at how do we truly build a sustainable cultural shift in science. So with that, we have our sort of QR codes at the bottom of this slide where you can engage in our GitHub as well as our email list to stay up to date on all things that we're doing. But I just want to take a moment and really thank our community panelists for joining over the past three days. This has been an incredible discussion. We appreciate you taking the time to engage with the NASA open science community. Gallery close Remarks

chelle gentemann 2:35:03

onward and upwards. Thanks so much. We're really excited to have all of your comments and we are working hard to get ready for the year of open science. So we have an extremely busy summer ahead of us. And we hope to see you at some of our community forums where we will continue to present our progress and ask for feedback. Thanks everyone so much if we could have all the panelists

Yvonne Ivey 2:35:28
turn on the cameras we just want to take a screen grab

chelle gentemann 2:35:48
Oh, great. Okay. Okay, everybody, on Dubois from us people afternoon or evening depending on where you're at. We really appreciate you being here again. Are well everyone take care. Bye. Thank you, everyone.