Transcript of FYI phone interview with Kelvin Droegemeier on 4/19/2019

Note: This transcript has been lightly edited for clarity.

FYI: We'd like to start off with some structural questions. What is the current size of the staff you have over there, including detailees, and what are your plans for the unfilled associate director positions?

Droegemeier: Let me just sort of back up a second and talk about sort of the mission of OSTP as I see it. You know, every director comes in and sort of expresses it differently. But in my view, coming from academia, this is really an extraordinary organization. It's very unique, as you know. The way I like to say it is that the role of OSTP is really to make sure that America's a world leader in science technology. Pure and simple. Doesn't mean we lead in absolutely everything. That's obviously not possible, but overall, let's make sure that we really are the world leader. So there's three dimensions to that, as I see it.

The first one is to kind of unleash discovery and innovation across the whole enterprise. In my speech at the American Association for the Advancement of Science, I spoke about the four pillars of the enterprise: the private sector, the non-profit sector, the government sector, and the academic sector, and the importance of strengthening ties among all of those components. So, ultimately, it's really focusing on unshackling, unleashing capabilities, removing barriers that stand in the way, and we can talk about that later, and so on. So that's the first piece.

Second piece has to do with workforce and STEM education, really kind of building a workforce of the future. Which includes lots of things like enhancing diversity, making sure that every corner of the nation participates in research and education activities. I'm from an EPSCoR state, as you know. EPSCoR jurisdictions are ones that don't traditionally compete in certain measures of competitiveness with grants and things like that as much as the other states. The one thing the Trump administration is very keen on, obviously, is making sure, and I share this very deeply, making sure that every opportunity to engage all Americans is realized.

And then the third one is advancing American values at home and abroad. You know, the four pillars I mentioned, we have exceptional universities, extraordinarily capable private companies, massive private industry. We have amazing nonprofits that invest billions and billions of dollars in R&D and in our universities and our government agencies.

And so, when you look at that, and you look at our national labs as well, the 17 Department of Energy national labs, in my mind, the thing that really makes this whole enterprise sing is our values. And frankly, this is something I don't think we do a good enough job really messaging, even to say, graduate students and post-docs, and students looking to enter, say for example, STEM fields or fields of national, critical need. There's lots of opportunity in the world, but what really sets us apart is, in addition to all of our assets, and sort of our physical assets, and our intellectual talent, is the values. That's something I'm messaging a lot, because I feel very strongly about it, but I think ultimately that's why we have been successful in our research enterprise, since the early days, and why we'll be so successful going forward.

So anyway, I just want to kind of put this whole narrative and this whole conversation in context, so we can go back to that if we talk about certain other pieces, like sexual harassment or research burdens, or whatever, and have you see how I try to tie those back to those three pillars.

So anyway, to your question, you know, OSTP is really an extraordinary organization, a lot of people were wondering, "Well, are the lights on?" in articles back in mid-2017 and you know, I could assure you, the lights were very much on at OSTP. There were people here doing amazing things and I think if you look at the progress that's been made, and I can give you some examples of this, or you look at our S&T highlights document that came out, I don't know, about a month, month and a half ago, or maybe when I gave my AAAS speech.

You see really, really strong evidence of this. And so, we're about 70, 65, 70 people strong. We're a very diverse organization. Roughly half of those individuals are women. I take great personal pride in that diversity because I've worked my whole career on diversity enhancement. Some of the individuals we're bringing in now, that you'll be hearing about later, one position is assistant director of academic engagement is a woman. So, I think it's great that we have this diverse and very, very talented group of people.

You mentioned sort of the breakdown, I don't honestly know exactly what it is as far as detailees, but our number of federally funded staff in terms of our budget is rather small. It's maybe, I don't know, 10% or so. And the rest of the folks, as you say, we have them on IPAs or detailees from agencies. I have to say, the agencies, and this is across the board, you know, NASA, NSF, NOAA, NIH, USGS, are extraordinarily collaborative with us. They love sending people here because, you know, they want a presence, but they have the experts, the PhD level experts who can really help us move the science agenda forward. So, I go knocking on doors sometimes asking for detailees in certain areas, and they're always amazingly happy to respond.

So that, I think, shows tremendous partnership and tremendous cohesion of our enterprise here, especially, and the value that OSTP plays as the multiagency, cross agency, interagency as we call it, convener, in bringing everybody together to plan the S&T agenda, engaging not just the federal folks, but also other parts of the enterprise, like the private sector and like our universities. And I can come back to that and tell you what I've been doing, meeting with universities, meeting with private companies, meeting with ministers of foreign countries. We can come back to that if you'd like. Did I hit what you asked there mostly?

FYI: The one other thing was the associate director positions. We know there's some leeway in the number that can be picked, but do you have notions on whether those will be filled sometime soon?

Droegemeier: So the statutes that OSTP was created on, our Organic Act, says there can be up to four Senate-confirmed associate directors. It does not specify the title of those individuals or what areas they're in. Right now, we have three divisions.

We have a science division, we have a technology division, and then we also have a national security and international affairs division. Other OSTPs have had a fourth division, but the three that we have have been there for quite a while and I see no real need to change it. Pretty much everything we do crosscuts; like, the technology, there's a lot of crosscut with the science division, and certainly the national security division crosscuts with science and education and technology and so on.

At the moment, we have no Senate-confirmed leaders of those divisions. We have what we call principal assistant directors. That's a title for somebody who's leading a division that is not Senate confirmed. As you know, Michael Kratsios has done a phenomenal job of running OSTP from the early days of the

administration, was recently nominated to be the associate director for technology. And so, that is a Senate-confirmed position. So we're in the process, you know, he's preparing for his hearing and it hasn't been announced yet or anything like that, so he's headed in that direction.

I don't anticipate trying to get Senate confirmation for the other two with only 18, 20 months left in the first term here. Because it's a long process and you know, we have a lot of work to do here. We are fortunate to have some extraordinary people at the helm of these other divisions. So, we'll have Michael, if he gets through the confirmation, which I see absolutely no impediments to, then the folks that have been leading these divisions will continue to do so.

FYI: Our other organizational question has to do with if you have any plans to reestablish the President's Council of Advisors on Science and Technology? Have you spoken to any potential members or do you have notions about issues that it might look at?

Droegemeier: Yes, we do. And PCAST will be coming back, happy to say. We have individuals who have been identified to serve on that great body, and so we're very excited about that. That will happen this year and I think it'll happen, hopefully soon. But we're very excited about that because PCAST plays a very important role, as you know, and I'll be making some other, when that actually gets announced, we'll be making some other announcements about that, that I think you'll find very exciting for the future of science. So stay tuned to that. But yes, I'm happy to say that it will be coming back.

FYI: Now that you've been settled in for a few months now, we're curious what your ideas are for particular new initiatives that would be led by OSTP.

Droegemeier: OSTP, it does lead things, to your — the word that you used. In some cases, we lead them because Congress requires us to do so. In some cases, we're asked to do so. In some cases, we decide that it needs to be done and we initiate it ourselves. So there's different sort of pathways of leading.

But, I would say, or hasten to add, that everything that we do, we do it in partnership. We do it in partnership with other components of the White House, we do it in partnership with federal agencies, we do it in partnership with private companies quite often, and certainly with the academic community, and increasingly, non profits.

I don't want to give the impression that everything I'm going to say here is us leading and nobody else, as it were, that we're the singular group doing it. But one of the things I've been doing, and I actually started thinking about this before I was confirmed, you know, what would be for the things that I would bring to the position that would add value, and it's not unique to me as a person, but as an academic, as a researcher, given the many, many things that OSTP was already doing. And they numbered — when I was preparing for my hearing, guys, there were like 80 or more projects, individual specific projects that were underway and it was quite extraordinary. It was daunting to have to learn all that so quickly.

It ranged from things like space weather, to STEM education, to opioids, to oceans, to emerging contaminants, and quantum, and AI. It was just a huge long list and each one of these is a very rich, deep thing. It wasn't just a passing topic. So that, to me, was really extraordinary. And I said, "Okay," you know, "That's great. What value can I add to that?" And what I came up with were several things. One of which, and a lot of this stuff is going to be a repeat from my AAAS speech. But there's several things that have emerged since then; I'll kind of highlight those to make sure that you see that they're different.

But what I talked about there was having a substantial, major assessment of the status of our R&D enterprise, and do it maybe every — I called it quadrennial, but honestly, it's probably more like every seven years that you do something like this — that takes the National Science Board's Science and Engineering Indicators, but it also takes information from other sectors. And does a full on state of the S&T enterprise in the United States, and especially in the context of the global enterprise. What are our strengths? What are the gaps?

As a weather guy, I kind of called it the initial conditions of the forecast, right? And so, once you do that, and we actually have a process that we're looking at. In fact, literally, just today, I got a draft of what was sort of suggested to be the framework of, "Okay, how would you actually do that," and then, you take that and you say, "Okay, let's now do kind of a look ahead that doesn't go the next budget cycle, doesn't go say even to a decadal survey kind of timescale, but it goes to maybe 20 or 30 years." We really think long term.

Now, I can tell you the physics community, right? High energy physics, and other parts of the physics community, they think decades and longer. You look at ITER, you look at the Large Hadron Collider, you look at all these kinds of experiments. Physicists are quite good at this, at doing long term forecasts. What I would like to do, is to take that same capability and think longer term in other sectors of science and technology.

So, the answer I'm giving you is, okay, it's the initial condition and then looking much longer term. I'm not at all suggesting we change the budgeting process. That's not going to be possible, but I think it would be better informed if we had this really long-haul view. You know, countries like China think in terms of decades. They don't think in terms of just a few years.

So, that's one thing that I've been working on and framing and deciding how we would do. Another set of things have to do with what I would call the research environment. And this really gets to our kind of American values piece. It has to do with things like reducing administrative burden to especially faculty doing research. The latest Federal Demonstration Partnership survey came out, and showed that essentially, the amount of time that faculty spend on federally funded projects in terms of their compliance related non-research activities is — the needle's not moved — it's still on the order of 42 to 44 percent. That's really something that is extraordinarily, I think, problematic for our research enterprise.

And the Trump Administration, one of the things that I really love about it, is it's so focused on removing barriers to progress, whether it's regulatory and in certain sectors, whether it's untying the hands of researchers. But let's remove the burden of the regulatory activities that show no practical value and make sure we retain those, like human subject research protocols and animal research protocols and safe handling of chemicals and virulent agents and things. We absolutely value those. If they're a burden, they're an appropriate burden, okay? What I'm talking about are the administrative burdens that have been shown to either be outdated or unnecessary and have no practical value. Let's reduce those. That's one thing.

Another thing is, I would call it sort of a safe, productive, and accommodating research environments. The sexual harassment issue. We want to make sure that the research environments that we have, in every part of the enterprise, not just academia, but certainly in academia, are welcoming to individuals, that they don't feel threatened there, they don't feel like it's a place that they would go and then leave

or once they get in there, they want to leave. It's got to be a welcoming and accommodating environment that allows researchers to be as productive as possible, and it has to value human beings, and it has to value collaboration and interactions, but in a way that is not demeaning to people, and in a way that is not harassing to people. To me, that is absolutely unacceptable to have in a research enterprise and we will be the model of how to make sure that environments are free from harassment. I think we owe that to the tax payers, we owe that to each other as we move forward.

Another thing is research integrity and responsible conduct of research and making sure that we are on — and this again, goes to our American values. Making sure that we're operating with the absolute highest levels of integrity. And sometimes people conflate that with reproducibility. That's an important topic. Sometimes it's related, sometimes it's not. But I think really we have to make sure that we are operating completely with full integrity in research.

And then the final piece of that, I would say of the four, would be this issue of research security. We have to balance openness in our research environment with vigilance and making sure that we have adequate protections for intellectual property, for our research outcomes, things like that. And I've met with many university presidents in the time I've been here, and to a person, each one of them listed this as one of their highest priority topics and one of their concerns. And so this is something that's, because there has not been an OSTP director, OSTP has not really been active in this arena. And I can tell you that I'm having wonderful conversations with agencies, with universities, with other folks, the other sectors, and that we are working on some of our internal processes to where we can start moving forward. And some of it involving OSTP in that discussion.

We have to find ways to do this, so it's a top priority for me, and I know a top priority for the research community.

FYI: We know that several federal agencies are implementing policy changes to address concerns that foreign governments, particularly China, are exploiting the openness of the U.S. research system. How is OSTP engaging in this process?

Droegemeier: Like I say, I'm happy that those agencies are making progress and doing things. The National Academies is involved. Other groups are involved. For us, one of the unique roles of OSTP is the convening authority. What I want to see OSTP do is to bring folks together to have a more holistic, cross-sector conversation and that's what the people I talk to, they say yes, that is what they want to see OSTP doing, and it's frankly what our statutory responsibility is.

I'm very pleased that other agencies are taking action and I think even universities, certainly. Of course, you know, Title IX and things like harassment, they're doing that. But I think with regard to the research environment itself, this is something that OSTP has a unique role in. But again, as a convener, bringing folks together. And everyone I've talked to said they want to see that happen, so we're going to do that.

FYI: There's a big article in Science Magazine today, for example, of how, based on some of NIH's actions, MD Anderson down in Texas has fired a couple Chinese scientists due to violations of policies. And that article highlights, in talking with folks in the community, that there's a lot of concern about people of Chinese descent being as if a broad shadow of suspicion is being cast on them. What would you say to someone who says that the actions of the FBI and other agencies are casting a shadow of suspicion and having a chilling effect on scientific collaboration?

Droegemeier: I was just at NIH for half a day yesterday and talked with folks there about this very issue. I think at the end of the day, what's really important here is that we have a balance. We know things are happening. We know that and, you talk to faculty, in the last couple years, research universities, people that do research, have really come to grips with the fact that this isn't just somebody blowing smoke. This is really true. Some of the stuff is really happening.

We have to balance that vigilance and that care with maintaining openness of our research environment and not in any way, I think, providing some type of a negative context for our international colleagues who are so important, historically have been so important to our research enterprise. We don't want to do that and we certainly welcome folks coming from other countries to study here. We want them to come here legally, we want them to come here with our values in mind, because that's what this country is founded upon. And if they don't do that, and if there are bad actors, and there will always be bad actors. Stop signs don't prevent people from running over people because they ran a stop sign. We have to be vigilant, but we've got to have a balance here.

And the question is what's the balance point? And I think part of that balance involves making sure that we don't discriminate or do things that dissuade individuals from other countries to come in to study here. But when they do come here, they need to realize that we take seriously the protection of our research assets. This is a tough problem. It's a very tough problem that we have to engage. And I'm convinced that if we get all the players in the room, and get a lot of smart people thinking about this and working on it, that we can address this issue. We can't do it imprudently. It's going to take some real care, but it's so important that we get this right, and getting it right isn't going to be easy, but I believe we can do that.

FYI: Coming back to the sexual harassment issue. We've been following very closely what's been going on at the agencies, and we know that OSTP is going to be engaged in that going forward. How do you plan to inspire confidence in the community that the policies you do develop are going to be effective and enforced? This question is particularly motivated by the recent reports that the company that was led by Barry Myers, the president's nominee to lead the National Oceanic and Atmospheric Administration, was found to have a toxic culture of harassment and retaliation. The company denies those allegations, but how can you make sure that at the top, you send the right message, that when people make allegations, that they are going to be believed and taken seriously?

Droegemeier: I think the most important thing that OSTP can do is to, like I said, bring people together to figure out how to address this incredibly important issue. But I think the top line messaging from us is that harassment of any kind is absolutely patently unacceptable in the research environment. Period. Done. That's end of sentence. It is unacceptable.

How things get dealt with are much more complicated in terms of their legal issues. Obviously there's Title IX and all that kind of thing. And so ultimately what we're talking about here, and this is really the crux of the matter, is a culture change. We've got to have a culture that is respectful and valuing other individuals and, you know, do not have bias and things like that. It's a really tough thing to do, but I think personally what I think that OSTP can do is to say we have no tolerance for this sort of thing. And so that we hopefully, what I think, one thing coming out of this would be to have a set of principles by which we have to operate and make sure these things get implemented.

And then of course, there has to be accountability and we have to have training. There's appropriate training that's necessary, and then also people that are actually in the research environments have to have ways to bring things forward and to know that if something is brought forward, that there is a process by which their allegations or whatever they bring forward, is going to be listened to and taken seriously. We have to protect against false claims. You could instantly destroy someone's scientific career if somebody just decides that they don't like somebody else and are going to bring forth a claim.

I think we've got to work together on doing this. But I think if we fix — not fix — but if we have the right environment where people respect one another, they value each other as colleagues, regardless of any aspects of diversity or whatever is at play, I think we're a long way towards solving this problem. My whole career has been about bringing people together, and that sounds like a Pollyanna statement, but honestly, that's what this needs to be. We've got to bring people together to figure out how to drive the culture change to where research is something that people flock to because they say, "That's where I want to be. That's a great environment. That's where you can be anything you want to be. You can unleash your creativity and people are going to respect you." That's the world I see, and that's the vision which I hope to bring about.

FYI: Sticking with some of these headline issues, there have been a number of press reports about the White House's plan to form a panel to review climate science. Are you able to tell us how involved OSTP has been with that process? And if OSTP doesn't end up being central to that effort, how do you avoid creating the impression that your office isn't a trusted source of scientific expertise for the administration?

Droegemeier: Ultimately my job as the OSTP director is to statutorily provide the president with the best science advice possible, making sure that advice is at the table in relevant decisions and policy decisions or whatever. The thing you mention is something that came out of the National Security Council. I don't think it's appropriate for me to talk about what they're doing any more than I would try to talk about the provost at my university is doing, since I was the vice president for research. I think it's better if you talk to them about that, because that's the right way to do it. I don't presume to speak for other components of the White House or any other agency or anything like that. I think it's best for me to direct you to them for any information about that.

FYI: Sticking with climate then: Several senior Republican members of Congress have recently said that climate change is caused by humans and that investment in energy innovation is needed to address the issue. For instance, Senator Lamar Alexander (R-TN) proposed doubling federal funding for energy research through what he calls a New Manhattan Project for Clean Energy. We won't ask you to comment on legislation that doesn't exist yet, but we're wondering if, in general, you agree with the aims of senators such as Alexander?

Droegemeier: What I would say is again, not commenting about anything specific like that. I think we really all benefit when we look at common sense, pro innovation, pro conservation policies that will really safeguard the natural environment and allow for economic prosperity for generations to come. I think the things that are being talked about there, a lot of them really think about economic growth and economic development. The president has made very clear he wants clean air, he wants crystal clear water, he wants all these kinds of things, and he's very serious about that.

And so the question is how do you do that? And I think there are various approaches, but I think again, when you get folks in a room and you talk about this sort of thing, and you say that we want a strong economy, because a strong economy means national power, it means national strength, it means that we're moving forward and allows us to address simply anything that is thrown at us, whether it's some pandemic disease or some other challenge, a strong economy is critical. I really support any common sense approach that is very pro innovation and pro economic growth that will protect our environment and allow for America to be strong.

FYI: Now transitioning to weather, the administration has made it a top priority through NOAA to develop world-leading weather prediction capabilities, and then separately the Federal Communications Commission has been prioritizing development of 5G through spectrum auctions. However, the heads of the Commerce Department and NASA have written to FCC expressing concerns about potential interference that could be caused through some of that auctioning of the spectrum. How is OSTP working to address this tension between these two priorities?

Droegemeier: I mean obviously with industries of the future, as we call it, 5G is very, very important for so many things. For autonomous vehicles, for — It's not just faster, right, it's a much smarter network for Internet of Things. I mean whatever you could think of, 5G is going to be so transformative, partly in ways I think we don't even understand. But yet on the other hand, as you say, we have satellites, we have weather satellites that operate in some of the same frequency bands.

It's really, I think, a classic example of you've got two competing national needs and you have to have a process by which you can navigate the mutual interest of those. And we certainly support both of those things, and I think there's a process underway that involves the National Telecommunications and Information Administration and the FCC and then also the State Department. And OSTP is certainly involved in conversations. We're aware of that, and I think as the process plays out, I'm confident we're going to come to an end solution that really accommodates all of those things. Because again, America leading means America finding ways to solve these tough problems, and I'm really confident that we'll get there.

FYI: You've spoken before about the relationship between climate and the weather and the difficulties of resolving the uncertainties of how one affects the other. But we're wondering if we can get you to be more specific when you talk about reducing uncertainties. Of course it's important for making more precise forecasts and more granular decisions about mitigation and resilience planning — I'm talking specifically about climate here — but then there are some people who will point to uncertainties to suggest that the climate science community is insufficiently careful in its work. In taking your message to the scientific community, can you clarify to what extent you're highlighting known limitations in climate science or whether you regard the conclusions of exercises such as the National Climate Assessment as perhaps over confident?

Droegemeier: With regard to uncertainty, I think the literature is very clear and scientists have been very clear about the models. The models are exceptionally capable. The climate models are, weather models as well. But they're exceptionally capable within the bounds of our own current understanding. But they're awfully darn good, they really are. But yet we know that they have limitations. And I'm a modeler, I'm an atmospheric modeler, so I know this area pretty well.

The limitations of climate models are well known, well understood. We know that clouds, the representation of clouds, things like precipitation, hydrologic cycle and so on. A lot of that is due, and I would say it this way, that our models are far more capable in their sort of raw capabilities than the way that we're able to run them on existing computers.

We have extraordinarily powerful computers out there, but the way these models are structured and have been for decades, and the way the computer architectures are structured, you can only get less than 10% of the actual total performance out of the machine. So in some sense, when the models actually have the capability to resolve clouds explicitly, and what are called deep convections, like thunderstorms and things like that. They can't, on the computers, because we don't have enough capacity in the computer, enough memory and stuff like that, to run them at those resolutions for long periods of time.

Those are things that are well known. There are certainly things we don't understand, in the physics of the atmosphere. The models themselves, you know, things are parameterized. Partly because the spatial resolutions of the models, those parameterizations aren't able to function as effectively as they could if we used higher resolution. Because again, the physics is much better than what we're able to achieve now because of the resolutions that we're forced to use.

Then the other component is sort of the forcing of the model with these, sort of the socio-economic pathways, the RCPs, as they're called. Trying to predict what the future will be like, you know. That's why you see such spread in the model, solutions after about 20 or 30 years, which is where the human, the anthropogenic effects become more pronounced. That's where the uncertainty becomes larger. Understandably so, we all get that.

I think for me, I'd just love to see continued research done to improve our understanding of the atmosphere, to improve the models, and especially to improve the computing. Which I think would — Right now there's really wonderful efforts underway, I think now, to sort of move forward in being able to run much higher resolution simulations on the climate system for longer periods of time. We can do that, we can run higher resolution, but you can't do it very long. Just because the power's not there to do it.

FYI: Moving to a completely different topic, open access. What is your opinion of Plan S?

Droegemeier: One of the things this government will not do is to tell researchers where they have to publish their papers. What journals, what types of journals. That is absolutely up to the scholar who's doing the publication. There's just no question about that. And that's one of the key sort of foundations of Plan S.

We certainly strongly support open access, have since the Holdren memo came out in 2013. We want timely access to the information, to data, and to publications and so on. That hasn't changed at all. But we certainly would not, again, want to put a kind of constraint. This goes back to the president's I think fundamental philosophy of let's not shackle people, let's let them be free and open and free to choose where they publish. Let's not put any administrative constraints on them.

I don't think you'll ever see, out of this administration, anything that would tie people's hands as to say, "You have to publish in this flavor of journal or this type of publication."

FYI: You referenced that Obama administration memo on open access. Are there any plans to modify that?

Droegemeier: There's always discussions going on. Various people have been to the White House visiting to talk about open access. I think we continue to be open to new ideas and things like that. I think conversations are always healthy to have.

FYI: Coming back to the talk that you gave at AAAS. You mentioned that you want to start thinking about the R&D budget in terms of thematic portfolios. Can you expand on that a little bit, particularly how that notion compares to existing cross-cutting initiatives like the National Nanotechnology Initiative or the U.S. Global Change Research Program?

Droegemeier: I think those are really good examples of portfolios. Where you're really thinking across disciplines, and across agencies, and across sectors. Not just say, you know, this isn't just the federal government. When I say portfolios, I'm including the private sector and non-profits. You know the reason I say that is that if we focus sort of on the veins on the leaf, we miss the forest completely.

If you look at some of the things you just mentioned and some other things, you say “Well OK, this budget for this agency program looks like this.” But when you step back and say, "What's our portfolio? What's our portfolio in AI? What's our portfolio in quantum? What's our portfolio in advanced manufacturing? You know, R&D and then the deployment thing?”

You see a much different picture. And you see a robust enterprise. It's not in any way to say that you want to have any dimensions of those enterprises diminished in some dramatic way. What you want is to leverage the resources of those enterprises, so that 1 + 1 = 5. I think that's not something we do great in this country, and I think when you take the portfolio approach, it changes your thinking, it changes your mindset. And it also brings people together to collaborate and leverage in ways that they wouldn't otherwise. If they say, "Well, I'm going to only do this thing," if I get funding from a particular agency all my career.

But I'm not talking just about research, I'm talking about agencies. For example, agency initiatives where you have an institution-to-institution collaboration. And there are lots of examples that are happening now with say the National Science Foundation and Boeing. I saw a thing with MIT and, I forget who it was, I guess they came out today. But you see examples at the top level of the institution, where you've got private foundations working with a federal agency to put their resources together to get 1 + 1 = 5. That's the kind of thing I'm talking about. When you do that in a portfolio context, I think you even get more horsepower out of it.

FYI: Can you speak to whether the president has engaged with science policy matters? Have you briefed him directly on science topics?

Droegemeier: I've spoken with the president, and I think the president has a lot of interest. At OSTP as well as other — Of course he gets advice on matters from lots and lots of different quarters. It's not just advising the president, which of course we do. But it's working with other components in the White House, and even other agencies, to bring forth the best policy advice that we can give him.

I really have enjoyed meeting with the president and also the vice president. I accompanied Vice President Pence to Huntsville, Alabama, this was about two weeks ago now, to the National Space

Council meeting. Where he announced boldly the president's plan to put a human on the moon again in 2024. I think that really conveys the great sort of vision of this president to do bold things.

With putting a person on the moon, it's not just putting boots on the moon. I just met with some folks at NASA the other day to talk about the science that would be done. And we had a wonderful discussion about landing some individuals near the poles, so you have access to water and you can do all kinds of things ranking from biology to geology. It's really cool. Yes, I think this president is very bold in his thinking. I think some of the things I just mentioned really reflect that.

One thing I didn't mention — there are some things we're doing, again, I want to mention a few things different from the AAAS speech. We created this whole agenda here now, and we're moving forward in parallel on lots of different things. There's some cool stuff we're doing with health care data, with workforce data, and also an initiative with Historically Black Colleges and Universities in terms of research capability, capacity, and education. Also, in areas of having them participate uniquely in some of their unique capabilities in workforce development and re-skilling. There's been things like that I just want to make quick mention of so that you see that, yeah, we're doing some other things in addition to the stuff that I had mentioned before.