Good morning! Thank you very much for coming. I am very privileged to share with you a few thoughts, being in the enviable position of having heard a lot of great talks yesterday by truly amazing people and having had several hours to reflect upon their wisdom.

Please note that I am acting here in my capacity as a faculty member and Vice President for Research at the University of Oklahoma – NOT as a member of the National Science Board.

Also, I was told to save time for a lot of discussion, so I’m going to be a bit provocative to add to the effects of the caffeine you’re drinking so you are wide awake and prepared for the rest of the day!!

Now, having said all that, I want to caution you for three reasons:

First, I am a meteorologist, so I wake up every morning asking with the following thought: “I know that today, I’m going to be wrong. The only question is, how wrong will I be?” Let me tell you, this makes for a very rewarding life! Just remember that no one in the Baseball Hall of Fame EVER CAME CLOSE to batting 500!!

Second, in her opening remarks yesterday, Sharon Hays noted that AAAS has a policy of doing something extra special at the end of the conference so people don’t leave early. Given that I’m the FIRST person on the last day, my job is to make you LONG for the final session and that special something.
But most importantly, Alan Leshner personally selected me to stand in for another speaker owing to a last-minute change, which means the selection was not vetted with anyone! So yes, you should be worried!

Seriously, I am ESPECIALLY honored that Alan would ask me because he’s one of my favorite people in the world and has made a truly exceptional impact on science globally. We will miss him greatly at AAAS, though I somehow feel – and GREATLY HOPE -- his voice will still be heard! We just need to convince him to stop holding back and begin telling us what he really thinks!

If you were here yesterday, you heard a great many facts about our nation’s research enterprise and how we compare globally in terms of monetary investment and other metrics. You heard several thoughtful views about topics ranging from innovation and competitiveness to STEM education and burdensome regulations. You also heard about the importance of researchers engaging in policy activities and finding ways of conveying the importance of research to lawmakers, policymakers, and the general public.

Although I’m not as old as Alan Leshner, nor nearly as wise, I might add, I’m getting old enough to notice that year after year, we continue to replay discussions about the same topics. Sometimes they’re expressed differently or have a different context, but ultimately, the underpinnings are the same. And they go something like this:

- Research is important and its value to society needs to be better understood in practical terms. We need to tell our story.
• Research is important and needs more funding. We need to connect the dots between research and everything to which it leads.
• Higher education, and especially research universities, are important to our future – in terms of the new knowledge they produce, the future scientists and engineers they educate, and the wealth they create by making possible corporate innovation. We need to tell our story.
• We are becoming a more diverse nation, but the research workforce does not even come close to reflecting the trajectory of that diversification. We are investing hugely in this area but the needle is not moving as it should.

Part of the reason we keep replaying these same points is that the players continually change. In 2011 alone, 23% of the Members of Congress were brand new. Thousands of new faculty are hired each year, and companies and the products they produce are changing more rapidly than ever.

Yet, another reason for the replay – which as in sports should help us in making the right call – is that we’re living in a TRULY UNIQUE TIME. We’ve heard that before, right? But it’s true, both good and bad.

• We are rapidly losing our global position in research for the first time EVER
• A vast array of opportunities exist for research and advanced study OUTSIDE the United States – which is wonderful, as Hunter Rawlings noted yesterday – but we’re in trouble if we do not likewise move forward
The public understanding of the true purpose of higher education has eroded, and now the rhetoric is “get a degree, get a job.” Hunter beautifully shot that full of holes yesterday morning.

We enjoy perhaps unprecedented bipartisan support for basic research – recall John Holdren mentioning the love fest on Tuesday at the Senate Appropriations Committee hearing – and I can attest to the veracity of his statement because I was there.

We have TRULY unprecedented financial challenges in this country that understandably are causing great angst, aversion to risk, and decisions to be made that are not entirely rational.

Because of these things, we have never before had to argue so strenuously to obtain support for something that is so obviously beneficial. We have never before been questioned with so much suspicion, or received such grave doubt, about the importance of what we do and how we do it. We have never before seen so many rules and regulations enacted so rapidly that produce outcomes that so often are ineffective or of marginal value.

As we heard yesterday, we can AND ABSOLUTELY MUST continue citing all sorts of examples of how research impacts our daily lives. Yet I find it ironic that, despite the vast array of technology and health care advances and wonderful things stemming from research that are right in front of everyone, every day – MORE SO THAN EVER BEFORE, we continue to lose ground. Is this obliviousness? Lack of caring? How could it be more clear than it is today, especially with social media continuously trumpeting research achievements and their translation into practical benefits for society? Are we just not telling the story, or is something else at work?
I believe something else IS at work – a challenge for which academia can play a unique role because it’s the only social construct left in our society that has the capability to do so. So here comes the stuff that I hope will stimulate discussion in just a bit.

If one looks at many small to medium sized companies – to several hundred or a few thousand employees – one finds that they frequently pass through a cycle involving three distinct generations. Simply put, the first generation starts the company, the second generation sustains it, and the third generation kills it! I believe this model may well apply to certain elements of our discussions at this policy forum and therefore provide useful guidance regarding actions we can take.

Let me be a bit more specific. The first generation is marked by strong leadership, creative thinking and problem solving, economic success, and immense personal fulfillment. This is the generation that built something out of nothing.

The second generation inherits that “something” – and it deeply appreciates and values it -- but importantly, it did not create it. Consequently, a loss of creativity ensues, as well as an appetite for taking risk and looking well over the horizon. The need for change often is downplayed, an unwillingness exists to address really important problems, and the main goal through all of this caution becomes singular: that of preservation. In other words, flatness.

The third generation has only seen preservation and flatness. It lacks the vision, passion, and personal identity with the value proposition, despite overwhelmingly obvious evidence of it.
For this, the third generation, it becomes common practice to reject the values of the first and even second generations, and ultimately, nothing is left.

This clearly is not a perfect analogy for what we face in our research enterprise and related policy activities, but I believe we can learn from it.

I would like to suggest that our first generation research enterprise – speaking a bit simplistically – spanned the period from around the time of World War II to the 1990s. It was a heady time for the most part, and the return on investment in research was well recognized and simply obvious. It was our “first Sputnik.”

In the late 1990s, we entered our second generation. The dot-com bubble came and went, then the 9/11 tragedy, which in many ways reinforced the importance of research, though was followed quickly thereafter by a continually burgeoning regulatory bureaucracy, a financial crisis, and other influences that have greatly lessened our appetite for risk and looking at the long term. The data presented yesterday by Matt Hourihan made this point very clearly.

Many have been calling for a “second Sputnik,” which is tantamount to saying that we recognize the need for a return to the first generation – because we’re clearly in the second generation – the period of preservation and flatness – and peering over at the third – the period of sustained decline. The research community understands this point. I believe others do not.
Is it possible to rewind back to the first generation? The old saying is “You can never go home,” and I believe that’s quite true. MANUFACTURING a second Sputnik has been and remains difficult because the ENVIRONMENT in which we live is completely different from that of the 1960s.

So what can be done?

I would like to suggest that the things we are missing, or that at least have been greatly diminished in their value and utilization, are foundational to our society as well as to our research and education enterprise. And they are: trust, honesty, and integrity.

We see evidence of this everywhere. In personal relationships. In jobs. In governance. In sports. Even in church.

Where in society does one find these three things healthy and in active, consistent use? Arguably, nowhere. But I would posit that our research enterprise – imperfect as it is and certainly not without embarrassing stains and skeletons – is where these three important qualities are the most healthy and also come together.

And they do so in universities – where thoughtful debate occurs, even on highly controversial issues, where every dollar for research is leveraged to the max, where researchers FOR THE MOST PART act with honesty and integrity, where DEEP THINKING occurs, problems are dissected, and important conclusions are drawn via rigorous approaches that involve careful, logical reasoning that rejects arbitrary actions. It is not only WHAT we do in research, but also HOW we go about it.
As crazy and arcane as the academic environment may be, the search for real answers based upon hard facts, honest and open debate, and rigorous approaches underpin us. If we fail to somehow reinvigorate these same things within other aspects of our society, then I believe we run a great risk of moving into that dreaded third generation rather than becoming a NEW first generation – where a second Sputnik may not even be needed.

Sometimes the simple things tend to elude us, and the big things seem too difficult to even consider tackling. That’s a mark of the second generation. If you think getting more funding for research is difficult, what I’m suggesting will seem impossible. Yet without an invigoration of trust, integrity and honesty, I truly believe we are on an unsustainable course.

So how do we make this happen?

We have all sorts of policy institutes, including at universities, which perform all manner of scholarly analysis and offer all sorts of views and options rooted in logic and proven methodologies. But at the end of the day, decisions frequently are made for reasons other than logic, and some of the most challenging problems never get addressed.

As a meteorologist I should avoid the temptation of making a prediction!! But I simply CANNOT!!
The cloudy/rainy version of the forecast is as follows. If our society, including our government, do not somehow learn to trust again, to make thoughtful decisions in a collaborative manner, to have honest debate and reject arbitrary pathways, and to act with full integrity, then we will continue to be a second generation without courage that becomes a third generation dealing with a nearly irreversible destiny.

However, we know the atmosphere is chaotic, and that a small change – a butterfly flapping its wings – can lead to a much different outcome.

So my second forecast sees the sun melting the clouds with a rainbow in full view. I believe we DO have the means, as a people of resolve, to do the hard things and make the right decisions. In many respects, I believe the future of our nation is in the hands of those who are able to resist the voices of expediency and act in the best and honorable traditions of the academy. We are all that is left and we cannot shrink from our responsibility to be part of the solution.

Thank you very much.