Hello everyone and good evening! First, I would like to thank Peter Harrowell and Templeton for inviting me to Sydney to give this talk. I pleasantly escaped the first winds of winter back in the states to enjoy your wonderful spring weather here.

So, the title and subject of my talk is the “cultural authority of science,” which is actually a social science program in abeyance. For many years, social scientists have been interested in public understanding of science and, the production of scientific knowledge. However, until recently, these two intellectual projects have advanced separately—the cultural authority of science has been a house divided (slide 2).

Public Understanding of Science (PUS) is a rare example of “big social science,” or a research program supported by national science organizations, policy makers, and even professional scientists (unlike most social science). PUS examines how well science is understood in the general public. Meaning, both “to understand” in terms of general cultural knowledge and acceptance of scientific discoveries. At the same time, “understanding” refers to the cultural background and meaning of science to various segments of society—or “the public perception of science.”

On the other hand, research on the production of scientific knowledge—or science and technology studies—emphasizes local settings where “science is done” (e.g., the laboratory). Science studies also examines the social processes that make something “scientific.” Too oversimplify somewhat, science studies research asks the question: what happens in laboratories or scientific practices to make a “special” form of culture (or
truth)? Whereas, PUS examines how science operates in the culture, alongside other forms of knowledge that also exist in the general public.

The cultural authority of science clearly must incorporate both of these processes. That is, the mystery about how “science” becomes authoritative—having superior standing in culture—and how the public perceives “science” once constituted, actually deeply depend on each other. They are not two mysteries but just one. This is the essential message of my talk. I will also argue that this division is limiting, because it fails to question how science’s authority, both in organizational settings and in the general public, is used and how it could be used more effectively in contemporary societies. It fails to uncover the human question: how can scientific authority be useful and to whom?

Okay, so that is a lot heady stuff about who studies what and why, but let me communicate this to you more directly with two omnipresent images (slide 3: Mr. Spock and Frankenstein). What does Mr. Spock represent? I would suggest that this image represents the transcendence of humanity, and the progress and hope of modernity. Moreover, it is logic and method that conquer human vicissitudes and biases—logic and method allow human knowledge to transcend time and space (to become eternal and pervasive).

But it is not the only cultural image of science. The other image is not so pleasant. Frankenstein represents science that is unable to transcend human affairs. It has a long history in Jewish folklore (slide 4), the fable of the Golem—usually a monster with great strength constructed by a human master who loses control of it (the golem like the Frankenstein creates unintended consequences).
Importantly, the Frankenstein/Golem image also has a kind of authority, a raw power to transform and destroy. It is only if we understand this dual meaning of science that we can fully unlock the secrets of its cultural authority. The first image (Spock) is very clearly the object of PUS and has been an implicit end: to promote public literacy and trust in science; to hope that science represents progress to the public; and to discover segments of society that do not accept this cultural image. The Frankenstein/Golem image resonates with the science studies literature, where scientific authority is a human affair, that once unleashed, can prove harmful to its masters (slide 5).

Now, we can ask the basic question: what is the cultural authority of science? How do we define it? The pragmatist philosopher and scientist Charles Sanders Peirce has a nice heuristic:

"Consider what effects, that might conceivably have practical bearings, we conceive the object of our conception to have. Then, our conception of these effects is the whole of our conception of the object."

Essentially, this means: you figure out what effects something has (in this case science), and that is basically what it is. Okay, we can do that pretty easily with science (slide 6). Simply ask, what are the social effects of science, and we have many, both on material culture and our beliefs. In this regard, the cultural authority of science is nearly boundless: it is after all the epistemic authority of modern society. That is science’s "institutional role." It is what I have called the transcendent meaning of science (slide 7).

Here we see a more systematic analysis of the cultural authority of science, compiled by Dr Drori and her colleagues at Stanford University. Thus, organizations clearly value scientific knowledge more and more.

**Riff on what the figure says**
(slide 8). And in terms of public opinion, we see further evidence of this transcendent meaning. These public opinion data are taken from the General Social Survey, a large biannual survey of American Adults run by the University of Chicago and funded by the National Science Foundation. These data come from the 2006 to 2012 waves of the survey. The sample includes between 800 and 4000 adult respondents in the U.S., depending on how many years the items were included in the survey.

Over 90% of respondents agree (that) “Because of science and technology, there will be more opportunities for the next generation.” (Slide 9) Similarly, a clear majority agrees that the benefits of science outweigh the harms (almost 75%). Notably, political or religious dispositions are not associated with responses to this item. However, trust in society (its people and government) is associated with these responses. Again, indicating how trust in science is related to the legitimacy of modern society. These views are affective, they represent science’s public valence—and it is positive.

**Might need to riff here about not presenting regression model**

(Slide 10) However, there are lingering doubts about science. Here we see slightly different patterns. So, why do we have different views of science when we ask about change? I will argue that science and public perceptions of science are often relational: when science is implicated in human processes, our everyday lives, our political systems, etc., it becomes human again. That is, science as a human practice is still popular and trusted, but not with the same vigor as the more “affective” attitudes we saw before. Again, pointing to this dual meaning, and different dimensions of public perceptions.

(Slide 11) Ignoring this dual meaning of science has lead PUS research down some strange paths. One example is the “deficit” model: which means that the public
doesn’t really know enough about science and therefore, fears what it doesn’t understand (science). So, we have this classic question about the earth going around the sun. And, as you might guess, public science literacy is rather low. We can also see this struggle in the way people demarcate science. Do people know what science even means? (Slide 12)

**riff on slide, describe different meanings of science, what happens to public opinion research, cause for alarm if people don’t have a clear definition, self serving because it reinforces an asymmetric relationship between the public and scientific authority, it is the seedbed of technocratic authority and failures of democracy**

(Slide 13) This brings us to a fundamental issue about public perceptions of science research: it must account for how people think in everyday life. And, it is just beginning to do so. First, people use general cultural maps to identify science: not specific facts or some abstract knowledge of the “scientific method.” Moreover, people use broad heuristics, because they are useful to their everyday lives. Very particularistic knowledge, in the form of fact quizzes, really fails to capture why the cultural authority of science is important. People need to know where science is located in our society, not detailed knowledge about what physicists are doing at CERN. (Key point, it is unreasonable to think that lay people will become experts, instead they need to know who and where the experts are). So people can identify that physics and medicine are very scientific, and economics and sociology less so, etc.

**riff on the next three slides***

slide 14 – cultural location

slide 15 – method

slide 16 – everyday context –
What is the key idea here? People have other forms of knowledge that they use, political, religious, and peer-groups that are very often more useful than expert knowledge. That doesn’t mean that people don’t value science or what it brings to society, but that it remains remote from their lives.

(slide 17) When does science get into trouble? As mentioned, when it must engage in political action to construct its own authority (what is called boundary work), enter deeply divided policy arenas, and compete with other interests for authority and resources. Again, this is paradox of the dual meaning of science—its credibility and cultural authority makes it a powerful tool for powerful interests, including governments and social movements, to push particular agendas. And, in doing so, science’s legitimacy and authority is expended, it is diminished: it spends its credibility like capital.

(Slide 18) Here we see public support from science tested, but even so, it is still enjoying a great deal of trust. (slide 19) The difference here is that science is politicized (when related to policy and government funding). In other words, analyses of statistical associations indicate that religious and neoliberal (fiscally conservative) segments of the public are far less accepting of science. There are similar patterns with the next two attitudes (slide 20) then (slide 21).

** riff here about religion and science, some trends over time**

(slide 22) So, now to the most pressing challenges to the cultural authority of science, what happens when society changes and science can’t fulfill its institutional role—to represent hope, progress, and collective achievement? Ulrich Beck and other sociologists have suggested that wealthy democracies are becoming “risk societies” Meaning that
Modern society has become...increasingly occupied with debating, preventing and managing risk that it itself produced.”

Here, the risk takes a different form than it did in previous epochs of civilization: It involves

- **Delocalization** – causes and consequences are not limited to one geographic location
- **Incalculableness** – consequences are “hypothetical,” based on scientific uncertainty, probabilistic logics.
- **Preservation through prevention** - “Threats to humanity” that defy scientific utopia, and that global society cannot compensate for.

A great example of this is climate change, because its consequences are clearly global, it is hypothetical—based on scientists’ best guess, and the solutions and policies remain poorly articulated. Recall, Science’s epistemic authority does not easily translate to policy solutions and political power, especially when the catastrophe is 30 to 50 years off.

(slide 23) Another wonderful case study in risk society is the Ebola controversy. Science has limited political power to control people’s actions at a local hospital in Dallas, TX: the Ebola protocol once disease is detected. The hospital failed to institute the protocol and two nurses got sick. However, the public and media hold science and the expert community responsible, they expect science to manage the risk. Here the transcendent meaning of science is damaging, because it builds expectations that it cannot actually meet. It cannot control all the conditions in society like it does the laboratory. Instead, it must try and fail to translate its epistemic power—the power to claim truth—into political capital.

(slide 24) Notice how Thomas Friedan defines the situation: “The existence of the first case of Ebola spread within the U.S. changes some things and it doesn't change other things. It doesn't change the fact that we know how Ebola spreads. It doesn't change the
fact that it's possible to take care of Ebola safely. But it does change substantially how we approach it. We have to rethink the way we address Ebola infection control, because even a single infection is unacceptable.” Again, it is all about “knowing” and unclear about the “doing.”

(slide 25) The expert community also uses the “crisis” as an opportunity to extract resources from the government. Francis Collins, head of the National Institutes of Health, states:

“NIH has been working on Ebola vaccines since 2001. It's not like we suddenly woke up and thought, ‘Oh my gosh, we should have something ready here’... Frankly, if we had not gone through our 10-year slide in research support, we probably would have had a vaccine in time for this that would've gone through clinical trials and would have been ready.”

So, how does science compare with other social roles: in terms of trust and credibility. (slide 26). **explain slide briefly: science controversies are another way to examine public perceptions of science, particularly relative to other social institutions.

(slide 27) *** and similarly with genetically modified foods.

(slide 28) In conclusion, the idea that science’s cultural authority faces severe challenges appears to be overblown. Science continues to enjoy a tremendous amount of epistemic authority. But, like powerful institutions in late modern societies, there are limits to its credibility. First, the credibility it has is domain specific: involves epistemic and not political authority. Moreover, it is often an agent of powerful institutions that are far less
popular than it is: governments and regulatory agencies. This too diminishes its standing, but only somewhat.

That said, science has a unique role, because the public wants it to “stand outside” politics and power, and mobilize truth against powerful interests. Climate change is a great example of this. That is, it may be that democratic societies have yet to fully realize the potential of science, as an agent for the public interest, in opposition to powerful forces in modern society like large corporations and political parties. The puzzle that remains is about how to organize science so that it can mitigate power and powerful interests. It is difficult to just declare that it is so, and science as a professional identity must live up to this standard. Yet, it is important to understand the dual meaning of science, if only because it provides an opportunity to overcome these limits, and a first step towards fully articulating science’s value and role in our culture.