✓+ fan-tas-tic. can we talk about these ideas of yours?

Often, when we talk about science and technology, we talk about them as one field: "science and technology." We acknowledge the imaginaries of both and then combine them into an even more monolithic imaginary of S&T. However, Pielke only discusses science. What, then, of technology in his framework? ✓

Among it's many uses, science can discover the natural laws/reality of the world we live in. We embed our values into scientific practice and policy and our values certainly become apparent when we choose where to invest money; but sometimes the outcome of scientific research - like the "discovery" of gravity - simply is. Gravity itself is value-neutral.

I believe that there is no value-neutral technological equivalent. All technology, and indeed everything that we make, is value embedded. Does this inherent difference mean that Pielke's work is only for science and not "science and technology"?

Let's look at his useful thought experiment of Tornado and Abortion politics. In Pielke's construction, we need Tornado politics as a contrast to Abortion politics. Finding a technology equivalent of Abortion politics is not hard to do. A good candidate is the use of criminal justice algorithms. These algorithms are often used to determine length of sentencing, whether to release an inmate on parole, or bail amounts. There are different types of algorithms, but their function is to estimate the likelihood that an individual will be a repeat offender.

Mapping this to Pielke's chart, the algorithms are used to *rationalize* punishment, justify racist/biased decisions, are applied selectively, are part of an emotional narrative and are a means of maintaining power (43). A perfect fit.

To what can we contrast that in technology? Tornado politics requires values consensus and low uncertainty. What technology exists that has values consensus? In the case of the

tornado, the role of science is to help people determine facts about a scientific phenomenon - in this case, a weather event. There is no contest about the inherent goodness or evil of the tornado itself. As Pielke states, in Tornado Politics "once everyone obtains a shared level of understanding a preferred course of action will become obvious and non-controversial" (42). This is simply not possible when making decisions about/with technology.

If the thought experiment does not map, do the corresponding roles? Yes and no.

The "Pure Technologist" embodies nearly everything that's wrong with technology today - focusing only on what technology is capable of and not at all on its uses or impacts.

The "Technology Issue Advocate" is certainly evident when you examine debates about AI or surveillance technology. It's trickier because one cannot be an expert in technology the way that one can be an expert in a discipline of science.

The "Technology Arbiter" focuses on issues that can be resolved by technology. This seems straightforward enough, but technologists do a very poor job of anticipating the impacts of their technologies. Thus, problems involving technological solutions don't meet some of Pielke's criteria for simple decisions - the problems are not bounded, and there is infinite ambiguity in the number of choices (24).

I also have my doubts about the "Honest Broker of Technology Policy Alternatives." Because so much technology is ambiguous and open to interpretation, even the title "Honest Broker" is inappropriate.

Given that the roles above don't map perfectly to the technology imaginary, how can we envision the roles of technologists in making policy decisions?