Intellectual Territorialism

By Avi Loeb on August 10, 2020

The Ancient Greek poet Archilochus wrote: “the fox knows many things, but the hedgehog one big thing”. When I started my career in astrophysics, the advice I received from my mentor, John Bahcall, was to use the hedgehog strategy in securing tenure: “focus on one area of research and aim to be the world expert in it”. This was wise advice that accomplished its goal, as I received tenure a few years later.

Within two decades, I became the world expert on the first stars in the Universe. But despite the success of the hedgehog strategy, I began to develop doubts about it. The doubts intensified when I and my former graduate student, Steve Furlanetto, wrote an extensive textbook on this emerging frontier exploring the earliest galaxies and reionization. Our purpose was to encourage young researchers to enter the field and make new discoveries. Their findings would require us to make substantial updates to future editions of the book, but with the great benefit of learning something new. Of course, as the field trended in popularity into the mainstream, established cosmologists developed expertise in it too. At that point I noticed that these so-called "experts" exhibited the unfortunate tendency to deter younger scientists with fresh ideas from entering into their field. The behavior appeared similar to the way animals protect their territory: they wish to remain dominant, minimize competition for available resources, and never expose their weaknesses – in the case of the experts, the important insights they might be missing. The perspective of an outsider poses a threat to conventional thinking. The consequences are particularly acute when the outsider raises foundational questions to which there is no good answer.

The situation is similar outside academia. When a few youngsters from a new company called Microsoft entered the executive office of Britannica in the 1980s and offered to collaborate on an electronic CD-ROM version of the lucrative encyclopedia, their offer was
declined by *Britannica*’s senior management. At that time, the hardcopy version of *Britannica* was a prominent luxury item with an unparalleled reputation. As a result of the rejection, Microsoft released its own digital encyclopedia *Encarta* in 1993. Two decades later, *Britannica* ceased production of its print version, while recognizing that it was unable to compete with online resources like *Wikipedia*. Ironically, the history of *Britannica* is now summarized as an item on *Wikipedia*.

Is there any evidence that spreading your focus across multiple scientific disciplines necessarily leads to a superficial impact? To the contrary, history demonstrates that polymaths like Leonardo Da Vinci, René Descartes, Gottfried Leibnitz, Isaac Newton, Charles Darwin, Benjamin Franklin, Marie Curie and Nikola Tesla, were all responsible for foundational breakthroughs in science. Recognizing the added value of the fox strategy, I was motivated to bring together astronomers, physicists, mathematicians and philosophers under the interdisciplinary umbrella of the *Black Hole Initiative* at Harvard University. That way, “non-experts” might help “experts” realize what they had been missing on unsolved puzzles about black holes. Knowledge is an island in an ocean of ignorance, and a fresh perspective could identify distant unexplored lands.

A set of separate experts, each focused on a single intellectual territory, provides a fragmented view similar to early maps of the world, which depicted a set of regions with unrealistic proportions and boundaries. For example, Anaximander’s map from around 550 BC, included only Europe, Asia and Libya, surrounded by a circular ocean. The only way to obtain a proportional view of the complete intellectual world is to allow scientists to cross boundaries between separate intellectual continents and venture into uncharted oceans. Such explorers might discover the Americas, those virgin continents of the new world beyond the imaginary circular ocean, that previous map makers had never visited.

When on a few occasions I started to suggest out-of-the-box ideas to “experts” in other fields, most of my proposals were flatly rejected. In retrospect, some of them turned out to be right on target. After noticing the experience repeat, I decided to just follow my curiosity and not be swayed away by colleagues who warn: "stay out of this lane". I realized that as long as I have tenure and my self-esteem does not depend on prizes or honor societies, I am not sacrificing much by following my own compass. Once an argument is validated beyond a reasonable doubt, the “experts” will agree with it, although they might also claim that they knew it all along.

My advice to young scientists is therefore different from the one I received – at least, after you have secured tenure. Define your path not by looking at the surrounding geography and restricting your expertise to intellectual boundaries, but by following your internal compass. Unwarranted resistance by experts might signal that you are on track for an important breakthrough. In the end, wearing early rejection as a badge of honor might give you more pride than any prize awarded to you afterwards by the same experts.
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