

Astronomy & Public Perception

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Scientific research is an important driver for technology, as everyone will acknowledge. Nuclear power plants, hybrid crops, magnetic resonance imaging of the human body, trains that are levitated by strong magnetic fields using superconductivity, and fiber optics communication have all been made possible by fundamental research in applied sciences that produced important discoveries. These breakthroughs have generally come from the applied sciences such as chemistry, physics, and metallurgy.

Astronomy is considered a pure, rather than an applied, science in that it has few practical applications. Yes, astronomy has been important for determining time, and one can point to advances in optics that have come from research on telescopes and their instruments. But by and large, the value of astronomy to society lies in its philosophical and inspirational qualities that derive from a better understanding of the universe and our relation to it. In an era when public funding of most endeavors seem to require the promise that society will benefit from it in a material way by improving the essentials of life (food, shelter, clothing, or health care) astronomy is often criticized as being 'non-essential'. Like music, one can live one's life without it.

That said, even though it is a pure science astronomy has had a profound effect on mankind's perception of ourselves. One of the great scientific revolutions in human history is the Copernican Revolution that displaced the earth from the center of the universe. Astronomy was the driving force behind the Copernican Revolution. It was the study of the sky and planetary motions that led early astronomers to doubt the teaching of Aristotle and the Greeks that the earth was 'perfect' and therefore not in motion. This view, strengthened by the perception that earth's motion should cause a constant wind that did not exist, was accepted in Western culture for 2,000 years, and it played a key role in the way people tried to explain phenomena they did not understand.

The difficulty that the sun-centered solar system presented to society is well known. It was rejected by a major religion of the world for more than a century, and certain of its advocates were jailed or put to death. Pre-conceived beliefs are not easily surrendered by anyone, even among those of us whose training has taught us to be open to new facts. The tendency of people to try to understand new things in the context of strongly held beliefs is a natural trait that could well have genetic origins. The great value of education is that it teaches us to resist this tendency for our own good. Strongly held beliefs are fine when they lead to enlightenment rather than conflict.

The questions that arise out of astronomy are among the most profound that can be imagined. Is there life elsewhere? Was there a beginning? Is there a unifying order to all things? The satisfaction of curiosity is a strong motivator, and one of the key features of intelligent beings is the length to which we will go to satisfy curiosity. Astronomy is front and center as a science that addresses some of the fundamental questions of our being, in addition to having an unbelievably beautiful domain! So, even those who are not philosophers find astronomy compelling. In the USA, the only subject that is more popular than astronomy, as measured by the posters that are put up in school classrooms, is dinosaurs!

Astronomy is indeed an essential science---one that arises out of the curiosity of intelligent beings. We are driven to understand what's going on 'out there' because we are a part of it and evolved with it. The quest for this understanding is essential to our existence and is arguably more important than its ultimate satisfaction.