

# Plato and Aristotle's Ether: Revisited and Redefined

By Declan J. O'Donnell, JD and Sherry E. Bell, PhD

## Is Ether Real?

Is there an Aether/Ether? Yes there is. Although the concept dates back over 2000 years, it is still alive and well and is indeed thriving.

Throughout the centuries, since around 360 BC, philosophers and physicists have been discussing Aether. The manner in which Plato used the word was that Aether (*Αιθήρ*) referred to the bright, untainted upper atmosphere in which the gods dwell, as distinct from the dense lower atmosphere, which was Aer (*Αήρ*). Plato, in his *Timaeus*, described Aether as that "which God used in the delineation of the universe."<sup>1</sup>

Aristotle expanded on this idea and expressed his view that this force was vital to the terrestrial elements, those being earth, water, air, and fire. He classified Aether as the "fifth element" (the quintessence). Aristotle believed the four terrestrial elements were subject to change and moved naturally in straight lines; whereas no change had been observed in the celestial regions and the heavenly bodies moved in circles. In Aristotle's system, Aether:

- had no qualities (was neither hot, cold, wet, or dry),
- was incapable of change (with the exception of change of place),
- by its nature moved in circles,
- had no contrary, or unnatural, motion.<sup>2</sup>

Today "Aether," also spelled "Ether," is defined as follows: "in physics, a theoretical, universal substance believed during the 19th century to act as the medium for transmission of electromagnetic waves (e.g., light and X rays) much as sound waves are transmitted by elastic media such as air. The Ether was assumed to be weightless, transparent, frictionless, undetectable chemically or physically, and literally permeating all matter and space."<sup>3</sup> It has also recently been described as the medium which fills the "empty space."<sup>4</sup>

In the newer concept as presented here it is spelled Ether, with a capital *E*. This reminds us that Ether is a conduit of *Energy* and is a product of an *Era* gone by, an Antecedent Estate, an older and *Easier* dimension.

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<sup>1</sup> Plato, *Timaeus*, line 1317, Project Gutenberg edition, [www.doc.ic.ac.uk/~rac101/concord/texts/timaeus/](http://www.doc.ic.ac.uk/~rac101/concord/texts/timaeus/).

<sup>2</sup> Adapted from G. E. R. Lloyd, *Aristotle: The Growth and Structure of his Thought* (Cambridge: Cambridge University Press, 1968) 133-39, [en.wikipedia.org/wiki/Aether\\_\(classical\\_element\)](http://en.wikipedia.org/wiki/Aether_(classical_element)).

<sup>3</sup> *The Free Online Dictionary*, s.v. "Aether/Ether", [dictionary.reference.com/browse/aether?s=t](http://dictionary.reference.com/browse/aether?s=t).

<sup>4</sup> J. Rafelski, "Vacuum, The Primordial Imponderable 'Matter'," paper presented at Ecole Polytechnique, March 20, 2009, [www.physics.arizona.edu/~rafelski/PS/0903EcolPolColl.pdf](http://www.physics.arizona.edu/~rafelski/PS/0903EcolPolColl.pdf).

Albert Einstein claimed that “the special theory of relativity does not compel us to deny Ether.” Einstein further stated, “According to the general theory of relativity space without ether is unthinkable; for in such space there not only would be no propagation of light, but also no possibility of existence for standards of space and time (measuring-rods and clocks), nor therefore any space-time intervals in the physical sense.”<sup>5</sup> According to Robert B. Laughlin, Nobel Laureate in Physics, endowed chair in physics, Stanford University,

It turns out that such matter exists. About the time relativity was becoming accepted, studies of radioactivity began showing that the empty vacuum of space had spectroscopic structure similar to that of ordinary quantum solids and fluids. Subsequent studies with large particle accelerators have now led us to understand that space is more like a piece of window glass than ideal Newtonian emptiness. It is filled with “stuff” that is normally transparent but can be made visible by hitting it sufficiently hard to knock out a part. The modern concept of the vacuum of space, confirmed every day by experiment, is a relativistic Ether.<sup>6</sup>

We propose Ether is the medium that functions to organize, accommodate, and affect all of the elements and forces of nature, both well-understood and not so well understood, including earth, water, air, and fire, as well as gravitation, electromagnetism, the strong nuclear force, and the weak nuclear force.

We contend that there was an Antecedent Estate in our universe prior to the Big Bang and it was filled with Ether. It is and was a solid reservoir of vacuum energy, a force in and of itself, the fifth force in nature, and it formed prior to matter and energy as we know it.

Even if Ether did not have a cause and effect on the entry of matter, at least it constituted the perfect envelope into which matter could be maintained. Nothingness could neither cause nor sustain a Big Bang.

### **Ether and the Antecedent Estate**

There might have been two or more Antecedent Estates in our universe. The first might have been nothingness. The pure void of nothingness might have been partly replaced by many prior estates. However, we are focused discretely on the status of our universe immediately prior to the Big Bang, that point in history 13.82 billion years ago<sup>7</sup> when matter was introduced. This we call the Antecedent Estate.

This estate consists of a six-pack of forces at least: the four natural forces, those being gravitation, electromagnetism, strong nuclear, and weak nuclear; and two special

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<sup>5</sup> Albert Einstein, “Ether and the Theory of Relativity”, address given at the University of Leyden, Netherlands, May 5, 1920, [www.tu-harburg.de/rzt/rzt/it/Ether.html](http://www.tu-harburg.de/rzt/rzt/it/Ether.html).

<sup>6</sup> Robert B. Laughlin, *A Different Universe: Reinventing Physics from the Bottom Down* (New York: Basic Books, 2005), 120-21.

<sup>7</sup> European Space Agency, “Planck Reveals an Almost Perfect Universe,” March 21, 2013, [www.esa.int/Our\\_Activities/Space\\_Science/Planck/Planck\\_reveals\\_an\\_almost\\_perfect\\_Universe](http://www.esa.int/Our_Activities/Space_Science/Planck/Planck_reveals_an_almost_perfect_Universe).

forces. These are believed to be embedded in the Ether. All of these are constant and universal.

The characteristics of the four natural forces are well understood. We can predict with certainty how they will react with matter. Ether, however, is less well understood. We do know that it is real and that it is constant and universal.

Nothingness implies the absence of the four natural forces and the absence of all cosmic constants and, therefore, the absence of Ether. Although nothingness might have been the state of the universe before Ether came in, it was somehow pushed out or consumed or otherwise destroyed. It appears that Ether literally replaced the nothingness estate within our universe before the Big Bang, because within nothingness atoms could not congeal and matter could not gravitate.

Perhaps nothingness still exists outside the borders of our universe. Perhaps there are places within our universe that host nothingness, such as at the bases of black holes. In that place perhaps even Ether could be destroyed and atoms could be reduced to point zero quanta.

### **The Roles of Ether**

Prior to the Big Bang 13.82 billion years ago, there had to have been an evolution of Ether, including its putative essence of the four natural forces: gravitation, electromagnetism, strong nuclear, and weak nuclear; and two special forces. Ether filled our entire universe and settled down with no variations, wobbles, or inconstancies.

The Hubble constant must have been in effect from the beginning. Stars appear to be fairly evenly spaced without any noticeable gaps between them and light is applied evenly throughout the entire universe. Our dimension appears to have had no failure of natural or special forces *ab initio*.

Just as these phenomena apply evenly, constantly and universally for us, so, too, must they have also worked for that prior dimension. However, in the Antecedent Estate they could not have served the purpose of organizing matter because prior to the Big Bang there was no matter. Wholly different objective organizing must have occurred. Even the cosmological constant that causes circular movement for matter had to have played an entirely different role back then: there was no cosmos.

Our conception and perception of energy is inextricably tied to matter. Our formula is as follows:

$$E = mc^2 \text{ (where } m \text{ is mass)}$$

The concept of energy in the Antecedent Estate had to be free from the concept of matter. Therefore, the Ether may consist of energy that is vacuum energy, something unbundled from the above equation as follows:

$$E = c^2$$

or, as to various other natural and special forces

$$E = (f)Fc^2$$

A non-material estate is unnatural to us. Consequently, it has been off the radar screen, so to speak, for the mainstream of science and technology. However, because Ether exists and plays an altogether important role in the universe we must learn to study it.

In the larger context, breakthroughs in science will be required before our species migrates off Earth. We have come a long way, but the way forward is much longer. It is predicted that the essences of the Antecedent Estate will be discovered by scientists who live and work in outer space.

### **Conclusion**

Ether *qua* Ether is asserted to be a fifth force in nature in our present post-Big Bang universe. It was probably the dominant force in the Antecedent Estate. It survived the Big Bang and continues to thrive. Its apparent function is to organize, accommodate, and affect all of known and unknown forces. What a task! Consider the complexity of not only holding earth, water, air, and fire, but, also, honestly, constantly, and universally hosting gravitation, electromagnetism, strong nuclear, and weak nuclear forces of nature (not to mention any special forces yet to be discovered).

It is time for Ether to be revisited as a scientifically respected force, rather than as a Greek philosophy. The lynchpin of this thesis is to agree that nothingness could not host any version of the Big Bang. Some evolution of a universal vacuum must have resulted in this Antecedent Estate immediately prior to the Big Bang, if not many eons prior to it.

### **Postscript**

In our soon-to-be-published novel, "*Cosmic Man Coming*," Declan describes Ether and the Antecedent Estate in far greater detail and deftly weaves those descriptions into the narrative. A brief example follows:

Gravity became that force used by the Ether to purge hydrogen, as it eventually was scattered throughout space, away from the pure space life forms, now thought of as souls. These life forms traveled on the electromagnetic waves at or near the speed of light....<sup>8</sup>

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<sup>8</sup> Declan O'Donnell and Sherry Bell (eds.), *Cosmic Man Coming* (in press).

**About the Authors:**

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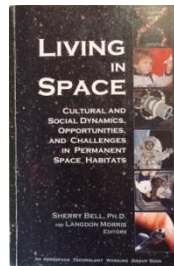


**Sherry E. Bell, PhD**

Dr. Sherry E. Bell received her Master of Science degree (2002) and her PhD (2005) from Capella University. She is an Industrial/Organizational Psychologist. Dr. Bell is the Dean of Psychology at Kepler Space Institute. Currently she is an active member of the National Space Society, [www.nss.org](http://www.nss.org), and plays several other roles in other space-related organizations.

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**Editor's Notes:** Kepler Space Institute is honored to have Declan J. O'Donnell and Sherry Bell contributing to *The Journal of Space Philosophy*. Their professional work over decades has made them top contributors to the global Space Community. Dr. Bell has just joined the Board of Directors for the Kepler Space Institute. *Bob Krone, PhD*.