

**Name: Michael Mireau**  
**Instructor: Sr. Fay Trombley, scic**  
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## *Physics and Faith*

### *Historical Overview – From the Church’s Side...*

- From the middle ages, the Church has considered itself the guardian of truth and had taken on a fundamental understanding of the universe.
- It had reworked the Ptolemaic cosmological model, wherein the universe revolves around the Earth, to fit the creation account of the book of Genesis.
- Copernicus (d. 1543) devised a simpler and more accurate model, wherein the universe revolves around the Sun.
- Galileo, using his telescope, scientifically proved the Copernican model. He was thus condemned by the Inquisition, and asked to recant he belief. This he did in 1616 and 1633.
- However, the work of Newton and Kepler turned out to show that the Church was **WRONG!**
- While many scientists remained in the Church after this, others felt their pursuit of truth to was incompatible with faith in the Church’s teaching, which they felt denied reason and ignored observation.
- The enlightenment held to two beliefs which became the main tenets of classical physics:
  - Human beings can know the Universe as it truly is – i.e. determinism.
  - This knowledge can be achieved through reason and observation alone.
- As such, the scientific community slowly separated itself from Church control.
- Meanwhile, the Church continued to maintain its authority to in determining what was true and what was not. Although it did not condemn any specific scientific teaching, it still maintained a fundamentalist interpretation of the scriptures.
- The attitude of animosity was further enhanced with the onset of liberalism. Many scientists continued to consider faith to be a hindrance to the pursuit of scientific and objective truth.
- The Ultramontanists, in insisting on Papal and Church authority over truth, furthered this polemic, even though they did not come out outright against any specific scientific theory.
- The development of historical biblical criticism in the 1800’s, allowed for the first time for the possibility that the creation accounts of the book of Genesis should not be taken literally.
- In the 20<sup>th</sup> century, and shown most clearly in Vatican II, **scripture has come to be regarded primarily as inerrant in expressing the revealed truth about faith and salvation (*Dei Verbum*)** which excludes the necessity of holding it as scientifically or historically accurate. Most mainline Protestant churches now also hold this view.
- Science then is regarded as accurate in studying and describing the natural world, whereas theology directed towards the study of the transcendent.
- In 1984, a Vatican commission admitted that the Church had erred in the matter of Galileo.
- For many prominent theologians (eg. Karl Rahner), the contents of science and theology should be studied independently, however they can have points of contact.
- In *Fides et Ratio*, Pope John Paul II maintains the importance of both **faith and reason as both being necessary for true knowledge of truth.**
- Now the Church permits science independence in study, except in those areas that overlap into areas of faith, such as questions about the existence of God, the dignity of humanity, etc.

### *Meanwhile, From Physic's Side...*

**The Scientific Method:** *On the basis of observed data, developing theories that are intended to explain and predict natural phenomena.* A theory is therefore only valid so long as it accurately explains and predicts. Once it fails to do so, it can always be replaced by a new theory.

- Newtonian physics, in the spirit of the enlightenment interpreted this in a deterministic way. It suggested that the universe can be known with complete accuracy and complete objectivity.
- Observations of Michelson and Morley in the late 19<sup>th</sup> century showed that light violated the Newtonian, or Classical, physical model. Newton was WRONG!!
- This paradox was resolved with the formulation of Special and General Relativity, by Albert Einstein, in 1905 and 1915, respectively. This theory was experimentally verified in describing macroscopic systems.
- At about that same time, studies in atomic physics led to the formulation of Quantum Mechanics, by scientists like, Schrodinger, Heisenburg, Dirac, Bohr, and Pauli. This theory has been very successful in explanation and prediction in microscopic systems.
- Thus the scientific method has had to be re-applied: there has been a shift from scientific *law* (Newton's Laws, Kepler's Law) to *theory*.
- So as for the epistemological question: can the universe be known? The best that science can say is, "we don't know." In fact uncertainty is built into the very structure of quantum theory itself. We have to be continually open to the possibility that the universe could present us with new data, which would lead us to reformulate current theory in favor of a new one.
- It also leads us to the conclusion that the pursuit of scientific theory can be very much *subjective*: a scientist may be directed in developing theory by the result they desire to achieve.

### *Current Point's of Contact Between Physics and Theology*

The Existence of God: Some scientists maintain that there is no God because the formation of the Universe does not need a God to create it. Is this so? Does the big bang theory explain *why* the Universe exists? Can science even prove or disprove the existence of a God that *transcends* creation?

Quantum Theology: Can analogies be drawn between the inter-relatedness of atomic particles and inter-relatedness of individual human beings? How far can we go in making these analogies, given that quantum mechanics does not even attempt to describe the macroscopic world, or given that quantum mechanics could be replaced within the next 50 –100 years with a completely new theory?

Anthropic Principle: The universe needs to be exactly the way it is in order for intelligent life to evolve within it. The order of the universe is needed for life. Given all the possible ways the universe could have been, it is therefore very unlikely that it would be the way it is, and that intelligent life should exist. Does this imply the existence of God, as some theologians and scientists think?

The Universe is Really Really Big: On a cosmic scale, the earth, and its history is completely insignificant. How can we then talk about God having an interest in this particular era and this particular planet? Is this idea not *absurd*? If it is, what does this tell us about God?

Omega Point Theory: Based loosely of the theology of Teilhard de Chardin, some believe that as the universe recollapses (if it does), humans will become one with it, and will essentially become one with God, or even become God. How does this fit into our understanding of the revelation and salvation? Is this theory not heretical?

The Infinite Mystery: The more we learn about the Universe, the more we realize how much more there is to know. Could not this be considered analogous to the idea of God as infinite mystery?