

# How Science and Engineering Strengthen Faith

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- **Science:** the systematic study of the structure and behavior of the physical and natural world through observation and experiment.
- **Engineering:** the work of designing and creating structures, products or systems, using scientific and mathematical methods
  - Engineers might be scientists; but engineering, as a discipline, solves problems using known science.

✓ All science and engineering is based on observation, measurement, calculation or experiment

Universally, the notion of GOD refers, by definition, to a SUPERNATURAL being



Most references to GOD refer to a spirit; but some refer to an essence, a principle or an embodied entity



The fact that GOD is supernatural, constrains science, which observes the natural, from measurement, calculation or experimental verification

➡ *By Definition, it's not possible to verify God through science*

# The Classic Statement from Scientists, Engineers and Students:



*"I don't believe in god  
because there is no  
scientific evidence  
which substantiates  
there is a god"*

**From the vantage point of faith, this is often expressed in the Scriptures:**

"No one has ever seen God ..."

"Without faith, it is impossible to please God, because anyone who comes to him must believe that he exists ..."

"... in the wisdom of God, the world, through its wisdom, did not know him"

# The inconsistency of our supposed need for direct evidence in order to believe:

- On every scale, from sub-atomic to astronomical, scientists and engineers take, by faith, what they “know.”
- Indirect evidence, which suggests the veracity of our science and our engineering design is what we rely on.
- That evidence makes our scientific explanation most plausible **OR** makes other explanations highly unlikely

but ... where does that evidence come from?

- Our teachers
- Our textbooks
- Our journals
- Our families
- Our friends
- Our peers
- and (a tiny %): Our experiences

What we learn and accept extrapolates to what we believe in science and engineering:  
- The data points to what we have faith in

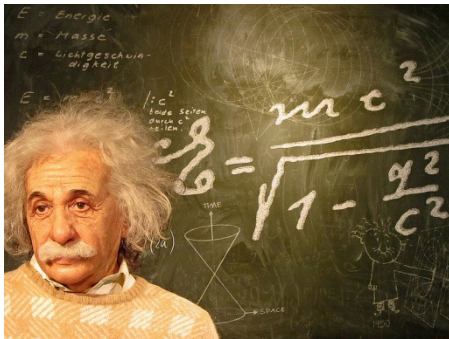


What we learn from the scriptures extrapolates to what we believe about God:  
- The Word points to what we have faith in

*Is there a difference? Does what we observe in the natural universe also point to the supernatural God?*

# Evidence in the Natural World Supports the Existence of The Supernatural God

*I believe it solidly ... but I'm not alone:*



“I want to know how God created this world. I am not interested in this or that phenomenon, in the spectrum of this or that element. I want to know his thoughts. The rest are details.” **Albert Einstein**

“My experiences with science led me to God. They challenge science to prove the existence of God. But must we really light a candle to see the sun?” **Wernher von Braun**



# Examples in Science and Engineering Which Extrapolate to The Supernatural *Things We Teach*

Entropy in the Universe

The Exclusion Principle

Chemical Evolution

DNA Information Theory

The Biological Machine

The Environmental Design of the Earth



$$\Delta S = \int \frac{dQ_{\text{rev}}}{T},$$

# Entropy

$$S = -k_B \sum_i p_i \ln p_i$$

The Second Law of Thermodynamics requires that, in a closed system, every type of order is unstable and must eventually decrease (or Entropy,  $S$ , must increase) as everything tends toward more probable states

Astronomy, with regularity, confirms this Law: measurements of the expansion of the Universe, since the Big Bang, indicate emanation from a singular source

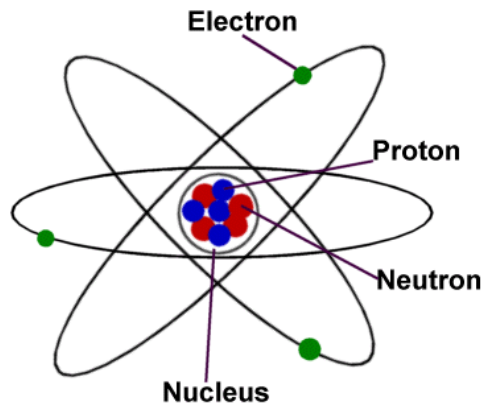
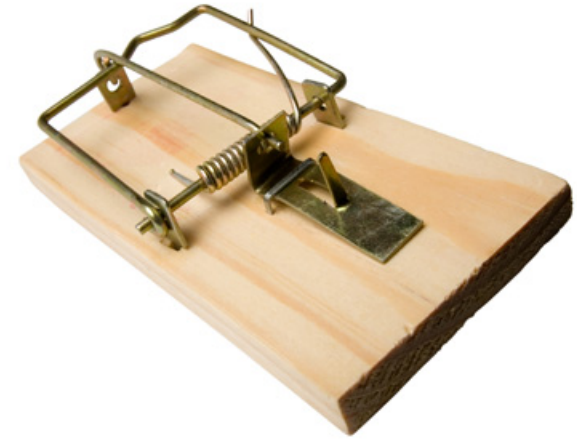
The standard argument: Earth is an open system: it receives energy and matter from other, higher-ordered open systems. Earth's theorized increase in order is "compensated" by comparable or greater decreases outside Earth's system. This has been shown to be mathematically improbable to an extreme degree \*

Astronomical observations, of the Universe's earliest stages, indicate no higher-ordered systems which could contribute to a theorized order increase on Earth

\*) "Can ANYTHING Happen in an Open System?", G. Sewell, *The Numerical Solution of Ordinary and Partial Differential Equations*, 2<sup>nd</sup> Ed. App.D (2005)

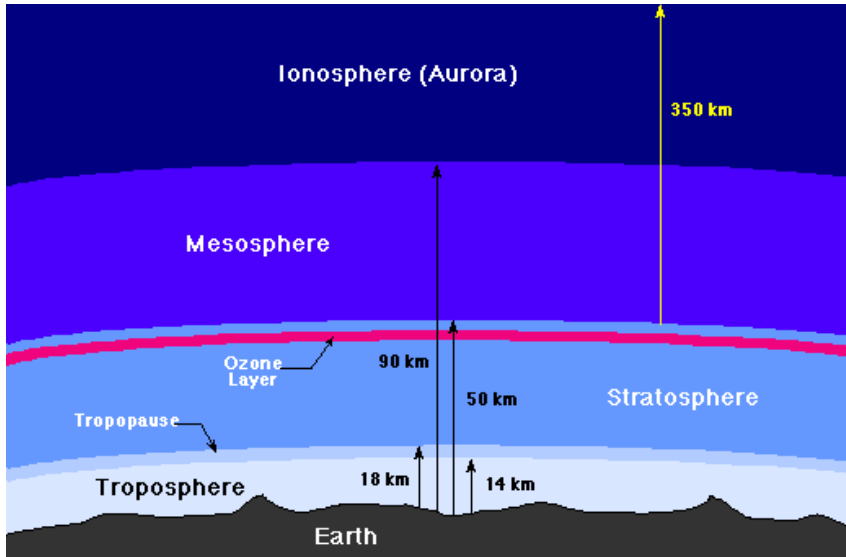
# The Design of an Atom

Biochemistry Professor Michael Behe's famous arguments about "Irreducible Complexity" (Darwin's Black Box, 1996) set the debate in motion about viability of a theory of evolution of species.



The same argument applies to irreducible complexity in the design of the atoms: protons, neutrons, electrons, 25 elementary sub-atomic particles in the 92 observed natural elements.

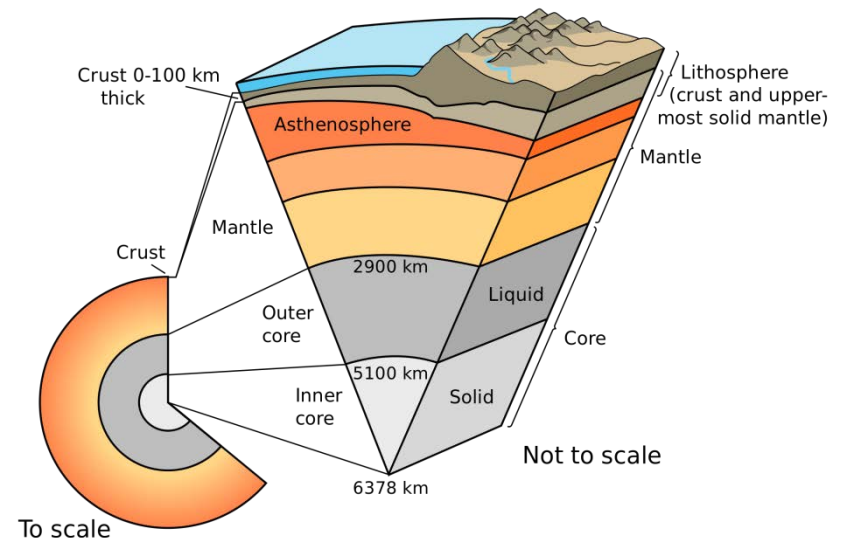
# The Design of This Island Earth



The Earth, domicile for ~8.4 M species, is irreducibly complex in its design for suitable habitat (as is the solar system, and our location in the Milky Way)



Steven Weinberg (Nobel laureate in Physics): “The evidence we can uncover from our Earthly home points to a universe that is designed for life, and designed for discovery.”



# My Role as an Educator:

## Teach all the facts as I know them, Encourage students to draw conclusions

- Faith is in the heart of each individual: you cannot teach it, or impose it; but you can nurture it
- Suppression of the truth, as we know it, is irresponsible and unethical
- Freedom of religion is more than an American value
- I can hope for, and pray for, the salvation of my students; but I cannot demand it



*The fool has said in his heart,  
"There is no God"*

*"The heavens declare the glory of  
God ..."*