Science and Faith: Discussing Astronomy Research with Religious Audiences

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Outline

- **Context for this talk:**
  - astronomy’s role in science outreach, responses to it

- **Distinguish worldviews from scientific method:**
  - different worldviews, same science

- **Importance of *integrity* in the scientific method**

- **Enabling religious (Christian) audiences to accept mainstream astronomy:**
  - without detriment to their faith
  - potentially enriching faith and understanding of God

- **Relevance (or not) of “Intelligent Design” (“ID”)?”**
Overall context

- Our work as research astronomers involves a variety of interactions - relevant here are:
  - with rest of scientific community (carrying out new scientific research)
  - with educators
  - with media/outreach
  - mentoring to students: next generation of scientists
  - directly with the general public
Outreach

• Includes interactions with religious audiences
• Particularly important in light of the following:
  – current movement against, or away from, mainstream science among some religious groups
  – scientific advances (esp. in astronomy) evoke two types of feelings, sometimes strongly coupled:
    ▪ awe and wonder at the beauty and splendor of nature
    ▪ humanity’s apparent physical insignificance in the cosmos
  – many mainstream religious/Christians not necessarily opposed to mainstream science unless they perceive it as being directly antagonistic toward their faith
Outreach (cont’d)

- Religious audiences may not necessarily realize:
  - possibility of accepting mainstream scientific results without detriment to their faith
  - positive interaction between science and faith

- Mainstream research scientists in many cases hold personal religious beliefs of various faiths, including Christianity (including myself):
  - ability to reconcile both personal faith and mainstream science
  - therefore, able to play a useful role in reaching out to the religious non-scientific community
Outreach (cont’d)

• Role in reaching out to the religious public:
  – arises naturally in the course of our obligation as scientists to present scientific research to the public through outreach and education
  – in this talk, focus primarily on the Christian faith since that is what I’m most familiar with (by my own background and through interactions with others)
  – note, however, that many of the concepts may also be generally applicable to other faiths
Different worldviews

- Worldview - overall perspective from which each person perceives and interprets the world, eg:
  - atheist/naturalist: adopts the view that there is no verifiable evidence for a creator
  - theist/Christian: takes on faith the existence of a creator

- Inherently not provable or disprovable:
  - each person develops their own worldview based on their own experiences throughout their life
Different worldviews, same science

- Scientific method is decoupled from worldviews:
  - scientific method involves observation, hypothesis and testing
- This is not to say there is no disagreement, but we need to be clear on where it lies:
  - disagreement is not between science and the Christian faith
  - instead, disagreement is between different worldviews, eg atheist/naturalist vs theist/Christian
- The scientific method itself (observations, hypothesis, validation) remains invariant
Science and Integrity

• Core principle of scientific method is essentially founded on *integrity* (irrespective of worldview - atheist/naturalist, theist/Christian, etc):
  
  – diligent construction of new instruments to provide the most accurate measurements possible (generally aimed at improving over previous instruments)
  
  – hard work in obtaining observations and continually improving data analysis to ensure:
    
    ▪ the highest quality data
    ▪ best possible removal of any instrumental artifacts
  
  – construction of plausible models or theories to explain the observations, and make testable predictions
Science and Integrity (cont’d)

• Integrity of the scientific method is continually reinforced by the process of independent observation and validation:
  – no advantage to being dishonest when doing science
  – all observations and theories eventually subject to independent validation, usually by competing teams!
  – scientific reputation is always at stake

• occasionally scientists erroneously (unknowingly) overstate _level of accuracy_ of results:
  – scientific process automatically provides long-term correction by improved (independent) observations
Science and Truth

• “Search for truth” in science really refers to:
  – “search for, and removal of, errors”
  – or “search for the correct underlying physical explanation, given the current observational data”

• Not to be equated with religious insight attributed to divine revelation, taken on faith

• Science cannot currently prove or disprove God:
  – whether it ever will is a matter of philosophical debate
  – note that ID refers to a “designer” but cannot prove whether this corresponds to the God of scriptures
Key points for a religious audience to realize (which they may not be aware of)

- Not all scientists are atheists or agnostics:
  - many current scientists (and some historically prominent scientists) hold personal religious beliefs of all faiths, including Christianity

- Integrity is crucial to the scientific process, irrespective of worldview (Christian, atheist, etc)

- Scriptures provide a call to understand the universe to the best of our intellectual abilities

- From the perspective of faith, mainstream astronomy in particular reveals God’s attributes (glory, beauty, power, immensity, eternity, etc)
“Two books” - Nature and Revelation

- The “two books” approach, helpful in explaining science to a Christian audience
- God is revealed in two domains, both of which need to be taken into account by Christians:
  - Divine revelation
  - the natural world: fundamental part of God's revelation and therefore must be taken into account
- Underlying philosophy is that both are capable of revealing truth:
  - in different ways
  - different aspects of truth
"Two books" (cont’d)

- Very useful tool for the Christian to resolve conflicts between scientific results and scriptural revelation:
  - “Science can purify religion from error and superstition; religion can purify science from idolatry and false absolutes. Each can draw the other into a wider world, a world in which both can flourish.” ("Pope John Paul II on Science and Religion")

- Biblical interpretation is separate from Divine revelation; prone to human misunderstanding

- Scientific interpretation of nature is also continually revised
“Two books” (cont’d)

• When a difference between scientific and scriptural interpretation arises, need to re-examine our interpretation of both

• Two well-known examples:
  – heliocentric solar system
  – ancient universe

• First, examine the astronomical evidence:
  – in both cases, scientific observations and interpretations are done with integrity and care to ensure the best possible accuracy
  – verified by many independent(/competing!) teams
“Two books” (cont’d)

• Next, examine our interpretation of scripture:
  – heliocentric vs geocentric:
    ▪ interpretation of scripture was eventually revisited
    ▪ understanding is now that apparent geocentric statements
      were made in the cultural context of the time
  – ancient universe vs young-earth:
    ▪ majority of Christians adopt a figurative interpretation of
      Gen. 1-2 in the context of the cultural cosmology of the time
    ▪ Genesis is not intended as a scientific text
    ▪ "days" can mean indefinite periods of time (Augustine)
    ▪ ordering of events in Gen. 1-2 can be figurative or poetic, to
      show the relative ordering of different aspects of creation

• No impact to essential tenets of Christian faith
Responses to nature

• Basic human response to the wonders of nature is awe:
  – either just at nature itself (for non-theist/naturalist)
  – or also at the wonder of God (for theist/Christian)

• These are simply different responses resulting from different worldviews:
  – the wonders of nature don't prove the existence of God, but instead reveal the extent of his attributes and can potentially enrich faith in a believer
  – atheist/naturalist still capable of the same degree of awe and wonder, just doesn’t attribute it to a Creator
Christian responses to nature

• Science reveals attributes about God, enriching faith for those who already have faith:
  – scripture teaches about God's attributes (glory, beauty, power, immensity, faithfulness ..)
  – science reveals the extent of these attributes, enriching the faith of believers who contemplate it

• Eg:
  – age of the universe (God's ancient existence)
  – scale of the universe (God’s immensity)
  – beauty of the universe
  – enormous energies involved (power)
Complementarity of science and religion when it comes to purpose

- (Judeo-)Christian perspective motivates and supports doing science to understand universe
- What role does religion play that is not covered by science?
- One example - religion provides purpose:
  - science cannot answer the question of why the universe exists: not a scientifically testable question
    “Why does the universe go to the bother of existing?” (Martin Rees)
  - in the Christian worldview, humans are created by God to share in his creation as responsible stewards
  - humans also share in a personal relationship with God and with one another
So what about Intelligent Design (ID)?

• Basic tenet of ID:
  – can infer observationally the existence of a designer for the universe

• Essentially proposes an alternative worldview to both naturalism and to Christianity:
  – ID postulates that its worldview has testable observational consequences

• Confusion comes about because:
  – ID is incorrectly equated with Christianity
  – incorrect impression of conflict between science and Christianity
ID (cont’d)

• As we've already seen, Christianity itself and the scientific method can be fully compatible
• The disagreement therefore is actually between:
  – the philosophical worldview of ID (which postulates that the existence of a creator is observationally testable)
  – and the worldview of methodological naturalism (which does not presume a creator)
ID (cont’d)

• Even if ID were valid (earlier today we have seen arguments against it) we need to point out:
  – ID makes no specific statement about the Judeo-Christian God or scriptural redemption and salvation
  – ID makes no statement about the purpose of our existence, only whether a designer is shown to exist

• Thus ID is not equivalent to the Christian faith, which makes explicit statements about:
  – our purpose
  – relationship between humanity and God

• If ID is invalid, no impact on Christian faith
Summary

• Astronomy plays unique role in science outreach
  – captures public imagination
  – evokes awe at natural world, invites contemplation

• Distinguishing personal worldviews from scientific method itself:
  – scientists’ personal beliefs span a wide range of worldviews (agnostic, atheist, theist, .. incl. Christian)
  – scientific method is the same - obs’s, theory models, validation - inrespective of personal worldviews

• Importance of *integrity* in the scientific method
  – always aim to provide the most accurate science
Summary (cont’d)

- Enabling religious (Christian) audiences to accept mainstream astronomy science:
  - show that there’s no detriment to their faith
  - potentially enriching faith and understanding of God
  - no conflict between science and scripture: both reveal different aspects of truth, in different ways

- ID is not equivalent to Christianity:
  - whether or not ID is valid does not impact on the basic Christian tenets of redemption and salvation

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