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 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, e.g.:
  - 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
“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 - irrespective 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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