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

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- 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

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Different worldviews, same science

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- 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

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Science and Integrity

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- 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

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Science and Integrity (cont'd)

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- 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

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Science and Truth

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- "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

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Key points for a religious audience to realize (which they may not be aware of)

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- 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

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- 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

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"Two books" (cont'd)

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- 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

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"Two books" (cont'd)

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- 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

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"Two books" (cont'd)

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- 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

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Responses to nature

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- 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

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Christian responses to nature

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- 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

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- (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

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So what about Intelligent Design (ID)?

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- 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

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ID (cont'd)

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- 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)

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ID (cont'd)

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- 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

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Summary

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- 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 - inrrespective of personal worldviews
- Importance of ***integrity*** in the scientific method
  - always aim to provide the most accurate science

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Summary (cont'd)

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- 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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