The Christmas Star

What was the “Star of Bethlehem”?

Dr. Paul Roche
University of Glamorgan
Cardiff University
Talk outline

• The nativity story
• Problems with dates?
• What might the “star” have been?
  – Lunar eclipse
  – Comet
  – Supernova
  – Planetary alignments
Nativity story


• Attempts at dating the birth of Jesus rely on various clues in the Gospels, and historical and archaeological evidence

• Lots of uncertainties...
Matthew 2:1-12

After Jesus was born in Bethlehem in Judea, during the time of King Herod, Magi from the east came to Jerusalem and asked, 'Where is the one who has been born king of the Jews? We saw his star in the east and have come to worship him.'
Matthew 2:1-12

Then Herod called the Magi secretly and
found out from them the exact time the star had appeared. He sent them to Bethlehem and said, 'Go and make a careful search for the child. As soon as you find him, report to me, so that I too may go and worship him.'

(Herod died between 6 and 4BC)
Matthew 2:16

Then Herod when he saw that he had been tricked by the wise men was in a furious rage, and he sent and killed all the male children in Bethlehem who were two years old or under according to the time which he had ascertained from the wise men.
Matthew 2:1-12

After they had heard the king, they went on their way, and the star they had seen in the east went ahead of them until it stood over the place where the child was. When they saw the star, they were overjoyed.
So Joseph also went up from the town of Nazareth in Galilee to Judea, to Bethlehem the town of David, because he belonged to the house and line of David. **He went there to register with Mary**, who was pledged to be married to him and was expecting a child.

(Global census of Augustus, under Governor Quirinius)
Luke 2:4-11

While they were there, the time came for the baby to be born, and she gave birth to her firstborn, a son. She wrapped him in cloths and placed him in a manger, because there was no guest room available for them.
Luke 2:4-11

And there were shepherds living out in the fields nearby, keeping watch over their flocks at night. An angel of the Lord appeared to them, and the glory of the Lord shone around them, and they were terrified. But the angel said to them, “Do not be afraid. I bring you good news that will cause great joy for all the people. Today in the town of David a Savior has been born to you; he is the Messiah, the Lord”.
Problems with dates...

• Luke states that Jesus born during the **Governorship of Quirinius**, who carried out a census – historical records show this occurred in **6/7AD** (Luke 2)

• **Herod the Great** was alive when Jesus was born (Matthew 2) - but it is known from many historical sources that he died between **6BC** and **4BC**
• Modern historians think Luke* got his dates wrong by ~10 years...

• Luke 3:1 reports that John the Baptist (6 months older than Jesus) started his ministry in the 15th year of reign of Tiberius Caesar (28 AD - 29 AD)

*Gospel of Luke probably written 80-95AD?
• Luke 3:1 says Jesus started preaching at age ~30

• Biblical meeting between John and Jesus would suggest date of Nativity in ~6BC?

• Ambiguity over Jesus birthday – born after **8BC** and before **1BC**?
Geography of the biblical world
Wise men/Magi?

Matthew (only): wise men, or Magi, came from “the east” - then Persia, Arabia and Sheba (now Iraq, Iran, Saudi Arabia or Yemen)

Often 'Three Kings‘ - but Matthew doesn't say how many there were, or that they were kings
They became three because of the gifts they brought with them...
• Magi probably priests in ancient Persian religions such as Zoroastrianism
• Today - astrologers...
• Then - astronomy and astrology went hand in hand with each other
• The magi would have studied the stars religiously...
A star shone in heaven beyond all the other stars, and its light was inexpressible, and its novelty struck terror into men's minds.

All the rest of the stars, together with the sun and moon were the chorus to this star; but that sent out its light exceedingly above them all.

And men began to be troubled to think whence this new star came so unlike all the others.

*Epistle of Ignatius to the Ephesians*
And he examined the Magi saying to them: What sign have you seen in reference to the king that has been born?

And the Magi said: We have seen a star of great size shining among the stars and obscuring their light so that the stars did not appear and we thus knew that a king has been born to Israel, and we have come to worship him.

The Protoevangelium of James
The story so far....

- We are unclear about the nativity story
- Did it happen?
  - if so, when?
  - and who attended?
- So what about the star that was reported by Luke and Matthew?
Possible causes?

• Over the years, many possible explanations have been put forward
• Some involve astronomical (astrological) phenomena
• Planetarium software can re-create the ancient night sky – we can see what the Magi might have seen(?)
Lunar eclipse?

March 13th 4 B.C. - total eclipse of the moon
What is a lunar eclipse?

The geometry of a lunar eclipse
Comet?

Halley’s Comet appears in 12/11BC
What is a comet?

A comet with a tail seen in Capricorn in 5 BC, and a comet with no tail Aquila (perhaps a supernova?), in 4 BC.
Supernova?

Supernova in spring 4BC, recorded in China & Korea (in constellation of Aquila)
What is a supernova?

- Death of a massive star (>5 times Sun’s mass)
- Creates/recycles chemical elements
Universe after the Big Bang...
Universe before supernovae...
Planetary alignments

• A number of planetary alignments have been suggested as being of “special significance” to astrologers

• In ancient Persian astrology:
  – **Pisces** sign of Israel and of Kings
  – **Jupiter** was the Royal planet
  – **Saturn** represented old rulers
Triple conjunction

**Jupiter** and **Saturn** in **7 B.C.** – seen close together in the sky three times

First proposed by Johannes Kepler in **1603**

So a new 'star' being made of **Jupiter** and **Saturn** in **Pisces** would have great significance...
Midnight 29th May 7BC (-6) Looking East
(from Persia/Babylonia)
Midnight 29th September 7BC (-6) Looking West
(from Persia/Babylonia)
Jupiter and Moon in Aries

• Roman coin from ~6AD - symbol of Aries on it, looking back at a bright star
• Astronomer Michael Molnar found a new 'star' - Jupiter and Moon, in Aries:
  - Jupiter is Ruler planet (Roman astrology)
  - Aries is symbol of Israel
  - Moon meant births (especially new kings...)
Jupiter in Aries
During 6 B.C.

Aug 23
Reversed Direction

"Went Before!"
Dec 19
"Stood Over"

April 17
"In the East"
& Lunar Occultation
• 17th April 6BC
• Because it was dawn, glare of Sun would have made it quite hard to see, but Magi would have known it was happening
Astrological significance?

1) The **sun**, **Jupiter**, **moon** and **Saturn** are in **Aries**; **Venus** in **Pisces**; **Mars** in **Taurus** - alignment of five planets and the **sun** and **moon** is very rare/significant

2) **Sun** in **Aries** meant this alignment would be particularly significant for a person born in **Judea**

3) **Jupiter** and the **moon** in same sign meant a powerful leader would be born who would die at an appointed time
4) **Saturn** together makes the ruler “most powerful”

5) Other “attending” planets **Venus** and Mars support the significance of this leader

6) **Jupiter** was moving backward relative to the background sky and indeed would have stood in the east in **Aries**

7) On the day after, **Jupiter** left **Aries** and became visible before sunrise, implying that this “star” would have literally been seen in the east
It’s all about Jupiter...

- Lawyer Rick Larson found that there was a **triple conjunction** of **Jupiter** and the star **Regulus** (in Leo) in **3 BC**
- This is followed by a conjunction of **Jupiter** and **Venus** in **Leo** (Aug. 12\(^{th}\) **3 BC**)
- Six months later, **Jupiter** 'stops' (goes retrograde) in **Virgo** (the virgin...)
Jupiter retrograde motion

- August 12\textsuperscript{th} 3 B.C.
- Apparent motion of “superior planets” reverses in sky
Matthew 2:1-12 again...

“...the star they had seen in the east went ahead of them until it stood over the place where the child was”

Note: the phrase “went ahead” or “going before” often referred to retrograde planetary motion in astrology; “stood over” was also used to denote the point at which a planet’s motion reverses...
Midnight 25th December 2BC (-1) Looking South (from Jerusalem)
Conclusions?

- Various possible contenders for “Star of Bethlehem” or “Christmas star” – but story of star is likely a later insert into biblical account
- Unclear whether nativity story is even vaguely factual(?) – lots of confusion over dates!
- Ambiguity between Gospels over timescale of nativity
- **Planetary alignments** clearly of great astrological significance, particularly those involving Jupiter
Chronology

• Sometime in 4BC - supernova (China, Korea)
• 13th March 4BC – total lunar eclipse
• 17th April 6BC – occultation of Jupiter by Moon in Aries
• May/Sept/Dec 7BC - Jupiter and Saturn in Pisces
• Halley's Comet – Visible through 11BC