

# A Sense of ComMOONity: Observing The New Crescent Moon And Its Role In The Islamic Calendar

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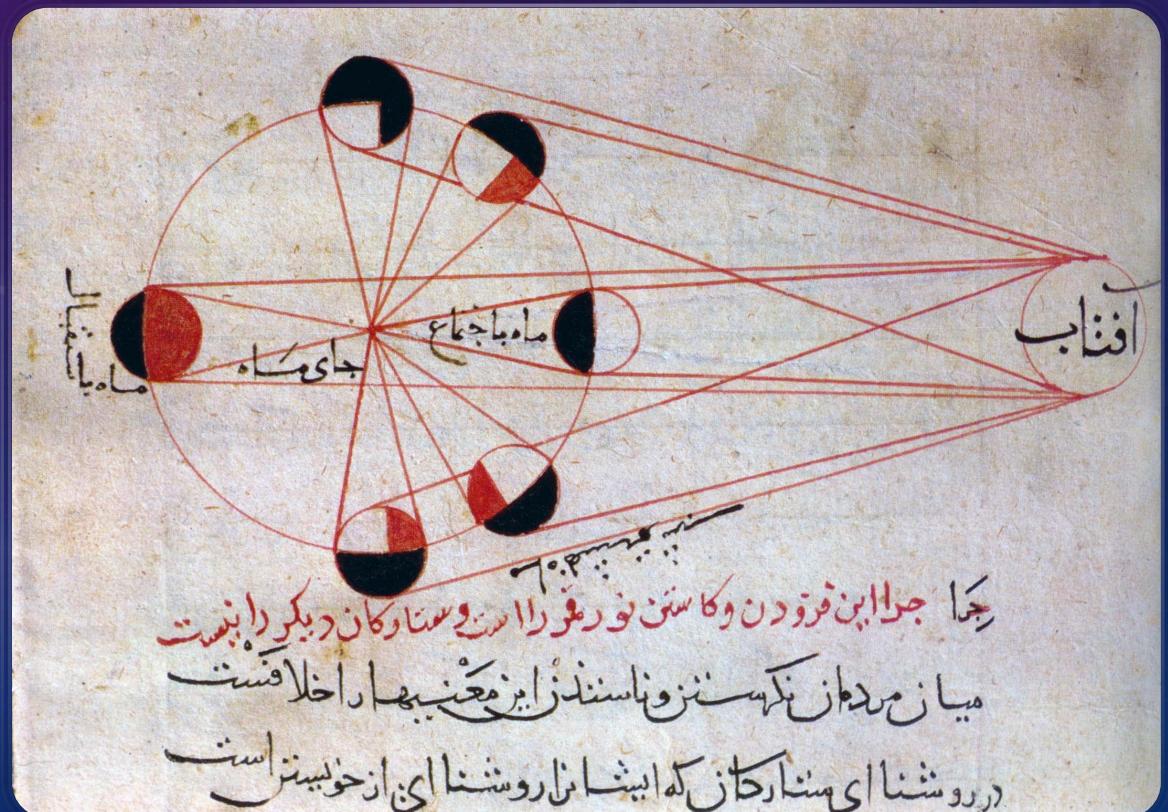
With Imad Ahmed (University of Cambridge/  
New Crescent Society)

And Qamar Uddin (ICOUK)

NAM 2023

MANCHESTER  
1824

The University of Manchester

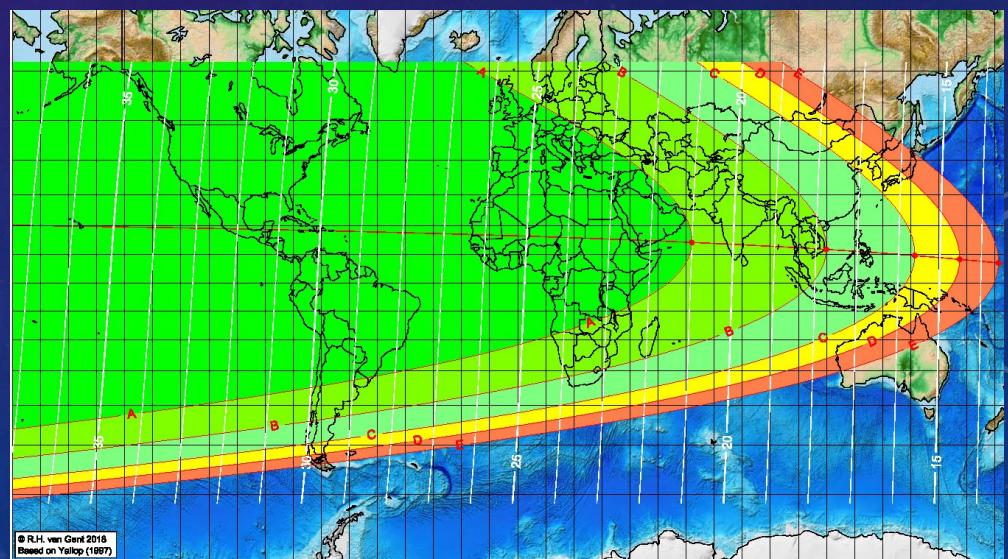


# TALK OVERVIEW

- Astronomy & Islam
- Moonsighting in Great Britain
- Experiences & recommendations

Take-home points from a mix of areas!

- EDI
- Public Engagement
- Academic study



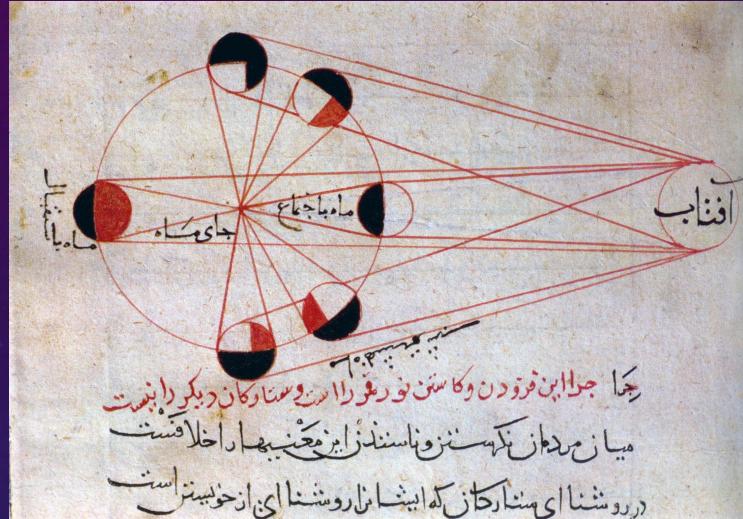
# PERSONAL INTEREST

- Background in ‘amateur’ astronomy. (Local Astronomical Societies do so much for astronomy promotion and education; their value shouldn’t be understated!).
- Very young new crescent is a great observing challenge!
- Family connection: partner is Muslim. His family started asking me about the Moon and it went from there!

Ramadan Moons  
from Manchester

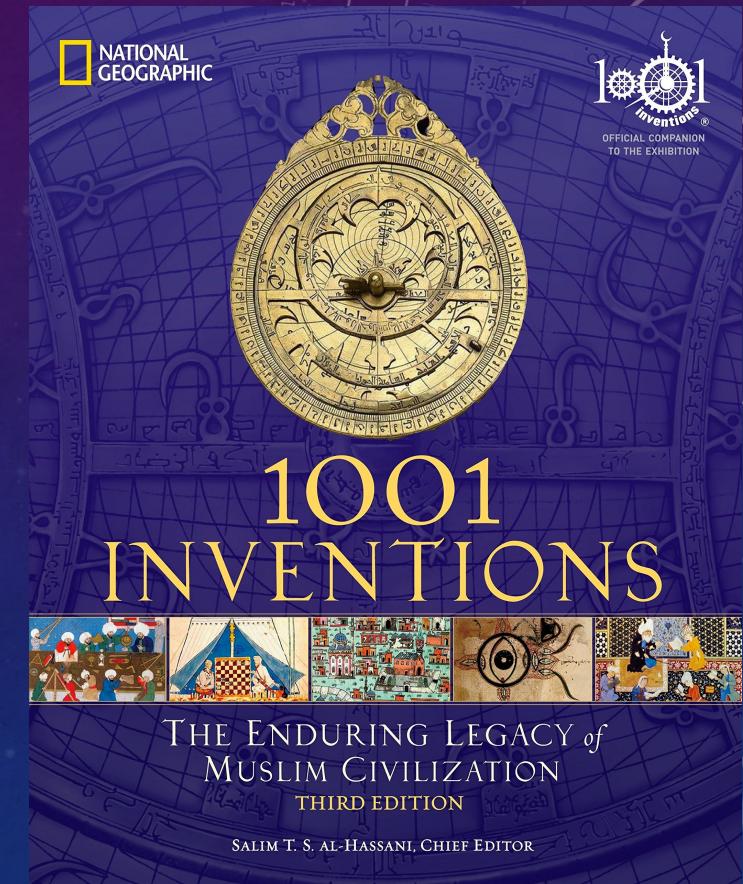


# ASTRONOMY & ISLAM



al-Biruni c. 1000

Diya' ad-din Muhammad  
1663, Lahore



# ASTRONOMICAL TERMS AND THEIR ARABIC ORIGINS

- **Aldebaran** *ad-Dabarān*: the Follower (of the Pleiades)
- **Algol** (*Ra'as*) *al-Ghūl*: (Head of) the Ghoul
- **Betelgeuse** *yad ul-Jawzā'*: hand of the Central One
- **Fomalhaut** *Fum al-Hūt*: Mouth of the Whale
- **Rigel** *Rijl ul-Jabbār*: Foot of the Giant
  
- **Algebra** from *al-jabr*
- **Algorithm** from *Muhammad ibn Mūsā al-Khwārizmī*
- **Zenith** from *samt al-ras* (misread)



The book of fixed stars by  
Abd al-Rahman al-Sūfī (Azophi)

# ISLAMIC CALENDAR

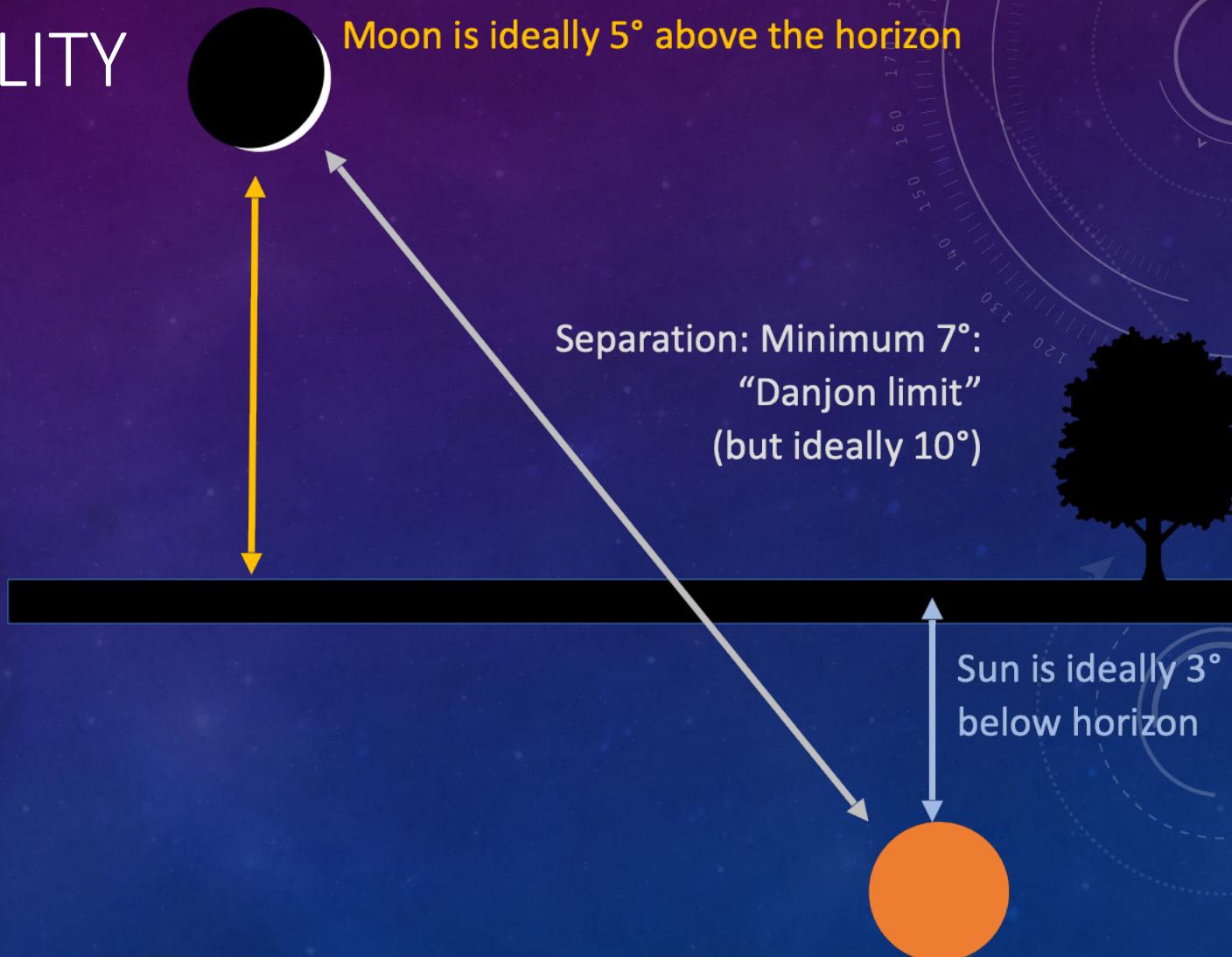
- A lunar calendar based on physical observation of the Moon.
- 12 months either 29 or 30 days long (c.f. lunar month 29.5 days).
- Moves forward by ~11 days each year compared to solar calendar.
- Some months of particular religious significance, e.g. Ramadan and Dhul Hijjah

# ISLAMIC CALENDAR

- Different schools of thought and communities take different approaches.
- Some calculate the calendar based on time of new Moon (e.g. Turkey).
- Some have a mix of calculated calendars and specially observed months (e.g. Saudi Arabia, Umm al-Qura calendar).
- Some observe every month (e.g. South Africa)

# NEW CRESCENT VISIBILITY

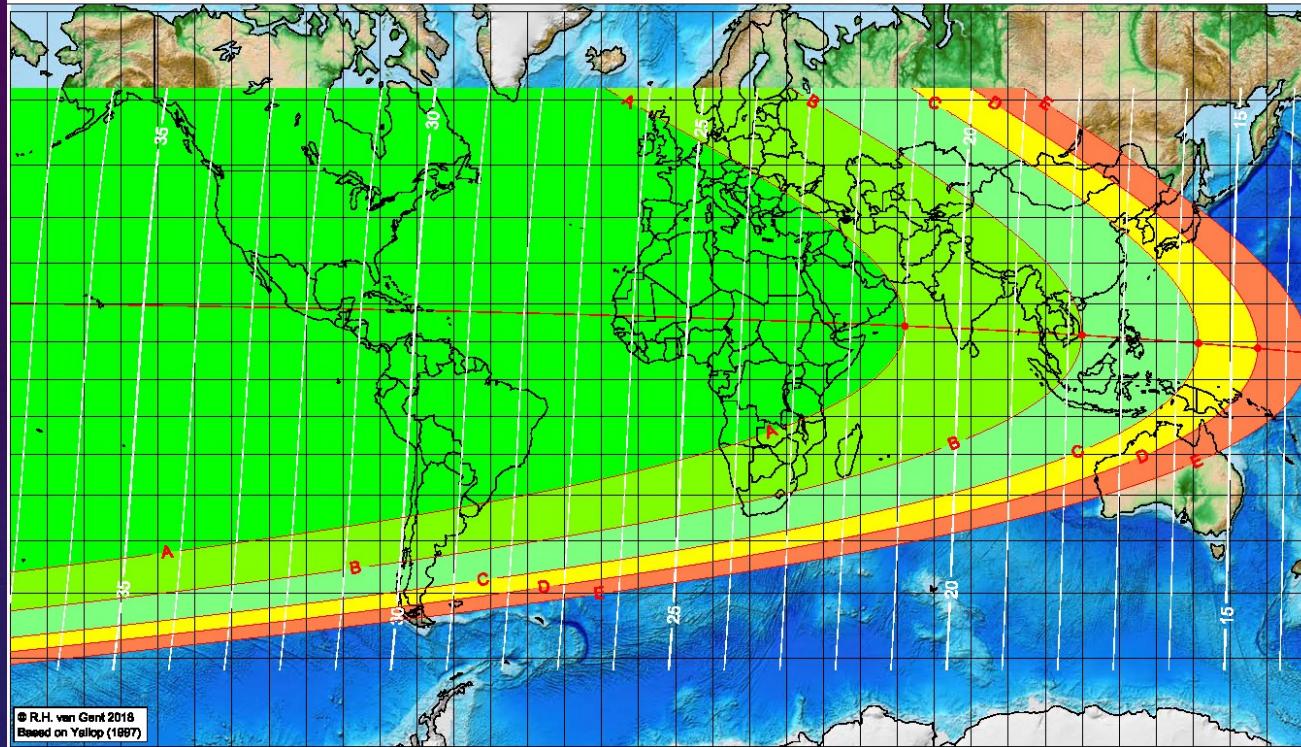
- Moon and Sun are at a 10 degree separation about 18 hours after the New Moon; realistic to see a crescent (with the naked eye) the day after a New Moon (not the day of!).
- Yallop criteria: based on HMNAO paper by Yallop (1998). Dependent on topographic lunar width (function of Sun-Moon sep)



# FIRST VISIBILITY MAPS

## First visibility lunar crescent for Ramadān 1444 AH

Global visibility map for 22 March 2023 [Wednesday]  
Day after luni-solar conjunction



Further West means Moon is “older” at location’s sunset time.  
Crescent gets thicker and brighter and is moving apart from the  
Sun in the sky = more easily visible.

- A: Easily visible to the unaided eye
- B: Visible under perfect conditions
- C: Visible to unaided eye after found with an optical aid
- D: Only visible with an optical aid
- E: Not visible with a conventional telescope
- F: Below Danjon limit

Equatorial

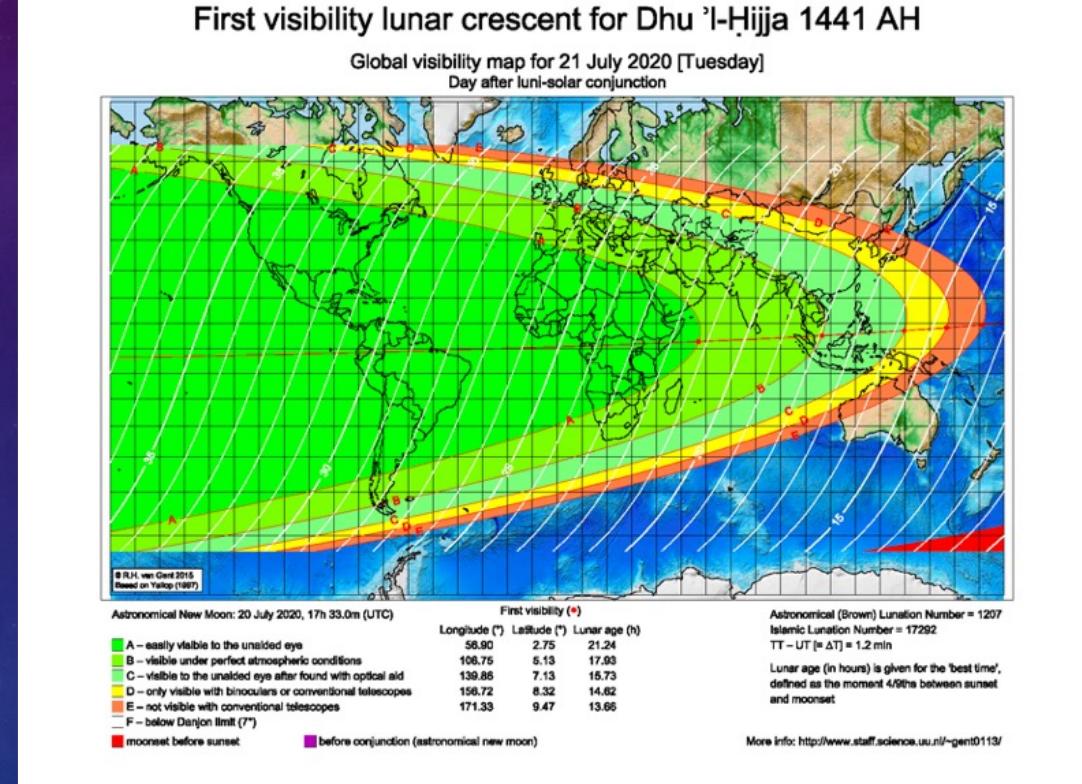
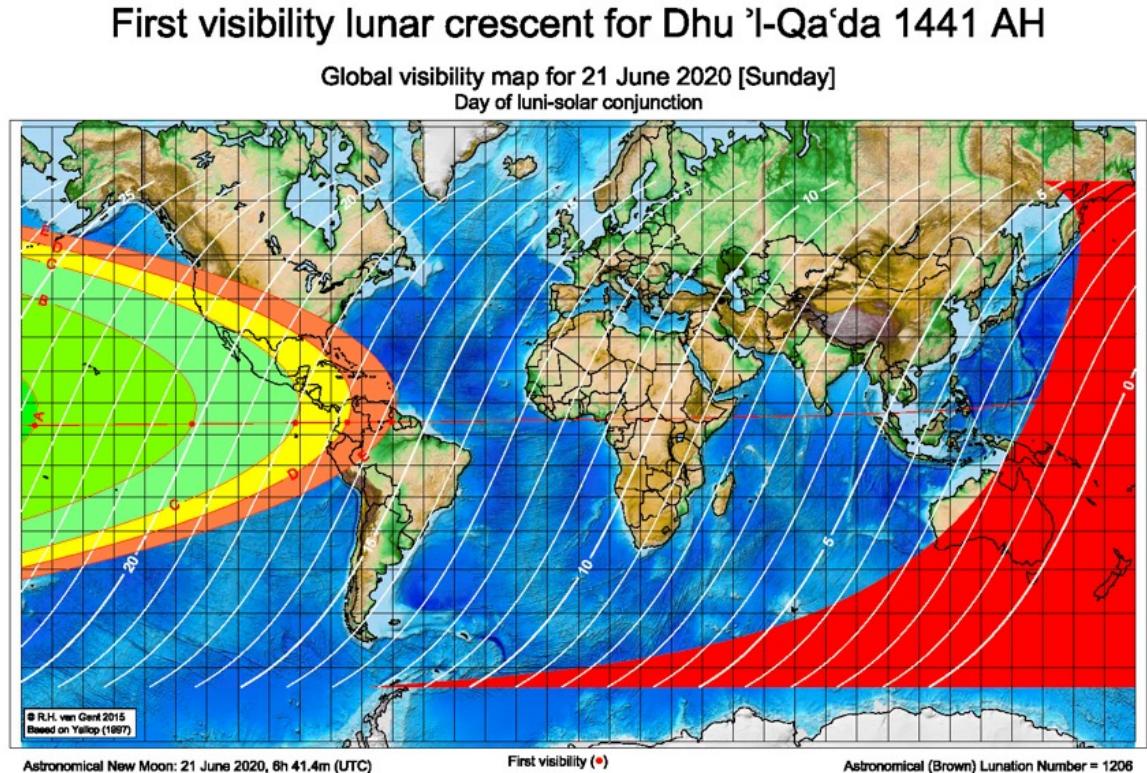


Northern Hemisphere



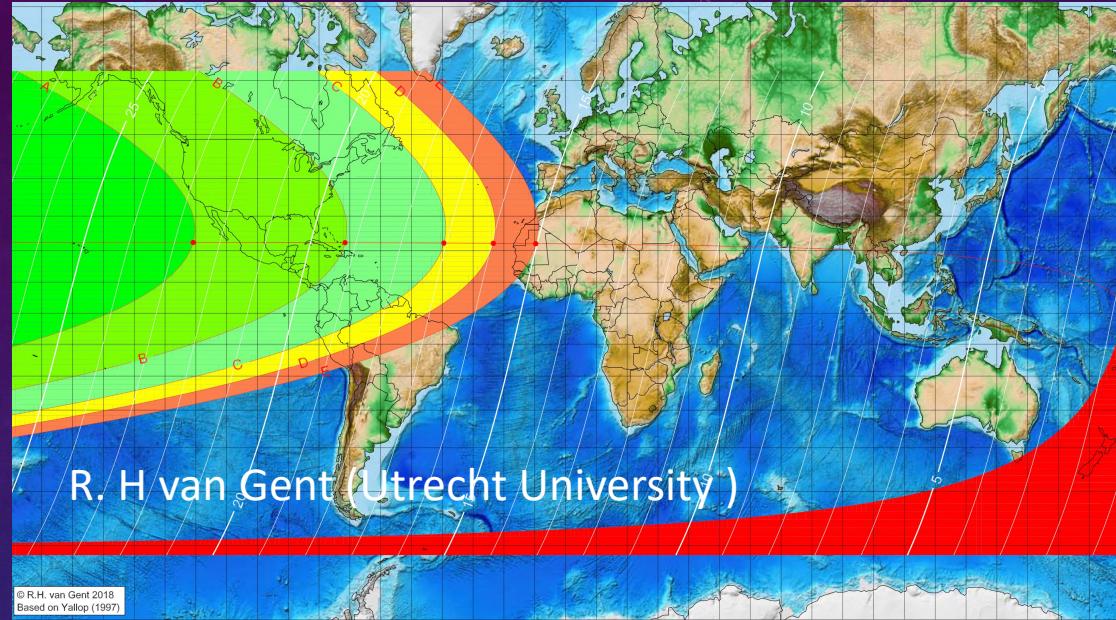
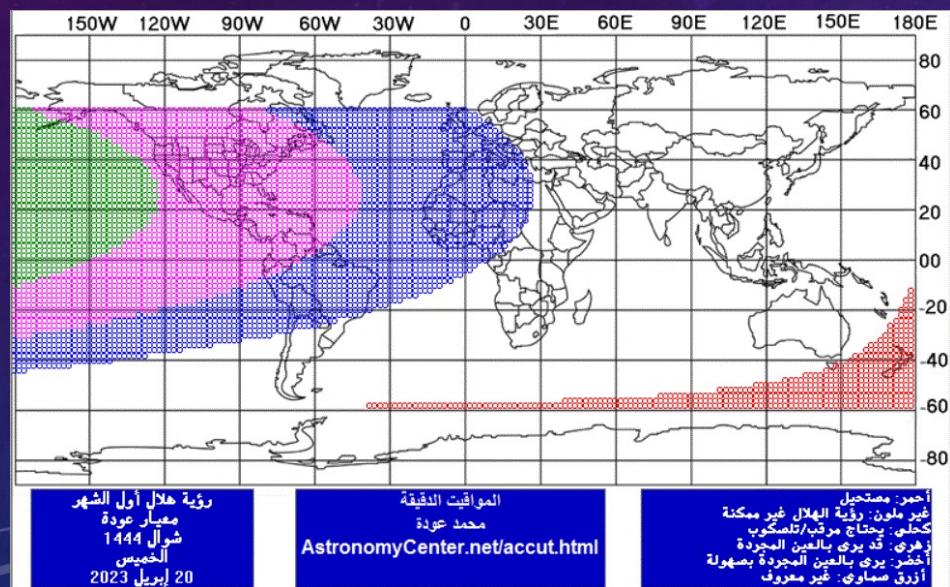
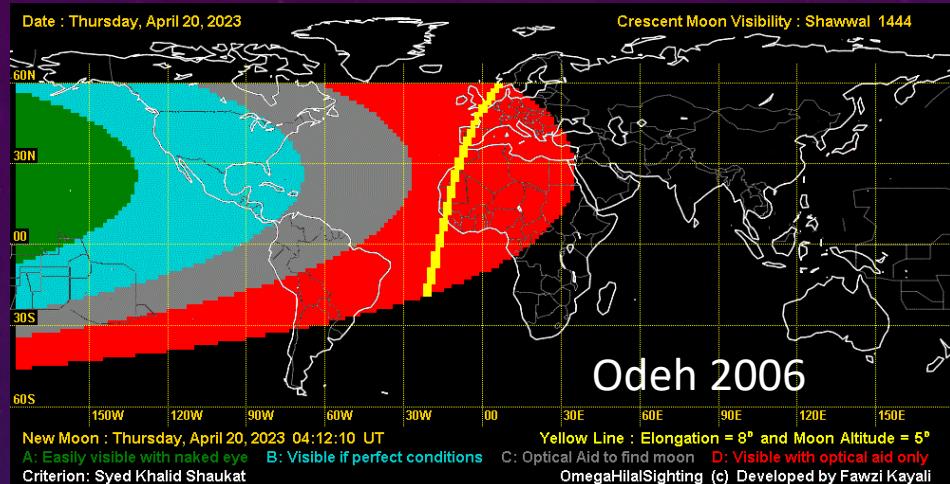
Same elongation,  
different vertical  
separation

# FIRST VISIBILITY MAPS

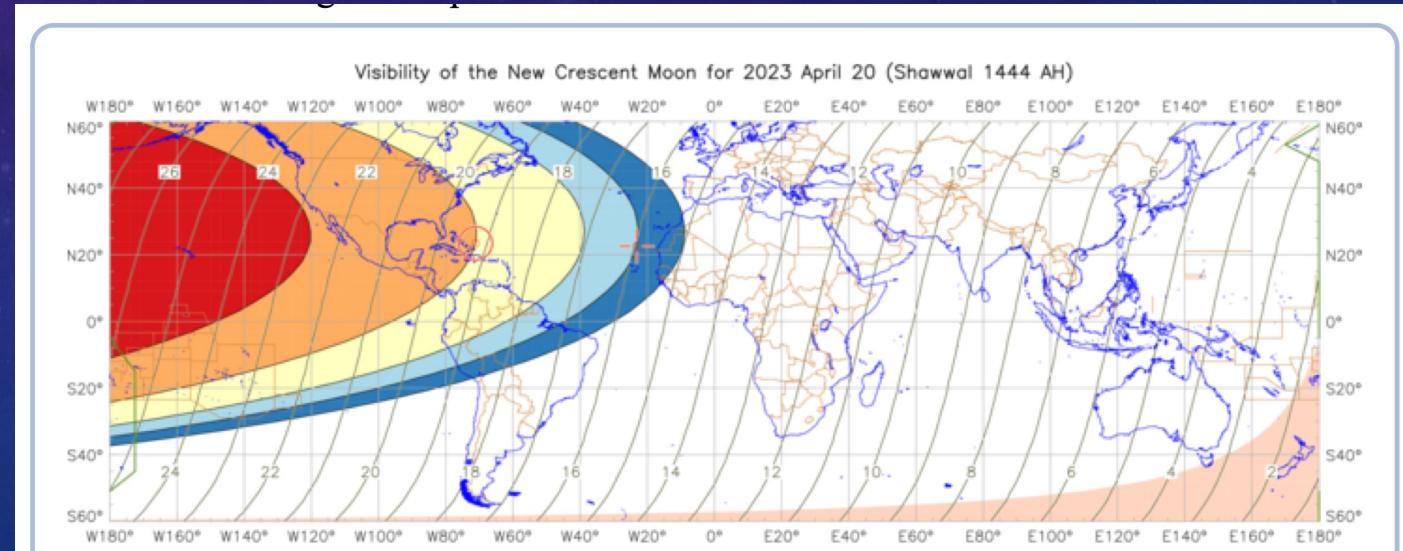


Maps change every month

# FIRST VISIBILITY MAPS



Yallop 1998

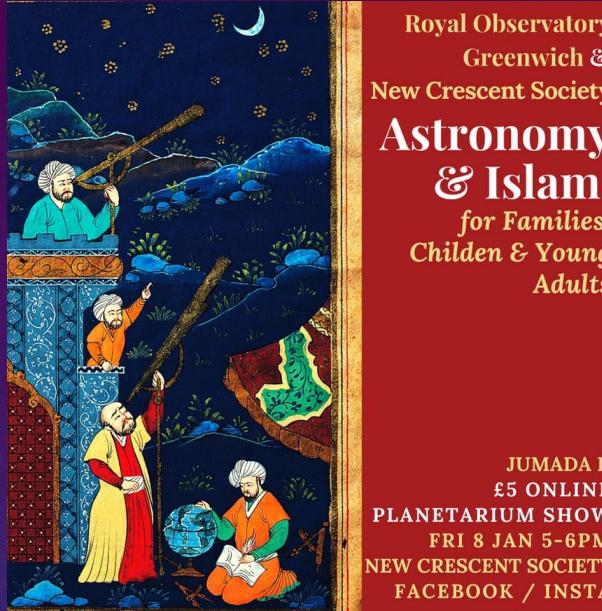


Different maps from different sources. No consensus on a hard visible/ not visible border.

HMNAO

# NEW CRESCENT SOCIETY

- Set up to promote astronomy within the British Muslim community.
- Aims to get people across the UK Moonsighting every month.
- Run workshops and information sessions regularly — partnership with the Royal Observatory Greenwich.



Royal Observatory Greenwich & New Crescent Society  
**"It is a Crescent which Guides us, and Brings Good!"**

Rabi' al Awwal Special Event: Tour of Makkah's night sky when the Prophet ﷺ was born

**BACK by Popular Demand!**  
ONE MORE SHOW!

ONLINE PLANETARIUM SHOW FRI 13 NOV 5-6PM  
BOOK ONLINE: NEW CRESCENT SOCIETY FB / INSTA

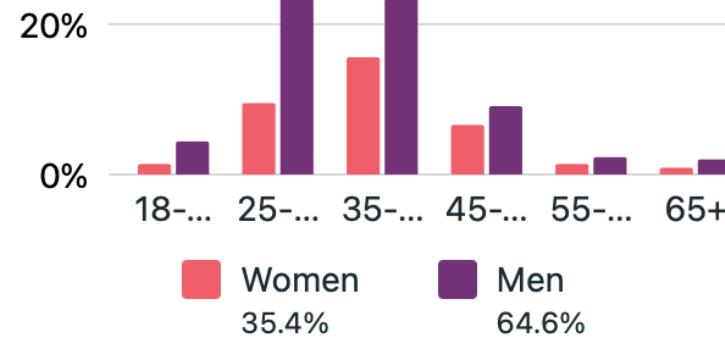


# NEW CRESCENT SOCIETY

Facebook followers ⓘ

22,770

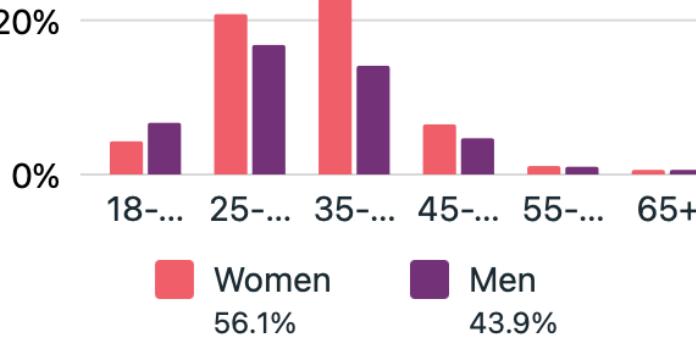
Age & gender ⓘ



Instagram followers ⓘ

5,129

Age & gender ⓘ



Dubhe - It's Arabic for bear! The constellation it's in is the Great Bear (Ursa Major)

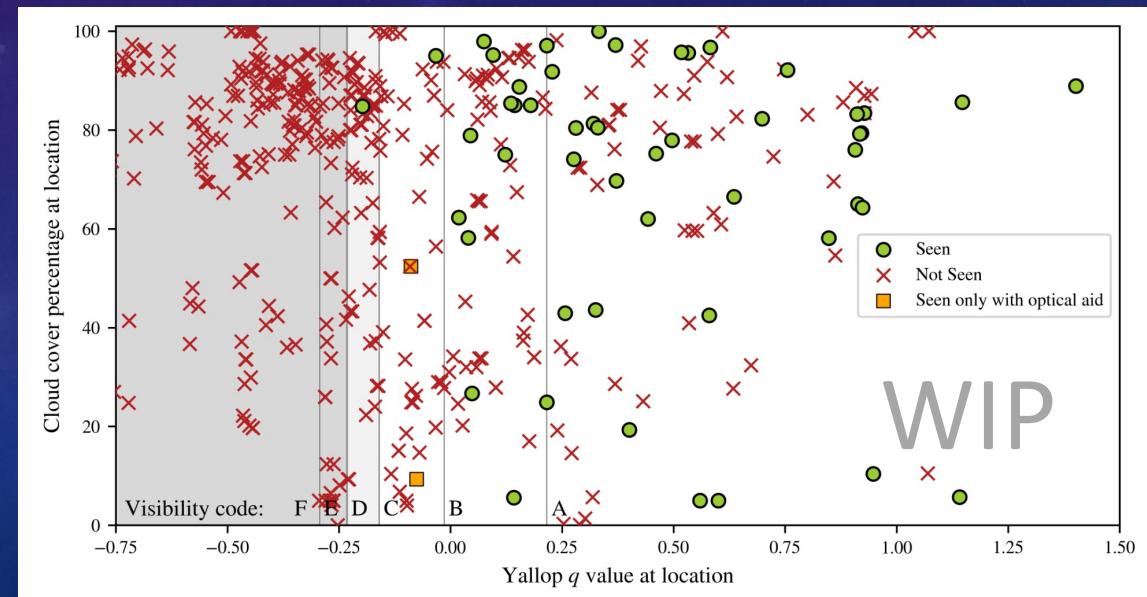
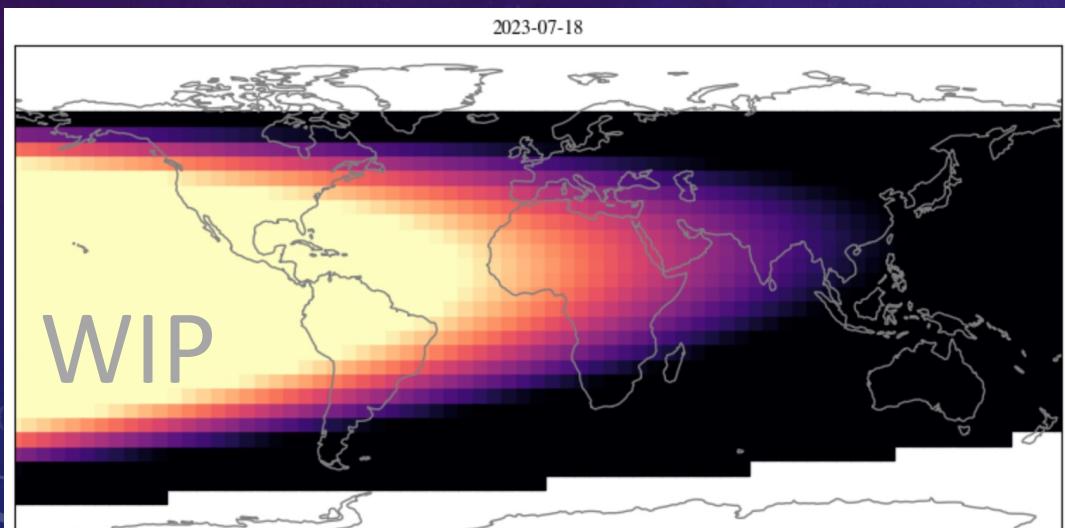
NORTH STAR



Last 2 stars in the 'cooking pot' as I call it, points to Polaris. North Star.

# ACADEMIC WORK

- Applying astronomy skills to help groups like the New Crescent Society who promote astronomy.
- Development of accessible visibility map making software
  - Analysis of data to support a UK-based Islamic calendar



# TAKE-HOME POINTS

Thanks for listening!

- Use relatable aspects of astronomy and work with community groups for public engagement. Reaches people it otherwise wouldn't!
- Work still to be done in making academic departments more inclusive of faith & culture (example first step: why is the pub a default social venue...?).
- Don't know when a religious holiday will fall until sometimes the day before! Be flexible to your colleague's availabilities. Different communities follow different sightings. E.g. last week as Eid al-Adha; some in the UK celebrated Wednesday (following Saudi Arabia Sighting) and others on Thursday (Morocco/ local UK sighting).