

UNANIMOUS STATEMENT OF ASTRONOMERS PARTICIPATING IN THE IIT LUNAR CALENDAR CONFERENCE

If the moon is sighted before the instant of conjunction, then by definition, the sighting is of an old moon belonging to the previous lunar month.

The instant of conjunction can be determined by modern astronomical methods to an accuracy of better than a second of time.

For a given lunar month, we can calculate a curved line west of which the new crescent of the moon must be visible on a particular day (local weather conditions permitting).

We can calculate another curved line east of which the new crescent will definitely not be seen until the next evening, when it definitely will be seen.

At high latitudes outside these lines the moon may not be seen on either day and conventions must be adopted to resolve that problem.

Between these two lines is a small **zone of conditional visibility**¹ for which observation is difficult, but if conditions are favorable it is possible for a sighting to occur in this zone. Conflicting reports inside the zone of conditional visibility are due to the *observational* difficulties of detecting the new crescent inside that zone. Reports of a sighting from this zone on the earlier evening must be carefully investigated before acceptance. We recommend that, as a minimum, the age of the observer and questions in the appended "Crescent Sighting Report" (designed by Charles Evans) be

1. It is this zone which the astronomers refer to as the "zone of uncertainty." It is important for nonscientists to bear in mind that the terms "uncertainty" and "error" have a technical meaning for scientists different from that of common parlance. The uncertainty here refers not to mistakes in calculations but to the fact that the actual observation is affected by variations in parameters that cannot be known in advance. The width of this zone is relatively small compared to the circumference of the earth.

asked of the *shāhid*. Other pertinent questions, for example, to ascertain the visual acuity of the observer, should be asked.

It is possible to calculate a time before which initial visibility is impossible. This time is a function of several variables, including lunar age and moonset lag, and it **must** be calculated for each lunation. It corresponds to the easternmost point of the **zone of conditional visibility**.

A moving Lunar Date Line (as described by Ilyas) will generally result in an Islamic day of the month spanning two solar dates. Any moving international lunar date line must result in 29 day months in one part of the world and 30 day months in another part of the world at the same time.

If strict local visibility is required, there will be seasons of months of longer than thirty days at high latitudes.

If strict local visibility is required, then some "villages" in the zone of conditional visibility may see the moon while others *west* of it may not.

From the time the new crescent is first sighted at a given latitude, it will take 24 hours before it can be seen at every point along that latitude.

No matter what basis is used, conventions for the purpose of an international lunar calendar are unavoidable.

Observation from high-flying aircraft deserve investigation as a method which may reduce the width of the zone of conditional visibility.

Astronomy is a physical science distinct from astrology and does not support astrological prediction of human action.

Calculation is not estimation.

Calculation does not require a month of fractional days for *any* system. For example, in a system based on conjunctions, the new month would begin at sunset after conjunction, except at high latitudes where a convention must be adapted for any system, including observed sighting.

Contradictions between countries using calculation are due to the fact that they are calculating different things.² If the *fuqaha* provide a uniform

2. Some calculate the time of conjunction before sunset, some the time of conjunction before midnight, some the formation of the crescent defined by an obsolete value of the Danjon limit, some the "optimal time of visibility" according to the "the Babylonian rule," and others the expected time of sightability by various criteria.

definition of what they want calculated, this sort of contradiction should not occur.

After consideration of comments to a first draft provided by all the participants at the conference, the preceding statement was unanimously adopted by the professional astronomers attending the conference:

Imad A. Ahmad (Imad-ad-Dean, Inc.; University of Maryland)

LeRoy Doggett (U.S. Naval Observatory)

Mohammad Ilyas (University Sains Malaysia)

Fakhraddine Karray (University of Illinois)

Ali Kyrala (Arizona State University)

Hussein Kamal-ad-Din

Ahmad Massasati [now at the University of New Orleans, Ed.]

Bradley Schaefer (NASA/Goddard Space Flight Center)



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Crescent Sighting Report

Date of observation

City/Town

Name: Tel.#

Address

Exact location from where observed :

When did you see it first:	Before sunset	1-2 minutes after sunset	3-5 min. after sunset	6-10 min. after sunset
Exact time when you first saw the moon:	10-15 min. after sunset	20-25 min. after sunset	25-35 min. after sunset	Using Binoculars Naked eye

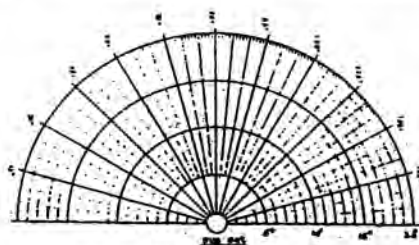
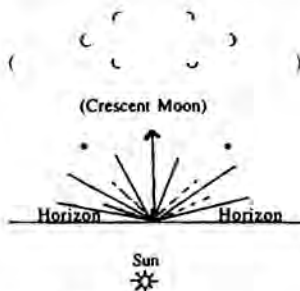
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Were you able to see by naked eye? Yes / No Were others able to see it? Yes / No Glasses

How long was it visible? Less than a minutes 1-2 minutes 2-10 minutes 10-15-20-25 Min.

Sky conditions where you saw it:	Clear blue	Clear white	White Haze	Pink haze
	Thin gray clouds	Heavy clouds	Rainy	Foggy
	Other			

Where did you see it? Left or Right of the sunset High Very high in the sky Low Close to the ground



Mark ↑ at west point

Please make a sketch of the crescent moon as you see it. Be sure to include a reference to TRUE WEST, the position of the sun at sunset, the shape of the crescent and the direction of its horns, any star.

Other witnesses with you: 1.

Tel.#

Saw by himself Yes / No Time..... For how many minutes

2.

Tel.#

Saw by himself Yes / No Time..... For how many minutes

3.

Tel.#