Prosiding Persidangan Antarabangsa Falak di Dunia Islam
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Unified World Islamic Calendar Sharia', Science, and Implementation Through Half a Century

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Abstract: Some issues concerning the critical nature of unity of correct time and why we all need to devote our time and energy to try and handle the development and re-establishment of correct Islamic calendar on modern globalised setting. The research focuses on unified world Islamic calendar which can be used in the whole Muslim world. The research objective is to standardize the basis for calculating the beginning of each Hijri month in every country or community. Research findings enlighten that this has been realized through a multi-pronged intensive International Islamic Calendar Programme (IICP) undertaken over the last 40 years involving practically all Muslim countries and communities worldwide and including major organizations like the Organization of the Islamic Cooperation (OIC), Rabeta, Jakim, COMSTECH, academic institutions and a multitude of individuals through numerous publications, data banks, books, and conferences. It's over a 40-year old initiative towards a unified Islamic calendar. This global effort aims at bringing good science close to Shari'ah and practicality through making progress on convergence of Islamic observance for the start of Islamic months.

INTRODUCTION

*Allah SubhanahuwaTaala*in His infinite mercy tied up science and technology to our needs for discharging our duties to Him in the usage of TIME in such a way that it helped develop science and technology as an urgent need for the community.

Unity of TIME is so important that Allah uses TIME as an element of 'Oath' in Surah Al-Asr. During the Last Pilgrimage (Hajj) by Prophet Muhammad, the issue of the correct Islamic calendar basis was one of the important messages delivered. This shows the critical nature of unity of correct Time and why we all need to devote our time and energy and handle this issue of development and re-establishment of a correct Islamic calendar on global and local levels.

The process of keeping track of time is almost as old as human civilization. Although today we widely use the sun for this purpose, it is only rather recently that the sun became dominant over the moon in this sphere of influence. The basic reason behind the early choice of the moon for calendrical use was its astronomical strength and superiority over the sun for an unaided yet simple and accurate cycle-system of time keeping. It is therefore, not surprising that almost all early civilizations started with the lunar calendar – Babylonians, Greeks, Jews and Egyptians in the Middle Eastern zone; Aztecs and Incas of the West; Chinese and Hindus of the East. Almost all of them carried on with the use of a purely lunar system initially, but eventually transformed it into a luni-solar system in which the system is basically lunar as far as the cycle (month) is concerned, but the lunar years are adjusted once in a while by adding an extra month to keep the seasons approximately around the same months. This practice carries on to this day in cultural/religious calendars of the Chinese and Hindus in contrast to the Muslim's use of a purely lunar system of fixed number of months to a year.

JULIAN SYSTEM

Julius Caesar in 46 B.C., 'the year of confusion', decided to replace the seasonally adjusted lunar calendar by a purely solar one (complied in 45 B.C.). It seems that it was not really so much the lunar calendar itself but the misuse of power by pontiffs in the matter of 'intercalation' which angered him enough to take that step. However, this did not really matter significantly for the importance of the moon until more recent times when Western civilization spread to the Americas and the Europeans colonized other parts of the world and thus gradually the Western calendar began to become dominant.

The Julian solar calendar of 45 B.C. accumulated an error of some 10 days by late 16th century C.E. It was this slow cumulative error which led to the Gregorian Reform of 1582 C.E. (by Pope Gregory) whereby the solar date was advanced by 10 days (Oct. 15 followed Oct. 4) and the additional quad-centennial rule of only 28 days in February was introduced. England did not agree to adopt the Gregorian correction until 170

years later in 1852 when in England Sept. 14 followed Sept. 2. On this occasion, England also shifted the start of the New Year to January 1 from March 21.

These chaotic practices in the use of solar calendar only go to reflect the intrinsic strength of the lunar calendar system which, in its over 5,000 years' recorded history, never gave a real cause for concern.

PRESENT NEEDS

In the present times, if a calendar is to serve a practical use on global scale, the dates have to be inter-related between any two places through a Date Line.

Both lunar and solar systems are basically local and in Europe as elsewhere, time and date was reckoned according to the local meridian of each place until nearly the end of the last century. But near the end of the 19th century, the introduction of the telegraph, trains, fast travel, and good time- clocks changed all that. It is here that the solar system began to be internationalized with the arbitrary adoption of Greenwich, in 1884, as the Prime Meridian. In fact, there were 10 strong contenders including Jerusalem and the Pyramids for the selection of the Prime Meridian. The adoption of the Prime Meridian gave rise to the International Solar Date Line (180^o longitude line) i.e. Anti-Prime.

It is here, in the matter of a Date Line, that the lunar calendar got stuck and was left behind, and it is this need of a Date Line for Lunar calendars that I had the pleasure to undertake research work for the Islamic lunar calendar during more than 35 years.

International Islamic Calendar Programmeis a 40-year old initiative for the establishment of a Unified Islamic Calendar. This global effort aims at bringing good science close to Shari'ah and practicality of a time systemthrough convergence of Islamic observance for the start of Islamic months with modern science and technology within the ambit of sharia'.

BASIS

The Islamic lunar calendar is based on the monthly lunar cycle. It is a manifestation of close interaction of science, Shari'ah and society. Unfortunately, due to some confusion on scientific aspects, the Islamic calendar practices underwent some serious problems about 50 years ago which resulted in the use of several different methods of calculations worldwide, varying within countries and from one country to another and resulting in public chaos over the years.

A new system puts us back on track. This has been realized through a multi-pronged intensive International Islamic Calendar Programme (IICP) undertaken over the last 40 years involving practically most Muslim countries and communities worldwide and including major organizations like Organization of the Islamic Conference (OIC), Rabeta, Jakim, COMSTECH, academic institutions and a multitude of individuals through numerous publications, data banks, books, and conferences.

Our primary focus under IICP has been:

- To standardize the basis for calculating the beginning of each Hijri month in every country/ community.
- The basis is to be the scientific expected visibility of the new crescent.
- Use of this information through the systematic use of International Lunar Date Lines (ILDL) in determining sighting reports and the beginning of all months but in particular the months of Ramadan, Shawwal, and DhulHijjah.

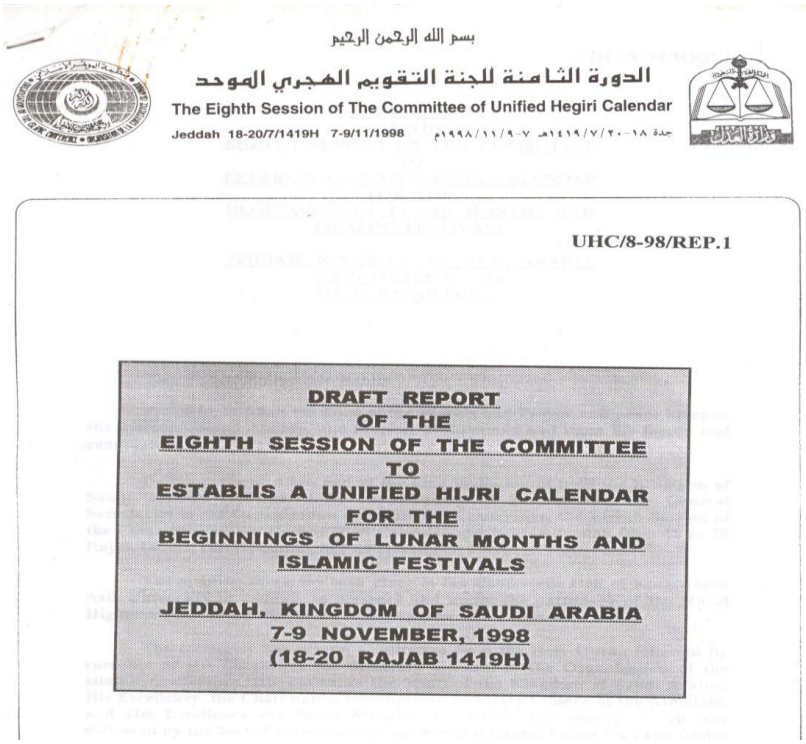
Although we need to implement unified expected visibility criterion for every place or region, but we would make practical simplifications in usage with '*ekhtlaf al-matale*' consideration [one sighting is sufficient for a whole region sharing same night] provided by Shari'ah.

GLOBAL ACCEPTANCE

Indeed this unification need has been established through many conference resolutions over the years and there is an increasing recognition of our task and goals through various workings e.g.:

Istanbul Resolution 1981; Pakistan Resolution 32: 1983, Intl Conf S&T in The Muslim World; Virginia Declaration, 1987; PENANG Resolution, 1988; Delhi Resolution, 1989; Islamabad Resolution,1990; *PENANG DECLARATION, 199; COMSTECH / OIC Resolution 1991;* Saudi Arabia Decree 1998; OIC Jeddah RESOLUTION 1998; Jakarta Resolution 2007; *Makkah Resolution 2012;* Istanbul resolution 2015 and many other similar agreements over the last four decades.

We may add that the Mecca Declaration helped to reestablish the modern effort to move away from the old Ummul Qura system of conjunction to the new improvement of moonset after sunset as azero order *Imkane ru'yah* basis and to be worked upon through new research project initiatives.



بسم الله الرحمن الرحيم

الدورة الثامنة للجنة التقويم الهجري الموحد

The Eighth Session of The Committee of Unified Hegiri Calendar

Jeddah 18-20/7/1419H 7-9/11/1998

UHC/8-98/REP.1

DRAFT REPORT OF THE EIGHTH SESSION OF THE COMMITTEE TO ESTABLIS A UNIFIED HIJRI CALENDAR FOR THE BEGINNINGS OF LUNAR MONTHS AND ISLAMIC FESTIVALS

JEDDAH, KINGDOM OF SAUDI ARABIA 7-9 NOVEMBER, 1998 (18-20 RAJAB 1419H)

Through the Qur'anic (9:36) verse,

"*The number of months in the sight of Allah is twelve in a year*"

the many possibilities linked to the scientific basis of using the lunar calendar was narrowed down to just one thereby converging to the single way of usage by combining sighting, calculations of expected visibility, and non-interference from administrative machinery by removing the practice of adding a thirteenth month irregularly (which is known as intercalation).

This established the natural time regulation into the Shari'ah domain of 'Lawful and Prohibited' perspective.

THREE STEP IMPLEMENTATION PROGRAMME

We aimed to establish a unified global basis for a World Islamic Calendar through a 3-Step Implementation Plan (3-SIP) to be adopted by each country/community to follow:

Step 1: Use the same basis (criterion) for the calculation of beginning/ end of each and every month of a year i.e. for all 12 months.

Earlier in many countries use of different basis was being used: for example using imkane-Ru'yah for some months and conjustion for others and sighting for a few.

Step 2: Use *ImkaneRuyah* (expected visibility) criterion as the basis, together with the associated concept of International Lunar Date Line (ILDL) for global uniformity.

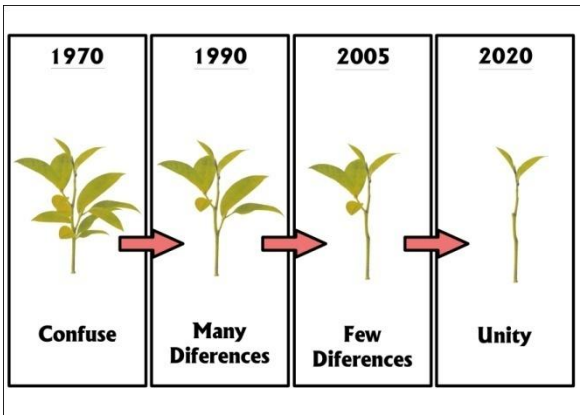
Earlier different places used different basis: conjunction before midnight at Greenwich, conjunction before midnight locally, conjunction before sunset, conjunction after sunset, moonset just after sunset, expected visibility, and sighting.

Step 3: Use modern scientific criterion for *ImkaneRu'yah* (such as the one developed under IICP) with regular review process on science and practical considerations for application as and when necessary

Previously a variety of criterion were being used as basis for expected visibility which have been now reduced to just a few:

We are pleased to record major successes: global at Step 1 and Step 2 has reached 100 percent level.

We need all countries to use one criterion for expected visibility, uniformly and practically. The progress in unifying the use of criterion is illustrated by the following diagram.



This practice of using shari'ahand science together in dealing with the Islamic calendar usage is well reflected by a quotation from the work of a 6thcentury (Hijrah) Jurist Qadi Ibn Rushd:

"What is dictated by analogy and experience is that the new moon cannot be seen when the sun has not disappeared yet, unless it is far away from it, for at that time it is greater than the arc of vision, though it varies growing greater or lesser, but it is unlikely -- Allah knows best -- to be so large as to be seen when the sun has not gone down yet. The best reliance in this matter is on experience, as we have said. There is no difference here whether it is before the declining of the sun or after it, and the thing to be considered is the disappearance of the sun."

SCIENCE

In order to establish a local calendar according to shari'ah, we need to sight the new crescent moon in the evening horizon at a place after sunset. To do this successfully, we need to calculate our calendars based on the expected visibility of the new crescent moon.

Also, we need all countries to use one criterion for expected visibility uniformly and practically. In a layman's terms, the calculations should be made to show that the moon is located atleast above the local horizon at the time of local sunset in a way we would need the sun to be above the local horizon for it to be seen by people from the surface; for the moon, the crescent has to be somewhat higher up from the horizon compared to the sun since the moon is not a self-lighted body whereas the sun is.

So, for the sighting of new moon, in a similar way as explained in the foregoing, since the moon has no light of its own, it has to have light shown on it from the already set sun for the moon to reflect some of this towards those observing the We can explain this by a simple example. It is somewhat similar to looking for a seat in a dark cinema or activity hall. As we enter the dark hall (lights switched off), we cannot find our seat because our seat does not emit light like a switched on bulb or sun (in the day time) and we cannot see things if they do not emit light. For us to see our seat we are helped by a person who directs a beam of light from his torch on to the seat and by reflection the seat directs some of this light in our direction and we can see it and follow in that way. Of course, after a while, we can begin to see people around and those hanging up there for direction; that is another phenomenon called dark adaptation and plays an important role in the exercise of sighting the new moon after sunset. This means that it is easier to see new moon a little later when the sunlight's glare is gone and our eye is adapted to fainter light.

New moon and see it. The light for this has to come from the sun after it has set and gone below horizon and it directs a beam on to the moon like the torch light beam we mentioned earlier. We can recognize that higher the moon at the sunset time, the bigger portion of lighted part of the moon faces us and thus we see it more easily.

CRITERION

The evolution of criterion and global visibility of the new crescent moon during thelast 3000 years -- including theoretical physics and observational approaches --is summarized below:

- *.Summary of observation-based new moon's visibility criteria*

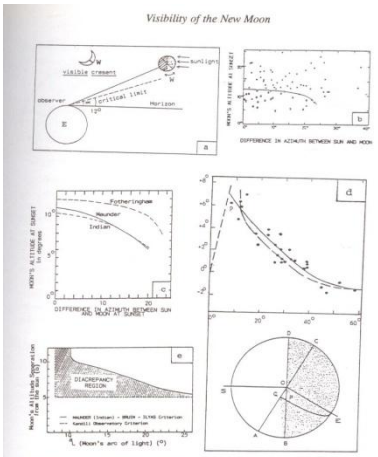


Figure 4.1b. Examples showing the evolution of 'observational' criterion: (a) Ancients, 100 B.C.: the 12° marked on the Fig. refers to the a value adopted as a standard for criterion of earliest visibility; (b) Fotheringham, 1910; (c) Maunder & Indian (Schoch) modifications, 1911/1960; (d) Danjon, 1932 and Ilyas, 1983 & Danjon Limit's geometrical configuration; (e) Istanbul/Danjon 1978.

- *Summary of physics-based new moon's visibility criteria*

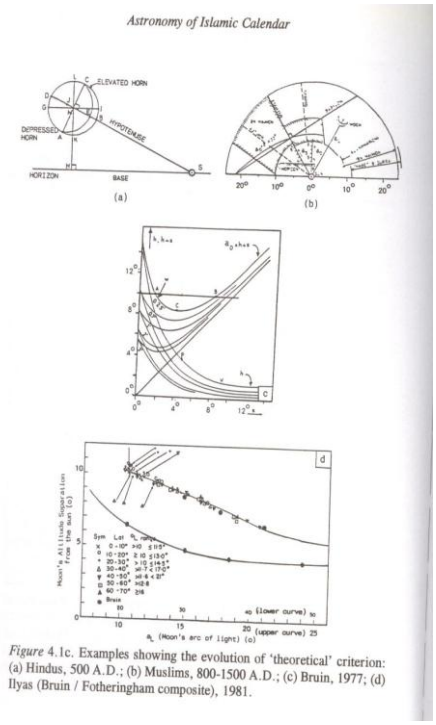


Figure 4.1c. Examples showing the evolution of 'theoretical' criterion: (a) Hindus, 500 A.D.; (b) Muslims, 800-1500 A.D.; (c) Bruin, 1977; (d) Ilyas (Bruin / Fotheringham composite), 1981.

c. *Combined physics (theory) and observation convergence of critera*

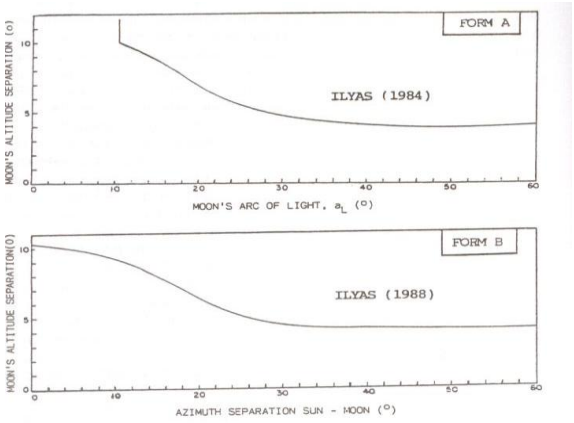


Figure 1.2. Composite extended modern criterion (Ilyas, 1988).

Currently, there is some confusion we experience world-wide because some people are presenting slightly altered forms of the basic 'altitude-azimuth' (or its other forms) criterion by tinkering some minor adjustments and putting numerous visibility zones. This micro-tuning is generally unnecessary unnecessary and indeed undesirable as the practical application of the criterion on global scale, in the light of sharia' consideration, makes things rather simple naturally.

GLOBAL VISIBILITY IN A LINE (ILDL)

We can make good calculations about the predictability of new moon's visibility all over the world on any evening which translates into a line of global visibility which is now widely known as International Lunar Date Line (ILDL).

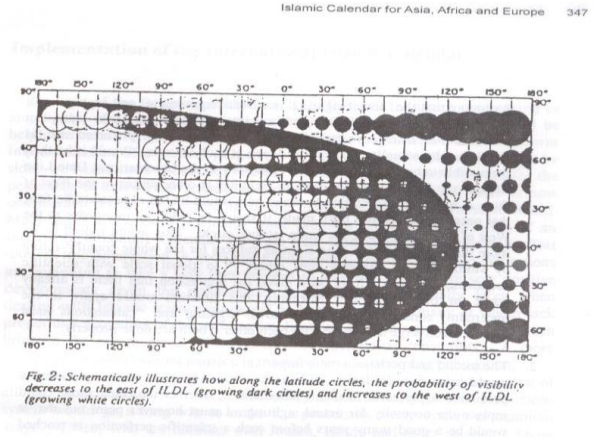


Fig. 2: Schematically illustrates how along the latitude circles, the probability of visibility decreases to the east of ILDL (growing dark circles) and increases to the west of ILDL (growing white circles).

A criterion and resultant ILDL (see the Diagrame) is a good starting point for practical simplificationsand for establishing a unified Islamic calendar. There have also been suggestions to add visibility zones around the ILDL based on optical aids eventhoughthere is very little scientific basis and limited localized observations. Besides, Shariah'sikhtalafe*Matale*concept normally takes care of much of this sort of modifications.

In any case, optical aids have marginal effect due to moon being an extended object by virtue of moon being close to the earth unlike sun which is a point source. Much of the improvements to observation of new crescent moon using optical aids could be achieved by using a long hollow tube-- which provides focus and cuts outside distractionand sky light as old time ship captains did.

We may add that it is easy to ascertain sighting reports against moonset after sunset and expected visibility calculations with the help of global visibility ILDL data and regional calendar data which are available through IICP and other internet based data systems.

SUMMARY

Important decisions by Saudi Arabia, Malaysia, Indonesia, and many other countries in South East Asia, the Indian subcontinent, North Africa, Europe and the American continent sealed the pact on the use of a new *Imkanal-Ru'yah* based unified Islamic calendar system worldwide. The new system has become operational in national calendars of these countries including Saudi Taqwim (UmmulQura).

Indeed, the dates for important occasions like the beginning and end of Ramadan and Hajj follow the new calculation system known as the *Imkanal-Ru'yah* even though small variations in the quantum of criterion need a little more work. This shows a great progress in the global implementation of a unified Islamic Calendar basis.

Although we see that there are observances on different days across the Muslim World as we had 40 years ago but now we know that these are systematic and known differences which need to be handled administratively rather than chaotic variations. *Inshaallah*, we should be able to narrow these down appropriately and soon.

The best course of action for individuals and organizations worldwide remains to get hold of the key publications-- which are available in several languages including Arabic, Malay and Urdu in addition to English—and get more people to master the science.

CONCLUDING REMARKS

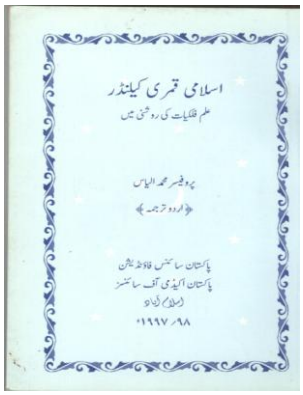
Alhamdolillah with the re-affirmation and consolidation of 'moonset after sunset' as a minimum basis in the Middle East region - after many years of work by individuals in these regions -- helps us greatly in moving towards our objective and moving to the positive side of the moon's position with reference to the horizon at local sunset. It greatly helps us in narrowing down to a few criterion from a large family of about 50 different versions / combinations in the past.

We can all be proud of this progress and grateful to Allah for making it possible. I should think that about 85% of our task is done in approaching the convergence of the criterion. There is some element of religio-administrative control in one or two key places which needs specific effort for creating better understanding to deal with this task effectively.

We have to be realistic with the fact that Calendar corrections normally take time and we need to be patient to let people understand the need for change. For this, we should remember that when Gregorian Correction was introduced to the Christian Solar calendar in 1582 C.E., it took England and the Colonies nearly 200 years to adopt it. Ours is a reasonable fast track operation.

FURTHER READING

Al Falaq al Taqwim al Islami
AltaqweemAlislamiAlalamiwaimkaneyehRuayetulAlhilal
Tadweel Al-Taqweem Al-Islamii: MunzurAsiwiBasikhiqi(co-ed)
Islamic Astronomy and Science Development: Glorious Past, Challenging Future
A Modern Guide to Astronomical Calculations of Islamic Calendar, Times &Qibla
Global Time System: The Natural Approach
Astronomy of Islamic Times for the Twenty-first Century
Astronomy of Islamic Calendar
Calendar in Islamic Civilization: Modern Issues
New Moon's Visibility and International Islamic Calendar, 1407H – 1443H.
Lunar Calendar Practices in Islamic, Chinese, Hindu and Other Civilizations (ed)
Unified World Islamic Calendar: Sharia', Science and Globalization (co-ed)
Towards a Unified World Islamic Calendar (co-ed)
Astronomi Islam Dan PerkembanganSains
Kalendar, Masa danManusia
SistemKalendar Islam dariPerspektifAstronomi
Kelandar Islam Antarabangsa
IslamiKalendarsains Ki Roshni Mein
SitarahShanasiZamanahai Islam


اسلامی قمری کیلنڈر
علم فلکیات کی روشنی میں
پروفیسر محمد الیاس
اردو ترجمہ
پاکستان سائنس فاؤنڈیشن
پاکستان اکیڈمی آف سائنسز
اسلام آباد
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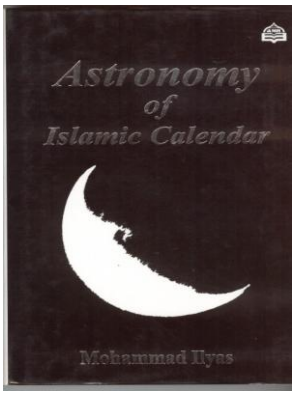
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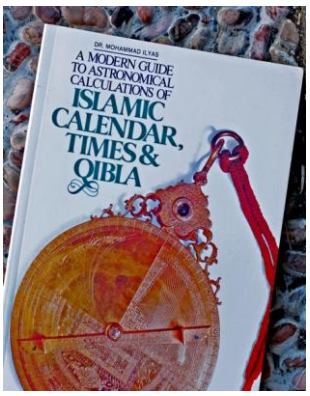
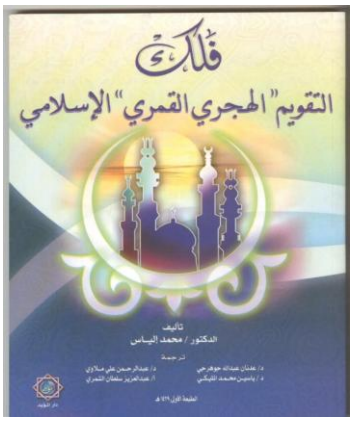
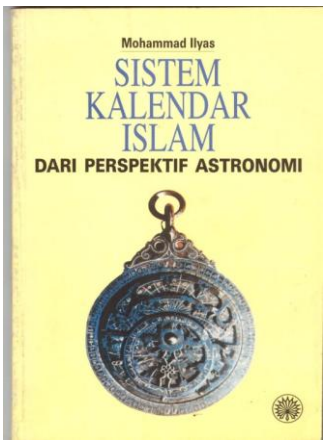

DR. MOHAMMAD ILYAS
A MODERN GUIDE TO ASTRONOMICAL CALCULATIONS OF
ISLAMIC CALENDAR, TIMES & QIBLA


فلك
التقويم "الهجري القمري" الإسلامي
تأليف
الدكتور / محمد الياس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