

# Revolutionary Scientists of the Muslim World

*When reading about Islamic history, one cannot help but be amazed at the scientific and intellectual accomplishments of Muslims when many parts of the now developed world languished in the dark ages. From medicine to mathematics, engineering to pharmacy and arts to physics, during their Golden Age, Muslims were at the forefront of almost all sciences, making new discoveries and building on earlier ones.*

*In this calendar, we share with you brief profiles of some of the revolutionary Muslim scientists. The profiles given are very brief and in no way cover the large amount of work and contributions made by these individuals; but we do get an idea, even through these very brief profiles, of the extensive contributions made to almost all branches of science by these extraordinary people.*

The information in this calendar has been extracted from numerous sources. Detailed references of the sources of this information are given on our website at the following location:

[www.meezanbank.com/calendar2014.aspx](http://www.meezanbank.com/calendar2014.aspx)

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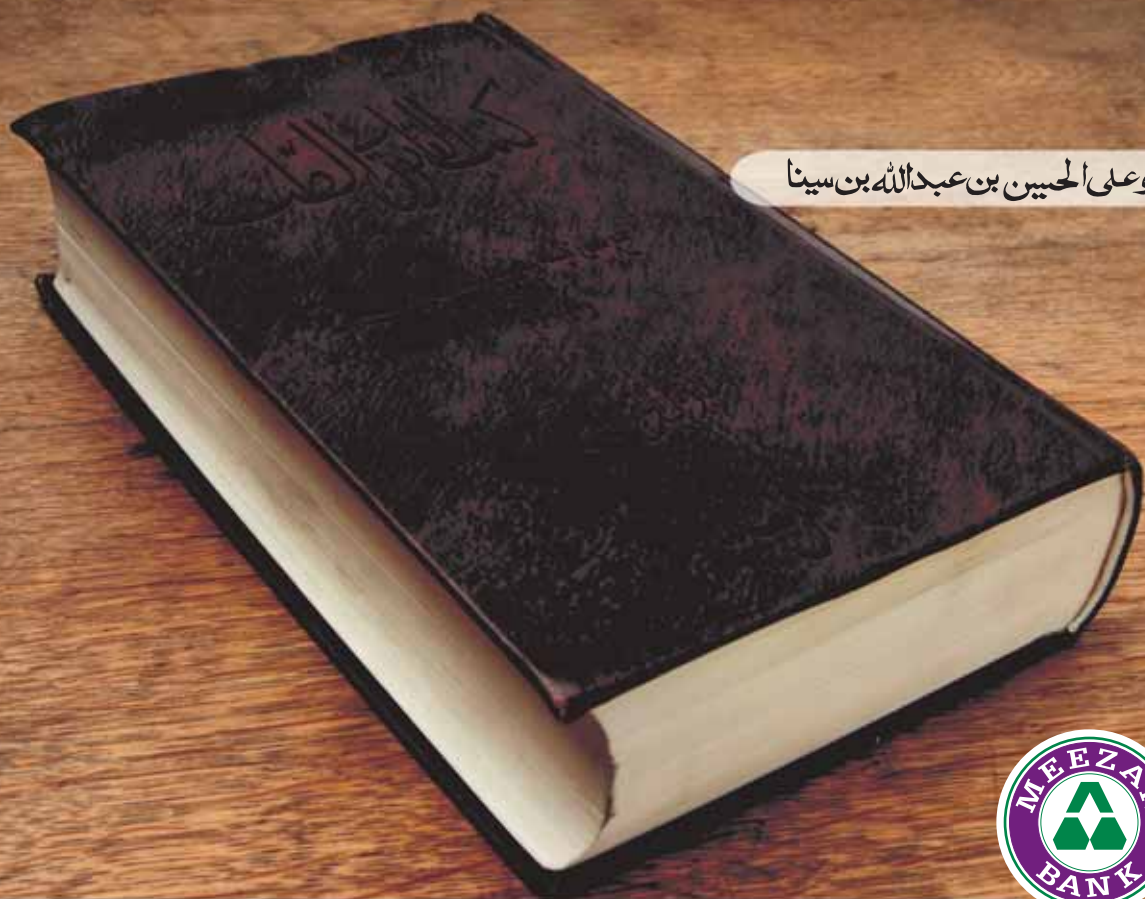
YAGHEN

ابن سينا  
جابر بن حيان  
البيروني  
عمر خيام  
ابن بطوطة  
الزهراوي الخوارزمي  
الرازي



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## Ibn Sina

Western Name: Avicenna

980 - 1037 C.E.

Uzbekistan

Ibn Sina's expertise spanned over numerous fields. He wrote almost 450 treatises on subjects as diverse as mathematics, geometry, astronomy, physics and medicine.

His book *القانون في الطب* (The Law of Medicine) is considered to be one of the most famous books in the history of medicine. The book provides a comprehensive system of medicine and was used as a standard text-book for medical education in the schools of Europe for hundreds of years, including the universities of Montpellier (France) and Leuven (Belgium) where it was being used as late as 1650 C.E.

Dr. William Osler, the Father of modern medicine wrote that the Qanun has remained "a medical bible for a longer time than any other work."

## January 2014

صَفَرٌ / ربيع الأول ١٤٣٥



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### February 2014

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# Al Jazari

1136 - 1206 C.E.  
Turkey

Considered the Father of modern engineering, Al Jazari occupies an important place in the history of Muslim origins of modern automation and robotics.

Al Jazari's book on engineering *الجامع بين العلم والعمارة في صناعة الحيل* written in 1206 C.E. describes 50 mechanical devices in six different categories in minute detail. He was the inventor of the Cam Shaft, the Crank Shaft, double-action suction pumps and the flush system used in modern day toilets. British engineer and historian of science and technology, Donald R. Hill wrote, "It is impossible to over-emphasize the importance of Al Jazari's work in the history of engineering. It provides a wealth of instructions for design, manufacture and assembly of machines."

# February 2014

ربيع الثاني ١٤٣٥



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## March 2014

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## Jabir ibn Hayyan

Western Name: Geber

722 - 804 C.E.

Iran

Jabir ibn Hayyan was a prominent Persian whose expertise spanned a significant number of different subject areas. He was a chemist, alchemist, astronomer, engineer, geographer, philosopher, pharmacist and physician.

Also known as the Father of chemistry, Jabir ibn Hayyan defined chemical combination as union of the elements together in small particles too minute for the naked eye to see - this was the concept of the Atom, which John Dalton, the English chemist discovered ten centuries later.

Jabir's books were translated into Latin and became standard texts for European chemists. His influence may be traced throughout the historic course of European chemistry. Several technical terms introduced by Jabir, such as Alkali, have become part of modern day scientific vocabulary.

## March 2014

ربيع الثاني / جمادى الأولى ١٤٣٥



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### April 2014

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# Al Zahrawi

Western Name: Albucasis

936 - 1013 C.E.

Spain

Al Zahrawi was one of the greatest Muslim surgeons history has witnessed. He has been described by many as the Father of modern surgery. Many modern surgical instruments including scalpels, bone saws, forceps, fine scissors for eye surgery and 200 other instruments being used today are built on the designs developed by Al Zahrawi.

His greatest contribution to medicine was كتاب التصريف لمن عجز عن التأليف a thirty-volume encyclopedia of medical practices that was used as a standard reference book in all the universities of Europe for over 500 years. His pioneering contributions to the field of surgical procedures and instruments had an enormous impact and his discoveries are still applied in medicine. The street in Cordoba (Spain) where he lived is named in his honor as 'Calle Albucasis'.

## April 2014

١٤٣٥ جُمَادَى الْآخِرَةَ



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## May 2014

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اسرار ازل را نہ تو دانی و نہ من  
وین حل معمّا نہ تو دانی و نہ من  
ہست از پس پردہ گفتگوی من و تو  
چون پردہ برافت نہ تو ماننی و نہ من

The secrets eternal neither you know nor I  
And answers to the riddle neither you know nor I  
Behind the veil there is much talk about me and you  
When the veil falls, neither you remain nor I.



## Omar Khayyam

1048 - 1131 C.E.

Iran

Omar Khayyam was an expert in mathematics, astronomy, medicine, jurisprudence and philosophy. His name Khayyam (Tentmaker) is said to have derived from his father's trade. The Jalali calendar developed by him during his time as advisor to Iran's Seljuc Sultan Malik Shah was more accurate than the present Gregorian calendar. He was tireless in his efforts; by day he would teach algebra and geometry, in the evening he would attend the Seljuc court as an advisor of the Sultan and by night he would study astronomy.

Outside Iran and Persian speaking countries, Khayyam has had an impact on literature through the translation of his works, the most popular of which was the translation of his Rubai'yaat into English by Edward FitzGerald (1809-83 C.E.), which have since then been translated into almost every major language and are largely responsible for introducing Persian poetry to Europe.

## May 2014

رجب / شعبان ۱۴۳۵



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## June 2014

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# Ibn al Baitar

1197 - 1248 C.E.  
Spain

Ibn al Baitar was the great Muslim botanist, pharmacist and physician who is credited with transforming pharmacy from the olden days to the modern times. He critically studied medicinal plants and relevant literature from Greece, Spain, North Africa and Asia Minor, as a result of which he prepared more than 150 manuscripts. His major contribution كتاب الجامع في مفردات الأدوية والأغذية was a pharmaceutical encyclopedia listing 1,400 plants, foods and drugs. Out of these, 300 medicinal plants were new to science. His book was translated into Latin, printed in 26 editions during and after the 15<sup>th</sup> century and was used in the formation of the first London Pharmaceutical Encyclopedia issued during the reign of James I.

# June 2014

شَعْبَانُ / رَمَضَانَ ١٤٣٥



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July 2014

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# Al Battani

Western Name: Albategnius

858 - 929 C.E.

Turkey

Al Battani was the best-known Arab astronomer in Europe during the Middle Ages and has been recognized as one of the greatest Muslim astronomers and mathematicians.

His work, which included timings of the new moons, calculation of the length of the solar and sidereal year, the prediction of eclipses and the phenomenon of parallax, exercised great influence on European astronomy. He made remarkably accurate calculations of the exact duration of the solar year. Also, the first notions of trigonometric ratios and expressions "Sine" and "Cosine" used today were popularized by Al Battani.

The crater 'Albategnius' on the moon is named after him.



# July 2014

رَمَضَانَ / شَوَّالَ ١٤٣٥



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## August 2014

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## Ibn e Battuta

1304 - 1369 C.E.

Morocco

Ibn Battuta was a Moroccan Muslim explorer. He was commonly known as Shams ad Din. His journeys spanning thirty years included North Africa, the Horn of Africa, West Africa and Eastern Europe in the West, and to the Middle East, South Asia, Central Asia, Southeast Asia and China in the East; a distance surpassing threefold his near-contemporary Marco Polo. Ibn Battuta is considered to be one of the greatest explorers of all times.

During his travels he also served as a judge as well as an ambassador. His travel experience *الرحلة* is one of the greatest travelogues ever written.

## August 2014

شَوَّال / ذُو الْقَعْدَةِ ١٤٣٥



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## September 2014

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## Al Tusi

1201 - 1274 C.E.

Iran

Naseer Ud Din Al Tusi, as he was more commonly known, was an architect, astronomer, biologist, chemist, mathematician, physician, physicist, scientist, philosopher and writer.

During his time as scientific advisor to the Mongols, he convinced Hulegu Khan, grandson of Genghis Khan, to construct an observatory in Azerbaijan for better astrological predictions. His research, *زيج الحاقاني* at this observatory is a splendidly accurate table of planetary movements.

In *التذكرة في علم الهيئة*, his most influential book, he wrote: "The Milky Way, i.e. the galaxy, is made up of a very large number of small, tightly-clustered stars, which, on account of their concentration and smallness, seem to be a cloudy patch." Three centuries later, in 1610 C.E., this theory was confirmed by Galileo. A 60 km diameter lunar crater is named after him as 'Nasireddin'.

## September 2014



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ذو القعدة / ذوالحجة ١٤٣٥

### October 2014

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## Al Razi

Western Name: Rhazes

854 - 925 C.E.

Iran

Al Razi was a physician learned in chemistry as well as philosophy. Numerous 'firsts' in medical research, clinical care and chemistry are attributed to him, including being the first to differentiate smallpox from measles, as well as the discovery of numerous compounds and chemicals including alcohol and kerosene. He has also been described as the Father of pediatrics and a pioneer of ophthalmology.

He is recognized for laying down the foundations of chemistry by setting up a laboratory for the first time and was performing distillation, calcinations and crystallization over eleven hundred years ago. Razi remained, up to the 17<sup>th</sup> century, the indisputable authority of medicine. Edward Granville Browne, the famous British Orientalist, considers him "probably the greatest and most original of all the physicians."

## October 2014

ذو الحجة ١٤٣٥ / محرم ١٤٣٦

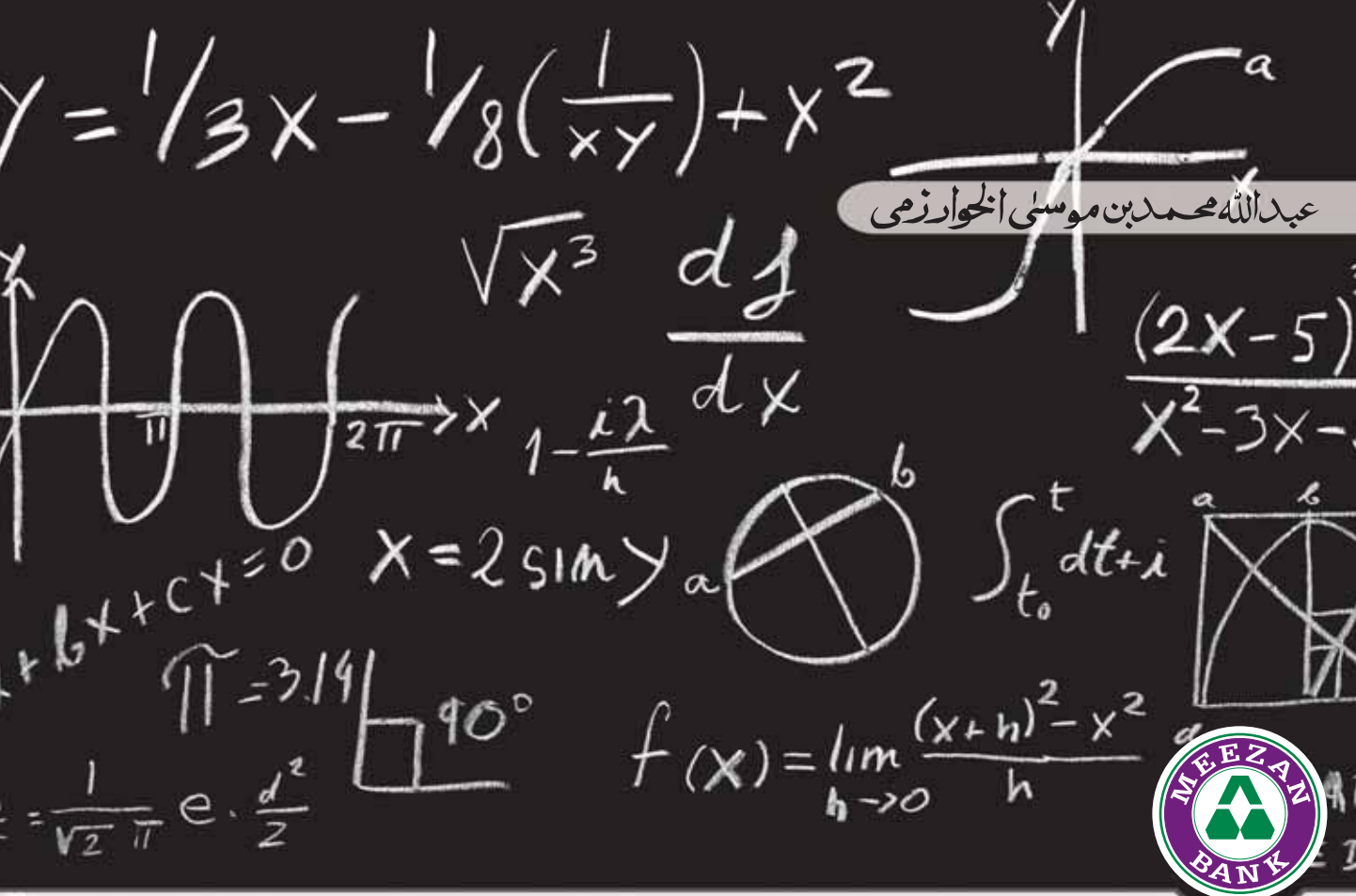


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### November 2014

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عبدالله محمد بن موسى الخوارزمي



# Al Khwarizmi

Western Name: Algoritmi

780 - 850 C.E.

Central Asia

Al Khwarizmi was a mathematician, astronomer and geographer. He is known as the Father of algebra. The word 'algebra' is derived from his book *الكتاب المختصر في حساب الجبر والمقابلة* written in 830 C.E., which was the first ever book to be written on the topic. His book presented the first systematic solution of linear and quadratic equations in Arabic. His contributions to mathematics, geography, astronomy and cartography established the basis for innovation in algebra and trigonometry.

His work on the Indian system of numerals was responsible for introducing the decimal positional number system to the Western world, which had a profound impact on the advancement of mathematics in Europe. A crater on the far side of the moon is named after him as 'al Khwarizmi' and the word 'Algorithm' stems from Algoritmi, the Latin form of his name.

## November 2014

مُحَرَّمٌ / صَفَرٌ ١٤٣٦



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### December 2014

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Lunar calendar is subject to appearance of the moon



# أبوريحان محمد بن أحمد البيروني



## Al Biruni

Western Name: Alberonius

973 - 1048 C.E.

Central Asia

Al Biruni was an expert in numerous subjects, including history, physics, mathematics, astronomy, linguistics, comparative religion and earth sciences.

Al Biruni researched on the earth's rotation on its own axis and on determining the direction towards Makkah for each city through calculation of latitude and longitude and calculation of prayer times. He is regarded as the Father of geodesy - the scientific discipline that deals with the measurement and representation of the earth in a three-dimensional space. His research also led to the understanding of plate tectonics - how the continents move and shift over time.

He compiled an encyclopedia known as كتاب تاريخ الهند (The Book of Indian History), which is considered as one of the world's first books on anthropology - the study of human societies and their development. Much of what is known today about ancient India comes directly from this book.

## December 2014

صَفَرٌ / رَبِيعُ الْأَوَّلِ ١٤٣٦



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### January 2015

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Lunar calendar is subject to appearance of the moon



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# CALENDAR 2015

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