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Yes, Virginia, the Moon Can Be Blue!

— Howard L. Cohen

The year 2009 ends with a “blue moon.” However, contrary to popular belief, a “blue moon” is not necessarily the second Full Moon in a calendar month.

In fact, historical research shows this is wrong.

But most important, the Moon, in fact, can be truly tinged blue!

During WCJB-TV Channel 20's local evening news broadcast Tuesday, 2009' October 6, chief meteorologist Bill Quinlin asked a weather question as he often does. Although I do not remember Quinlin's exact words, his question that evening asked if a “blue moon” was caused by atmospheric particles? Possible answers were either “True or False.”

Quinlin replied the correct choice was “False.” He then concluded by saying a blue moon was the second Full Moon in a calendar month.

I shared this question at the Alachua Astronomy Club's board meeting later the same evening. Most present at the meeting acknowledged that the correct answer was obviously the choice “False” as Quinlin had asserted.

“Not quite right,” I said. “The correct answer is True.”

Skeptical eyes stared at me.

Can the Moon Really Be Blue?

I then replied that the term “blue moon” can, in fact, refer to a Moon actually tinged blue, a real though uncommon phenomenon. This rare effect results from atmospheric particles as fine dust from a volcanic eruption or forest fire. If these particles are just the right size to scatter red light, then this particulate matter acts as a filter so only bluish light passes.



Figure 1. A blue colored Moon. On rare occasions the Moon can appear with a bluish color. (See note in text if image not in color.) Cred. Tom King, Watauga, TX, 2003 Oct. 30.

I mentioned to the board that I have seen photographs of this rare event although I have not seen this sight myself except on a few occasions when the Moon was tinged blue during a total lunar eclipse.

Figure 1 shows a photograph of a blue colored Moon taken by Tom King of Watauga, Texas 2003 October 30. This photograph and stories about blue moon sightings can be found at spaceweather.com/glossary/bluemoonstories.html.

Note: If reading this article from *FirstLight's* mailed print copy for 2009 Nov/Dec (printed in black and white), the Figure 1 image will obviously not be in color. To view this image in color, members of AAC can view the color pdf version of *FirstLight* at floridastars.org/firstltonline.html. Otherwise, see this image at spaceweather.com/glossary/images2004/bluemoon/King2.jpg.

Moreover, in 1883 and in the following several years after the Indonesian volcano Krakatoa exploded, people around the world saw the Moon turn blue. And, in September 1950, Robert Wilson, an astronomer of the Royal Observatory, saw the Moon go blue from Edinburgh, Scotland. Apparently particulates from a forest fire in Alberta, Canada blowing across the Atlantic Ocean may have been the cause.

I also said to AAC board members that I had reported this rare but real spectacle in a previous *FirstLight* article (April/May 2007, "Double Full Moons," at floridastars.org/firstltonline.html). I originally wrote this article because May 2007 was to have two Full Moons for the USA.

So, yes, Virginia, the Moon can be truly blue.

A Blue Moon Has Many Meanings

Nevertheless, my 2007 *FirstLight* story went on to explain that the term "blue moon" has multiple meanings. These meanings include **(1)** moons actually tinted blue by our atmosphere as already noted, **(2)** *Blue Moon*, a Belgian-Style white beer (Figure 2) from the Molson Coors Brewing Company, and **(3)** the feeling of being sad, lonely, depressed, gloomy, etc., as expressed in many songs. Also included is **(4)** an early reference apparently connecting blue with "absurd" through a 1528 proverb that states, "If they say the moon is blue, then we must believe that it is true." And, of course, we have the popular phrase **(5)** "once in a blue moon," meaning infrequent, hardly ever, rare or now and then.



Figure 2. Blue Moon Beer. This is a Belgian-Style Beer with an orange-amber color and cloudy appearance because it is unfiltered. It has a more noticeable orange taste compared with other similarly styled beers.

But I discussed still another meaning that relates to a modern tradition, **(6) the second Full Moon in a calendar month is a "blue moon."**

How the popular phrase, "once in a blue moon," connects to actual lunar events is unclear since second Full Moons in a month are common, occurring every few years (averaging once every nineteen months or so). In fact, three occur from 2009 to 2015: 2009 December 31, 2012 August 31 and 2015 July 31.

Nevertheless, the thrust of my article pointed out that this trendy definition of a "blue moon" as the second Full Moon in a month is historically a mistake! So, really, we have a seventh meaning to the term "blue moon."

The Historical Blue Moon

Modern research interprets “blue moons” otherwise. Historically, **(7)** *calendrical blue moons* represented the *third Full Moon* in a quarter of the year that has four Full Moons! (Usually a quarter year has only three Full Moons.) Folklorist Philip Hiscock (*Sky & Telescope*, March 1999) had traced the original calendrical meaning of the term “Blue Moon” back to the *Maine Farmers’ Almanac* for 1937. See my original article for more details.

This traditional meaning is complex because it can depend on the length of the year and when the year begins. For example, the *Maine Almanac* used the tropical not a calendar year to mark the seasons starting with the winter solstice. Moreover, traditional or old style Blue Moons, since set by the seasons, occur about a month before equinoxes and solstices, in February, May, August, or November.

Note: A *tropical year* is the time for the Sun to return to a fixed point along its path on the sky (the *ecliptic*) such as from vernal equinox to vernal equinox.

The rationale for the traditional meaning given in the Maine Almanac ensures that other named Full Moons fall at their proper places during the year such as the “Moon before Yule” or the “Easter Moon” just before Easter, etc.

So, the original answer given by WCJB-TV could be considered wrong for two reasons. If one takes into account the original meaning of a calendrical blue moon, a calendrical blue moon is not necessarily the second Full Moon in a calendar month.

Rather, a blue moon is the third Full Moon in a quarter year with four Full Moons.

But more important, the original question asked on WCJB-TV did not specify a “calendrical blue moon,” only a “blue moon.”

Therefore, a blue moon, as already noted, could really be a Moon with a blue appearing disk under unusual and special circumstances when our atmosphere has particles just the right size to scatter red light.

Making Up Origins

Lastly, making up origins is sometimes easy although not necessarily true as noted in my April/May 2007 *FirstLight* article. I suggested in 1991, for example, a hypothetical, fanciful connection between lunar events and the idea that blue relates to unlucky. A second Full Moon in a calendar month or four in one season gives thirteen full Moons in a calendar year. Since some consider the number thirteen unlucky, people might view the occurrence of this “extra” full Moon in a year with displeasure or gloom. Therefore, because people often connect the word “blue” with hopelessness, melancholy or despair, it is possible that this extra full Moon became associated with the color blue. Believe it (or not)!

A Blue Moon New Year

Still, for those who insist that “blue moons” (of the calendrical type) are the second Full Moons in calendar months, be aware that December 2009 has such a Full Moon.

And this “blue calendrical moon” of 2009 is extra special.

Two Full Moons occur for us (in the USA and many other places) during the last month of the year, **December 2** and **December 31**. (I say “us” since dates of Moon phases are time zone dependent.)

Therefore, 2009 will end with a “blue moon special,” a real treat for New Year Eve partygoers!

Party poopers, nonetheless, will say, using the *Farmer's Almanac* definition of a blue moon (third Full Moon in a quarter year with four Full Moons), the next will not occur until 2010 November 21 and then not again until 2013 August 2.

Still, I am willing to concede, that we should still be sure to have Blue Moon Beer on hand to welcome the New Year.

And don't forget to sing the “**Astronomer's Drinking Song.**” Yes, Virginia, astronomers have a drinking song! (You can find it on the AAC web site at floridastars.org/drinksng.html along with the “tune” itself.)

Of course, please drink responsibly.

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