

Celebrating the Sun

— Howard L. Cohen

*"The night has a thousand eyes, the day but one.
Yet the light of a whole world dies with the setting sun."*

~ Francis William Bordillon

The Sun is especially important this year. The United Nations and the International Astronomical Union have already proclaimed 2009 "The International Year of Astronomy" to honor Galileo's astronomical use of the telescope. The Sun will also add to the special nature of this year in several ways. For example, a new solar sunspot cycle is now beginning and midyear brings the longest total solar eclipse of our lifetime.

However, calendrical reckoning will similarly mark 2009 as a special year to praise the Sun! A rare coincidence brings together two events this spring—a celebration of the spiritual birth of our Sun, last observed twenty-eight years ago, and an annual spring festival memorializing the exodus of slaves from ancient Egypt. The simultaneity of these two events, both representing rebirth, is a once in a lifetime occurrence.

Astronomy is filled with cyclic events. Some recur over short times as the rising and setting of the Sun or the monthly cycle of the Moon's phases. Longer events as eclipses require more patience, especially eclipses that are total. Still, even total solar eclipses occur every few years although traveling into the path of totality often requires some effort. But, longer events, such as transits of Mercury across the face of the Sun, are savored more since only thirteen to fourteen occur in a one hundred-year period.

However, events that happen but once, or only a few times in one's life, are prized like no other. If you missed the last close approach of Comet Halley, the next is still more than a half century away. The last transit of Venus across the Sun was in 2004, an event no one alive had ever seen since the previous was in 1882, more than a lifetime ago. Fortunately, transits of Venus now occur in pairs separated by eight year intervals. The next, in 2012, will be the last for anyone living today. So, many of us may still have an opportunity to witness this extraordinary, historic event not to occur again for another 105 years! Meanwhile, Pluto reached perihelion in 1989 and became visible in small telescopes for the first time, a sight not to repeat for almost 250 years.

The Sun itself also teases with events not to be missed. This summer (July 22) will bring the longest total solar eclipse of our lifetime with a duration of totality over six minutes. Nevertheless, one must travel to India, China or the South Pacific to see this ethereal and emotional event. Although three more total solar eclipses of six minute durations occur this century, the next long duration eclipse will be eighteen years hence. And for those who cannot travel long distances to reach paths of totality, the continental USA will not see any total eclipse of the Sun until 2017. This is a long stretch in time since the last for the lower forty-eight was thirty-eight years ago!

In addition, this year the Sun is about to embark on a new sunspot cycle, a cause for celebration by avid Sun watchers since the solar disk has been nearly spotless for the last year. Since, the sunspot cycle typically lasts ten to twelve years, or about 22 years for a complete magnetic reversal, only several complete solar cycles fit into a human lifetime.

Astronomical events as these remind us not only of nature's grandeur but also how short our lives are compared with the existence of the cosmos. For those, who believe that we only "go around once," astral events are not to be missed.

Thinking about this recalls another cycle, a twenty-eight year cycle of the Sun. Most have never heard of this period since it does not mark an actual astronomical event. Instead, this sun cycle is more spiritual, again reminding us of our finite place in the universe.

We count 52 weeks of seven days each during our year, a period of 364 days. Since normally our year is really just over one day more, the same day of the week occurs one day later after the passage of a 365-day year. Therefore, after seven years, the days of the week should occur on the same calendar day. So, should we recycle our calendars every seven years?

No. We partially reckon dates based on the Julian Calendar, which uses leap years every four years, giving us an average year of 365.25 days. So, the repetition of dates does not occur after seven years. Instead, we must wait through four cycles of seven years or 28 years before the same sequence of calendars repeats. Therefore, the days of the week usually begin again on the same calendar day every 28 years, a period of 10,227 days (365.25×28).

Early Babylonian and Judaic traditions held that the Sun was created at the vernal equinox in the first hour of the night before the fourth day of creation (cf. Genesis 1: 14-19). Jewish law regards the Sun as having returned to its original position whenever the equinox occurs at the same moment in the week. Therefore, the Sun returns to its supposed point of birth on the equinox every 10,227 days marking an auspicious time to bless the Sun. Ultimately, Jewish law codified this event into a little-known but joyful prayer service, the *Birkat HaChamah* ("Blessing of the Sun"), marking this 28-year cycle (also known as "the large cycle").

Although the vernal equinox currently falls about March 20 on our civil or Gregorian Calendar, Jewish law originally set the date as March 25. In addition, Jewish law bases the date of *Birkat HaChamah* on the Julian Calendar. Consequently, the inaccuracies of this calendar have now moved the date of this celebration into April on the Gregorian Calendar though it continues to fall on March 25 using the Julian Calendar. (The Gregorian Calendar adds a leap year on century years only if not divisible by four giving an average length of 365.2425 days every 400 years).

Thus, *Birkat HaChamah*, which is conducted at the first appearance of the Sun on the first Wednesday of the Jewish month of *Nisan*, now occurs on April 8 every twenty-eight years. However, this date for the Sun's blessing is moving later about a day every few hundred years since it remains fixed in the Julian Calendar. Gregorian dates celebrating the Sun this century occur on April 8 in 2009, 2037, 2065, and 2093 but then shift to April 9 in 2121.

This year, after a lapse of twenty-eight years, observant Jews and those wishing to reaffirm the Sun's radiance, strength and hope for renewal, will rise early on the morning of Wednesday, 2009 April 8. As the Sun rises (about 7:11 a.m. EDT in Gainesville, Florida), they will gather outside in the morning dawn to recite *Birkat HaChamah* prayers and special psalms to bless the Sun. Since 2009 is the year 5769 in the Jewish Calendar, this day will signify the 206th birthday of the Sun. Celebrants may also dance in circles and sing joyous songs as "Here Comes the Sun," "Ev'rybody's Happy When the Sun Shines," and "The World is Waiting for the Sunrise"! This ceremony of prayers and songs will not be said again for another twenty-eight years when people again gather to praise the creation of the Sun.

Finally, this year *Birkat HaChamah* has special significance. For, on the very evening of this day that honors the "Sun's birth," begins one of the most important and oldest religious holidays and

festivals. This is the Jewish and Samaritan Passover (*Pesach*), a remembrance of the supposed Exodus of the Israelite slaves from Egypt. Passover always occurs on the 15th day of the Jewish month of *Nisan* near the time of Full Moon. The simultaneous occurrence of *Birkat HaChamah* and Passover is truly a rare event in one's lifetime. The last time both *Birkat HaChamah* and Passover occurred together was eight-four years ago, in 1925!

Indeed, *Birkat HaChamah* and its coincidence with Passover have only previously occurred ten times in Biblical history. So, 2009 marks an especially auspicious year for the Sun—the simultaneous celebration of both the birth of the Sun and a spring festival that celebrates the renewal of life. These are once in life time experiences. Celebrating events as these that only happen once every generation or less forces us to take a deeper view of both ourselves and the light and life of the Sun—where we all came from, what are we now, and where will we be in the future.

Perhaps members of the Alachua Astronomy Club, Inc., may also want to gather with family and friends early on the morning of April 8 with telescopes to view the Sun and celebrate, even if only symbolically, the birthday of the Sun. □

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