

## BRIGHT IRIDIUM FLARES NOT FOREVER

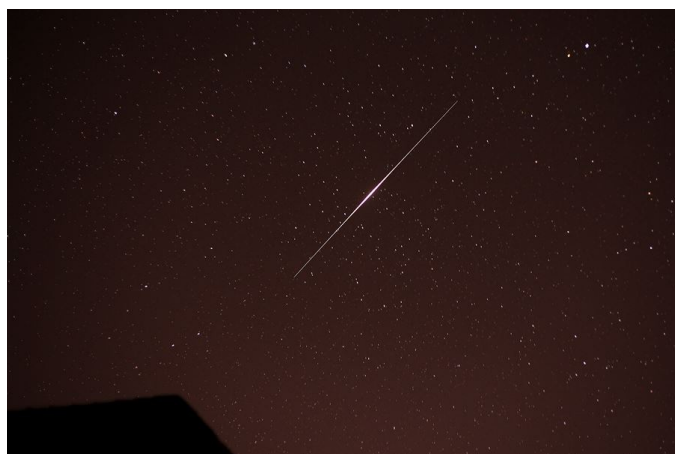
Howard L. Cohen  
January 25, 2017

*These beautiful and startling events can astonish sky watchers  
but will not last forever*

**Iridium Communication Satellites** are notable for their predictable, sudden and amazing appearances in the sky. Although normally invisible to the naked eye, these polar orbiting communication satellites (more than 60) can produce brief (seconds-long) and often brilliant flashes of light that can sometimes outshine the brightness of Venus, our brightest appearing planet. (Not all flares are bright but, when they are, they dazzle!)

*Have you ever seen one or more of these brilliant Iridium flashes?*

A photograph of a recent, brilliant flare visible from Gainesville appears in Figure 1. (More details on pages 2 and 3.) **A larger picture is also at: <https://goo.gl/y8YKXV> .**



**Figure 1. Brilliant Iridium Flare.** This bright flare appeared over Gainesville, Florida on the evening of 2017 January 24. The flare started at upper right, peaked and faded out at lower left after about five seconds. Photo by author. (Details on pages 2 & 3.)

A bright Iridium flare or glint can be both startling and marvelous. (People unaware of the flare may even dial 911!) Although sky watchers often look for and observe passages of the International Space Station across the sky, the sudden blazing glint of an Iridium satellite is even more exciting and more beautiful.

*You can amaze family and friends* by having them stare at the sky's location of the flare a minute before the predicted event without telling what will happen. The sudden appearance of a bright flare will either make them think you are a genius or a magician!

The momentary appearance of a flare is only visible from a small area of Earth's surface. Fortunately, accurate predictions of these events are available. The appearance of the flare at your location and at its predicted time usually astound observers.

(See box on page 3 about how to observe them.)

**However, seeing these wonderful, gleaming flares is not forever.**

**Iridium NEXT**, a second-generation network of telecommunications satellites, will now gradually replace the current aging network of active Iridium satellites.

The original Iridium satellites have flat, shiny, door-size antenna arrays that can periodically reflect sunlight toward the ground. Unfortunately, Iridium NEXT satellites do not have the same antenna array and are not expected to glint bright sunlight.

*Iridium* is the name for this network of high (but not geosynchronous) polar orbiting communication satellites first launched in the 1990s. But they are aging. So, as the old Iridium network is phased out with satellites moved to parking orbits or deorbited, brilliant and sometimes startling glints of sunlight from the original Iridium network may become a thing of the past.

**So, catch them when you can!**

**Why Iridium?** The 77th element in the periodic table of elements is *iridium*, a hard, brittle, whitish metal. However, these satellites are not made of iridium! Instead 77 satellites were planned for the original network and so were named for this corrosion-resistant and second densest element (after *osmium*). In addition, the polar orbiting satellite network mimics the simplistic atomic image of 77 electrons orbiting the iridium atomic nucleus. (However, ultimately only 66 satellites, with some spares, were needed for global coverage.)

## THE PHOTOGRAPH (FIGURE 1)

**Despite lights from Archer Road and I-75, clear skies Tuesday evening, 2017 January 24, allowed me to image a brilliant flare from Iridium Satellite 83.** This photograph was taken from in front of my S.W. Gainesville suburban home. The satellite passed over the northeast horizon at 7:26:08 p.m. EST moving down toward the northern horizon over my home's roof.

Gradual brightening and eventual dimming of the flare were visible for about five seconds. The predicted peak brightness was magnitude -8 (about 25 times brighter than the current brightness of Venus at magnitude -4.5). See details below. However, I estimated maximum brightness much less, possibly about magnitude -5. Peak brightness lasted only about a second, so estimating its magnitude was difficult. In addition, the north sky was bright from lights on Archer Road and its intersection with I-75. Still, an amazing sight!

### PHOTO DETAILS

**Camera:** Canon DSLR EOS 5D II with Canon 50mm f/1.8 lens; tripod mounted.  
**Exposure:** 30 sec, f/2.5, ISO 500 (Post processed and slightly trimmed).  
**Date/Time:** 2017 January 24, from 7:25:53 to 7:26:23 p.m. EST.  
**Location:** Suburban S.W. Gainesville, Florida.

(Details about this flare event and Iridium satellite 83 on next page)

**FLARE EVENT**

**Flare Date:** 2017 January 24  
**Predicted Time:** 7:26:08 p.m. EST  
**Predicted Brightness (magnitude):** - 8  
**Direction:** Altitude 48°; Azimuth 35°  
**Sun:** Altitude -18.5°  
**Angular Separation from Sun:** 134.4°  
**Satellite Distance:** 1008 km (626 mi)  
**Distance to Flare Center:** 3 km (1.9 mi)

**IRIDIUM SATELLITE 83**

**Launched:** 1998 Nov. 6, 13:37 UTC  
**Launch Site:** Air Force W. Test Range  
**Polar Orbit:** 776x779 km (482x484 mi)  
**Inclination:** 86.4°  
**Orbit Period:** 100.4 min  
**Semi-Major Axis:** 7,155 km (4,446 mi)  
**Perigee:** 783.3 km (486.7 mi)  
**Apogee:** 786.3 km (488.6 mi)

**WANT TO OBSERVE IRIDIUM FLARES?**

To observe an Iridium flare requires the exact date/time of the flare and your exact location (latitude and longitude). Even a difference of a few miles from the flare center can produce a large difference in the observed magnitude. **Heavens-Above** gives predictions:

1. Enter the following web address in your browser: <http://www.heavens-above.com>
2. **Change Your Location.** In the Top Right Box, click on **Unspecified** or **Coordinates** (default is equator at 0.0°N, 0.0°E).
3. This brings up the **Location Page**. Enter your exact address or enter your latitude and longitude. If not known, use the displayed Google map to zoom in on your exact location. Center the red Google marker at your location. (The latitude, longitude and elevation will automatically fill as you move the red marker.)
4. Finally, click **UPDATE** (bottom of page). The Heavens-Above Home Page will redisplay and should show your location in the top right box.
5. Click **Iridium Flares** (under *Satellites Heading*).
6. This brings up an **Iridium Flare Table** showing several future flare occurrences for your location. (Clicking right arrow will move to more future dates.)
7. To see **Flare Details** (including a **Sky Map**) for any single flare event in the table, click the **Time** in the first tabular column. Note that some are evening events and others are early morning events. (Iridium satellites are in polar orbits so tracks follow a north-south path.) Not all flare events are bright but often a few brighter than Venus appear.
8. Pick bright flares to observe, hope for clear skies and amaze others!