Astronomers are often interested in how long a particular event took. This can be used to explore how fast something is moving, or how rapidly it is changing in time. Here are some ‘far out’ examples!

1 – The gamma-ray burst from the galaxy TXS1510-089 was detected on July 24, 2007 by the AGILE satellite. The burst began at 23:25:07 and ended at 23:25:57. How many seconds did it last?

2 – The black hole orbiting the star A0620-00 in the constellation Monoceros produced a micro-flare on September 29, 2002 visible at radio wavelengths as it swallowed some of the gas falling into it. If the flare began at 01:50:00 and ended at 01:53:20 how many seconds elapsed?

3 – On September 1, 1859 the sun released a cloud of plasma called a Coronal Mass Ejection at 11:18 AM. If the cloud reached Earth on September 2 at 04:54 AM how many hours did it take the cloud to travel from the sun to Earth?

4 – Full Moon occurred on July 18, 2008 and August 16, 2008. How many days elapsed between the two lunar phases?

5 – A massive star in the Eta Carina cluster erupted in a giant flare in 1843. How many years has it been since this eruption if the current year is 2008?

6 – The Crab Nebula was formed by a supernova in the year 1054 AD. If the next supernova spotted by humans occurred in 1987, how many years elapsed between these events?

7 – The earth was formed 4.5 billion years ago. The asteroid bombardment of its surface ended 3.9 billion years ago. How many million years did the asteroid bombardment era last?

8 – The universe came into existence in the Big Bang 13.7 billion years ago. The most ancient galaxy astronomers have detected so far is A1689-zD1, which was probably formed about 13.0 billion years ago. How many millions of years was the universe in existence before this galaxy began to form?

Space Math http://spacemath.gsfc.nasa.gov
Answer Key


2 – Answer: 01:53:20
   - 01:50:00
   ------------------
   3:20
The burst lasted 3 minutes and 20 seconds.

3 – Answer: September 2 04:54 add 24h 28:54
   - September 1 11:18
   ----------------------
   17:36
The CME took 17 hours and 36 minutes to arrive.

4 – Answer: August 16, 2008
   - July 18, 2008
   ------------------
   You can use a calendar to count the days, or from 31 days in July, there are 31-18 = 13 days plus the 16 days in August the sum is 13+16 = 29 days.

5 – Answer: 2008 – 1843 = 165 years.

6 – Answer: 1987 – 1054 = 933 years.

7 – Answer: 4.5 billion – 3.9 billion = 0.6 billion years or 600 million years.

8 – Answer: 13.7 billion – 13.0 billion = 0.7 billion years or 700 million years.

Space Math http://spacemath.gsfc.nasa.gov