

## U3Astronomy meeting – 23rd May 2008

### 2008 ASTRONOMICAL MILESTONES

#### **1608 – The first telescope**

Four hundred years ago the German born spectacle maker Hans Lippershey developed the first telescope. Galileo Galilei used it for the first time in astronomy in 1609 and started to build – and improve – them himself. Its use enabled him to discover the four largest moons of Jupiter, which was one of the most important discoveries ever made in astronomy: not everything in the sky orbits the Earth, so the Earth is not the centre of the Universe.

All astronomical discoveries dating from before 1608 were based on naked eye-observations!

#### **1758 – Halley vindicated**

Edmund Halley (1656-1742) was a famous English scientist, who discovered many new things in astronomy and also studied comets, especially the very bright one that was visible in 1682. When he compared the data on the passage of comets in 1531 and 1607 he deduced that this was probably the same comet, which orbited the Sun in a very elongated elliptical orbit and returned every 75/76 years. So he predicted that it would return in 1758 – which it did (16 years after his death).

The latest passage was in 1986, when a probe was sent to it which measured its size: approx. 15 x 8 km (mainly ice). The next visit will be in 2062.

#### **1908 – The Tunguska event**

On 30-06-1908 the Earth witnessed one of the largest asteroid impacts in human history. There was a huge aerial explosion in Central Siberia, just North of the Tunguska River. The explosion was preceded by a fireball as bright as the Sun, it was heard 800 km away, it was recorded on seismographs all around the world and in an area of about 2000 sq.km. trees were felled and burned. The asteroid or parts of it were never found, and neither was there a large impact crater. So the theory was developed that a roughly 50 meter diameter asteroid exploded when still some 8 km above the Earth. Last year, however, Italian scientists discovered a small circular lake in the area, up to 50 meters deep, which may fill an impact crater. They will return this summer to try and find out more.

#### **1933 – Dark Matter discovered**

Nowadays it is fairly general knowledge in astronomy that there must be far more matter in the Universe than what can be seen, in order to explain how galaxies behave etc. It is called *dark matter* and estimated to account for some 23% of all matter in the Universe.

This was discovered as far back as 75 years, when in 1933 a Swiss astronomer – Fritz Zwicky - discovered that a cluster of some 1000 galaxies he was studying could only be stable if there was a much larger gravitational force at work than what could be concluded from the visible stars and galaxies. He called the 'missing' mass *dark matter*, but it was not before the seventies that his ideas were taken seriously (he died in 1974).

#### **1958 – NASA created – *Explorer-1* launched – *Vanguard* launched**

Less than 10 months after *Sputnik*, US Congress – in somewhat of a panic – converted the 43 years old NACA into the National Aeronautics and Space Administration NASA.

Already by the end of January 1958 the Americans launched the *Explorer-1* missile, which discovered the belts of highly energetic charged electrons high in the atmosphere – the *Van Allen Belts*.

Just 6 weeks later the Americans launched the *Vanguard* satellite. It was the first one to use solar power and it sent back to Earth a wealth of information, on the exact size and form of the Earth, its air density and temperatures. It stopped broadcasting information in 1964, but it still orbits the Earth (by far the oldest satellite in orbit).



