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LIGHT POLLUTION

Causes

What is LP? → 'Light that shines where it is neither needed nor wanted.'

LP is caused by all sorts of artificial lighting: street and road lights, lights on airports, security lights, lights on sporting grounds, building floodlights etc. Urban areas are of course most affected.

Much lighting is simply necessary, but it is important not to use too much light, and to reduce the amount of light that goes upward. Much has been achieved already, but it is important to reduce the amount of less necessary lighting much further.

International organizations and conferences

In April 2007 a conference on LP, backed by UNESCO and the International Astronomical Union, held in La Palma, resulted into the *StarLight Declaration*, which states that

'An unpolluted night sky that allows the enjoyment and contemplation of the firmament should be considered an inalienable right.'

In August 2008 18 European countries + USA + Israel participated in the 8th *European Dark Sky Symposium*, held in Vienna. One of the topics were the plans for dark sky activities during the International Year of Astronomy 2009.

There are several other international conferences on LP, especially in Central-European countries: Sept. '09 and '10 in Croatia, Sept. '10 in Hungary.

The 9th *Dark Sky Symposium* was held in Armagh, Northern Ireland, in September last year. The event lasted for four days and was attended by dark-sky campaigners from all over the world.

British examples

In Britain, the *Campaign for Dark Skies* (CfDS) was started in 1989. It wants the sky to be recognised as a site of special scientific interest and an area of natural beauty. They have a website: www.britastro.org/dark-skies, and a handbook '*Blinded by the Light?*', aimed at local councils and others who make and install exterior lighting.

In November last year the Galloway Forest Park in SW Scotland became the UK's first *International Dark Sky Park*, certified by the American *International Dark-skies Association* (on a clear night one can see about 200 stars in the sky above London, and 7000 in the Galloway Park!). Together with a site in Hungary, these are the first two Dark-Sky Parks in Europe.

In addition to this the CfDS aims to establish a network of *Dark Sky Discovery Sites*, dark but safe and accessible locations in or around towns and villages, where individuals, schools, astronomy groups etc can come and watch the night sky. About a year ago, the first two sites were announced, both in Scotland.

In the autumn of 2008 *Operation Noah* – a Christian environmental campaign – called upon churches in the UK to limit the number of nights when floodlights are used to illuminate churches. The main aim is probably the saving of energy and money, but darker skies may well form a pleasant side-effect!

There are already dozens of local authorities that are switching off streetlights during the night. In recent years the Highways Agency revised its standards about the question if roads should be lit and what type of lighting should be used (less orange 'low-pressure sodium lighting'),

Concluding, we can say that despite the increase in the use of artificial light in the world, there are many promising actions to reduce light pollution. Of course, it's not always in the first place to satisfy star gazers, but often mainly to spare both the environment and to save money. But the results can be positive for all these purposes.

NEWS

Falcon-9

Last month we heard about President Obama's idea that private companies should gradually take over the task from NASA to transport astronauts and cargo to and from the ISS, and that at the moment a company called *Space X* is the leading one. Its latest rocket - the *Falcon 9* - had a successful launch on 04/06 and put a mockup of a capsule into orbit around Earth as planned. Launching this rocket costs about 5% of the cost of launching a shuttle! If this idea is going to work, NASA will be able to spend much more money to really groundbreaking research projects than it did over the last decades.

To Mars in Moscow

On Thursday 3/6, six astronauts (or cosmonauts) began a 520-day journey to Mars and back – in a dummy spacecraft in a hangar in a Moscow suburb. They'll simulate as much as possible a real mission to Mars. Six men – three Russians, one Frenchman, one Chinese and one Italian – will not get out of their mock space ship before November next year. There are four windowless modules, for sleeping, working, storage and experiments.

The main purpose is to see what the psychological influence on humans is of such a long time in isolation with a small number of people. They will imitate a real Mars mission as much as possible: 250 days for the journey to Mars, then some 30 days on the Red Planet – with simulated spacewalks in a large sandpit – and then about 240 days for the journey back home.

They'll see no daylight for a year and a half and eat the same sort of meals as the crew of the International Space Station. The only big difference with a real Mars mission is that they'll not be weightless.

Hayabusa

On 13/06 a Japanese capsule returned to Earth, landing on a parachute in South Australia, after having made a most extraordinary trip. It was launched in May 2003 on board of a spacecraft - called *Hayabusa* – and travelled to a meteorite orbiting the Sun. It flew around this meteorite at a very low altitude, landed on it in 2005, took photographs and – hopefully – collected some dust from the surface (instrument designed to collect surface material failed, but it is hoped that nevertheless some dust may have been picked up). Then it started its journey back to Earth, missed an opportunity to land in 2007, but now returned safely. When the spacecraft was still 40,000 km above the Earth's surface, it ejected the 16-inch (or 40 cm) wide capsule which should contain the meteorite's dust, which then unfurled a parachute when still only 10 km above the Earth, and landed at almost exactly the planned spot. The capsule will be sent to Japan for extensive and very careful examination of its contents. It is hoped that these will offer further insight into the creation of the solar system, 4.5 bn years ago.

Soyuz to the ISS

Early on Wednesday 16/6 a Soyuz was launched from Kazakhstan, taking three astronauts towards the ISS, thereby bringing the crew back to six again (including, for the first time, two women). They'll stay there again for about six months. This was the 100th launch of any space vehicle to the ISS since 1998!

