Workshop Caipan; CNES Paris, 8-9 July 2014

The Hessdalen Phenomena (HP). 30 years of research. Instrumentation, results, witness stories, challenges, and difficulties.

Erling Strand (1), Bjørn Gitle Hauge (1), Jacques Zlotnicki (2), Stelio Montebugnoli (3), Jader Monary (3), Elizabeth Blank (4) Thomas Farges (4), Paul Yvetot (2) and Fréderic Fauquet (2).

(1) Østfold University College, Halden, Norway, (2) CNRS UMR6524-OPGC-UPB, France, (3) Instituto di radioastronomia, Radiotelescopi di Medicina, Bologna, Italy (4) CEA, DAM, DIF, France

The Hessdalen valley is a North-South elongated isolated valley, 15 km long, located 120 km south of Trondheim city, in Norway. About 200 people were living there in 1980. Today, the population is close to 120. In the second part of November 1981, the inhabitants started to notice the appearance of mysterious transient lights at low altitude in the atmosphere.
The number of such mysterious lights was very high in the period from late 1981 to late 1984. At the most there were 20 observations a week. From 1985 the rate decreased down to 20 a year.
The HP is more easily observed during night time. In spite large number of lights, the randomly manifestation of these phenomena is difficult to assess. Several inhabitants have reported several phenomena, while some of them have become skeptical and are against the interest brought by these unknown lights.
The first Project Hessdalen (http://www.hessdalen.org/) was established in June 1983 by a group of 5 persons. This first part ended 1985. In 1993 the project was started again at Ostfold College in Norway (http://www.hiof.no/eng/). A one month field investigation with instruments was run during January and February 1984 and a 14 day period with instruments in January 1985. An automatic field station was established in Hessdalen in 1998.
Since 2000 the EMBLA project was run in cooperation with scientists from Institute of Radio astronomy (IRA, http://www.ira.inaf.it/Home.html) in Italy. From 2000 to 2007, a team from IRA came in Hessdalen valley every year for a field campaign. They used different specific devices and were watching for the HP, with success. Since 2002, Science Camps were organized by the Østfold College and later also together with Inspiria Science Center (http://www.inspiria.no/) . The objective was, and still remains, to involve students of a junior high school in 1- to 2-weeks field campaigns. After 2007 the IRA scientists participated in the Science Camps. Since 2010 scientists from CNRS and CEA in France began to enlarge the project. They established temporary electromagnetic stations in the valley.

All these Science Camps, the campaigns run by the IRA, the automatic stations run by the IRA, the CNRS, the CEA and the Project Hessdalen, have brought large harvest data outstanding observations. Description of lights, trajectories, time of appearance, altitude, and discrimination with human activities were more and more detailed studied.

Such kind of instruments have been used: 1) Radar, 2) Geiger counter, 3) Spectrum analyzer, 4) VLF and HF receivers, 5) Magnetometer, 6) Spectral camera, 7) Still camera, 8) Video camera, 9) Laser, 10) Seismograph, 12) Meteorology[temperature, wind speed and direction, humidity, air pressure], and 11) Electrical properties of the ground.

Let's remind that this project is - until now - only supported by sparse financial annual supports. The talk will present witness reports and instrumental observations. Some of the challenges will also be discussed.