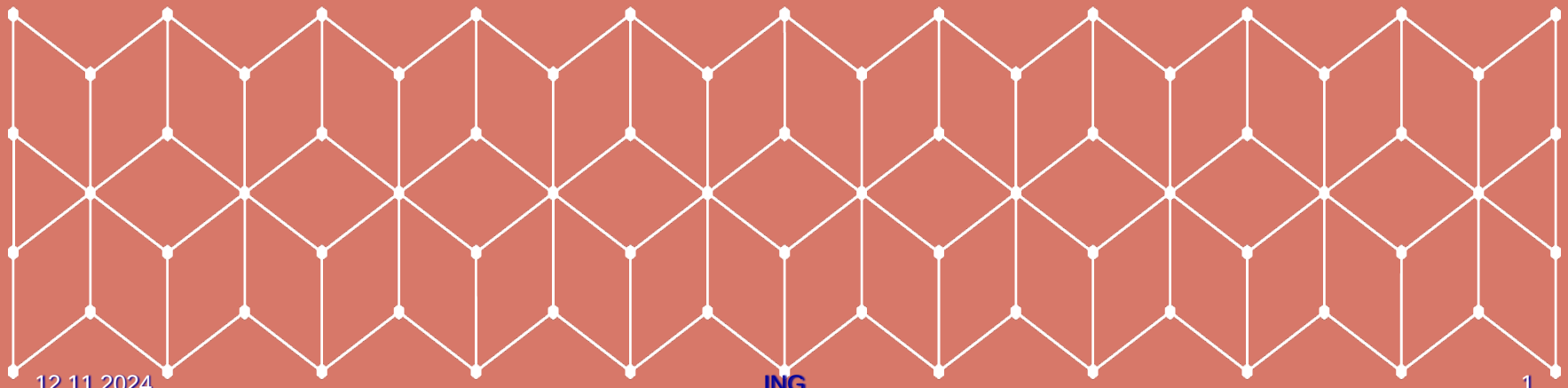
Østfold University College

Høgskolen i Østfold i Hessdalen

Presentasjon av resultater og ambisjoner



Forskningsstasjonen i Hessdalen er og blir:

- Viktig for internasjonale forskningsprosjekter
  - Grunnleggende forskning for å forstå «lysfenomenet»
  - Nye metoder og mulige anvendelser tas over i anvendt forskning

- Viktig for studentene og studentrekrutteringen
  - «Feltkurset» er unikt i Norge, og gir et enestående læringsutbytte
  - Svært gode tilbakemeldinger fra studentene

Høgskolen i Østfold vil:

- Legge til rette for langsiktig og forutsigbar bruk av anlegget
  - Prosjekter over flere år
  - Søke ytterligere forskningsmidler
  - Jevnlige studentkurs og studentprosjekter
- Sørge for nødvendig løpende vedlikehold

CNES Centre National d'Etudes Spatiales

The National center for space research
"NASA-France"

Hessdalen Observatory

2017 EU Horizon søknad 26mil.NKr.

Proposal Submission Forms

Please check our wiki for help on navigating the form.

Horizon 2020

Call: H2020-FETOPEN-2018-2020

(FET Open – Novel ideas for radically new technologies)

Topic: FETOPEN-01-2018-2019-2020

Type of action: RIA

(Research and Innovation action)

Proposal number: 899809

Proposal acronym: VolantiLumine

Deadline Id: H2020-FETOPEN-2018-2019-2020-01

Table of contents

How to fill in the forms

The administrative forms must be filled in for each proposal using the templates available in the submission system. Some data fields in the administrative forms are pre-filled based on the steps in the submission wizard.

This proposal version was submitted by **Anna-Lena KJØNIKSEN** on **18/09/2019 16:24:38** Brussels Local Time. Issued by the Funding & Tenders Portal Submission System.

Proposal Evaluation Form

EUROPEAN COMMISSION

Horizon 2020 - Research and Innovation Framework Programme

Evaluation Summary Report - Research and innovation actions

Call: H2020-FETOPEN-1-2016-2017
Funding scheme: RIA
Proposal number: 801439
Proposal acronym: VolantiLumine
Duration (months): 36
Proposal title: Vision of controllable spherical Lights as a domestic source of light - anticipating the discovery of the physical mechanism beyond Luminous natural phenomena.
Activity: FETOPEN-RIA-2017-2

N.	Proposer name	Country	Total Cost	%	Grant Requested	%
1	HOGSKOLEN I OSTFOLD	NO	2,687,410	62.24%	2,687,410	62.24%
2	CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE CNRS	FR	260,000	6.02%	260,000	6.02%
3	ARISTOTELIO PANEPISTIMIO THESSALONIKIS	EL	606,250	14.04%	606,250	14.04%
4	UNIVERSITETET I BERGEN	NO	81,250	1.88%	81,250	1.88%
5	ISTITUTO NAZIONALE DI ASTROFISICA	IT	43,125	1.00%	43,125	1.00%
6	ISPAS AS	NO	640,000	14.82%	640,000	14.82%
	Total:		4,318,035		4,318,035	

Abstract:
The generation of stable balls of light as consumers lighting source is currently a non-existent technology. However, lights reminiscent of ball lightning but longer lasting and without sound, have been observed in nature, floating above the ground for extended periods of time under normal temperature and pressure conditions. These balls of light have not been observed to cause any harm to their surroundings. Assuming our current technologies could reproduce similar physical conditions, it should be possible to generate corresponding lights artificially. Such lights are frequently observed in Hessdalen, Norway, where they have also been authenticated as a genuine light phenomenon. The aim of this project is to discover the physical mechanism causing these natural spheres of lights. This knowledge could then be used to generate artificial spherical lights in the future. In shorter terms, some of the technical results could be used for industrial applications, for instance improved RADAR technologies are relevant for detections of drones (which are difficult to follow by traditional RADARs due to rapid change of direction).
Although observation of such natural lights is reported from several locations around the world, little scientific fieldwork has been done to understand their mechanism. In order to push further the understanding of such physical mechanism, we need an interdisciplinary team of researchers. The consortium partners are experts in different fields, and cover the main scientific areas needed to solve this problem, with an interdisciplinary team of experts in geophysics/volcanology, astrophysics, RADAR technology, chemistry, physicists with experience in lightening and sprites, experts in multivariate analyses. In addition, the team includes some of the very few scientists with any prior experience in doing field research on such lights. The understanding of this phenomena, will open the path to breakthrough consumers lighting concepts.

Evaluation Summary Report

Evaluation Result

Total score: 4.20 (Threshold: 0)

Form Information

SCORING

Scores must be in the range 0-5.

Interpretation of the score:

0 *The* ***proposal fails to address the criterion*** *or cannot be assessed due to missing or incomplete information.*

1 Poor. *The criterion is inadequately addressed, or there are serious inherent weaknesses.*

2 Fair. *The proposal broadly addresses the criterion, but there are significant weaknesses.*

3 Good. *The proposal addresses the criterion well, but a number of shortcomings are present.*

4 Very good. *The proposal addresses the criterion very well, but a small number of shortcomings are present.*

5 Excellent. *The proposal successfully addresses all relevant aspects of the criterion.Any shortcomings are minor.*

*** The asterisk means mandatory field**

Panel comments on proposal

This evaluation summary report contains the final scores, endorsed by the FET-Open final review panel. The panel based its conclusions on the prior individual reviews, conducted by four independent evaluators. The comments from the individual evaluators, or extracts from them, are included below in this report. They are collated per sub-criterion, so in the report the comments on each sub-criterion reflect the opinions from the four remote evaluators.
While not necessarily subscribing to each and every opinion expressed, the panel finds that to a big extent the comments from the remote

Skarvan 975m.o.h

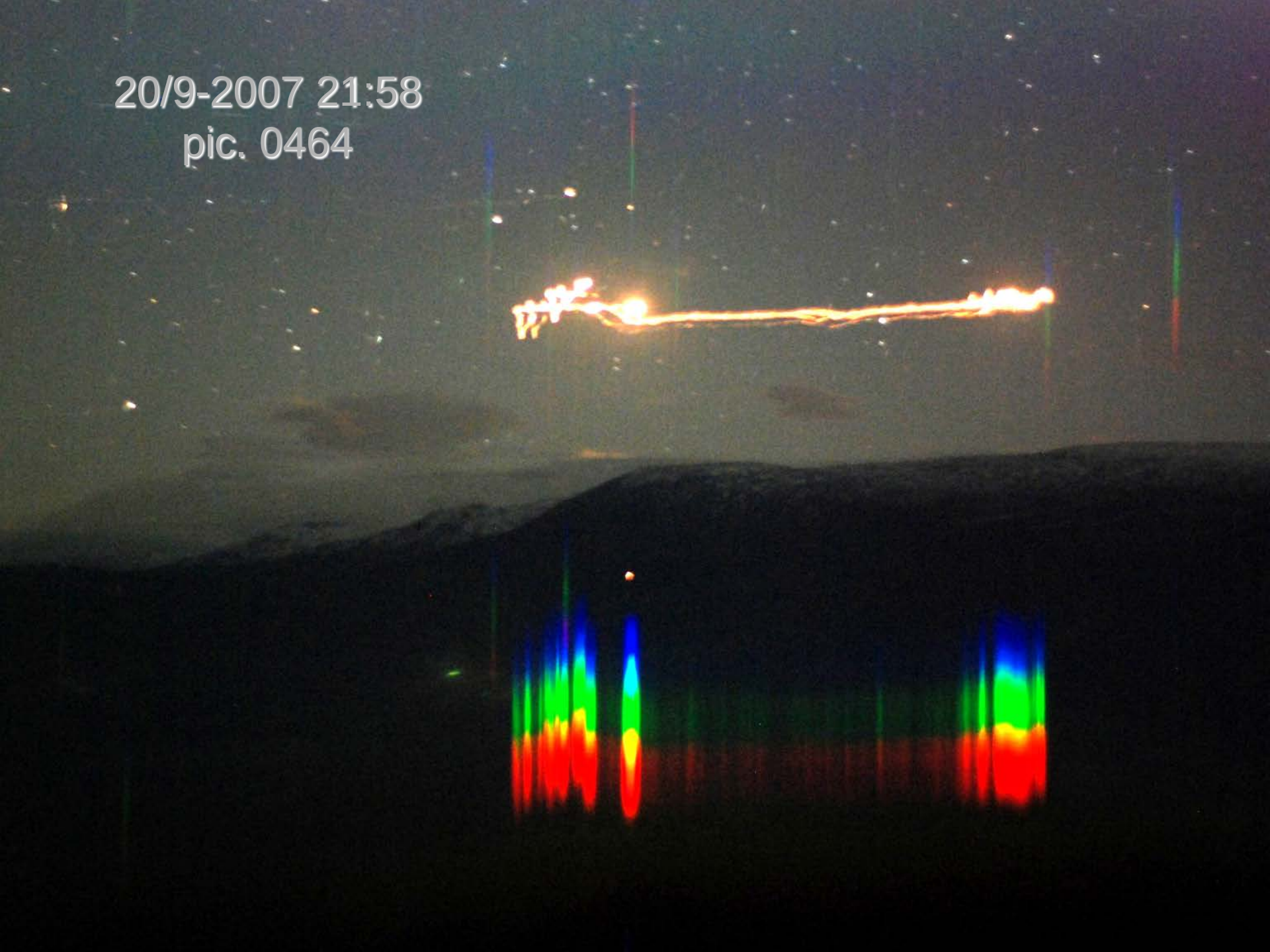
16 computer sensors

Overvåking døgnet rundt

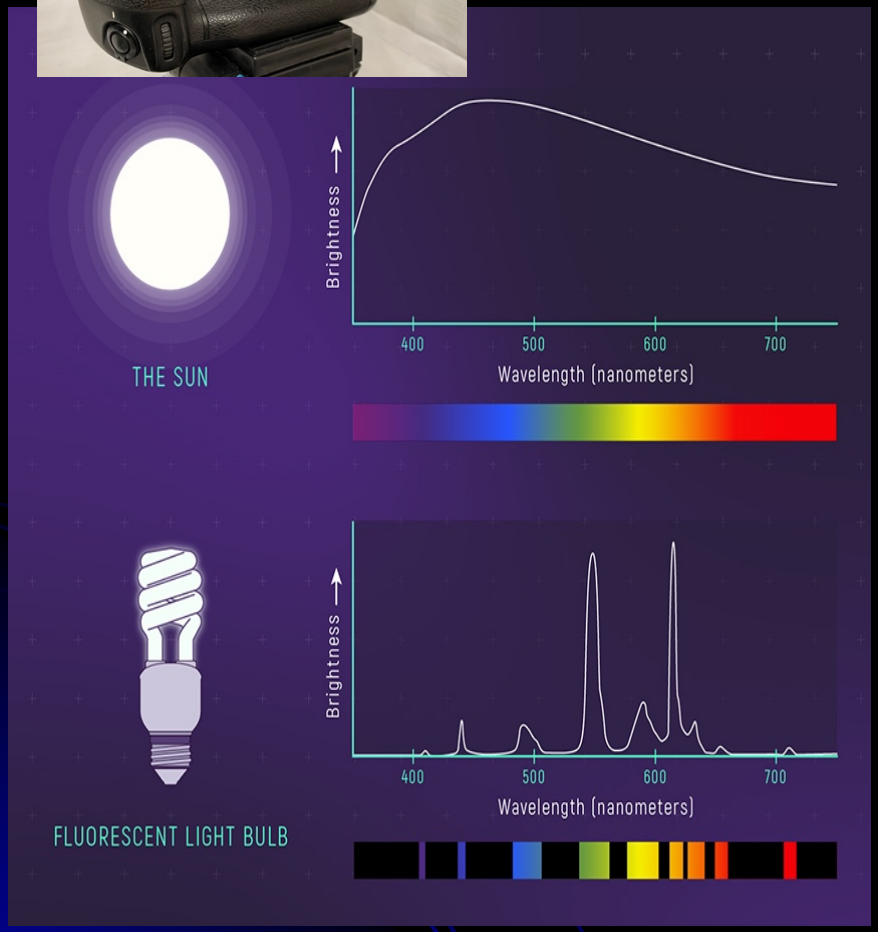
Øyungen 19.09.2012
22:34 UTC

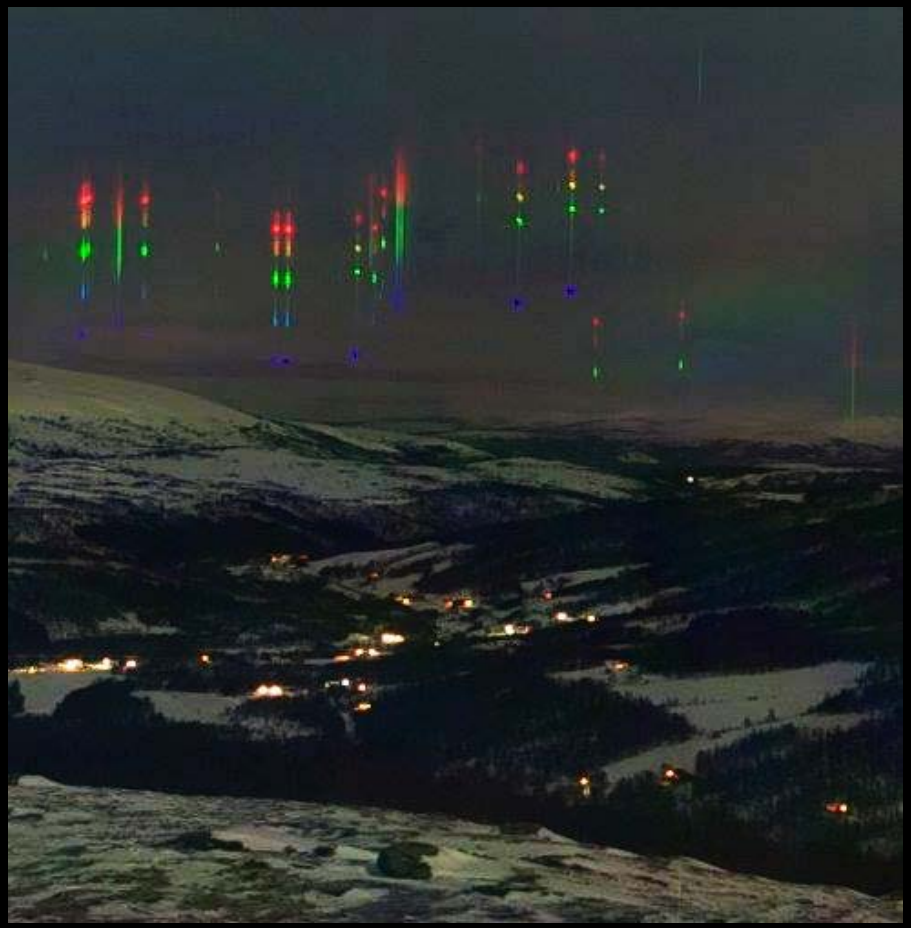
Hessdalsfenomenet

Bilde tatt fra Skarvan mot nord september 2016
Eksponeringstid 30 sek. Spektralfilter lager regnbuemønster


20/9-2007 21:58
pic. 0464

Spektroskopi





Internasjonal publisering

Acta Astronautica 67 (2010) 1443–1450

Contents lists available at ScienceDirect

Acta Astronautica

journal homepage: www.elsevier.com/locate/actaastro

Investigation & analysis of transient luminous phenomena in the low atmosphere of Hessdalen valley, Norway

Bjørn Gitle Hauge *

Østfold University College, 1757 Halden, Norway

ARTICLE INFO

Article history:
Received 22 February 2009
Received in revised form
17 September 2009
Accepted 18 January 2010
Available online 24 March 2010

Keywords:
Hessdalen phenomena
Optical spectrum
Radar data
Ball lightning
Plasma

ABSTRACT

For over 100 years, transient luminous phenomena have been seen in the Hessdalen valley. Italian and Norwegian scientists, gaining experience from the SETI program, has since 1998 installed cameras, spectrometers and RADAR's to unveil the nature of this phenomenon. Results indicate a combustion process driven by an unknown power source.

1. Introduction

During the last 25 years researchers have tried to explain the nature of the transient luminous phenomena which have been observed in the low atmosphere above the Hessdalen valley. The valley is located in the middle of Norway, 120 km southeast of Norway's old capital city Trondheim at latitude 62° 41′ North and longitude 11° 12′ East between two mountain ranges, stretching out 15 km in north-south direction at an altitude of 600 m. In the south, at 800 m altitude, the lake Øyungen gives birth to the river Hesja, which runs through the center of the valley towards north.

Two thousand years ago inhabitants dug out bog iron from surface mines scattered all over the valley. Several copper mines are also situated inside this small valley, and one of Norway's biggest ore deposits is found in the southern part, where several hundred tons of species of ore, copper and zinc, still awaits to be excavated. The climate is humid and rainy during summertime, and sub arctic in wintertime.

During the winter of 1811, the priest Jakob Tode Krogh wrote in his diary: "In the last days of the year 1811 a star with big shining brushwood's was seen on the sky. It gave away a huge glare…" [1]. In 1895 the newspaper "fjeldljom" [2] reported about strange lights in the valley, and during the Second World War people saw lights in the valley [3].

After the war, very few lights were seen until 1982. This time the lights were so intense and frequent that they became a tourist attraction. This attracted interest among scientists, and in 1984, Strand conducted a research campaign.

Instruments used during the campaign were:

(1) Camera with grating for optical spectrum analyzers.
(2) Infrared viewer.
(3) Spectrum analyzer scanning receiver sensitive to electrical field 10 KHz–1GHz.
(4) Seismograph for detecting crust in the earth/earthquake.
(5) Geiger counter for detecting radio activity.

* Tel.: +47 41675282; fax: +47 69104002.
E-mail address: bjorn.g.hauge@hiof.no

0094-5765/$ - see front matter © 2010 Elsevier Ltd. All rights reserved.
doi:10.1016/j.actaastro.2010.01.019

Journal of Applied Geophysics 226 (2024) 105398

Contents lists available at ScienceDirect

Journal of Applied Geophysics

journal homepage: www.elsevier.com/locate/jappgeo

Contribution of VLF electromagnetic survey to the investigation of Hessdalen lights (Norway)

G.N. Vargemezis [a,e,*], J. Zlotnicki [b,e], B.G. Hauge [c], A.L. Kjøniksen [c], E.P. Strand [d]

[a] *Department of Geophysics, School of Geology, Aristotle University of Thessaloniki, Greece*
[b] *Centre National de la Recherche Scientifique, Observatoire de Physique du Globe de Clermont-Ferrand (UMR6524), France*
[c] *Department of Engineering, Østfold University College, P.O. Box 700, 1757 Halden, Norway*
[d] *Faculty of Computer Sciences, Østfold University College, P.O. Box 700, 1757 Halden, Norway*
[e] *International Association of Electromagnetic Studies of Earthquakes and Volcanoes (EMSEV), Institute of Oceanic Research and Development, Tokai University, Japan*

ARTICLE INFO

Keywords:
Hessdalen lights
VLF measurements
Geophysics
Geomorphology

ABSTRACT

Hessdalen valley in Norway is known for luminous phenomena suddenly and evenly appearing temporarily. Since several decades, these phenomena are observed by many witnesses, and they are sometimes traced by geophysical devices. The first appearance in modern times was reported in 1981 but systematic observations started during winter of 1984 when the Hessdalen project was launched. Later, Østfold University College led the project and yearly organized one to two field campaigns, with the objective to systematically record and investigate the phenomenon. Till that epoch, detailed tectonics, fault systems and superficial conductive structures remained unknown. Therefore, during the last years, VLF surveys have been performed in Hessdalen valley as part of six geophysical field campaigns which sometimes also included Total Magnetic Field and Self Potential spatial ground measurements. VLF measurements have been carried out on a 20 m average spacing along many traces totaling to100 km length. The entire covered area was about 100 km^2.In this paper, we focus on the results of the VLF measurements. Several conductive zones have been found. They are mainly related to mineral deposits (mainly sulfides). The trace at the ground surface of these conductive zones could suggest that they draw an ellipse of 6 by12 km, related to the shape of the gabbro intrusion present in the area and oriented in the SW-NE direction. The results combined with other geophysical data contribute to better understand how the near surface structures (depth less than a few hundred meters) could supply the generation of the so-called Hessdalen lights ('HL') and explain why these lights appear inside this valley. The particular geological structure detected in Hessdalen valley may encourage similar campaigns in other areas where similar phenomena are observed.

1. Introduction

Luminous phenomena have been reported in some localized areas over the world during the last decades. Unfortunately, scientific examination of such lights is scarce. It is therefore difficult to discern genuine luminous phenomena from lights caused by human activities. Areas where luminous phenomena have repeatedly been reported include Hessdalen, Norway (Hauge, 2010), Marfa, Texas, USA (Stephan et al., 2011; Darack, 2008), Silver Cliff, Colorado, USA (), Paasselkä, Finland, and Queensland, Australia (Pettigrew, 2003; Moravec, 2003). These transient appearances of atmospheric lights easily spark the imagination of people.

Although luminous phenomena ('LP') in Hessdalen valley were first reported in 1811, scientific investigations only began in 1984 (Hauge, 2010). To find out the real genesis of these lights, a *Hessdalen project* was gradually enlarged by camera monitoring, and yearly field campaigns during which geophysical devices were implemented (Teodorani, 2004; Hauge, 2010). However, a hypothesis considering a possible interaction between geology, tectonics and the environmental conditions, has not yet been considered.

A key consideration must be underlined right now. Hessdalen valley is located in a very remote and almost uninhabited region (−62°44′N-62°54′N/−10°54′E-11°54′E). During winter, the temperature can be below −30 °C and wind can blow up to190 km/h. These harsh conditions associated with dozens of lakes and muskeg areas make geophysical observations difficult to implement and maintain in the long term

* Corresponding author at: Department of Geophysics, School of Geology, Aristotle University of Thessaloniki, Greece.
E-mail address: varge@geo.auth.gr (G.N. Vargemezis).

https://doi.org/10.1016/j.jappgeo.2024.105398
Received 21 March 2022; Received in revised form 28 January 2024; Accepted 10 May 2024
Available online 11 May 2024
0926-9851/

Feltforsking

Østfold University College

For employees Norwegian website

Home Research Studies Student life Services About People Search

Spring

IREXC30018 Field Research for International Students (Spring 2020)

Table of contents

Facts about the course

ECTS Credits: **10**

Responsible faculty: **Faculty of Computer Science, Engineering and Economics**

Campus: **Fredrikstad and Hessdalen**

Course Leader: **Anna-Lena Kjøniksen**

Teaching language: **English**

Duration: **½ year**

The course is connected to the following study programs

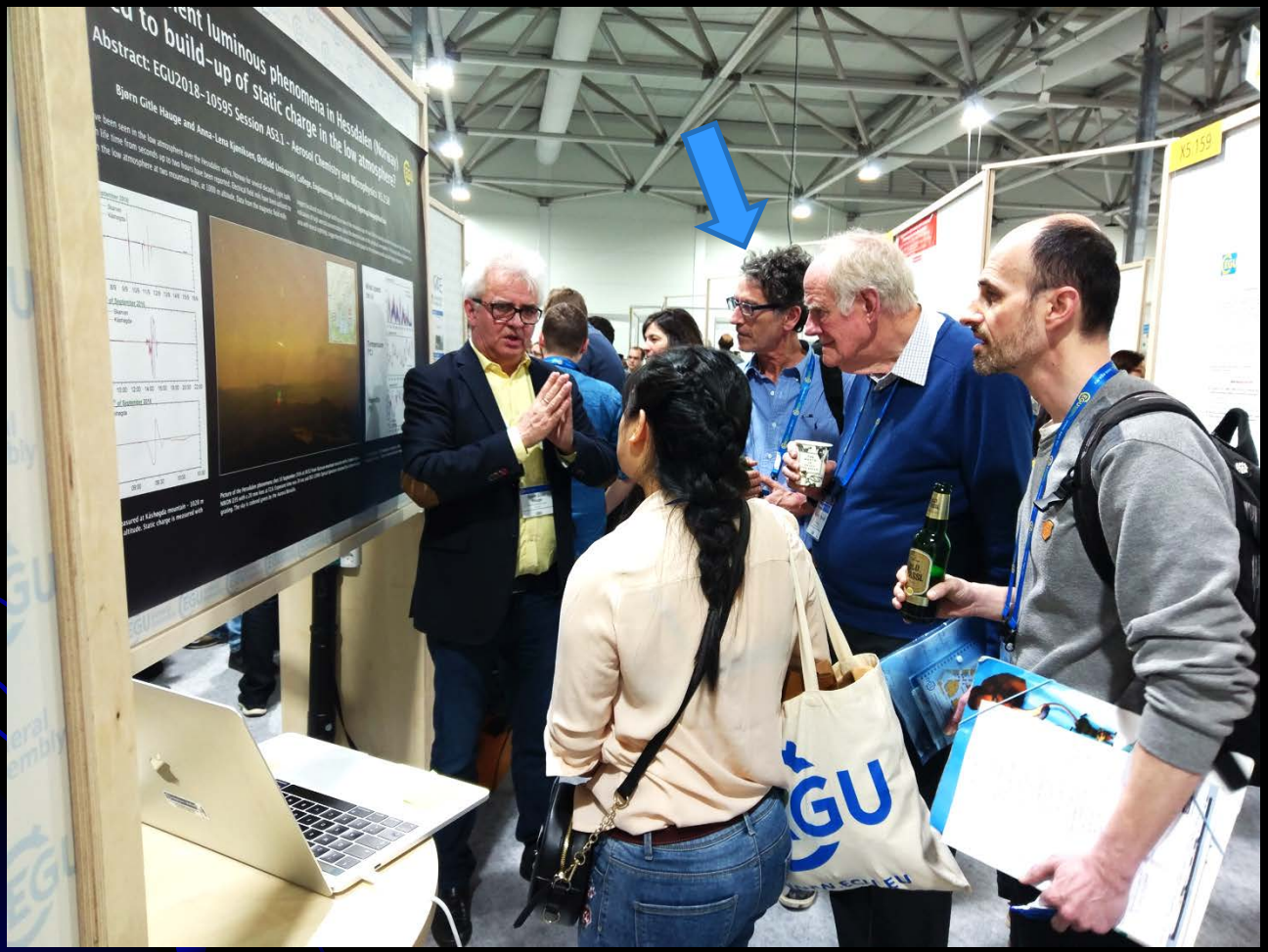
Elective course in all Bachelor of Engineering study programmes.

Feltforsking 10 Stp

European Geosciences Union

EGU 2018

Professor Konstantinos Kourtidis
COST Manager CA15211

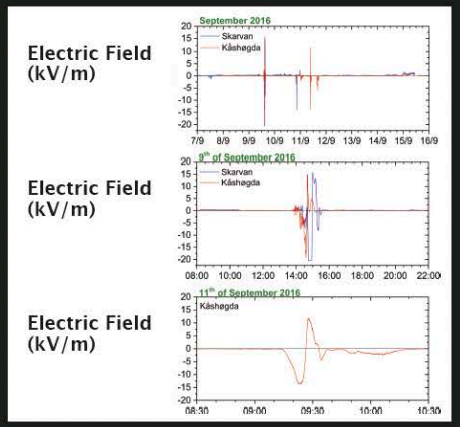


Are the transient luminous phenomena in Hessdalen (Norway) related to build-up of static charge in the low atmosphere?

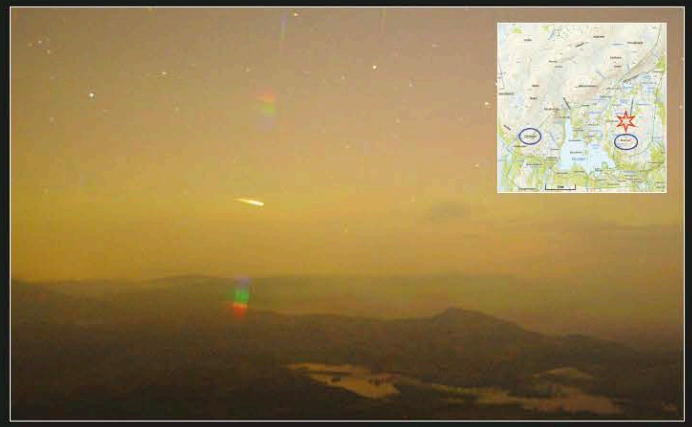
Abstract: EGU2018-10595 Session AS3.1 – Aerosol Chemistry and Microphysics X5.158

Bjørn Gitle Hauge and Anna-Lena Kjøniksen, Østfold University College, Engineering, Halden, Norway (bjorn.g.hauge@hiof.no)

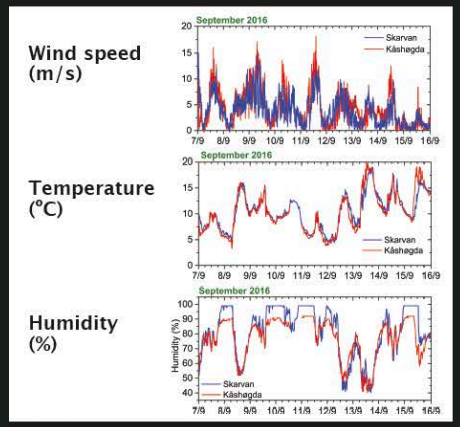
Transient luminous phenomena have been seen in the low atmosphere over the Hessdalen valley, Norway for several decades. Light balls of different shapes and colour, with life time from seconds up to two hours have been reported. Electrical field mils have been utilized to measure the static electrical field in the low atmosphere at two mountain tops, at 1000 m altitude. Data from the magnetic field mills suggest localized static charge build up on one of the mountain tops of over 20KV/m during a period of not more an hour. There are also indications of high aerosol concentrations (above the detection limit of the utilized air ion counters). This charge build up is detected in an area with several sightings, suggesting the detection of a birth place for the phenomena and a possible trigger mechanism.



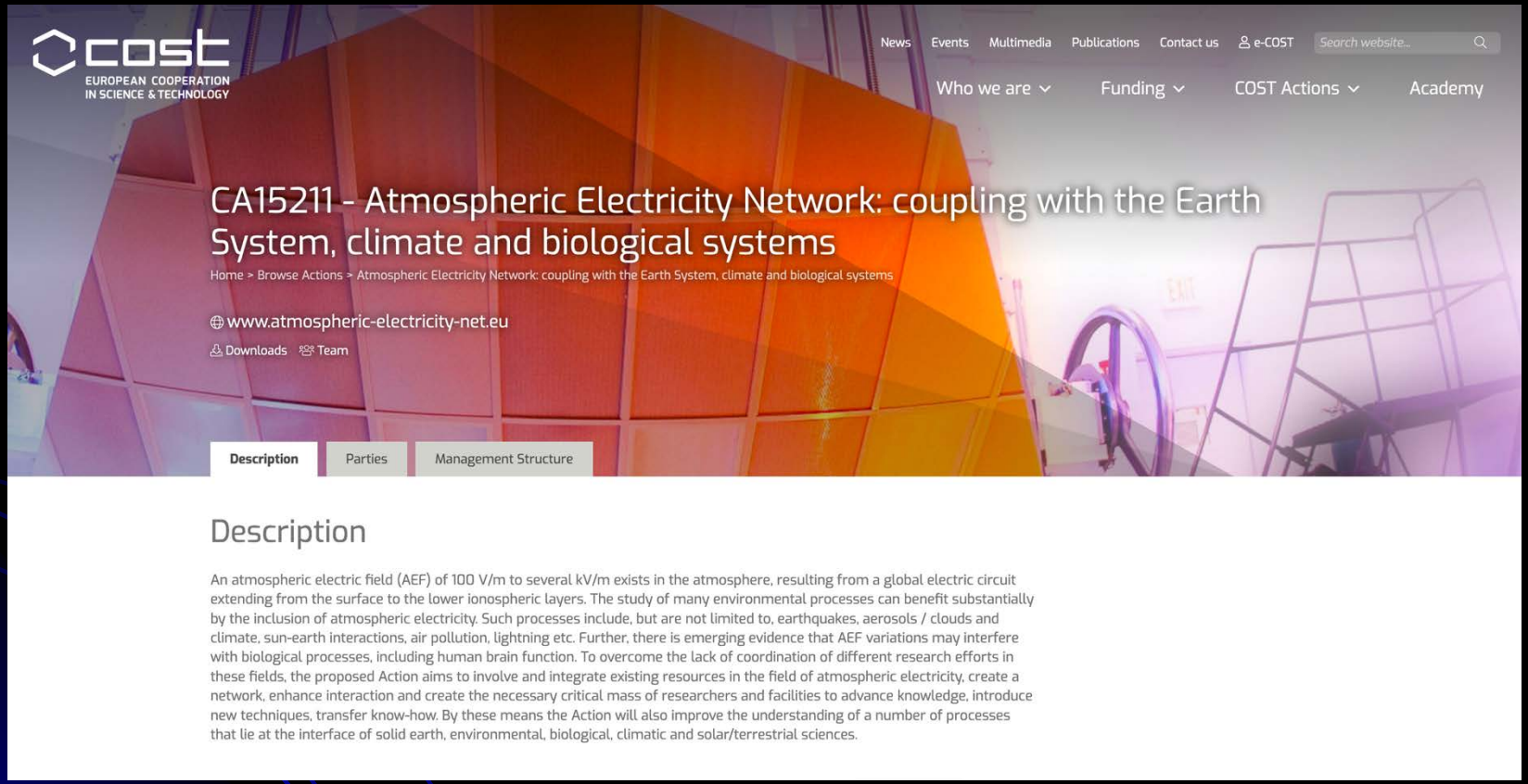
7– 16 September 2016: Static charge measured at Kåshøgda mountain – 1028 m altitude and Skarvan mountain – 974 m altitude. Static charge is measured with Boltek electric field mills.



Picture of the Hessdalen phenomena shot 10 September 2016 at 00:52 from Skarvan mountain towards north. Camera was a NIKON D3S with a 20 mm lens at f2,8. Exposure time was 30 sec and ISO 12800. Optical Spectrum obtained by a transmission grating. The sky is colored green by the Aurora Borealis.



7 – 16 September 2016: Windspeed, temperature and humidity measured at Kåshøgda mountain – 1028 m altitude and Skarvan mountain – 974 m altitude.



Description

An atmospheric electric field (AEF) of 100 V/m to several kV/m exists in the atmosphere, resulting from a global electric circuit extending from the surface to the lower ionospheric layers. The study of many environmental processes can benefit substantially by the inclusion of atmospheric electricity. Such processes include, but are not limited to, earthquakes, aerosols / clouds and climate, sun-earth interactions, air pollution, lightning etc. Further, there is emerging evidence that AEF variations may interfere with biological processes, including human brain function. To overcome the lack of coordination of different research efforts in these fields, the proposed Action aims to involve and integrate existing resources in the field of atmospheric electricity, create a network, enhance interaction and create the necessary critical mass of researchers and facilities to advance knowledge, introduce new techniques, transfer know-how. By these means the Action will also improve the understanding of a number of processes that lie at the interface of solid earth, environmental, biological, climatic and solar/terrestrial sciences.

Elektrisk felt V/m

cost EUROPEAN COOPERATION IN SCIENCE & TECHNOLOGY eLECTRONET

STATIONS VARIABLES SHOWCASES ABOUT CONTACT

Home › Stations

Stations

DUTH Station

Széchenyi István Geopysical Observatory (NCK)

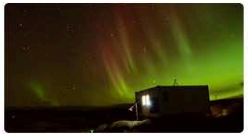
Geophysical Observatory Swider, Poland

Aragats

Antikythera NOA

Cyprus digital ionosonde Station

Polish Polar Station Hornsund



Hessdalen Observatory

SGO

Submit station

(requires login)

STATIONS ARTICLES

DUTH Station

Széchenyi István Geopysical Observatory (NCK)

Geophysical Observatory Swider, Poland

VIEW ALL

Main navigation

- Stations
- Variables
- Showcases
- About
- Contact

cost EUROPEAN COOPERATION IN SCIENCE & TECHNOLOGY

eLECTRONET

STATIONS VARIABLES SHOWCASES

SELECT VARIABLES

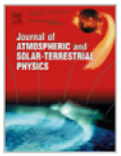
☐ Aerosols ☐ Airglow ☐ CCN ☐ Charged aerosols ☐ Charged precipitation ☐ Clouds ☐ Cosmic rays ☐ ELF ☐ Environmenta

☐ Ionospheric sounding ☐ Jz ☐ Lightning ☐ Medical ☐ Meteorology ☐ Model ☐ Other (please specify) ☐ PG ☐ Radon ☐ Sc

☐ ULF ☐ VLF

Journal of Atmospheric and Solar-Terrestrial Physics

Volume 72, Issue 16, October 2010, Pages 1200-1203



A hypothetical dusty plasma mechanism of Hessdalen lights

G.S. Paiva, C.A. Taft

https://doi.org/10.1016/j.jastp.2010.07.022

Abstract

Hessdalen lights (HL) are unexplained light balls usually seen in the valley of Hessdalen, Norway. In this work, it is suggested that HL are formed by a cluster of macroscopic Coulomb crystals in a plasma produced by the ionization of air and dust by alpha particles during radon decay in the dusty atmosphere. Several physical properties (oscillation, geometric structure, and light spectrum) observed in HL phenomenon can be explained through the dust plasma model.


Takk for oppmerksomheten!

Skarvan 975m.o.h


Hessdalen Observatory
HESSDALEN OBSERVATORY
ØSTFOLD UNIVERSITY COLLEGE
Nasjonalparkstyret for Forolhogna 08112024