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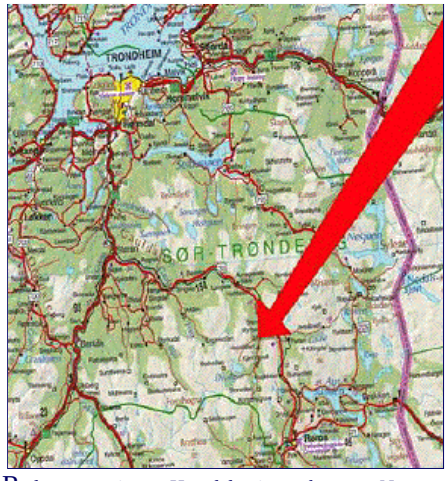
Scientists Say Mysterious Lights in Hessdalen, Norway, Are Thermal Plasmas of Unknown Origin

"We saw that those lights were changing shapes suddenly from very big to very small and the phenomenon was there standing still. But the temperature was just constant because we measured the temperature in both phases. So, there must be some kind of self-heating mechanism that keeps the temperature constant. This is highly anomalous." - Massimo Teodorani, Ph.D., Astrophysicist

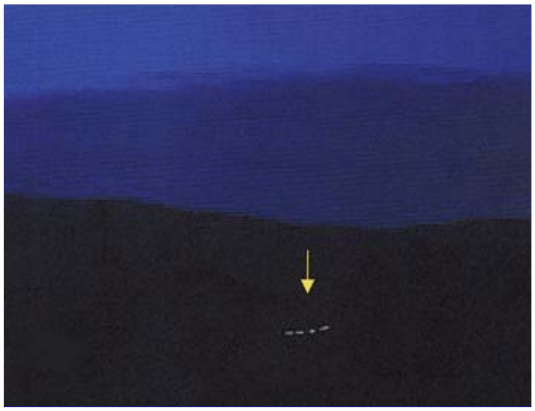
Observation point is Aspaskjolen in the valley of Hessdalen, Norway, on August 18, 2001 looking southeast. The exposures are about 30 seconds for each of the first three photo frames (upper left). The remaining three photos (upper right) were taken an hour later at the same exposure rate. Reflex camera was Yashica 107 Multiprogram; film 200 ASA. Photograph and processing by M. Teodorani.



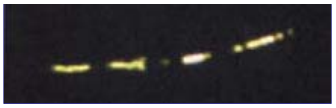
Red arrow points at Hessdalen in northeastern Norway.

November 17, 2001 Hessdalen, Norway - Over the past decade, many eyewitnesses in the valley of Hessdalen in northeastern Norway have reported flickering, pulsing, lights that change shape. Norwegian engineers in 1984, lead by Prof. Erling Strand of Project Hessdalen, demonstrated that the light phenomenon is indeed measurable. Since 1998, the science team has taken automatic video frames of the lights in real time. But the research started to assume even more physical relevance in August 2000 and August 2001 when Italian astrophysicists joined the Norwegian engineers in a joint study with radio spectrum analyzers, photographs, videotape and spectroscopes. The results can be broken down into two groups: 95% are thermal plasmas and 5% are unidentified solid objects. The plasmas

emit long wave radio frequencies and strangely, their temperatures do not vary with change in size or brightness.



Pulsating ball-like flash in motion.
Several minutes of exposure on Reflex camera:
Yashica 107 Multiprogram; film: 100 ASA.
Image and processing by M. Teodorani.



Highly enlarged and enhanced close-up
of the pulsating light.

Quoting from their research summary:

> "1) most of the luminous phenomenon is a thermal plasma;
> 2) the light-balls are not single objects but are constituted of many small components which are vibrating around a common barycenter;
> 3) the light-balls are able to eject smaller light-balls;
> 4) the light-balls change shape all the time;
> 5) the luminosity increase of the light balls is due to the increase of the radiating area. But the cause, and the physical mechanism with which radiation is emitted, is currently unknown."

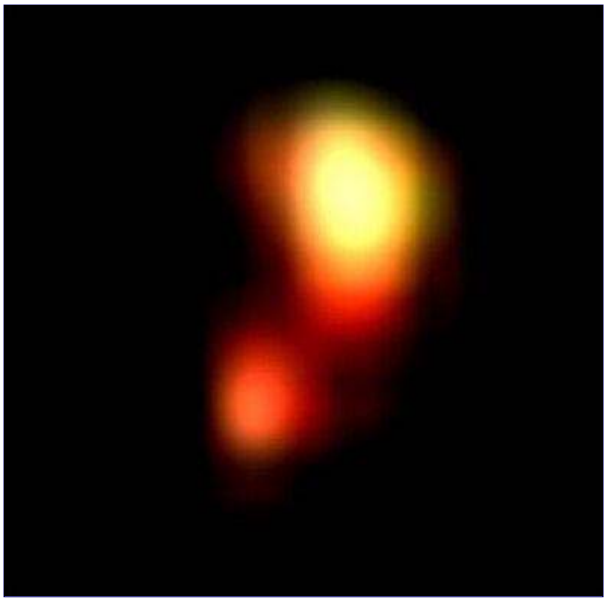
Photometric data obtained with the CCD videocamera was
pre-processed by DV Studio and Ulead Media Studio Pro 6.0 software.

Massimo Teodorani, Ph.D., Astrophysicist, scientific consultant of
Consiglio Nazionale delle Ricerche, Bologna, Northern Italy,
and team leader of EMBLA 2001 Hessdalen, Norway investigation.

The team leader on the EMBLA 2001 Hessdalen investigation is astrophysicist Massimo

Teodorani from Consiglio Nazionale delle Ricerche (CNR) in Bologna, Italy. His mission was financed by the Italian Committee for Project Hessdalen. He says there are at least thirty regions on the earth today in which similar mysterious lights are reported. Some of those are the Marfa lights in Texas, the Ontario Lake lights in Canada, the Ural lights in Russia, and the Victoria lights in Argentina. He is also aware that mysterious lights have been associated with worldwide crop formations. In the mid-1990s, biophysicist W. C. Levengood of Michigan published his discoveries about changes in formation crops and soils which indicate that rotating plasmas are involved.

No one yet knows the source of such thermal plasmas and their existence has not been acknowledged by main stream physics to date. But physicists have been coming to Dr. Teodorani since he released the 2001 Hessdalen study. This week, I talked with him about the lights he and his team monitored.



One of a red and yellow light's several changing shapes on August 18, 2001.
Video frame by S. Righini. Processing and analysis by M. Teodorani.

Interview:

Massimo Teodorani, Ph.D., Astrophysicist, Naples Observatory, Bologna, Italy: "We saw two types of targets. Most of the ones are plasma-like lights. So, nothing with structure, but just like balls of lights with no geometry or so. This is 95% of the things we saw with our own eyes.

These plasma balls could last up to two hours?
Yes. They could last up to two hours according to reports by Dr. Erling Strand who is the professor directing the project in Norway.

That would exclude ball lightning?
Absolutely, yes.

That is a very short phenomenon?
Yes.

Please describe what you've seen and what the characteristics are that make the light phenomenon so amazing to you scientists and why you are investigating.
Yes, what is amazing is the fact that the phenomenon is very energetic. And so, with our measurement we want to understand what is the physical mechanism with which this energy is emitted. This is the scope of our investigation.

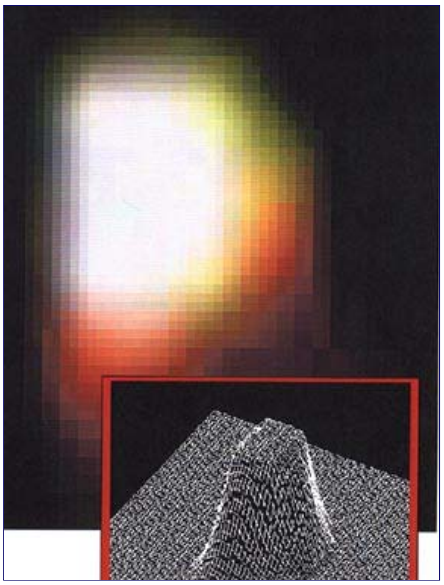
What we have seen is that the phenomena is very complex. It is not simple light balls, but when we process the data we see that many small light balls vibrate around a common barycenter. So it is something like a center force that is ejecting balls or the mini-balls are going around the center body. It is quite complicated.

Structure of a blinking light is shown in this processed frame that is the summation of 30 contiguous video frames (1/25 sec each). The "mini-ball" components can be seen around the main luminous body. Date: August 6, 2001. Video frames by Simona Righini; processing and analysis by M. Teodorani.

A typical blinking light while it is ejecting a "sub-ball" on August 10, 2001. Reflex camera: Yashica 107 Multiprogram; film: 200 ASA, Exposure: 3 minutes. Photograph, processing and analysis by M. Teodorani.

We also saw during the processing phase that these plasmas are able to assume several shapes. Sometimes, also geometric.

Also geometric shapes?
Yes. Sometimes also geometric. We don't know yet the reason about that yet, but we saw something that was like a rectangle. It suddenly changes from an amorphous plasma to a rectangle. It happened transiently and we saw it and it is in my paper, *EMBLA 2001: The Optical Mission*.



An enlarged picture of the rectangle after change from sphere
and the corresponding 3-D Point Spread Function (PSF) in order
to obtain simultaneously the peak intensity and the apparent dimension in pixel
of the target. Date: August 18, 2001. Image processing by M. Teodorani.

So you were watching something round like a sphere of plasma and it suddenly transformed into a rectangle?
Absolutely. At first we thought it was a sort of instrumental effect due to the video camera. But after we compared the photo of this same phenomenon with the video of the same phenomenon, we saw that they were the same thing.

That is a plasma in spite of that geometrical shape because we can do certain analyses by studying the distribution of light. And also by taking the spectra. We see that one is a plasma. So, it is strange. A plasma phenomenon that we can describe, but not yet tell what is the main reason that is causing it.

Is it fair to say that none of you or any other astrophysicists have ever documented this kind of plasma interaction and transformation before now?
No (we haven't). To me it doesn't result that other astrophysicists have found this. I know that some astrophysicists have seen the light phenomenon as amorphous light balls, but it is the first time that we saw that this year.

You have concluded in your scientific paper that these are 'thermal plasmas of unknown origin.' Why?
Because if I take spectrum and I plot the spectrum in a flux wavelength, that spectrum resembles typical Max Plank curve which is typical of a cocktail of ions and electrons. That speaks very clearly. And we can also measure the temperature and the temperature was in that case a little bit higher than the solar temperature; 6,500 Kelvin degrees.

Would this be considered a low energy plasma or a high energy plasma?
It is a quite high energy plasma. If you have some triggering cause that is creating the plasma, we expect that the plasma expands. This is a cooling mechanism. We expect that it expands and in that case a temperature must drop. But we saw that those lights were changing shapes suddenly from very big to very small and the phenomenon was there standing still. But the temperature was just constant because we measured the temperature in both phases. So, there must be some kind of self-heating mechanism that keeps the temperature constant. This is highly anomalous.

It is highly anomalous because you are defining a plasma that is self-sustaining temperature in a way that you have neveer identified before?
Yes. Absolutely yes. I don't know how it is possible that Nature is spontaneously is able to do that. Anyway, we deduce that the plasma is trapped inside a sort of magnetic cage and the magnetic cage closes around the plasma and keeps it fixed in some way, prevents it from expanding. But where does it come from? We don't know. In a way we have a measured correlation between magnetic perturbation and the apparition of lights. This is another discovery.

Lights On Radar But Not Seen by Human Eyes

Sometimes the lights are not lights, but invisible. In fact, Prof. Erling Strand, my friend and colleague from Norway, in 1994 got about 34 radio tracks of phenomenon that sometimes

were visible, but sometimes were not visible. So, the radar was giving exactly the position and velocity, but it was not visible. So, we have a big suspicion that this kind of phenomenon can shift into low energy and so become invisible.

So it shifts to a lower frequency that the retina of the human eye cannot see...
A lower... yes,

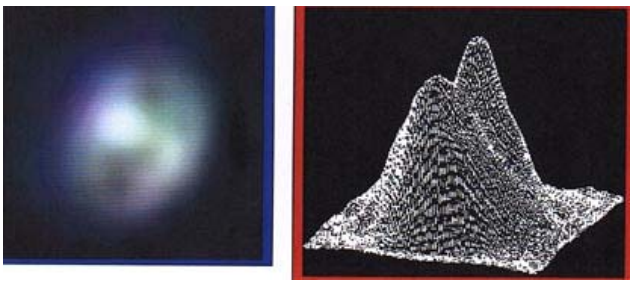
And yet on radar, it is still there?
Yes.

That is consistent with at least twelve years of eyewitness accounts in England, myself included, in which through an infrared scope or starscope I have been able to see what looked like an oval of light change into a square of light that was pulsing. I saw this along with six other people and we could only see the pulsing light in the starscope with infrared. We could not see it with our eyes.
This is very interesting. We also used the infrared detector, but we have it pointed it at the lights themselves. But how were you able to point if you were not able to see?

We discovered it totally by a fluke. I had this instrument and somebody yelled that they thought they saw a flash of red which we all seemed to see at the same time. That was the only thing. And just as you can lift up something in a direction, I lifted the scope and saw the oval that had a pulsing to it, very bright, in the infrared starscope. We passed the scope around and no one could see anything in the dark with their eyes, but through the instrument there was the pulsing oval. We were all shocked when it transformed immediately into a square of pulsing light similar to what you have described.
Absolutely. Very interesting. Next year we are also going to use a more sophisticated infrared detector. This is very interesting because we are going to use sensors to track the phenomenon with infrared, optical, radar and so on, so we can track them everywhere. But we need some money for that yet.

A Few Solid Objects Amid the Thermal Plasmas - What Are They?

I have become convinced as an investigative reporter that a lot is happening outside the range of the human retina.
Yes, for sure. And I didn't tell you the other thing besides those plasmas which were 95% of the events. But we saw also in two or three cases compact (solid) objects. One appeared suddenly when we were taking a photograph of each other on top of a mountain. It was a remembering photo and when the flash was activated, the object appeared. But it was not a plasma object because I analyzed it. It was just a polished surface, very clear.



Mysterious object floating in sky appeared in a digital photo taken on August 19, 2001.
On left is processed enlargement of the object that Dr. Massimo Teodorani concluded has a solid, polished surface. PSF of object on right. Processing and analysis by M. Teodorani.

It is present in my paper and last year, we had one very small sphere. I could measure it. It was about 40 centimeters, sort of a probe. It arrived over our head. There were about three (of us who saw it) at night. It stopped 90 meters far from us near the trees and there it floated standing still for a long time, about 15 minutes. I took a photograph of that and by analyzing the frame, I could see that it was a solid. It was like alabaster (glowing) and I was able to follow it with my binoculars very well.

When you are describing the surface, you saw one that had a smooth, shiny surface. This one, did you say, was like alabaster glowing from the inside out?
Yes. Yes. In that case, it was a sort of low luminosity, like a 100 watt bulb. Not more. So we don't know why in this valley there most are plasmas. In other cases, there are other things. So there is an overlap of the two phenomenon and we don't know if this overlap is by something different or by behavior of the same phenomenon. We don't know yet.

An Unidentified Triangular Craft Hovers Over the Hessdalen Scientists

Last year we also saw a triangle in the sky.

A triangle?
Yes, you can get information on this by reading my EMBLA 2000 report indicated in the bibliographic reference of the last EMBLA 2001 study. Last year we saw the triangle, but we couldn't document it because that day we didn't have a videocamera with us. It was impossible to follow it with a normal reflex camera. But it was just a triangle with three lights on the vertices. The lights were fixed, not blinking, and it was coming from north towards us and it did stop exactly over us. There were five of us and when it was over us it started to make a rotation around its axis while it was standing still. And after some seconds, about 15 seconds, the lights faded very gradually and the triangle disappeared over our heads. This is a story, but unfortunately we couldn't document or take measurements. But it happened.

That took place this past summer of 2001 and those triangles with the lights at the three vertices have been reported in Belgium and England since at least 1990.
I know, yes.

How big would you estimate the size of the triangle you saw?
It was practically impossible to understand. It was very big and I can only say that the size was about 10 times the moon. Probably more. I could see with my binocular that there was a dark surface very well. But differently from the Belgium cases. There was no blinking center light. There were only three lights fixed and then afterward fading gradually and disappearing.

I tell you that my friend is director of a radio astronomical station. He is a radio astronomer and I am an astrophysicist. There were two professors there who are engineers and another professor. And it was in fact incredible!

You have five scientists who are all working in universities out trying to understand what these plasma spheres in the Hessdalen valley are and this object of triangle lights - you all see it and it stops right over you as if aware that you are there?
Yes, yes, yes, it is exactly so. Of course, I have to tell what happens. I am a scientist and my duty is not to select what I don't like or what is not convenient for me. We have to find out what it is. But we cannot document with data this. We were just witnesses because no one of us had a video camera. But we were 5 and we were all scientists. And one of them - I cannot tell you the name - felt a little bit like a sort of rocking motion.

In himself?
Yes, and it is very well known that very low frequency can interact with the human brain.

You already have documented that some of the phenomenon associated with the plasma lights are long frequency radiowaves?
Yes. but sometimes we see them and we also have cases we see only long radio waves without seeing anything. And of course, we could exclude any kind of manmade radio waves, but what remained was one sort of Doppler waves if we interpret it in the astrophysical way, it is like a fast rotating ball which is accelerating high energy particles. The velocity was 100,000 kilometers per second and of course, this can be due only to particles which are channeled along the magnetic field. This is the only interpretation that we can do.

In the case of lights that don't appear in the photo, the temperature must be very low, something like 100 Kelvin or so.

How high does it have to go to break into the frequency that the eye can see?
I think it should reach something like 1,000 Kelvin probably, maybe 2000, the eye should be able to see. But I haven't calculated precisely.

That would mean that you have been able to document what seems like a temperature range that would go from 100 Kelvin to 1000 Kelvin out of the invisible range into the visible range.
Yes.

Yet, your instruments keep showing there is no temperature change from these plasma lights?
Yes, this is when the phenomenon is inside, the temperature remains constant. This I can document. We didn't use very much infrared detector, but in the case of the lights when they were on, they were just lighting, the temperature was established at a constant level. This is what I can say in spite of the fact that the phenomenon was changing dimension (size), but the temperature was always constant. We don't know why. We don't know the physics that is behind all this.

Then this would be a huge physical anomaly because in the physics world that we understand so far, frequency of temperature and vibration you would think would become lower if it disappeared.
Yes, when it disappeared, the frequency becomes lower.

But you are saying that the temperature does not become lower, even when these plasma spheres disappear?
No, the temperature was not changing at all when the plasma was always there.

Did the temperature go down when the plasma sphere disappeared to your eye, but was still there on radar?
This is a good question. My problem is that the spectrum we took when the plasma was disappearing was too weak. So, it was impossible to process it with good signal to noise ratio. So we cannot tell this yet.

So it might have gone from 1000 degrees Kelvin in the visible range suddenly down to 100 degrees Kelvin in the invisible range, but so far you haven't been able to get continual linear data?
No, we have not. But I can tell you anyway that the phenomenon is not turning on gradually, but it turns on in a matter of 1 second. Just like when you turn on or turn off the light. It goes away immediately. So, it's very difficult to see the shift in temperature unless we use a high speed photometer.

Possible Sources of Plasma Spheres

What would be the source behind these plasma spheres that have the ability to transform in shape and still don't lose their temperature?
I am not able to tell this, but I can only deduce indirectly that the only way to keep a plasma self-consistent, self-contained, the only way to do that is we need a center force. We don't know yet the nature of that center force, but as an astrophysicist I can predict the existence of some kind of mini black holes. In that case, if you take a mini black hole inside the atmosphere, our atmosphere, what you have is a sort of potential well and the gas falls into the potential well. It gets very hot and remains there. If the mini black hole has angular momentum, it can make also the shape of a disc, for instance, because it is rapidly rotating. Mini black holes have been predicted by theoreticians and they could be a component of the cosmic rays. This is one way.

Another way, I don't know frankly what can it be if not a gravitational singularity which suddenly occurs in our atmosphere. Of course, the theory of wormholes has been settled theoretically. But we are scientists, not engineers, and we have to imagine what can it be.

What do you think it is going to take to get other astrophysicists around the world to pay attention to not only your work, but the fact there is increasing evidence that some kind of unidentified plasma spheres with all of these strange characteristics are on this planet and scientists should investigate more?

Yes, you are right. In fact, the scope and goal of this work with my colleagues was to trigger, to provoke my colleagues in order to give funds and to involve many other scientists."

Image Sources: All photographs and spectra used with permission of Dr. Massimo Teodorani.

More Information:

EMBLA 2001 : The Optical Mission

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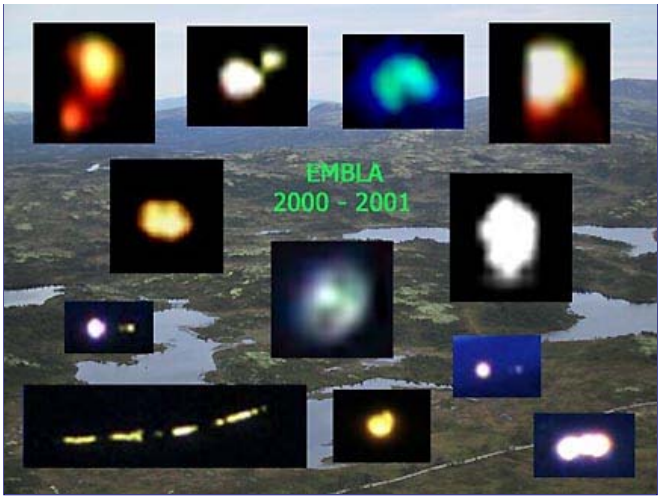

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