

L.E.M.U.R.

League of Energy Materialization & Unexplained phenomena Research

Asheville, North Carolina

[www.LEMURteam.com](http://www.LEMURteam.com)

Report on the Cause of the Mysterious Brown Mountain Lights

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Basic History of the Lights:

"The Brown Mountain Lights" is the general term for unexplained illuminations seen on, or around, Brown Mountain, a low-lying ridge (approx. 1.5 miles long) in the Pisgah National Forest on the border of Burke and Caldwell counties near Morganton, North Carolina (at approx. 35 degrees 55 minutes North and 81 degrees, 45 minutes West). According to Cherokee Indian legend, the lights have been seen since the year 1200, but have been witnessed since 1913 based on journalistic accounts (Charlotte Observer). They have been investigated at least three times by the United States government since 1922, twice by the U.S. Geological Survey and once by the U.S. Weather Service. However, no report has ever accounted for all the characteristics attributed to the lights. They have been studied by the Smithsonian Institution and have inspired numerous artistic endeavors such as a famous bluegrass song, "Brown Mountain Light" written by Scotty Wiseman and performed by Tommy Faile, and an episode of the popular "X-Files" television program called "Field Trip" (originally aired May 9, 1999). For more information on the history of the phenomenon, see [www.BrownMountainLights.com](http://www.BrownMountainLights.com).

The lights have generally been described as spheres of illumination, of various colors, that float throughout the trees, sometimes dividing into smaller lights, and usually wink out after 6-10 seconds (at the most 60 seconds), or float into the sky and disappear. They are usually seen from overlooks at least 2.5 miles away, but some claim to have seen them from only ten feet away, and consistently describe them as being slightly larger than a basketball, glowing so bright as to appear opaque, and hovering around three feet above the ground. At such a close range, eyewitnesses say the lights move away from them when approached, but often follow them when the viewer moves away, displaying a clear interaction between the viewer and the sphere. One man claimed he touched a light and received a strong, electrical shock. However, the light did not dissipate, but simply moved away.

Many experts in various fields of study have attempted to explain the lights. Geologists generally believe they are related to piezoelectricity, astronomers lean to the idea of an optical illusion, chemists cite "swamp gas" (principally methane), while believers in ghosts and UFOs from space cite spiritual or extraterrestrial origins.

I personally began studying the phenomenon in 1990, and L.E.M.U.R. (after its official foundation) initiated its formal study in 1995. Altogether, this report is based upon fifteen years of research. Considering the diversity of perspectives available, L.E.M.U.R.'s goal was to take an objective, open-minded approach to documenting and studying the activity, relying on information that could be measured using scientific tools and the opinions and approval of experts in various scientific fields.

Throughout our course of investigation, the following instruments have been primarily employed:

1. Tri-Field Natural EM Meters, Models 1 and 2: These devices are designed to pick up changes in extremely weak DC or "natural" electric fields (as small as 3 volts per meter or v/m), magnetic fields in the microtesla range (as small as 0.05 percent of the earth's magnetic field when an antenna is used), combinations in variations of electric and magnetic (or electromagnetic) fields, and energy in the radio/microwave range spanning from 100,000 to 2.5 billion oscillations per second (100 KHz to 2.5 GHz) with minimum and maximum detectable signal strengths of 0.01 milliwatt/cm squared and 1 milliwatt/cm squared respectively. The advantage of the Model 2 is an input jack for a coil antenna to be used for measuring magnetic fields.
2. Dr. Gauss/Gauss Master EMF meters calibrated for 50/60 Hz AC and sensitive from 1/10 mG to 10 mG.
3. A handheld Electrosmog Multidetector II Prof I sensitive to either electric or magnetic fields ranging from 5-500 Hz as the ELF (Extreme Low Frequency) setting or 500 and above on the VLF (Very Low Frequency) setting.
4. A large, tabletop VLF (Very Low Frequency) detector with a manually-scannable range of 0-500,000 Hz, using a large coil antenna (1780 feet of coil, as one layer of 24 awg wire, wrapped on a span of 21.5 inches) tuned to 145,000 Hz.

5. A handheld, non-contact infrared thermometer to register surface temperatures instantly in fahrenheit.

6. Digital still cameras and Sony Digital 8 HandiCams capable of sensing into the near-infrared range.

7. A digital volt meter sensitive to milliVolts, both AC and DC.

8. Telluric readings obtained by placing two 3-foot steel rods 15 feet apart into the ground to measure electrical activity.

9. Electrostatic detectors capable of measuring up to 5,000 volts and identifying polarity.

10. A basic spectroscope attached to a digital still camera.

11. Geiger counters sensitive enough to measure microRem and detecting x-rays, alpha, beta, and gamma radiation.

Though these devices were the bulk of our equipment, we additionally employed more simplistic, informal devices (e.g. using AM radios to search for interference).

#### Methodology:

L.E.M.U.R. has spent years interviewing witnesses and camping on, or near, the mountain taking measurements. In 2000, our team was the first to obtain clear video footage of unexplained illuminations on Brown Mountain via our Imaging Specialist, Brian Irish. He used an IR-sensitive camera to obtain over an hour of footage in 2/3 weekends of November (evenings of the 4th and 11th, from sundown to midnight). We were unable to conclusively exclude some conventional sources of light (such as headlights from 4-wheelers) from portions of the footage. However, some of the footage shows distinct illuminations over rock faces that divide into smaller lights that orbit around each other in an amoebic and fluid fashion, seemingly impossible to reproduce by any conventional means on the rugged, isolated terrain. In addition to gathering objective data, L.E.M.U.R. consulted with numerous experts in specialized fields (some of whom attended our

camping expeditions at the ridge) such as David Hackett (a former nuclear engineer at the Oak Ridge National Laboratory and member of the ORION--Oak Ridge Isochronous Observation Network--team that researched the lights in the 1970s and 80s), Charles A. Yost (a NASA engineer, in the NASA Hall of Fame, who worked on the Apollo projects and now operates the "Electric Spacecraft" lab and scientific journal), John Connor (a professional geologist in North Carolina) and Primary Forest Researcher Robert E. Messick. Such experts provided valuable guidance and feel our current conclusions have merit.

Principal Results from our Research thus Far:

1. Footage of unexplained illuminations on the ridge obtained by L.E.M.U.R. (especially that of Brian Irish) demonstrate that lights can be seen through IR-sensitive cameras even when they cannot be seen by the naked eyes. Sometimes, lights are seen first in the IR spectrum, then are visible to the naked eye as red, flaring to white, and dwindling back down to red and then into the IR range. They therefore appear to change frequencies throughout their duration.
2. In 2000, a specialist in IR photography with L.E.M.U.R. shot a roll of IR 35mm film at the 181 overlook (see [www.BrownMountainLights.com](http://www.BrownMountainLights.com) for directions) when the illuminations appeared. Later, he was shocked to find all his prints completely overexposed.
3. The evening of November 2, 2001, Brian Irish and the author shot clear video footage of a pulsating sphere of white light rising steadily above the ridge and disappearing into the sky over the course of 60-90 seconds. The anomaly produced no sound and could not be explained as a conventional aircraft (no blinking or colored lights).
4. On the mountain at night, especially when lights appear, a Geiger counter will go "haywire." This has been experienced numerous times by both L.E.M.U.R. and David Hackett. The Geiger reaction does not necessarily indicate alpha, beta, or gamma radiation, but seems to react to extremely high ionization that creates a current in the Geiger tube. One Geiger indicated it was maxed out (more than 10 mR/h on its scale) all night long both nights of August 8 and 9, 2003.
5. Erratic telluric currents (electricity flowing through the ground) have been measured near the ridge by L.E.M.U.R. without obvious explanation, spanning from tiny milliVolts to spontaneous surges of well over a volt.

6. Our large VLF detector, hooked to an oscilloscope, detected a strong array of disturbances, especially around 140 KHz, producing well-formed, tight oscilloscope patterns at night (often regardless of whether or not lights were apparent to the naked eye).

7. Though L.E.M.U.R. was never able to obtain a clear spectrograph of the lights, Hackett was able to do so and found they produce a wide range of spectra: so wide that it was impossible to ascertain what specific elements may create the illuminations.

8. Nights (such as November 4 and 11, 2000) when the lights appeared to the naked eye often corresponded with a recent, high level of disturbance in the Kp index (a reading of 5 or above, supplied by NOAA, indicating strong disruption of the magnetosphere due to solar activity).

9. Consistent with legend, we found the lights could be most easily observed in the fall during, or just after, a rainy period.

10. We discovered the Brown Mountain area is largely composed of, or contains, layers of quartz and magnetite. Small pieces of magnetite can be easily discovered on the ground and manipulated with magnets.

11. We documented that Brown Mountain is almost completely encircled by thrust faults (Geological Survey Professional Paper 615: Geology of the Grandfather Mountain Window and Vicinity, North Carolina and Tennessee by Bruce Bryant and John C. Reed, Jr.).

12. One of our most successful observation periods, November of 2000, coincided with nearby forest fires.

#### Our Hypothesis Based on Results:

1. Considering all data available, the most likely explanation was that those primary illuminations traditionally known as the "Brown Mountain Lights" are a form of plasma, the fourth state of matter, naturally produced by the mountain. Plasma is the product of so much energy being added to a gas (including air) that one or more electrons are ripped from each atom producing a swirling, luminous mass of free-floating electrons and atoms that have a positive charge (positive ions). Plasmas are enhanced by having fuel in the air, such as the carbon produced from a forest fire. The BM Lights

may have appeared more often in the past when wood fires were more commonly used. According to David Hackett, ORION also concluded the lights are most likely a plasma phenomenon. Plasmas would indeed interact with nearby human observers since the plasma field would be influenced by the field of a human body.

2. Layers of quartz and magnetite on the mountain create natural capacitors. Quartz is a non-conductor or dielectric (though it will produce electricity when under stress or vibrate when electricity is applied to it), and magnetite is a conductor. Layers of conductors and dielectrics store electrical energy to a critical point until a powerful discharge occurs.

3. There are cavernous holes that run throughout Brown Mountain (some of them can be seen on trails with water running swiftly below). As water runs through the mountain, it charges the layers of quartz and magnetite, in effect charging the mountain's capacitance. In our lab, L.E.M.U.R. proved that water running over layers of a capacitor can build a charge.

4. At night, the mountain cools and contracts, bringing the layers of quartz and magnetite closer together, resulting in electrical discharges, particularly after water has run through the structure. The contraction of the mountain is enhanced by the thrust faults that surround it, allowing it extra flexibility.

5. Discharges from the natural capacitance presumably provide the most outstanding electrical activity, but strong winds (known as zephyr winds) that blow through the valley building high electrostatic charges may also contribute.

6. As electrical discharges occur, the quartz resonances create complex, overlapping harmonic frequencies, or nodes, similar to those important to tuning Tesla Coils.

7. When numerous discharges, between the mountain and the atmosphere, occur simultaneously from various cliffs and rock overhangs, they sometimes intersect. These points of intersection create points of electrical momentum where one or more discharges swirl. These "pivot points" sometimes spin fast enough to oscillate at a rate in the visible electromagnetic spectrum. Once in the visible EM spectrum, the color changes as the frequency varies; and sometimes the frequency drops so low that it is only detectable in the IR range. Therefore, the traditional lights are simply the only small, visible portion of a much larger invisible discharge. Their appearance as self-contained spheres is an illusion. As a discharge occurs, sometimes lasting many seconds, the "ball" of light moves back and forth along the layers of discharge and usually winks out once the discharge is complete. More rarely, the pivot point will rise with the shaft of discharge, appearing to strobe or pulsate with the spin, as it floats upward into the atmosphere. The lights are probably occurring

more often than believed, but simply are not oscillating fast enough to enter the visible electromagnetic spectrum. Though we have discovered singed trees around Brown Mountain, the plasma balls evidently do not radiate a great deal of heat, at least in one spot for a long period of time, or usually create sounds audible to human ears.

8. If this model is correct, it might explain how most, if not all, ball-lightning-type manifestations are created: they are not truly self-contained, but are simply the only visible portion of large columns of intersecting electrical discharges following pathways partially determined by electromagnetic nodes. This may especially explain such lights seen over railroad tracks or streams: areas where numerous discharges may originate from various points in a small area and touch each other a short distance above ground. Though this hypothesis is complicated, the number of relevant variables would explain why subjects like ball lightning have been so difficult to understand thus far.

Testing the Hypothesis:

L.E.M.U.R. knew we could never produce electrical discharges in a lab comparable to those produced on a mountain by nature. Therefore, to compensate, L.E.M.U.R. Investigator Robert McGhee constructed a plasma chamber. The chamber would allow us to reduce the level of atmospheric pressure so that smaller amounts of voltage/amps might behave in a manner more similar to huge energy levels in nature.

The chamber was constructed from a clear cast acrylic tube that was one foot high with an outside diameter of 4.5 inches and a wall thickness of 0.25 inches. It had a PVC cap and seven wires entering the top. One electrode was positioned at the top of the chamber and the other at the bottom (as our primary electrodes, representing the earth and atmosphere) with an array of five wires positioned at the side, between the two primary electrodes, with each of the five wires fixed at different angles. By switching between the wires extending at the top, we were able to test the result of discharges intersecting at a variety of angles. Though varied throughout the experiment, our DC current was a maximum of 1200 volts and 10-25 milliAmps.

Our goal was to manufacture a simple discharge between the primary electrodes (one representing the earth and the other the atmosphere above) and, by introducing a third discharge, separate the primary discharge so that what appeared to be an independent plasma existed between the primary electrodes (perhaps like a Brown Mountain Light hovering between the earth and atmosphere). The vacuum level was 2 milliTorr and the experiment was conducted at the "Electric Spacecraft" lab ([www.ElectricSpacecraft.com](http://www.ElectricSpacecraft.com)). Former NASA engineer Charles A. Yost managed our vacuum and the DC power supply.

When the bottom terminal was positive and the top negative (interchangeable without consequence) we charged a third electrode positive. It was positioned at a slightly upward angle, toward the negative at an approx. 7-10 degree angle (comparable to the slope of points on Brown Mountain), and we created a colorful plasma form, between the primary electrodes, that appeared to be independent and self-contained, like a Brown Mountain Light. The "separated" plasma form, produced by this arrangement, confirmed our hypothesis: that intersecting electrical discharges could create what appears to be a separated plasma form hovering between two primary points of discharge. Gravity did not seem to have an impact on the plasma, and magnets affected it only slightly. Though it was distinct to our naked eyes, it created "blobs" of light when viewed through our IR cameras (just like the BM lights) and also affected our instrumentation like the BM lights.

#### Predicting an Appearance of the Lights:

Though there are many complex variables involved in the production of the Brown Mountain Lights, L.E.M.U.R. believes you have the best chances of seeing them when the following conditions are met:

1. You are viewing the area in late October or the first half of November (due to temperature change and increased visibility with leaves off the trees)
2. It is either raining, or a rain has recently occurred
3. The Kp index reads a 5 or above, indicated by a red bar (see [www.LEMURteam.com](http://www.LEMURteam.com) for a live report)
4. There is an increased level of carbon in the air due to campfires or forest fires

#### Concluding Overview:

Our group is primarily based upon collecting objective data, and we do not receive support and funding from any regular source. Therefore, the accuracy of our results is always limited to the



equipment we have available and the time we can invest. However, to the best of our ability, we have pursued the mystery of Brown Mountain, and we feel our experiments in the lab, based on fifteen years of research, have yielded the only explanation for the lights that is consistent with the data we've gathered. It certainly does not account for all eyewitness testimonies attributed to the phenomena, but is the best we can do from a scientific perspective. There is no way to conclusively prove this explains what happens on Brown Mountain without investing an enormous amount of money, effort, and manpower to systematically collect data from the ridge on a daily basis for at least a year. However, even though the lights are popularly attributed to the ridge, they have been reported all throughout the general Linville area. We can say that such geologically significant areas are highly likely to produce extraordinary plasmas, and our current conclusion is certainly the most supportable based on obtainable data.

Obviously, lots of conventional lights, such as those from nearby towns, vehicles, or campers have been called "Brown Mountain Lights" by inexperienced observers. That is why, in order to maintain as much accuracy as possible, our research did not focus solely on documenting illuminations, but seemingly anomalous and outstanding energies measured at the time of appearances (energies that would not be associated with conventional sources of illumination or optical illusions).

#### Possible Implications for Technology:

The ability to produce and control focused plasmas has implications for at least non-lethal weaponry, efficient wireless communication, and transportation/propulsion. By studying how such plasmas occur in nature, and reproducing them artificially in the lab, we hope to contribute to the valuable task of tapping this resource for the civilian market. We also hope other researchers will compare our findings to various places on earth where unexplained illuminations are seen and reproduce our research (and experiments) independently.

For more information, including photos, see: [www.BrownMountainLights.com](http://www.BrownMountainLights.com)

End of Report