

**LIGHTNING DATA CENTER MINUTES**  
**MARCH 9, 2012**  
**ST. ANTHONY HOSPITAL WEST, LAKEWOOD, CO**

Monthly Quote: "...and I shall dwell in the house of the Lord for ever." From Psalms 23:6.

1. The meeting began at 11:45 AM and adjourned at 1:05 PM. Members present: Clark, Yarnell, Gift, Elder, Claus, Stewart, and Keen. Clark moderated the meeting.
2. As most of you know, the LDC lost one of its members, Dr. Gil McDonough. He passed away on Sunday, November 13, 2011. Dr. Cherington noted he was a wonderful physician and a valued member of the LDC. Cherington and McDonough met 50 years ago as residents at the University of Colorado Medical Center. McDonough wrote a 12-page report titled "Analysis of Lichtenberg Figures". He also co-authored, with other LDC members, "Lichtenberg Figures and Lightning: Case Reports and Review of the Literature", which was published in Cutis in August 2007. McDonough also gave these three LDC presentations:

2/8/02: Electrophysiology of Nerve, Muscle, and Blood Vessels – Relating to Lightning Injury.

7/12/2002: Lichtenberg Figures.

6/11/04: Lichtenberg Figures, Part 2.

The LDC will miss Gil's gentle nature, soft voice, expertise, and thoughtfulness. His contributions to the LDC were invaluable and will be deeply missed. Those who want to send a card to the family, may send one to Julia Herring, who is Gil's niece, as follows: Julia Herring; 1127 Ridglea Way; Boulder, CO 80303.



3. Steve Clark presented follow-up information on the airplane that was struck on the tarmac that was discussed in the February meeting. Other people on the Yahoo Lightning Group made comments in response to the questions posed along similar lines as those given during the meeting.
4. Phil Yarnell was curious about how the plasma balls work, after seeing Robert's demonstration of his Tesla coil last month. Robert says they are like small Tesla coils with their tips inside a glass ball filled with Argon, and perhaps, other noble gases. Phil wondered if they respond to sound. Robert noted they do, by way of a microphone that modulates sound waves into effects seen inside the plasma ball.
5. Greg Stewart addressed three lightning-related items. He first talked about NASA's detection of Schumann resonances in space. Lightning discharges are considered to be the primary natural source of Schumann resonance excitation. A U.S. Air Force satellite confirmed that low-frequency waves are "leaking out" into space. The investigating team found "...the resonance showing up in almost every orbit [the satellite] made around Earth, which added up to some 10,000 examples." "This comes as a surprise, since current models of Schumann resonance predict these waves should be caged at lower altitude, between the ground and [the ionosphere]." For more information and animated representation: [http://www.nasa.gov/mission\\_pages/sunearth/news/lightning-waves.html#.TxhBS5Ove0w.gmail](http://www.nasa.gov/mission_pages/sunearth/news/lightning-waves.html#.TxhBS5Ove0w.gmail)
6. Second, Greg spoke on the history of lightning protection at the Washington Monument. At the completion of the monument in 1884, a small and very expensive aluminum pyramid was placed atop the monument to function as a lightning rod. The cap was the largest piece of aluminum ever produced. It was such a novelty that it was displayed at Tiffany's jewelry store in New York prior to being placed on the monument apex. At the time, aluminum was more precious than silver. In 1935, thieves took advantage of scaffolding and stole 107 lightning rods. Plated with gold and tipped with platinum to reduce corrosion, their value in today's dollars was over \$13,000. More recently, the 5.8-magnitude earthquake, which struck the east coast in August 2011, damaged the lightning protection components and other structural elements. Inspectors rappelled down the 555-foot needle to survey the damage. Billionaire philanthropist David Rubenstein agreed to contribute \$7.5 million (about half the total cost) for repairs to the landmark. Greg also provided photos of lightning strikes to the side and near the base of the monument, further demonstrating lightning's inconsistency in connecting to the top of tall structures. For more information and photos see the attachment: "PointofMonument.pdf". For additional information on the history of the aluminum cap: <http://www.tms.org/pubs/journals/jom/9511/binczewski-9511.html>

7. Third, Greg presented some archival information about ball lightning (BL). He noted Dr. Cherington's interest in BL and the extensive file he contributed to LDC's reference library. In the first of a series of reports entitled "Kugelblitz", Greg presented several models for a scientific explanation of the phenomenon. From the file, Greg noted BL had been reproduced, with varying degrees of success, in Israel and in the U.S. In Israel, BL was simulated in the lab using a "microwave drill." With a magnetron from a standard microwave oven, the device was able to inject microwaves through a pointed rod onto a solid substrate made of glass, silicon, germanium and alumina of other ceramics. Under the intense energy, the substrate would become molten and lead to the formation of a floating fireball.

Prominent American physicists Dr. Irving Langmuir, C.G. Found and A.F. Dittner performed early experiments in the labs of the General Electric Company. They produced what was described as "spectacular and beautiful discharges." From the article entitled: "Irving Langmuir's Ball Lightning Tube": "These glowing detached globules seem to have characteristics similar...to those...belonging to ball lightning." Also, "Under the influence of the horseshoe magnet, these balls of fire can be made to move up and down the tube."

Theories for the formation of BL are many and varied. Some of them are:

- Ignition of semiconductor vapors.
- Oxidation of nanoparticle networks from normal lightning strikes on soil.
- Radiation emission from Little Black Holes (LBH).
- Lines of magnetic force created by normal lightning which form an electromagnetic knot which then confines a glowing plasma ball.
- Thunderstorms produce radio-frequency energy with intensities high enough to convert ordinary air into glowing plasma.
- Gases from objects struck by lightning, including tree bark.

The great English physicist Michael Faraday concluded in 1839 that BL is an optical illusion, an "after-image" from the dazzling effect of a flash on the eyes, and is therefore not real.

In 2000, it was estimated only 1% of the population reported seeing BL.

Greg passed around a postcard, which Dr. Cherington had kept in his file. The postcard depicts lightning strikes against the Atlanta, Georgia skyline. Two of the lightning flashes appear to intersect and form a brighter area near the intersection. Someone had wondered if that intersection was BL. Universally, we agreed it was not. We attributed the localized area of brightness to the overlapping of the two flashes on the image. The brightness could be explained by the presence of clouds and water droplets reflecting light from the flashes.

8. LDC Disclaimer: These minutes do not represent official positions of LDC or its members. They simply reflect the comments made at the meeting. Furthermore, the LDC does not explicitly or implicitly recommend or endorse *any* product or service. Any service or product presented in these minutes is done so for the purpose of discussion and analysis. The merit (or lack thereof) is open for consideration and review by the entire membership.
  
9. Next meeting: Friday, April 13, 2012 at 11:45 AM at St. Anthony Hospital West, The Bighorn Room. Subject: Ken Langford will be the featured speaker and will discuss what he learned at the International Lightning Meteorology Conference on April 4 and 5. PLEASE NOTE: The Bighorn Room is now the “official home” of the LDC.

Respectfully Submitted,

Steven E. Clark, Consulting Meteorologist