

Ball Lightning Characteristics Help Us Understand the Strange Particles: Micro Ball Lightning

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The study of ball lightning properties helps people to understand what I call “microplasmoids” such as the “strange radiation” that are studied by various Russian groups and those produced decades earlier by Bostick, Matsumoto and Shoulders. The various sizes of plasmoids that are in the 5th state of matter are similar to ball lightning and are similar no matter the size scale. So we can use ball lightning to understand how micro ball lightning act and how they are structured and vice versa. Knowing how ball lightning behaves helps us to understand whether models and hypotheses about the experimental micrometer-sized microplasmoids are correct and helps to develop a general theory about plasmoid state materials and also liquid, solid, gas and plasma.

The study of ball lightning (BL) properties helps people to understand what I call “microplasmoids” such as the “strange radiation” that are studied by various Russian groups and those produced decades earlier by Bostick, Matsumoto and Shoulders. The basic point of view of the plasmoid paradigm is that the various sizes of plasmoids that are in the 5th state of matter are similar to ball lightning and are similar no matter the size scale. So we can use BL to understand how micro ball lightning (MBL) act and how they are structured and vice versa. This is how the MBL/microplasmoid field started in the early 1990s by considering that their properties and characteristics are the same as BL. Understanding microplasmoids as MBL has been very fruitful. Knowing how BL behaves helps us to understand whether models and hypotheses about the experimental micrometer-sized microplasmoids are correct and helps to develop a general theory about plasmoid state materials and also liquid, solid, gas and plasma.

History of Micro Ball Lightning Research

After studying and learning about natural BL properties and characteristics, when Matsumoto wrote in early 1992 that he had discovered microscopic markings such as rings and lines on his nuclear emulsion films for particle detection, I realized that Matsumoto was producing MBL and encouraged him to start research on them. See Figure 1. It is his photograph of three rings and also a borehole, a tunnel, made by an MBL at the empty corner of the parallelogram. The MBL tunnel isn’t visible in this photograph though it is visible in the original publication. From reading about BL in books and research articles, I knew BL is sometimes associated with transmuted residues as well as tunnels and various kinds of grooves and ditches they leave on surfaces and the ground. He didn’t publish his BL articles in the ICCF conferences. I don’t think he was ever invited to do so. Matsumoto experimented on MBL (microplasmoids) and attended BL symposiums.

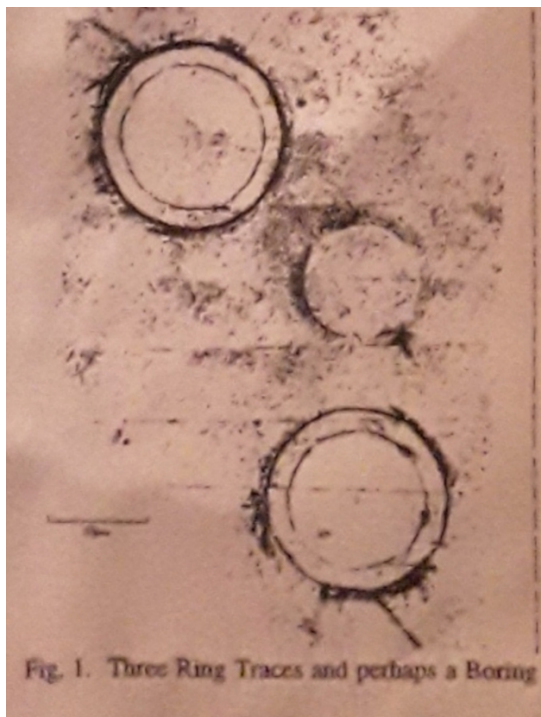


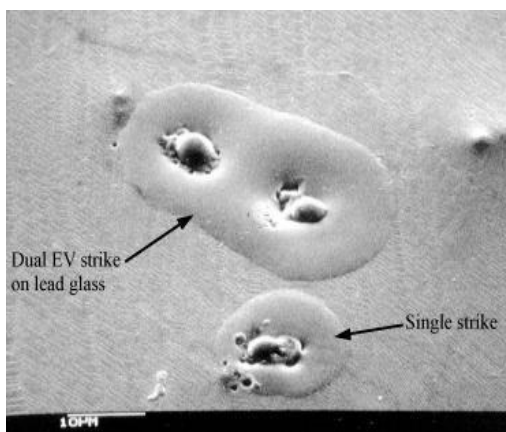
Fig. 1. Three Ring Traces and perhaps a Boring

In the early 1990s, I realized that the atoms themselves can enter a state in which they behave like BL. I called this state the “BL state” or alternatively the “plasmoid state” of matter.[1] I realized the anomalous reactions of the cold fusion field occurred when this state of matter was formed in experiments and that the microplasmoids could convert regular material to be in this state.

In 1992, I read Ken Shoulders’ patents. At that time, he didn’t have publications other than his book which few people had a copy of. In his writings, Shoulders called them “EVs” in the 1980s and early 1990s. By the middle 1990s, Matsumoto and Shoulders both experimentally showed that microplasmoids produced tracks and transmutation. Shoulders

focused on explaining though his extensive experimental research that EV objects have black and white states into which they shift[2], and he also explained that there are other anomalous phenomena such as the “cold sloshing” phenomena in which the objects move materials without heat as if they make atoms of materials become superfluid.[3]

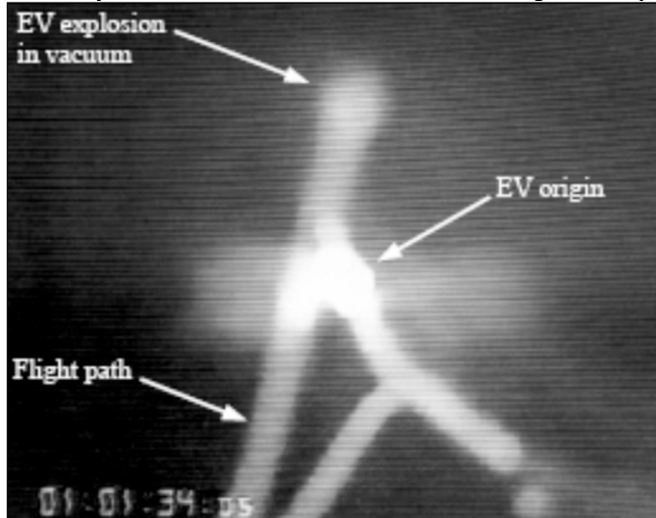
See Figure 2. It is a picture of MBL strike marks on glass. You can see that the



individual MBLs left domes, and around the domes it looks as if the glass had melted.

According to Shoulders, atoms in such MBL strike marks would spread out to a thickness of only 1 atom. This suggested that the atoms had temporarily been in a superfluid state at ordinary temperatures, but he emphasized that there was no evidence that the glass was heated above room temperatures. This was a heatless “sloshing” of material as BL also does. In contact with BLs and MBLs, atoms lose their usual normal state properties and seem to have no inertia or friction. Friction is an electromagnetic phenomena. Inertia according to relativity theory is a property of mass-energy.

Shoulder’s also emphasized the inertia-less motions of MBL. That is, when MBL makes turns, they turn without deceleration or curvature in flight. In the photograph in Figure 3, he



pointed out that the streak of light on the photographic film that was created by the very fast moving MBL did not show any brightening at the corners that would have happened if the MBL slowed down as it made the very sharp angled turns without curvature. This is highly anomalous but is characteristic also of BL motions when they make sharp angled turns in the atmosphere. This is why people consider them to be from some other world since they never saw anything move in this way. Any model of microplasmoids must explain these anomalies as well as BL size and duration and gravity-like effects. As explained below, some large BL last more than an hour and have gravity-like effects on matter.

Micro Ball Lighting and Gigantic Atmospheric Ball Lightning Called UFOs

Microscopic-sized ball lightning (MBL) and giant ball lightning (BL) hundreds of meters or kilometers wide exist too.

Micro Ball Lighting

No matter the size, BL appears to behave the same. The MBL act just like bigger BL. Until the 1990s, no one knew that BL existed in microscopic form. They were discovered when the Japanese researcher Matsumoto started to detect microscopic ring markings that were about 50 micrometers wide on particle detection film that he put outside of an electrolysis cell in 1992. Figure 1 with 3 rings is an example of the rings he discovered.

They are smaller than 80 micrometers or a little smaller than the width of human hair. Like snowflakes, each individual MBL and BL is different. I realized he was producing MBL because natural BL sometimes leave ring markings.

Since 1992, about two dozen groups of researchers have studied MBL. They produce them with electrical discharges and in other ways. They are easy to make with electrical discharges.

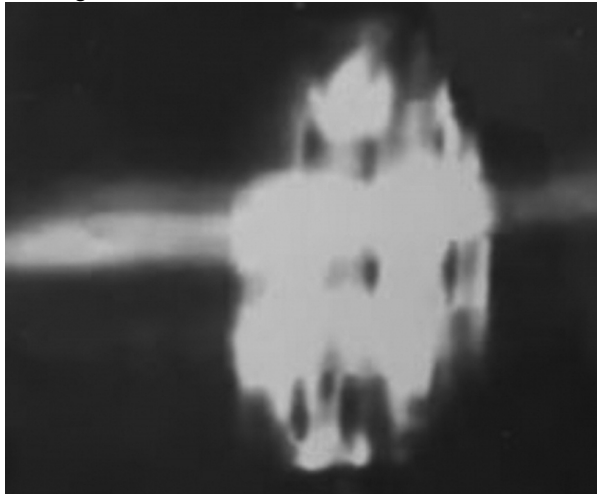


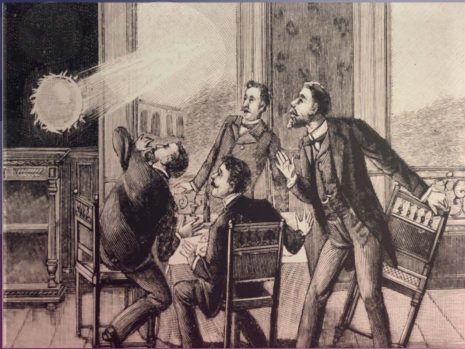
Figure 4 is a picture of a group of MBL in a geometrical cluster. It is 15 millimeters long. BL and MBL arrange themselves geometrically. Usually they are arranged as chains or rings, but more complex patterns are seen too. You can imagine that people seeing a big one like that in the sky might call it a UFO. Figure 4 was published by Bogdanovich et al. in 2019[4].

Usually, there is a haze or cloud around the 5th state components of an MBL or BL. Such a cloud around the geometric configuration of MBL would make the object in Figure 4 appear more like a ball, perhaps an oblong ball. In the same way, a ring of individual MBL is visible as individual objects if it doesn't have a cloud around it. If it does, then it appears as a toroid or donut shape or a disc. Such a cloud would also include water vapor, leaves, and other materials if a BL is big enough or powerful enough to take materials with it. This happens with tornadoes.

Giant Ball Lightning

Usually, people say that BL are about the size of a volleyball or basketball as in Figure 5 that is a painting of a BL with a tail.

Ball Lightning is Mysterious and Can Be Beautiful



A painting of the path of a ball lightning that was observed at the *Hotel Georges du Loup* near Nice, France in 1902. It had a tail!

Ball lightning is mysterious. Now it can be made and studied in laboratories in microscopic form, but almost no one in the world knows this....???

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Giant BLs form in storm clouds or come out of the earth during volcanic eruptions and earthquakes. They can be bigger than 100 meters wide. Egon Bach wrote a wonderful book with photographs and his description of state changing giant plasmoids changing repeatedly from black state to white state. His book is titled: "UFOs From the Volcanoes." [5] Giant BLs have been videoed around volcanoes since the time that video cameras and phones with video cameras have become widely used, and people have been calling them "orbs."

In Egon Bach's book [5], there is a chapter with very remarkable accounts from eyewitnesses about the emission of many huge ball lightnings about 130 meters wide and smaller from Redoubt Volcano in Alaska in Feb. 15, 1990. The book is extremely valuable for plasmoid researchers just for this section of the book. Bach had many far-reaching ideas. Bach published this description given by John Burns who was a foreman on the Drift River Oil Terminal. Burns said:

"These comet-like things were mostly brilliantly white with a pale greenish ... tinge ... the objects really resembled the illustrations of comets. They left really broad tracks as they flew straight on their paths. There were also common lightnings ... I have seen lightnings in a big tornado back in Texas, but they were no match for all the volcanic lightning."

Equally large BL may be in storm clouds too. According to several meteorologists who published in the 1950s and 1960s, nimbus or cumulonimbus storm clouds may have big round blue blinking lights inside. For example, a meteorologist named Herbert L. Jones called them "tornado pulse generators." He wrote that the tornado pulse generators are generally at an elevation of six kilometers "somewhere in the middle of a massive thunderstorm structure" and appears as a "blinking, pale blue, circular area of light on the side of the thunderstorm cloud." [6]

As explained in several papers such as "Tornadoes and Ball Lightning"[7], a big BL that Jones saw became a huge, powerful and brilliantly shining blue tornado an hour later. Jones wrote that a storm cloud that he studied had such a big round blue light. This big blue BL turned into a huge, powerful and brilliantly shining blue tornado an hour later that wrecked destruction in Oklahoma and Kansas. The tornado started with a blue toroidal top, and later the whole funnel was brilliantly lit and blue.

Here is the sequence reports about the BL that turned into a tornado. This is all published material. First, a meteorologist in the Tornado Laboratory and the Department of Electrical Engineering of Oklahoma State University watched a big blue light that blinked on and off every two seconds in a nimbus or cumulonimbus thunder cloud that passed by in the evening at 9:25 P.M. near Stillwater, Oklahoma on May 25, 1955.[7] He and others in his Tornado Laboratory observed with meteorological equipment that there was considerable electrical activity from the cloud that would indicate the generation of very much lightning, but he could see no visible lightning. He concluded that the electrical activity came from a big blue light in the cloud that blinked on and off every two seconds. It would shine for two seconds and then be totally dark for two seconds. While it was shining, it emitted a great intensity of electromagnetic radiation. In the 2 second intervals when it was dark, their equipment didn't register the electromagnetic radiation. This is a common behavior of both atmospheric and microscopic BL because BL switch between black and white states. It is one of the strange behaviors of BL that people call UFOs.

Then in Blackwell, Oklahoma, at 9:27 P.M., just two minutes later, a weather observer for the U. S. Weather Service named F. Montgomery[8] who was stationed in Blackwell, Oklahoma in May of 1955 reported that the tornado in the same cloud structure passed by. He wrote that it had a deep blue section that was near the top near the cloud layer and that the top bright section of the tornado was "very much brighter" than an arc welder and too bright for him to look at, though the tornado was 9 blocks or 3600 feet away from him! I suspect that the bright section may have been toroid shaped since a common plasmoid form is toroidal and tornadoes are cylindrical as if they are composed of stacks of toroids. He reported that the air from the tornado felt hot and that the temperature as recorded by a thermometer at his instrument shelter rose from 74 degrees Fahrenheit to 80 degrees Fahrenheit when the storm struck. This is evidence of a spectacular rate of radiation. Someone with the necessary mathematical skill and knowledge of thermodynamics might be able to calculate the energy release necessary to raise the temperature by 6 degrees in the open atmosphere from the energy from the tornado at that distance. And he reported:

"There were rapidly rotating clouds passing in front of the top of the funnel. These clouds were illuminated only by the luminous band of light. The light would grow dim when these clouds were in front, and then it would grow bright again as I could see between the clouds. As near as I can explain, I would say that the light was the same color as an electric arc welder but very much brighter. The **light was so intense that I had to look away** when there were no clouds in front. The light and the clouds seemed to be turning to the right like a beacon in a lighthouse[9].

A person named Lee Hunter saw this same tornado a little later, four miles north of Blackwell, Oklahoma. He reported:

"The funnel from the cloud to the ground was lit up. It was a steady, deep blue light -- very bright. It had an orange color fire in the center from the cloud to the ground. As it came along my field, it took a swath about 100 yards wide. As it swung from left to right, it looked like a giant neon tube in the air, or a flagman at a railroad crossing. As it swung along the ground level, the orange fire or electricity would gush out from the bottom of the

funnel, and the updraft would take it up in the air causing a terrific light -- and it was gone! As it swung to the other side, the orange fire would flare up and do the same[9].”

So the entire funnel became luminescent. This shows that the deep blue band of light that Montgomery saw was not intrinsically different than the rest of the funnel. The tornado was layered, I am guessing, and composed of stacked toroids because other observations support this idea. It is suggested that tornadoes too are plasmoid phenomena.

For example, a trained weather observer named R. Hall[10] was inside a tornado in Texas in 1948. In addition to reporting a large brilliant cloud which shimmered like a fluorescent light that partly filled the middle of the funnel and that did not touch the seemingly opaque sides, and no vacuum, he wrote: “It looked as if the **whole column were composed of rings or layers**, and when a higher ring moved on toward the southeast, the ring immediately below slipped over to get back under it. This rippling motion continued on down toward the lower tip.”

It is quite rare that people have been inside tornadoes and survived. It is rarer still that people would be observant inside a tornado, and even rarer that an experienced weather observer would be so observant. It is quite rare still that a person's report of experiences inside a tornado would be published as widely as his was. So experiences like these should be pondered by those wishing to understand this phenomena.

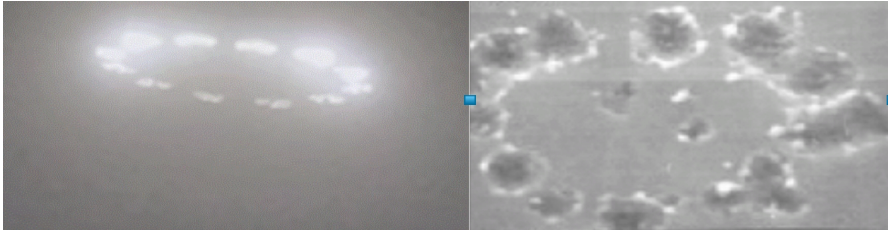
Recently, better quality photographs of MBL strike marks that have been made available by various researchers show that some MBL may have inside them an internal structure of close-linked rope-like structures. It isn't clear as yet whether all MBL might have such structures inside them. This linkage structure is different than the one described by Shoulders for an MBL chain or an MBL ring, and it is different than the structure usually seen when atmospheric BL link into chains.

Shoulders described that the typical MBL chain or ring structure is one where the spacing of the MBL is about the same as the diameter of the MBLs in the chain or ring. In a typical chain or ring of BL and MBL, the individual components are about the same size. Now it is clear that inside at least some MBL, there are closely-linked MBL ropes that have components that seem to almost touch each other or to actually touch as in the tornado stack that Hall saw. Greenyer recently obtained Matsumoto's original high quality photographs that show closely-linked chain structures in some MBL traces. These photographs are clearer and more detailed than those that Matsumoto made available in print while he was still publishing articles about the year 2005 and before.

Through repeated observations and tracking of nimbus or cumulonimbus clouds with big blue lights, Jones concluded that these clouds with lights might generate tornadoes, but they don't always do so. The electrical activity is higher if a tornado forms. He noticed that there was intense electrical activity recorded by meteorological equipment when the blue lights were visible when they are blinking and that there wasn't any electrical activity recorded when the blue lights were dark. This matches my ideas about the states of ball lightning and plasmoids in general. In the white state, they are energetic, and in the black state they are non-energetic and have little or no interaction with common matter so that they pass through common matter with little or no damage as BL does through windows and other materials without making a tunnel or pit.

Based on Jones report that he saw these blue lights on other occasions and other evidence, this shows that tornadoes develop from plasmoids. The big BLs might be in a dark state in clouds so that they are not easy to see until they switch to the white state or start blinking, and of course if a tornado exists at night, it is easier to see the luminescence. Most tornados in the US occur during the daytime however.

Giant BL structures in clouds such as the ones seen by Jones are apparently not so uncommon. In a book about the Bermuda Triangle titled *The Devil's Triangle*, there is a drawing of a typical cumulonimbus cloud that was courtesy of the Aviation Training Division of the U.S. Navy. The drawing was meant to be a diagram of typical cumulonimbus cloud structures. They drew a black spot in the base of the cloud, below the altitude of freezing, that was termed a "dark area" that is roughly similar in size and shape and position relative to the rest of the structure of the cloud as the blue spots in the clouds drawn by H. Jones and shown in his article. Perhaps they drew black state giant BL in clouds.



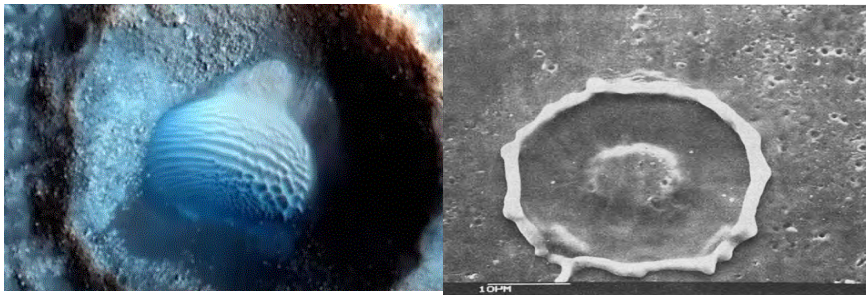
In Figure 6, there is a photograph of a big ring of shining giant BLs over Tijuana. It is easy to see that people would call that a UFO. It resembles the shape and structure of the ring of pits in the Figure 7 that was photographed by Shoulders. It is a ring of pits that was left on material by a ring of MBL. He called these circular string of MBLs "necklaces." Both of these rings show what Shoulders and myself thought was the more typical spacing for MBL in the 1990s.

Astrophysical Fifth State Plasmoids

The plasmoid field started in the 1950s when Bostick experimented with electrical discharges and photographed the shapes of the plasmoids that were created. The plasmoids had the shape of galaxies. After that, much work about astrophysical modeling and theorizing of the Universe as plasmoid phenomena was accomplished for several decades by astrophysicists. The plasmoid concept was developed substantially by astrophysics and people modeling astrophysical plasmoids. In the 1970s, the focus of Shoulders and Bostick was in the fine structure of the microplasmoids. They both noticed that the energetic density of plasmoids was greater than would be possible if quantum mechanics were valid. People believed that so much charge could not exist in such tiny spaces. People believe that electrons would naturally spread out and dissipate. Shoulders concluded that quantum mechanics isn't valid.

Shoulders continued his research to try to fine tune his equipment, and he was able to detect that the types of plasmoids that Bostick and others were studying are composed of smaller components he called "EVs." He intensively studied these EVs with a group of others in the 1980s. I call these EVs MBLs. Figure 7 is the mark of a ring of MBLs. He knew that the EVs violated the laws of quantum mechanics. The charge density was greater than quantum mechanics says is possible, but he convinced Richard Feynman, one of the developers of QED theory, that the charge density actually exists.

About 20 years ago, a group called the Thunderbolts Project started to try to find evidence of planetary plasmoid activity. They've collected much evidence that huge plasmoids affect the planets and mark them with typical plasmoid markings. However, they do not research in the concept of BL or seem to appreciate the work being done in this microplasmoid field since they never mention the research. They showed that giant plasmoids exist in the solar system. There are hundreds of photographs of BL-like markings on planets and moons and asteroids. Figure 8 is an example. It is a picture of a dome and crater on the planet Mars that was taken by a spacecraft near Mars. It is shown next to Figure 9 that is a photograph of a similar crater and dome by Ken Shoulders. The inner dome is about 11 micrometers wide. Even though both craters look as if heating was involved in their formation and that there was melting of material, the material might have actually not melted. Perhaps the atoms changed state to move like a fluid with contact with the huge planetary BL and the MBL. Compare these domes with the domes in Figure 2. Domes are common in MBL markings.

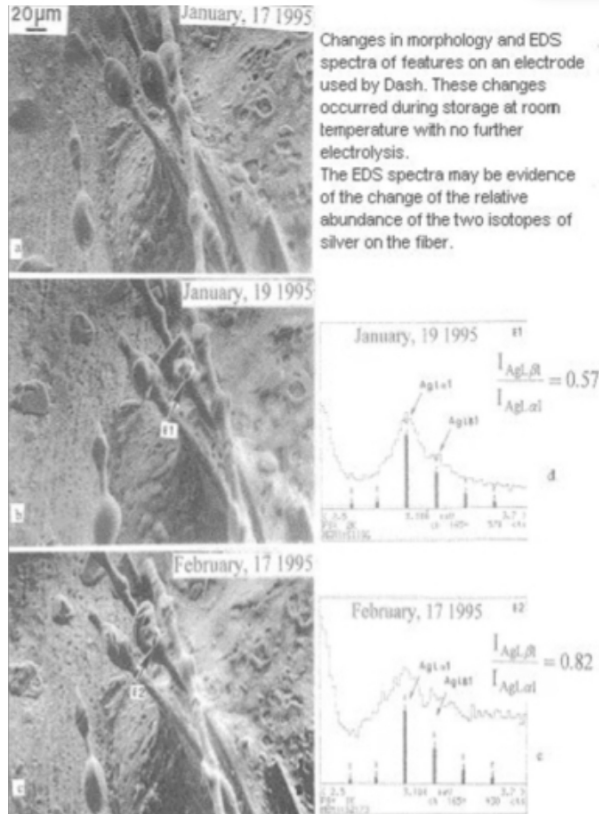


What They Are: The 5th State of Matter!

These MBL, BL, and giant BL objects behave very differently than material in the common states of plasma, gas, water and solid. It is obvious that quantum mechanics principles can't apply to them since their behavior, including transmutation, frictionless and inertialess motion, and gravitational effect contradict quantum mechanics. In the early 1990s, I realized that BL and MBL are in the 5th state of matter. There is evidence that small patches of this state of matter exists for months and years in components of electrical discharge and electrolysis experiments. Sometimes, such equipment continues to emit MBLs for months or years as Urutskoev reported. Researchers such as Savvatimova and Rodionov[11] find that microscopic patches of such equipment move very slowly, transform in shape, and transmute after the experiment is over. When material contains a patch of material that is in the fifth state, I call it a "microplasmoid patch." Such patches can't be called an MBL because BL move freely.

For example, in 2006[11], Savvatimova and Rodionov wrote: “Sometimes these structures remind bacteria or a colony of bacteria, which may glow (fluoresce) in the dark. These objects move randomly, they appear on the surface or “plunge” back into the depth of the previously monolithic material. This activity of ‘live’ bacteria objects may continue for weeks after the energetic influence (after it has been finished).” Though they use the word

“bacteria” in their article, they know it isn’t biological bacteria. They are saying that the active, moving, and strange materials almost behave like living bacteria.



The first hard evidence I saw of this fifth state material existing for a long period of time, much longer than the hours of a BL-tornado structure, was an article published by John Dash in the middle of the 1990s. In his article, he showed the picture in Figure 10. These are fibers that grew during a period of 1 month. You can see that the maximum width of the fibers were 20 micrometers. He showed EDS spectra with the pictures.

So when researchers stop their experiments and put the pieces away, the fifth state material may still transmute, transform, and emit MBL. They may be dangerous actually. The fifth state

materials might damage equipment as they move around and transmute chemically, elementally, and morphologically, and the MBL that the patches emit might damage equipment and life as well.

The Fifth State of Matter Has States of Existence



The 5th state of matter itself exists in states of plasmoid material: black, white and possibly grey states. Shoulders explained this in his writings and his book. This is what makes controlling and even detecting 5th state material difficult. The white state is energetic, luminescent and may explode and cause transmutations. If it contacts materials, it may leave pits, tunnels, or grooves in the materials. The black state may be endothermic and absorb light. It can pass through materials without disturbing the materials they pass through. They emit little or no radiation as when the giant BL in the cloud that Jones tracked was in the black state as it blinked black and white. Fifth state plasmoids can blink back and forth from white to black states. This is another reason people think they are seeing UFOs. Egon Bach and Shoulders both showed photographic evidence of the state changing. Egon Bach's photographs of this effect are in his book. Shoulders picture of the flight path of an MBL that switched from white to dark to white as it moved is in his book. Shoulder's photograph is similar to Daviau's MBL tunnel and the picture of the two part tunnel that is discussed in the conclusion.

Bagdanovich took several pictures of black state MBLs[4]. See Figures 11, 12, and 13. They are only seen as black rings against the bright background behind them.



For comparison, people are claiming that Figure 14 is as a photograph of a black hole. Might it actually be a picture of an astronomically large ring plasmoid? See how the shape of it is very similar to these black state toroidal MBL. It looks like a toroidal white state ball lightning.

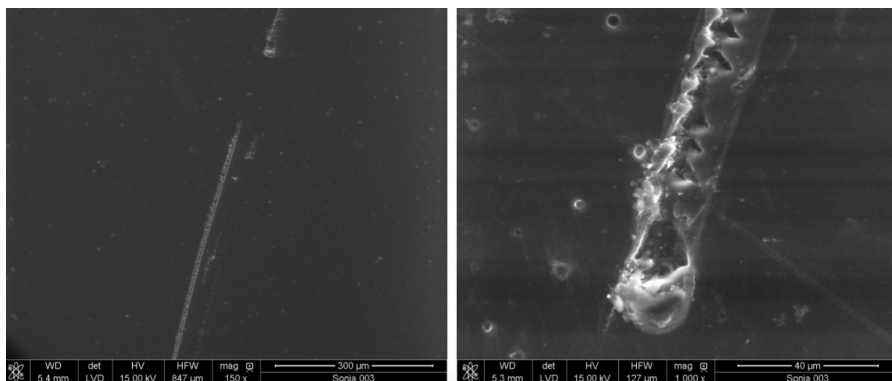
Both tornadoes and BL show gravitational effects. However, there isn't really space here to write about that or show the examples of where these gravitational effects were noticed. But here is one example: A person named Dr. Pettier saw fir trees being plucked up, and then "he felt a kind of pressure from above; he noticed an unusual smell of ozone; then he felt himself raised up, and this not by the wind, for it was calm, but as though by some invisible force." Also, "on many trees the foliage was scorched[12]." This particular tornado was also associated with ball lightning and round holes with sharp edges that were left in window panes. Anyone experiencing such gravitation effects from large BL might deem this as UFO activity too.

Conclusion

The fifth state of matter exists from atomic sizes to astronomical sizes. On earth, large BL exist in clouds in the black state or the white state or shift between the two states, and sometimes, these large BL become tornadoes. People have seen huge brightly luminous tornadoes and ball lightning. They are often called UFOs.

Transmutation occurs when fifth state matter is formed. It causes atoms to act very anomalously, even losing their friction, and when they move in flight, they don't exhibit inertial motion. They make very sharp angled turns or backtrack on themselves without deceleration. There is also evidence collected by researchers such as Nikitin and myself that they exhibit some sort of attractive force as was described above when R. Hall was inside a luminescent tornado in Texas. I think this is gravity.

Just as a BL or MBL may pass through glass or other materials, this state of matter, as it moves through atoms or contacts them, may cause atoms to change state, become like BL, and transmute. If the BL or MBL are in the black state, they may have no effect on regular state atoms as they pass through. The fifth state material, depending on its state, may interact with the regular state atoms or cause atoms to change state and interact and so transmutations and morphological transformations occur. If black state material is inside materials or beside atoms, if it changes state to a white state, then there may be sudden transmutation and changes of morphology. Crystals or strange objects such as spheres may form.



The fifth state of matter might be dangerous. BL kills or wounds people and animals and burns down buildings, and MBL may damage equipment and also cause cellular harm as the article by Priakhin and Urutskoev[13] described about the damage done to growing plants. Please take precautions by constantly monitoring MBL emission and using lead shielding. Perhaps stay away from the experiments during operation, and make sure that the components, especially the active components such as electrodes, are also put someplace safe, perhaps in a lead container, since they also might continue to emit MBL. The MBL might be in a black state coming out of the experiment so that you wouldn't detect it. However, it might continue to travel past your detectors, change state and cause damage away from the experiment. Also, MBL might fly and embed themselves in materials around your experiment or device and become long-lasting microplasmoid patch material.

For more information about fifth state matter safety considerations and also for a discussion and photographs about how an MBL in the white state made a micro tunnel in one of Daviau's samples and converted in motion to a black state and then changed to the white state leaving a two part tunnel with undisturbed material between them, see Reference 14. See Figure 15 by Daviau[15]

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Характеристики Шаровой Молнии Помогают Нам Понять Странные Частицы: Микрошаровую Молнию

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Изучение свойств шаровых молний помогает людям понять то, что я называю «микроплазмоидами», такими как «странное излучение», которое изучают различные российские группы, а также те, которые десятилетиями ранее были вызваны Бостиком, Мацумото и Шоулдерсом. Различные размеры плазмоидов, находящихся в 5-м состоянии материи, подобны шаровой молнии и одинаковы независимо от масштаба размеров. Таким образом, мы можем использовать ШМ, чтобы понять, как действуют микрошаровые молнии, как они структурированы, и наоборот. Знание того, как ведет себя шаровая молния, помогает нам понять, верны ли модели и гипотезы об экспериментальных микроплазмоидах микрометрового размера, и помогает разработать общую об плазмоидном состоянии материалов, жидкости, твердого тела, газа и плазмы.

