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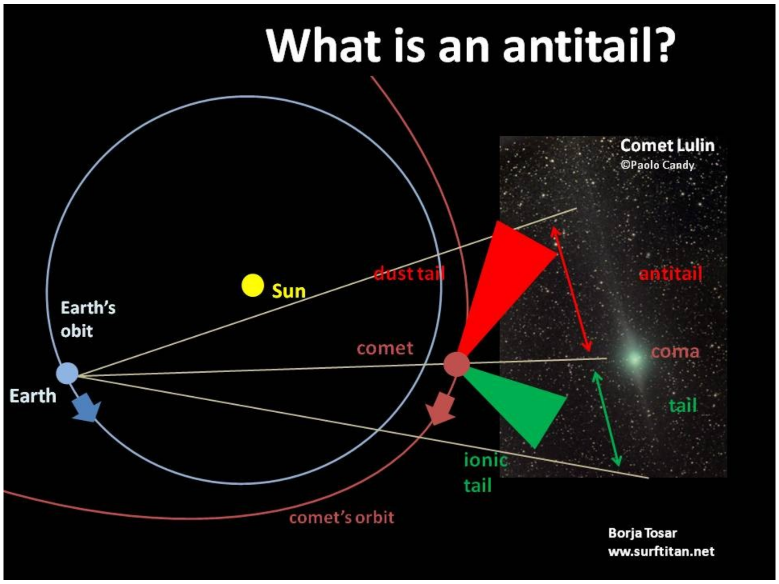
The Cometary Antitail



by Miles Mathis

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Comet ISON is already generating excitement, since it is predicted to be one of the brightest ever seen in our lifetimes. It is scheduled to pass beginning November 28. The comet PANSTARRS is currently being seen in the south and will soon be seen here as well. This gives me the opportunity to address cometary theory, how it currently fails, and how to improve it with the unified field.

Let's look at the antitail. The antitail is one of three cometary tails known, along with the dust tail and the ion tail. The ion tail points directly away from the Sun, and is caused by the Solar wind. According to this diagram above, the dust tail *appears to* point mainly on the tangent, behind the comet, and so it forms a pretty natural exhaust tail. But the antitail is not so easy to explain with current theory. It is a dust tail that leads the comet, so it is neither exhaust nor ion push caused by the Sun. This is what Wikipedia says on the main page for "comet":

On occasions a short tail pointing in the opposite direction to the ion and dust tails may be seen – the antitail. These were once thought somewhat mysterious, but are merely the end of the dust tail apparently projecting ahead of the comet due to our viewing angle.

But if we click on the "antitail" link on that page, we don't find that explanation. Instead we find this:

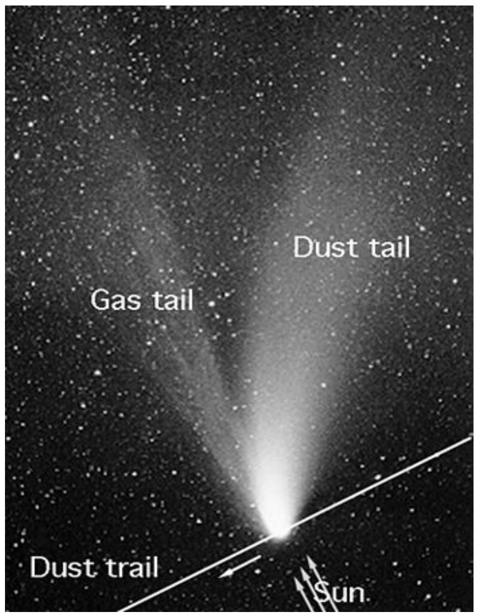
The antitail is therefore normally visible for a brief interval only when the Earth passes through the comet's orbital plane.

And if we click on “comet tail,” we go to another page, where the antitail is defined in a completely different way:

The streams of dust and gas each form their own distinct tail, pointing in slightly different directions. The tail of dust is left behind in the comet's orbit in such a manner that it often forms a curved tail called the antitail.

What was that? I thought the antitail was forward of the comet. On the main page, it just said that the antitail was “in the opposite direction to the dust tail,” and “projecting *ahead* of the comet.” Now the antitail is being defined as “the tail of dust behind the comet's orbit.” Can it be both ways?

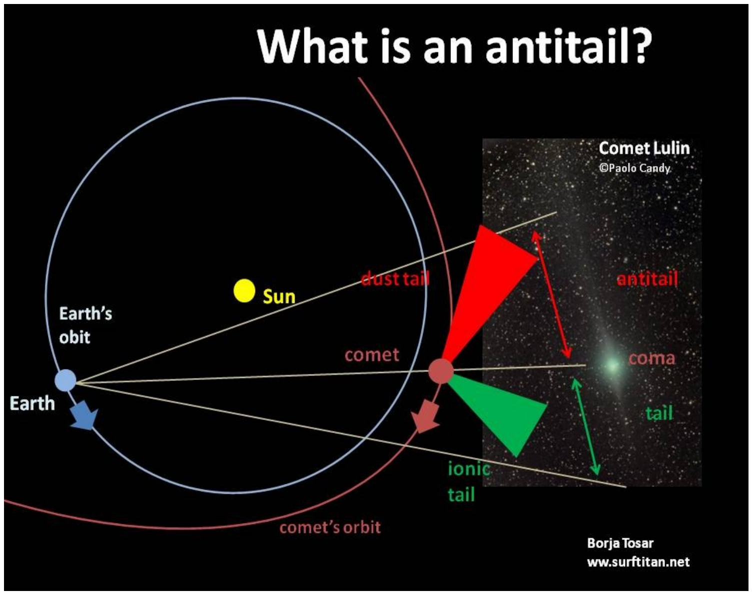
We also get this confusing diagram:



The “dust trail” now replaces the antitail, but the dust trail is drawn here as an orbital line. That is simply false, since no dust trail ever precedes the comet by the distance implied by the words. As it is diagrammed, one would think there is a linear dust trail all along the entire orbit of the comet. This diagram also contradicts the diagram under title (also linked from Wiki). In the first diagram, the dust tail is very near the tangent. In this diagram, the dust tail is nowhere near the tangent.

Even more confusing is that this page on *comet tail* doesn't even mention the dust trail. We get a diagram of a dust trail, but no mention of it on the entire page, or any of the other pages. As it is, the dust trail just looks like a shell game to get your mind off the antitail. That is probably why they chose a name that is just one letter different from dust *tail*. Dust trail, dust tail. Now shake your head around and dunk it under water. When you come up, don't ask any questions.

But let us return to the first diagram:

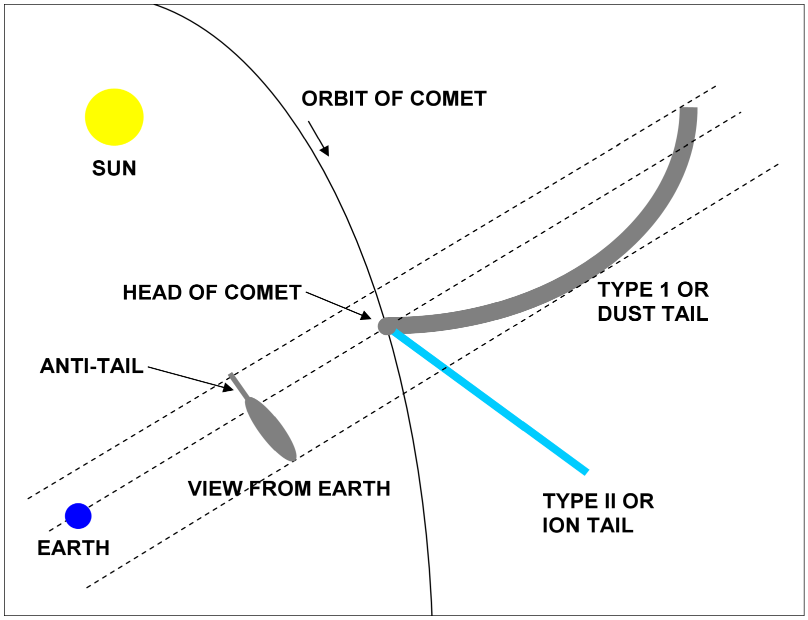


If we study that diagram, we find it doesn't tell us what an antitail is, although the title would imply it should. The antitail is supposed to be forward of the comet, but here it is diagrammed behind the comet. In the diagram, the antitail and dust tail are the same thing. They are both written in red, to increase your confusion. We are told that the antitail is part of the dust tail that only “appears” ahead of the comet due to a viewing angle. OK, then why didn't this Borja Tosar diagram a viewing angle where part of the dust tail would appear forward of the comet? Wouldn't that have been the logical thing to do? Why go to the trouble of making a diagram for antitail, then diagram a viewing angle that showed no antitail at all? Tosar draws the line from Earth to comet, and even extends it out to the word “coma,” as you see. There, it intersects the red “antitail” arrow. Problem is, the red antitail arrow doesn't extend past the comet line, meaning that from the Earth no part of the dust tail would appear to be in front of the comet. This is a diagram of absolutely nothing.

What Tosar has diagrammed forward of the comet is the ion tail. It is the green tail that is forward of this comet. But in the definitions, the antitail is never linked to the ion tail. That isn't the data.

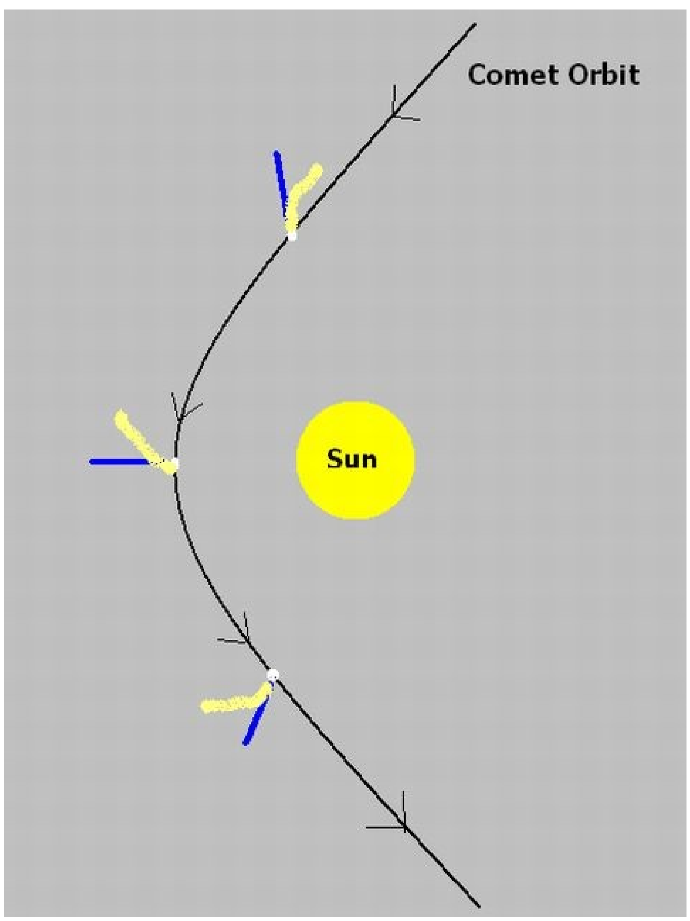
I will be told that Wikipedia is written by mischievous web-elves or naughty net-boys, but it isn't. The science pages are written and heavily policed by the universities. We know that. So what are they trying to hide with all this misdirection? They are trying to hide the fact that the antitail is still mysterious. The mainstream can't explain it, so they have to try to bury it.

I will be shown this diagram, as indication this can all be explained sensibly:



That gif is at Wikicommons, but isn't published on any of the comet pages at Wikipedia. Nor is it listed as a link. That is curious, since this diagram is indeed helpful. As is this diagram below, which I found at the Astroprof's page:

Astroprof's diagram



In that diagram, the yellow tail is the dust tail. In the lowest position, the dust tail would initially be seen as moving forward of the comet from some orbital positions of the Earth. But of course that means the definitions at Wiki were upside down. It isn't the antitail that is forward of the comet, it is the dust tail. The antitail is behind when the dust tail is *ahead*, as we see in this photo of comet Arend-Roland.

Arend-Roland is moving left to right there. The antitail is behind and the dust tail is ahead.

This clears up the awful mess at Wikipedia, but it leaves us with a new problem, which we can see very clearly in the Astroprof's diagram. The Astroprof has solved Wikipedia's problem, but he has given us a bigger one—which is probably why Wikipedia preferred to misdirect. His lowest diagrammed position shows us that not only the ion tail but the dust tail initially moves off directly away from the Sun *in all positions*. Notice that the diagram under title fails here, too. Tosar has diagrammed the dust tail at nearly a tangent, but it wouldn't be at a tangent in that position. It would be nearest a tangent only in the Astroprof's upper position, when the comet was approaching the Sun.

Why is this a bigger problem? Because it shows us that it is not only the ions that are reacting to the Solar wind or charge, it is the dust as well. The Astroprof explains it like this:

But, the dust tail is a bit more complicated. It is pushed outward by light pressure... Most people don't realize it, but light can actually push on things. So, the light from the Sun is able to push the tiny dust grains outward. But, these dust grains are still orbiting the Sun. So, a push outward causes them to be pushed into farther orbits. The farther an orbit is from the Sun, the slower it moves. So, these dust grains lag ever so slightly behind the nucleus of the comet. The farther they are pushed, the more they lag, so the tail gently sweeps backward, though still largely pointing away from the Sun.

That answer is pretty clear, and part of it is actually close to correct. Problem is, it conflicts with current theory. That is why you won't see it at Wikipedia. Notice that the Astroprof is careful not to give the motion of the dust tail to the Solar Wind. He switches to light pressure. Why? Because the Solar Wind effect is currently given to the E/M field. The ion tail is moved by the Solar Wind precisely because it is ionic. It is charged. So the ion tail is explained as an E/M field effect. But the dust tail can't be explained that way, since the dust is not charged. It isn't ionic. It is also thought to be too heavy to be moved so forcibly by something as tenuous as the Solar Wind. It is not thought that ion bombardment can so forcibly redirect relatively large particles like dust. If it could, the dust tail would also be given to the Solar Wind. So the Astroprof switches to light pressure, which is NOT thought to be an E/M field effect. Why not? Because photons are not thought to be charged. According to the mainstream, "photons have no electrical charge nor are they influenced by magnetic fields." They also have no mass. They also have no radius. The Astroprof is using an extension of the photoelectric effect here to explain the dust tail, but the mainstream doesn't like to do that so explicitly since it puts their dirty laundry out in the front yard. It begs a whole passel of questions, starting with,

1) If light pressure can explain the motion of dust, why can't it explain the motion of ions? Surely it is easier to push little ions than to push larger dust particles?
2) Why should light pressure be a stronger force than the Solar Wind? If the Solar Wind is ions and the light is just photons, shouldn't the larger ions impart a greater force than the smaller photons? In the comet tail theories, it seems like the bigger particles are being pushed by the smaller field. Ions are pushed by ions, but dust is pushed by photons?
3) I will be told that the ion field interaction is not a simple push or bombardment. It is an E/M field effect. But if that is so, and if the photon pressure is NOT an E/M field effect, then how do the protons create pressure? If they have no mass and no radius, the field must also not be a bombarding field. If it is neither a bombarding field nor an E/M field, how is the force transferred to the dust? Yes, photons have energy, but if they have no mass or radius, how do they transfer that energy to the dust?

If we return to Wikipedia and scan the pages closely, we find that one author briefly gives the ion tail to *both* the Solar Wind and the photoelectric effect:

The observation of antitails contributed significantly to the discovery of solar wind. The ion tail is formed as a result of the photoelectric effect [dubious—discuss] of solar ultra-violet radiation acting on particles in the coma.

Notice that "dubious—discuss" insertion by the university editors of the page, which confirms what I said above. The editors would prefer the question remain unasked as well as unanswered, and I predict the photoelectric effect sentence will not last much longer on the page. It will soon be deleted. From this, it looks like the mainstream can't really decide what is going on, so they cover all their bases, as usual. On the "comet tail" page, they even float a third variation of this theory: "The ion tail is the result of ultraviolet radiation ejecting electrons off particles in the coma." That is sort of a mixture of the previous two statements, since although ultraviolet radiation is of course photons, the action of photons on electrons is not normally giving to real pressure or bombardment. It is explained as an E/M field effect or quantum effect, immediately making it non-mechanical. Nothing in quantum mechanics is really mechanical, as I have shown in dozens of papers. When the mainstream doesn't have a mechanical explanation, it dodges into "quantum effects."

All this begins to tell us why the authors at Wikipedia don't like to provide any diagrams that show the dust tail moving ahead of the comet, or even moving ahead of the orbital perpendicular. In those positions, the dust tail can't be explained as natural exhaust. Despite that, the article at Wikipedia tries to divert you in that direction:

At the same time, the ion or type I tail, made of gases, always points directly away from the Sun, as this gas is more strongly affected by the solar wind than is dust, following magnetic field lines rather than an orbital trajectory.

That implies that the dust tail follows an orbital trajectory. The mainstream would prefer you think that, so that you ask no questions about it. But we have just seen on the Astroprof's page that in most positions, the dust tail doesn't follow an orbital trajectory or look like a normal exhaust plume. The dust follows the same initial trajectory as the ions and then curves.

Also strange is that the pages at Wikipedia give no theory for the curvature of the dust tail. We have to go to the Astroprof or other lesser sources for theory on that, as you have seen.

So let's return to that. If space is empty, what is driving the dust back in a curve? Why doesn't the dust travel back in a straight line like the ions? Both the light pressure and the Solar Wind are still blowing straight out on a radial line, all the way out to Pluto. Why should the dust curve back? The Astroprof tells us it is because the dust is being blown into a higher Solar orbit. To keep in synchronous orbit with the comet, it would have to speed up. It has no way to do that, therefore it lags behind. That appears to work at first, but on closer study it falls apart.

It falls apart because the dust tail is curving back not only relative to the comet, but also relative to the blue line. In Astroprof's diagram, the yellow line is curving back relative to the blue line, not relative to the advancing comet. *Of course* the yellow line must curve back relative to the advancing comet, and that is what Astroprof is explaining here. But that doesn't explain anything because even the blue line is curving back relative to the advancing comet. *From the comet*, the straight blue line would appear to curve back. Only from our god's-eye view does the blue line look straight. The question is, why does the yellow line appear curved relative to the straight blue line? Astroprof's answer doesn't address that question, you see.

If you don't see what I mean (and it is a bit tricky), think of it this way. Follow the straight blue line out. Is *it* maintaining synchronous orbit with the comet? No. From the comet, it would appear to fall behind. So telling us the yellow line can't maintain synchronous orbit with the comet is not to the point. "Lagging behind the nucleus of the comet" is not what causes the curvature. **The blue line also lags behind the nucleus of the comet as time passes, and it is straight. Therefore the Astroprof's explanation fails.**

The mainstream can't answer these questions without getting into major binds, which is why all this is buried on purpose. Only a few fairly honest (or impetuous) guys like the Astroprof lead you into these areas; all the rest prefer to misdirect you. They don't want to get trapped in a place where they don't have any answers, so they don't let you go there. But my unified field has answers to almost all the questions that come up in cases like this. In the unified field, we don't need to separate photon pressure from "E/M field effects," because all E/M field effects are ultimately caused by photons. The Solar Wind itself travels in the charge field, and is directed by it, so there is no real separation of Solar Wind from charge or photons. All the ions that come out of the Sun—whether these ions are an outcome of charge or fusion—must travel on pre-established charge field lines. This is because the E/M field is based on charge, and charge is photons. Charge itself is light pressure. The E/M field IS light pressure, not just visible Sunlight, but the entire spectrum. The photons drive the ions, and then the ions create the larger E/M field effects we see. But the photons drive the ions by *real* bombardment (including spin interactions).

The photons are not massless and they are not point particles. Photons do have a real radius. They also have real spins. The summed photon field will have a single spin value, but locally and individually the photons can have multiple spins and competing spins. Once we make the charge field photons real and mechanical (and stop separating charge photons from light photons), a lot of mysteries simply evaporate. For instance, we can now understand why the ion tail doesn't curve while the dust tail does.

The Solar charge field is made up of charge photons. It is the charge photons that set the field lines in the first instance. These field lines don't curve back at all relative to the Sun, since there is no reason for them to. They can't curve back relative to the center of the system, from which they are released. Most of the charge in the system comes from the Sun, and the Sun is at the center of the system. The center doesn't move relative to its own system, therefore the charge photons could not curve back relative to that unmoving center.

The Solar Wind must follow this charge field as well. The charge field lines are pre-existing and much stronger than most understand. They are fully capable of channeling the ions in the Solar Wind, which are electrons or protons or other very small ions. When the Solar Wind hits the comet, the ions of the comet are also small enough to be fully channeled by the existing charge channels. This channeling is straight bombardment and is really no different than light pressure. The ion effect on the comet is initially electrical, not magnetic, and we can tell that just from the direction of the tail. Electrical effects like this match the motions we would expect from a bombarding field, and that is what we see. The Solar Wind is moving out, as a matter of the particles, and so is the ion tail. That is bombardment, and it is also what we call electrical.

The same applies to the dust. The *initial* motion could be called either electrical or photon pressure, since at the fundamental level they are the same thing (at least in this case). When the photons and the larger particles are moving in the same direction, we have an electrical effect. But when the larger particles are moving as a result of the photon spin, we have a magnetic effect. Therefore, **the curvature of the dust indicates a magnetic effect**.

Follow me closely here, because this is the kernel of the new argument. The ion tail *doesn't* curve back because the magnetic field of the comet matches the ambient magnetic field. The ions coming out of the comet aren't given any *extra* spin by the field, therefore they do not create any extra curve. In other words, the ions in and around the comet are already spinning to the left (say), so a left spinning photon field will not be able to spin them anymore than they are already spinning. Their trajectory, whatever it is, will not change. That is the definition of a straight trajectory.

But the dust, being relatively magnetic-neutral, will not already be spun. This means the ambient photon field will be able to impart spin to it. As the dust moves off from the comet, it remains in the ambient field. So the dust gains spin from the field as time passes. This causes the curve. The dust, which is not initially ionized when it is still stuck in the comet head, is capable of *becoming* ionized once it is blown into small enough free particles. With the curve, we are watching the process of ionization. We are watching the dust particles being given more and more spin by the charge field.

If you extend this analysis, you can see that it is possible to explain the planetary orbit itself by such a magnetic effect, which is what I have done in previous papers. With the magnetic effect like this, you no longer need to explain the sideways motion of a planet as due to an "innate motion," as Newton did. The "sideways" motion of orbiters is a magnetic response to the Sun's charge field. That is why they all orbit in the same direction. In order for a planet to orbit retrograde, the Sun's charge field would have to change its summed spin, and it simply cannot do that. The summed spin is pre-determined by the spin of the galaxy, and is simply recycled by the Sun. Even the Sun can only respond to larger fields.

This is why 93% of known short-period comets orbit prograde. The charge field nearer the Sun is simply too strong—and therefore too polarized—to allow retrograde comets (except in very specific circumstances, see below).

This also explains the various torques in Solar System dynamics, which cannot be explained mechanically by the gravity field. These torques work at field tangents, and gravity cannot act at a right angle to the field. Only the magnetic field can work at a right angle or tangent to the gravity field. Every torque in celestial mechanics is an indication of the magnetic field, and therefore of the unified field.

Now that you begin to understand the unified field theory as it applies to comets, we can use the theory to explain other cometary features. Let's now look at Halley's comet, the most famous and brightest of the short-period comets. The crucial fact of Halley's comet is that it orbits retrograde, unlike almost all other short-period comets. The mainstream does not link this retrograde orbit to the brightness, because mainstream theory has no way to explain such a link. But my theory tells us that the brightness is a direct outcome of the retrograde motion. With my theory, we would *predict* that retrograde comets should be brighter, and hopefully you can already see why. A retrograde comet is moving against the magnetic field of the Sun. A majority of the Sun's photons are spinning left, but the retrograde comet is trying to orbit to the right. Therefore the comet is experiencing a sort of "photon spin friction" at all times. As the charge field of the comet interacts with the ambient charge field, we get spin cancellations at the photon level (and therefore at all higher levels). These spin cancellations are caused by actual edge-to-edge collisions of real photons (like opposite cogs colliding), and in these collisions a higher number of photons are re-directed. Being re-directed means they are given escape trajectories from the normal radial trajectory they were previously on. This creates more light escaping the vicinity, which leads to greater brightness for viewers.

This creates not just more light, but more heat. It creates a release of energy at all frequencies, since the energies of the cancelled spins must go somewhere. The spins sum to zero, but the energy does not. The two energies are integrated and released.

This effect is analogous to what is currently called a matter-antimatter collision. Since photons are material—they have radius and mass—they are just the smallest particles of matter. When right photons meet left photons, we get these magnetic field effects, one of which is increased brightness. We see the same thing when electrons meet positrons, or protons meet anti-protons. According to current theory, we get annihilation in such cases, but I have shown this is false. Matter is never annihilated. When positron and electron collide, we again only get a loss of spin. Both particles are despun, so they will appear to disappear in a magnetic field. A magnetic field detection relies on particle spin, and a particle that has been despun will no longer be detected. But it has not been annihilated. The particles is still there and can be respun. I have shown experimental proof for this in other papers.

In any case, matter-antimatter collisions also cause E/M brightness, and this is known. The brightness of a retrograde comet is caused by the same basic mechanism: photon collisions, spin cancellations, energy release, and photon redirection.

You may be interested to know that the brightness of Venus should be explained in the same way. Since Venus is spinning the wrong way (retro to the Sun's ambient field), her emitted charge is also upside down to her external field, in the same way Halley's comet's field is. I have already shown this is the explanation of Venus' lack of a magnetosphere, and it explains part of the brightness as well. The mainstream has even confirmed this recently, and Wikipedia was nice enough to post the link:

On January 29, 2013, ESA scientists reported that the ionosphere of the planet Venus streams outwards in a manner similar to "the ion tail seen streaming from a comet under similar conditions."

Of course ESA isn't intending to confirm my theory, but they are doing so nonetheless. Given that the ionosphere of Venus acts "in a manner similar" to a comet's ion tail, we may ask if the brightness of Venus is linked to the brightness of some comets that have "similar conditions." I am showing you that it is. The brightness of Venus should be linked to the brightness of Halley's comet, since both are caused by the retrograde motion of the orbit or axial spin. Under normal conditions, both the orbital direction and the axial spin are caused by the spin of the ambient charge field. Since both Halley's comet and Venus are trying to spin against this ambient field, both create magnetic effects in the charge field, including increased brightness.

So how does Halley's comet maintain this retrograde orbit? Shouldn't the ambient field break it up? Well, the ambient field *is* breaking it up very quickly. That is what we are seeing. "Observations by D.W. Hughes suggest that Halley's nucleus has been reduced in mass by 80–90% over the last 2000–3000 revolutions." That is an extremely fast dissolution, faster than most other comets studied. Not surprisingly, the retrograde comets are destroyed by the Sun more quickly than prograde comets, and my theory tells us why. "Halley is the most active of all the periodic comets, with others such as Comet Encke and Comet Holmes displaying activity one or two orders of magnitude weaker." That means Halley's comet is dissolving much faster than is normal for a comet. In the rare cases that the mainstream tries to explain that much greater activity, it is explained as due to composition. But you cannot explain "orders of magnitude" difference based on composition alone. Halley is dissolving so much faster precisely because it is retrograde.

From my theory, we would predict that any retrograde, short-period comet should be traveling extremely fast. Only speed would allow it to overcome the prograde charge field. And indeed this is what we find. Halley's comet is known to have one of the highest velocities of any object in the Solar System. The comet is traveling at over 250,000 km/hr, which is five to ten times faster than most comets. From this we can confidently predict that we will never find a retrograde, short-period comet that is large and moving slowly. This sort of comet is disallowed for the same reasons that retrograde planets are disallowed. Such a beast simply cannot survive in the left-spinning ambient charge field.

For more on this question, see my recent paper on Saturn's very bright moon Enceladus.