There is no such thing as a black hole

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Abstract

The black hole and dark matter are two pillars of contemporary General Relativity. Week after week, we read about them in the specialized journals and in popularization magazines. Here we show that the term 'black hole' has yet to be defined scientifically. To pique the skeptic, mathematical physicists assign many dimensions to the black hole, confess that they have never seen one, and have no idea what these alleged objects are made of. For its part, dark matter is nothing more than an *ad hoc* variable that Mathematical Physics invented to plug holes in its leaky conception of gravity. The Rope Model of Light and Gravity offers a rational alternative for phenomena attributed to magical black holes and invisible dark matter.

Keywords - black hole, dark matter, General Relativity, galaxy rotation problem, Rope Hypothesis, gravity, magnetic field

I. THE DEFINITION OF THE TERM *BLACK HOLE*

The black hole has been given widespread coverage in the mathematical literature and in popularization magazines. It is one of the most talked about objects of 'physics', so much so that the term needs no introduction. Just about everyone has heard of black holes and is familiar with the notion that whatever falls inside them disappears forever.

But do black holes exist in the real world? Are there heavy, invisible, black vacuum cleaners lurking out there in the night sky, sucking up stars and compelling them to move in circles around nothing?

In order to answer this question, it would seem basic to begin by defining the term at the center of our inquiry. What is the scientific definition of the term *black hole*? What are the proponents referring to when they say 'black hole'?

An in-depth review of the literature reveals that General Relativity treats the black hole as both an object and a concept. Some sources treat it as a *black ball*, a physical object that has surface, size, dimensions and volume. Others propose that it is a *region*: an area, an abstract mathematical concept.

The black hole as an *object* (black ball)

"black hole: a great amount of matter packed into a very <u>small</u> area… a star ten times more massive than the Sun squeezed into a <u>sphere</u> approximately the diameter of New York City…" [1]

"matter has been squeezed into a <u>tiny</u> space… Black holes can be <u>big</u> or <u>small</u>. Scientists think the <u>smallest</u> black holes are as <u>small</u> as just one atom." [2]

"The <u>smallest</u> ones are known as primordial black holes. Scientists believe this type of black hole is as <u>small</u> as a single atom." [3]

"Black holes are… <u>objects</u> of extreme density… (relatively) small… Such an <u>object</u> packs three times or more the mass of the sun into a <u>city-size</u> range." [4]

"an <u>object</u> with such an enormous concentration of mass in such a <u>small radius</u>… The more massive a black hole is, the more space it takes up. In fact, the Schwarzschild <u>radius</u> (which means the radius of the horizon) and the mass are directly proportional to one another: if one black hole weighs ten times as much as another, its <u>radius</u> is ten times as <u>large</u>. A black hole with a mass equal to that of the Sun would have a <u>radius of 3 kilometers</u>. So a typical 10-solar-mass black hole would have a <u>radius of 30 kilometers</u>, and a million-solar-mass black hole at the center of a galaxy would have a <u>radius of 3 million kilometers</u>." [5]

The black hole as a *region*
(an abstract *concept* lacking body or substance)

"a black hole is not a tangible object but <u>a region</u> in space" [6]

Black hole is <u>a region</u> of space that has… much mass concentrated in it." [5]

"The concept of a singularity is <u>a mathematical concept</u>, not a physics concept" [7]

"One of the conceptual difficulties involved with characterizing spacetime <u>singularities</u> is that one seems to land in <u>paradoxes if one thinks of them as things</u>. It is typical to think that actual physical things must exist in spacetime. However, general relativity characterizes spacetime in terms of <u>a metric</u> (on <u>a manifold of points</u>)…" [8]

Let's make the distinction between an object (the ball) and a concept (a region) clear with an example. Is a ball the same thing as a region of the ball? Is a ball anything like a hole in the wall? For instance, the palm is a region of the hand and China is a region of the planet. The objects are hand and planet. A region is always of something else. There is no standalone object called 'region'.

If a standalone *ball* is not equivalent to a *region* (area or volume of something else), the proponents of black holes are tasked to settle their differences before they can present their theories, let alone claim that they have proven the existence of black holes. They must decide whether a black hole is a rip in the cosmic canvas or a tiny marble floating all by itself in space. Did a standalone star collapse to a 3D golf *ball* or to a 0D *region* of spacetime? How else can we discuss the black hole's existence or behavior if we have yet to understand *what* a black hole *is*? What should an astronomer look for in the night sky? The black ball is in the theorists' court. They have no excuse to elude a definition if the black hole is a concept or to declare it an object.

Fig. 1   Searching for a region?

II.   WHAT IS A BLACK HOLE MADE OF?

The BBC interviewed and asked four leading celebrities of relativity to tell the viewers what a black hole is made of. [9] This is what they replied:

Michio Kaku (City College NY): (simply shrugged his shoulders)

Lawrence Krauss (ASU): *"Hmmmm…uuuuhhh…"*

Andy Strominger (Harvard): *"Oh. Okay. Already you've asked me a question that I can't answer."*

Max Tegmark (MIT): *"We don't really have any idea what's going on, so…"*

Stunning reactions coming from college professors!

The answers the scholars gave are perplexing in light of the fact that the 'no hair' theorem [10] – which they should all be familiar with – states:

"all black holes solutions… can be completely characterized by only three… parameters: mass, electric charge, and angular momentum." [11]

There is a special type of black hole – a non-rotating, Schwarzschild black hole – that is alleged to have no charge or angular momentum. [12] Therefore, *some* black holes have mass, electric charge, and angular momentum, but *ALL* black holes have mass:

"All of that material left over from the explosion, many times the mass of our Sun, falls into an infinitely small point… large black holes can have tens to millions of times the mass of our sun trapped in a point smaller than the tip of a pin!" [13]

"There is no limit in principle to how much or how little mass a black hole can have. Any amount of mass at all can in principle be made to form a black hole if you compress it to a high enough density." [5]

Therefore, the answer was straightforward. They should have all answered that a black hole is 'made' of mass. Why did the experts suddenly draw a blank on this simple question if the existence of black holes has been resolutely and forevermore proven?

The reason the professors evaded the question is that answering it would have opened an even bigger can of worms. Imagine the follow-up question: "What do you mean it has or is made of mass? What is mass?" If the mathematical physicists answered "Mass is the quantity of matter", they would have debunked the black hole on camera. It is well-established and widely proclaimed that a black hole crushes all matter out of existence…

"The matter that forms a black hole is crushed out of existence. Just as the Cheshire Cat disappeared and left only its smile behind, a black hole represents matter that leaves only its gravity behind." [14]

"an object whose gravitational pressure is so intense that the matter of the object is crushed out of existence" [15]

"General relativity predicts that all matter inside a black hole goes to a point-like "singularity" at the center, where it is crushed out of existence except for its mass" [16]

The scholars would have been embarrassed in public. They would have been caught running around in circles (*Fig. 2*):

1. a black hole has mass

2. mass is the quantity of matter

3. but a black hole crushes all matter out of existence!

Fig. 2   The circular argument of Relativity
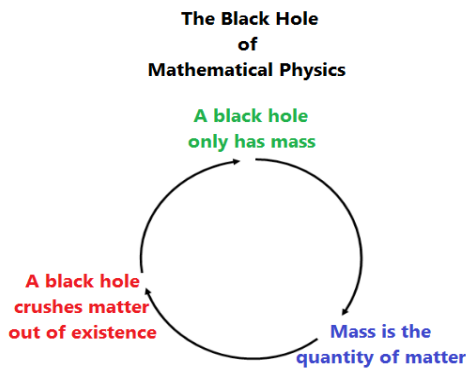
The glove is in their face. Relativists are hereby formally challenged to clarify via a formal article in a respectable peer-reviewed journal what they propose that a black hole is made of or contains. Until then, they cannot use the black hole as an actor in any theory. To simply state dogmatically that there is no elephant and that it is actually the late pachyderm's spiritual *weight* that is crushing the branches of the tree sounds eerily like the explanations that our generation inherited from traditional religions.

III.   HOW MANY DIMENSIONS DOES A BLACK HOLE HAVE?

If a rational individual is asked to tell you how many dimensions a cubic box has, he would answer three: length, width, and height. It is a direct answer with no runaround. If facing the box, the person might reply that the object in front of him has only two dimensions – width and height – but this is clearly a matter of perception and not of objective reality. What the individual sees and believes is not what the box is on its own. Indeed, all standalone objects in the Universe are three-dimensional. Even the ideal 2D plane of Geometry is conceptually no more than one of the faces of a solid.

Let's now ask the same question in the context of black holes: How many dimensions does a black hole have? This would seem to be a valid and basic question if the black hole is defined as or assumed to be a physical celestial object, more so if we are going to ask the astronomers to look for it in the night sky. It should have a single answer.

The proponents of black holes have six different answers for this simple question, each accompanied by a different set of explanations:

1. It's an illegal question: *"a meaningless question because the spacetime geometry is undefined at a singularity"* [8]

2. Many dimensions: *"if r is the length of a vector the singularity comes when x,y,z are zero. So you can have many dimensions for a point singularity"* [8]

3. 0 dimensions: *"Lehner… showed that… the black hole's radius is zero…"* [17][18]

*"Scientists now refer to an object with zero-volume but all of its mass as a **singularity**.* [19]

4. 1 dimension: *"the singularity is a line in spacetime i.e. a one dimensional object in spacetime… If we think just in terms of space, it's zero-dimensional. But in* spacetime *it is one-dimensional, because it exists over a period of time."* [8]

5. 2 dimensions: Relativists routinely illustrate a black hole as a 2D whirlpool and Grossman's article is no exception. [17] Everything in the image the article depicts – *Fig. 3* – from the event horizon to the singularity is at least 2D. Anything we can draw is at least 2D! Therefore, relativists will never be able to illustrate a 0D or a 1D 'entity'.)

Fig. 3   The 0D - 2D black hole of Relativity
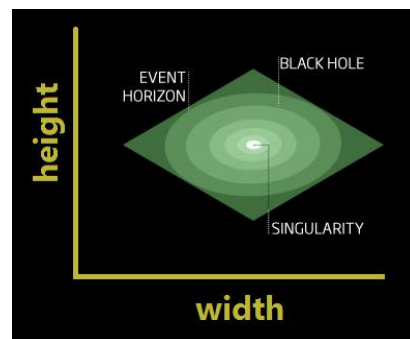
6. 3 dimensions: "*a star ten times more massive than the Sun squeezed into a <u>sphere</u>…*"[1]

"*a singularity was surrounded by a <u>spherical</u> gravitational boundary*"[19]

If a black hole can simultaneously be 0, 1, 2, and 3 dimensional, and have many as well as no dimensions, it is very difficult to follow the speaker's theory… let alone 'falsify' or challenge such a proposition.[20] The presenter has covered all the bases.

IV.   PROOF OF THE EXISTENCE OF BLACK HOLES?

Theorists have claimed to have proven the existence of black holes every decade at least since as far back as the 70s.[21 22 23 24 25 26 27] Therefore, it is pertinent to review this history to learn how the theorists accomplished this feat to ensure that they crossed all the Ts. This is all the more intriguing since there are just as many colleagues that assert the opposite:

1. Asked by the BBC in 2009 if they had ever seen a black hole,[9] the same scholars who earlier couldn't say what they were made of replied:

Andy Strominger (Harvard): "*No!.*"

Max Tegmark (MIT): "*No*"

Lawrence Krauss (ASU): "*No one has ever seen a black hole.*"

2. The Physics FAQ:

"*they are entirely theoretical… It's doubtful that "simplistic" black holes with the bizarre properties that are described here really exist… Their existence is nowadays taken for granted by young scientists, but it's important to realise that none have ever conclusively been found.*"[28]

3. "*Are black holes real? The short answer to the question is, 'Likely.' That means that most astronomers and physicists have good theoretical reasoning to believe that black holes can exist.*"[29]

4. "*Data from a vast number of astrophysical experiments **will** provide solid evidence (images) of event horizons and hence confirmation that black holes exist.*"[30]

One author who boasts to have already proven the existence of black holes is Reinhardt Genzel at the Max Planck Institute for Extraterrestrial Physics. He writes:

"*The outstanding, main result of our work is the proof of existence of an astrophysical massive black hole, beyond any reasonable doubt.*"[31]

Up front, Genzel's criterion – 'beyond a reasonable doubt' – is unscientific. It sounds suspiciously like a familiar line from the legal profession and quite a lot like a personal opinion. Is the existence of black holes a matter of belief or of fact? Should we hold a Galilean trial and allow a panel of Cambridge relativists to vote and resolve once and for all (and for everyone) whether black holes exist?

Genzel's claim raises even more questions when he tells his interviewer the secret of how he proves the existence of black holes in his office…

"*While we can't see black holes as such, we can see that they're there and what they are, through their interaction with visible objects like stars, like gas in their vicinity.*"[9]

Another source gives a similar account:

"*We can't see them, but we can infer their existence from their gravitational effects on their neighbor-hoods.*"[32]

Genzel offers a more detailed explanation of his reasoning in one of his published papers:

"*An unambiguous proof of the existence of a massive black hole as defined by General Relativity requires the determination of the gravitational potential to the scale of the event horizon. This proof can in principle be obtained from spatially resolved measurements of the motions of test particles (interstellar gas or stars) in close orbit around the nucleus. In practice, it is not possible (yet) to probe the scale of an event horizon of any black hole candidate (stellar as well as massive black holes) with spatially resolved dynamical measurements. A more modest goal then is to show that the gravitational potential of a galaxy nucleus is dominated by a compact non-stellar mass and that this central mass concentration cannot be anything but a black hole…*"[33]

In other words, Genzel observes a star revolving around nothing, or realizes that its surface gasses are being vacuumed into a region where there is nothing visible, and concludes that there *must* be something in that dark region of space that is creating these effects. Since he can't see the alleged invisible entity, he *infers* it indirectly by observing the motions of the visible one. He concludes that it can't be anything else that *he* can imagine and calls this mental exercise a 'proof'. Genzel is in effect saying that he proved the existence of an invisible chair because he can't think of anything else that the mime could be sitting on (*Fig. 4*). Of course, he caters to his peers, individuals who have already been conditioned to believe in the mathematics of black holes and just nod when they are asked to approve his paper for publication.

Fig 4   Relativistic rationale: "We proved the existence of a chair. What else could the mime be sitting on?"

Genzel confuses a proof for an assumption. Genzel starts with an assumption. He *assumes* that there is an object called a black hole despite that he can neither define nor illustrate a black hole. As far as he's concerned a black hole is a 'mathematical object' and this is sufficient for him. He then *theorizes* that this invisible, massive abstraction is triggering stars to revolve in circles or to lose gaseous matter because he has no other explanation for what he observes.

Let's put Genzel's method of 'proving' in another context to underscore his ingenuous and specious reasoning. Genzel watches the curtain waving and proposes that a spirit is the culprit. Genzel cannot illustrate a *spirit* or define the term, yet he claims to have proven its existence by observing its effects on the visible object: the curtain. What else, he asks, could possibly be compelling the curtain to wave? It never crossed his mind that perhaps the air coming through the window is blowing the curtain back and forth. For that matter, we can just as well simulate the motion of stars with angels and claimed to have proven angels (*Fig. 5*). Certainly, the Angel Hypothesis is a stronger candidate than Genzel's Black Hole Hypothesis because we can illustrate a 2D angel and make a sculpture of a 3D angel whereas Genzel will be hard-pressed to draw or make a mockup of a 0D singularity.

A more subtle issue is the reason Genzel introduces the incongruous word *prove* when it is clear that he did no such thing. The word *proof* suggests that whatever has been proven to be true (i.e., the existence of black holes) is forevermore a fact. It can no longer be doubted or challenged, especially when the word is introduced in the course of a scientific debate. The word *proof* tells skeptics that the matter has already been settled and that they just need to catch up on their reading.

The Greek geometers casually used the word *proof* to mean that the conclusions followed logically and inescapably from a set of axioms and premises used as foundations. A proof was a logical consequence that converged upon truth and that no rational person could

deny. The word is still used extensively in Mathematics in the context of theorems.

Genzel extrapolates this ancient mathematical usage of the word *proof* to Physics. He reasons that if we concede the existence of the black hole as an axiom or premise, it inevitably follows that the behavior of stars revolving around nothing or having their gasses ripped by nothing must be due to an invisible mass. Since he cannot imagine what else could be causing such effects, Genzel concludes that we have no choice but to admit that black holes exist. He calls this entire mental exercise a 'proof'.

Fig. 5   Proof that angels exist: two angels moving a star in circles around nothing. In what way is the ad hoc black hole different from invisible spirits?

The first problem with Genzel's reasoning is that he hasn't established the black hole as a valid axiom or premise to begin with. As argued above, the black hole has yet to be defined as either an object or a concept, and there is no object that is 0D or made of 'mass'. Therefore, Genzel will never be able to illustrate a black hole if he introduces it as an object.

But let's concede that black holes exist for the sake of argument and to look at this matter in light most favorable to Genzel. Whether he believes that it is a black hole that is causing the miracle in the night skies boils down to his personal opinion. It means that *he* accepted this theory. Proof is a personal matter of conviction. Many theologians have argued that the theory that God created the Universe has been proven… and then again there are atheists.

The word *proof* has the sole purpose of imposing a theory upon a skeptic on the basis of authority. It has become a weapon that the mathematicians use to silence dissent and win discussions. The intent is to sideline and isolate the dissident by suggesting that he simply needs to come up to speed on an issue that is now closed. It summarily denies the dissident the chance to contest the claim. The mathematician is in effect telling him that the matter has been settled. The word *proof* in effect reduces to nothing more than an argumentative tactic.

If theorists such as Genzel are *inferring* the existence of black holes indirectly by watching what happens to visible objects, the correct language to use is *assumption* or *hypothesis* and not *proof*. Therefore, Genzel's incongruous use of the term *proof* offends intelligence. His runaway enthusiasm for black holes does harm to Science because the casual reader is likely to construe the false claim of their settled existence (which is published in a respectable, peer-reviewed journal) as an intractable law.

V. MASS

A more fundamental issue that needs to be addressed in the context of black holes is the use of the strategic word *mass* as a physical object. In Science, it is irrational to say that a concept such as *information* or *love* had an effect on visible matter. Love can move mountains in ordinary speech and poetry, never in Physics.

Mass is an abstract mathematical concept. Mass has no body, substance, surface, or dimensions. By what physical means does a mathematical concept pull on a star? Can *mass* be compressed into infinite density? Can mass exist in the absence of matter like 'soul' without the body?

It is pertinent at this point to briefly review the major mathematical milestones that culminated in the black hole.

1. 1783 Michell becomes the first to conceptualize the black hole. [34] [35]

2. 1911 Einstein argues that gravity bends light. [36]

3. 1915 Schwarzschild finds a solution to Einstein's equation for a non-rotating spherical mass (i.e., singularity) [37]

4. 1930s Chandrasekhar publishes a series of articles in which he proposes that a star can collapse to a 0D singularity (all mass and no structure). [38]

5. 1963 Kerr discovers a solution to Einstein's field equations that describes a rotating black hole. [39]

6. 1960s Penrose and Hawking popularize black holes through a series of articles and lectures in which they argue that singularities do in fact exist. [40] [41]

7. 1972 Bolton claims to have discovered the first black hole by observing a visible star revolving around nothing. [22]

What the mathematicians have done, in effect, is simulate what would happen to a star that has many times the size of our Sun and morphed their mass into matter. If the Sun is calculated to collapse to a small ball, a much bigger star would conceivably continue shrinking beyond any possible diameter. The star's own 'weight' would end up crushing all its matter out of existence through gravitational compression. The mathematicians extrapolated these calculations into Physics without regard to qualitative considerations. And then again, mass is '*the quantity of matter*'…

VI. PROOF THROUGH EQUATIONS

A mathematician may quip that there are no equations in any of the objections raised so far. They are all conceptual and semantic.

Correct! We have no need of Mathematics to make a case against the existence of black holes any more than we have a need for any equation to challenge the existence of God or of spirits or of the alleged invisible chair the mime sits in. These are all qualitative, not quantitative conceptual issues. Math only has the power to describe, and then only quantitatively. [42] If the black hole is introduced as the main actor in a physical theory the proponent has no choice but to illustrate this object. The audience needs to visualize the entity that is going to perform the actions.

Le Verrier's failed prediction of the planet Vulcan exposes the folly of Mathematical Physics. It shows how powerless Mathematics is in attempting to explain what happens in the barely visible night sky through a set of equations. Energized by his success in the discovery of Neptune, Le Verrier predicted that there was a celestial object near the Sun that was causing Mercury's orbit to shift over the years. [43] The 19th Century astronomers spent decades searching for Vulcan, a phantom 'mass' that was never there. [44] The erratic orbit of Mercury had a different explanation that had no need for 'a mass' to be present. Mass is a quantitative issue. How the Sun physically influences planets from a distance is a qualitative issue.

Likewise, Mathematics is powerless to elucidate the nature of one glaring modern-day celestial curiosity that remains shrouded in mystery: the *black hole – galaxy bulge* ratio. [45] The mathematicians begin their presentation with sweeping claims of fact and knowledge designed to preempt skeptics:

> *"We now* **know** *that essentially all large galaxies have supermassive black holes at their centres."* [46]

If we already 'know' that all galaxies have black holes at their centers, this instantly sidelines any and all skeptics. Asking what a black hole is, how many dimensions it has, or what it is made of will only offend the presenter. Yet, having carved the black hole in stone and quashed all dissent, the mathematician is perplexed that he can't explain why the mass of a black hole at the center of a galaxy is directly proportional to the size of the galaxy, specifically, to its bulge mass (*Fig. 6*). [9]

In contrast, Thread Theory provides (below) a rational, *qualitative* explanation to the *black hole mass – galaxy bulge* phenomenon without the need for equations, magical concepts, or excuses. In this context, 'rational' means that we can make a movie of the theory and the viewer can understand the mechanism by merely watching the film.

Fig. 6   Astronomers cannot explain the direct correlation between black hole mass and the bulge of the host galaxy.
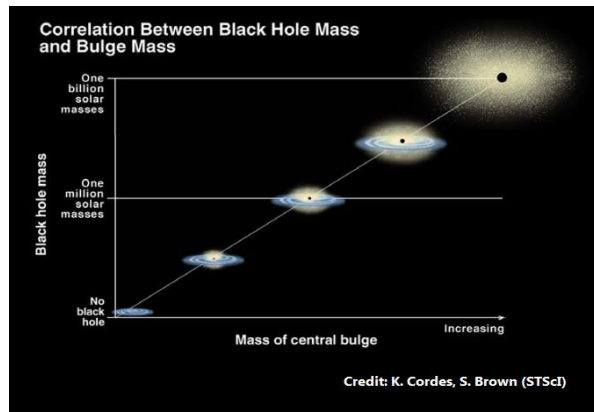
To recap, the main points are…

- The term *black hole* has never been defined. It is used as both a *concept* (region) and an *object* (black ball) at the convenience of the theorist.

- Relativists avoid saying that a black hole has or is made of mass because mass is the quantity of matter and a black hole crushes matter out of existence.

- A black hole has 0, 1, 2, and 3 dimensions, depending one what hole the theorist wishes to plug in his theory.

- Relativists boast that the existence of black holes has been proven. The reality is that they have never seen one. The black hole is an *assumption* they make to simulate their observations. Relativists refer to this assumption as a *proof* to neutralize dissent and because *they* believe in it.

VII.   ALBERT EINSTEIN ON BLACK HOLES

Before continuing, it is pertinent at this point to mention that relativists continue to invoke Albert Einstein's name as a means to lend a measure of authority to black holes. A simple Internet search will show the name of Einstein being credited with predicting and vouching for the existence of black holes. [4][47][48] The logic behind this effort is that if a major intellectual celebrity such as Einstein (touted as the most intelligent man ever) believed in black holes, who would dare challenge his authority?

Actually, Einstein specifically wrote a paper in 1939 arguing that black holes do not and cannot possibly physically exist. Here are some relevant excerpts:

"Of course, these paradoxical results are not represented by anything in physical nature… The essential result of this investigation is a clear understanding as to why the 'Schwarzschild singularities' do not exist in physical reality… The problem quite naturally leads to the question, answered by this paper in the negative, as to whether physical models are capable of exhibiting such a singularity." [49]

Many in the mathematical establishment are well aware that Einstein believed neither in black holes nor in Quantum Mechanics. The jury is still debating whether he believed in gravitational waves [50] and Big Bang. [51][52] It is the general public which is not keenly aware that Einstein denied all of these fantastic explanations throughout his life and especially in his latter days. He wrote:

"I consider it quite possible that physics cannot be based on the field concept, i.e., on continuous structures. In that case, nothing remains of my entire castle in the air, gravitation theory included, [and of] the rest of modern physics." [53]

Einstein's thinking had evolved over the years and he became an atheist in the religion that he founded as well as in Mathematical Physics. His colleagues ended up resenting the man they had once admired so much that they isolated him and treated him like a senile old man:

"I have become an obstinate heretic in the eyes of my colleagues…" (letter to M. Besso, August 8, 1949) [54]

"I am generally regarded as a sort of petrified object, rendered blind and deaf by the years." (letter to M. Born, April 12, 1949) [46]

The mathematical community exacted vengeance against him by making Einstein a reluctant hero of General Relativity. It is thus that contemporary mathematicians attribute every irrational phenomenon invented in relativity including dark matter and dark energy to Einstein. [55][56][57]

The real reason that relativists invoke the unchallengeable brand name 'Einstein' against his will in every article is to compel lay people to believe in the existence of black holes on the basis of his authority. The reasoning is that if Einstein believed in them, who's going to question his wisdom? What more weight than his signature does anyone need to believe in black holes, dark matter, and Big Bang?

Of course, this is no longer science, but politics. Relativists are no longer in the business of attempting to provide rational explanations for celestial phenomena. They

are on a crusade to persuade, convince, convert, and recruit the unsuspecting public using the name *Einstein* on their shields and the holy battle cry *proof* in their mouths.

VIII.   Phenomena attributed to black holes

The two most common phenomena attributed to black holes are:

1. stars orbiting around nothing [22]

2. stars losing gasses to the vacuum. [58][59]

In both cases, the theory consists in making an assumption that an unimaginably large 'mass' is affecting a visible companion.

Again, the implacable Golden Principle of Physics stands as an impenetrable barrier in the way of black hole theories. [42] Physics requires an object. Mass is not an object. Therefore, the word *mass* cannot be used as a mediator in any physical transaction. End of story. It is irrational to propose that "mass attracts gasses" or that "a star is revolving around 'a' mass". The proponent of 'mass' has the obligation to define the term *mass* before he uses it in a sentence. Otherwise, the audience has no chance of following the presentation. If the theorist presents or treats mass as a physical object, he has no alternative but to illustrate this entity. An object is *that which has shape*. Therefore, the presenter has no excuse to avoid illustrating 'mass'. The theorist either illustrates or defines. There's no other choice.

In contrast to General Relativity, the Rope Hypothesis does illustrate the objects and has a more down-to-Earth explanation for phenomena attributed to black holes such as stars revolving in circles around nothing and gasses being siphoned off the skins of stars. We propose that they are caused by the same agent: the galactic magnetic 'field'. We introduce the subject by establishing the physical nature of a *magnetic field*.

IX.   The Rope Model of Light and the Atom

Let's first distinguish between the Quantum and Rope versions of light, the atom, and the magnetic field. It is on these foundations where the different theories have cemented their pillars.
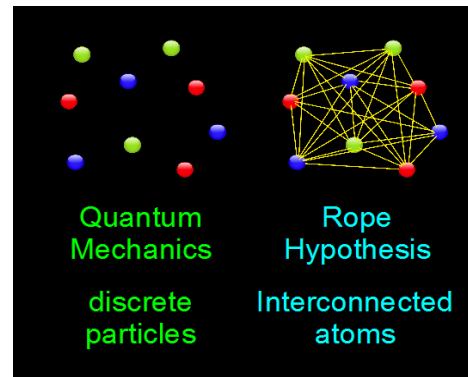
Quantum Mechanics proposes that atoms are discrete, independent entities. Each atom is a unit isolated from all others and floating freely in space like an island. Quantum also proposes that an electron *bead* magically jumps back and forth between 'energy levels', a phenomenon known as *Quantum Leap*. This oscillation is magical because the mathematicians have yet to propose an entity that pulls and pushes on the electron bead. The mathematician tacitly fills the blank with spirits.

In contrast, the Rope Hypothesis proposes that all atoms are interconnected (*Figs. 7* and *8*) via a pair of twined threads. [60][61][62][63] Under the Rope Model, this 'jump' consists of the expansion and contraction of the electron shell. By doing so, the atoms torque the rope (i.e., light).

Fig. 7   Two atoms bound by the EM rope
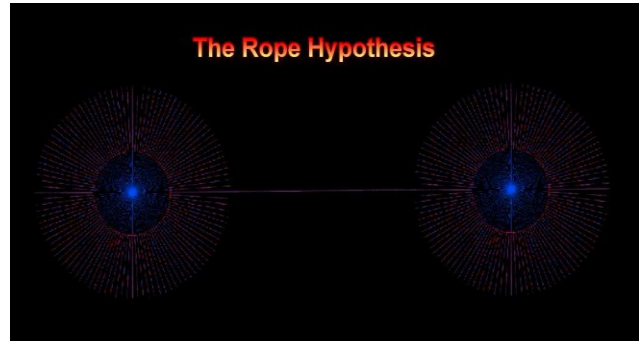
Fig. 8   Quantum discreteness vs. Rope interconnectedness

X.   The Rope Model of magnetic 'field'

Quantum Mechanics proposes that a magnetic field consists of photons, specifically of *virtual photons*, magical 'particles' that pop in from the void and then disappear at the whim of the proponent. [64] The Wikipedia defines a virtual particle as:

> "*a transient fluctuation that exhibits many of the characteristics of an ordinary particle, but that exists for a limited time. The concept of virtual particles arises in perturbation theory of quantum field theory where interactions between ordinary particles are described in terms of exchanges of virtual particles... The term is somewhat loose and vaguely defined, in that it refers to the view that the world is made up of "real*

particles": it is not; rather, "real particles" are better understood to be excitations of the underlying quantum fields. Virtual particles are also excitations of the underlying fields, but are "temporary" in the sense that they appear in calculations of interactions… As such the accuracy and use of virtual particles in calculations is firmly established, but their "reality" or existence is a question of philosophy rather than science." [65]

In other words, since the mathematicians could not provide a rational physical mechanism of attraction they invented a spirit they call 'virtual particle': a particle that appears and disappears at the whim of the theorist. The virtual particle has the exact mass that a mathematician needs for the calculation to come out right and also the magical ability to produce attraction without any intervening mediator (*Fig 9*). Therefore, it is not an exaggeration or offensive to say that a mathematical 'physicist' does 'physics' with *ad hoc* spirits.

Fig. 9   How does the exchange of 'virtual' particles produce attraction between two magnets?

The mathematicians reply that it is a philosophical issue outside the bounds of 'science'. The reasoning behind this claim is that they can't prove the existence of virtual particles through an experiment. Yet they claim to have proven the existence of black holes without experiments or ever having seen one directly.
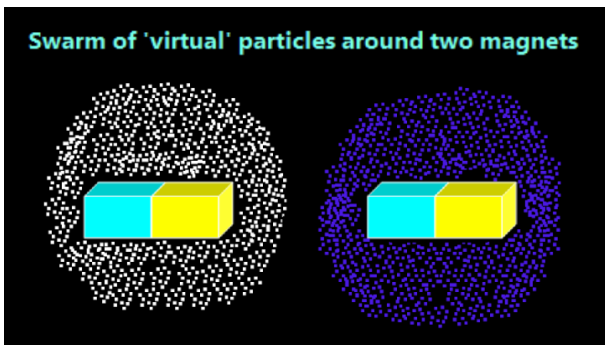
In contrast, the Rope Model proposes that a magnetic 'field' consists of countless threads swinging around rows of aligned atoms (*Fig. 10*). [66] When a row of atoms spins at high speeds, one of the threads of the EM rope binding any two atoms is released and begins to swing round the other. It is these walls of threads (known in Mathematics as *lines of force*) sweeping around their atoms that make up the invisible magnetic 'field' of Mathematics. We now have a *physical* entity with which to explain attraction and repulsion.

XI.   THE ROPE MODEL OF BLACK HOLE PHENOMENA

Mathematical Physics typically depicts a galaxy as a spiral disk devoid of a magnetic field (*Fig. 11A*). The jets sprouting out of the center of a galaxy have been 'proven' (i.e., 'assumed') to be matter released by black holes despite that black holes are supposed to swallow everything in their vicinity and forbid anything to leave their sphere of influence (*Fig. 12*). Hawking explains that the jets are what he calls 'Hawking radiation'. [67] In essence, Hawking proposes that space is made of particles. These space particles are made of particles and anti-particles. You must envision a white ball blending together with a black ball and turning into *no* ball. They both disappear. Conversely, a space particle can spontaneously separate into a white ball and a black ball. In the presence of a black hole, one of the two balls falls into the singularity and the other is free to escape and arrive at your eyes (*Fig. 14*). [68] Mathematical Physics has yet to offer a physical interpretation for why both particles are not sucked in by runaway gravity.

The Rope Hypothesis proposes, on the other hand, that countless threads forming the magnetic 'field' of a galaxy compel a highly 'charged' object such as a star to circle around nothing (*Fig 11B*). The star is usually a large one and therefore has a greater magnetic field. A galaxy's magnetic field is not uniform or symmetric. Some regions experience greater magnetic influence than others. It is in these regions where highly charged stars revolve around nothing like a bead at the end of a car antenna (*Fig. 15*).

We can readily simulate this mechanism here on Earth in our labs. If we place a charged ball in a region where the magnetic field is strong, the ball will circle around nothing perpendicular to the flow of threads comprising the field (*Fig 16*). Thread Theory [60] suggests that the circular motion of a star around absolutely nothing is this same phenomenon on a galactic scale.

Fig. 10   Electric 'current' and magnetic 'field'

Conventional left-hand rule has abstract 'negative charges' (a mathematical concept) 'flowing' along the wire (A).   Under the Rope Model, the physical serpentine spins in situ like a drill bit (B). Consistent with experience, the walls of threads (magnetic field) swing perpendicular to the direction of 'current'.
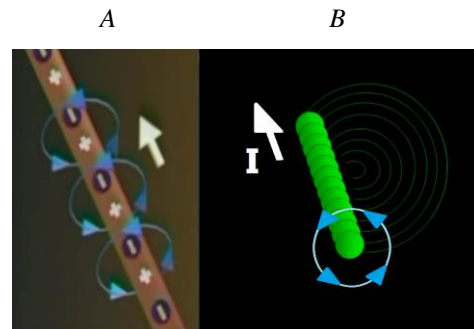

A   B

*Fig. 11   Traditional Galaxy (A) versus
the Rope Model of a galaxy (B).*

The galaxy depicted by Mathematical Physics never shows the invisible magnetic field that sweeps perpendicular to the galactic equator (A). The theorists have erroneously concluded that the geyser-like springs emanating from galaxy centers are jets of matter discharged by black holes (Fig. 12). Under the Rope Model, the galaxy looks more like a carousel (B). The magnetic field is comprised of countless threads sweeping perpendicular to the disk. The alleged 'jets' are simply the region near the center of a galaxy where the threads are squeezing through (Fig. 13)

A   B
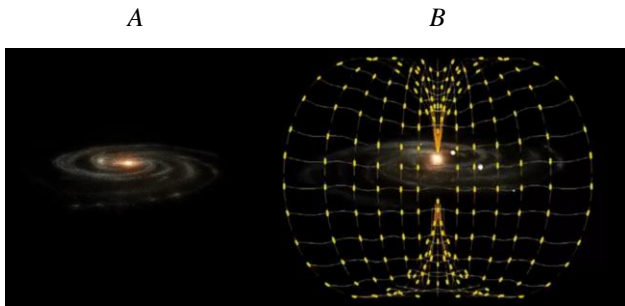
Fig. 12   Galactic 'jets'

Fig. 13   Pattern left by iron filings sprinkled around two wires carrying current in opposite directions. The theorists have mistaken the magnetic field of a galaxy for the 'jets' springing out of an alleged black hole. [66]
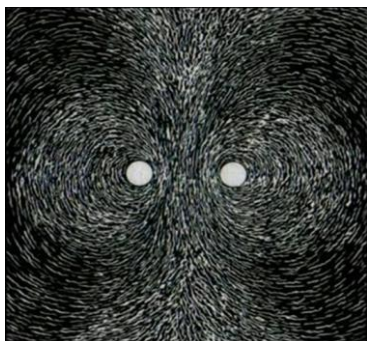

Fig. 14   Hawking radiation

According to Quantum, space is a blend of particles and anti-particles. One of these is attracted by mass. The other escapes at the limit of the black hole: the event horizon. There is still no explanation for why both don't fall down to the singularity. Why does one particle escape runaway gravity near a black hole?
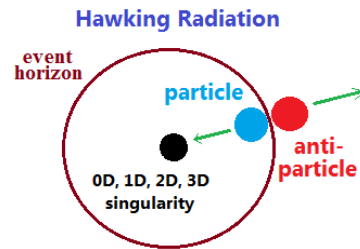

Fig. 15   Galactic field: walls of galactic EM threads sweep upon a star and compel it to circle around nothing.
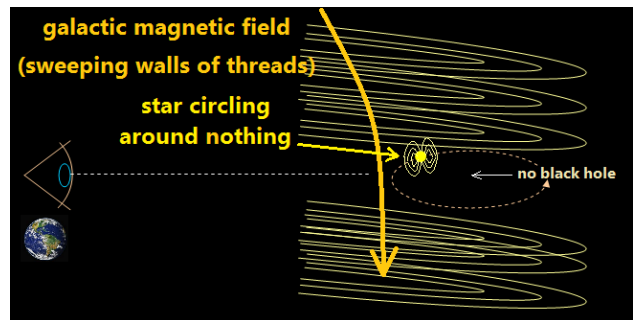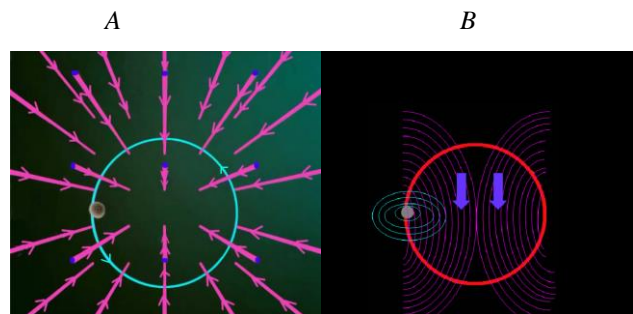

Fig. 16   A. Top view of a 'charged' ball circling around nothing in the presence of a magnetic field (downward flow). B. Under the Rope Hypothesis, the countless walls of threads forming the magnetic field sweeping downwards interact with the countless swinging threads that form the magnetic field of the ball.

A   B

XII.   ACCRETION

Stars have been theorized and observed to lose copious amounts of gaseous material from their surfaces to the nothingness of space in their surroundings (*Fig. 17*). Mathematical Physics proposes that an invisible black hole lurks nearby and is literally eating the star alive through unimaginably strong gravitational processes. [69] [70]

The Rope Hypothesis again comes to the rescue and explains the phenomenon without invoking magic. It is well established in laboratories here on Earth that a rotating magnetic field inhales gasses inwards. The experiment consists of releasing smoke near an oscillating field. The smoke disappears into nothingness as if sucked in by an invisible vacuum cleaner (*Fig. 18*).

The powerful magnetic field of a galaxy not only has the muscle to toy around with a star as if it were a bead at the end of a car antenna, but it also has the authority to strip gasses off the skin of a star. The galactic magnetic field sweeps across a star located in a region of the galaxy where the field is swirling and particularly strong. This rotating field has the potential to siphon off layers of surface gasses from the star. From Earth, the astronomers would see gasses of the beleaguered star dissipating into nothingness.

As a bonus, the Rope Model has a fair chance of explaining the reason for the galactic bulge and why the alleged 'mass' of its center is proportional to the size of a galaxy. The more stars a galaxy has, the greater its size. The galactic magnetic field has no choice but to be stronger because the number of threads is proportional to the number of atoms. This means that more threads will be swooping up (or down) through the center of the galaxy. Any matter in the center of the galaxy – whether stars, gasses, or rocks – will be pushed aside as the volcano-like eruption passes through. This matter will tend to pile up at the edges of the galactic center through which the threads pass.

Fig. 17   Gasses being sucked out of a star

Relativists can't think of a mechanism other than the magical black hole

What they see   *What they put in by hand*
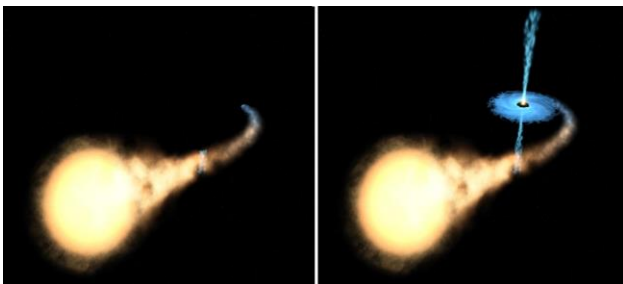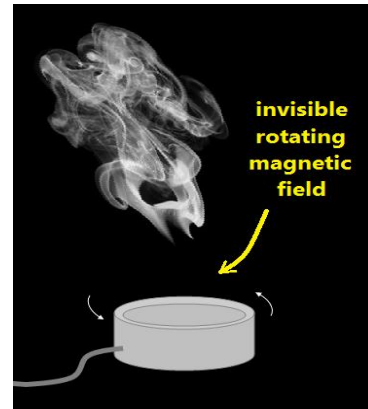

### Fig. 18   Smoke being drawn in by and disappearing into a rotating magnetic field

XIII.   DARK MATTER

Rubin et al. established that the speed of stars in many galaxies increases or remains constant the farther they are from their galactic centers (*Fig. 19*). [71] This contrasts with the workings of the Solar System where planetary speeds decrease steadily with distance (*Fig. 20*). For instance, Mercury (47.36 km/s) travels ten times faster than Pluto (4.67 km/s).

### Fig. 19   Galaxy Rotation Problem

Stars travel faster the farther they are from the galactic center. Newtonian and Einsteinian gravitational equations predict the opposite. It is to account for the galactic rotation problem that the mathematicians invented a variable called 'dark matter'. Dark matter is conveniently invisible and has the weight and location inside the galaxy that allows calculations to match observation.
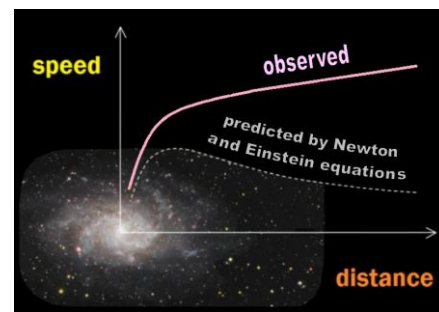
Cosmologists propose that this unpredictable behavior can be accounted for if we *assume* that there is very heavy, invisible 'mass' sprinkled between the stars. [72] [73] The mathematical establishment has designated these exotic particles with the nebulous term 'dark matter'. Actually, a

term that places this theory in a more appropriate perspective is 'dark kilograms'. The theorists are saying, in essence, that it is abstract 'weight' that pulls on stars and compels them to move around swiftly in the outer regions of the galaxy. There is no physical object called *mass*.

Fig. 20   Planetary speeds as a function of distance from the Sun
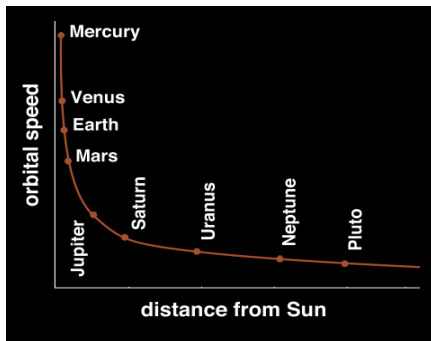
In essence, dark matter is an *ad hoc* variable that the mathematicians invented in a vain attempt to make sense of what the astronomers observe. The mathematicians needed to sprinkle these tailor-made, ultra-heavy 'kilograms' in the exact locations in order to make the calculations match observation. Furthermore, by making them conveniently invisible and undetectable, the astronomers are relieved of the burden of having to find them. It's win-win for everyone.

An alternative mathematical *description* known as MOND proposes that there is no dark matter, but rather that gravity works differently at the galactic scale than what either Newton or Einstein synthesized in their famous equations. [74] What dark matter and MOND actually confirm is that Mathematics is not the language of Physics.

Will astronomers ever see dark matter with their own eyes through a sophisticated telescope? Is invisibility just a matter of state-of-the-art technology or will 'mass' and 'kilograms' remain forever beyond our sense of sight?

As long as the mathematical establishment continues to present its interpretations of visible matter in the guise of proof, truth, and fact, there will never be any pressure or incentive to produce a picture or direct evidence of dark matter. The mathematicians will continue to publish equations that 99% of humanity does not understand and popularizers will continue telling laymen that they must simply trust what Einstein and the Nobel Prize winners have proven on their boards.

XIV.   The Thread Theory version of dark matter

Thread Theory proposes that the galaxy rotation problem has a straightforward explanation. If every atom in our galaxy is interconnected, this means that all stars in our galaxy are also interconnected. We must visualize a galaxy not as a bunch of discrete, disconnected stars, but as an enormous spider web (*Fig. 21*). The countless threads comprising the magnetic field that squeezes through the galactic center and sweeps down its sides as well as the interstitial matter floating between stars – gasses, planets, moons, asteroids – help maintain the integrity of the galaxy.

A galaxy spins like a carousel with the horses on the inside going around just as fast as the buggies on the outside because they all sit on the same platform: a gigantic spider web that binds each to all. This interconnectivity explains why no star is flung out of the system.

Fig. 21   A galaxy is like a spider's web. The reason stars on the outside of a galaxy travel just as fast or faster than stars on the inside and that none of them are flung out of the galaxy is that all stars are physically interconnected by countless EM ropes binding their constituent atoms. Interstellar gasses and other matter, as well as the galactic magnetic field, help maintain the integrity of a galaxy. This is a qualitative issue over which Mathematics has no jurisdiction.
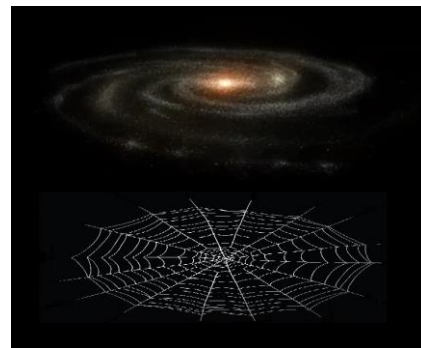
XV.   Conclusions

The mathematical establishment proposes irrational and surrealistic discrete entities to explain the workings of the Universe. Specifically, the mathematicians introduce abstract concepts such as mass, 0D 'point' particles, and the mathematical abstraction known as *space-time* as physical mediators in their dissertations. Predictably, the theorists were compelled to invent ever more undetectable, yet conveniently invisible, ultra-heavy objects such as black holes and dark matter to cover more holes in their cosmic gravitational theories. It should not surprise anyone, therefore, that mathematical physicists cannot illustrate any of their proposed celestial agents or find them in the night sky. The theorists are will find it rather difficult to illustrate mathematical concepts. The mathematical *concepts* known as black hole and dark matter will forever remain invisible

to the lay public. The only way to 'see' them, the official version argues, is by taking a high-level brainwashing course at the university.

The *ad hoc* mathematical spirits invented by mathematical physicists can no longer be challenged in 'respectable peer reviewed journals' because the mathematicians are the secret peer reviewers of those journals and they have agreed and decreed that the matter is now closed. The only alternative left to freshmen is to memorize the catechism if they want to graduate. Yet we have just shown that the term black hole has never been defined, let alone proven. The mathematicians have no idea what a black hole is and do not agree on something as basic as whether it is a physical object or an abstract mathematical concept.

In contrast, the Rope Hypothesis proposes that all matter is physically interconnected. The medium that underlies light and gravity is the EM rope. This model does not rely on magic to explain how the Universe works nor does it fall back on excuses to justify why it can't. We can make a movie of the mechanism and the audience can objectively determine whether it makes sense by merely watching the film.

The Rope Hypothesis destigmatizes the amusing explanations proposed by both Quantum Mechanics and General Relativity. Unlike Quantum and Relativity, the Rope Model can be illustrated and the mechanisms proposed by Thread Theory can be set in motion on the screen or in the lab for everyone to see. And unlike Quantum and Relativity, the Rope Model does not rely on magic or surrealism because it does not reify concepts into objects and then ask the audience to make believe that the abstraction is moving.

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"The electromagnetic interaction is mediated by the constant exchange of photons from one charged object to another… electric and magnetic fields are made of the same "stuff" (photons)… Some electromagnetic interactions involve "real" photons with definite frequencies, energies, and momenta. Electrostatic and magnetic fields involve the exchange of "virtual" photons instead… you're thinking there's some other ingredient, besides photons. There isn't… I have no idea still what a magnetic field is, except for some of the things it does."

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