Quasars and Mini-Quasars

by Clark M. Thomas

Artist's rendering of ULAS J1120+0641, a very distant quasar powered by a black hole with a mass two billion times that of the Sun.[1]
Credit: ESO/M. Kornmesser

SUMMARY

Red-shifted *quasars* from our early visible universe are important for the Big Bang scientific paradigm. *Mini-quasars*, as recorded by Halton Arp, are important for the Steady State scientific paradigm. Something has to give, or does it? This essay explores how to have both models in harmony.

My discussion includes (on pages 8-9) a proper explanation for quantum entanglement's "spooky action at a distance."

[1] https://en.wikipedia.org/wiki/ULAS_J1120%2B0641

TERMS DEFINED

What is a *quasar*, and what is a *mini-quasar*?

A classical big-bang *quasar*[2] is visually a quasi-stellar object. It is associated with a very active galactic core, probably a black hole, in an early period of our visible universe. Typically it is more brilliant than its host galaxy, and its red-shifted beam of light reaches Earth billions of light years after it was formed. These distant, star-like beacons are now extinguished in today's Earth time frame – but due to the less-than-infinite speed of photons, our telescopes can "look back" into time to detect these early objects. (My retina has directly received quasar photons, using my Dobsonian telescope, from a point-like quasar that is by its Hubble red shift apparently a half-billion years older than the Sun and its family of planets.)

A *mini quasar* may form in the same way as a big-bang quasar, but likely on a smaller, more local scale. The steady state model places these visible objects much closer in space and time to our galaxy. They may not appear as a dim point of light. The famous astronomer and astrophysicist, Halton Arp[3], amassed some impressive data supporting the local quasar model, which we will discuss below. He was ostracized by the majority big-bang cosmologists who control access to giant telescopes, prestigious journals, and press releases[4]. Arp passed in 2013, and we can only access his work historically in scientific essays and videos. Halton Arp did not use the term "mini-quasars," because he considered all quasars to include what I describe as mini-quasars.

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[2] https://en.wikipedia.org/wiki/Quasar

[3] http://www.haltonarp.com

[4] http://www.haltonarp.com/articles/rebuttals

ELEMENTS OF THE CORRECT PARADIGM

If you are not yet familiar with my model of physical reality, here are some basic elements for understanding what follows[5]:

OVERALL PERSPECTIVE:

I am basically a modern Newtonian particle theorist, as was the early Einstein. Even where the historical Newton could not understand gravity, except within medieval alchemy, he had the genius to measure the unknown gravitational force within the physical frame he knew. The 1915 Einstein of General Relativity was able to formulate some "verifiable" algorithms for gravity which describe gravitation in limited cases, without understanding at all how the force comes about[6].

The push particles to which I refer are not duplicates of the ancient Greek idea of atoms, as developed (but likely not originated) by Democritus[7]. He logically deduced the existence of primary particles moving in space (the void) more than two thousand years ago, in an era where astrology was the accepted model for astrophysics. Much in science as changed over two millennia – and indeed much in science has changed in the full century since Einstein developed his Special and General relativities.

Parmenides and Plato were in contrast to the particle theorists. These idealistic thinkers liked to see the real world as pure, not messy. Parmenides even denied motion. His follower, Zeno of Elea[8], proposed a *Paradox of the Arrow* to explain how no-motion and motion are two aspects of the same thing. Plato's *Republic*

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[5] http://astronomy-links.net/Gravities,BlackHoles,BigBangs.pdf

[6] http://astronomy-links.net/GGvsGR.html

[7] http://www.iep.utm.edu/democrit/

[8] https://en.wikipedia.org/wiki/Zeno_of_Elea

spoke of ideal celestial forms. Such forms were more real to Plato than the best human efforts to duplicate these forms.

Out of this idealistic tradition we see a long line of sincere philosophers and mathematicians who have been eager to express the superiority of their algorithms over messy observed phenomena. String theorists have been the worst offenders of late, but others such as Hawking[9] have been just as bad.

(2) A 21st CENTURY MODEL OF PRIMAL "ATOMS":

Atoms in the Copenhagen model basically do exist, along with a zoo of measurable components, such as electrons, protons, neutrons, and quarks. The problem is that what people today call atoms, and even their known components, are not primal atoms in the Greek materialistic sense of primary particles. Today's atoms are much larger, derivative, matter/energy entities.

Atoms are mostly empty realms of strong and weak forces. A hydrogen atomic core would be like a marble inside a stadium. If an atom is at 10^-14 meters, and its nuclear core is at 10^-15 meters – and if its nuclear quarks are at 10^-18 meters, and their gluons and neutrinos down to slightly smaller than 10^-24 meters … that still doesn't get us anywhere near the level of the real primal "atoms." In other words, what we have thought of as fundamental particles, are actually composite secondary particles.

Quantum theory speaks of the Planck limit around 10^-35 meters, where random (quantum) physics takes over from classical physics. That idea points to the possibility of "stuff" much smaller than what we can experimentally measure and verify. The entire progression of experimental science is built on verifiability of hypotheses; but Democritus did amazingly well with his unverifiable version of scientific logic. The tiny size of 21st century true "atoms" presents all sorts of verifiability issues,

[9] http://astronomy-links.net/Holograms.html

especially when the *Yin/Yang particles*[10] model is logical and scientifically elegant, and when it coherently fills gaping holes in the partially verified Standard Model.

Individual *Y/Y particles* are in the realm of 10^-39 meters. If a single Y/Y particle were magnified to the size of a house, it could exist within an equally magnified single atom about the size of our visible universe! Very strange, and possibly very true. There is no materialistic scientific theory that conclusively refutes, or can refute, this coherent possibility. This model of dynamic and fundamental Y/Y energy/matter particles follows and coherently extends the Standard Model of particle physics.

Y/Y particles are Yin (matter) and Yang (energy) co-existing and interpenetrating. Being so small, and often contained within their own spheres, their transition from matter to energy, and back again, happens virtually instantaneously. These transitions can be partial or seemingly total. These transitional events occur not randomly, but following the real laws of physics. At this level push/shadow gravity does not determine all that happens.

Y/Y particle strings can adhere to other Y/Y particles structured in looping gravitons with what I now refer to as an expression of the Strong Force. Linear strings of various lengths can express both the Strong Force and Electromagnetism (EM).

Strings of Y/Y particles join, or assemble, at looping *gravitons*[11]*,* themselves composed of Y/Y particles. The proximal Y/Y particle of a linear string attaches to a graviton's proximal Y/Y particle with the strong force; and the Y/Y particles in each graviton join each other with the Strong Force. However, independent strings can express EM polarity, or not, depending on the occasion.

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[10] http://astronomy-links.net/quantumgravity.html

[11] http://astronomy-links.net/Graviton%20mass.pdf

New strings can begin with one Y/Y particle attaching to an available spot on the host graviton. Along comes other Y/Y particles in the quantum soup, which can attach either to an open graviton particle, or to the incipient string particle. It is likely that numbers of Y/Y particles strung together experience adhesive force multiplication, as when batteries are strung together to amplify EM voltage in discrete units.

[My earlier essays refer to Y/Y particle *Strong Force* attachment as "Primary EM," and standard EM attachment as "Secondary EM." I have since realigned my particle vocabulary toward the Standard Model's.]

Individual Y/Y particle strings come in different lengths, making for different wave frequencies as they move. Shorter strings are less massive and therefore stronger as a unit, resisting with less inertial mass the host graviton's vibration until a sufficiently high energy frequency launches them. Liberated shorter strings can join with other Y/Y particles – and as string length increases, frequency reduces, leading to less kinetic energy and more manifest matter. In all cases total energy and matter are conserved. At sufficient scale, this is the transformational path from energy beams to new galaxies.

Graviton hosts can be excited by microwaves and lasers. The more energy they absorb, the faster they vibrate. There comes a point where attached individual strings break off and fly away AT "c" LIGHT SPEED:

- *Each exiting string of linear Y/Y particles first stretches[12] through discrete deformation of the individual connected spheres, then snaps free at "c" …*

[12] http://astronomy-links.net/zenoandsufis.html

- *The time from detachment to terminal acceleration as the spheres regain their sphericality is the "t" in photon acceleration.* This detachment process itself sends each new string away at what we call light speed. Detachment light speed "c" is a discrete escape constant, which fooled Einstein into thinking that "c" is a cosmic constant.

- On the other hand, strings can attach much more slowly at any time only to other strings, to strings attached to gravitons, and directly to gravitons. Transfer of energy happens with the push phase of gravity. Importantly, not every gravitational collision results in new string-graviton attachments, but all collisions result in transfers of energy.

In other words: Each Y/Y particle within the host looping graviton has two strong force connections. Each proximal Y/Y particle in each attached linear string also has two connections. The proximal particle is joined once to the host graviton particle, which is literally a relatively weak link. At discrete given energy levels, particle strings break off from (or adhere to) gravitons, depending on the graviton's vibration frequency. Short strings with less total inertial mass can hang on longer with higher frequency gravitons. As free entities, Y/Y particle strings can express both the strong force and the weak force.

Because there is no practical limit for the length of any string, there is nothing stopping linear strings from exercising the *Weak Force* within atoms, holding electrons in their orbits. Short strings (as gluons) exercise the *Strong Force* that holds nucleons together. Indeed, the majority of the "mass" in nucleons is kinetic energy/matter.

As for the *Weak Force*, it is contained within EM, though it appears separate because of great scale differences. *Push/*

shadow gravity itself typically does not dominate at the Y/Y level, even while present. Strong and EM forces can be mathematically expressed as Newton expressed gravity, with Coulomb's inverse-square law[13].

(3) THE PROBLEM WITH "SPOOKY ACTION AT A DISTANCE":

Einstein's spooky action at a distance can be explained by hyperluminal force transmissions between and among juxtaposed Y/Y particles. Since there is no space between attached Y/Y particles, and since Y/Y particles have very small, but positive, dimensionality – it is possible for *information energy,* such as spin changes, to give us spooky action at a distance in limited cases. Even though Y/Y particles are extremely small, they are not Euclidean points. This information transfer process can be much faster than "c," because we are not talking about a stretching phase, a snapping free, and a reforming phase – just proximal transfer of energy between juxtaposed particles. You can call that entanglement, if you wish.

The most recent experiment confirming this spooky "quantum phenomenon" only goes 1.3 kilometers ALONG A PRE-SET INFORMATION PATH[14,15]. It would be interesting as a thought experiment to go fully "quantum foam," by next hypothesizing and verifying spooky action at any distance within our universe, and without a guiding experimental path.

I remain skeptical about such a general proof, especially because push/shadow gravity fully explains many phenomena over great distances. Also, for any electron to entangle with *any* other *anywhere*, that emanating electron would need to connect with *all* other electrons *everywhere*. If universal entanglement

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[13] https://en.wikipedia.org/wiki/Coulomb%27s_law

[14] http://www.nature.com/nature/journal/v526/n7575/full/nature15759.html

[15] http://time.com/4083823/einstein-entanglement-quantum/?xid=homepage

and feedback were so, the universe itself would become a monolithic "god brain."

Even though each human brain is a sublime example of dialectical information interconnectivity – it is way too slow, local, and hard-wired to be a congruent, small-scale model for vast intergalactic quantum information phenomena.

For every Y/Y particle in the universe to directly and thus instantaneously connect/entangle with every other Y/Y particle, the idea of quantum entanglement information exchange without motion would have to be entertained. In this case, there would be no space, just quantum stuff crammed together. I find such a monolithic model at large scales highly problematic. Space is real, but general spooky action at a great distance in all directions is manifestly not real.

(4) PUSH/SHADOW GRAVITY AND THE MULTIVERSE:

I have explained elsewhere how gravity does not flow along imagined 2D gravitational membranes called branes. Nor does gravity act as a tractor beam between adjacent and parallel branes, with many such dimensions as string theorists imagine. This silly mess pollutes General Relativity[16].

The 1905 model of Special Relativity did not please Einstein himself as he got older. He actually became more relativistic in 1952, suggesting that there are a host of local frames of reference. Of course, each accelerating photon has its own local reference, and that's why "c" exists. Or, as Newton said: *F=m(a)*. Einstein almost got Special Relativity right, finally. He should have developed that superior 1952 model to bring a "frame of reference" to each Y/Y particle, or to a collection of such particles, as in a plasma beam.

[16] http://astronomy-links.net/ethers.html

The idea of a special relativistic frame of reference is just another way of expressing *E=mc^2/t*, where *t* is the time it takes for the available energy to accelerate the relative mass toward *c*, which is the "terminal" speed of light.

It is easy to misunderstand what is going on with acceleration, where *F=m(a)*, and where gravity and ordinary acceleration can be equivalent. The Y/Y model easily explains the elastically propelling force of acceleration as a Y/Y string leaves its graviton base. That is what "acceleration to c" is all about, NOT some mystical cosmic speed limit.

The idea of *push/shadow gravity* originated with Nicholas Fatio, a friend of Newton. It was further developed by Georges LeSage in 1748. It wasn't until the late 19th century that LeSage's hard hyperluminal corpuscles were shown to be improperly described. I have modified and upgraded his push/shadow concept to answer those critical objections, and have thereby restored the general model of push/shadow gravity to viability[17].

Even though LeSage in the 18th century did not feature a *multiverse* (a Universe of interpenetrating universes), recent cosmological theory is starting to point toward that model. Surely, the idea of vast numbers of push particles coming equally from all directions works best with a vast Universe that precedes and supersedes the universe we know.

In relativity (not Einstein's Relativity) there is a *primary reference frame* when seen omnisciently from outside the multiverse. That super frame is not a sheet or sheets, but rather more like an immense, possibly infinite, "sphere" containing interpenetrating sub-universal big-bang spheres, almost like bubbles in a bubble bath. Within that primary multiversal frame are *vast numbers of local frames* of reference. My 21st century model is much grander than Newton's 17th century local frame where gravity seems to work instantly. The multiverse primary

[17] http://www.haltonarp.com/articles/the_observational_impetus_for_le_sage_gravity

frame of reference embraces many billions of light years – yet all these frames constitute a constant when seen from omniscience. Both Zeno and Democritus would agree with this conclusion.

The primary consequence of such a model is that near spaces are essentially Euclidean, even with some time delay – and the great distances within our visible universe are nearly flat and linear, not curving inward or outward. This flatness is so from point A to point B, even though we live locally in a big-bang bubble. Thus, push/shadow gravity works in a linear fashion among local universes, from all directions equally.

The vectors of photons and other flying particles can be bent by dense concentrations of mass, such as galaxy groups or clumps of dark matter – but this does not negate the general idea of push/shadow gravity. Such bending behavior is indeed a clear signature of how real push/shadow gravity works. We don't need to concoct gravitational flying carpets.

Seen properly, this modern push/shadow model is just as elegant as that of brane-dependent General Relativity, and much more real. Newton's math described astrophysical dimensions that he did not clearly understand. Einstein's field equations helped us conceptually move beyond Newton's tidy 17th century world into a four-dimensional reality. Their combined maths help us in proper context – up to multiversal push/shadow gravity, and down to aspects of the primary Y/Y dimension. In other words, their formulas reflect aspects of very different perceived realities.

QUASARS

Quasars appear to us as quasi-stellar beams received from much earlier times in the visible universe. Most are like very dim stars from far away. Quasars, because of their red shifted spectra within the idea of accelerating universal expansion, help us define how far away in space/time each quasar is from us. Interestingly, every very distant quasar we record is already

extinct from an infinite speed perspective. It is the "slow" speed of light over immense distances that allows us to capture a stream of photons from earlier eras.

These beams are the subject of much investigation, but the current theory sees them as an extremely strong plasma stream focused by magnetic fields around the originating galactic core, which majority opinion says is a black hole and its event horizon[18]. Just outside the event horizon of these ancient galaxies is the "photon sphere," where matter that hasn't been brought inside the event horizon gets highly agitated. Some of that energy can escape the galaxy as a magnetically focused beam[19].

For such a beam to survive over great distances, it must have laser-like qualities. Normal flashlight beams scatter, but laser beams can go for great distances, if properly focused. Of course, if a quasar light source is sufficiently brilliant, then it can go out in all directions, and still be detected at distance. That may be the case with many early quasars, as they typically are more brilliant than their host galaxies.

There is a question of light absorption, which is an increasing probability over time and distance. For example, normal galactic space dust forms a "great rift" in the visible Milky Way in the area of Cygnus. Telescopes show that many other galaxies and galaxy clusters exhibit the absorption of light by ordinary dark matter, but not by DARK Matter. One of the characteristics of Dark Matter is its transparency to light, even while it can affect the trajectory of light through the effects of push/shadow gravity. Light passing through Dark Matter can bend gravitationally, and it can change frequency toward the red.

This red shift is problematical, because that would indicate that the quasar appears to be more distant than it really is. On the

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[18] http://astronomy-links.net/BlackDark.html

[19] http://www.sciencemag.org/content/348/6232/311.abstract

other hand, it is possible that the right kind of low-mass photon beam could penetrate a Dark Matter cloud unscathed. Such different types of plasma flows are subject to experimental verification, which will be possible fairly soon.

I suspect that the differences between nearby mini-quasars and distant quasars, with similar red shifts, may reflect the different types of galaxies from which they emerge. It may be that early-universe galaxies, composed of lighter elements, would generate different types of plasma beams than those emanating from later-generation galaxies with many heavier elements.

MINI-QUASARS

Halton Arp is famous for discovering what appear to be nearby quasars emanating from easily visible galaxies. His catalogue of irregular galaxies has several with nearby quasars, including a number of satellite galaxies nearby, often joined to their parental irregular galaxy by detectable plasma streams. These associated quasars exhibit red shifts befitting quasars much more distant.[20]

There have been attempts to discredit his documented findings, which he links to a steady state universe. Primarily, it has been claimed that the small satellite quasars/galaxies are not local, but background distant quasars. Arp's more recent data sources disprove many of these objections, and so his data serves as a corrective to the general expansion thesis.

His reward was ostracism from the general cosmological community. Fortunately, he has left a treasure of data, and one or more videos, following his passing in 2013.

[20] http://www.haltonarp.com/articles/from_high_redshift_galaxies_to_the_blue_pacific

SYNTHESIS

What do we make of this dispute? My guess is that both sides can enjoy the candy. Astronomy is like a buffet of stars, and people can pick and choose what they want to enjoy.

A synthesis of differing data leads to exciting opportunities for radio telescopes over the next two decades. The great optical telescopes going online in the 2020s and 2030s should play an important synergistic role with the arrays of radio dishes. Newer and better satellites will capture more photon frequencies that are filtered by Earth's atmosphere. Unlike the problem with trying to directly detect individual Y/Y particles – astronomers can enjoy the puzzles quasars and mini-quasars composed of streams of Y/Y particles present.

For now, let us consider how and why a plasma beam from a nearby galaxy could produce a satellite galaxy – whereas a plasma beam from an early-universe galaxy might produce something that does not soon or always turn into communities of sparkling baryonic matter.

One idea from Peter Jackson[21] regarding the production of nearby satellite galaxies involves increasingly large helical waves, whereby plasma flows start with high frequencies, and then degenerate into lower photon frequencies. Because of the conservation of energy and matter, the loss of kinetic frequency energy converts regular photons into an equal increase in potential energy matter. That new matter can organize itself into satellite galaxies.

My guess is that satellite galaxies form after local plasma beams encounter dense areas of Dark Matter[22]. Initially, they may encounter some less dense Dark Matter within the bulge and

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[21] http://youtu.be/KPsCp_S4cUs

[22] http://astronomy-links.net/spiral.galaxy.arms.pdf

disk. However, these beams are far too intense to be stopped within the galaxy plane, though their frequency could begin to red shift.

When a partially attenuated quasar beam next encounters a nearby extragalactic Dark Matter cloud of sufficient size and density – gravitational interactions between accumulating Y/Y particles in the weaker beam and Y/Y particles in the Dark cloud produce new star fields we recognize as satellite galaxies.

In other words, energy transforms into matter, and with the shadow force of Dark Matter's gravitational influence, that matter transforms into new energy in the form of new stars. We can envision this process as a cosmic Yin-Yang mandala wheel, whereby creation and destruction are aspects of one continuum.

As for the truly distant quasars from ancient era, they are likely very different phenomena. They come from different type host galaxies more closely allied to their Big Bang origins. These early quasars could either be plasma beams, or omnidirectional explosions, as seen from our frame of reference. (Unto itself, a quasar could have both a beam and an omnidirectional glow, as illustrated by the visual at the top of this essay.) Each discrete type of quasar has its own physics. For ancient light to reach us with a red shift satisfying the Hubble theory, there must be a minimal amount of blocking or distorting dark and/or Dark matter.

If what we are viewing with today's telescopes are beams, then it must be that ancient quasars are much more common than what we detect. Even allowing for some spreading of each coherent, laser-like plasma beam over great time and distance, there must be over a hundred times as many quasars out there in our visible universe, only detectable from different directions.

On the other hand, we can detect many of the local mini-quasars and their resultant satellite galaxies. Their population makes it seem that quasars in general are more local, not distant.

However, simply comparing numbers of visible local quasars to numbers of distant quasars can lead to erroneous conclusions.

Bottom Line: Both quasars and mini-quasars are evident and abundant. There are vastly more truly distant quasars than we can detect. Likewise, there are vastly more mini-quasars than anybody elsewhere in the visible universe can detect beyond their local galaxies. Overall, local mini-quasars in our universe should greatly outnumber the massive primeval quasars.

STEADY STATE OR EXPANDING UNIVERSE?

Lower case relativity allows for all possible perspectives on that which is. By definition it all is correct, because it can never be self-contradicting, and in fact is omnipresent. Let us back off from pure relativity, which we can never attain or understand. Let us consider the best that we humans can perceive from our own frames of reference. From there we can launch coherent laboratory experiments AND elegant thought experiments to test the limits of what may be. Ultimately, this multi-verifiability is where science is heading.

From the omniscient perspective, all that is simply is. There is no relativity, as all that exists is One, both energy and matter. The summation of all forms of Y/Y energy and matter equals the physical universe of universes[23,24].

The idea of a multiverse is more logical and sensible than the vain idea that our local big bang bubble is all that is[25]. From that total perspective there are many sub-perspectives, depending on each observer and his/her inertial frame of reference. The totality of all movement is no movement when seen from omniscience.

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[23] http://astronomy-links.net/InfiniteSpace.html

[24] http://astronomy-links.net/universebeyondmultiverse.htm

[25] http://astronomy-links.net/Universe.universes.pdf

Unity within diversity is a paradox when seen from one local perspective.

In a stable multiverse framework, the local big bangs come and go. Imagine the multiverse as like a cosmic bath tub, and local universes are bubbles that come and go within the same tub. Our own universe can be expanding from a historical big bang – and still many parts of our universe can co-exist as steady remnants from earlier universes. Ancient elements of local galaxies can include pre-Big-Bang red dwarfs, some globular clusters, or even Dark Matter from universes in the same space preceding our local bubble[26,27].

Always and everywhere interpenetrating, multiverse push/shadow Y/Y particles come and go as a steady constant. Nearly all penetrate our bodies like phantoms by the trillions every second, but some of them perform the magic of push/shadow gravity.

Trees appear to us as stuck in the dirt[28]. Come back to a forest thirty years later, and you might not recognize many of the trees. On a smaller scale, flies live an entire lifetime in just a few days, but we last many decades. Does the fly experience anything less of a total life than we do?

Quasars and mini-quasars are visible expressions of invisible Yin and Yang. Understanding the life histories of quasars helps us more deeply appreciate the world we enjoy[29].

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[26] http://www.livescience.com/38533-photons-may-emit-faster-than-light-particles.html

[27] http://astronomy-links.net/whatisdarkmatter.htm

[28] http://astronomy-links.net/speedoflife.html

[29] http://astronomy-links.net/zenastronomy.htm