# Observations and Transformations in HST Imagery of Galactic Dynamics

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**The Alpha Institute for Advanced Study - AIAS.US**, has established through regular, computer checked, algebraic mathematics, geometry, observation and experiment, that the orbits of masses leaving the core area of spiral galaxies will develop hyperbolic spiral orbit and an increasing radius to the central core mass, of such outwardly spiralling track.

**Fig. 1. M51 - The "Whirlpool" Galaxy in Wide Field view**

This has been possible by including the major parameter T in all relative calculations and cosmological observations, that of Torsion. This parameter, when re-introduced correctly and primarily, is the physical spin dynamic which had been causing enough confusion for mainstream observers to discount it in favour of other, untraceable models which hitherto, were used to describe galactic dynamics in great and obfuscated complexity, and by such models of no discernable registration in Nature.

Massive, stellar bodies in space are spinning and orbiting just as electrons and atoms spin, orbit and are orbited. If torsion is a reaction of spacetime to the spinning mass within it, and that galactic systems have been present for billions of years then Descartes was, most definitely on the right lines! Billions of years of spinning in a reactive spacetime of only partly quantified densities - space being infinitely more than a nothingness that is of no substance or charges - will and has created in spiral as other galaxies, a field of spacetime spin that:

a) Will create a rotating plane about the central mass of the galactic core which will be effective for many magnitudes of the diameter of a visibly distinct, spiral galaxy;

b) May present this plane as an almost 2D disc - a 3D disc of minimal thickness [excepting some galactic core centres which bulge and approach the spherical] and of a virtual containment, that rotates in the same direction as the spinning core and, as defined by the orbit path of visible masses within the rotating plane may inculcate the analogous image of a whirlpool;

c) Can also present as a virtual, spinning "island" in spacetime where the perimeter is indistinct but where the plane and core are as good as equal by rotational velocity. The surface tension and spinning of water on Earth can gather flotsam and jetsam to spin as one whole island of individual items - plastics, wood and vegetation et cetera, caught spinning as one in the weirs, whirlpools and watercourses of our inland waterways. This may be a reasonable, pictorial analogy so long as it is a "snapshot" analogy or "freeze frame". The analogy fails in motion since galactic matter is moving within and about its 2D, rotating "island" plane but *away* from the centre, *not* towards it.

**Fig 2. M51 in fuller view**

The "whirlpool" image is apposite in the envisaged quality of a higher ratio of revolutions at the centre, versus less revolutions with radial increase. This would apply to orbiting masses of *constant* orbital velocity despite the illusionary image that near-core matter appears to travel faster. Outer, orbiting masses appear slower but are "covering the same ground" as the inner orbiting masses.

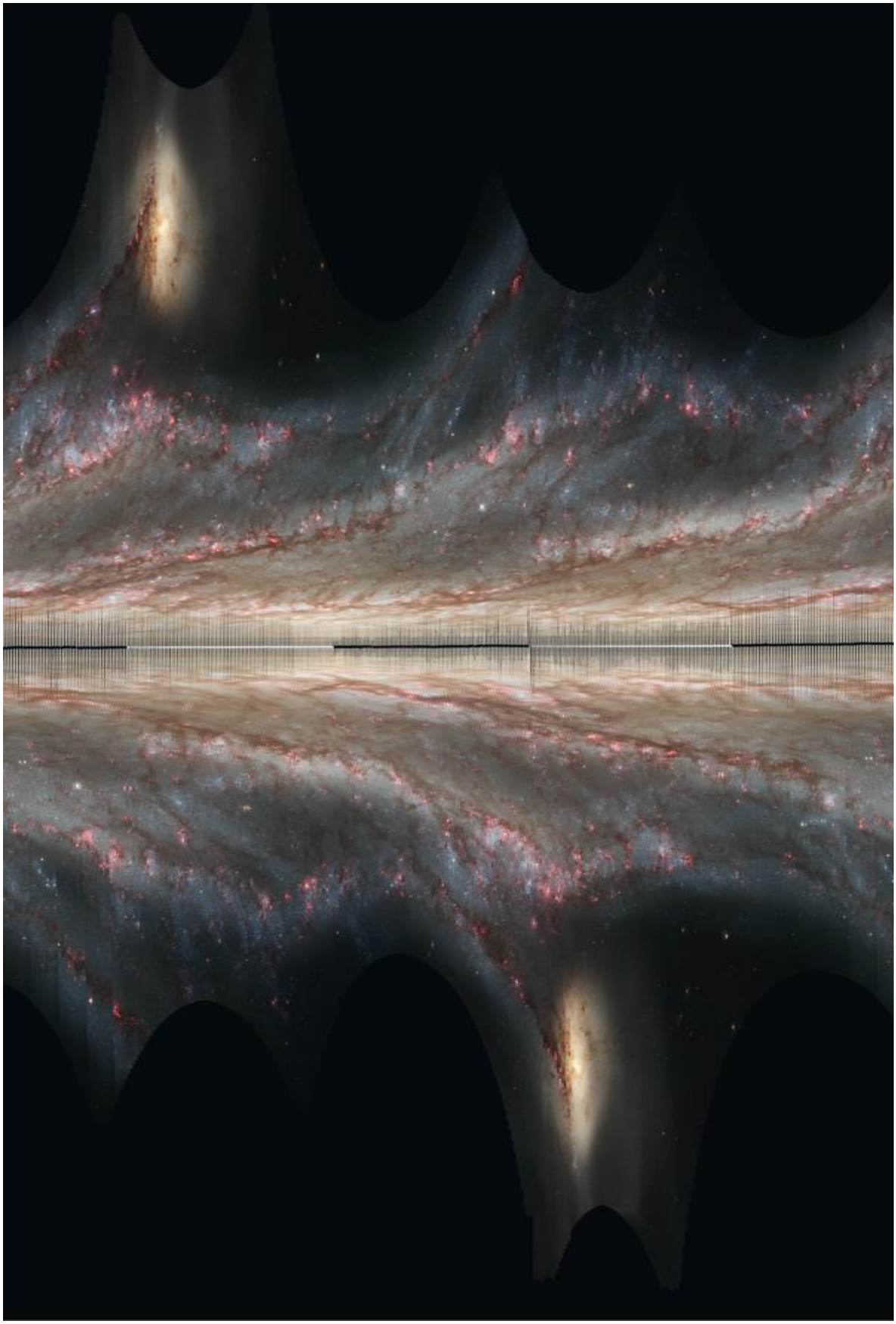

**Fig 3. M51 as a Composite Transformation - without core detail.**

Describing torsion successfully in the physical world of Cosmology leads to the familiar, hind sighted conclusion that this [torsion] now states the obvious. Despite the creation of a seemingly complex dynamic, torsion like other, previous omissions and reinstatements in Physics, gives clear explanation when it is emplaced, truly understood and calculated correctly. If the concept of this parameter is NOT properly understood, then all or very many visible, galactic dynamics will more often appear to be counter intuitive to the uninitiated observer, thereby promoting in some, an inclination towards the mystical or magical by way of alternative explanation and that, judged by the overly long existence of such failed models of fantasy offered by the 20th century, "standard model" era.

It is a mistake to believe that Torsion can be seen by resultant activity alone. We have a similar difficulty on Earth in that is not so easy for some to envisage; that the surface of our planet is travelling at around 1000 miles per hour [equatorially] as it rotates about its polar axis. We see scudding clouds or clear blue skies or slow, billowing clouds and a variety of apparently static atmospheres. We are actually looking at weather systems that are operating within the spinning field of Torsion. Without Torsion, we'd see clouds and/or atmospheres jet by at up to or around 1000 mph and apparently opposing our planets rotational direction - assuming we observers could be bolted down! The space around us is spinning with us as if we were centred in a stirred and massive cup of coffee. The massive coffee is invisible! Nevertheless and obviously, this spinning torsion effect is tiny in comparison to galactic torsion which reaches outward from galactic centres to span tens and thousands and even millions of light years distance. Torsion indicates that any body of mass when caused to spin in spacetime will create an empathetic spinning of the surrounding spacetime.

**Fig 4. Central Development of The Whirlpool Galaxy M51**

From space, it becomes clear that the weather systems are actually spinning with the planet and so it can be further detected that the many layers above the Earth are also spinning as if "clinging" to the central, spinning mass - Planet Earth. This is Torsion at a simpler level and in tandem with gravity. Gravity is on the rear saddle!

It is true to say that gravity by nature will keep your feet on the ground but it's also true to say that a 1000 mph wind would blow you away! Atmospheres have mass and density. The masses may be anything from gases to liquid or frozen droplets and/or a variety of solid particles. In spinning, heavenly bodies of no atmosphere, there appears to be no general blanket of mass or thinning matter in the surrounding space yet many examples of grouped and orbiting masses can be seen. The planets around our Sun are all in elliptical orbit. Such orbital velocities of masses around a central, larger mass, will appear to increase as the planet rounds the Sun at its closest point [Perihelion] - notwithstanding that some planets in our solar system are in near circular orbit but they are nevertheless elliptical. Earth is in near circular orbit with the smallest distance between its closest orbital distance from the Sun, the Perihelion; and its farthest, the Aphelion.

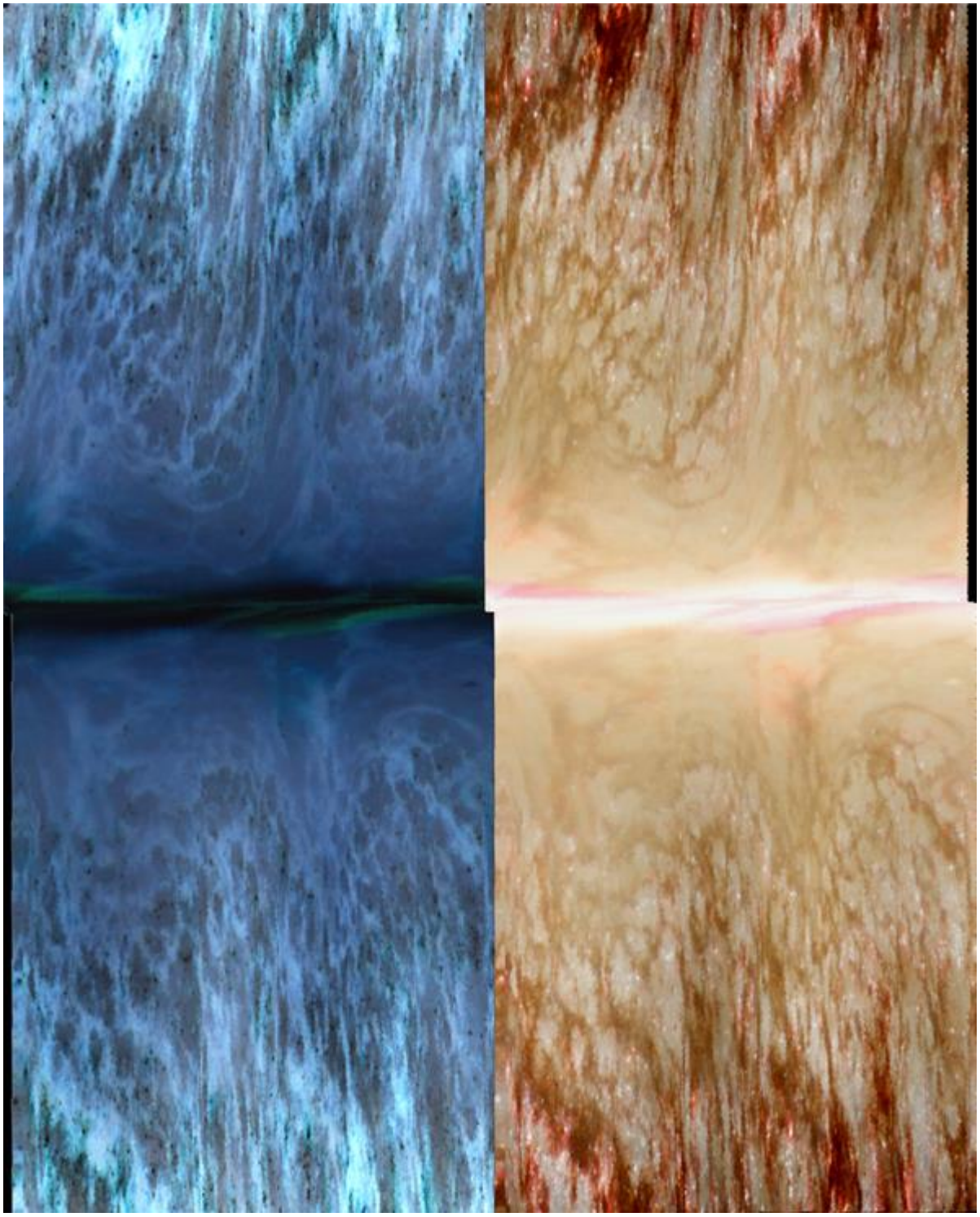

**Fig 5. M51 Core Detail as a Composite Transformation in both Positive and Negative Colour.**

This "speeding up" of masses nearing Perihelion, had been attributed solely to "gravitational pull" by the orbited mass and or reciprocated attraction by the planet. The facility is used to "sling-shot" space vehicles and gain momentum in trajectory from this phenomenon. Emplacing the field of Torsion goes on to explain why such effects are present on a general and galactic scale and beyond the known, singular confines of either Gravity or Electromagnetism; and why it might be better to slingshot *with* the rotation of the major mass rather than *against* it!

Unlike a total vacuum, universal space is full of matter some of which CAN be seen. Light particles - Photons have mass and these masses are deflected by gravity just as larger masses are. Photons are by mass, the lightest physical particles known in Nature. Other particles, waves, potential charges and atoms also abound and spin in space to act and react in spacetime.

Photons travel at light-speed and so "steerage" by gravity would be more fleeting and less acute in angle of deflection than in larger masses of up to stellar magnitudes and slower velocities. If a light-speed event in a galaxy left any trail or track between the core and the outer reaches of the galactic plane, it's trajectory would inevitably be curved. This curving is not so much due to Gravity as to Torsion. Given that an average, visible galactic plane diameter may span tens of thousands of light years distance, a range of velocities outside the constant velocity of the rotating torsion field defines individual exposure time to the field [of torsion] and therefore the amount of hyperbolic curve imposed by that field upon any included mass. Whilst gravity may be effective throughout the scale of the solar system, such fields may be dwarfed by any field of torsion that is a rotating, galactic plane.

If you could roll a ball bearing covered in wet, white paint onto the middle of a revolving, black vinyl disc, and that disc and "releasing mechanism" is spinning at a constant velocity - say 33 rpm; Then any momentum toward the outer edge of the disc would describe a hyperbolic curve or spiral. The painted ball bearing LEADS the daub. The curve angle might be altered by:

(a) differences in momentum given at the start of the "roll on", i.e. subjective velocity.
(b) differences in rotation speed of the disc, i.e. 16; 33; 45 or 78 rpm in this analogy.
(c) differences in "release" tangent, - angular deviations here result in deviant curves.
To complete the galactic core analogy, the "hold and release" outlet mechanism should range over *n* degrees of tangent and be rotating by virtue of being fixed to the central area of the spinning disc.

**Fig 6. M51 in Wide Field, Composite Transformation**

A cue ball, when striking an object ball, can be made to stop dead by use of "spin manipulation". That is, striking the cue ball beneath its "equator" with the chalked cue-tip, will induce a degree of "backspin" in the cue ball as it travels toward the object ball. The amount of this "bottom" and thrust applied to the cue ball, governs whether after impact with the object ball, the cue ball rolls on, stops dead or is given rearward momentum. Collision coursing stellar nebulae may be spinning in any direction when it hits an impeding mass. Such "target mass" may be struck on, above or below any equator and go on to similarly strike masses in a chained set of events. A one way, "Newtons Cradle" with gaps! This analogy relies on the extra friction

supplied by the beige cloth of the snooker table but angular and energetic momentum are transferred similarly.

The field of space that houses the visible galactic plane and outwardly beyond is spinning. Like a virtual "vinyl record" of comparatively little thickness and undefined perimeter; within which are all manner of localised events from collisions to solar systems creation, taking place inside a floating, spinning "discworld" akin to that of the much smaller, Rings of Saturn. Where the masses in Saturn's Rings are of fixed orbital radii, galactic masses are of increasing orbital radii and in hyperbolic spiral development. The latter masses are generally outward bound from the central area of or near the core in a range of velocities and are all inescapably influenced by the spinning field they are in, that is Torsion. It is this dynamic that spans so many light years in distance, NOT gravity. Torsion explains why orbiting systems are usually on an almost 2 dimensional plane. All surrounding masses of the visible plane and far beyond in 2D, radiated effect, are affected by proximity to the extended galactic plane with its concomitant torsion field. The far reaching effects of torsion must be considered in the sheer number concentrate of galaxies in the universe.

Ostensibly, there are no universal planes or coordinates in known spacetime, since the billions of galaxies share no common planar attitudes other than by coincidence [assumed]. Galactic planes are at random attitudes in space - to all intents and purposes. As a result, productive galaxies are sending out masses in all their planar angles and of deeply curved to almost straight trajectories along and about those individual planes. Collisions between extra-galactic masses would therefore be inevitable and apparently, ever more functional by natural design. Galactic destruction may not after all, be as destructive as universal creation and just as winter's death begets the birth of spring. We Earthly humans are potentially insignificant enough to merely be in the way and by no means an end product in light of such of Nature's plans!

**Fig 7. M100 Spiral Galaxy**

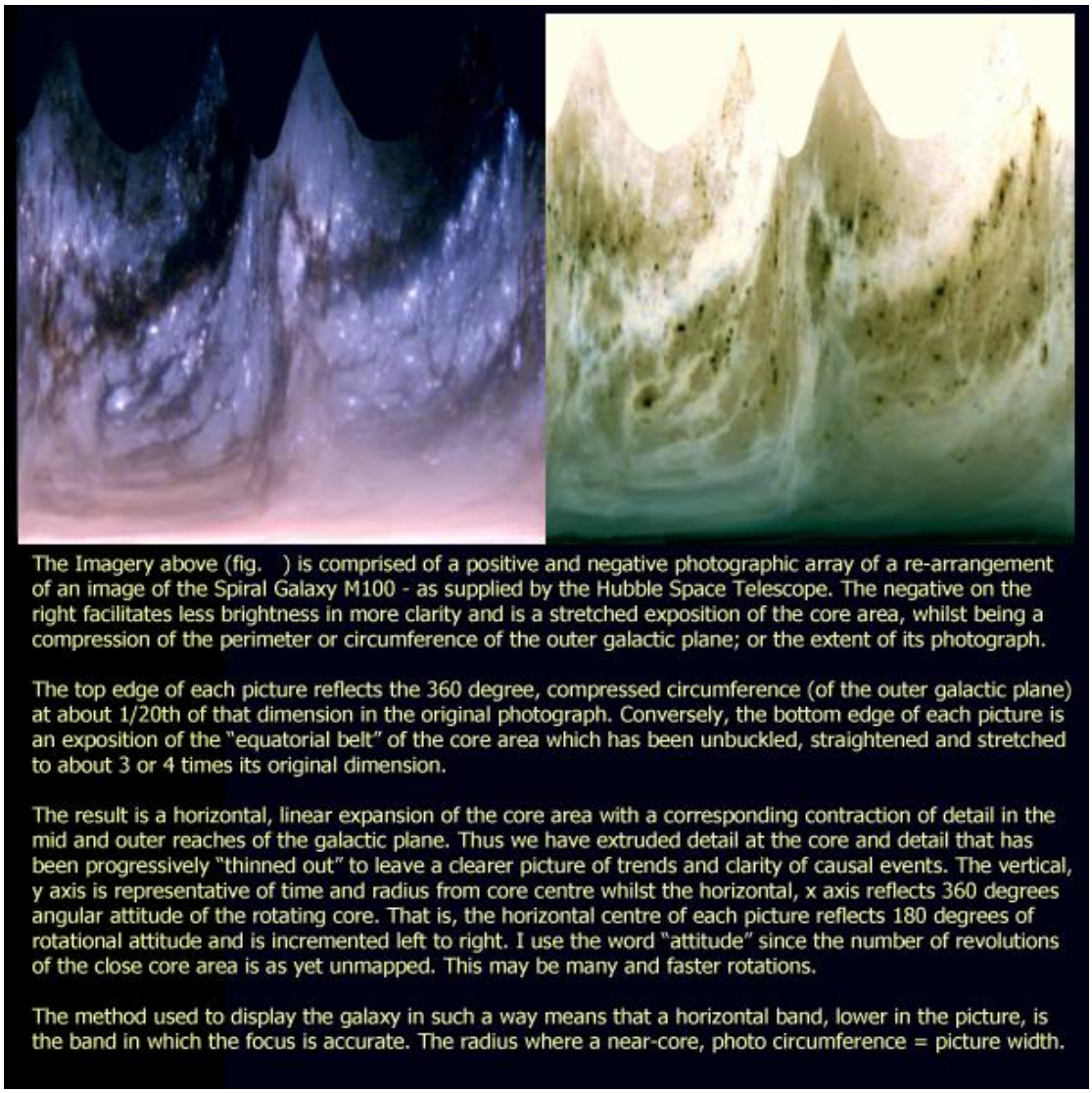


**Fig 8. M100 Spiral Galaxy as a Composite Transformation and Negative**

Dark Matter with its "invisible pull" had been ascribed as reasoning for the development of the definitive spiral arms prominent in visible observations of the Galaxies. This kind of erroneous assignation has been employed in quite a few key, 20th century models where the true nature or dynamic has been obscured and has previously been a mystery to man.

"Best Guesses" had taken hold and exciting but erroneous models and theories had somehow taken a precedence over fundamental, tried and tested methodologies of Natural Philosophy - Physics. Baconian principles and Ockham's Razor had been "stowed in a locker" as far as these exciting and literally fantastic model[ler]s of the last century had been concerned.

It may have been merely coincidence, but these models began to spring up in earnest following Heisenberg's Principle of Uncertainty of the late 1920's. Heisenberg had highlighted functions of Probability in his deliberations on Atomic measurement. Resultant "Indeterminacy" was born of further interpretations or exacerbations. Exacerbations insofar as it was not many years following before Chemical Physicists could measure that which Heisenberg could not; and that despite such practical advance, "Mainstream" authority had galvanised itself to the old principles of and within, uncertain or indeterminate models.

More fundamentally and again thanks to the AIAS and ECE Theory, we also know that Einstein had made more than one or two gaffs among his otherwise excellent endeavours. Einstein's Special Relativity - ESR survives with much contemporary importance along with other related studies of a brilliantly instinctive mind. Special Relativity was published in 1906 and then 9 years or so later, Einstein's General Relativity came into being as if an attempt to extend the Special into the General, to expand Special Relativity Theory to accommodate a wider grasp of the gravitational regime. With the benefit of hindsight, diligent, contemporary scholarship and computer checked calculation, Einstein's General Relativity is now proven to be in error in many and enough areas, to be deemed to be scientifically obsolete where his Special Relativity is not.

Einstein's General Relativity - EGR, had also been the springboard for many of the erroneous models subsequent to Heisenberg's Principles of Uncertainty. By the second half of the 20th century, we had confident, "Black Hole" models and "Point Singularity" and Big Bangs that were to source eventual "God Particles" that incredibly, are still prevalent yet physically *in absentia* as the "Standard Model" of today. More accurately, of yesteryears.

All of these models have been shown to be in gross error if only on the single count of their reliance on a fatally flawed EGR. A plethora of chained errors in these models begin to leap out on that basis alone. It only takes one such error to bring all the rest down like a house of cards.

The cosmological result is that we had been left with leading and misleading mainstream models such as Dark Matter, Black Holes and other models of the universe that cannot be seen, cannot be traced, cannot be reached, and cannot be agreed upon! "The Emperors New Clothes" cannot be ignored either!

**Fig. 9. M100 in Wide Field, Composite Transformation**

The proof of these errors and red herrings is not only to be found catalogued in the UFT series of papers and the related works and essays of the AIAS.US site, but such and varied refutations by other contemporary scientists and institutes may be found, together with documented refutations throughout the 20th as well as into this century.

We still greatly admire Einstein. We celebrate his successes but with our advanced computer technology, we MUST correct his errors. We believe that Einstein would have welcomed our technology and shrugged off such errors as simply a part of progress. He would have taken great delight in 22nd century Physics via an iPad!

This kind of technology is available to all and the means to share ideas through peer review comes with it. We have the Internet and proprietary mathematics programs and such that will enable 16 year old students to identify such errors of science as mentioned above. This does not insult the elder Doctorate, it is technological progress. It must also be remembered that it takes the highest of scholarship to even begin to correctly disseminate the complexities of 20th century models with their spurious metrics and endless and suspect addenda and infinite parametric adjustments. Only the finest and most diligent of minds can begin to trace and cite points of error that will eventually manifest as obvious to the rest of us. That obviousness has more often, been hard won and with a backdrop of political or administrative resistance and obstruction.

In the end, this kind of technological advance can only help Physics if it is used primarily, to verify or refute long held beliefs or assumptions that have seen no real ratification. There are many who have avoided this process and for many reasons. Paradigm shifts are both wondrously creative and abjectly cruel by necessity. Thomas Edison had good reason albeit subjective, for his disparagement of Nikola Tesla as did J.P.Morgan. Tesla brought a paradigm shift that threatened the others in similar but

isolated ways. Thomas Edison would lose money and status where J.P.Morgan would lose money and power, literally. One an inventor, the other a venture capitalist respectively. Judiciously, Tesla won out as a humanitarian discoverer and it is his AC Power and Electric Motors we use now.

Perhaps and sadly, it is better to say that Tesla won out as a discoverer alone. His humanitarianism would catapult him into almost a century of obscurity. Perhaps and again heartening, a contemporary resurgence of interest in his remarkable discoveries may have assisted and accelerated the general and primal urge to find clean, new energy as was within this brilliant Smiljanian, Nikola Tesla.

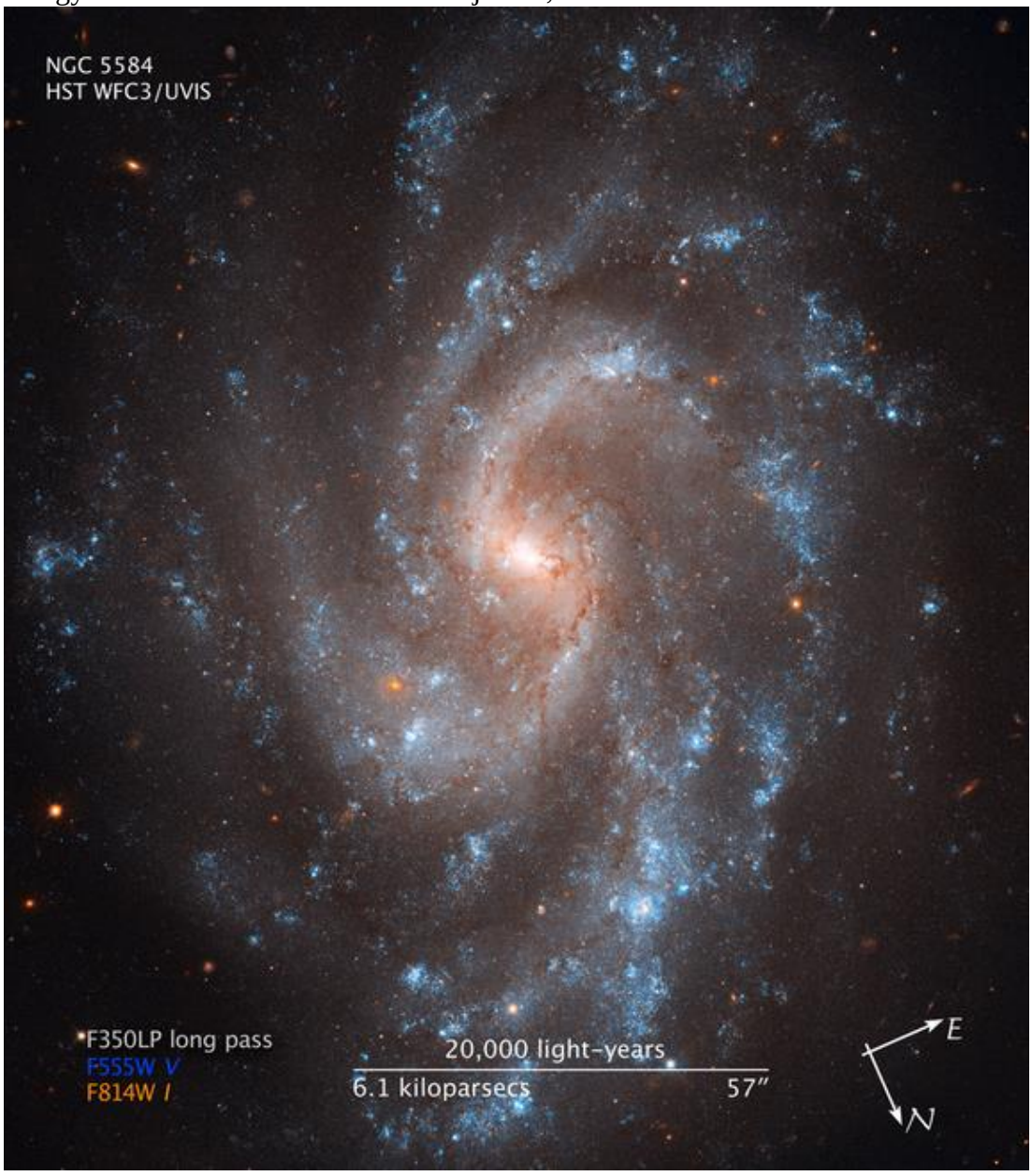


**Fig 10. NGC 5584 Spiral Galaxy**

We are privileged with such data as supplied by the Hubble Space Telescope in their High Resolution Images of galaxies and visible, cosmological events. All of us may

study these photographs in great and equal detail. We can use programs such as Photoshop to change tonal parameters or as in my own studies, re-arrange the imagery by "Radar-scan" techniques in order to produce transformations of hyperbolic spiral development in galaxies, as transformations into linear representations. That is and simply, converting "target rings and spirals" into "straight, musical staves". My lateness to the subject meant that I was never hidebound or blinded by "standard models" and I could keep my eyes and mind open.

The point of this exercise is to extend visible clarification of the effects of Torsion and subsequent hyperbolic development of Stellar Nebulae in Spiral Galaxies. Study has also been given toward the detection of any reactive and visible signs of the Standard Models. That is, Black Holes had been reputed to "draw in and swallow" matter from in and around their location. Amid a spiralling maelstrom one might expect to find anomalous or chaotic reactions but when the spiral is ironed out towards the straight, more order defines less chaos and no need nor traces of any such Black Hole and further, absolutely no need or trace of  Dark Matter to predetermine the now comparatively straightforward dynamic of spiral arm formation.

It should be fully digested that Torsion, being the spinning of spacetime will create dynamics of the galactic plane that may first appear to be counter intuitive if a fuller understanding has not been achieved. Torsion governs all of these galactic dynamics.

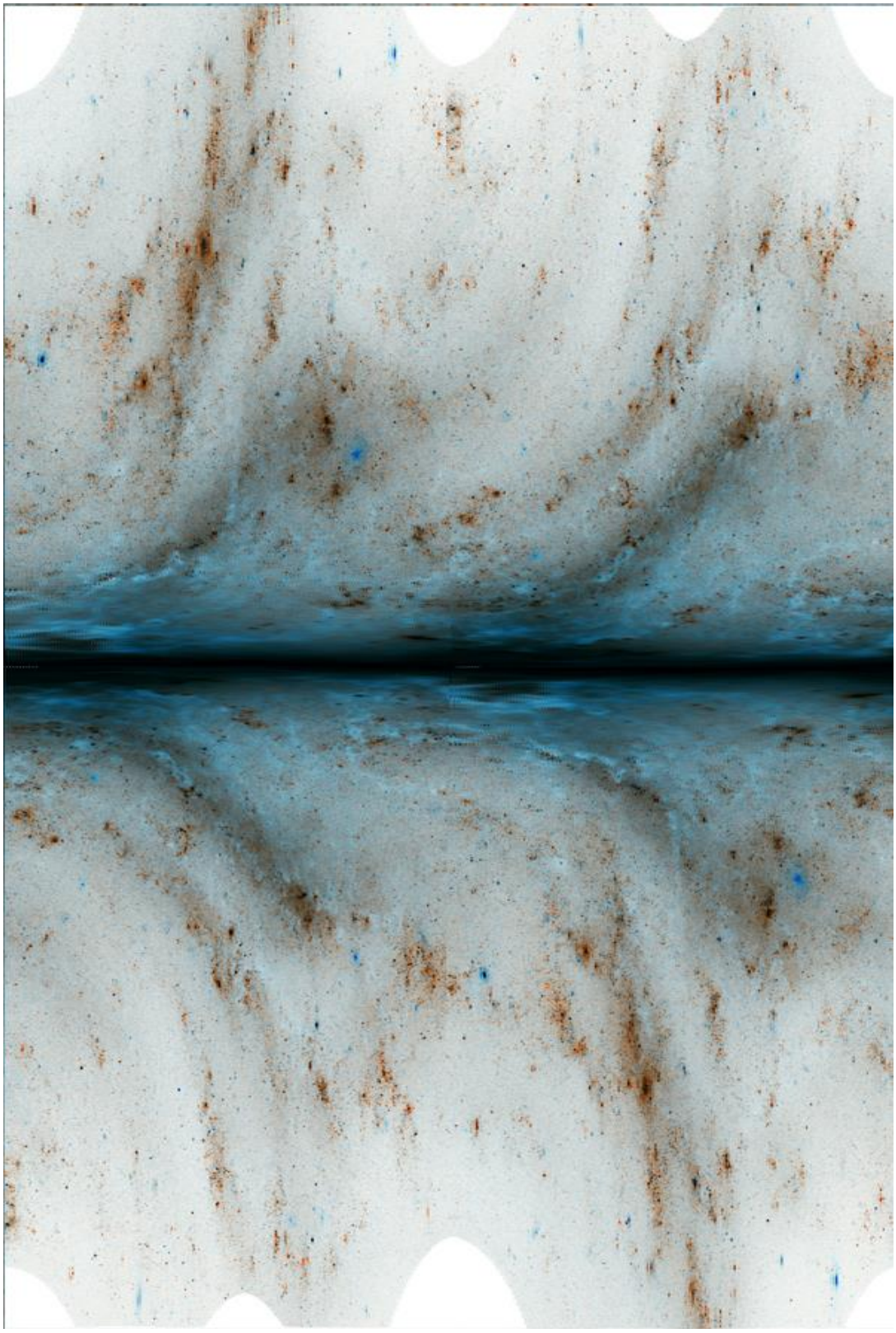

**Fig 11. NGC 5584 in Negative Colour and Composite Transformation**

In the technique shown, unedited and replicate "needle" images of 5 or more pixels in width; and which are duplicated from the full extent of the visible galactic perimeter as if in 360 x 1 degree arc scans and which, when arranged as a horizontal array are separated by 1, 2, 3 or 4 pixels. These then are the gathered and spaced perpendiculars of all 360 angular attitudes of the core as viewed in 2 dimensions.

The resultant imagery converts the tight turns of orbit track near the core from circular - though spirally expansive - to a more gently sloping curve of clearer visual and deductive discernment [IMO]. The spacing of the "needles" along an x axis, presents all core perpendiculars at 0 degrees and Time may be measured as upward and of y value. Spacing of 0 pixels would simply be a leafed or stacked set of 360 images showing only the top or first needle image. Spacings of 1, 2, 3 and more pixels will horizontally expand the imagery near the core; whilst horizontally compressing the imagery in the visible, outer reaches of the galactic plane - now the top of a narrow rectangular picture. Spacing also governs the general curve angle in that 1 pixel spacing = sharp curve angle and therefore correspondingly less acute by increased pixel spacing.

Analogously for the core area, a chosen core perimeter has had its equatorial belt unbuckled, straightened and stretched to order. The whole being as a circular, oriental hand-fan being closed and then reopened along the horizontal axis only. The new curve of hyperbolic development is directly transferable back to hyperbolic spiralling via simple mathematics as well as photographic technique reversal and presents as calculable within 90 degrees of a graphic quadrant as opposed to the full 360 degrees of hyperbolic spiral development. No imagery is content edited or altered integrally. The colours of the original images have been inverted and made "negatives" for ease of study and to avoid "retinal burn"!

The vast majority of masses in orbit around and outward of the galactic core is subject to disruption due to numerous collisions of stellar masses on the galactic plane. Torsion will maintain the hyperbolic orbit development regardless of such impacts but resultant debris may defy the trend in limited ways and in their consequential orbital trajectories. Certain collisions may also send debris outward and beyond the visible plain and this trajectory bears minimal arc and enough momentum to traverse the Torsion field and avoid being drawn much into the inevitable hyperbolic development into which the general, or larger proportion of masses are bound.

Impact debris or stellar nebulae is generated by:

(i) Collision by mass leaving the core by intermittent issue and as described in the original animation by Dr. Horst Eckhart and elaborated by Bernhard Foltz in both non- interactive and interactive animations at AIAS.US; Such masses will inevitably "cross lanes" as they are emitted at differing tangent angles and at differing times, thereby colliding with other masses of tight formation in the more tightly coiled spirals of the hyperbolic development and therefore, specifically around the central area. Ejections or emissions may be less likely to collide as they spiral further outward. Spacing of such stellar nebulae is increased as are radial distances and opening "throughways".

Impact debris may be struck into transverse trajectories as a snooker ball may strike another or "the pack". If the snooker table were spinning like a galactic plane, transferred angular momentum and high energy impacts will result in initial scattering in all potential directions before remaining debris resumes more sedate orbit or becomes causal in more collision resultant dynamics. The overall impression from this is that masses may be emitted at differing levels of energetic activity or velocity:

(ii) The second consideration is that of "inbound" masses from other galaxies and sources that may collide as they cross or enter another galactic plane. Given the evidence for star generation by such sheer number, and the planar angular disposition range of galaxies, collision would seem a natural and inevitable function of universal galactic dynamics. Torsion maintains an almost 2 dimensional plane that sends masses to arc ever outward about that plane in a growing radius of hyperbolic development. The only thing to interrupt such progress would be another coincidental mass on collision course or the relatively static "target" matter of another galaxy:

(iii) A third consideration in the definitive spiral galaxies, that is those with specific and obvious spiral developments, may be displaying the debris from disintegration of their own core. Torsion has brought the galactic plane to quite some momentum. In the event of a core disintegration, stellar nebulae from such an event would be carried into hyperbolic orbit by such existent rotary momentum in the Torsion field that may be assumed to reduce over time after such an event, if at all.

Common to the first two causes if not so much the third, is the fact that masses colliding or exploding appear to do so at some significant radius of the core centre as opposed to discernibly from within it. To include the third cause (iii) would be to assume that reactive disintegration had not visibly manifested before this radial point - another common potential for all three.

**Fig 12. NGC 2082 Spiral Galaxy**

Nuclear reactions from the impacts between such gigantic masses may be instant or delayed in resultant debris or deformations. Reacting masses may not display much energetic activity until further into hyperbolic orbit. Torsion will carry all matter in outward hyperbolic spiral orbit regardless of the local angular momentum of collision resultant trajectories unless the impact induced velocity of these masses is sufficient to carry them more directly beyond the visible plane. The traces or tracks of such masses manifest as radials emanating from nearer the core area and tangential to specific radii of the central core. Such tracks or traces are transverse to the spiral flow.

In a "close to core" impact, there is traced evidence for resultant debris, stellar nebulae, to cross the core centre and leave a "dust-trail" accordingly. It must be supposed that this cannot happen unless such crossing trajectories have been made above or below the central core as these masses would be unlikely to pass through the same plane as the core centre and also leave a lasting trail. Such explosive collisions that are near the core do not appear to send debris out generally on a 2 dimensional plane as does the mother galaxy, but more locally and initially in all 3 spatial dimensions. This allows that debris from core proximity impacts may be projected or "fired out" above the angle of the plane and would merely require a specific range of "elevation" and velocity, and a coincidental bearing to cross over the top of the core centre. This is shown in various galactic photographs and more clearly at the centre of M51, the Whirlpool Galaxy.

At the core of this galaxy is a very small "port-hole" of view of the core area, where two crossing trails appear. These "wisps" seem to be dissipated and truncated at each end to clear but minimal diameter across the core centre to form shapes resembling the letter 'X' or a slightly distorted 'K'. This might indicate a calm "eye". Conversely, if a red, letter 'X' were painted on the central hub of an aircraft propeller, and later with the prop then spinning, a photograph taken of the whole to see the extremes of the 'X' dissipate outwardly into a blur with the main blades. Some clear form of cross is nevertheless visible in the central focus and "freeze-frame" of the photograph.

The clearest indicators and tracks in the HST galaxy composites are more often found by the disturbances caused and left by masses as they either make outbound way more directly as "blast resultant" or fall into the general and more orderly outbound, hyperbolically spiralling orbit path.

**Fig 13. NGC 2082 Composite Transformation in Negative Colour**

In an Earthbound explosion, mass is violently ejected as debris in all directions - notwithstanding controlled explosions where debris may be directed specifically, i.e. by "sandbagging". Whilst the explosion may be violent and erupt mass at high velocity, gravity ensures that such debris will not reach a sustained escape velocity and will return to Earth. Volcanoes or nuclear explosions are similarly governed. All debris will eventually return to Earth. The explosives used and the "ground zero", may also cause uneven distribution and create debris of varying velocity and trajectory within a single explosion.

Galactic explosions, particularly those seen to be collision resultant, are on such a comparatively massive scale that gravity is no longer as relevant, in that whole gravity fields smash into other whole gravity fields within the galactic plane, to throw stellar nebulae in all directions and with various energy and velocities. Since the resultant debris of these explosions is shown to subsequently rejoin the general, hyperbolic orbit path, or to traverse outwardly across the plane more directly, it can be shown that torsion governs all galactic, orbital dynamics and overrides local gravity fields and further; Torsion can be seen to be effective in a wider field and spacetime, in a star or mass that has travelled hundreds of thousands or millions of light-years from its original galactic core, its birthplace, to be moving on its hyperbolic spiral path for a seeming "evermore". Torsion has far wider effects on masses than any gravity and this effect in comparison, is by orders of great and galactic magnitude.

**Fig 14. The Spiral Galaxy M74**

In any hi-res, HST images of most Spiral Galaxies, our inner Solar system would be represented as a pin point, much less than one zoomed-in pixel. Just as we are such in our own Milky Way galaxy. We are almost "molecular" by comparison with the magnitude of galactic dynamics. Solar system spans and distances are calculated in thousands and millions of miles or kilometres, whereas such galactic measurements are calculated in thousands and millions of light years in spanning distances. In viewing these hi-res photos, it's easy to forget that one pixel may represent tens or hundreds of light years of distance and that one tiny galactic collision could wipe away into gas clouds, our whole Solar system. Fortunately, the Milky Way appears much less active collision-wise, than do some of the spiral galaxies under scrutiny.

Composite Transformations such as are shown here present much visual evidence to show that masses are leaving the core area at a tangent angle and as described by Dr. Horst Eckhart in his original, graphic animation of core mass departure and in further, hyperbolic development graphs and data. The images offer little if any evidence of

mass travelling toward the core centre. All of the visible data from the HST at least, show a predominance of outward bound masses.

My own overview of spiral, galactic dynamics - knowing that there is much more to uncover in such systems - is that the spiral galaxies are like massive "pepper grinders". Stellar masses or nebulae more often begin their journey at or around the centre of the galaxy - its core. Huge single or grouped masses may be emitted or ejected to make their way straightforwardly via outward, hyperbolic spiral orbits to be spread by this process, out into much wider spacetime than can be seen on the visible, galactic plane.

Masses that complete this "obstacle course" of much other orbiting matter, are unlikely to leave definitive traces other than where they may have travelled through gas clouds or dust lanes and may have left a trail of 'mild' turbulence in their wake. Seemingly much more occasional, are sequential collisions.
Massive collisions where ever diminishing in size, debris becomes progressively prone to subsequent collision and so on and reductively so on. M51 is peppered by comparatively tiny, nucleic reactions that resemble tightly packed frogspawn in a 2 dimensional array, a 2 dimensional honeycomb of explosive abutment.

From enormous masses in diverted but general orbit, the galactic plane also displays a "mist" of finely gauged masses that form "milky bands" of this more densely packed debris. These are stars by the million and have been broken down as if in an enormous aggregates sorting machine or a giant "pepper grinder". Masses of all sizes or gauges are first generated at or near the core - notwithstanding extra-galactic collisions which may occur further from the central area - and these former masses, due largely to collision resultant deformation or disintegration, evolve by stages, a "fine mist" of stars that will make its way outward - via hyperbolic spiral orbit - and spread out into the wider universe in the same extended pattern. This alongside the delivery of more sporadic but larger masses that relatively unhampered, make their hyperbolic way out from, across and about the galactic plane. Back on Earth, rock moves through boulders and pebbles to become sand.

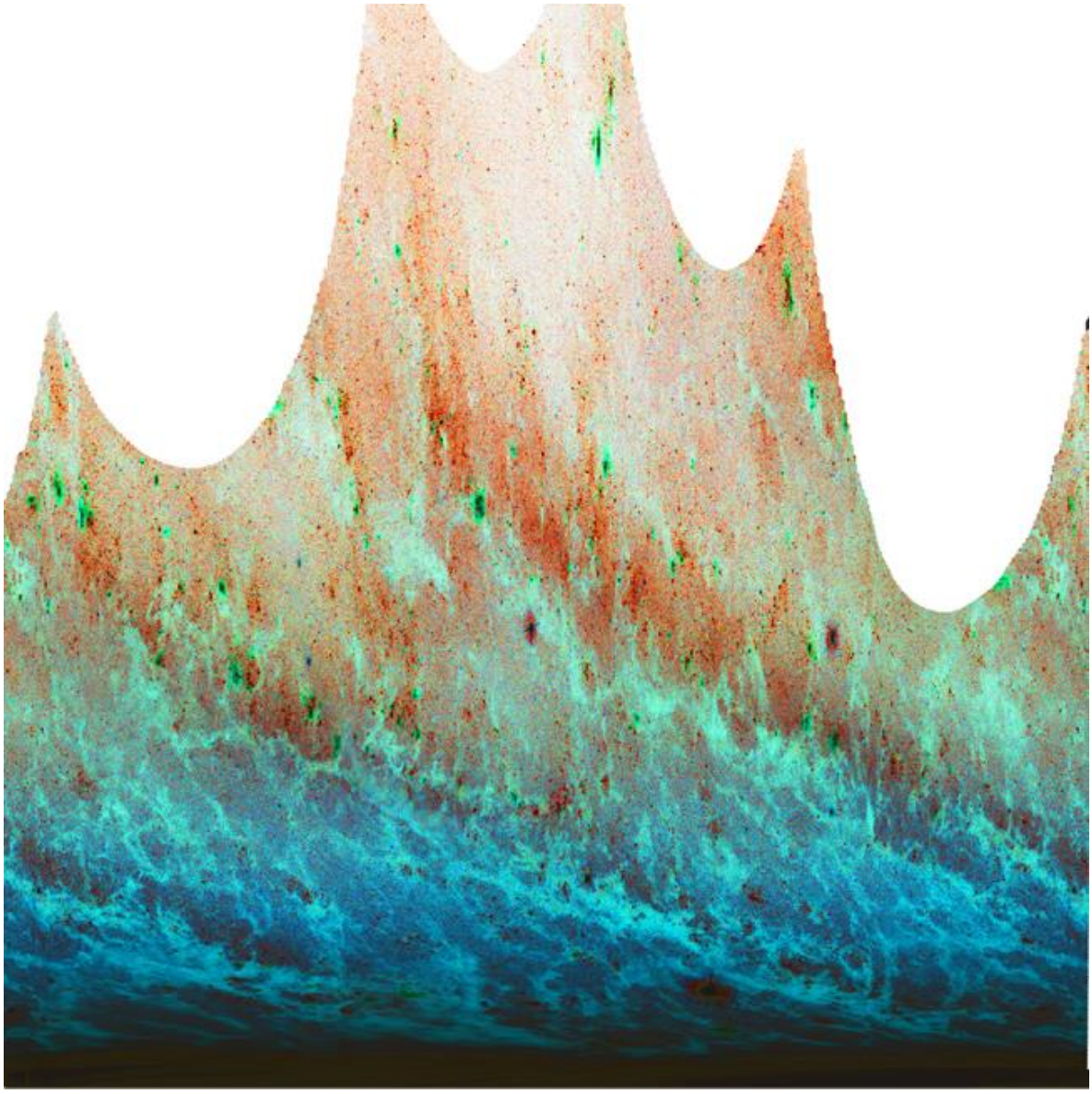

**Fig 15. The Spiral Galaxy, M74 as a Composite Transformation, negative colour and with tonal enhancement.**

Spiral Arms present as the result of core, or near core energetic activity which has been forceful enough to project resultant debris to opposite sides of the core centre. More commonly, these spiral trails are formed by energetic activity - translated as collision resultant - which is instigated near but not necessarily at the core centre. Photographic data shows such near core events as predominant.
M51 displays an almost symmetrical and reciprocal spiral together with energetic energy which is very close to the core centre but also in close proximity to discernible masses that are orbiting separately to become "escapees" of near core collision. In M51 particularly, the data allows for both the possibility of an explosive core disintegration; and a very near core centre collision. It has not yet been possible for this author to clarify this source definitively.

Most other spiral galaxies studied display explosive energy farther from the core than as seen in M51. In all cases, these collisions start numerous spiralling tracks from the central core area, and can go on if less often, to instigate "part-spiral" arms by collision further out on the galactic plane. The same photographic data suggests that there is no real regularity or symmetry of emission or ejection since M51 is a rare example of such near symmetry and the trajectory of collision resultant debris is likely to cause spiral arms to be generated from all angles of a core "equator" and at non specific times. Most cases in spiral galaxies observed, show "arm" development that is resultant from *one* major and explosive collision or event. Dependent on the angles of impact that would eject stellar debris or nebulae, together with proximity to the core and other factors, is the potential to send such debris in almost all of the 180 degrees of the opposing semicircle of possible trajectory angles. Torsion carries most of the debris outward and in much less than a semicircle of "blast" arc but nevertheless occasional sojourns to the other side are forced. These events may be confused as two separate events or such that hold inherent, reciprocal symmetry as may the "perfect", symmetrically dispersed "blast" debris of a core explosion or disintegration.

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