

*On the Alleged “Black Hole” Binary in Nova Scorpii*

Schmidt et al. authored the paper FORMATION OF THE BLACK HOLE IN NOVA SCORPII, THE ASTROPHYSICAL JOURNAL, 567:491-502, 2002 March 1. I wish to bring a number of important points to your attention.

All alleged ‘black hole solutions’ to Einstein’s field equations pertain to a universe that contains only one mass, namely, the mass of the black hole itself, by mathematical construction. There are no known solutions to the field equations for two or more masses and there is no existence theorem by which it can even be asserted that the field equations contain latent solutions for two or more masses.

In the model and analysis for Nova Scorpii the authors have inadvertently applied the Principle of Superposition where the Principle of Superposition does not apply. In Newton’s theory of gravitation the Principle of Superposition applies and so one can simply pile up masses at will, although the gravitational interaction of these masses soon becomes intractable. In Einstein’s theory the gravitational field, manifest in the curvature of spacetime, is coupled to its sources by the field equations, the sources being described by an appropriate energy-momentum tensor, and so the Principle of Superposition does not apply. This means that one cannot simply pile up masses in any given spacetime because the field equations must be solved for each and every configuration of matter proposed. The proposed model for Nova Scorpii has not done this. For instance, upon what energy-momentum tensor do the authors rely for the black hole close binary system, and hence upon what solution to the field equations do they rely for this binary system? There is in fact no known set of field equations for the model proposed by the authors for Nova Scorpii.

The authors’ model begins with a Newtonian universe and ends with a non-Newtonian universe, manifest as an inadvertent blending of two different and incompatible theories, by means of an inappropriate application of the Principle of Superposition; a Newtonian universe containing a non-Newtonian entity (a black hole), which is impossible; or conversely, a Relativistic universe that contains additional masses besides that of the black hole, which is also impossible, as paragraphs one and two above show.

Owing to the foregoing one cannot, by an analogy with Newton’s gravitational theory, assert that black holes can exist in multitudes, merge or collide, or that a black hole can be a component of a binary system.

According to Einstein his Principle of Equivalence and his Special Relativity must hold in sufficiently small regions of his gravitational field and that these regions can be located anywhere in his gravitational field. Now a simple calculation proves that Special Relativity forbids infinite densities. Thus an infinitely dense point-mass singularity is forbidden by the Theory of Relativity no matter how it is alleged to be formed. It is worth noting that infinitely dense point-mass singularities occur in Newton’s gravitational theory too; they are merely ‘centres of masses’. But a centre of

mass is not a physical object – it is a mathematical artifice, nothing more. In the case of the black hole the infinitely dense point-mass singularity is claimed to be a real object.

The subject paper does not clearly specify what type of black hole is allegedly formed in Nova Scorpii. The signatures of the simplest black hole, whether or not it is rotating, are an infinitely dense point-mass singularity and an event horizon. Now it is an irrefutable fact that nobody has ever found an infinitely dense point-mass singularity or an event horizon and so nobody has ever assuredly found a black hole. This is not surprising owing to paragraphs one to five above. Additionally, all reports of black holes being found in multitudes is wishful thinking due to a misapplication of the Principle of Superposition.

The so-called ‘Schwarzschild solution’ upon which black hole theory mostly relies is in actual fact not Schwarzschild’s solution at all. Schwarzschild’s actual solution forbids the black hole. One can easily confirm this by a reading of Schwarzschild’s original paper on the subject<sup>1</sup>.

Unfortunately most astronomers and astrophysicists are completely unaware of Schwarzschild’s actual paper because it has become buried and all but forgotten in the literature, and the metric which bears his name has thereby become incorrectly associated with him. The ‘Schwarzschild solution’ is due to David Hilbert and is a corruption of the original solution by Schwarzschild. It is from Hilbert’s corruption that the black hole was incorrectly spawned, as pointed out by the late American theoretical physicist Dr. Leonard S. Abrams<sup>2</sup>.

As an aside, paragraph three above raises some other interesting and relevant issues. Scientists frequently assert that the escape velocity of a black hole is that of light in vacuum and that nothing, not even light, can escape from the black hole. In fact, according to the same scientists, nothing, including light, can even leave the black hole. But there is already a serious problem with these claims. If the escape velocity of a black hole is that of light in vacuum, then light, on the one hand, can escape. On the other hand, light is allegedly not able to even leave the black hole; so the black hole has no escape velocity. If the escape velocity of a black hole is that of light in vacuum, not only can light both leave and escape, material objects can also leave the event horizon, but not escape, even though, according to the Theory of Special Relativity, they can only have a velocity less than that of light in vacuum. This just means that if the black hole has an escape velocity then material bodies can in fact leave the black hole and eventually stop and fall back to the black hole, just like a ball thrown into the air here on Earth with an initial velocity less than the escape velocity for the Earth. So the properties of the alleged black hole event horizon are irretrievably contradictory. It has also become commonplace in the literature, and in textbooks for students, to claim that Newton’s theory predicts the existence of a kind of black hole. But the black hole is not predicted by Newton’s theory of gravitation either, despite the claims of the astrophysical scientists that the theoretical Michell-Laplace dark body is a kind of black hole. The Michell-Laplace dark body possesses an escape velocity, whereas the black hole has no escape velocity; it does not require irresistible gravitational collapse to form, whereas the black hole does; it has no infinitely dense point-mass singularity, whereas the black hole does; it has no event horizon, whereas the black hole does; there is always a class of observers that can see

the dark body (as the late British astronomer G. C. McVittie pointed out), but there is no class of observers that can see the black hole; the Michell-Laplace dark body can persist in a space which contains other masses and interact with those masses, but the spacetime of the black hole is devoid of masses other than that of the black hole itself, by mathematical construction, and so it cannot interact with any other masses. Thus the Michell-Laplace dark body does not possess the signatures of the alleged black hole and so it is not a black hole. Additionally, escape velocity is a two-body concept; one body escapes from another body. But as pointed out above there are no known solutions to Einstein's field equations for two or more bodies and no existence theorem by which it can be asserted that his field equations contain latent solutions for two or more masses. A very simple proof that the Michell-Laplace dark body is not a black hole is given by G. C. McVitte (The Observatory, 1978)<sup>3</sup>.

Yours faithfully,

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#### *References*

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