Dark Matter and Vera Rubin

https://blogs.scientificamerican.com/guest-blog/vera-rubin-didnt-discover-dark-matter/
my comment will be in red font

Vera Rubin did not discover dark matter. She herself was not convinced that it existed · Richard Panek **December 29, 2016**

Rubin and her collaborator, Kent Ford, discovered that M31, the Andromeda Galaxy, was spinning in an unexpected way. Credit: NASA, JPL-Caltech Vera Rubin did not discover dark matter. **Rubin died last weekend, aged 88**. Headlines repeatedly identified her as having "discovered" dark matter or "proved" the existence of dark matter. I regret that Vera Rubin never met my HDV and the new idea about her error in evaluating her measurements. Even the Carnegie Institution press release announcing her death - she worked as a staff astronomer in the Carnegie Department of Terrestrial Magnetism in Washington, D.C. D.C., half a century before her recent retirement - that she "**confirmed** the existence of dark matter." Rubin would say that she did not **confirm** anything, she did nothing of the sort. I know because she has said so on several occasions. One could argue that the correct formulation of her success is that she discovered evidence for the existence of dark matter, unfortunately she didn't. No, she hasn't discovered the evidence either and while Rubin would probably agree with this construction, she would find it incomplete, perhaps even misleading. She would say that while she discovered evidence for the existence of dark matter, you should not infer from this statement that dark matter actually exists. The difference was not just a matter of semantics. For her, it was a matter of philosophy, of integrity - a matter of how science works. In the late 1960s, she and her frequent collaborator W. Kent Ford, Jr. began studying the gas and dust in our neighboring galaxy, Andromeda. In fact, they were testing a new instrument designed by Ford that provided a level **of measurement accuracy previously unavailable**. Observation performances were correct, but Newton substitutions were incorrect. Now a nipple from another source →

https://astronomy.com/news/2016/10/vera-rubin

(M31). It represented a return to Rubin's interest in the dynamics of galaxies. "People have deduced what the rotation of galaxies must be," (they used Newton) Rubin said, "but no one has actually done a detailed study to show that this is the case. !! No one noticed until me in 2001 that a "modified" Newton should have been used. " Now, thanks to Ford's out-of-this-world **spectrograph,** they could turn the conclusions into observations. She used the spectrograph to infer velocities When they pointed the telescope at M31, they expected to see rotation like the solar system: Objects closer to the center move faster than objects toward the edge. She expected this because she was fitting "her speeds" to Newton's $\mathbf{F = M \,.\, m / x^2}$ And unfortunately, she made a mistake (that is, the mistake was also made by thousands of physicists after her when they checked her results) that she did not substitute *"x" - the distance in the arc which is longer...*, because it is already visible in the galaxy from the perspective of a distant observer the curvature of spacetime in which the galaxy "floats". http://www.hypothesis-of-universe.com/docs/c/c_439.jpg

Equation used by Rubin …….. a) $\mathbf{v_{(measured)} = M \,.\, t / x_{(straight\ line)}^2}$

Correct equation that was not used ……. b) $v_{(real)} = M \cdot t / x_{(segment\ in\ the\ arc)^2}$

By this wrong substitution in Newton, Rubin discovered that $n \cdot v_{(measured = calculated)} > v_{(real)}$ and therefore Rubin and other physicists after her believed that M must be "increased" for the equation to hold, i.e. that in the galaxy the mass is missing for it to "reduce" that speed in the arms on the periphery of the galaxy. **Mass** causes gravity, which determines the **speed** of rotation. However, the speed also causes the distance between the bodies !!! as if there was much more mass in the bunch, because he was substituting in Newton →

Why the stars in the arms of galaxies run slower than they should after inserting observation numbers into the law of gravity..., not least because you use the "correct" observation numbers and insert them into the "wrong Newton's law." Fg = G.M.m / x², where after "x" you substitute the distance between two bodies "as a straight line x", but in the reality of the universe according to OTR it is different: for Observers from a great distance the space-time inside the galaxy is already curved and it is necessary to substitute this line "x" in arc "x". Then the results are different and no dark matter is missing in the galaxy http://www.hypothesis-of-universe.com/docs/f/f_056.jpg ; http://www.hypothesis-of-universe.com/docs/aa/aa_031.jpg ; http://www.hypothesis-of-universe.com/docs/c/c_439.jpg

What they found surprised them: the gas and dust swirling on the outer edges of the galaxy were **rotating** just as fast as the gas and dust near the galaxy's center. ..ie like a gramophone record If the galaxy was really spinning at this rate it should be shredding in all directions, but apparently it's stable. Rubin and Ford published their results in 1970, but one unusual detection is not a convincing argument. Over the course of the 1970s, however, they and other astronomers found the same pattern again and again in galaxy after galaxy until theorists had little choice but to reach a consensus: Galaxies are embedded in a much, much larger, stabilizing halo of matter we can't detect at any scale of the electromagnetic spectrum - that is, it is "dark". Theorists have even identified properties of what could be hypothetical matter, and experimentalists have begun to design instruments that could in principle detect or collect particles. In 1980, Rubin predicted the discovery of dark matter within ten years. Ten years later, British astronomer (and future Astronomer Royal) **Martin Rees** predicted the discovery of dark matter within ten years. Eleven years later, in his book Our Space Habitat, Rees wrote: "I think there is a good chance of achieving this goal within ten years." That's 30 years in total.

Five years later, at an American Institute of Physics symposium, Rees doubled down on that prediction: another five years, he promised. Rubin, who happened to be in the audience, stood up. "I know about the earlier predictions," she said. Rubin told me about this last exchange shortly after it happened in 2006. She told me about it again over dinner in January 2011. By then another five years had passed (!). And now another five years have passed. I think she enjoyed it, I think it illustrated an important point about science - one that she herself often made when I talked to her as part of my research, or later when we talked just for the fun of the conversation. **She did her job; She made an observation**. The observations were correct, but the substitution into the physics equations was wrong…and that happens quite often in physics. I think the same will happen to the Hubble expansion. Heisenberg and his indeterminacy, ...even the STR is misinterpreted : it should explain the rotation of the systems (the observed object and the system of the Observer) Now it was up to others to do their

work: interpret the data, predict further results, make a discovery. Or don't make a discovery. It was the "or not" that caught her eye. Perhaps the discovery of dark matter was not possible. Maybe dark matter doesn't exist. **Maybe what she found in the 1960s and 1970s was proof that gravity doesn't work on large scales the way Newton taught us**.. Yes, Newton's

$F_a = M . m/ x^2$ must be used in flat spacetime differently from curved spacetime… which I have presented many times on my site since 2001…MOND-Navrátil.

JN, 07.06.2022