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Celebrating the centenary of the Schwarzschild solutions and Einstein's prediction of gravitational waves and their detection by LIGO

Schwarzschild presented his exterior and interior solutions a hundred years ago. They describe spacetime outside and inside an incompressible, spherically symmetric body. I give a review of these solutions and how they have been interpreted physically. Einstein predicted the existence of gravitational waves as a consequence of the general theory of relativity in June 1916. I briefly follow his thoughts about gravitational waves in the periods from 1016 to 1918 and from 1936 to 1938. The LIGO-detection of gravitational waves is reviewed. Consequences of this detection as investigated in later preprints are also discussed.

Biography

Oyvind G Gron is a Norwegian Physicist. He took the Cand. Real. Degree at the University of Oslo in 1973, majoring in Meteorology. He followed up with Dr. Philos. Degree in 1990 with a thesis on Repulsive Gravitation. He was appointed as a Professor at Oslo University College in 1994. He has also been Professor II at the University of Oslo since 1994. He has conducted research within the areas of general relativity, cosmology and classical electromagnetism. He has thrown new light on themes like the twin paradox, the physics in a rotating reference system and repulsive gravitation associated with vacuum energy. Together with Erik Eriksen at the University of Oslo, he has also studied properties of the electromagnetic field produced by accelerated electric charges. They have in particular shown how gravitation modifies such fields. He has also found new solutions to equations in Einstein's theory of gravity that describe time space where one can travel backwards in time. In several studies, he has focused on relativistic models of the universe. He has, among other things, shown that it is possible to interpret observations from cosmos so that the concept of dark energy is unnecessary. The relationship between gravitation and time and between gravitation and entropy are also themes where he has contributed several journal articles. He has 153 research articles, and has written 3 books on the theory of relativity published by Springer.

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