A Solution to Einstein's Gravitational Field Equation for a Space-Time Filled with Gravitating Matter of Density $\rho(r,\theta,\varphi)$ LEE W SCHUMANN, None — In the 100+ years since Einstein introduced his gravitational field equation, only two solutions have been found: Schwarzschield's solution for a point mass at the origin of coordinates and the Friedmann-Robinson-Walker (FRW) cosmological solution containing two free parameters. In fact there are as many solutions to the field equation as there are different configurations of the sources of the field . I show a solution in terms gravitating matter distributed throughout space-time with density $\rho(r,\theta,\varphi)$. This is the relativistic equivalent of solving Newton's non-relativistic gravitational field equation: $\div G = 4\pi G\rho, where \rho(r,\theta,\varphi)$ is the gravitational field and G = 6.67 X 10-11 (m3/kg-s2) is Newton's gravitational constant.

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