A Unification of General Theory of Relativity with Dirac's Large Number Hypothesis

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Abstract: Taking a hint from Dirac's large number hypothesis, we note the existence of cosmologically combined conservation laws that work cosmologically long time. We thus modify Einstein's theory of general relativity with fixed gravitation constant G to a theory for varying G, with a tensor term arising naturally from the derivatives of G in place of the cosmological constant term usually introduced ad hoc. The modified theory, when applied to cosmology, is consistent with Dirac's large number hypothesis, and gives a theoretical Hubble's relation not contradicting the observational data. For phenomena of duration and distance being short compared with those of the universe, our theory reduces to Einstein's theory with G being constant outside the gravitating matter, and thus also passes the crucial tests of Einstein's theory.

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