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Einstein - Eddington generalized gravity

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<p>The present observational data strongly suggest that Einstein's gravity must be modified, one of the popular modifications being provided by superstring ideas. In view of the mathematical problems of the string theory, other, much simpler, modifications of gravity that affect only the gravitational sector (not touching other interactions) are also popular.

One of them is based on Einstein's idea to formulate the gravity theory in a non-Riemannian space with a symmetric connection by use of a special variational principle that allows one to determine the connection from a "geometric" Lagrangian. This Lagrangian is assumed to depend on the generalized Ricci curvature tensor and on other fundamental tensors and is varied in the connection coefficients.

We discuss new models of this "affine" theory of gravity in multidimensional space-times with symmetric connections. We use and generalize Einstein's proposal to specify the space-time geometry by use of the Hamilton principle to determine the connection coefficients from a geometric Lagrangian that is an arbitrary function of the generalized Ricci curvature tensor and of other fundamental tensors. Such a theory supplements the standard Einstein gravity with dark energy (the cosmological constant, in the first approximation), a neutral massive (or tachyonic) vector field (vecton), and massive (or tachyonic) scalar fields. These fields couple only to gravity and can generate dark matter and/or inflation. The concrete choice of the geometric Lagrangian determines further details of the theory. The most natural geometric models look similar to recently proposed brane models of cosmology usually derived from string theory.

Level (Hons, MSc,
   PhD, other)?

PhD

Consider for a student
   award (Yes / No)?

No

Would you like to
 submit a short paper
 for the Conference
 Proceedings (Yes / No)?

Yes

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