

**The Origin and Its Meaning**  
Gravitation and Cosmology

Cosmology has a dilemma with the amount of mass, of gravitation, in the universe. There appears to be both a shortage and an excess.

- The shortage is that the gravitation of the mass that has been identified is not enough to account for the present structure of the universe.
- The excess is that the state of the universe is just between the case of an open-ended expansion and that of an expansion - collapse alternation forever.

Thus it would appear that the universe simultaneously needs both:

- more mass so as to have been able to become so organized over the past, and
- less mass to insure its future expansion and dispersion. (A real infinity is impossible; there cannot be an infinite cycle of universes.)

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does for physics what Euclid did for geometry -- it supersedes mere empirical conclusions with derivation of all of physics.

One result is finding that the universe is in exponential decay. Among other quantities, gravitation is decaying.

Thus there was more past gravitation to organize the universe and there will be future less gravitation insuring continued expansion and dispersion.