

## 1.11: GUTS, Supersymmetry, and Supergravity

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This is not the end of the story. The standard model is surprisingly inelegant, and contains way to many parameters for theorists to be happy. There is a dark mass problem in astrophysics – most of the mass in the universe is not seen! This all leads to the idea of an underlying theory. Many different ideas have been developed, but experiment will have the last word! It might already be getting some signals: researchers at DESY see a new signal in a region of particle that are 200 GeV heavy – it might be noise, but it could well be significant!

There are several ideas floating around: one is the grand-unified theory, where we try to combine all the disparate forces in nature in one big theoretical frame. Not unrelated is the idea of supersymmetries: For every “boson” we have a “fermion”. There are some indications that such theories may actually be able to make useful predictions.

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