**Recursive Generation of Space-Times** DENNIS MARKS, Valdosta State University — Space-times can be generated recursively from a time-like unit basis vector **T** and a space-like one **S**. **T** is unique up to sign, corresponding to particles and antiparticles. **S** has the form of qubits. Qubits can make quantum transitions, suggesting spontaneous generation of space-time. Recursive generation leads from 2 dimensions to 4, with grades of the resulting algebra corresponding to space-time, spin-area, momentum-energy, and action. Dimensions can be open (like space-time) or closed. A closed time-like dimension has the symmetry of electromagnetism; 3 closed space-like dimensions have the symmetry of the weak force. The 4 open dimensions and the 4 closed dimensions produce an 8-dimensional space with a symmetry that is the product of the Yang regularization of the Heisenberg-Poincaré group and the GUT regularization of the Standard Model. After 8 dimensions, the pattern of real geometric algebras repeats itself, producing a recursive lattice of spontaneously expanding space-time with the physics of the Standard Model at each point of the lattice, implying conservation laws by Noether's theorem. The laws of nature are not preexistent; rather, they are consequences of the uniformity of space-time. The uniformity of space-time is a consequence of its recursive generation.

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