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Rotating Space Elevator: Classical and Statistical Mechanics of cosmic scale spinning strings[1] STEVEN KNUDSEN, LEONARDO GOLUBOVIC, West Virginia University — We introduce a novel and unique nonlinear dynamical system, the Rotating Space Elevator (RSE). The RSE is a multiply rotating system of cables (strings) reaching beyond the Earth geo-synchronous satellite orbit. Strikingly, objects sliding along the RSE cable do not require internal engines or propulsion to be transported far away from the Earth's surface. The RSE action employs, in a very fundamental way, basic natural phenomena – gravitation and inertial forces. The RSE exhibits interesting nonlinear dynamics and statistical physics phenomena. Its kinetic phase diagram involves both chaotic and quasi-periodic states of motion separated by a morphological phase transition that occurs with changing the RSE angular frequency.

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