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A UNIVERSAL BRIDGE USING HIGH TENSILE 2D LAYERED MATERIALS.

Abstract

A paper to propose the utilisation of the very high tensile strengths of 2d layered materials for use as a passenger transportation system. The unique, never-before-seen property of the system is that it would not require midway support and be ideal to span rivers, cities and the lunar surface. Bridges being traditionally supported by thousands of tonnes of concrete and steel, here only require two end anchors. The scalable design allows in theory, to bridge any distance before planetary curvature would interfere. The design requires the mass-manufacture of 2d layered materials in cylinders and in kilometre lengths. To bridge a span, two end anchors create a tensile force on a line of material in the tens of gigapascals range. Entwined and pressurised, the resulting helical topology of the surface allows for the reactionary force or grip of a topologically paired drive mechanism whose propulsion can be described. A comparatively simple transport system to construct and after years of public use, robotic construction of the design for future habitations off-world should also be possible.