A fully functional space frame structure made from 3D-printed components

**A FULLY FUNCTIONAL SPACE FRAME STRUCTURE MADE FROM 3D-PRINTED COMPONENTS**

**ARCHITECTURE & DESIGN**

Taking a mere two days to assemble, the components advance a new era of highly resource-efficient designs and unprecedented lightweight architecture.

**Spotted:** Architectural intelligence research lab AIRLAB SUTD has built what may be the world’s first fully functional space frame structure, made entirely from 3D-printed stainless-steel components.

Nested in the Gardens by the Bay, the pavilion opens up new potential for architectural practices and also demonstrates how materials could be efficiently be used to design more sustainable futures.

The AIRMESH system allows the load to be spread into more efficient standard components, which are also dramatically reduced in size and thus minimise the steel usage.

“We wanted to test the delivery of a plug and play “KEA-like assembly system, setting the precedence for future 3D-printed structures, which has the potential to replace traditional construction methods,” say AIRLAB.

The entire digital design and fabrication process not only minimises wastage in construction but has also been proven to increase structural efficiency and technological advancement.

Assembly took only 2 days, with transportation of much lighter products incurring a much lower carbon footprint, by improving the fuel economy.
**Takeaway:**

The steel industry alone generates between 7 per cent and 9 per cent of global fossil fuel emissions. By exploring the opportunities of 3D-printing technologies, AIRLAB has provided the possibility of creating energy-efficient structures that use much less material than traditional manufacturing processes. This lowers energy use, resource demands and related CO2 emissions over the entire product life cycle, which will likely induce changes in labour structures and generate shifts towards digital supply chains.