





**WHY**  
has Venturi reinvented the wheel?

Advanced technology wheels exist, but the engineers, chemists and physicists at Venturi Lab have designed a unique, hyper-deformable lunar wheel. Why develop this breakthrough technology based on unique materials?

**TO ACCOMMODATE**  
numerous significant challenges.

Solutions used on vehicles for the Apollo lunar mission and Curiosity Mars rover are not suitable, nor are terrestrial pneumatic tyres.

WHEEL CHALLENGES AND CAPABILITIES

	FLEX 2027 > ...	APOLLO LRV MISSIONS 1971 > 1972	CURIOSITY 2011 > ...	TERRESTRIAL TYRE
Works without atmosphere	✓	✓	✓	✗
Puncture proof	✓	✓	✓	✗
Radiation resistant	✓	✓	✓	✗
Supports a weight of 2T while travelling at 15 km/h	✓	✗	✗	✓
Works in temperatures up to -240 °C	✓	✗	✗	✗
Durable for over 5,000 km	✓	✗	✗	✓

## HOW has Venturi reinvented the wheel?

To achieve this breakthrough, as important as the invention of the rubber, and later pneumatic rimmed tyre in the 19th century, the Swiss teams of Dr. Antonio Delfino developed a system that required the invention of new materials.

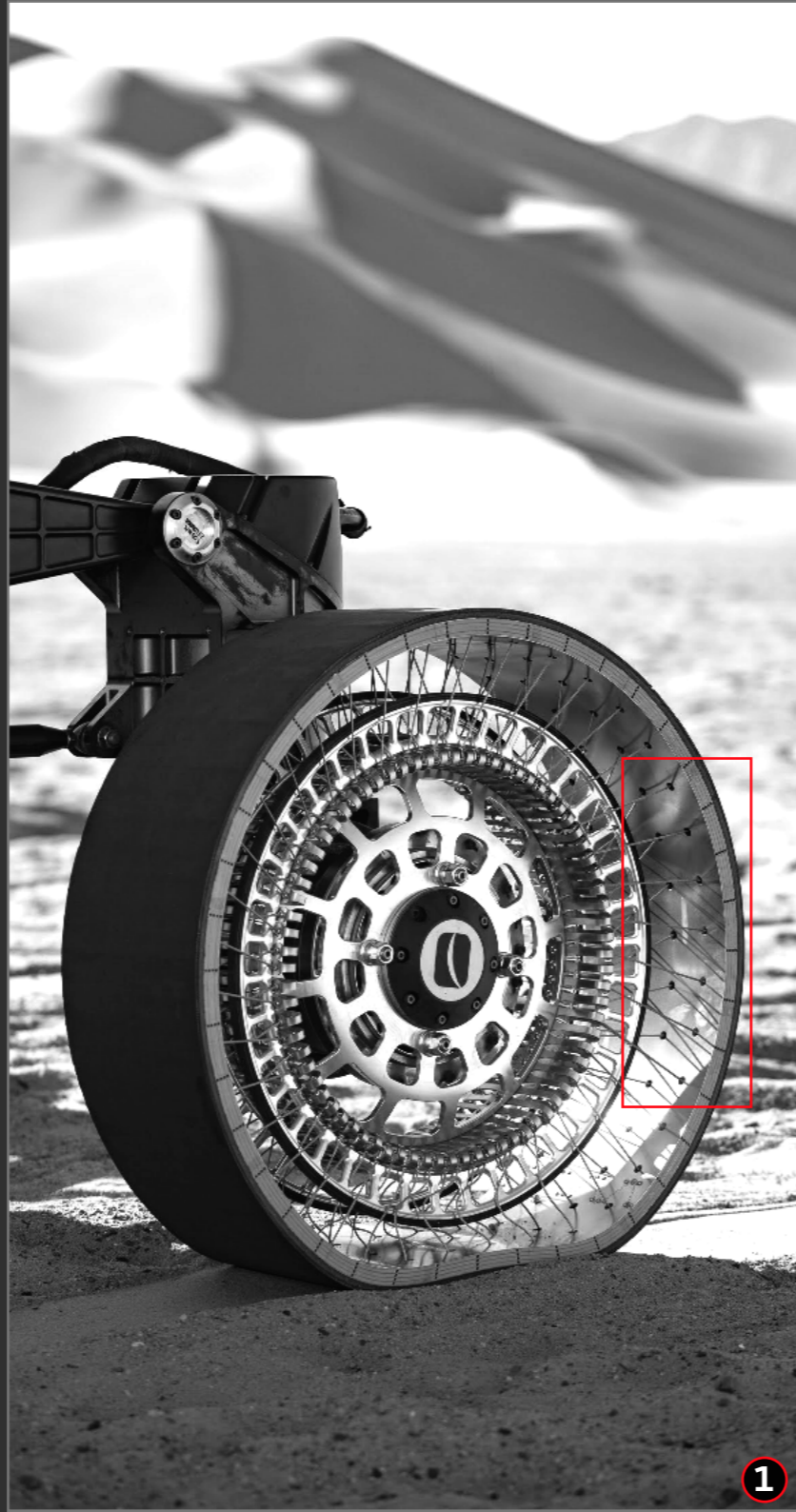
WATCH THE VIDEO 

## NASA and Venturi Space: a first-time partnership.

NASA has selected 16 projects from 12 different companies to analyse and test various innovations. Among those selected: Venturi Astrolab. The American-owned company – which is the strategic partner of Venturi Space (in Monaco) and Venturi Lab (in Switzerland) – submitted the Venturi wheel, which will be tested and analysed by NASA teams at the Glenn Research Center in Cleveland, and the Johnson Space Center in Houston.

*The materials and the wheel are protected  
by pending patent applications.*

VENTURI SPACE



**1.** 192 cables connect the inner circumference of the wheel to springs arranged along the large rim.

**2.** The bottom cables expand to allow the flexible tyre tread to hug the surface, while the upper cables stretch beyond their initial position thanks to the springs.

**3.** The spokes warp upon contact with the surface and regain their shape as the wheel rolls on.

**4.** The large rim acts as a stop and marks the limit of deformation of the tread.

**5.** Cables are arranged in four rows at different angles to optimise the

transmission of lateral forces, acceleration, braking and torque.

**6.** The tread is composed of several relatively inextensible stainless steel blades, held in place by a unique, super-elastic material, developed by Venturi Lab, that offers high flexibility at particularly low negative temperatures.

