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Story: Fred Lewsey

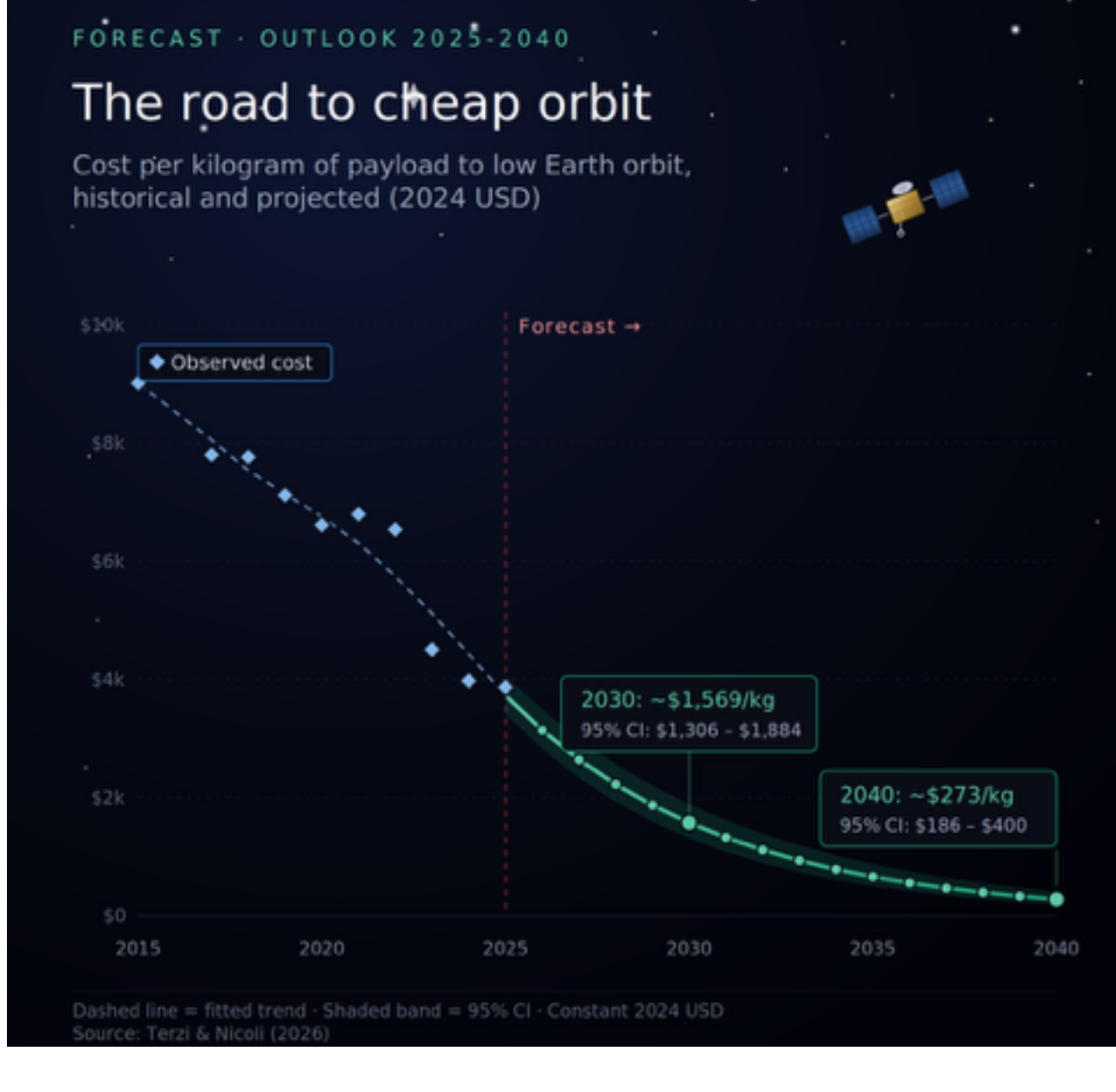
The cost of reaching **orbit** is now falling faster than that of **steamship** freight during the 1800s, a shift that economists say will once again **transform** global commerce.

The expense of launching cargo into space will plummet over the next few years, with the cost of reaching orbit forecast to more than halve between now and the end of the decade, and fall around 93% by 2040, [according to new Cambridge-led research](#).

The cost of sending a kilogram of payload into low Earth orbit, an average of \$3,868 last year, is set to fall more than 58% to just \$1,569 by 2030, and could reach as little as 273 US dollars per kilo by 2040, the study suggests.*

Researchers analysed the economics of the space industry using the largest global dataset of rocket launches yet assembled, covering more than 4,400 launches between 1960 and 2025, to project future trends.**

They show that the cost of reaching space is falling faster than the expense of steamship freight did during the 19th-century transport revolution, and even faster than solar photovoltaics: a benchmark for rapidly affordable “transformative technologies”.



Economists behind the report say that tumbling launch costs could see new industries emerge to create a space marketplace, from zero-gravity research and orbital tourism to factories exporting fibre-optic cables and 3D-bioprinted organs back to Earth.

“Space is no longer a science-fiction fantasy or a purely scientific pursuit, it is becoming a marketplace”

Dr Alessio Terzi

“As launch costs fall and commercial activity expands, we are entering an era where spacefaring is like any other economy, driven by incentives, trade and investment, and economists should be paying more attention,” said Dr Alessio Terzi from Cambridge’s Bennett School of Public Policy, who led the [study](#) published in the journal *PNAS Nexus*.

However, researchers caution that profit-maximising corporate monopolies combined with geopolitical tensions could drive up prices and delay the next stage of the space age, as nations focus on developing and using their own launch technologies.

They note that the space launch market is already dominated by one firm, SpaceX, which accounts for roughly 80% of total annual payload sent into orbit globally.

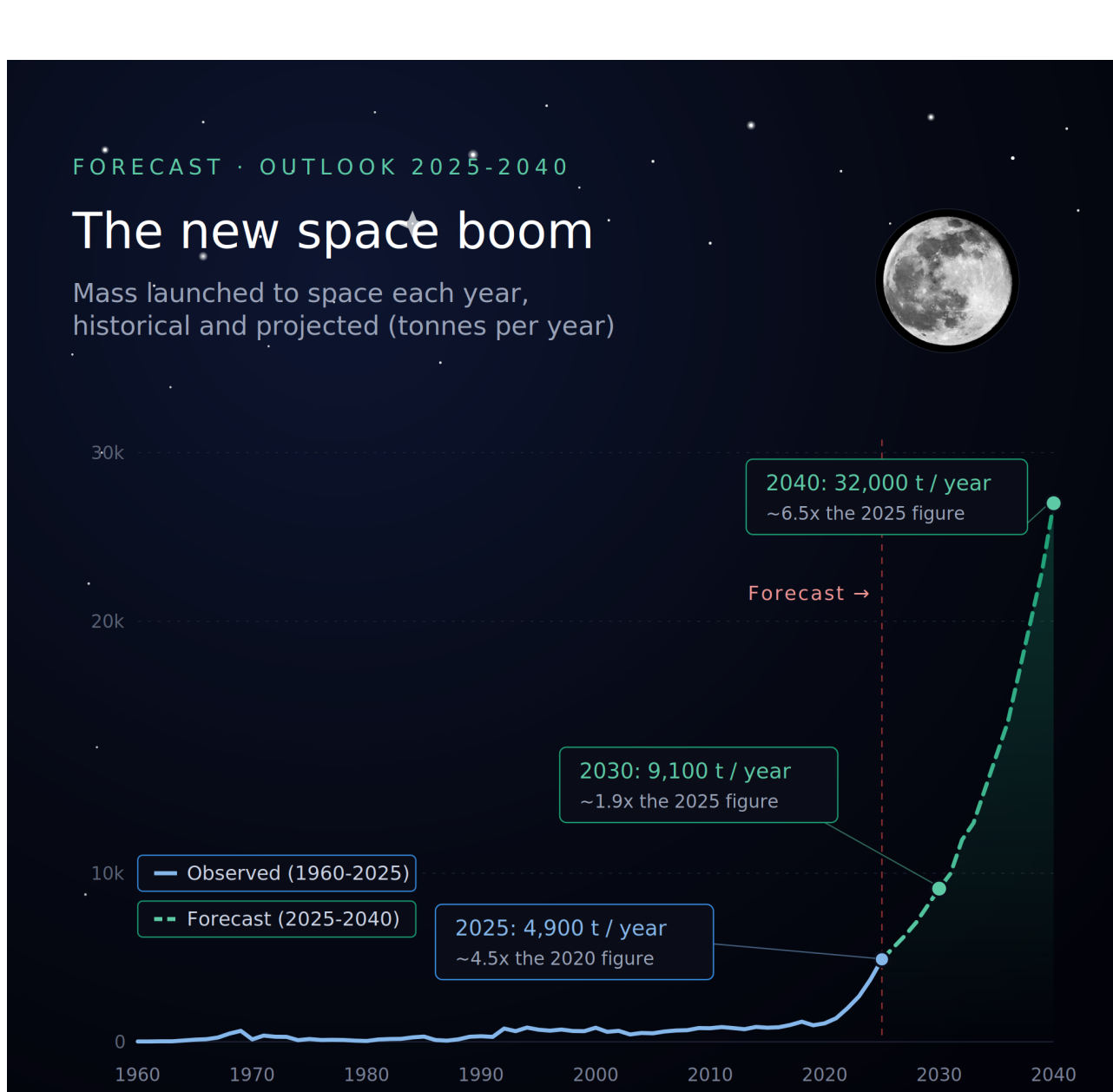
A [recent working paper](#) co-authored by Terzi shows this dominance of a frontier economy by SpaceX is equivalent to the East India Company’s hold on maritime trade in the 1820s.

The space sector has surged since 2020, thanks to the boom in satellite technologies, with the amount of payload launched into orbit growing by 31% a year, compared with average annual growth of 4% between 2000 and 2019.

About 4,900 tonnes were launched into orbit in 2025, and the space economy was worth over \$600 billion in 2024, equivalent to Sweden’s GDP.

Terzi and his colleague Dr Francesco Nicoli from the Politecnico Institute of Turin forecast this will almost double by 2030, when humanity will have the joint capacity to send 9,100 tonnes a year to low Earth orbit.

“SpaceX alone could achieve this with eighty flights of its new superheavy rocket Starship, which will be fully reusable,” said Terzi. He thinks the figure could hit 32,000 tonnes a year by 2040.

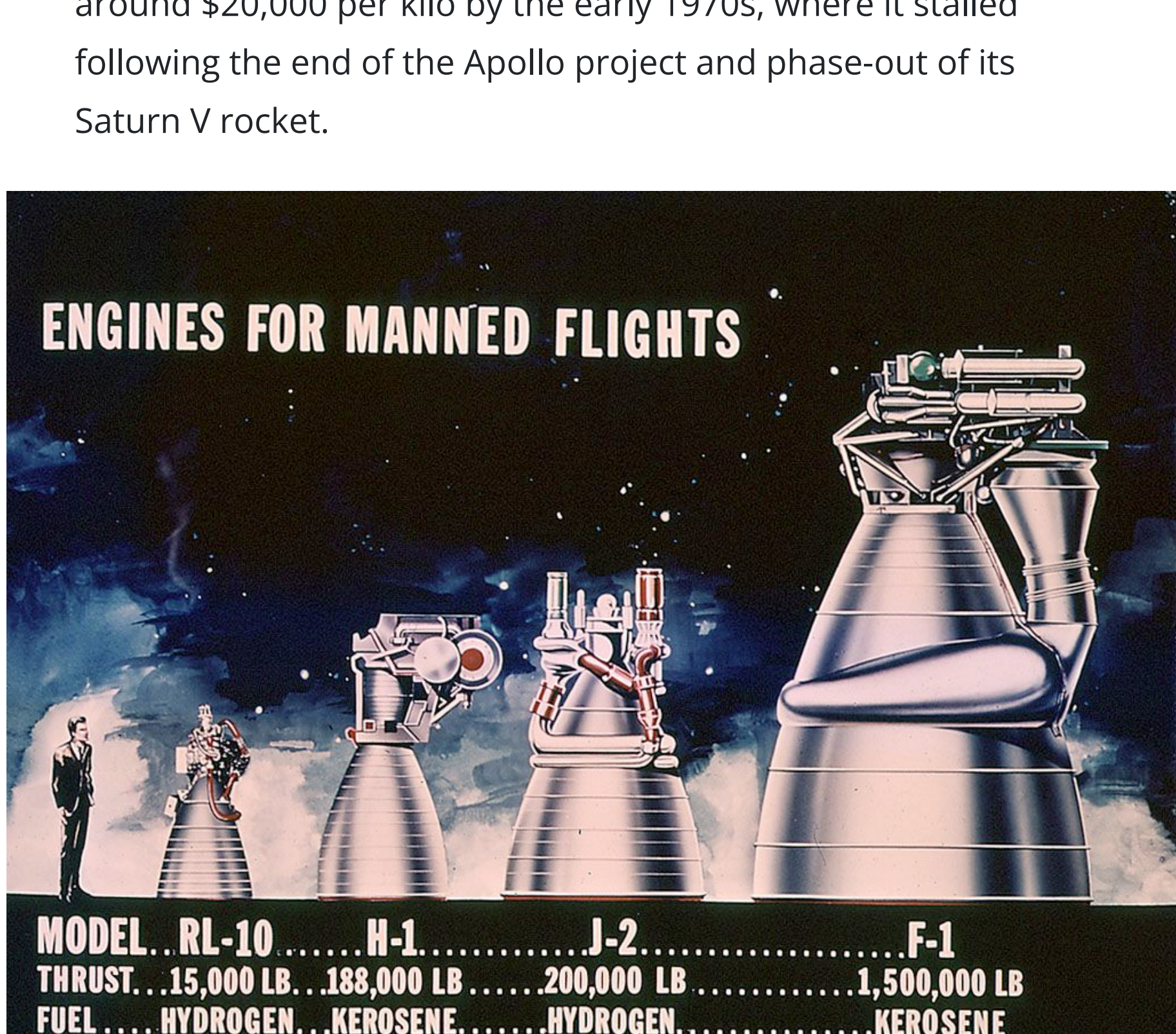


Their research found that every doubling of cumulative payload cut the average cost of sending a kilo into orbit by 21.2%. The economists compare the trend to steamship freight during the globalised Industrial Revolution of the 1800s, when costs fell by about 15.5% for each doubling of cargo volumes such as wheat and cotton.

“The cost of space launch technology is now falling faster than during one of history’s greatest transport revolutions,” said Terzi.

“Steamships cut costs through explosive growth in global trade. Space technology, by contrast, has achieved even steeper declines at a far smaller scale. This suggests there is plenty of scope for further cost reductions and the industry may now be on the cusp of a comparable economic boom.”

According to estimates in the latest study, the cost of reaching orbit fell 96% between 1960 and 2025. The Space Race drove costs down from over \$87,000 per kilo into orbit in 1960 to around \$20,000 per kilo by the early 1970s, where it stalled following the end of the Apollo project and phase-out of its Saturn V rocket.



Launch costs remained stable right up until the early 1990s, when the end of the Cold War saw big commercial interests injected into space, and costs once again began to slide.

In fact, Terzi and Nicoli compared space launch costs before and after 1989, and found that they fell over two-and-a-half times faster once the Berlin Wall came down, compared to the Cold War era of government investment in space.***

“State-led competition during the Cold War did not foster cost efficiency on the same scale as the ensuing era of international space cooperation and private sector involvement,” said Nicoli.

Researchers point out that the relationship between distance and cost works differently in space. Escaping our planet requires large amounts of energy, but once spacecraft reach orbit the gravitational pull is a fiftieth of that at sea level, and there isn’t that much difference in energy needs between, say, the Moon, or Mars.

“Rapidly falling launch costs could open the way to space colonisation and commercial activity far beyond low Earth orbit,” said Terzi. “Ever cheaper launch costs could open up possibilities around solar power production in orbit, asteroid mining, and a self-sustaining economy producing fuel, food and infrastructure in orbit or on the Moon.”

“Major polluting industries currently devastating the biosphere could even be offshored to sit outside the Earth’s atmosphere.”

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*****In 2022, some 78% of satellites orbiting the Earth were primarily commercial, with just 8% government operated, and 7% military.

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