

OKAJIMA Lena, who received her Ph.D. in astronomy from the University of Tokyo, founded Ale with the aspiration of developing man-made shooting stars. Besides wishing to inspire more interest in space, she hopes that her company's research will lead to the sustainable development of humankind and science.

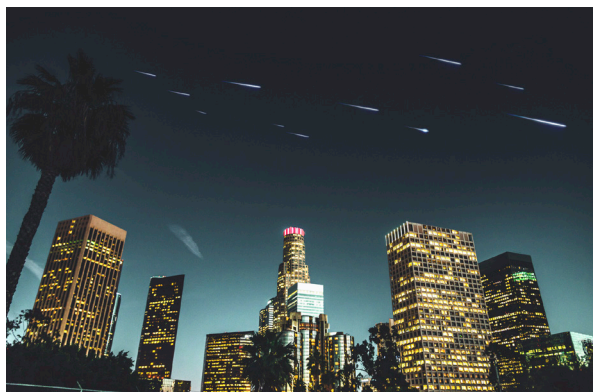
THE DAY WHEN MAN-MADE SHOOTING STARS WILL SHINE IN THE SKY

As part of its growth strategy, the Kishida administration has pledged its support for startup companies. A leader in innovation, Ale Co., Ltd. is pioneering the original idea of releasing man-made shooting stars into the night sky. This new startup won a prize in the 21st Japan Venture Awards and now seeks to develop its own unique technologies for sustainable progress in space exploration and scientific development.

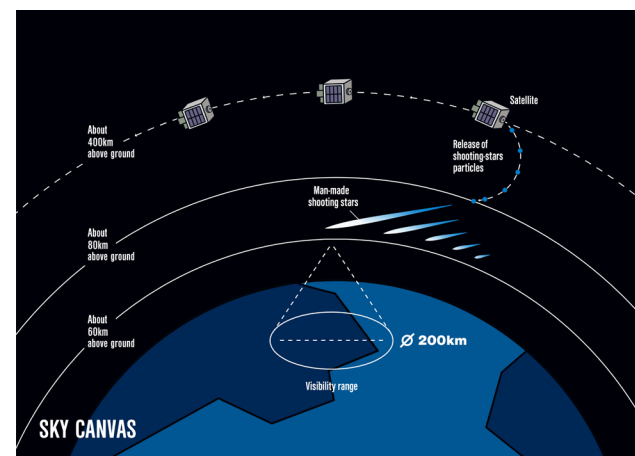
It all began in November 2001 with the Leonid meteor shower. The shower of shooting stars fizzling through the night sky consisted of tiny dust particles from outer space that burn up as they enter the Earth's atmosphere. Given their relatively simple composition, one can create their very own shooting stars—inspiring

the idea of making falling stars visible on demand from anywhere in the world. While majoring in astronomy at the University of Tokyo, OKAJIMA Lena was able to envisage such a possibility.

To make her dream a reality, Okajima founded Ale Co., Ltd. in 2011. For a man-made shooting



Left: Ale's man-made shooting stars, designed to be observable for a longer duration than natural shooting stars, will be visible within a 200-km diameter in the night sky. The company is also looking to branch into new business areas such as tourism. ALE CO., LTD.
Right: The shooting star particles—just 1 cm in diameter—will completely burn up in the Earth's atmosphere and are designed not to collide with other objects orbiting the Earth. ALE CO., LTD.



In the Sky Canvas mission, which will release shooting stars in the night sky, particles of about 1 cm in diameter are to be released by a device installed on a satellite. The meteor particles will look like shooting stars as they burn up at an altitude of about 60-80 km, and from the Earth's surface will be observable at a maximum distance of 200 km. ALE CO., LTD.

stars on such a grand scale, our goal is to inspire more interest in science and curiosity about the universe, and at the same time, we hope to contribute to a sustainable Earth and space with the technologies we develop.”

One goal that the company has set as its mission is solving the problem of space debris. In collaboration with the Japan Aerospace Exploration Agency

(JAXA), Ale has developed a device to use the Earth's atmospheric drag and the Lorentz force to change the orbit of old satellites and the upper stages of rockets, bringing them down to a level where they can safely burn in the atmosphere, thus preventing them from becoming debris.

The company is also developing a technology to measure water vapor concentrations from around sea level up to an altitude of about 50 km using remote sensors on satellites. Atmospheric observations at sea are relatively difficult, and the data available are scarce compared to measurements from the ground. Using satellites to obtain the wealth of oceanic atmospheric data that is currently lacking will not only improve weather forecasting but will also help unravel the mechanisms of climate change and extreme weather.

To develop the necessary science and bring innovations to space is the strong desire that drives Okajima. “We plan to extend into a variety of businesses. For example, we can use the technology as a tourism resource by releasing shooting stars at events worldwide,” she says. “Over the last decade, the environment surrounding space exploration has changed dramatically, making it easier to obtain technical cooperation or raise funds.”

The Kishida administration is promoting Japan as a science and technology nation and has proposed comprehensive support for startups. Just as Okajima pioneered a space business with her novel idea, new innovators will contribute to creating future industries. ●

star to be created, a small satellite will be launched that releases particles roughly 1 cm in diameter. These particles will then burn up as they enter the atmosphere to look just like shooting stars when seen from the ground. The shooting stars developed by Ale will emit light observable even from brightly lit cities, with the spectacle lasting for a few seconds longer than natural shooting stars. “Fireworks can be seen from about 10 km away, but man-made shooting stars will be observable with the naked eye over an area 200 km in diameter. I hope that people will share those precious extra seconds to enjoy the fun and excitement of looking up at the night sky,” explains Okajima.

Technological development on small satellites and a meteor-release device proceeded smoothly at first thanks to the support of a university and other organizations, enabling the launch of two satellites in 2019. Though Ale's first man-made shooting stars had been scheduled for release in 2020, this unfortunately had to be postponed due to a malfunction with one of the satellites. Undeterred, however, the company is aiming to release the world's first man-made shooting stars in 2023.

Ale's activities are not limited to painting the sky through the science of shooting stars under the Sky Canvas project. Okajima, who majored in astronomy, explores how science can lead to business. “I strongly believe that fundamental science is crucial for the sustainable development of humankind. Through space entertainment with man-made shooting