Ariane 6 launches: Splashdown for Nyx Bikini

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Installing Nyx Bikini alongside other first passengers on Ariane 6. Credit: European Space Agency

Europe's newest rocket soon launches, taking with it many space missions each with a unique objective, destination and team at home,

cheering them on. Whether launching new satellites to look back and study Earth, peer out to deep space or test important new technologies in orbit, Ariane 6's first flight will showcase the versatility and flexibility of this impressive, heavy-lift launcher.

Hot on the heels of being selected for Europe's cargo transportation initiative to the International Space Station, the Exploration Company's Nyx Bikini intends to perform a ballistic reentry demonstration.

Nyx Bikini is a technology demonstrator of 60 cm diameter—about the size of a large lampshade—that will allow Exploration Company to get their first data on atmospheric reentry and calibrate their mathematical models.

At the end of the Ariane 6 mission, the upper stage of Europe's new rocket will be flying at roughly 28,800 km/h around Earth. A few minutes before the upper stage sends itself to a fiery and safe disposal into Earth's atmosphere, Nyx Bikini will be detached to also fall down to Earth.

Unlike the Ariane 6 upper stage, Nyx Bikini has been designed to survive the intense heat that generates during reentry—up to 2,100°C.

Developed in just nine months and for a cost of under 2 million euros Nyx Bikini is an example of the new European space sector.

Hélène Huby, The Exploration Company CEO explains, "From an industrial point of view, having built Nyx Bikini in just nine months from sketch to qualification has enabled us as a start-up to prove ourselves to supply chain partners, prove our development and production processes, and it demonstrates that we can build spacecraft fast and for a fraction of the costs—while accepting risks."

Artist's view of The Exploration Company's Nyx Bikini reentry capsule demonstrator as it enter's Earth's atmosphere. Credit: The Exploration Company

Some of the hardware in the reentry capsule is not designed for space, for example, the avionics hardware—the spacecraft's "brain"—has been

taken from the drone industry and is not qualified to withstand the radiation it may receive in space. As the Nyx Bikini mission will last just three hours, the risk of a serious failure is low and using established hardware for Earth is a way to reduce costs and time to build.

Another example is how Nyx Bikini phones home during its descent into the Pacific Ocean: it will be using a standard satellite phone. Simulations show it should work, but the phone terminal was—unsurprisingly—not designed to be used from inside a returning spacecraft.

Bikini is an uncontrolled capsule, so in order to prevent that it tumbles and reenters with its heatshield backwards, three flaps will force Bikini to reenter with its heatshield forward. This technical solution bears more risk but is cheaper than costly and complicated thrusters.

"If one of these risks materialize, we will gather no data and our mission will fail," explains Hélène, "but we will have gathered unique learnings about our technical capabilities, our industrial processes, our supply-chain partners, and the legal and technical path to secure a reentry license."

Hélène continues, "This mission is a first step that paves the way for a European reusable space capsule. We are receiving countless messages from people from different backgrounds and countries in Europe, thanking us for inspiring them, because our company embodies that Europe can be bold and pioneer technologies beneficial for the world."

"This first launch with Ariane 6 will be a special time for all of us, at The Exploration Company, as we will also be going to space, for the first time. Our team will be experiencing it together, and our emotions will be intense," says Hélène,

"Whatever the outcome of the mission, I am grateful for the relentless

work of our team and of our partners who all contributed to build and qualify our Bikini capsule at unprecedented high speed and low costs.

"This also means that we have accepted some risks of mission failure. It reflects our DNA: for our first missions, we prioritize learning and iterating fast (which means more risks, but also faster learning), versus building the perfect capsule."

And the name?

"The name was chosen jokingly, because the capsule might be almost 'naked' when it splashes down, and the bikini swimwear when it was invented in the 1960s, was quite innovative," concludes Helene.

Provided by European Space Agency

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