QUANTUM CYBER

The Quantum Photonic Antenna

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Quantum Cyber N.V. (NASDAQ: QUCY)

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The Quantum Photonic Antenna

A new way to capture, organize, and use light across autonomous and defense platforms

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SUMMARY

Sunlight contains a variable mix of wavelengths, but today's photovoltaic technology captures only a limited band of the available spectrum. The Quantum Photonic Antenna is designed to capture a much broader range of light and aggregate that multiphoton energy into a narrow-phase, narrowband, quasi-coherent photomagnetic stream, capturing a significant portion of the infrared, visible, and ultraviolet energy reaching the antenna surface.

Put simply, sunlight arrives as many different colors at once. Conventional hardware can use only part of that traffic. The Quantum Photonic Antenna is designed to open more lanes, sort what arrives, and bring that energy into a tighter, more organized stream.

The same architecture can be configured as a multiphoton transmitter-receiver. Shift-encoded photon signals can be distributed across multiple frequencies, received, reorganized, and converted toward a controlled output band.

For communications, think of the antenna as both a receiver and a frequency-agile translator. Instead of forcing an entire message through one predictable lane, the architecture can move an encoded photonic stream across multiple frequency lanes and reorganize it at the receiving end.

In either mode, squeezing is a critical step. Fermi-based processing is designed to make the photonic stream predominantly magnetic, reducing ohmic dissipation during transmission, supporting frequency-diverse cyber-resilient signaling, and facilitating teleportation.

The practical picture is compression and control. Instead of allowing many photon events to remain a loose crowd, squeezing is intended to bring them into a tighter formation so the system can move and use the resulting energy or signal more efficiently.

THE OPPORTUNITY

A receiver built for the limits of autonomous systems

Autonomous platforms are advancing quickly, but every mission still runs on a finite energy budget. More flight time, more sensing, stronger communications, and greater payload capacity all compete for the same limited weight and surface area. The antenna's multiphoton communications mode is also intended to add cyber resilience by shifting an encoded photonic stream across multiple frequencies rather than relying on a single predictable channel.

Quantum Cyber N.V. holds an exclusive worldwide license from Project LightShift, Inc. to develop and commercialize the patent-pending Quantum Photonic Antenna for unmanned aerial vehicles and drone platforms used in defense and national security applications.

The architecture is designed to interact with a much broader range of light than a conventional single-band receiver. It separates photons by wavelength, uses probability and state-transition logic to control what happens next, converts different inputs toward a common band, squeezes the resulting stream into a narrower predominantly magnetic state, and coordinates its movement through phase control. The result is intended to be a thin, integrated surface that can harvest energy and also operate as a multiphoton transmitter-receiver.

A SIMPLE PICTURE
Think of a digital soundboard for light. Different channels listen to different colors, a translator brings those inputs toward a common form, and a compressor tightens the result into one controlled stream. The technology is doing to photons what a sound studio does to many separate tracks: identify them, organize them, shape them, and bring them together.

THE PLATFORM PROBLEM

Why a different receiver-transmitter and energy capture layer is needed

A small unmanned aircraft cannot solve every mission requirement by carrying more hardware. Additional batteries reduce payload. Larger apertures add drag and weight. Separate receivers for power, sensing, and communications consume space that the platform does not have.

The Quantum Photonic Antenna begins with a different design question: what if one nanoscale surface could interact with a much broader range of light than a conventional single-band receiver and organize it for multiple uses? Instead of forcing one material or one aperture to do everything, the architecture combines many specialized photonic elements into a coordinated receiver-transmitter and energy-capture array.

FIVE COORDINATED STEPS

How the architecture works

The system can be understood as a five-step pipeline. Each stage adds structure and control. The simplest way to think about it is that the antenna first listens broadly, then sorts what it receives, translates the inputs into a common form, squeezes that stream into a tighter state, and finally keeps the resulting wave moving in step.

STEP	TECHNICAL FUNCTION	PLAIN-LANGUAGE PICTURE
Capture	Broad-spectrum photonic energy reaches the array.	Many small windows open to different colors of light.
Separate	Frequency-specific structures identify and isolate photons by wavelength.	A sorting center sends each incoming color to the correct lane.
Convert	Different photon inputs are converted toward a common output band.	A translator brings different inputs into a common language.

Squeeze	Photon-squeezer processing consolidates the converted stream and makes it predominantly magnetic.	A compressor tightens a loose stream into a denser, more controlled formation.
Synchronize	Probability/state-transition logic and phase control coordinate wave propagation across the array.	Traffic signals release each packet only when the next part of the route is ready.

Local thermal-control functions are also part of the architecture. They are intended to manage heat near active photonic elements, where thermal noise can disrupt nanoscale behavior. This is especially important for airborne systems, which cannot rely on the large cooling infrastructure used in laboratory quantum machines.

THE OPERATING PHYSICS

What makes it quantum

The word quantum describes how the device is intended to operate, not a marketing label. At approximately one to four nanometers, quantum dots behave differently from ordinary bulk materials. Their available energy states are discrete and can be influenced by their size and structure.

That gives the designer a powerful control lever: different dots can be tuned to interact with different wavelengths. The system then uses probability-state storage and transition logic to decide when a photon can advance, squeezing to consolidate the converted stream into a narrower predominantly magnetic state, and phase control to keep wave propagation coordinated across the array. In plain terms, the device is not simply collecting photons; it is controlling when they move, what form they take, and how they travel together.

WHY TIMING MATTERS
The array behaves less like a bucket collecting light and more like a controlled traffic network. Each quantum element must know when a photon has arrived, when its conversion is complete, and when the next element is ready. Probability and state-transition logic act like traffic signals; phase control keeps the flow moving in step; squeezing keeps that flow tightly organized.

DEFENSE AND AUTONOMY

Mission value across power, communications, sensing, and navigation

The licensed field centers on unmanned aerial systems and defense platforms. Within that field, the antenna is being developed as a multifunction photonic layer for energy capture, transmitter-receiver communications, sensing, and navigation.

EXTENDED ENDURANCE
Supplemental energy capture may slow battery depletion, extend loiter time, or preserve payload capacity. The objective is not to replace the battery, but to capture a significant portion of otherwise unused infrared, visible, and ultraviolet energy reaching the antenna surface.

OPTICAL POWER BEAMING
Broad spectral reception can accept changing optical inputs, while internal conversion, squeezing, and phase control are designed to organize those inputs toward a common output. Instead of requiring every source to speak exactly the receiver's language, the antenna is designed to accept a wider range of optical inputs and translate them into a form the system can use.

CYBER-RESILIENT COMMUNICATIONS
The antenna can be configured as a multiphoton transmitter-receiver for shift-encoded signals in denied or contested environments. By distributing the encoded stream across multiple photonic frequencies, the architecture is designed to make the signal more difficult to identify, intercept, jam, or disrupt. Post-quantum cryptography can then protect the information carried across the link. In simple terms: the antenna helps protect the pathway; cryptography protects the message.

SENSING & NAVIGATION
Wavelength-selective reception may support multispectral sensing and optical navigation by allowing the system to distinguish useful visual information across different parts of the spectrum. In GPS-degraded or denied environments, this capability could support celestial, terrain-referenced, or other optical navigation methods that help the platform determine where it is without relying on a satellite signal. In simple terms: the antenna may help the drone use the world around it as a navigation reference.

The communications concept has two complementary security layers. At the physical layer, the antenna can transmit and receive shift-encoded multiphoton signals across multiple photonic frequencies. By changing the frequency structure of the transmitted stream, the architecture is intended to make the signal more difficult to identify, intercept, jam, or disrupt through attacks aimed at a single predictable channel. At the information layer, post-quantum cryptographic protocols can protect the message carried across that photonic link. One layer protects how the signal travels; the other protects what the signal says.

BEYOND DRONES

A broader photonic platform

The initial focus is defense UAVs, where the technology can be developed around a clear and immediate mission need. But the underlying quantum photonic architecture has potential well beyond drones. Its broad-spectrum capture, frequency conversion, squeezing, phase control, and transmitter-receiver capabilities may extend across other platforms where power, communications, sensing, and surface area are constrained. For QUCY, that creates a focused entry point today with the potential to participate in a much broader technology platform as it develops.

SATELLITES & SPACE SYSTEMS
A conformal photonic surface may support supplemental energy harvesting, including solar-facing panels integrated into satellite surfaces, while also supporting low-latency optical communications between satellites and ground stations. The same architecture could help space platforms collect energy, relay data, and make more productive use of limited surface area.

LOW-LATENCY SPACE COMMUNICATIONS
The transmitter-receiver architecture may support frequency-diverse optical links between satellites, aircraft, and ground stations. By shifting, receiving, and reorganizing photonic signals across multiple frequencies, the system is intended to support rapid, low-latency space-to-space and satellite-to-ground communications.

ENERGY HARVESTING & CONFORMAL SURFACES
The broad-spectrum capture architecture may also extend to solar roof panels, vehicle skins, building surfaces, maritime platforms, and other exposed structures. The idea is to turn otherwise passive surface area into an energy-harvesting layer while preserving the ability to support sensing and communications functions.

LADAR (LASER RADAR) VS. RADAR
The same photonic transmitter-receiver concept may support laser-based detection and ranging. Where RADAR uses radio waves to detect and range objects, LADAR uses laser light. Because the antenna is designed to work across multiple photonic frequencies, it may provide a foundation for future multispectral sensing, ranging, and target-detection applications.

DEVELOPMENT PATHWAY

From architecture to demonstrable hardware

The program is moving from modeled architecture toward a demonstrable module. The development plan covers system definition, risk assessment, simulation, photolithography to create the target device pattern, controlled dot deposition for component and array fabrication, integration, environmental testing, yield demonstration, and final prototype delivery. Rather than relying on a conventional clean-room fabrication flow, the array is designed to be built through controlled dot deposition that places and forms the nanoscale elements according to the photolithographed pattern.

The prototype is intended to test broad-spectrum photonic capture, photon isolation, frequency conversion, squeezing, coordinated wave propagation, transmitter-receiver functionality, frequency-diverse cyber-resilient signaling, thermal regulation, antenna coupling, and integration with a representative drone power and data interface. The central objective is repeatability: the device must not only work, but be fabricated consistently and operate under representative vibration, thermal-cycling, electromagnetic-interference, and contested-environment conditions.

DEFINE	SIMULATE	PHOTOLITHOGRAPH	FABRICATE	INTEGRATE	DEMONSTRATE
Architecture and process	Risk and performance	Create target pattern	Components and array	Module and environment	Hardware and data

WHAT THE HARDWARE MUST ANSWER

Can the array capture a significant portion of useful spectrum, convert and squeeze it into a coordinated output, transmit and receive shift-encoded multiphoton signals across multiple frequencies, demonstrate cyber-resilient communications behavior under contested conditions, be fabricated with repeatable yield, and survive real UAV environments? In other words: can the physics be turned into a repeatable, field-ready device?

DR. WOLF KOHN

A long research lineage, applied to a new mission

The Quantum Photonic Antenna draws on decades of work by Dr. Wolf Kohn in quantum systems, deterministic phase control, hybrid control, photonic energy conversion, and nanoscale array design. His research has consistently focused on a central idea: physical systems can be engineered not only through their materials, but through the controlled behavior of their states, transitions, and interactions.

Project LightShift applies that lineage to a patent-pending photonic architecture. Quantum Cyber brings a defined defense and unmanned-systems commercialization pathway to the technology.

BUILD. MEASURE. IMPROVE.

The near-term objective

The ambition is broad, but the next step is practical: build the device, measure its performance, improve the design, and establish where it creates the greatest mission advantage. Progress will be judged by energy capture, conversion, squeezing and phase-control performance, transmitter-receiver operation, frequency-diverse communications resilience, manufacturing repeatability, environmental performance, and platform integration.

THE INVESTMENT LENS
The next value inflection points are concrete: completed design, fabricated array, measured capture and conversion, validated squeezing and phase control, transmitter-receiver demonstration, frequency-diverse communications testing, repeatable yield, environmental validation, and an integrated prototype. Each step moves the program from an engineered concept toward measured hardware performance.

Forward-Looking Statements

This whitepaper contains forward-looking statements concerning anticipated capabilities, development milestones, potential applications, commercialization pathways, and prospective benefits of patent-pending technology. The technology is early-stage and pre-commercial. Prototype performance may differ materially from modeled expectations, and development is subject to technical, fabrication, yield, integration, environmental, regulatory, export-control, funding, intellectual-property, customer-adoption, and defense-procurement risks. Actual results may differ materially. Quantum Cyber N.V. undertakes no obligation to update forward-looking statements except as required by law. This document is for informational purposes only and is not an offer to sell or a solicitation of an offer to buy any security.