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PRESS RELEASE

Vescent Awarded Multi-Year, Multi-Million Dollar Contract to Develop Portable Atomic Clocks

- Vescent awarded BAA optical clock development contract by the Office of Naval Research
- 5-year, \$16.2M award
- Deliverables include field deployable units
- New clock to be more stable, lower SWAP, and higher TRL than previously available in field-deployable clocks

Golden, Colorado; 9 December 2021. Vescent Photonics, LLC has signed a \$16.2M development program contract with the Office of Naval Research (ONR) in response to an ONR Broad Area Announcement (BAA). Under the three-phase, five-year Compact Rubidium Optical Clock (CROC) program, Vescent will design, build, and deliver a new generation of atomic clocks with improved performance that are ready for field deployment at a high Technology Readiness Level (TRL). “This award could not have come at a better time,” said Dr. Scott Davis, co-founder & CEO of Vescent. “Vescent has a deep and wide R&D team that is poised to deliver on this important program. This contract represents a milestone for both Vescent and the Navy. Our continuing focus on field-deployable, low-SWaP architectures will bridge the gulf between the current unwieldy laboratory-bound technology and the DoD’s pressing need for field-deployable optical clocks with the next level of stability.”

The final deliverable of the award will be 10 prototype field-deployable optical clocks at or above TRL 6 that exhibit long-term instability of $<3 \times 10^{-14} / \tau^{1/2}$ and offer >50% reduction in power consumption. “Our development team has some challenging days ahead of them,” said Dr. Kurt Vogel, Vice President of Technology. “They will be re-engineering current technology and developing new methods to reduce the size, weight, & power consumption, increase environmental durability, and improve long-term stability. The clocks must be truly field deployable. We will integrate our optical frequency comb technology with the strengths of our team partners: ColdQuanta will provide the physics package with development inputs from the Atomic Devices and Instrumentation Group at the National Institute of Standards and Technology (NIST). Octave Photonics and the Quantum Nanophotonics Group at NIST will supply crucial advances in non-linear nanophotonics. Together, we will deliver this new level of performance.”



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CROC will improve upon existing commercial atomic clocks by interrogating a two-photon optical clock transition in a warm vapor of rubidium (Rb) atoms to achieve better stability than obtained by probing the conventional microwave clock transition. The contract began in November 2021 and will continue in three phases through 2026. During phase one of the program, all critical technology elements will be advanced to TRL 6 and demonstrated in a modular clock. In phase two, engineering and verification efforts will integrate the individual components into prototype clocks. Phase three will focus on manufacturing the ten final prototype clocks for ONR evaluation in relevant platforms.

[About Vescent Photonics LLC](#)

Vescent Photonics, LLC was founded in 2002 to develop and market products combining the flexible properties of liquid crystals and the capabilities of lasers. Wholly non-mechanical products (without moving parts) including beam steerers, tunable lasers, and spectrometers were designed and delivered to the market. Vescent began offering its unique series of precision lasers and control electronics in 2005. In 2016, the liquid crystal business unit and technology rights were sold to Analog Devices (ADI) and Vescent has since emphasized its photonics tools business serving the Quantum 2.0 market space. Vescent has a long history of converting government funding to market-ready products.

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