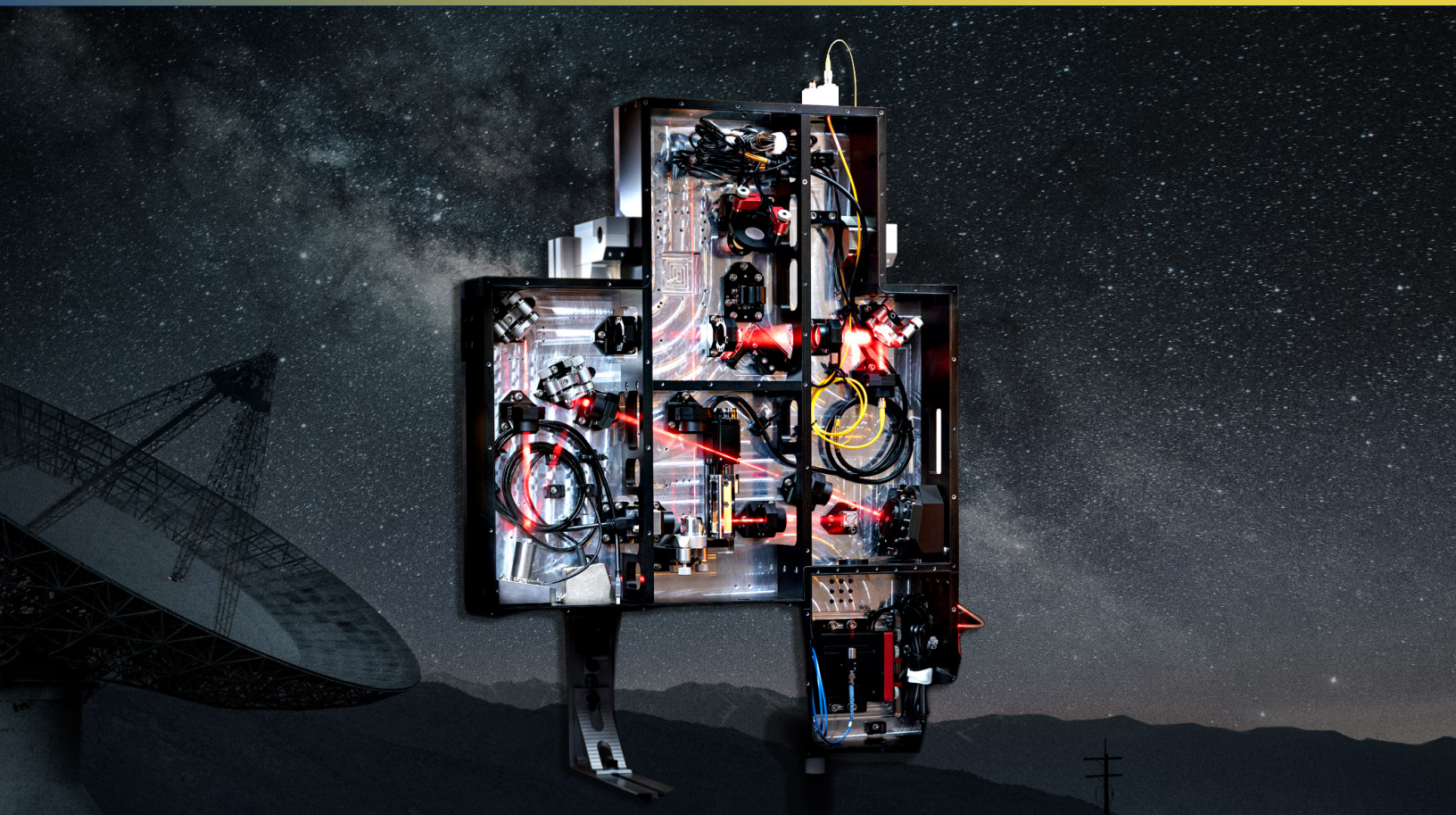


MULTI-USE ADAPTIVE OPTICS SYSTEM



GA SYNOPTA ADAPTIVE OPTICS (PHOTO © FRAUNHOFER IOF)

The General Atomics Synopta Multi-Use Adaptive Optics System (MuAO) is designed to efficiently couple optical signals received by a telescope into a single mode fibre, enabling reliable, highly stable classical and quantum optical communication links, even under strong atmospheric turbulence conditions. The MuAO system is designed to be compatible with multiple telescopes with aperture sizes ranging from 0.6 meters up to 2.2 meters, and for links with satellites in LEO/MEO and GEO, as well as airborne platforms. The design of the MuAO system supports free-space laser communication for classical and quantum signals in the optical c-band between 1530 nm and 1570 nm. Alternate wavelength ranges can be accommodated by request.

The MuAO system is compatible with telescopes with Nasmyth, Cassegrain, and Coudé focus configurations. The output interface of the MuAO system is two optical ports. The first optical port is a single mode fibre output, and the second is a flexible free space output that can be configured for specific application needs.

Included in the MuAO system is the acquisition and tracking functionality, specifically adapted to each telescope interface to ensure reliable link acquisition with a single mode fibre output. The MuAO software control allows active user interface as well as fully automated and remote operation.

The MuAO system is designed to operate under harsh environmental conditions ranging from high altitude mountainous regions to sea level, and in regions with challenging atmospheric turbulence conditions.

Building on more than 10 years of successful laser communication ground station and adaptive optics operations, the MuAO system offers the functional performance and reliability needed for current and future classical and quantum communication networks. Furthermore, the MuAO system meets the most rigorous industrial quality standards and combines traditional Swiss precision with most advanced technologies in a high-performance industrial product for harsh environment.

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MuAO MAIN FUNCTIONAL AND PERFORMANCE FEATURES

Input telescope diameter	0.6 up to 2.2 meters
Input telescope f-number	6.8 to 12 nominal, up to 40 possible upon request
Telescope configuration	Nasmyth, Cassegrain, Coudé configurations accommodated
Operating wavelength range	1530 to 1570 nm shared between classical and quantum channels Alternate wavebands available upon request.
Acquisition field-of-view	typical 0.15° (sensor diagonal)
Classical Output	Single Mode Fibre
Quantum Output	Free Space or Single Mode Fibre (customer choice)
Actuator count	492 (performance version) 140 (economy version)
Number of corrected spatial modes	≥ 320 (performance version) ≥ 80 (economy version)
r_0 (assuming 0.8 m telescope diameter)	≥ 3 cm (performance version) ≥ 6 cm (economy version)
Recommended Greenwood frequency	Up to 100 Hz Operation with reduced performance is possible at higher wind speeds.
Polarization dependent loss	< 0.2 dB
Electrical Power	110 - 230 VAC, 50 Hz, < 750 W
ENVIRONMENTAL CONDITIONS	
Operational Temperature Range	0°C up to +40°C
Relative Humidity Range	5% up to 80% (non-condensing)
Operating Altitude	Sea level up to 2'500 m (@40°C), higher altitudes possible upon request
Non-operational Temperature Range	-10°C up to +60°C