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Towards a NEMO prototype

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Future detectors, such as NEMO, Voyager, & Cosmic Explorer, will likely use Silicon optics, ~2000nm lasers, cryogenic temperatures, active mode control, high-circulating power & AlGaAs coated mirrors. We present progress & plans towards a prototype coupled cavity that combines these technologies. This poster presents an overview of the experimental topology and status updates.

On input optics & suspensions, we show progress in stabilising a 1995nm laser to a 7m ultra-stable, suspended cavity. We present the characterisation of our piezo pre-isolation scheme.

On active mode control, we present a coupled cavity mode sensing scheme and the development of large-diameter, thermally actuated recycling mirrors (TSAMS).

On cryogenics, we show a status update on our cooling scheme and the successful integration of the technologies in the vacuum envelope.

Together, these updates develop the path towards a high-power, 3G prototype facility. This facility is essential in developing the NEMO concept.

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