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Cryoscope, a technology pathfinder for time domain astronomy in the NIR

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The convergence of many new technologies will soon enable high cadence surveys of the infrared sky for the first time. We describe a pathfinder telescope currently under construction, which will demonstrate imaging over a field of view two orders of magnitude greater than previously achieved in the thermal infrared. The novel optical design not only delivers diffraction limited image quality over larger fields, but its double meniscus corrector serves as the entrance window to a fully cryogenic optical path that assures low thermal background. We describe the window manufacturing and support strategies which allow scaling to apertures larger than a meter, and the various methods to prevent ice precipitation. A new, cheaper, growth process for large format infrared detectors is showing promise of making a 600 megapixel NIR focal plane feasible. High speed direct drive telescope mounts, now commercially available, will be upgraded to provide the vibration isolation necessary to take advantage of the exquisite seeing.

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