

New Pre-Alignment Camera
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Astronomers use Laser Guide Stars (LGS) to expand the range of Adaptive Optics (AO). At Gemini North Observatory a one of a kind 15W solid-state laser propagates from the top of the telescope 90km high, causing sodium resonance that creates an LGS. The path of the beam starts from the lower side of the telescope and continues in an enclosed series of mirrors and lenses called Beam Transfer Optics (BTO). The objective of this project is to design and install a pre- alignment camera (PAC) to view one of these mirrors in the BTO, known as TCM (Trust Centering Mirror). The TCM PAC will speed up the alignment of the laser beam by eliminating the need for a person to physically look at the mirror and radio in the position. Alignment is necessary before each laser run. As the telescope moves in altitude and azimuth, so does the BTO. Although the BTO is held firmly in place, the beam tends to vignette over time due to gravity. In addition, the design must be MCAO (Multi Conjugate Adaptive Optics) compatible. MCAO is the Gemini South LGS/AO system that will involve the use of 5 beams to improve image quality.