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Catching the Light: the Giant Magellan Telescope

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There has been an explosion of theoretical work outlining how the first galaxies might have formed 13 billion years ago. The Giant Magellan Telescope (GMT) is to be the first of three extremely large ground-based telescopes capable of confronting theory with detailed observations of primordial galaxies. With a collecting area approaching 400 square meters and adaptive optics to remove the image blurring of the earth's turbulent atmosphere, the GMT offers a huge leap in sensitivity over the largest existing telescopes. Building a high-performance telescope of this scale relies on recent technical advances in optics and electronics. I describe the major technical challenges addressed in the GMT's design, and offer a glimpse of ground-based astronomy with extremely large telescopes a decade hence.