There is a growing demand for novel solar power technologies to extend the current capabilities of small satellite missions.

Diffraction occurs when a wave (ex: light) falls on a slit of an aperture less than or equal to the size of the incoming wavelength. With a right shape and distance between two slits an interference system can be produced to focus light.

Leveraging non-imaging and diffractive optics we are able to increasing the acceptance angle significantly. The second layer is composed of many diffractive cells which can bend light to the silicon strip beneath them or to the neighboring one. Our current design is optimized to provide an acceptance angle of +/-30°.

Utilizing Diffraction Efficiency Modulation (DEM) we are able to “shunt” IR wavelengths between cells. DEM decreases junction temperature resulting in an increase in overall electrical performance.

Diffractive optical elements are fabricated via lithography. This process enables the small etching depth and width that are required for this technology. Once the lithography has been performed on quartz wafers, the pattern can be transferred to plastic layers by embossing enabling a rollable solar wrap.

To meet this demand in energy, we have developed a new solar power technology called MOUND which utilizes 3 diffractive optical layers. MOUND is rollable, mass fabricable and achieves a 10x increase in energy density providing robust, cost-effective and mission enabling power conversion.

MOUND