

have circular symmetry about their axis, or linear focus, in which the lens has a constant cross section along a transverse axis. Such lenses focus the light into a line. Point-focus lenses usually use one cell behind each lens, whereas line-focus lenses have a linear array of cells. A particularly successful linear configuration is the domed Fresnel lens. As will be seen in the section on concentrator optics, this minimizes the image dispersion coming from chromatic aberration and flexural distortion. It also provides the lens with greater rigidity. Domed point-focus lenses have also been developed. These variations are illustrated in Figure 11.1.

The material of choice for the lens is usually Acrylic plastic (polymethyl methacrylate or PMM), which molds well and has shown good weatherability. Nevertheless, there remain some long-term durability concerns for PMMA, and so attempts to make the lens from glass, or to mold the lens material to the underside of a glass substrate, have been made. So far, these ideas have remained in the laboratory.

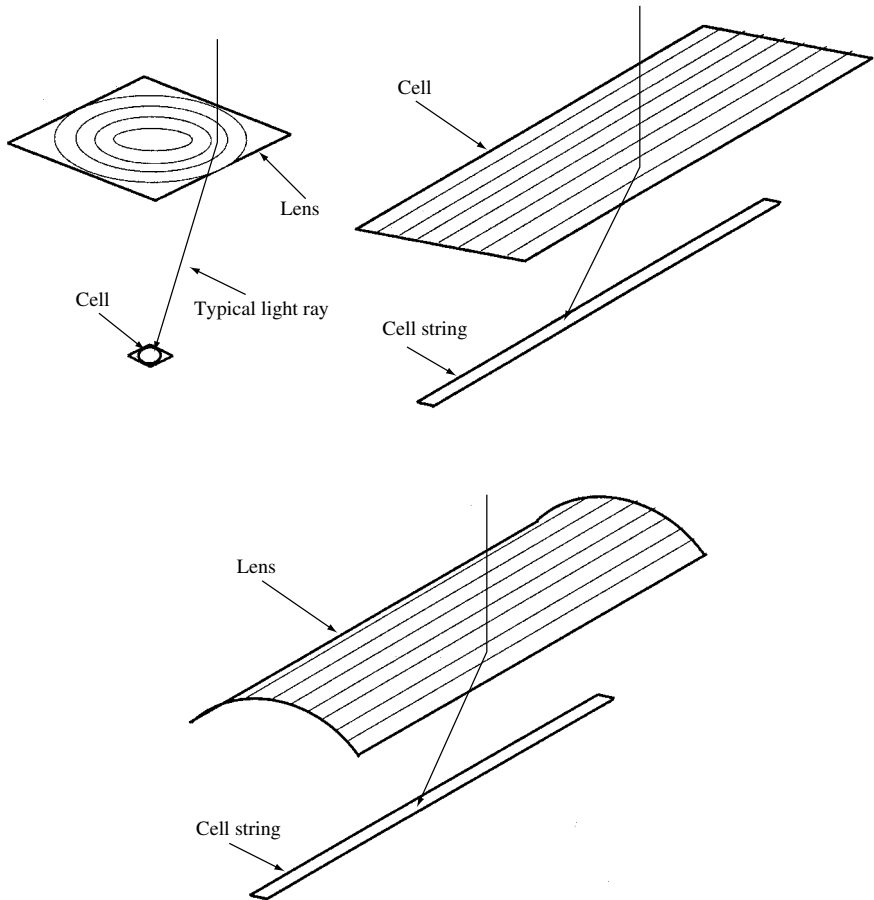


Figure 11.1 Fresnel lens configurations. (a) Point focus Fresnel lens showing a typical ray hitting the circular active area of the solar cell. (b) Linear, or one-axis, Fresnel lens focusing on a line of solar cells in a string. (c) Domed linear Fresnel Lens