

HIGH RESOLUTION IMAGING USING SUBWAVELENGTH GRATING STRUCTURES

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Conventional optics are generally restrained by a law of physics known as the diffraction limit, which dictates that optical systems can only resolve images down to about half the wavelength of the light used to produce the image ($\lambda/2$), or down to about 200 nanometers for most standard optics. This invention uses a grating system consisting of alternating layers of metal with openings smaller than operating wavelength. This allows for one order of magnitude smaller than operating wavelength (doubles the diffraction limit). Analyzing the measured intensity of light and reconstruction of fine details of images smaller than operating wavelength – achieves high optical imaging resolution ($\lambda/20$) or 20nm. This technology would be useful to image semiconductors and thin slices of biological tissues. .