

A Martian ethologist observing humans using their visual systems would almost certainly include in their report back: ‘they move these small globes around a lot and that’s how they see’... We believe that movements of the eyeballs are a fundamental feature of vision. This viewpoint is not widely current. Many texts on vision do not even mention that the eye can move.

— **John M. Findlay and Iain D. Gilchrist (2003; 1) Active Vision: The Psychology of Looking and Seeing. Oxford University Press. Oxford, UK.**

## IT'S ALL ABOUT THE FOVEA

Our synchronized eyeballs shift in their sockets relentlessly. Stimuli of interest are captured by peripheral vision and processed at lightning speed to determine the precise trajectory of saccadic shifts. Saccadic movements place selected points of interest precisely in line with the fovea, the tiny portion of each retina which provide visual acuity.

The spherical shape of the eyeballs provides maximum maneuverability. The protruding corneas provide the correct focal lengths without compromising the spherical structure of the embedded portions of the eyes. (The corneas are responsible for about 70% of focusing.) Again, mostly in service of optimizing fixation at the foveae, the antagonistic muscles of the irises and the ciliary muscles of the lenses also make constant fine adjustments.

The irises optimize the amount of incoming light by adjusting the pupil apertures. The ciliary muscles stretch the lenses (which in their relaxed states resemble transparent jelly-filled bags) to refract incoming light patterns to the foveae. Focusing by adjusting the shape of the lenses is known as accommodation.