

## The Neutrino

The neutrino is perhaps the most bewildering of all the elementary particles known to physics and among the most philosophically provocative. It has no physical properties—no mass, no electric charge, and no magnetic field. It is neither attracted nor repelled by the electric and magnetic fields of passing particles. Thus, a neutrino originating in the Milky Way or in some other galaxy and traveling at the speed of light can pass through the earth as if it were so much empty space. Can it be stopped? Only by a direct, head-on collision with another elementary particle. The chances of that are infinitesimally small. Fortunately, there are so many neutrinos that collisions do occur. Otherwise, physicists would never have detected them. Just think, even as you read this sentence, billions of neutrinos coming from the sun and other stars are passing through your skull and brain. And how would the universe appear to a neutrino? Eminent astronomer V. A. Firsoff provides a picture:

*The universe as seen by a neutrino eye would wear a very unfamiliar look. Our earth and other planets simply would not be there, or might at best appear as thin patches of mist. The sun and other stars may*

*be dimly visible, in as much as they emit some neutrinos.... A neutrino brain might suspect our existence from certain secondary effects, but would find it very difficult to prove, as we would elude the neutrino instruments at his disposal.*

*Our universe is no truer than that of the neutrinos—they exist, but they exist in a different kind of space, governed by different laws.... The neutrino ... is subject neither to gravitational nor to electromagnetic field.... It might be able to travel faster than light, which would make it relativistically recede in our time scale.*

### QUESTIONS

1. What impact does the presence of neutrinos have on your view of reality?
2. Arthur Koestler writes: "To the unprejudiced mind, neutrinos have indeed a certain affinity with ghosts—which does not prevent them from existing." What does this mean?

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Sources: V. A. Firsoff, *Life, Mind and Galaxies* (New York: W.A. Benjamin, 1967); Arthur Koestler, *The Roots of Coincidence* (New York: Random House, 1972), 63.