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Speed Kills: Highly Relativistic Spaceflight Would be Fatal for People and Instruments WILLIAM EDELSTEIN, Johns Hopkins School of Medicine, ARTHUR EDELSTEIN, University of California, San Francisco — Stories, books and movies about space travel often describe journeys at near-light velocities. Such high speed is desirable, as the resulting relativistic time dilation reduces the duration of the trip, at least for the travelers, so that they can cover interstellar distances in a reasonable amount of time (by their own clocks) and live long enough to reach their destination. The relativistic rocket equation shows the enormous difficulty of achieving such velocities. As spaceship velocities approach the speed of light, interstellar hydrogen, although only present on average at a density of about 2 atoms per cm^3, impinges on the spacecraft and turns into intense radiation (Purcell, 1963) that would quickly kill passengers and destroy instrumentation. In addition, the energy loss of ionizing radiation passing through the ship's hull represents an increasing heat load which necessitates large expenditures of energy to cool the ship. Preventing this irradiation by the use of material or electromagnetic shields is a daunting and, as far as we know, unsolvable problem. The presence of interstellar hydrogen is yet another formidable obstacle to interstellar travel.

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