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**A Brief Introduction to the  
Kerr Metric Space Warp**

(as extracted from the Glossary of *StarDrive Engineering*)

German physicist Karl Schwarzschild found a solution to Einstein's field equations in 1916 which, roughly speaking, describes the space-time in which a black hole resides. But this solution is strictly valid only for "static" black holes having zero spin (angular momentum) and zero net electrical charge.

An *Einstein-Rosen bridge* is a type of space warp or "wormhole" produced by a static black hole, which is thought to connect the hole with another (and perhaps remote) position in space-time *via an alternate continuum or set of dimensions* and which is a phenomenon that was found to be necessary to preserve the internal consistency of the Schwarzschild solution. A starship cannot traverse an E-R bridge, however, because the black hole *contains a point-like singularity*.

A *Kerr metric space warp* is a type of spatial anomaly which may be produced by a rotating black hole. New Zealand mathematician Roy Kerr derived a set of solutions to Einstein's field equations that presented a much more realistic picture of black hole space-time than the static Schwarzschild solution, by assuming that the star from which the black hole formed must have a finite rotation that the hole would inherit.

Such a black hole would collapse to a modified *annular* (ring) singularity which still requires the presence of a wormhole, but in this case it is theoretically possible to enter such a space warp *intact* on a certain trajectory that cuts across the plane of the black hole's rotation. Since a *metric* is essentially any formula yielding the distance between two points in a given spatial frame of reference, a Kerr metric space warp is then one in which it is actually possible to calculate the foreshortened length the wormhole must have if a starship's velocity through it is still properly limited to a value less than that of light.