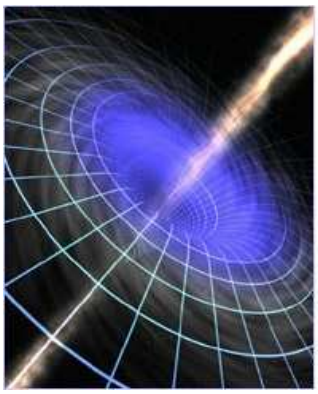
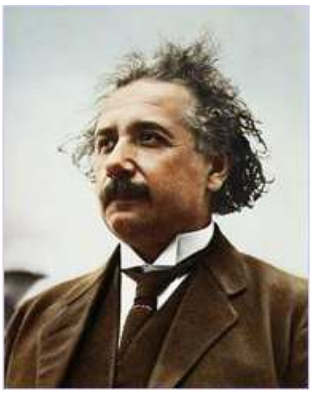
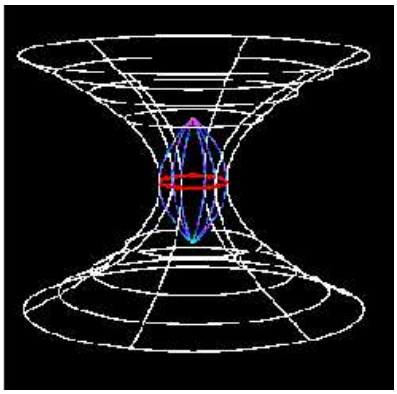
WANT TO LEARN ABOUT EINSTEIN'S RELATIVITY AND BLACK HOLES?

Take Differential Geometry at ETSU this summer!

The East Tennessee State University Department of Mathematics and Statistics will offer a **graduate level class in Differential Geometry** (MATH 5310) Term II of Summer 2011 (July 11 to August 12). The class will be held in Gilbreath Hall, Room 314 at 11:20-12:50 Monday through Friday. This will be a somewhat unconventional introduction to differential geometry. The class will use as a text *Differential Geometry and Relativity Theory, An Introduction* by Richard L. Faber (ISBN 0-8247-1749-X). For a general **introduction to relativity theory**, we will use as a supplemental text "Relativity: The Special and the General Theory" by Albert Einstein, available from Random House. The only formal **prerequisites are Calculus 3 and Linear Algebra**. Some exposure to physics would also be useful.

Topics to be covered include: curvature of paths and surfaces, geodesics, Gauss' *Theorema Egregium*, inertial frames, special relativity, time dilation and length contraction, Lorentz transformations, space-time diagrams, simultaneity, the Twin Paradox, gravity, Einstein's field equations, general relativity, the Schwarzschild solution, bending of light, the precession of Mercury's orbit, black holes, Schwarzschild radius, Eddington-Finkelstein coordinates, light-like geodesics, event horizon, causality, singularity.

Students will be evaluated based on their performance on homework assignments. Dr. Gardner will also offer a Summer Term II **undergraduate Special Topics** in Math (MATH 4957) as a senior level class covering similar topics. For more information, call Dr. Gardner at 439-6979 or check out the website at `http://faculty.etsu.edu/gardnerr/5310/diffgeo-2011.htm`

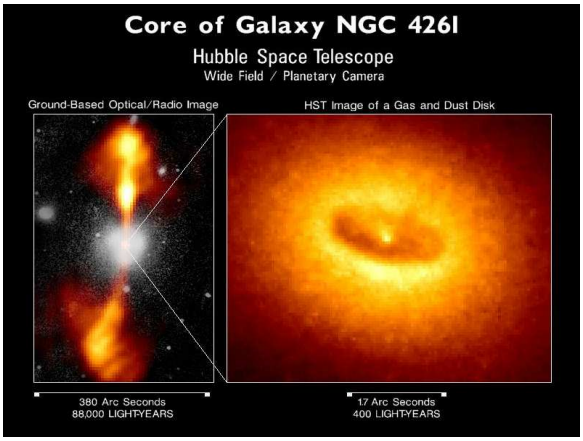


Image of the core of NGC 4261 showing the accretion disk around the central supermassive black hole.