

Special and General Relativity, Black Holes, Warp Drives, Gravitational Waves, Wormholes as Time Machines, Cosmology, Modified Gravity Theories, Horizons, Casimir Effect, Unruh Radiation and Quantized Inertia, Thermodynamics and Entropy, Information, and Why we do not need Dark Matter

TOPICS:

- (1) Special Relativity: Spacetime Diagrams, Lorentz Transformations, Invariant Intervals, Light Cones, Acceleration and Rindler Horizons, Paradoxes, Energy and Momentum.
- (2) General Relativity: Light Cones, Einstein Equations, Curved Spacetime, Black Holes and Event Horizons, Hawking radiation, Gravitational Waves and Warp Drives.
- (3) Wormholes and Time Machines
- (4) A little Bit of Cosmology: Big Bang, Inflation, Expanding Universe and Cosmic Background Radiation, Standard Model of Cosmology, The assumption of Dark Matter and Dark Energy and the Hubble Problems.
- (5) Modified Gravity Instead of Dark Matter: MOND possibilities. The Amazing Many-Year-Saga of the Heretic Stacy McGaugh From Dark Matter believer to Dark matter doubter based on "experimental" evidence.
- (6) Horizons, Casimir Effect, Unruh Radiation and Quantized Inertia can replace dark matter!
- (7) Thermodynamics and Entropy, Information and Missing Mass can replace dark matter!
- (8) Are Superfluids the answer to all the conflicts?