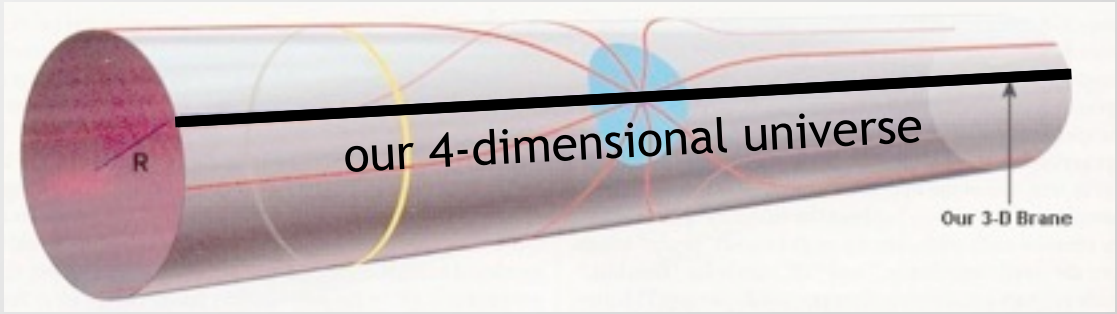
Kaluza's fifth dimension

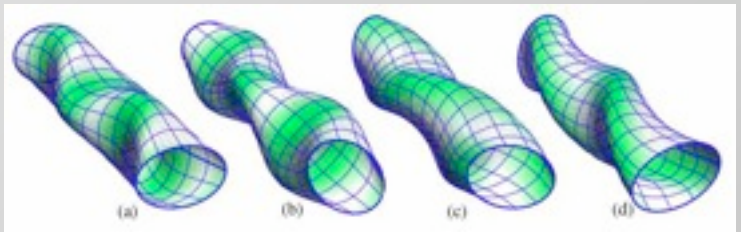
How does Einstein's general relativity look like,
if the universe has five instead of four dimension ?



a 5-dimensional universe

Einstein gravity : $R_{\mu\nu} - \frac{1}{2}\, g_{\mu\nu}\, R \;=\; 0$

now gravitational waves can propagate along the fifth dimension



describe a four-dimensional
electromagnetic field !
(T. Kaluza, 1921)