Teaching Physical Concepts Beyond the Boundaries of "Standard Culture" and Language

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Understanding proton spin (1920's) makes Magnetic Resonance Imaging possible (1970's). Understanding the energy density tensor and its associated curvature tensor (1925) makes global positioning work accurately (1990's). Understand electron quantum tunneling (1920's) makes iPods possible (ca. 2000). Understanding superconductivity (1930's) may revolutionize electrical power distribution (trial grids since the 1980's) and mass transit (Japan 1980's), and understanding the zero-mass behavior of electrons near a Brillion zone boundary in graphene (late 2005) is, apparently, going to dramatically revolutionize *all* electronic devices. These notions or concepts are "outside" the "standard culture" boundaries at this time in the same way "gravity," (introduced in the late 1600's was outside the "standard culture" of that time. There is no question that some people must understand these notions or concepts if our technological society is to survive. At the present time the only "representation" of these "concepts" involves sophisticated mathematics, the only truly universal language on the planet. Any "common language" used simply is used between priests of the cult to represent the mathematics. There is no "physical understanding" of any of these concepts. If we continue to *begin* teaching these concepts with junior-level physics and physical chemistry courses in universities, then the "cultural divide" (in the C P Snow sense) will become enormous and lead to a culture with a very few number of priests who have complete control of all society. So, how do we start teaching these "concepts," all of which involve time and distance scales beyond anything that evolution has armed us with, at the kindergarten level? I have no idea ,but we should, as a society, at least get the issue on the table.