

# The twistor perspective on space-time, string theory and quantum mechanics

George Sparling

University of Pittsburgh

Following the initiative of Max Planck, Albert Einstein set quantum mechanics on its path with his theory of the photoelectric effect. He also gave a deeper impetus to statistical physics with his theory of Brownian motion. Finally, following on his formulation of the theory of special relativity and the invention of space-time by Hermann Minkowski, Einstein produced his theory of general relativity describing the gravitational field in terms of the curving of space-time. The outstanding problem has been to integrate these three facets of his work.

The twistor theory of Sir Roger Penrose is an attempt to provide a unifying framework for the fundamental physics of Einstein. Recently dramatic progress in twistor theory has been made by incorporating ideas of string theory, which is itself an approach to unifying gravity and quantum mechanics. In my talk I will discuss these problems from a mathematical and geometrical point of view and I will try to indicate avenues for future progress. I will not assume any prior knowledge of the subject.