What are the essential differences between classical physics and quantum theory? According to Planck, action is quantized (not energy); according to Schrödinger and Heisenberg, quantum theory deals with complex quantities since the imaginary unit $i$ occurs in both their equations. In history, Plato and Pythagoras "quantized" the world in terms of right-angled triangles and triples of integers. How can all these aspects be unified and even extended to cover more than conventional quantum theory? The answers to these questions can be found by studying the time-dependent Schrödinger equation with Gaussian wave packet solutions that are characterized by their maximum and their width. The equation of motion for the maximum simply reflects the classical dynamics, whereas, a complex nonlinear Riccati equation describes the dynamics of the width and, thus, typical quantum effects like tunnelling. The combination of both aspects allows one to find a dynamical invariant with the dimension of action that still exists in cases where the energy or Hamiltonian no longer possesses this property. This even holds for open systems with irreversible dissipative dynamics. The operator corresponding to this invariant permits the definition of generalized creation and annihilation operators and associated coherent states. The same formal structure can also be found in many other fields of physics like time-independent quantum mechanics, nonlinear dynamics, statistical thermodynamics, Bose-Einstein condensates and even cosmology, for which certain examples will be given.