# 4D Electron Microscopy:
# History, Development and Applications

Ahmed H. Zewail
*California Institute of Technology, Pasadena, CA 91125*
*zewail@caltech.edu*

Whereas in all conventional EM methods, imaging, diffraction, and chemical analyses have been conducted in a static (time-integrated) manner, now it has become possible to unite the time domain with the spatial one, thereby creating four-dimensional (4D) electron microscopy. This development is based on the fundamental concept of timed, coherent single-electron packets, or electron pulses, which are liberated with femotosecond durations. Structural phase transitions, nanomechanical motions, and the embryonic stages of nucleation and crystallization are examples of phenomena that can be imaged with high spatial resolution and ten orders of magnitude as fast as hitherto. In this talk, we will present an overview of advances in this field, including recent extensions to nanoscale plasmonics, 4D tomography, and near-field biological imaging.

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Some recent references:
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