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Electron Microscopy for Atomic/Electronic Structure of Quasicrystals

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As stated with special emphasis in the Noble Lecture by Dr. Shechtman, the quasicrystal discovery is definitely the victory of electron microscopy – the first icosahedral stereogram was constructed by a series of electron diffraction patterns from a tiny quasicrystalline grain, and the following high-resolution electron microscope images indeed confirmed a unique aperiodic order that can never be consistent with twinning of normal crystals. Almost thirty years after these early electron microscopy studies, we are now in the era of aberration-corrected electron microscopy which realizes a remarkable resolution beyond an Ångstrom scale [1, 2]. In the talk, I will describe the local atomic/electronic structure of quasicrystals using state-of-the-art scanning transmission electron microscopy, providing several striking insights that may lead to the answers for the longstanding key questions; “Where are the atoms? And why do quasicrystals form?”

[1] Eiji Abe, *Chem. Soc. Rev.*, 41 (2012) 6787-6798., [2] Eiji Abe, in "Scanning Transmission Electron Microscopy" pp. 583-614 (Springer, 2011)

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