

Measurements of Electron Densities in Solids

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This talk reports the recent progress in the measurement of electron densities in inorganic crystals and its significance for our understanding of bonding and electronic structure [1]. The talk is organized in two parts. The first part first emphasizes the importance of accuracy in experimental structure factors for electron density mapping and the challenge of studying inorganic crystals, which is then followed by an introduction of the convergent beam electron diffraction technique for accurate structure factor measurement. The second part of the talk reports the study of electron density in several inorganic crystals of materials interest with focus on transition metals and ions. Comparison between experiment and theory will be made to highlight the significance of experimental electron density and the need for further study. The talk will be concluded by looking into future challenges and opportunities in materials science for crystallography.

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[1] Zuo J.M., *Reports on Progress in Physics*, 2004, **67**, 2053-2103.

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