

10. Reciprocal Space

- Ewald sphere
 - Higher-order Laue zones, HOLZ rings
 - Excitation error
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11. Crystal Potential

- Delta function, Fourier transform, convolution theorem
 - Crystal potential, unit-cell potential, crystal function
 - Incident beam and diffracted beams as plane waves, diffracted-beam amplitudes
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12. Dynamical Diffraction

- Solutions of the wave equation for high-energy electrons in the periodic crystal potential.
 - Periodic structure function $U(\mathbf{r})$, extinction distance ξ_g
 - Two-beam condition, strong two-beam condition, general two-beam result $\Psi_g(z)$
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13. Diffraction from Crystals

- Structure factor definition; Forms for *sc*, *bcc*, *fcc* lattices
 - Diamond and zinblende structures
 - Systematically absent and kinematically forbidden reflections
 - Indexing hexagonal lattices
 - Superlattices, atomic ordering
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14. Kinematical Diffraction

- Effective excitation error
 - Kinematical approximation
 - Diffraction from thin crystals, relrods
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15. Indexing Diffraction Patterns

- Determining zone axis
 - Indexing spot patterns; indexing ring patterns
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16. Kikuchi Diffraction

- Variations with beam/sample tilt of diffraction-spot position, intensity
 - Origin of Kikuchi diffraction: diffuse scattering; Kossel cones
 - Kikuchi bands, maps
 - Dependence of Kikuchi-line positions on beam/sample tilt; measuring excitation error
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17. Convergent-Beam Diffraction

- Differences between selected-area and convergent-beam diffraction

- Influences of condenser aperture size, first condenser lens current
 - Kossel-Mollenstedt vs. Kossel patterns
 - Kikuchi and HOLZ (Bragg) lines in CBED
 - Indexing spots in HOLZ ZAP diagrams
 - Determining type of ZAP
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18. Using CBED

- Influence of thickness, extinction distance and thickness determination
 - HOLZ ring radius
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Labs

6. Raman Spectroscopy
7. Atomic Force Microscopy
8. TEM Sample Prep – Polishing, Dimpling, Ion Milling
9. Convergent-Beam Electron Diffraction