✓ **Chapter 1**: The Quantom Theory Of Potential Scattering

- Quantal scattering by a short range potential
  - The differential cross section
  - Calculation of the scattering amplitude
  - Scattering by a complex potential
- Charged-particle scattering
  - Rutherford scattering
  - Coulomb-plus-nuclear scattering
- Scattering of identical particle
  - Classical scattering
  - Quantal scattering
- An example of potential scattering

✓ **Chapter 2**: Semiclassical Scattering

- Classical scattering
  - The deflection function
  - The classical cross section
  - Glory, rainbow and orbiting
- The semiclassical approximation (WKB)
  - The phase shifts in the semiclassical approximation
  - Evaluation of the scattering amplitude in WKB
- Special features of semiclassical scattering
  - The glory
  - The rainbow
- semiclassical approximation for complex potentials
  - Phase shift for integer angular momenta
  - Complex angular momenta: saddle points

✓ **Chapter 3**: The Wave Optical Description Of Potential Scattering

- Diffraction in optics and nuclear scattring
  - The scattering of light
  - Nuclear scattering
- Diffraction by a black nucleus
  - Fraunhofer diffraction
  - Fresnel diffraction
- The strong absorption model