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Nota di contenuto	Intro -- Author's Foreword -- Contents -- 1 Introduction -- 1.1 Introduction -- 1.2 General Introduction -- 1.3 Special Relativity -- 1.4 Quantum Mechanics -- 1.5 de Broglie Particle-Wave Mechanics -- 1.6 Plan of Text -- 1.7 Tables of Major Symbols and Basic Equations -- 2 Special Relativity -- 2.1 Introduction -- 2.2 Lorentz Transformations -- 2.3 Einstein Addition of Velocities Law -- 2.4 Lorentz Invariances -- 2.5 Lorentz Invariant Velocity Fields $u(x, t)$ -- 2.6 General Framework for Lorentz Invariances -- 2.7 Integral Invariants of the Lorentz Group -- 2.8 Alternative Validation of Lorentz Invariants -- 2.9 Jacobians of the Lorentz Transformations -- 2.10 Space-Time Transformation $x' = ct$ and $t' = x/c$ -- 2.11 The de Broglie Wave Velocity $u' = c^2/u$ -- 2.12 Force and Physical Energy Arising from Work Done -- 2.13 Lorentz Invariant Energy-Momentum Relations -- 2.14 Force Invariance for Constant Velocity Frames -- 2.15 Example: Motion in an Invariant Potential Field -- 2.16 Alternative Energy-Mass Velocity Variation -- 3 General Formulation and Basic Equations -- 3.1 Introduction -- 3.2 Louis Victor de Broglie -- 3.3 James Clerk Maxwell -- 3.4 Four Types of Matter and Variable Rest Mass -- 3.5 Modified Newton's Laws of Motion

-- 3.6 Identity for Spatial Physical Force ps: [/EMC pdfmark [/objdef Equ /Subtype /Span /ActualText (bold f) /StPNE pdfmark [/StBMC pdfmarkfps: [/EMC pdfmark [/StPop pdfmark [/StBMC pdfmark -- 3.7 Assumed Existence of Work Done Function ps: [/EMC pdfmark [/objdef Equ /Subtype /Span /ActualText (upper W left parenthesis bold x comma t right parenthesis) /StPNE pdfmark [/StBMC pdfmarkW(x, t)ps: [/EMC pdfmark [/StPop pdfmark [/StBMC pdfmark.

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Rest Mass.

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9.10 Positive Energy (I)  $e = (e_0^2 + (pc)^2)^{1/2}$ , ps: [/EMC pdfmark [/objdef Equ /Subtype /Span /ActualText (e 0 not equals 0) /StPNE pdfmark [/StBMC pdfmarke0 0ps: [/EMC pdfmark [/StPop pdfmark [/StBMC pdfmark -- 9.11 Negative Energy (II)  $e = - (e_0^2 + (pc)^2)^{1/2}$ , ps: [/EMC pdfmark [/objdef Equ /Subtype /Span /ActualText (e 0 not equals 0) /StPNE pdfmark [/StBMC pdfmarke00ps: [/EMC pdfmark [/StPop pdfmark [/StBMC pdfmark -- 9.12 Positive Energy (III)  $e = pc$ ,  $e_0 = 0$  -- 9.13 Negative Energy (IV)  $e = -pc$ ,  $e_0 = 0$  -- 9.14 Similarity Stretching Solutions of Wave Equation -- 9.15 Some Examples Involving the Dirac Delta Function -- 9.16 Calculation Details for Similarity Solutions -- 9.17 de Broglie's Centrally Symmetric Guidance Formula -- 10 Relation with Quantum Mechanics -- 10.1 Introduction -- 10.2 Quantum Mechanics and Schrödinger Wave Equation -- 10.3 Group Velocity and de Broglie Waves -- 10.4 Lorentz Invariants ps: [/EMC pdfmark [/objdef Equ /Subtype /Span /ActualText (xi equals e x minus c squared p t) /StPNE pdfmark [/StBMC pdfmark= ex - c<sup>2</sup> ptsps: [/EMC pdfmark [/StPop pdfmark [/StBMC pdfmark and ps: [/EMC pdfmark [/objdef Equ /Subtype /Span /ActualText (eta equals p x minus e t) /StPNE pdfmark [/StBMC pdfmark= px - etps: [/EMC pdfmark [/StPop pdfmark [/StBMC pdfmark -- 10.5 Klein-Gordon Partial Differential Equation -- 10.6 Alternative Klein-Gordon-Schrödinger Equation -- 10.7 General Wave Structure of Solutions of Wave Equation -- 10.8 Wave Solutions of Klein-Gordon Equation -- 10.9 Time-Dependent Dirac Equation for Free Particle -- 11 Coordinate Transformations, Tensors and General Relativity -- 11.1 Summation Convention and Cartesian Tensors -- 11.2 Alternative Derivation of Basic Identity -- 11.3 General Curvilinear Coordinates -- 11.4 Partial Covariant Differentiation -- 11.5 Illustration for Single Space Dimension. 11.6 Formulae for Ricci and Einstein Tensors.

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