

Publications of Kirk T. McDonald

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<http://physics.princeton.edu/~mcdonald/examples/onoochin.pdf>
1077. *The Radiation Reaction Force and the Radiation Resistance of Small Antennas* (Jan. 21, 2006), <http://physics.princeton.edu/~mcdonald/examples/resistance.pdf>
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<http://physics.princeton.edu/~mcdonald/examples/3dpacket.pdf>
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http://physics.princeton.edu/~mcdonald/examples/pem_forms.pdf
1081. *McKenna’s Paradox: Charged Particle Exiting the Side of A Solenoid Magnet* (Apr. 12, 2006), <http://physics.princeton.edu/~mcdonald/examples/mckenna.pdf>
1082. *Momentum in a DC Circuit* (May 26, 2006),
<http://physics.princeton.edu/~mcdonald/examples/loop.pdf>
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<http://physics.princeton.edu/~mcdonald/examples/crossedfield.pdf>
1086. *The Fields of a Short, Linear Dipole Antenna If There Were No Displacement Current* (July 5, 2006),
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1087. *Hexagonal Pencil Rolling on an Inclined Plane* (Nov. 14, 2006),
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1088. (with J.L. Junquera) *Galilean Transformation of Wave Velocity* (Jan. 14, 2007),
http://physics.princeton.edu/~mcdonald/examples/wave_velocity.pdf
1089. *Stabilization of Insect Flight via Sensors of Coriolis Force* (Feb. 17, 2007),
<http://physics.princeton.edu/~mcdonald/examples/stabilization.pdf>
1090. *Permeable Shell in a Uniform External Field* (Feb. 24, 2007),
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1091. *Where Does the Power Become AC in an AC Power Source?* (Feb. 27, 2007),
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1093. (with H. Jostlein) *Path Length of Muons Traversing an Arbitrary Volume* (Mar. 24, 2007), <http://physics.princeton.edu/~mcdonald/examples/muonpath.pdf>
1094. (with S. Palestini) *Space Charge in Ionization Detectors* (Mar. 25, 2007),
<http://physics.princeton.edu/~mcdonald/examples/spacecharge.pdf>
1095. *Flow of Energy and Momentum in a Coaxial Cable* (Mar. 31, 2007),
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1096. *Torque Analyses of a Sliding Ladder* (May 6, 2007),
<http://physics.princeton.edu/~mcdonald/examples/ladder.pdf>
1097. *Electric Guitar Pickups* (May 6, 2007),
<http://physics.princeton.edu/~mcdonald/examples/guitar.pdf>
1098. *Voltage Across the Terminals of a Receiving Antenna* (June 25, 2007),
<http://physics.princeton.edu/~mcdonald/examples/receiver.pdf>
1099. *Currents in a Center-Fed Linear Dipole Antenna* (June 27, 2007),
<http://physics.princeton.edu/~mcdonald/examples/transmitter.pdf>
1100. *Tokyo Drift* (Oct. 7, 2007),
http://physics.princeton.edu/~mcdonald/examples/tokyo_drift.pdf

1101. *Energy, Momentum and Stress in a Belt Drive* (Oct. 20, 2007),
http://physics.princeton.edu/~mcdonald/examples/belt_drive.pdf
1102. *Energy Flow in a Moving Bimetallic Strip* (Oct. 28, 2007),
<http://physics.princeton.edu/~mcdonald/examples/bimetallic.pdf>
1103. “Hidden” Momentum in a Sound Wave (Oct. 31, 2007),
http://physics.princeton.edu/~mcdonald/examples/hidden_sound.pdf
1104. *Relativity of Steady Energy Flow* (Nov. 3, 2007),
<http://physics.princeton.edu/~mcdonald/examples/1dgas.pdf>
1105. *Radiation from Hertzian Dipoles in a Uniaxial Anisotropic Medium* (Nov. 16, 2007),
<http://physics.princeton.edu/~mcdonald/examples/anisotropic.pdf>
1106. *Thermodynamics of a Tire Pump* (Nov. 29, 2007),
<http://physics.princeton.edu/~mcdonald/examples/tireppump.pdf>
1107. *Flow of Energy from a Localized Source in a Uniform Anisotropic Medium* (Dec. 8, 2007), <http://physics.princeton.edu/~mcdonald/examples/biaxial.pdf>
1108. *Electron Trajectories in a Hall Thruster* (Feb. 27, 2008),
<http://physics.princeton.edu/~mcdonald/examples/thruster.pdf>
1109. *The Velocity Factor of an Insulated Two-Wire Transmission Line* (Mar. 6, 2008),
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1110. *What Does an AC Voltmeter Measure?* (Mar. 16, 2008),
<http://physics.princeton.edu/~mcdonald/examples/voltage.pdf>
1111. *Static-Voltage Gauge* (Mar. 25, 2008),
http://physics.princeton.edu/~mcdonald/examples/static_gauge.pdf
1112. *The Helmholtz Decomposition and the Coulomb Gauge* (Apr. 17, 2008),
<http://physics.princeton.edu/~mcdonald/examples/helmholtz.pdf>
1113. (with J. Castro) *Magnetic Field at the Origin of a Grounded, Conducting Sphere Circled by a Moving Charge Q* (June 26, 2008),
<http://physics.princeton.edu/~mcdonald/examples/rotatingcharge.pdf>
1114. *The Wilson-Wilson Experiment* (July 30, 2008),
<http://physics.princeton.edu/~mcdonald/examples/wilson.pdf>
1115. *Electrodynamics of Rotating Systems* (Aug. 6, 2008),
<http://physics.princeton.edu/~mcdonald/examples/rotatingEM.pdf>
1116. *Unipolar Induction via a Rotating Magnetized Cylinder* (Aug. 17, 2008),
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<http://physics.princeton.edu/~mcdonald/examples/faradayrotation.pdf>
1118. (with C.T. Ridgely) *Charged, Counter-Rotating Disks on a Rotating Platform* (Sept. 11, 2008), <http://physics.princeton.edu/~mcdonald/examples/counterrotation.pdf>
1119. *Radiation of Turnstile Antennas Above a Conducting Ground Plane* (Sep. 18, 2008),
<http://physics.princeton.edu/~mcdonald/examples/turnstile.pdf>
1120. *Can Dipole Antennas Above a Ground Plane Emit Circularly Polarized Radiation?*
(Sep. 19, 2008), <http://physics.princeton.edu/~mcdonald/examples/groundplane.pdf>
1121. *Air Hockey Bowling* (Oct. 17, 2008),
http://physics.princeton.edu/~mcdonald/examples/air_hockey_bowling.pdf
1122. *Darwin Energy Paradoxes* (Oct. 29, 2008),
<http://physics.princeton.edu/~mcdonald/examples/darwin.pdf>
1123. *Classical Diamagnetism and the Satellite Paradox* (Nov. 12, 2008),
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1124. *Electromagnetic Fields of a Small Helical Toroidal Antenna* (Dec. 8, 2008),
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1125. *Low-Frequency Electromagnetic Waves on a Twisted-Pair Transmission Line* (Dec. 24, 2008), http://physics.princeton.edu/~mcdonald/examples/twisted_pair.pdf
1126. *Charging a Capacitor via a Transient RLC Circuit* (Mar. 6, 2009),
<http://physics.princeton.edu/~mcdonald/examples/seriesrlc.pdf>
1127. *Orbital and Spin Angular Momentum of Electromagnetic Fields* (Mar. 12, 2009),
<http://physics.princeton.edu/~mcdonald/examples/spin.pdf>
1128. “Hidden” Momentum of a Steady Current Distribution in a System at “Rest” (Apr. 21, 2009), <http://physics.princeton.edu/~mcdonald/examples/current.pdf>
1129. (with M. Moriconi) *Energy Flow in a Waveguide below Cutoff* (May 20, 2009),
<http://physics.princeton.edu/~mcdonald/examples/cutoff.pdf>
1130. *Reactance of Small Antennas* (June 3, 2009),
http://physics.princeton.edu/~mcdonald/examples/cap_antenna.pdf
1131. *Total and Frustrated Reflection of a Gaussian Optical Beam*, (July 7, 2009),
<http://physics.princeton.edu/~mcdonald/examples/internal.pdf>
1132. *Second-Order Paraxial Gaussian Beam*, (July 8, 2009),
http://physics.princeton.edu/~mcdonald/examples/davis_psi2.pdf

1133. *Charged, Conducting, Rotating Sphere*, (July 22, 2009),
<http://physics.princeton.edu/~mcdonald/examples/chargedsphere.pdf>
1134. *Electric Field of a Uniform Charge Density*, (July 27, 2009),
<http://physics.princeton.edu/~mcdonald/examples/uniformcharge.pdf>
1135. *Lorentz Invariance of the Number of Photons in a Rectangular Cavity*, (July 28, 2009), <http://physics.princeton.edu/~mcdonald/examples/uoveromega.pdf>
1136. *How Much of Magnetic Energy Is Kinetic Energy?*, (Sep. 12, 2009),
<http://physics.princeton.edu/~mcdonald/examples/kinetic.pdf>
1137. *Is Bernoulli's Equation Relativistically Invariant?*, (Sep. 13, 2009),
<http://physics.princeton.edu/~mcdonald/examples/bernoulli.pdf>
1138. *Reflection of a Gaussian Optical Beam by a Flat Mirror*, (Oct. 5, 2009),
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<http://physics.princeton.edu/~mcdonald/examples/maxwell.pdf>
1141. *Dielectric (and Magnetic) Image Methods*, (Nov. 21, 2009),
<http://physics.princeton.edu/~mcdonald/examples/image.pdf>
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<http://physics.princeton.edu/~mcdonald/examples/power.pdf>
1143. *Radiation from the Open End of a Coaxial Cable*, (Dec. 2, 2009),
http://physics.princeton.edu/~mcdonald/examples/coax_rad.pdf
1144. (with C.G. Tully) *Spinning Lasso*, (Dec. 11, 2009),
<http://physics.princeton.edu/~mcdonald/examples/lasso.pdf>
1145. *Accelerating Through a Resonance on a "Washboard" Road*, (Dec. 13, 2009),
<http://physics.princeton.edu/~mcdonald/examples/washboard.pdf>
1146. *Image Method for an Electric Charge above a Topological Insulator with a Quantum Hall Surface* (Jan. 14, 2010),
http://physics.princeton.edu/~mcdonald/examples/image_monopole.pdf
1147. *An Antenna Reciprocity Theorem* (Apr. 3, 2010),
<http://physics.princeton.edu/~mcdonald/examples/reciprocity.pdf>
1148. *Can Sheared Surfaces Emit Light?* (Apr. 9, 2010),
<http://physics.princeton.edu/~mcdonald/examples/sheared.pdf>

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<http://physics.princeton.edu/~mcdonald/examples/lewin.pdf>
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1153. *Does the Moon Always Fall Towards the Sun?* (June 9, 2010),
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1154. *Blondel's Experiment* (June 11, 2010),
<http://physics.princeton.edu/~mcdonald/examples/blondel.pdf>
1155. *Displacement Current of a Uniformly Moving Charge* (June 15, 2010),
<http://physics.princeton.edu/~mcdonald/examples/dedt.pdf>
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1158. *On the Definition of Radiation by a System of Charges* (Sept. 6, 2010),
<http://physics.princeton.edu/~mcdonald/examples/radiation.pdf>
1159. *Radiation by a Time-Dependent Current Loop* (Sept. 26, 2010),
<http://physics.princeton.edu/~mcdonald/examples/currentloop.pdf>
1160. *Čerenkov Radiation from a Short Path* (Oct. 5, 2010),
<http://physics.princeton.edu/~mcdonald/examples/cerenkov.pdf>
1161. *Reactance of a Sinusoidally Driven Antenna* (Nov. 15, 2010),
<http://physics.princeton.edu/~mcdonald/examples/reactance.pdf>
1162. *Charge Density in a Current-Carrying Wire* (Dec. 23, 2010),
<http://physics.princeton.edu/~mcdonald/examples/wire.pdf>
1163. *Potentials for a Rectangular Electromagnetic Cavity* (Mar. 4, 2011),
<http://physics.princeton.edu/~mcdonald/examples/cavity.pdf>
1164. *Poincaré Potential for a Finite Solenoid* (Mar. 8, 2011),
<http://physics.princeton.edu/~mcdonald/examples/solpot.pdf>

1165. (with J. Gallardo) *Potentials for a Cylindrical Electromagnetic Cavity* (Mar. 9, 2011), <http://physics.princeton.edu/~mcdonald/examples/cylindrical.pdf>
1166. *Expansion of an Axially Symmetric, Static Magnetic Field in Terms of Its Axial Field* (Mar. 10, 2011), <http://physics.princeton.edu/~mcdonald/examples/axial.pdf>
1167. *Static Magnetic Field as Determined by Its Value on a Surface* (Mar. 17, 2011), <http://physics.princeton.edu/~mcdonald/examples/surface.pdf>
1168. *Hamiltonian with z as the Independent Variable* (Mar. 19, 2011), <http://physics.princeton.edu/~mcdonald/examples/hamiltonian.pdf>
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1173. *The Equivalence Principle and Roundtrip Times for Light* (May 25, 2011), <http://physics.princeton.edu/~mcdonald/examples/accel.pdf>
1174. *An Ill-Posed Problem in Rigid-Body Dynamics* (June 11, 2011), <http://physics.princeton.edu/~mcdonald/examples/illposed.pdf>
1175. *Excitation of a Rectangular Electromagnetic Cavity by a Passing, Relativistic Particle* (June 29, 2011), <http://physics.princeton.edu/~mcdonald/examples/excitation.pdf>
1176. *Power Consumption in a Pulsed Copper Magnet* (July 16, 2011), <http://physics.princeton.edu/~mcdonald/examples/pulsed.pdf>
1177. *Information Channel Capacity* (July 23, 2011), <http://physics.princeton.edu/~mcdonald/examples/shannon.pdf>
1178. *Force-Free Magnetic Fields aka Eigenfunctions of the Curl Operator* (Aug. 10, 2011), <http://physics.princeton.edu/~mcdonald/examples/forcefree.pdf>
1179. *Wire Polarizers* (Sep. 21, 2011), <http://physics.princeton.edu/~mcdonald/examples/polarizer.pdf>
1180. *Scattering of a Plane Electromagnetic Wave by a Small Conducting Cylinder* (Oct. 4, 2011), http://physics.princeton.edu/~mcdonald/examples/small_cylinder.pdf

1181. *Box Toss* (Oct. 17, 2011),
http://physics.princeton.edu/~mcdonald/examples/box_toss.pdf
1182. *Wagon in the Rain* (Oct. 22, 2011),
<http://physics.princeton.edu/~mcdonald/examples/wagon.pdf>
1183. *Perfectly Conducting Cylinder in an External, Static Magnetic Field* (Oct. 29, 2011),
http://physics.princeton.edu/~mcdonald/examples/perfect_cylinder.pdf
1184. *Small Oscillations of a Mass That Slides inside a Cylinder Which Rotates about a Horizontal Axis* (Nov. 1, 2011),
<http://physics.princeton.edu/~mcdonald/examples/sliding.pdf>
1185. *Resistive Cylinder in an External, Static Magnetic Field* (Nov. 2, 2011),
http://physics.princeton.edu/~mcdonald/examples/resistive_cylinder.pdf
1186. *Slingshot Ride* (Nov. 13, 2011),
http://physics.princeton.edu/~mcdonald/examples/slingshot_ride.pdf
1187. *Energy Flow in a Transformer* (Nov. 15, 2011),
<http://physics.princeton.edu/~mcdonald/examples/transformer.pdf>
1188. (with V. Hnizdo) *Fields and Moments of a Moving Electric Dipole* (Nov. 29, 2011),
<http://physics.princeton.edu/~mcdonald/examples/movingdipole.pdf>
1189. *What is the Role of the Arms of a Linear Broadcast Antenna?* (Dec. 19, 2011),
<http://physics.princeton.edu/~mcdonald/examples/arms.pdf>
1190. *A Gentler Loop-the-Loop* (Jan. 7, 2012),
<http://physics.princeton.edu/~mcdonald/examples/looptheloop.pdf>
1191. (with Z.M. Tan) *Symmetries of Electromagnetic Fields Associated with a Plane Conducting Screen* (Jan. 14, 2012),
<http://physics.princeton.edu/~mcdonald/examples/emsymmetry.pdf>
1192. (with Z.M. Tan) *Babinet's Principle for Electromagnetic Fields* (Jan. 19, 2012),
<http://physics.princeton.edu/~mcdonald/examples/babinet.pdf>
1193. *Sommerfeld's Diffraction Problem* (Jan. 22, 2012),
<http://physics.princeton.edu/~mcdonald/examples/sommerfeld.pdf>
1194. *Motion of a Pair of Oppositely Charged Spheres* (Feb. 3, 2012),
http://physics.princeton.edu/~mcdonald/examples/charged_balls.pdf
1195. *Circuit Q and Field Energy* (Apr. 1, 2012),
http://physics.princeton.edu/~mcdonald/examples/q_rlc.pdf
1196. *Magnetic Damping* (Apr. 14, 2012),
<http://physics.princeton.edu/~mcdonald/examples/eddy.pdf>

1197. *Mansuripur's Paradox* (May 2, 2012),
<http://physics.princeton.edu/~mcdonald/examples/mansuripur.pdf>
1198. *Maxwellian Vacuum Polarization* (June 2, 2012),
<http://physics.princeton.edu/~mcdonald/examples/polarization.pdf>
1199. *Abraham, Minkowski and "Hidden" Mechanical Momentum* (June 6, 2012),
<http://physics.princeton.edu/~mcdonald/examples/abraham.pdf>
1200. *"Hidden" Momentum in an Oscillating Tube of Water* (June 24, 2012),
<http://physics.princeton.edu/~mcdonald/examples/utube.pdf>
1201. *"Hidden" Momentum in a Link of a Moving Chain* (June 28, 2012),
<http://physics.princeton.edu/~mcdonald/examples/link.pdf>
1202. *"Hidden" Momentum in a Set of Circulating Rockets* (June 29, 2012),
<http://physics.princeton.edu/~mcdonald/examples/rockets.pdf>
1203. *"Hidden" Momentum in a Current Loop* (June 30, 2012),
<http://physics.princeton.edu/~mcdonald/examples/penfield.pdf>
1204. *"Hidden" Momentum in a River* (July 5, 2012),
<http://physics.princeton.edu/~mcdonald/examples/river.pdf>
1205. *"Hidden" Momentum in a Plane Electromagnetic Wave* (July 7, 2012),
<http://physics.princeton.edu/~mcdonald/examples/planewave.pdf>
1206. *"Hidden" Momentum in an Oscillating Spring* (July 8, 2012),
<http://physics.princeton.edu/~mcdonald/examples/spring.pdf>
1207. *On the Definition of "Hidden" Momentum* (July 9, 2012),
<http://physics.princeton.edu/~mcdonald/examples/hiddendef.pdf>
1208. *"Hidden" Momentum in a Spinning Sphere* (Aug. 16, 2012),
<http://physics.princeton.edu/~mcdonald/examples/spinningsphere.pdf>
1209. *"Hidden" Momentum in a Linked Pair of Gyrostats* (Aug. 17, 2012),
<http://physics.princeton.edu/~mcdonald/examples/gyrostat.pdf>
1210. *Potentials of a Hertzian Dipole in the Gibbs Gauge* (Aug. 23, 2012),
<http://physics.princeton.edu/~mcdonald/examples/gibbs.pdf>
1211. *Center of Mass of a Relativistic Rolling Hoop* (Sept. 7, 2012),
<http://physics.princeton.edu/~mcdonald/examples/hoop.pdf>
1212. *Voltage Drop, Potential Difference and \mathcal{EMF}* (Sept. 18, 2012),
<http://physics.princeton.edu/~mcdonald/examples/volt.pdf>

1213. *Rocket Car* (Oct. 1, 2012),
<http://physics.princeton.edu/~mcdonald/examples/rocketcar.pdf>
1214. *The Pin and the Pendulum* (Oct. 30, 2012),
<http://physics.princeton.edu/~mcdonald/examples/pin.pdf>
1215. *Unipolar Induction via a Rotating Magnetized Sphere* (Nov. 13, 2012),
<http://physics.princeton.edu/~mcdonald/examples/magsphere.pdf>
1216. *Electric Field Distribution in a Reverse-Biased p-n Junction* (Nov. 17, 2012),
<http://physics.princeton.edu/~mcdonald/examples/diode.pdf>
1217. *Ladder + Rope* (Nov. 21, 2012),
http://physics.princeton.edu/~mcdonald/examples/ladder_rope.pdf
1218. *Skiing on a Cosine Hill* (Nov. 25, 2012),
http://physics.princeton.edu/~mcdonald/examples/cosine_hill.pdf
1219. *Rolling Off a Log with Friction* (Nov. 26, 2012),
<http://physics.princeton.edu/~mcdonald/examples/log.pdf>
1220. *Stability of Transverse Oscillations in a Betatron* (Nov. 26, 2012),
http://physics.princeton.edu/~mcdonald/examples/betatron_osc.pdf
1221. *Oscillating Fluid in a U-Tube* (Nov. 28, 2012),
http://physics.princeton.edu/~mcdonald/examples/utube_osc.pdf
1222. *Bernoulli's Equation for a Rotating Fluid* (Nov. 29, 2012),
http://physics.princeton.edu/~mcdonald/examples/bernoulli_rot.pdf
1223. *From Fick's Law to the Mean Free Path* (Dec. 5, 2012),
<http://physics.princeton.edu/~mcdonald/examples/fick.pdf>
1224. *Intensity, Brightness and Étendue of an Aperture Lamp* (Dec. 8, 2012),
<http://physics.princeton.edu/~mcdonald/examples/lamp.pdf>
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<http://physics.princeton.edu/~mcdonald/examples/watchdog.pdf>
1226. *Does Transmission of Light through a Window Involve Physics at the Planck Scale?*
(Feb. 4, 2013), <http://physics.princeton.edu/~mcdonald/examples/bekenstein.pdf>
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Dynamo?* (Feb. 12, 2013),
<http://physics.princeton.edu/~mcdonald/examples/dynamo.pdf>
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http://physics.princeton.edu/~mcdonald/examples/spherical_cap2.pdf

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http://physics.princeton.edu/~mcdonald/examples/ph406/ph406_set5.pdf
1403. *Ph406 Problem Set 6* (Mar. 1993),
http://physics.princeton.edu/~mcdonald/examples/ph406/ph406_set6.pdf
1404. *Ph406 Problem Set 7* (April 1993),
http://physics.princeton.edu/~mcdonald/examples/ph406/ph406_set7.pdf
1405. *Ph406 Problem Set 8* (April 1992 and 1993),
http://physics.princeton.edu/~mcdonald/examples/ph406/ph406_set8.pdf
http://physics.princeton.edu/~mcdonald/examples/ph406/ph406_set8_93.pdf
1406. *Ph406 Problem Set 9* (April 1993),
http://physics.princeton.edu/~mcdonald/examples/ph406/ph406_set9.pdf
1407. *Ph406 Problem Set 10* (March 1993),
http://physics.princeton.edu/~mcdonald/examples/ph406/ph406_set10.pdf
1408. *Ph406 Final Exam* (May 1992),
http://physics.princeton.edu/~mcdonald/examples/ph405ph406_final.pdf
http://physics.princeton.edu/~mcdonald/examples/ph405ph406_final_sol.pdf
1409. *Ph406 Problem Set 1* (2014),
http://physics.princeton.edu/~mcdonald/examples/ph406/ph406_set1_2014_sol.pdf
1410. *Ph406 Problem Set 2* (2014),
http://physics.princeton.edu/~mcdonald/examples/ph406/ph406_set2_2014_sol.pdf

1411. *Ph406 Problem Set 3* (2014),
http://physics.princeton.edu/~mcdonald/examples/ph406/ph406_set3_2014_sol.pdf
1412. *Ph406 Problem Set 4* (2014),
http://physics.princeton.edu/~mcdonald/examples/ph406/ph406_set4_2014_sol.pdf
1413. *Ph406 Problem Set 5* (2014),
http://physics.princeton.edu/~mcdonald/examples/ph406/ph406_set5_2014_sol.pdf
1414. *Ph406 Problem Set 6* (2014),
http://physics.princeton.edu/~mcdonald/examples/ph406/ph406_set6_2014_sol.pdf
1415. *Ph406 Problem Set 7* (2014),
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1416. *Ph406 Problem Set 8* (2014),
http://physics.princeton.edu/~mcdonald/examples/ph406/ph406_set8_2014_sol.pdf
1417. *Ph406 Problem Set 9* (2014),
http://physics.princeton.edu/~mcdonald/examples/ph406/ph406_set9_2014_sol.pdf
1418. *Ph406 Problem Set 10* (2014),
http://physics.princeton.edu/~mcdonald/examples/ph406/ph406_set10_2014_sol.pdf
1419. *Ph406 Problem Set 11* (2014),
http://physics.princeton.edu/~mcdonald/examples/ph406/ph406_set11_2014_sol.pdf
1420. *Ph406 Problem Set 12* (2014),
http://physics.princeton.edu/~mcdonald/examples/ph406/ph406_set12_2014_sol.pdf

Ph410: Physics of Quantum Computation

1421. *Problem Sets (2005-2006)*,
<http://physics.princeton.edu/~mcdonald/examples/ph410problems.pdf>
1422. *Reflections of a (Skeptical) Experimental High-Energy Physicist after Teaching a Course on Quantum Computation* (Feb. 24, 2006),
<http://physics.princeton.edu/~mcdonald/examples/QMtrans1.pdf>

Ph501: Electricity and Magnetism

1423. *Ph501 Lecture 1: Overview of Maxwell's Equations; Electrostatics*,
<http://physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture1.pdf>
1424. *Ph501 Lecture 2: Conductors and Dielectrics*,
<http://physics.princeton.edu/~mcdonald/examples/ph501ph501lecture2.pdf>

1425. *Ph501 Lecture 3: Electrostatic Energy, Maxwell Stress Tensor,*
<http://physics.princeton.edu/~mcdonald/examples/ph501ph501lecture3.pdf>
1426. *Ph501 Lecture 4: Potential Theory: Image Methods, 2-D Problems with Rectangular Boundaries,*
<http://physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture4.pdf>
1427. *Ph501 Lecture 5: Potential Theory: 2-D Problems with Cylindrical and Spherical Boundaries,*
<http://physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture5.pdf>
1428. *Ph501 Lecture 6: Potential Theory: 3-D Problems with Cylindrical Boundaries; Conducting Needles, Spheroids, Disks; Use of Conjugate Functions,*
<http://physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture6.pdf>
1429. *Ph501 Lecture 7: Steady Currents; Magnetostatics,*
<http://physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture7.pdf>
1430. *Ph501 Lecture 8: Sources of the Magnetic field; Magnetic Materials,*
<http://physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture8.pdf>
1431. *Ph501 Lecture 9: Faraday's Law,*
<http://physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture9.pdf>
1432. *Ph501 Lecture 10: Electromagnetic Energy, Momentum and Angular Momentum; Inductance,*
<http://physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture10.pdf>
1433. *Ph501 Lecture 11: Introduction to Electromagnetic Waves,*
<http://physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture11.pdf>
1434. *Ph501 Lecture 12: Plane Waves in Dielectric Media,*
<http://physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture12.pdf>
1435. *Ph501 Lecture 13: Plane Waves in Conducting Media,*
<http://physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture13.pdf>
1436. *Ph501 Lecture 14: Waves in Boxes and Pipes,*
<http://physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture14.pdf>
1437. *Ph501 Lecture 15: Sources of the Waves – The Retarded Potentials,*
<http://physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture15.pdf>
1438. *Ph501 Lecture 16: Multipole Radiation; Antennas; Scattering,*
<http://physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture16.pdf>
1439. *Ph501 Lecture 17: Optics and Diffraction; Gaussian Laser Beams,*
<http://physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture17.pdf>

1440. *Ph501 Lecture 18: Special Relativity; The 4-Potential of a Moving Charge*,
<http://physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture18.pdf>
1441. *Ph501 Lecture 19: Other Force Fields; Significance of Gauge Invariance; Fields of a Moving Charge*,
<http://physics.princeton.edu/~mcdonald/examples/ph501ph501lecture19.pdf>
1442. *Ph501 Lecture 20: Relativistic Radiation Effects: Bremsstrahlung, Synchrotron Radiation*,
<http://physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture20.pdf>
1443. *Ph501 Lecture 21: Relativistic Radiation Effects: Čerenkov Radiation, Transition Radiation*,
<http://physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture21.pdf>
1444. *Ph501 Lecture 22: Electromagnetic Mass; Radiation Reaction*,
<http://physics.princeton.edu/~mcdonald/examples/ph501ph501lecture22.pdf>
1445. *Ph501 Lecture 23: Interaction of Radiation with Matter – Microscopic View*,
<http://physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture23.pdf>
1446. *Ph501 Lecture 24: Mechanics and Electromagnetism*,
<http://physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture24.pdf>
1447. *Ph501 Lecture 25: Lasers from a Classical Perspective*,
<http://physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture25.pdf>
1448. *Ph501 Lecture 26: Solitons*,
<http://physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture26.pdf>
1449. *Ph501 Problem Set 1*,
<http://physics.princeton.edu/~mcdonald/examples/ph501set1.pdf>
1450. *Ph501 Problem Set 2*,
<http://physics.princeton.edu/~mcdonald/examples/ph501set2.pdf>
1451. *Ph501 Problem Set 3*,
<http://physics.princeton.edu/~mcdonald/examples/ph501set3.pdf>
1452. *Ph501 Problem Set 4*,
<http://physics.princeton.edu/~mcdonald/examples/ph501set4.pdf>
1453. *Ph501 Problem Set 5*,
<http://physics.princeton.edu/~mcdonald/examples/ph501set5.pdf>
1454. *Ph501 Problem Set 6*,
<http://physics.princeton.edu/~mcdonald/examples/ph501set6.pdf>

1455. *Ph501 Problem Set 7*,
<http://physics.princeton.edu/~mcdonald/examples/ph501set7.pdf>
1456. *Ph501 Problem Set 8*,
<http://physics.princeton.edu/~mcdonald/examples/ph501set8.pdf>
1457. *Ph501 Problem Set 9*,
<http://physics.princeton.edu/~mcdonald/examples/ph501set9.pdf>
1458. *Ph501 Problem Set 10*,
<http://physics.princeton.edu/~mcdonald/examples/ph501set10.pdf>
1459. *Ph501 Problem Set 11*,
<http://physics.princeton.edu/~mcdonald/examples/ph501set11.pdf>
1460. *Ph501 Problem Set 12*,
<http://physics.princeton.edu/~mcdonald/examples/ph501set12.pdf>
1461. *Ph501 Midterm Exam (October 2000)*,
http://physics.princeton.edu/~mcdonald/examples/ph501midterm_102300.pdf

Physics 529: Elementary Particle Physics

These lectures, written in the 1980's, give a sense of how the Standard Model came to be.

1462. *Ph529 Lecture 1: Why High Energy?*
<http://physics.princeton.edu/~mcdonald/examples/ph529/ph52911.pdf>
1463. *Ph529 Lecture 2: History: The Strong Interaction*
<http://physics.princeton.edu/~mcdonald/examples/ph529/ph52912.pdf>
1464. *Ph529 Lecture 3: History: Electromagnetic and Weak Interactions*
<http://physics.princeton.edu/~mcdonald/examples/ph529/ph52913.pdf>
1465. *Ph529 Lecture 4: Detecting Elementary Particles*
<http://physics.princeton.edu/~mcdonald/examples/ph529/ph52914.pdf>
1466. *Ph529 Lecture 5: The Electromagnetic Structure of Matter*
<http://physics.princeton.edu/~mcdonald/examples/ph529/ph52915.pdf>
1467. *Ph529 Lecture 6: Elastic Scatterin fo Electrons and Hadrons*
<http://physics.princeton.edu/~mcdonald/examples/ph529/ph52916.pdf>
1468. *Ph529 Lecture 7: Elastic Scatterin fo Electrons and Hadrons, II*
<http://physics.princeton.edu/~mcdonald/examples/ph529/ph52917.pdf>
1469. *Ph529 Lecture 8: Inetastic Electron Scattering*
<http://physics.princeton.edu/~mcdonald/examples/ph529/ph52918.pdf>

1470. *Ph529 Lecture 9: Invariance Principles and Conservation Laws*
<http://physics.princeton.edu/~mcdonald/examples/ph529/ph52919.pdf>
1471. *Ph529 Lecture 10: Charge Conjugation, Isospin, etc.*
<http://physics.princeton.edu/~mcdonald/examples/ph529/ph529110.pdf>
1472. *Ph529 Lecture 11: 3-Body Decays, Partial-Wave Analysis*
<http://physics.princeton.edu/~mcdonald/examples/ph529/ph529111.pdf>
1473. *Ph529 Lecture 12: Phenomenology of the Strong Interaction at High Energies*
<http://physics.princeton.edu/~mcdonald/examples/ph529/ph529112.pdf>
1474. *Ph529 Lecture 13: The Quark Model*
<http://physics.princeton.edu/~mcdonald/examples/ph529/ph529113.pdf>
1475. *Ph529 Lecture 14: The Quark Model, II*
<http://physics.princeton.edu/~mcdonald/examples/ph529/ph529114.pdf>
1476. *Ph529 Lecture 15: Heavy Quark States*
<http://physics.princeton.edu/~mcdonald/examples/ph529/ph529115.pdf>
1477. *Ph529 Lecture 16: The Weak Interaction*
<http://physics.princeton.edu/~mcdonald/examples/ph529/ph529116.pdf>
1478. *Ph529 Lecture 17: Weak Interactions, II*
<http://physics.princeton.edu/~mcdonald/examples/ph529/ph529117.pdf>
1479. *Ph529 Lecture 18: CP Violation*
<http://physics.princeton.edu/~mcdonald/examples/ph529/ph529118.pdf>
1480. *Ph529 Lecture 19: Neutrino Interactions*
<http://physics.princeton.edu/~mcdonald/examples/ph529/ph529119.pdf>
1481. *Ph529 Lecture 20: The Need for a Better Theory*
<http://physics.princeton.edu/~mcdonald/examples/ph529/ph529120.pdf>
1482. *Ph529 Lecture 21: The Glashow-Weinberg-Salam Model*
<http://physics.princeton.edu/~mcdonald/examples/ph529/ph529121.pdf>
1483. *Ph529 Lecture 22: Test of the Glashow-Salam-Weinberg Model*
<http://physics.princeton.edu/~mcdonald/examples/ph529/ph529122.pdf>
1484. *Ph529 Lecture 23: Quantum Chromodynamics*
<http://physics.princeton.edu/~mcdonald/examples/ph529/ph52923.pdf>
1485. *Ph529 Lecture 24: Speculations*
<http://physics.princeton.edu/~mcdonald/examples/ph529/ph529124.pdf>

Short Course on Astroparticle Physics (1988)

1486. *Lecture 1. Techniques of Astroparticle Physics*,
<http://physics.princeton.edu/~mcdonald/papers/schladming1.pdf>
1487. *Lecture 2. Gamma-Ray Protons and Photons*,
<http://physics.princeton.edu/~mcdonald/papers/schladming2.pdf>
1488. *Lecture 3. Solar and Supernova Neutrinos*,
<http://physics.princeton.edu/~mcdonald/papers/schladming3.pdf>
1489. *Lecture 4. Detectors for the Rest of the Universe*,
<http://physics.princeton.edu/~mcdonald/papers/schladming4.pdf>

Short Courses on Accelerator Physics

1490. *A Short Course on Targetry for a Neutrino Factory and Muon Collider* (June 4, 2003)
<http://physics.princeton.edu/~mcdonald/mumu/target/targettrans38.pdf>
1491. *A Short Course on Targetry for Neutrino Superbeams, Neutrino Factories and Muon Colliders* (NuFACT06 Summer Institute, Aug 21, 2006),
<http://physics.princeton.edu/~mcdonald/mumu/target/targettrans53.pdf>