

Publications of Kirk T. McDonald

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1492. *Ph406 Problem Set 6* (2014),
physics.princeton.edu/~mcdonald/examples/ph406/ph406_set6_2014_sol.pdf
1493. *Ph406 Problem Set 7* (2014),
physics.princeton.edu/~mcdonald/examples/ph406/ph406_set7_2014_sol.pdf
1494. *Ph406 Problem Set 8* (2014),
physics.princeton.edu/~mcdonald/examples/ph406/ph406_set8_2014_sol.pdf
1495. *Ph406 Problem Set 9* (2014),
physics.princeton.edu/~mcdonald/examples/ph406/ph406_set9_2014_sol.pdf
1496. *Ph406 Problem Set 10* (2014),
physics.princeton.edu/~mcdonald/examples/ph406/ph406_set10_2014_sol.pdf
1497. *Ph406 Problem Set 11* (2014),
physics.princeton.edu/~mcdonald/examples/ph406/ph406_set11_2014_sol.pdf
1498. *Ph406 Problem Set 12* (2014),
physics.princeton.edu/~mcdonald/examples/ph406/ph406_set12_2014_sol.pdf

Ph410: Physics of Quantum Computation

1499. *Problem Sets (2005-2006)*,
physics.princeton.edu/~mcdonald/examples/ph410problems.pdf
1500. *Reflections of a (Skeptical) Experimental High-Energy Physicist after Teaching a Course on Quantum Computation* (Feb. 24, 2006),
physics.princeton.edu/~mcdonald/examples/QMtrans1.pdf

Ph501: Electricity and Magnetism

1501. *Ph501 Lecture 1: Overview of Maxwell's Equations; Electrostatics*,
physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture1.pdf
1502. *Ph501 Lecture 2: Conductors and Dielectrics*,
physics.princeton.edu/~mcdonald/examples/ph501ph501lecture2.pdf

1503. *Ph501 Lecture 3: Electrostatic Energy, Maxwell Stress Tensor,*
physics.princeton.edu/~mcdonald/examples/ph501ph501lecture3.pdf
1504. *Ph501 Lecture 4: Potential Theory: Image Methods, 2-D Problems with Rectangular Boundaries,*
physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture4.pdf
1505. *Ph501 Lecture 5: Potential Theory: 2-D Problems with Cylindrical and Spherical Boundaries,*
physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture5.pdf
1506. *Ph501 Lecture 6: Potential Theory: 3-D Problems with Cylindrical Boundaries; Conducting Needles, Spheroids, Disks; Use of Conjugate Functions,*
physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture6.pdf
1507. *Ph501 Lecture 7: Steady Currents; Magnetostatics,*
physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture7.pdf
1508. *Ph501 Lecture 8: Sources of the Magnetic field; Magnetic Materials,*
physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture8.pdf
1509. *Ph501 Lecture 9: Faraday's Law,*
physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture9.pdf
1510. *Ph501 Lecture 10: Electromagnetic Energy, Momentum and Angular Momentum; Inductance,*
physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture10.pdf
1511. *Ph501 Lecture 11: Introduction to Electromagnetic Waves,*
physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture11.pdf
1512. *Ph501 Lecture 12: Plane Waves in Dielectric Media,*
physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture12.pdf
1513. *Ph501 Lecture 13: Plane Waves in Conducting Media,*
physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture13.pdf
1514. *Ph501 Lecture 14: Waves in Boxes and Pipes,*
physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture14.pdf
1515. *Ph501 Lecture 15: Sources of the Waves – The Retarded Potentials,*
physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture15.pdf
1516. *Ph501 Lecture 16: Multipole Radiation; Antennas; Scattering,*
physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture16.pdf
1517. *Ph501 Lecture 17: Optics and Diffraction; Gaussian Laser Beams,*
physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture17.pdf

1518. *Ph501 Lecture 18: Special Relativity; The 4-Potential of a Moving Charge,*
physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture18.pdf
1519. *Ph501 Lecture 19: Other Force Fields; Significance of Gauge Invariance; Fields of a Moving Charge,*
physics.princeton.edu/~mcdonald/examples/ph501ph501lecture19.pdf
1520. *Ph501 Lecture 20: Relativistic Radiation Effects: Bremsstrahlung, Synchrotron Radiation,*
physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture20.pdf
1521. *Ph501 Lecture 21: Relativistic Radiation Effects: Čerenkov Radiation, Transition Radiation,*
physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture21.pdf
1522. *Ph501 Lecture 22: Electromagnetic Mass; Radiation Reaction,*
physics.princeton.edu/~mcdonald/examples/ph501ph501lecture22.pdf
1523. *Ph501 Lecture 23: Interaction of Radiation with Matter – Microscopic View,*
physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture23.pdf
1524. *Ph501 Lecture 24: Mechanics and Electromagnetism,*
physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture24.pdf
1525. *Ph501 Lecture 25: Lasers from a Classical Perspective,*
physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture25.pdf
1526. *Ph501 Lecture 26: Solitons,*
physics.princeton.edu/~mcdonald/examples/ph501/ph501lecture26.pdf
1527. *Ph501 Problem Set 1,*
physics.princeton.edu/~mcdonald/examples/ph501set1.pdf
1528. *Ph501 Problem Set 2,*
physics.princeton.edu/~mcdonald/examples/ph501set2.pdf
1529. *Ph501 Problem Set 3,*
physics.princeton.edu/~mcdonald/examples/ph501set3.pdf
1530. *Ph501 Problem Set 4,*
physics.princeton.edu/~mcdonald/examples/ph501set4.pdf
1531. *Ph501 Problem Set 5,*
physics.princeton.edu/~mcdonald/examples/ph501set5.pdf
1532. *Ph501 Problem Set 6,*
physics.princeton.edu/~mcdonald/examples/ph501set6.pdf

1533. *Ph501 Problem Set 7*,
physics.princeton.edu/~mcdonald/examples/ph501set7.pdf
1534. *Ph501 Problem Set 8*,
physics.princeton.edu/~mcdonald/examples/ph501set8.pdf
1535. *Ph501 Problem Set 9*,
physics.princeton.edu/~mcdonald/examples/ph501set9.pdf
1536. *Ph501 Problem Set 10*,
physics.princeton.edu/~mcdonald/examples/ph501set10.pdf
1537. *Ph501 Problem Set 11*,
physics.princeton.edu/~mcdonald/examples/ph501set11.pdf
1538. *Ph501 Problem Set 12*,
physics.princeton.edu/~mcdonald/examples/ph501set12.pdf
1539. *Ph501 Midterm Exam (October 2000)*,
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.

1540. *Ph529 Lecture 1: Why High Energy?*
physics.princeton.edu/~mcdonald/examples/ph529/ph52911.pdf
1541. *Ph529 Lecture 2: History: The Strong Interaction*
physics.princeton.edu/~mcdonald/examples/ph529/ph52912.pdf
1542. *Ph529 Lecture 3: History: Electromagnetic and Weak Interactions*
physics.princeton.edu/~mcdonald/examples/ph529/ph52913.pdf
1543. *Ph529 Lecture 4: Detecting Elementary Particles*
physics.princeton.edu/~mcdonald/examples/ph529/ph52914.pdf
1544. *Ph529 Lecture 5: The Electromagnetic Structure of Matter*
physics.princeton.edu/~mcdonald/examples/ph529/ph52915.pdf
1545. *Ph529 Lecture 6: Elastic Scatterin fo Electrons and Hadrons*
physics.princeton.edu/~mcdonald/examples/ph529/ph52916.pdf
1546. *Ph529 Lecture 7: Elastic Scatterin fo Electrons and Hadrons, II*
physics.princeton.edu/~mcdonald/examples/ph529/ph52917.pdf
1547. *Ph529 Lecture 8: Inetastic Electron Scattering*
physics.princeton.edu/~mcdonald/examples/ph529/ph52918.pdf

1548. *Ph529 Lecture 9: Invariance Principles and Conservation Laws*
physics.princeton.edu/~mcdonald/examples/ph529/ph52919.pdf
1549. *Ph529 Lecture 10: Charge Conjugation, Isospin, etc.*
physics.princeton.edu/~mcdonald/examples/ph529/ph529110.pdf
1550. *Ph529 Lecture 11: 3-Body Decays, Partial-Wave Analysis*
physics.princeton.edu/~mcdonald/examples/ph529/ph529111.pdf
1551. *Ph529 Lecture 12: Phenomenology of the Strong Interaction at High Energies*
physics.princeton.edu/~mcdonald/examples/ph529/ph529112.pdf
1552. *Ph529 Lecture 13: The Quark Model*
physics.princeton.edu/~mcdonald/examples/ph529/ph529113.pdf
1553. *Ph529 Lecture 14: The Quark Model, II*
physics.princeton.edu/~mcdonald/examples/ph529/ph529114.pdf
1554. *Ph529 Lecture 15: Heavy Quark States*
physics.princeton.edu/~mcdonald/examples/ph529/ph529115.pdf
1555. *Ph529 Lecture 16: The Weak Interaction*
physics.princeton.edu/~mcdonald/examples/ph529/ph529116.pdf
1556. *Ph529 Lecture 17: Weak Interactions, II*
physics.princeton.edu/~mcdonald/examples/ph529/ph529117.pdf
1557. *Ph529 Lecture 18: CP Violation*
physics.princeton.edu/~mcdonald/examples/ph529/ph529118.pdf
1558. *Ph529 Lecture 19: Neutrino Interactions*
physics.princeton.edu/~mcdonald/examples/ph529/ph529119.pdf
1559. *Ph529 Lecture 20: The Need for a Better Theory*
physics.princeton.edu/~mcdonald/examples/ph529/ph529120.pdf
1560. *Ph529 Lecture 21: The Glashow-Weinberg-Salam Model*
physics.princeton.edu/~mcdonald/examples/ph529/ph529121.pdf
1561. *Ph529 Lecture 22: Test of the Glashow-Salam-Weinberg Model*
physics.princeton.edu/~mcdonald/examples/ph529/ph529122.pdf
1562. *Ph529 Lecture 23: Quantum Chromodynamics*
physics.princeton.edu/~mcdonald/examples/ph529/ph52923.pdf
1563. *Ph529 Lecture 24: Speculations*
physics.princeton.edu/~mcdonald/examples/ph529/ph529124.pdf

Short Course on Astroparticle Physics (1988)

1564. *Lecture 1. Techniques of Astroparticle Physics*,
physics.princeton.edu/~mcdonald/papers/schladming1.pdf
1565. *Lecture 2. Gamma-Ray Protons and Photons*,
physics.princeton.edu/~mcdonald/papers/schladming2.pdf
1566. *Lecture 3. Solar and Supernova Neutrinos*,
physics.princeton.edu/~mcdonald/papers/schladming3.pdf
1567. *Lecture 4. Detectors for the Rest of the Universe*,
physics.princeton.edu/~mcdonald/papers/schladming4.pdf

Short Courses on Accelerator Physics

1568. *A Short Course on Targetry for a Neutrino Factory and Muon Collider* (June 4, 2003)
physics.princeton.edu/~mcdonald/mumu/target/targettrans38.pdf
1569. *A Short Course on Targetry for Neutrino Superbeams, Neutrino Factories and Muon Colliders* (NuFACT06 Summer Institute, Aug 21, 2006),
physics.princeton.edu/~mcdonald/mumu/target/targettrans53.pdf