References

[1] For an early demonstration for renormalizable theories see:
Appelquist, T. and Carazzone, J. 1975.
Infrared Singularities and Massive Fields.
Physical Review **D11** (1974) 2856.

[2] Weinberg, S. 1979.
Phenomenological Lagrangians.
Physica A **96** (1979) 327.

[3] Nambu, Y. 1960.
Quasiparticles and Gauge Invariance in the Theory of Superconductivity.
Physical Review **117** (1960) 648.

[4] Goldstone, J. 1961.
Field Theories with Superconductor Solutions.
Nuovo Cimento **19** (1961) 154.

[5] Goldstone, J., Salam, Abdus and Weinberg, S. 1962.
Broken Symmetries.
Physical Review **127** (1962) 965.

[6] Heisenberg, W. 1938.
Zur Theorie der explosionsartigen Schauer in der kosmischen Strahlung. II *Zeitschrift für Physik* **113** 61.

[7] Sakata, S., Umezawa, H. and Kamefuchi, S. 1952.
On the Green-Functions of the Quantum Electrodynamics.
Progress in Theoretical Physics **7** 327.

[8] Borchers, H. 1960.
Über die mannigfaltigkeit der interpolierenden felder zu einer kausalen S-matrix.
Nuovo Cimento **15** (1960) 784.

[9] Chisholm, J.S.R. 1961.
Change of variables in quantum field theories.
Nuclear Physics **26** (1961) 469.

[10] Kamefuchi, S., O'Raifeartaigh, L. and Salam, A. 1961.
Change of variables and equivalence theorems in quantum field theories.
Nuclear Physics, **28** (1961) 529.

[11] Weinberg, S. 1968.
Nonlinear realizations of chiral symmetry.
Physical Review **166** (1968) 1568.

[12] Coleman, S. R., Wess J., and Zumino, B. 1969.

Structure of phenomenological Lagrangians, 1.
Physical Review **177** (1969) 2239.

[13] Callan, C. G., Coleman, S. R., Wess J., and Zumino, B. 1969.
Structure of phenomenological Lagrangians, 2.
Physical Review **177** (1969) 2247.

[14] Weinberg, S. 1969.
Feynman Rules for Any Spin III.
Physical Review **181** (1969) 1893.

[15] Jona-Lasinio, G. 1964.
Relativistic field theories with symmetry breaking solutions.
Nuovo Cimento **34** (1964) 1790.

[16] Symanzik, K. 1970.
Renormalizable models with simple symmetry breaking 1.
Symmetry breaking by a source term.
Communications in Mathematical Physics **16** (1970) 48.

[17] Coleman, S. 2010.
Aspects of Symmetry: Selected Erice Lectures.
Cambridge University Press, 2010.

[18] Wick, G.C. 1950.
The evaluation of the collision matrix.
Physical Review **80** (1950) 268.

[19] Kaplan, D.B. 2005.
Five lectures on effective field theory.
(arXiv:nucl-th/0510023).

[20] Politzer, H.D. 1980.
Power Corrections At Short Distances.
Nuclear Physics **B172** (1980) 349.

[21] Iliopoulos, J., Itzykson, C. and Martin, A. 1975.
Functional Methods and Perturbation Theory.
Reviews of Modern Physics **47** (1975) 165.

[22] Taylor, J.C. 1971.
Ward Identities and Charge Renormalization of the Yang-Mills Field.
Nuclear Physics **B33** (1971) 436.

[23] Slavnov, A.A. 1972.
Ward Identities in Gauge Theories.
Theoretical and Mathematical Physics **10** (1972) 99
(*Teoreticheskaya i Matematischeskaya Fizika* **10** (1972) 153).

[24] Burgess, C.P. 2004.
Quantum gravity in everyday life: General relativity as an effective field theory,.
Living Reviews of Relativity **7** (2004) 5 (arXiv:gr-qc/0311082).

[25] Polchinski, J. 1984.
Renormalization and Effective Lagrangians.
Nuclear Physics **B231** (1984) 269.

[26] Wetterich, C. 1993.
Exact evolution equation for the effective potential.
Physics Letters **B301** (1993) 90(arXiv:1710.05815).
[27] Morris, T. 1993.
Exact renormalization group and approximate solutions.
International Journal of Modern Physics **A9** (1993) 2411(arXiv:hep-ph/9308265).
[28] Burgess, C.P. and London, D. 1993.
Uses and Abuses of Effective Lagrangians.
Physical Review **D48** (1993) 4337 (arXiv:hep-ph/9203216).
[29] Beneke, M. and Smirnov, V.A. 1998.
Asymptotic expansion of Feynman integrals near threshold.
Nuclear Physics **B522** (1998) 321344 (hep-ph/9711391).
Smirnov, V.A. 1999.
Problems of the strategy of regions.
Physics Letters **B465** (1999) 226234 (hep-ph/9907471).
[30] Becher, T., Broggio, A. and Ferroglia, A. 2014.
Introduction to Soft-Collinear Effective Theory.
Lecture Notes in Physics **896** (2015) 1 (arXiv:1410.1892 (hep-ph)).
[31] Weinberg, S. 1980.
Effective Gauge Theories.
Physics Letters **91B** (1980) 51.
[32] Gasser, J. and Leutwyler, H. 1984.
Chiral Perturbation Theory to One Loop.
Annals of Physics **158** (1984) 142.
[33] Bollini, C., Giambiagi, J.J. 1972.
Dimensional Renormalization:
The Number of Dimensions as a Regularizing Parameter.
Nuovo Cimento B12 (1972) 20.
[34] ’t Hooft, G. and Veltman, M. 1972.
Regularization and renormalization of gauge fields.
Nuclear Physics **B44** (1972) 189.
[35] ’t Hooft, G. 1973.
Dimensional regularization and the renormalization group.
Nuclear Physics **B 61** (1973) 455.
[36] ’t Hooft, G. 1973.
An algorithm for the poles at dimension four
in the dimensional regularization procedure.
Nuclear Physics **B 62** (1973) 444.
[37] Weinberg, S. 1973.
New Approach to the Renormalization Group.
Physical Review **D8** (1973) 3497.
[38] Landau, L. D. 1959.
On analytic properties of vertex parts in quantum field theory.
Nuclear Physics **13** 181.

[39] 't Hooft, G. and Veltman, M.J.G. 1974.
Diagrammar.
NATO Science Series **B4** (1974) 177.
[40] Weinberg, S. 1981.
Why The Renormalization Group Is A Good Thing.
Cambridge, Proceedings *Asymptotic Realms Of Physics*, (1981) 1–19.
[41] Wigner, E.P. 1931.
Gruppentheorie und ihre Anwendung auf die Quanten-mechanik der Atomspektren.
Braunschweig, 1931. (English translation, Academic Press Inc, New York 1959).
[42] Noether, E. 1918.
Invariante Variationsprobleme.
Nachrichten von der Gesellschaft der Wissenschaften, Gottingen, Mathematisch-Physikalische Klasse **2** (1918) 98.
(English translation: in *Transport Theory and Statistical Physics* **1** 186.
See also (arXiv:physics/0503066).)
[43] Fabri, E. and Picasso, L.E. 1966.
Quantum Field Theory and Approximate Symmetries.
Physical Review Letters 16 (1966) 408.
[44] Weinberg, S. 1972.
Approximate symmetries and pseudoGoldstone bosons,.
Physical Review Letters **29** (1972)1698.
[45] Gell-Mann, M. 1964.
The Symmetry group of vector and axial vector currents.
Physics Physique Fizika **1** (1964) 63.
[46] Weisberger, W. 1965.
Renormalization of the Weak Axial-Vector Coupling Constant.
Physical Review Letters **14** (1965) 1047.
[47] Adler, S. 1965.
Calculation of the axial-vector coupling constant renormalization in beta decay.
Physical Review Letters **14** (1965) 1051.
[48] Weinberg, S. 1966.
Pion scattering lengths.
Physical Review Letters **17** (1966) 616.
[49] Weinberg, S. 1966.
Dynamical approach to current algebra.
Physical Review Letters **18** (1966) 188.
[50] Cartan, E. 1904.
Sur la structure des groupes infinis de transformation.
Annales scientifiques de lécole normal supërieur 3e srie, tome 21, (1904) p. 153.
[51] Weinberg, S. 1964.
Feynman Rules for Any Spin 2: Massless Particles.
Physical Review **134** (1964) B882.
[52] Weinberg, S. 1964.
Photons and Gravitons in S Matrix Theory: Derivation of Charge Conservation and

Equality of Gravitational and Inertial Mass.
Physical Review **135** (1964) B1049.

[53] Weinberg, S. 1965.
Infrared photons and gravitons.
Physical Review **140** (1965) B516.

[54] Weinberg, S. and Witten, E. 1980.
Limits on Massless Particles.
Physics Letters **96B** (1980) 59.

[55] Brout, R. and Englert, F. 1964.
Broken Symmetry and the Mass of Gauge Vector Mesons.
Physical Review Letters **13** (1964) 321.

[56] Guralnik, G.S., Hagen, C.R. and Kibble, T.W.B. 1964. Global Conservation Laws and Massless Particles.
Physical Review Letters **13** (1964) 585.

[57] Kibble, T.W.B. 1967.
Symmetry breaking in nonAbelian gauge theories.
Physical Review **155** (1967) 1554.

[58] Higgs, P.W. 1964.
Broken symmetries, massless particles and gauge fields.
Physics Letters **12** (1964) 132.

[59] Higgs, P.W. 1964.
Broken Symmetries and the Masses of Gauge Bosons.
Physical Review Letters **13** (1964) 508.

[60] Anderson, P.W. 1963.
Plasmons, Gauge Invariance, and Mass.
Physical Review **130** (1963) 439.

[61] Weinberg, S. 1967.
A Model of Leptons.
Physical Review Letters **19** (1967) 1264.

[62] Olive, K.A. *et al.* (Particle Data Group). 2014.
Chinese Physics **C38**, 090001 (2014).

[63] Stueckelberg, E. 1938.
Die Wechselwirkungskräfte in der Elektrodynamik und in der Feldtheorie der Kräfte.
Helvetica Physica Acta **11** (1938) 225.

[64] Weinberg, S. 1971.
Physical Processes in a Convergent Theory of the
Weak and Electromagnetic Interactions.
Physical Review Letters **27** (1971) 1688.

[65] Weinberg, S. 1973.
General Theory of Broken Local Symmetries".
Physical Review **D7** (1973) 1068.

[66] Fujikawa, K., Lee, B.W. and Sanda, A. 1972.
Generalized Renormalizable Gauge Formulation of

Spontaneously Broken Gauge Theories.
Physical Review **D6** (1972) 2923.
[67] Lee, B.W., Quigg, C. and Thacker, H.B. 1977.
Weak Interactions at Very High-Energies: The Role of the Higgs Boson Mass.
Physical Review **D16** (1977) 1519.
[68] Froissart, M. 1961.
Asymptotic Behavior and Subtractions in the Mandelstam Representation.
Physical Review **123** 1053.
[69] Cornwall, J.M., Levin, D.N. and Tiktopoulos, G. 1974.
Derivation of Gauge Invariance from High-Energy Unitarity Bounds on the S Matrix.
Physical Review **D10** 1145; Erratum: (*Phys. Rev.* **D11** (1975) 972).
[70] Bell, J.S. and Jackiw, R. 1969.
A PCAC puzzle: $\pi^0 \to \gamma\gamma$ in the σ model.
Nuovo Cimento A60 (1969) 47.
[71] Adler, S.L. 1969.
Axial vector vertex in spinor electrodynamics.
Physical Review **177** (1969) 2426.
[72] Bardeen, W.A. 1969.
Anomalous Ward identities in spinor field theories.
Physical Review **184** (1969) 1848.
[73] Adler, S.L. and Bardeen, W.A. 1969.
Absence of higher order corrections in the anomalous axial vector divergence equation.
Physical Review **182** (1969) 1517.
[74] Coleman, S.R. and Grossman, B. 1982.
't Hooft's Consistency Condition as a Consequence of Analyticity and Unitarity.
Nuclear Physics **B203** (1982) 205.
[75] Capper, D.M. and Duff, M.J. 1974.
Trace anomalies in dimensional regularization.
Nuovo Cimento **A23** (1974) 173.
[76] Fujikawa, K. 1979.
Path Integral Measure for Gauge Invariant Fermion Theories,.
Physical Review Letters **42** (1979) 1195.
[77] Green, M.B. and Schwarz, J.H. 1984.
Anomaly Cancellation in Supersymmetric D=10
Gauge Theory and Superstring Theory.
Physics Letters **149B** (1984) 117.
[78] Wess, J. and Zumino, B. 1971.
Consequences of anomalous ward identities.
Physics Letters **B37** (1971) 95.
[79] Weisskopf, V.F. 1939.
On the Self-Energy and the Electromagnetic Field of the Electron.
Physical Review **56** (1039) 72.
[80] 't Hooft, G. 1980.
Naturalness, chiral symmetry, and spontaneous chiral symmetry breaking.

In the proceedings of 'Recent Developments in Gauge Theories' NATO Advanced Study Institute, Cargese, *NATO Science Series* **B59** (1980) 135.

[81] Finkelstein, R.J. 1947.
The γ-Instability of Mesons.
Physical Review **72** (1947) 415.

[82] Fukuda, H. and Miyamoto, Y. 1949.
On the γ-Decay of Neutral Meson.
Progress of Theoretical Physics **4** (1949) 347.

[83] Steinberger, J. 1949.
On the Use of subtraction fields and the lifetimes of some types of meson decay.
Physical Review **76** (1949) 1180.

[84] Schwinger, J.S. 1951.
On gauge invariance and vacuum polarization.
Physical Review **82** (1951) 664.

[85] Sutherland, D.G. 1967.
Current algebra and some nonstrong mesonic decays.
Nuclear Physics **B2** (1967) 433.

[86] Veltman, M. 1967.
Theoretical Aspects of High Energy Neutrino Interactions.
Proceedings of the Royal Society of London **A301** (1967) 107.

[87] Duff, M.J, Inami, T., Pope, C.N., Sezgin E. and Stelle, K.S. 1988.
Semiclassical quantization of the supermembrane.
Nuclear Physics **B297** (1988) 515.

[88] Polchinski, J. 1995.
Dirichlet Branes and Ramond-Ramond charges.
Physical Review Letters **75** (1995) 4724 (arXiv:hep-th/9510017).

[89] Burgess, C.P., Horbatsch, M.W. and Patil, S.P. 2013.
Inflating in a Trough: Single-Field Effective Theory
from Multiple-Field Curved Valleys.
Journal of High Energy Physics **1301** (2013) 133 (arXiv:1209.5701 (hep-th)).

[90] Ostrogradsky, M. 1850.
Mémoires sur les équations différentielles, relatives au problème des isopéimètres.
Mémoires de l'Académie impériale des sciences de St. Pétersbourg **VI 4** (1850) 385.

[91] Woodard, R.P. 2015.
Ostrogradsky's theorem on Hamiltonian instability.
Scholarpedia **10** (2015) 32243 (arXiv:1506.02210 (hep-th)).

[92] Motohashi, H. and Suyama, T. 2015.
Third order equations of motion and the Ostrogradsky instability.
Physical Review **D91** (2015) 085009 (arXiv:1411.3721 (physics.class-ph)).

[93] Burgess, C.P. and Williams, M. 2014.
Who You Gonna Call? Runaway Ghosts, Higher Derivatives
and Time-Dependence in EFTs.
Journal of High Energy Physics **1408** (2014) 074 (arXiv:1404.2236 (gr-qc)).

[94] Horndeski, G.W. 1974.
Second-order scalar-tensor field equations in a four-dimensional space.
International Journal of Theoretical Physics **10** (1974) 363.
[95] Nicolis, A., Rattazzi, R. and Trincherini, E. 2009.
The Galileon as a local modification of gravity.
Physical Review **D79** (2009) 064036 (arXiv:0811.2197 (hep-th)).
[96] Deffayet, C., Gao, X., Steer, D.A. and Zahariade, G. 2011.
From k-essence to generalised Galileons.
Physical Review **D84** (2011) 064039 (arXiv:1103.3260 (hep-th)).
[97] Solomon, A.R. and Trodden, M. 2018.
Higher-derivative operators and effective field theory for general scalar-tensor theories.
Journal of Cosmology and Astroparticle Physics **1802** (2018) 031 (arXiv:1709.09695 (hep-th)).
[98] Sarbach, O. and Tiglio, M. 2012.
Continuum and Discrete Initial-Boundary-Value
Problems and Einsteins Field Equations.
Living Reviews of Relativity **15** (2012) 100 (arXiv:1203.6443 (gr-qc)).
[99] Kreiss, H.-O. and Lorenz, J., 1989.
Initial-Boundary Value Problems and the Navier-Stokes Equations.
Pure and Applied Mathematics 136, Academic Press, San Diego, 1989.
[100] Hadamard, J. 1902.
Sur les problèmes aux dérivées partielles et leur signification physique.
Princeton University Bulletin 13 (1902) 4952.
[101] Papallo, G. and Reall, H.S. 2017.
On the local well-posedness of Lovelock and Horndeski theories.
Physical Review **D96** (2017) 044019 (arXiv:1705.04370 (gr-qc)).
[102] Tikhonov, A. N. and Arsenin, V. Y. 1977.
Solutions of Ill-Posed Problems.
Winston Press, New York, 1977.
[103] Allwright, G. and Lehner, L. 2018.
Towards the nonlinear regime in extensions to GR: assessing possible options.
(arXiv:1808.07897 (gr-qc)).
[104] Cheung, C., Creminelli, P., Fitzpatrick, A.L, Kaplan J. and Senatore, L. 2008.
The Effective Field Theory of Inflation.
Journal of High Energy Physics **0803** (2008) 014 (arXiv:0709.0293 (hep-th)).
[105] Nicolis, A. and Piazza, F. 2011.
Spontaneous Symmetry Probing.
Journal of High Energy Physics **1206** (2012) 025 (arXiv:1112.5174 (hep-th)).
[106] Volkov, D.V. 1973.
Phenomenological Lagrangians.
Soviet Journal of Nuclear Physics **4** (1973) 1;
(*Fizika Elementarnykh Chastits i Atomnogo Yadra* **4** (1973) 3).
[107] Burgess, C.P., 2000.
Goldstone and pseudo-Goldstone bosons in nuclear,

particle and condensed matter physics.
Physics Reports **330** (2000) 193 (hep-th/9808176).
[108] Watanabe, H. and Murayama, H. 2012.
Unified Description of Nambu-Goldstone Bosons without Lorentz Invariance.
Physical Review Letters **108** (2012) 251602 (arXiv:1203.0609 (hep-th)).
[109] Glashow, S.L., 1961.
Partial Symmetries of Weak Interactions.
Nuclear Physics **22** (1961) 579.
[110] Salam, A. 1968.
Weak and Electromagnetic Interactions.
Conference Proceedings **C 680519** (1968) 367.
[111] Glashow, S.L., Iliopoulos, J. and Maiani, L. 1970.
Weak Interactions with Lepton-Hadron Symmetry.
Physical Review **D2** (1970) 1285.
[112] Cabibbo, N. 1963.
Unitary Symmetry and Leptonic Decays.
Physical Review Letters **10** (1963) 531.
[113] Kobayashi, M. and Maskawa, T. 1973.
CP Violation in the Renormalizable Theory of Weak Interaction.
Progress in Theoretical Physics **49** (1973) 652.
[114] Pontecorvo, B. 1957.
Inverse beta processes and nonconservation of lepton charge.
Zhurnal Éksperimental'noǐ i Teoreticheskoǐ Fiziki **34** 247
(*Soviet Physics JETP* **7** (1958) 172).
[115] Maki, Z., Nakagawa, M. and Sakata S. 1962.
" Remarks on the Unified Model of Elementary Particles.
Progress of Theoretical Physics **28** 870.
[116] Fermi, E. 1933.
Tentativo di una teoria dei raggi β.
La Ricerca Scientifica **2** (12). *Il Nuovo Cimento* **11** 1.
[117] Fermi, E. 1934.
Versuch einer Theorie der beta-Strahlen. I.
Zeitschrift für Physik **88** 161. For an English translation see Wilson, F. L. 1968.
Fermi's Theory of Beta Decay.
American Journal of Physics **36** 1150.
[118] Feynman, R. P. and Gell-Mann, M. 1958.
Theory of the Fermi interaction.
Physical Review **109** 193.
[119] Sudarshan, E. C. and Marshak, R. E. 1958.
Chirality invariance and the universal Fermi interaction.
*Physical Review***109** 1860.
[120] Dirac, P.A.M. 1927.
The Quantum Theory of the Emission and Absorption of Radiation.
Proceedings of the Royal Society of London **A 114** 243.

[121] Fermi, E. 1932.
Quantum Theory of Radiation.
Reviews of Modern Physics **4** 87.
[122] Dirac, P. A. M. 1928.
The Quantum Theory of the Electron.
Proceedings of the Royal Society A: **117** 610.
[123] Tomonaga, S. 1946.
On a Relativistically Invariant Formulation of the Quantum Theory of Wave Fields.
Progress of Theoretical Physics **1** 27.
[124] Schwinger, J. 1948.
On Quantum-Electrodynamics and the Magnetic Moment of the Electron.
Physical Review **73** 416.
[125] Feynman, R.P. 1949.
SpaceTime Approach to Quantum Electrodynamics.
Physical Review **76** 769.
The Theory of Positrons.
Physical Review **76** 749.
[126] Dyson, F.J. 1949.
The Radiation Theories of Tomonaga, Schwinger, and Feynman.
Physical Review **75** 486.
[127] Dyson, F.J. 1949.
The S-matrix in quantum electrodynamics.
Physical Review **75** (1949) 1736.
[128] Furry, W.H. 1937.
A Symmetry Theorem in Positron Theory.
Physical Review **51** 125.
[129] Rutherford, E. 1911.
The Scattering of α and β rays by Matter and the Structure of the Atom.
Philosophical Magazine **6** 21.
[130] Euler, H., Kockel, B., 1935.
Über die Streuung von Licht an Licht nach der Diracschen Theorie.
Die Naturwissenschaften **23** 246.
[131] Heisenberg, W. and Euler, H. 1936.
Folgerungen aus der Diracschen Theorie des Positrons.
Zeitschrift für Physik **98** 714.
[132] Karplus, R. and Neuman, M. 1951.
The Scattering of Light by Light.
Physical Review **83** (1951) 776.
[133] Low, F.E. 1954.
Scattering of Light of Very Low Frequency by Systems of Spin 1/2.
Physical Review **96** (1954) 1428.
[134] Gell-Mann, M. and Goldberger, M.L. 1954.
Scattering of Low-Energy Photons by Particles of Spin 1/2.
Physical Review **96** (1954) 1433.

[135] Bloch, F. and Nordsieck, A. 1937.
Note on the Radiation Field of the Electron.
Physical Review **52** (1937) 54.

[136] Yennie, D.R., Frautschi, S.C. and Suura, H. 1955.
The infrared divergence phenomena and high-energy processes.
Annals of Physics (NY) **13** (1955) 379.

[137] Kinoshita, T. 1962.
Mass Singularities of Feynman Amplitudes.
Journal of Mathematical Physics **3** (1962) 650.

[138] Lee, T.-D. and Nauenberg, M. 1964.
Degenerate Systems and Mass Singularities.
Physical Review **D133** (1964) B1549,

[139] Callan, C.G. 1970.
Broken Scale Invariance in Scalar Field Theory.
Physical Review **D2** (1970) 1541.

[140] Symanzik, K. 1970.
Small distance behaviour in field theory and power counting.
Communications in Mathematical Physics **18** (1970) 227.

[141] Gell-Mann, M. 1961.
The Reaction $\gamma + \gamma \to nu + \bar{\nu}$.
Physical Review Letters **6** (1961) 70.

[142] Dicus, D.A. and Repko, W.W. 1993.
Photon neutrino scattering.
Physical Review **D48** (1993) 5106 (arXiv:hep-ph/9305284).

[143] Dicus, D.A and Repko, W.W. 1997.
Photon - neutrino interactions.
Physical Review Letters **79** (1997) 569 (arXiv:hep-ph/9703210).

[144] Aghababaie, Y. and Burgess, C.P. 2000.
Two neutrino five photon scattering at low-energies.
Physical Review **D 63** (2001) 113006 (arXiv:hep-ph/0006165).

[145] Yang, C.N. 1950.
Selection Rules for the Dematerialization of a Particle Into Two Photons.
Physical Review **77** (1950) 242.

[146] Bowick, M.J. and Travesset, A. 2000.
The Statistical mechanics of membranes.
Physics Reports **344** (2001) 255 (cond-mat/0002038 (cond-mat.soft)).

[147] Aghababaie, Y. and Burgess, C.P. 2003.
Effective actions, boundaries and precision calculations of Casimir energies.
Physical Review **D70** (2004) 085003 (hep-th/0304066).

[148] Casimir, H.B.G. 1948.
On the Attraction between Two Perfectly Conducting Plates.
Proceedings of the Koninklijke Nederlandse Akademie van Wetenschappen **51** 793.

[149] Jaffe, R. 2005.

Casimir effect and the quantum vacuum.
Physical Review **D72** (2005) 021301 (arXiv:hep-th/0503158).
[150] Sparnaay, M. J. 1957.
Attractive Forces between Flat Plates.
Nature **180** (1957) 334.
[151] Lamoreaux, S. K. 1997.
Demonstration of the Casimir Force in the 0.6 to 6 μm Range.
Physical Review Letters **78** 5.
[152] Mohideen, U. and Roy, A. 1998.
Precision Measurement of the Casimir Force from 0.1 to 0.9 μm.
Physical Review Letters **81** 4549.(arXiv:physics/9805038).
[153] Brown, L.S. and Maclay, G.J. 1969.
Vacuum Stress between Conducting Plates: An Image Solution.
Physical Review **184** (1969) 1272.
[154] Ravndal, F. and Thomassen, J.B. 2001.
Radiative corrections to the Casimir energy and effective field theory.
Physical Review **D63** (2001) 113007 (hep-th/0101131).
[155] Bordag, M., Wieczorek, E. and Robaschik, D. 1984.
Radiation Corrections To The Casimir Effect. (in Russian).
Soviet Journal of Nuclear Physics **39** (1984) 663 (*Yadernaya Fizika* **39** (1984) 1053).
[156] Bordag, M., Wieczorek, E. and Robaschik, D. 1985.
Quantum field theoretic treatment of the Casimir effect.
Annals of Physics **165** (1985) 192.
[157] Gell-Mann, M. 1964.
A Schematic Model of Baryons and Mesons.
Physics Letters **8** (1964) 214.
[158] Zweig, G. 1964.
An SU(3) model for strong interaction symmetry and its breaking. Version 1.
(preprint CERN-TH-401).
An SU(3) model for strong interaction symmetry and its breaking. Version 2.
in *Developments in the Quark Theory of Hadrons, Volume 1* edited by D. Lichtenberg and S. Rosen. pp. 22-101 (preprint CERN-TH-412).
[159] Bjorken, B.J., Glashow, S.L. 1964.
Elementary Particles and SU(4).
Physics Letters **11** 255.
[160] Feynman, R.P. 1969.
Very High-Energy Collisions of Hadrons.
Physical Review Letters **23** (1969) 1415.
[161] Greenberg, O.W. 1964.
Spin and Unitary Spin Independence in a Paraquark Model of Baryons and Mesons.
Physical Review Letters **13** (1964) 598.
[162] Han, M.Y. and Nambu, Y. 1965.
Three-Triplet Model with Double SU(3) Symmetry.
Physical Review **139** (1965) B1006.

[163] Struminsky, B.V. 1965.
Magnetic moments of baryons in the quark model.
JINR-Preprint P-1939 Dubna, Russia.

[164] Fritzsch, H., Gell-Mann, M. and Leutwyler, H. 1973.
Advantages of the Color Octet Gluon Picture.
Physics Letters **47B** (1973) 365.

[165] Vanyashin, V.S. and Terent'ev, M.V. 1965.
The vacuum polarization of a charged vector field.
Journal of Experimental and Theoretical Physics **21** (1965) 375.

[166] Khriplovich, I.B. 1970.
Green's functions in theories with non-Abelian gauge group.
Soviet Journal of Nuclear Physics **10** (1970) 235.

[167] 't Hooft, G. 1972.
Unpublished talk at the Marseille conference on *Renormalization of YangMills fields and applications to particle physics*.

[168] Gross, D.J. and Wilczek, F. 1973.
Ultraviolet behavior of non-abelian gauge theories.
Physical Review Letters **30** 1343.

[169] Politzer, H.D. 1973.
Reliable perturbative results for strong interactions.
Physical Review Letters **30** 1346.

[170] S. Schael *et al.* (ALEPH and DELPHI and L3 and OPAL and SLD Collaborations and LEP Electroweak Working Group and SLD Electroweak Group and SLD Heavy Flavour Group). 2005.
Precision electroweak measurements on the Z resonance.
Physics Reports **427** (2006) 257 (hep-ex/0509008).

[171] Gross, D.J. and Wilczek, F. 1973.
Asymptotically Free Gauge Theories I.
Physical Review **D8** (1973) 3633.

[172] Weinberg, S. 1973.
Nonabelian Gauge Theories of the Strong Interactions.
Physical Review Letters **31** (1973) 494.

[173] Glashow, S.L., Jackiw, R. and Shei, S-S. 1969.
Electromagnetic Decays of Pseudoscalar Mesons.
Physical Review **187** (1969) 1916.

[174] t Hooft, G. 1976.
Symmetry Breaking Through Bell-Jackiw Anomalies.
Physical Review Letters **37** (1976) 8.

[175] Jackiw, R. and Rebbi, C. 1976.
Physical Review Letters 37 (1976) 172.

[176] Callan, C.G., Dashen, R.F. and Gross, D.J. 1976.
The Structure of the Gauge Theory Vacuum.
Physics Letters **63B** (1976) 334.

[177] Vafa, C. and Witten, E. 1984.
Parity Conservation in QCD.
Physical Review Letters **53** (1984) 535.
[178] Heisenberg, W. 1932.
Über den Bau der Atomkerne.
Zeitschrift für Physik **77** 1.
[179] Wigner, E. 1937.
On the Consequences of the Symmetry of the
Nuclear Hamiltonian on the Spectroscopy of Nuclei.
Physical Review **51** 106.
[180] Adler, S.L. 1965.
Calculation of the axial vector coupling constant renormalization in beta decay.
Physical Review Letters **14** (1965) 1051;
[181] Weisberger, W.I. 1965.
Renormalization of the Weak Axial Vector Coupling Constant.
Physical Review Letters **14** (1965) 1047.
[182] Gell-Mann, M., Oakes, R. J. and Renner, B. 1968.
Behavior of Current Divergences under SU3?SU3.
Physical Review **175** (1968) 2195.
[183] Bardeen, W. A., Bijnens, J., Gérard, J.-M. 1989.
Hadronic Matrix Elements and the $\pi^+ - \pi^0$ Mass Difference.
Physical Review Letters **62** (1989) 1343.
[184] Donoghue, J.F. and Perez, A.F. 1997.
The Electromagnetic mass differences of pions and kaons.
Physical Review **D55** (1997) 7075 (hep-ph/9611331).
[185] Ruderman, M. and Finkelstein, R. 1949.
Note on the Decay of the π-Meson *Physical Review* **76** (1949) 1458.
[186] Goldberger, M.L. and Treiman, S. 1958.
Decay of the Pi Meson.
Physical Review **110** (1958) 1178.
[187] Jenkins E.E. and Manohar, A.V. 1990.
Baryon chiral perturbation theory using a heavy fermion Lagrangian.
Physics Letters **B255** (1991) 558.
[188] Goldberger, M.L. and Treiman, S. 1958.
Form Factors in β Decay and μ Capture.
Physical Review **111** (1958) 354.
[189] Donoghue, J.F., Golowich, E. and Holstein, B.R. 1992.
Dynamics of the standard model.
Cambridge Monographs in Particle Physics, Nuclear Physics and Cosmology **2** (1992) 1 (2nd edition: *Cambridge Monographs in Particle Physics, Nuclear Physics and Cosmology* **35** (2014)).
[190] Glashow, S. and Weinberg, S. 1968.
Breaking Chiral Symmetry.
Physical Review Letters **20** (1968) 224.

[191] Gell-Mann, M. 1961.
Caltech Synchrotron Laboratory Report CTSL-20 (1961), reproduced in the book *The Eightfold Way*, by M. Gall=Mann and Y. Ne'eman (Benjamin, New York, 1964).

[192] Okubo, S. 1962.
Note on Unitary Symmetry in Strong Interactions.
Progress in Theoretical Physics **27** (1962) 949.

[193] Dashen, R. 1969.
Chiral SU(3) x SU(3) as a symmetry of the strong interactions.
Physical Review **183** (1969) 1245.

[194] Burgess, C.P. and Moore, G.D.
The Standard Model: A Modern Primer
(Cambridge Press, 2007; post-Higgs update 2013).

[195] Weinberg, S. 1979.
Baryon and Lepton Nonconserving Processes.
Physical Review Letters **43** (1979) 1566.

[196] Perl, M. *et al.* 1975.
Evidence for Anomalous Lepton Production in $e^+e^?$ Annihilation.
Physical Review Letters **35** (1975) 1489.

[197] Zel' dovich, Ia. B. 1952.
Doklady Akademii Nauk SSSR **86** (1952) 505 (1952).

[198] Davis, R., Harmer, D.S. and Hoffman, K.C. 1968.
Search for Neutrinos from the Sun.
Physical Review Letters **20** (1968) 1205.

[199] Fukudae, Y. *et al.* (Super-Kamiokande Collaboration) 1998.
Evidence for Oscillation of Atmospheric Neutrinos.
Physical Review Letters **81** (1998) 1562(arXiv:hep-ex/9807003).

[200] Ahmad, Q. R. *et al.* (SNO Collaboration) 2001.
Measurement of the Rate of $\nu_e + d \to p + p + e^-$ Interactions
Produced by ^{8}B Solar Neutrinos at the Sudbury Neutrino Observatory.
Physical Review Letters **87** (1968) 071301 (arXiv:nucl-ex/0106015).

[201] Abe, Y. *et al.* (Double Chooz collaboration) 2012.
Indication for the disappearance of reactor electron
antineutrinos in the Double Chooz experiment.
Physical Review Letters **108** (2012) 131801 (arXiv:1112.6353).

[202] An, F. P. *et al.* (Daya Bay Collaboration) 2012.
Observation of Electron-Antineutrino Disappearance at Daya Bay.
Physical Review Letters **108** (2012) 171803 (arXiv:1203.1669).

[203] Pontecorvo, B. 1957.
Mesonium and anti-mesonium.
Zhurnal Éksperimental'noĭ i Teoreticheskoĭ Fiziki **33** (1957) 549
(*Soviet Physics JETP.* **6** (1957) 429431).

[204] Pontecorvo, B. 1968.
Neutrino Experiments and the Problem of Conservation of Leptonic Charge.

Zhurnal Éksperimental'noĭ i Teoreticheskoĭ Fiziki **53** (1968) 1717
(*Soviet Physics JETP.* **26** (1968) 984).
[205] Chivukula, R.S. and Georgi, H. 1987.
Composite Technicolor Standard Model.
Physics Letters **B188** (1987) 99.
[206] DAmbrosio, G., Giudice, G.F. Isidori, G. and Strumia, A.
Minimal Flavour Violation: an effective field theory approach.
Nuclear Physics **B645** (2002) 155 (arXiv:hep-ph/0207036).
[207] Georgi, H. and Glashow, S.L. 1972.
Gauge theories without anomalies.
Physical Review **D6** (1972) 429.
[208] Bouchiat, C., Iliopoulos, J. and Meyer, P. 1972.
An Anomaly Free Version of Weinberg's Model.
Physics Letters **38B** (1972) 519.
[209] Gross, D.J. and Jackiw, R. 1972.
Effect of anomalies on quasirenormalizable theories.
Physical Review **D6** (1972) 477.
[210] Alvarez-Gaume, L. and Witten, E.
Gravitational Anomalies.
Nuclear Physics **B234** (1984) 269.
[211] Minahan, J.A., Ramond, P. and Warner, R.C. 1990.
A Comment on Anomaly Cancellation in the Standard Model.
Physical Review **D41** (1990) 715.
[212] Weinberg, S. 1980.
Varieties of Baryon and Lepton Nonconservation.
Physical Review **D22** (1980) 1694.
[213] Minkowski, P. 1977.
$\mu \to e\gamma$ at a Rate of One Out of a Billion Muon Decays?
Physics Letters **67B** (1977) 421.
[214] Gell-Mann, M., Ramond, P. and Slansky, R. 1979.
in *Supergravity*, ed. by D. Freedman and P. Van Nieuwenhuizen,
North Holland, Amsterdam (1979), p. 315.
[215] Wilczek, F. and Zee, A. 1979.
Operator Analysis of Nucleon Decay.
Physical Review Letters **43** (1979) 1571.
[216] Abbott, L.F. and Wise, M.B. 1980.
The Effective Hamiltonian for Nucleon Decay.
Physical Review **D22** (1980) 2208.
[217] Buchmuller W. and Wyler D. 1986.
Effective Lagrangian Analysis of New Interactions and Flavor Conservation.
Nuclear Physics **B268** (1986) 621.
[218] Grzadkowski B., Iskrzynski M., Misiak M. and Rosiek J. 2010.
Dimension-Six Terms in the Standard Model Lagrangian.
Journal of High Energy Physics **1010** (2010) 085 (arXiv:1008.4884 (hep-ph)).

[219] Georgi, H. and Glashow, S.L. 1974.
Unity of All Elementary Particle Forces.
Physical Review Letters **32** (1974) 438.
[220] Georgi, H., Quinn, H.R. and Weinberg, S. 1974.
Hierarchy of Interactions in Unified Gauge Theories.
Physical Review Letters **33** (1974) 451.
[221] Dimopoulos, S., Raby, S. and Wilczek, F. 1981.
Supersymmetry and the Scale of Unification.
Physical Review **D24** (1981) 1681.
[222] Ibanez, L.E. and Ross, G.G. 1981.
Low-energy predictions in supersymmetric grand unified theories.
Physics Letters **B105** (1981) 439.
[223] Dimopoulos, S. and Georgi, H. 1981.
Softly Broken Supersymmetry and SU(5).
Nuclear Physics **B193** (1981) 150.
[224] Peccei, R.D. and Quinn, H.R. 1977.
CP Conservation in the Presence of Pseudoparticles.
Physical Review Letters **38** (1977) 1440.
[225] Weinberg, S. 1977.
A New Light Boson? *Physical Review Letters* **40** (1978) 223.
[226] Wilczek, F. 1977.
Problem of Strong P and T Invariance in the Presence of Instantons.
Physical Review Letters **40** (1978) 279.
[227] Weinberg, S. 1975.
Implications of Dynamical Symmetry Breaking.
Physical Review **D13** (1976) 974 Addendum: (Phys. Rev. **D19** (1979) 1277).
[228] Susskind, L. 1978.
Dynamics of Spontaneous Symmetry Breaking in the Weinberg-Salam Theory.
Physical Review **D20** (1979) 2619.
[229] Gervais, J.-L. and Sakita, B. 1971.
Field theory interpretation of supergauges in dual models.
Nuclear Physics **B34** 632.
[230] Volkov, D.V. and Akulov, V.P. 1972.
Possible universal neutrino interaction.
Pisma Zh.Eksp.Teor.Fiz. **16** (1972) 621;
(JETP Letters **16** (1972) 438)
Is the Neutrino a Goldstone Particle?
Physics Letters **46B** (1973) 109;
Teor.Mat.Fiz. **18** (1974) 39.
[231] Wess, J. and Zumino, B. 1974.
Supergauge transformations in four dimensions.
Nuclear Physics **B70** 39.
[232] Farrar, G.R. and Fayet, P. 1978.
Phenomenology of the Production, Decay, and Detection

of New Hadronic States Associated with Supersymmetry.
Physics Letters **76B** (1978) 575.

[233] Fayet, P. 1977.
Spontaneously Broken Supersymmetric Theories
of Weak, Electromagnetic and Strong Interactions.
Physics Letters **69B** (1977) 489.

[234] Witten, E. 1981.
Dynamical Breaking of Supersymmetry.
Nuclear Physics **B188** (1981) 513.

[235] Alvarez-Gaume, L., Polchinski, J. and Wise, M.B. 1983.
Minimal Low-Energy Supergravity.
Nuclear Physics **B221** (1983) 495.

[236] Randall, L. and Sundrum, R. 1999.
Large Mass Hierarchy from a Small Extra Dimension.
Physical Review Letters **83** (1999) 33703373. (arXiv:hep-ph/9905221)
Randall, L. and Sundrum, R. 1999.
An Alternative to Compactification.
Physical Review Letters **83** (1999) 4690 (arXiv:hep-th/9906064).

[237] Arkani-Hamed, N., Dimopoulos, S. and Dvali, G. 1998.
The Hierarchy problem and new dimensions at a millimeter.
Physics Letters **B429** (1998) 263(arXiv:hep-ph/9803315);
Arkani-Hamed, N., Dimopoulos, S. and Dvali, G. 1999.
Phenomenology, astrophysics and cosmology of theories with
submillimeter dimensions and TeV scale quantum gravity.
Physical Review **D59** (1999) 086004 (arXiv:hep-ph/9807344).

[238] Riess, A.G., *et. al.* 1998.
Observational evidence from supernovae for an
accelerating universe and a cosmological constant.
Astronomical Journal **116** (1998) 100938 (arXiv:astro-ph/9805201).

[239] Perlmutter, S. *et. al.* 1999.
Measurements of Omega and Lambda from 42 high redshift supernovae.
Astrophysical Journal **517** (1999) 565(arXiv:astro-ph/9812133).

[240] Weinberg, S. 1989.
The Cosmological Constant Problem.
Reviews of Modern Physics **61** (1989) 1.

[241] C. Burgess, “The Cosmological Constant Problem: Why it’s hard to get Dark Energy from Micro-physics,” (in the proceedings of the Les Houches School on Post-Planck Cosmology 2013) [arXiv:1309.4133 [hep-th]].

[242] Einstein, E. 1915.
Erklärung der Perihelbewegung des Merkur aus der allgemeinen Relativitätstheorie.
Königlich Preußische Akademie der Wissenschaften (Berlin). Sitzungsberichte, 10301085.
Einstein, E. 1915.

Die Feldgleichungen der Gravitation.
ibid., 844847.

[243] Einstein, E. 1916.
Die Grundlage der allgemeinen Relativitätstheorie.
Annalen der Physik **49** 769822.

[244] Feynman, R.P. 1963.
Quantum theory of gravitation.
Acta Physica Polonica **24** (1963) 697.

[245] DeWitt, B.S. 1967.
Quantum Theory of Gravity. 1. The Canonical Theory.
Physical Review **160** (1967) 1113.
DeWitt, B.S. 1967.
Quantum Theory of Gravity. 2. The Manifestly Covariant Theory,.
Physical Review **162** (1967) 1195.
DeWitt, B.S. 1967.
Quantum Theory of Gravity. 3. Applications of the Covariant Theory,.
Physical Review **162** (1967) 1239.

[246] Hilbert, D. 1915.
Die Grundlagen der Physik.
Königliche Gesellschaft der Wissenschaften zu Göttingen Mathematisch-physikalische Klasse. Nachrichten, 395407.

[247] Lovelock, D. 1971.
The Einstein Tensor and Its Generalizations.
Journal of Mathematical Physics **12** 498501.
Lovelock, D. 1972.
The Four-Dimensionality of Space and the Einstein Tensor.
Journal of Mathematical Physics **13** 874876.

[248] Donoghue, J.F. 1994.
Leading quantum correction to the Newtonian potential.
Physical Review Letters **72** (1994) 2996 (gr-qc/9310024).
Donoghue, J.F. 1994.
General relativity as an effective field theory: The leading quantum corrections.
Physical Review **D50** (1994) 3874 (gr-qc/9405057).

[249] Gross, D.J. and Sloan, J.H. 1986.
The Quartic Effective Action for the Heterotic String.
Nuclear Physics **B291** (1987) 41.

[250] Simon, J.Z. 1991.
The Stability of flat space, semiclassical gravity, and higher derivatives.
Physical Review **D43** (1991) 3308.

[251] Burgess, C.P., Holman, R., Tasinato, G. and Williams, M. 2014.
EFT Beyond the Horizon: Stochastic Inflation and How Primordial Quantum Fluctuations Go Classical.
Journal of High Energy Physics **03** 090 (arXiv:1408.5002 (hep-th)).

[252] Burgess, C.P., Holman, R. and Tasinato, G. 2015.
Open EFTs, IR effects & late-time resummations: systematic corrections in stochastic inflation.
Journal of High Energy Physics **01** 153 [arXiv:1512.00169 [gr-qc]].
[253] Will, C.M. 2014.
The Confrontation between General Relativity and Experiment.
Living Reviews of Relativity **17** (2014) 4 (arXiv:1403.7377 (gr-qc)).
[254] Berti, E. *et al.*, 2015.
Testing General Relativity with Present and Future Astrophysical Observations.
Classical and Quantum Gravity **32** (2015) 243001 (arXiv:1501.07274 (gr-qc)).
[255] Hawking, S.W. 1974.
Black hole explosions?
Nature **248** (5443) 3031.
Hawking, S.W. 1974.
Particle Creation by Black Holes.
Communications in Mathematical Physics **43** (1975) 199
Erratum: (*Communications in Mathematical Physics* **46** (1976) 206).
[256] See, for example:
Peebles, P. J. E. 1980.
The large-scale structure of the universe.
(Princeton Press, 1980).
Peebles, P. J. E. 1993.
Principles of Physical Cosmology.
(Princeton Press, 1993).
Mukhanov, V.F. 2005.
Physical foundations of cosmology.
(Cambridge Press, 2005).
[257] Jeans, J. H. 1902.
The Stability of a Spherical Nebula.
Philosophical Transactions of the Royal Society **A 199** 153.
[258] Mukhanov, V.F. and Chibisov, G.V. 1981.
Quantum Fluctuations and a Nonsingular Universe.
Pisma Zh.Eksp.Teor.Fiz. **33** (1981) 549;
(JETP Letters **33** (1981) 532).
Guth, A.H. and Pi, S.Y. 1982.
Fluctuations in the New Inflationary Universe.
Physical Review Letters **49** (1982) 1110.
Starobinsky, A.A. 1982.
Dynamics of Phase Transition in the New Inflationary
Universe Scenario and Generation of Perturbations.
Physics Letters **117B** (1982) 175.
Hawking, S.W. 1982.
The Development of Irregularities in a Single Bubble Inflationary Universe.
Physics Letters **115B** (1982) 295.

Linde, A.D. 1982.
Scalar Field Fluctuations in Expanding Universe
and the New Inflationary Universe Scenario.
Physics Letters **116B** (1982) 335.
Bardeen, J.M., Steinhardt, P.J. and Turner, M.S. 1983.
Spontaneous Creation of Almost Scale - Free Density
Perturbations in an Inflationary Universe.
Physical Review **D28** (1983) 679.

[259] Aghanim, N. *et al.* (Planck Collaboration), 2018.
Planck 2018 results. VI. Cosmological parameters.
(arXiv:1807.06209 (astro-ph.CO)).

[260] Guth, A.H. 1981.
The Inflationary Universe: A Possible Solution to the Horizon and Flatness Problems.
Physical Review **D23** (1981) 347-356.
Linde, A.D. 1982.
A New Inflationary Universe Scenario: A Possible Solution of the Horizon, Flatness, Homogeneity, Isotropy and Primordial Monopole Problems.
Physics Letters **108B** (1982), 389-393.
Albrecht, A. and Steinhardt, P.J. 1982.
Cosmology for Grand Unified Theories with Radiatively Induced Symmetry Breaking.
Physical Review Letters **48** (1982) 1220-1223.
Linde, A.D. 1983.
Chaotic Inflation.
Physics Letters **129B** (1983) 177.

[261] Burgess, C.P., Lee H.M. and Trott, M. 2009.
Power-counting and the Validity of the Classical Approximation During Inflation.
Journal of High Energy Physics **0909** (2009) 103 (arXiv:0902.4465 (hep-ph)).
Adshead, P., Burgess, C.P., Holman R. and Shandera, S. 2018.
Power-counting during single-field slow-roll inflation.
Journal of Cosmology and Astroparticle Physics **1802** (2018) 016
(arXiv:1708.07443 (hep-th)).

[262] Liddle, A.R. and Lyth, D.H. 1992.
COBE, gravitational waves, inflation and extended inflation.
Physics Letters **291B** (1992) 391 (astro-ph/9208007).

[263] Akrami, Y. *et al.* (Planck Collaboration), 2018.
Planck 2018 results. X. Constraints on inflation.
(arXiv:1807.06211 (astro-ph.CO)).

[264] See for example: Oriti, D. 2009.
Approaches to quantum gravity:
Toward a new understanding of space, time and matter.
(Cambridge Press, 2009).

[265] Nambu, Y. 1970.
Quark model and the factorization of the Veneziano amplitude.

In *Symmetries and Quark Models: Proceedings of the International Conference* World Scientific 1969 (pp. 269277).
Nielsen, H.B. 1969.
An almost physical interpretation of the dual N point function.
Nordita preprint (1969) unpublished.
[266] Susskind, L. 1969.
Harmonic oscillator analogy for the Veneziano amplitude.
Physical Review Letters **23** 545547.
Susskind, L. 1970.
Structure of hadrons implied by duality.
Physical Review **D1** 11821186.
[267] Ramond, P. 1971.
Dual Theory for Free Fermions.
Physical Review **D3** 2415.
Neveu, A. and Schwarz, J. 1971.
Tachyon-free dual model with a positive-intercept trajectory.
Physics Letters **34B** 517518.
Gliozzi, F., Scherk J. and Olive, D.I. 1977.
Supersymmetry, Supergravity Theories and the Dual Spinor Model.
Nuclear Physics **B122** (1977) 253.
[268] Duff, M., Howe, P., Inami, T. and Stelle, K. 1987.
Superstrings in D=10 from supermembranes in D=11.
Nuclear Physics **B191** 7074.
Witten, E. 1995.
String theory dynamics in various dimensions.
Nuclear Physics **B443** (1995) 85 (hep-th/9503124).
Horava, P. and Witten, E. 1995.
Heterotic and Type I string dynamics from eleven dimensions.
Nuclear Physics B **460** 506524. (arXiv:hep-th/9510209).
Duff, M. 1996.
M-theory (the theory formerly known as strings).
International Journal of Modern Physics A **11** 652341 (arXiv:hep-th/9608117).
[269] Green, M. B. and Schwarz, J. H. 1982.
Supersymmetrical string theories.
Physics Letters **109B** 444448.
Green, M. B.and Schwarz, J. H. 1984.
Anomaly cancellations in supersymmetric D = 10 gauge theory and superstring theory.
Physics Letters **149B** 117122.
Gross, D.J., Harvey, J.A., Martinec, E.J. and Rohm, R. 1985.
Heterotic String Theory. 1. The Free Heterotic String.
Nuclear Physics **B256** (1985) 253.
[270] Gross, D.J., Harvey, J.A., Martinec, E.J. and Rohm, R. 1986.
Heterotic String Theory. 2. The Interacting Heterotic String.
Nuclear Physics **B267** (1986) 75.

[271] Witten, E. 1984.
Some Properties of O(32) Superstrings.
Physics Letters **149B** (1984) 351.
[272] Witten, E. 1986.
New Issues in Manifolds of SU(3) Holonomy.
Nuclear Physics **B268** (1986) 79.
Burgess, C.P., Font, A. and Quevedo, F. 1986.
Low-Energy Effective Action for the Superstring.
Nuclear Physics **B272** (1986) 661.
Burgess, C.P., Escoda, C. and Quevedo, F. 2006.
Nonrenormalization of flux superpotentials in string theory.
Journal of High Energy Physics **0606** (2006) 044 (hep-th/0510213).
[273] Veneziano, G. 1968.
Construction of a crossing-symmetric,
Regge-behaved amplitude for linearly rising trajectories.
Nuovo Cimento **A57** 1907.
[274] Virasoro, M. 1969.
Alternative constructions of crossing-symmetric amplitudes with Regge behavior.
Physical Review **177** 23092311.
Shapiro, J. A. 1970.
Electrostatic analogue for the Virasoro model.
Physics Letters **33B** 361362.
[275] Gross, D.J. and Witten, E. 1986.
Superstring Modifications of Einstein's Equations.
Nuclear Physics **B277** (1986) 1.
[276] Candelas, P., Horowitz, G.T., Strominger, A. and Witten, E. 1985.
Vacuum Configurations for Superstrings.
Nuclear Physics **B258** (1985) 46.
Giddings, S.B., Kachru, S. and Polchinski, J. 2002.
Hierarchies from fluxes in string compactifications.
Physical Review **D66** (2002) 106006 (hep-th/0105097).
[277] Kaluza, T. 1921.
Zum Unitätsproblem in der Physik.
Sitzungsberichte der Königlich Preussischen Akademie der Wissenschaften Berlin (Math. Phys.) 966972.
Klein, O. 1926.
Quantentheorie und fnfdimensionale RelativitŁtstheorie.
Zeitschrift für Physik **A37** 895906.
Klein, O. 1926.
The Atomicity of Electricity as a Quantum Theory Law.
Nature **118** 516.
Witten, E. 1981.
Search for a Realistic Kaluza-Klein Theory.
Nuclear Physics **B186** (1981) 412.

[278] Cremmer, E. and Scherk, J. 1976.
Spontaneous Compactification of Space in an Einstein Yang-Mills Higgs Model.
Nuclear Physics **B108** (1976) 409.
Freund P.G.O. and Rubin M.A. 1980.
Dynamics of Dimensional Reduction.
Physics Letters **97B** (1980) 233.
Candelas P. and Weinberg S. 1984.
Calculation of Gauge Couplings and Compact Circumferences
from Self-consistent Dimensional Reduction.
Nuclear Physics **B237** (1984) 397.
Salam A. and Sezgin E. 1984.
Chiral Compactification on Minkowski $\times S^2$ of $N = 2$
Einstein-Maxwell Supergravity in Six-Dimensions.
Physics Letters **147B** (1984) 47.

[279] Christensen, S.M. and Duff, M.J. 1979.
New Gravitational Index Theorems and Supertheorems.
Nuclear Physics **B154** (1979) 301.
Hoover D. and Burgess, C.P. 2005.
Ultraviolet sensitivity in higher dimensions.
Journal of High Energy Physics **0601** (2006) 058 (hep-th/0507293).

[280] Burgess, C.P. and Hoover, D. 2005.
UV sensitivity in supersymmetric large extra dimensions: The Ricci-flat case.
Nuclear Physics **B772** (2007) 175 (hep-th/0504004).

[281] Kaloper, N., March-Russell, J., Starkman, G.D. and Trodden, M. 2000.
Compact hyperbolic extra dimensions: Branes, Kaluza-Klein modes and cosmology.
Physical Review Letters **85** (2000) 928 (hep-ph/0002001).

[282] Einstein, A. 1916.
Näherungsweise Integration der Feldgleichungen der Gravitation.
Sitzungsberichte der Königlich Preussischen Akademie der Wissenschaften Berlin
part 1: 688696.
Einstein, A. 1918.
Über Gravitationswellen.
Sitzungsberichte der Königlich Preussischen Akademie der Wissenschaften Berlin
part 1: 154167.

[283] Lichnerowicz, A. 1961.
Propagateurs et commutateurs en relativité générale.
Publications Mathématiques de l'Institute des Hautes Études Scientifiques **10** (1961)
293-344.

[284] Kachru, S., Kallosh, R., Linde, A.D. and Trivedi, S.P. 2003.
De Sitter vacua in string theory.
Physical Review **D68** (2003) 046005 (hep-th/0301240).
Balasubramanian, V., Berglund, P., Conlon, J.P. and Quevedo, F. 2005.
Systematics of moduli stabilisation in Calabi-Yau flux compactifications.
Journal of High Energy Physics **0503** (2005) 007 (hep-th/0502058).

[285] Antoniadis, I., Arkani-Hamed, N., Dimopoulos S. and Dvali, G.R. 1998.
New dimensions at a millimeter to a Fermi and superstrings at a TeV.
Physics Letters **436B** (1998) 257 (hep-ph/9804398).

[286] Arkani-Hamed, N., Dimopoulos S. and Dvali, G.R. 1998.
The Hierarchy problem and new dimensions at a millimeter.
Physics Letters **429B** (1998) 263 (hep-ph/9803315).

[287] Kapner, D.J., *et. al.* (Eot-Wash collaboration) 2007.
Tests of the gravitational inverse-square law below the dark-energy length scale.
Physical Review Letters **98** (2007) 021101 (hep-ph/0611184).

[288] Hawking, S.W. 1976.
Breakdown of Predictability in Gravitational Collapse.
Physical Review **D14** (1976) 2460.

[289] De Witt, B.S. 1965.
Dynamical Theory of Groups and Fields.
in Relativity, Groups and Topology, ed. by B.S. De Witt and C. De Witt, (New York, Gordon and Breach, 1965).

[290] Gilkey, P.B. 1975.
The Spectral Geometry of a Riemannian Manifold.
Journal of Differential Geometry **10** 601.

[291] Barvinsky, A.O. and Vilkovisky, G.A. 1985.
The Generalized Schwinger-Dewitt Technique in Gauge Theories and Quantum Gravity.
Physics Reports **119** 1.

[292] Vassilevich, D.V. 2003.
Heat kernel expansion: Users manual.
Physics Reports **388** 279 [hep-th/0306138].

[293] Foldy, L. L. and Wouthuysen, S. A. 1950.
On the Dirac Theory of Spin 1/2 Particles and its Non-Relativistic Limit.
Physical Review **78** 2936.
Foldy, L. L. 1952.
The Electromagnetic Properties of the Dirac Particles.
Physical Review **87** 688693.

[294] Pauli, W. 1927.
Zur Quantenmechanik des magnetischen Elektrons.
Zeitschrift für Physik **43** 601-623.

[295] Caswell, W.E. and Lepage, G.P. 1986.
Effective Lagrangians for Bound State Problems in
QED, QCD, and Other Field Theories.
Physics Letters **167B** (1986) 437.

[296] Labelle, P. 1996.
Effective field theories for QED bound states: Extending
nonrelativistic QED to study retardation effects.
Physical Review **D58** (1998) 093013 (hep-ph/9608491).

[297] Luke, M.E. and Manohar, A.V. 1996.
Bound states and power counting in effective field theories.
Physical Review **D55** (1997) 4129 (hep-ph/9610534).

[298] Grinstein, B. and Rothstein, I.Z. 1997.
Effective field theory and matching in nonrelativistic gauge theories.
Physical Review **D57** (1998) 78 (hep-ph/9703298).

[299] Pineda, A. and Soto, J. 1998.
Effective field theory for ultrasoft momenta in NRQCD and NRQED.
Nuclear Physics Proceedings Supplement **64** (1998) 428 (hep-ph/9707481).

[300] Bauer, C.W., Fleming, S., Pirjol, D. and Stewart, I.W. 2001.
An effective field theory for collinear and soft gluons: heavy to light decays.
Physical Review **D63** (2001) 114020 (arXiv:hep-ph/0011336).
Bauer, C.W., Pirjol, D. and Stewart, I.W. 2002.
Soft-collinear factorization in effective field theory.
Physical Review **D65** (2002) 054022 (arXiv:hep-ph/0109045).
Bauer, C.W., Pirjol, D. and Stewart, I.W. 2002.
Power counting in the soft-collinear effective theory.
Physical Review **D66** (2002) 054005 (arXiv:hep-ph/0205289).
Beneke, M., Chapovsky, A.P., Diehl, M. and Feldmann, T. 2002.
Soft collinear effective theory and heavy to light currents beyond leading power.
Nuclear Physics **B643** (2002) 431 (hep-ph/0206152).

[301] Goldberger, W.D. and Rothstein, I.Z. 2004.
An Effective field theory of gravity for extended objects.
Physical Review **D73** (2006) 104029 (hep-th/0409156).

[302] Bethe, H.A. and Salpeter, E.E. 1957.
Quantum Mechanics of One- and Two-Electron Atoms.
Springer Verlag doi:10.1007/978-3-662-12869-5.

[303] Sudakov, V.V. 1956.
Vertex parts at very high-energies in quantum electrodynamics.
Zhurnal Éksperimental'noĭ i Teoreticheskoĭ Fiziki **30** (1956) 87-95
(*Soviet Physics JETP* **3** (1956) 65–71).

[304] Bauer, C.W., Fleming, S. and Luke, M. 2000.
Summing Sudakov logarithms in $B \to X_s \gamma$ in effective field theory.
Physical Review **D63** (2000) 014006 (arXiv:hep-ph/0005275).

[305] Luke M.E. and Manohar, A.V. 1992.
Reparametrization invariance constraints on heavy particle effective field theories.
Physics Letters **B286** (1992) 348 (hep-ph/9205228).

[306] Manohar, A.V. 1997.
The HQET / NRQCD Lagrangian to order α/m^3.
Physical Review **D56** (1997) 230 (hep-ph/9701294).

[307] Heinonen, J., Hill, R.J. and Solon, M.P. 2012.
Lorentz invariance in heavy particle effective theories.
Physical Review **D86** (2012) 094020 (arXiv:1208.0601 (hep-ph)).

[308] Labelle P. and Zebarjad, S.M. 1996.
Derivation of the Lamb shift using an effective field theory.
Canadian Journal of Physics **77** (1999) 267 (hep-ph/9611313).
[309] Hill, R.J., Lee, G., Paz, G. and Solon, M.P. 2012.
NRQED Lagrangian at order $1/M^4$.
Physical Review **D87** (2013) 053017 (arXiv:1212.4508 (hep-ph)).
[310] Rosenbluth, M.N. 1950.
High Energy Elastic Scattering of Electrons on Protons.
Physical Review **79** (1950) 615.
[311] Hofstadter, R. 1956.
Electron scattering and nuclear structure.
Reviews of Modern Physics **28** (1956) 214.
[312] Klein, O. and Nishina, Y. 1929.
Über die Streuung von Strahlung durch freie Elektronen
nach der neuen relativistischen Quantendynamik von Dirac.
Zeitschrift fur Physik **52** (1929) 853.
[313] Born, M. and Oppenheimer, J.R. 1927.
Zur Quantentheorie der Molekeln.
Annalen der Physik **389** (20) 457484.
[314] Kinoshita, T. and Nio, M. 1995.
Radiative corrections to the muonium hyperfine structure: The $\alpha^2(Z\alpha)$ correction.
Physical Review **D53** (1996) 4909 (hep-ph/9512327).
[315] Politzer, H.D. and Wise, M.B. 1988.
Effective Field Theory Approach to Processes Involving Both Light and Heavy Fields.
Physics Letters **B208** (1988) 504.
Eichten, E. and Hill, B.R. 1990.
An Effective Field Theory for the Calculation of Matrix
Elements Involving Heavy Quarks.
Physics Letters **B234** (1990) 511.
Georgi, H. 1990.
An Effective Field Theory for Heavy Quarks at Low-energies.
Physics Letters **B240** (1990) 447.
Falk, A.F., Georgi, H., Grinstein, B. and Wise, M.B. 1990.
Heavy Meson Form-factors From QCD.
Nuclear Physics **B343** (1990) 1.
[316] Coleman, S., Mandula, J. 1967.
All Possible Symmetries of the S Matrix.
Physical Review **159** 1251.
[317] Isgur, N. and Wise, M.B. 1989.
Weak Decays of Heavy Mesons in the Static Quark Approximation.
Physics Letters **B232** (1989) 113.
[318] Voloshin, M.B. and Shifman, M.A. 1987.
On Annihilation of Mesons Built from Heavy
and Light Quark and anti-B0 $\leftrightarrow$ B0 Oscillations.

Soviet Journal of Nuclear Physics **45** (1987) 292
(*Yadernaya Fizika* **45** (1987) 463).
Bauer, C. and Manohar, A.V. 1997.
Renormalization Group Scaling of the $1/m^2$ HQET Lagrangian.
Physical Review **D57** (1998) 337 (hep-ph/9708306).
[319] Labelle, P., Zebarjad, Z.M. and Burgess, C.P. 1997.
NRQED and next-to-leading hyperfine splitting in positronium.
Physical Review **D56** (1997) 8053 (hep-ph/9706449).
[320] Pineda, A. and Soto, J. '998.
Potential NRQED: The Positronium case.
Physical Review **D59** (1999) 016005 (hep-ph/9805424).
[321] Fierz, M. 1937.
Zur Fermischen Theorie des β-Zerfalls.
Zeitschrift fur Physik **104** (1937) 553.
[322] Abalmasov, V.A. 1998.
Comment on Nonrelativistic QED and next-to-leading
hyperfine splitting in Positronium.
Physical Review **D58** (1998) 128701.
[323] Pineda, A. and Soto, J. 1997.
Effective Field Theory for Ultrasoft Momenta in NRQCD and NRQED.
Nuclear Physics Proceedings Supplement **64** (1998) 428 (hep-ph/9707481);
Matching at one loop for the four quark operators in NRQCD," *Physical Review* **D58** (1998) 114011 (hep-ph/9802365).
[324] Lehmann, H., Symanzik, K. and Zimmerman, W. 1955.
Zur Formulierung quantisierter Feldtheorien.
Nuovo Cimento **1** (1955) 205.
[325] Wheeler, J.A. 1946.
Polyelectrons.
*Annals of the New York Academy of Sciences***46** (1946) 221.
Harris, I. and Brown, L.M. 1957.
Radiative Corrections to Pair Annihilation.
Physical Review **105** (1957) 1656.
Czarnecki, A., Melnikov, K. and Yelkhovsky, A. 1999.
α^2 corrections to parapositronium decay.
Physical Review Letters **83** (1999) 1135 (hep-ph/9904478).
Physical Review **A61** (2000) 052502 (hep-ph/9910488).
[326] Ore, A. and Powell, J.L. 1949.
Three Photon Annihilation of an Electron Positron Pair.
Physical Review **75** (1949) 1696.
Adkins, G.S. 1996.
Analytic Evaluation of the Orthopositronium-to-Three-Photon
Decay Amplitudes to One-Loop Order.
Physical Review Letters **76** (1996) 4903 (hep-ph/0506213).
Hill, R.J. and Lepage, G.P. 2000.

Order ($\alpha^2\Gamma$, $\alpha^3\Gamma$) Binding Effects in Orthopositronium Decay.
Physical Review **D62** (2000) 111301(R) (hep-ph/0003277).
Kniehl, B. and Penin, A.A. 2000.
Order $\alpha^3 \ln(1/\alpha)$ Corrections to Positronium Decays.
Physical Review Letters **85** (2000) 1210; Erratum **85** 3065 (hep-ph/0004267).
K. Melnikov and A. Yelkhovsky, O($\alpha^3 \ln \alpha$) corrections to positronium decay rates.
Physical Review **D62** (2000) 116003 (hep-ph/0008099).

[327] Karplus, R. and Klein, A. 1952.
Electrodynamics displacement of atomic energy levels 3.
The Hyperfine structure of positronium.
Physical Review **87** (1952) 848.
Gupta, S.N., Repko, W.W. and Suchyta, C.G. 1989.
Muonium and positronium potentials.
Physical Review **D40** (1989) 4100.
Pachucki, K. and Karshenboim, S.G. 1998.
Complete result for positronium energy levels at order $m\alpha^6$.
Physical Review Letters **80** (1998) 2101 (hep-ph/9709387).

[328] Lepage, G.P. and Thacker, B.A. 1988.
Effective Lagrangians for Simulating Heavy Quark Systems.
Nuclear Physics Proceedings Supplement **4** (1988) 199.
Thacker, B.A. and Lepage, G.P. 1991.
Heavy quark bound states in lattice QCD.
Physical Review **D43** (1991) 196.
Bodwin, G.T., Braaten, E. and Lepage, G.P. 1995.
Rigorous QCD analysis of inclusive annihilation and production of heavy quarkonium.
Physical Review **D51** (1995) 1125
Erratum: (Physical Review **D55** (1997) 5853) (hep-ph/9407339).

[329] Zel'dovich, Ya. B. 1957.
Parity nonconservation in the first order in the
weak-interaction constant in electron scattering and other effects.
Zhurnal Éksperimental'noĭ i Teoreticheskoĭ Fiziki **33** 1531
(*Soviet Physics JETP* **6** (1957) 1184).

[330] Borie, E. 2012.
Lamb shift in light muonic atoms: Revisited.
Annals of Physics (NY) **327** (2012) 733.

[331] Pineda, A. and Soto, J. 1998.
The Lamb shift in dimensional regularization.
Physics Letters **B420** (1998) 391 (hep-ph/9711292).

[332] Coleman, S.R. 1977.
Classical Lumps and their Quantum Descendents.
Subnuclear Series **13** (1977) 297.
(reproduced in *Aspects of Symmetry: Selected Erice Lectures* ref. [17] above).

[333] Salam, A. and Strathdee, J. 1969.

Nonlinear realizations 1: The Role of Goldstone bosons.
Physical Review **184** (1969) 1750.

[334] Nielsen, H.B. and Olesen, P. 1973.
Vortex-line Models for Dual Strings.
Nuclear Physics **B61** (1973) 45-61.

[335] Hughes, J. and Polchinski, J. 1986.
Partially Broken Global Supersymmetry and the Superstring.
Nuclear Physics **278** (1986) 147.

[336] Chern, S.S. and Simons, J. 1974.
Characteristic forms and geometric invariants.
Annals of Mathematics **99** (1974) 4869.

[337] Schwarz, A. 1979.
The partition function of a degenerate functional.
Communications in Mathematical Physics **67** (1979) 1.
Witten, E. 1988.
Topological quantum field theory.
Communications in Mathematical Physics **117** (1988) 353.
Atiyah, M. 1988.
Topological quantum field theories.
Publications Mathématiques de l'IHÉS **68** (1988) 175.

[338] Deser, S. and Zumino, B. 1976.
A complete action for the spinning string.
Physics Letters **B65** (1976) 369.

[339] Brink, L., Di Vecchia, P. and Howe, P.S. 1976.
A locally supersymmetric and reparametrization invariant
action for the spinning string.
Physics Letters **B65** (1976) 471.

[340] Polyakov, A.M. 1981.
Quantum geometry of the bosonic string.
Physics Letters **B103** (1981) 207.

[341] Grassmann, H. 1844.
Die Lineale Ausdehnungslehre Ein neuer Zweig der Mathematik.
(Verlag, Leipzig, 1844)

[342] Lw, R., Weimer, H., Nipper, J. and Balewski, J.B., Butscher, B., Büchler, H.-P. and Pfau, T. 2012.
An experimental and theoretical guide to strongly interacting Rydberg gases.
Journal of Physics B: Atomic, Molecular and Optical Physics **45** (2012) 113001.
Gallagher, T.F. 1994.
Rydberg Atoms. (Cambridge Press, 1994)

[343] Burgess, C.P., Hayman, P., Williams, M. and Zalavari, L. 2017.
Point-Particle Effective Field Theory I: Classical
Renormalization and the Inverse-Square Potential.
Journal of High Energy Physics **1704** (2017) 106 (arXiv:1612.07313 (hep-ph)).

[344] de Boer, J., Verlinde, E.P. and Verlinde, H.L. 2000.
On the holographic renormalization group.
Journal of High Energy Physics **0008** (2000) 003 (hep-th/9912012).
[345] Maldacena, J.M. 1997.
The Large N limit of superconformal field theories and supergravity.
International Journal of Theoretical Physics **38** (1999) 1113 (*Advances in Theoretical and Mathematical Physics* **2** (1998) 231) (hep-th/9711200).
Witten, E. 1998.
Anti-de Sitter space and holography.
Advances in Theoretical and Mathematical Physics **2** (1998) 253 (hep-th/9802150).
Gubser, S.S., Klebanov, I.R. and Polyakov, A.M. 1998.
Gauge theory correlators from noncritical string theory.
Physics Letters **B428** (1998) 105 (hep-th/9802109).
[346] Preston, M.A. and Bhaduri, R.K. 1982.
Structure of the Nucleus.
(Addison-Wesley, Reading Massachusetts, 1975; 2nd printing 1982).
[347] Kaplan, D.B., Savage, M.J. and Wise, M.B. 1998.
Two nucleon systems from effective field theory.
Nuclear Physics **B534** (1998) 329 (nucl-th/9802075).
E. Braaten and H.-W. Hammer, 2006.
Universality in few-body systems with large scattering length.
Physics Reports **428** (2006) 259 (cond-mat/0410417).
[348] Feshbach, H. 1958.
Unified theory of nuclear reactions.
Annals of Physics **5** (1958) 357.
Fano, U. 1961.
Effects of Configuration Interaction on Intensities and Phase Shifts.
Physical Review **124** (1961) 1866.
[349] Jackiw, R. 1991.
Delta function potentials in two-dimensional and three-dimensional quantum mechanics.
In *Jackiw, R.: *Diverse topics in theoretical and mathematical physics* 35-53. (1991)
[350] Weyl, H. 1910.
Über gewöhnliche Differentialgleichungen mit Singularitäten und de zeugehörigen Entwicklungen willkürlicher Funktionen.
Mathematische Annalen **68** (1910) 220.
von Neumann, J. 1929.
Allgemeine Eigenwertheorie Hermitescher Funktionaloperatoren.
Mathematische Annalen **102** (1929) 49–131.
Stone, M.H. 1932.
On one-parameter unitary groups in Hilbert space.
Annals of Mathematics **33** (1932) 643–648.
Berezin, F.A. and Faddeev, L.D. 1961.
A Remark on Schrodingers equation with a singular potential.

Proceedings of the Soviet Academy of Sciences **2** (1961) 372
(*Doklady Akademii Nauk (Ser. Fiz.)* **137** (1961) 1011).
[351] Plestid, R., Burgess, C.P. and O'Dell, D.H.J. 2018.
Fall to the Centre in Atom Traps and Point-Particle EFT for Absorptive Systems.
Journal of High Energy Physics **1808** (2018) 059 (arXiv:1804.10324 (hep-ph)).
[352] Efimov, V. 1970.
Energy levels arising from resonant two-body forces in a three-body system.
Physics Letters **B33** (1970) 563–564.
Braaten, E. and Hammer, H.W. 2007.
Efimov Physics in Cold Atoms.
Annals of Physics **322** (2007) 120 (cond-mat/0612123).
[353] Burgess, C.P., Plestid, R. and Rummel, M.
Effective Field Theory of Black Hole Echoes.
Journal of High Energy Physics **1809** (2018) 113 (arXiv:1808.00847 (gr-qc)).
[354] Erickson, G.W. 1977.
Energy Levels of One electron Atoms.
Journal of Physical Chemistry Reference Data **6** (1977) 831.
Friar, J.L. 1979.
Nuclear Finite Size Effects in Light Muonic Atoms.
Annals of Physics **122** (1979) 151.
Friar, J.L. and Sick, I. 2005.
Muonic hydrogen and the third Zemach moment.
Physical Review **A72** (2005) 040502 (nucl-th/0508025).
[355] Backenstoss, G. 1970.
Pionic atoms.
Annual Reviews of Nuclear and Particle Science **20** (1970) 467.
[356] Deser, S., Goldberger, M.L., Baumann, K. and Thirring, W.E. 1954.
Energy level displacements in pi-mesonic atoms.
Physical Review **96** (1954) 774.
[357] Burgess, C.P., Hayman, P, Rummel, M. and Zalavari, L. 2017.
Point-Particle Effective Field Theory III: Relativistic Fermions and the Dirac Equation.
Journal of High Energy Physics **1709** (2017) 007 (arXiv:1706.01063 (hep-ph)).
[358] Kaplan, D.B., Lee, J.W., Son, D.T. and Stephanov, M.A. 2009.
Conformality Lost.
Physical Review **D80** (2009) 125005 (arXiv:0905.4752 (hep-th)).
[359] Arnold, V.I., Kozlov, V.V. and Neishtadt, A.I. 1988.
Dynamical Systems III: Mathematical aspects of classical and celestial mechanics.
Encyclopedia of Mathematical Science **3** (Springer, Berlin, 1988).
Lochack, P. and Meunier, C. 1988.
Multiphase averaging for classical systems.
(Springer, New York, 1988.)
Shapere, A.D. and Wilczek, F. 1989.
Geometric Phases in Physics.
Advanced Series in Mathematical Physics **5** (1989) 1.

Berry, M.V. and Robins, J.M. 1993.
Classical electromagnetic forces of reaction: an exactly solvable model.
Proceedings of the Royal Academy of Sciences **A44** (1993) 631.

[360] Goldberger, W.D. and Rothstein, I.Z. 2004.
An Effective field theory of gravity for extended objects.
Physical Review **D73** (2006) 104029 (hep-th/0409156);
Dissipative effects in the worldline approach to black hole dynamics.
Physical Review **D73** (2006) 104030 (hep-th/0511133).
Porto, R.A., Ross, A. and Rothstein, I.Z. 2012.
Spin induced multipole moments for the gravitational
wave amplitude from binary inspirals to 2.5 Post-Newtonian order.
Journal of Cosmology and Astroparticle Physics **1209** (2012) 028
(arXiv:1203.2962 (gr-qc));

[361] Bethe, H. 1935.
Theory of Disintegration of Nuclei by Neutrons.
Physical Review **47** (1935) 747.

[362] Greene, B.R., Shapere, A.D., Vafa, C. and Yau, S.T. 1990.
Stringy Cosmic Strings and Noncompact Calabi-Yau Manifolds.
Nuclear Physics **B337** (1990) 1.

[363] Bayntun, A., Burgess, C.P. and van Nierop, L. 2010.
Codimension-2 Brane-Bulk Matching: Examples from Six and Ten Dimensions.
New Journal of Physics **12** (2010) 075015 (arXiv:0912.3039 (hep-th)).

[364] Polchinski, J. 1998.
String theory. Vol. 1: An introduction to the bosonic string.
String theory. Vol. 2: Superstring theory and beyond.
(Cambridge Press, 1998).

[365] Phillips, T.G. and Rosenberg, H.M. 1966.
Spin waves in ferromagnets.
Reports on Progress in Physics **29** (1966) 285

[366] Heisenberg, W.G. 1928.
Zur Theorie des Ferromagnetismus.
Zeitschrift für Physik **49** (1928) 619.
Holstein, T. and Primakoff, H. 1940.
Field Dependence of the Intrinsic Domain Magnetization of a Ferromagnet.
Physical Review **58** (1940) 1098.

[367] Dyson, F.J. 1956.
General Theory of Spin-Wave Interactions.
Physical Review **102** (1956) 1217.

[368] Néel, L. 1932.
Influence des fluctuations du champ moléculaire sur
les propriétés magnetiques des corps.
Annales de Physique **18** (1932) 5.
Bitter, F. 1937.

A Generalization of the Theory of Ferromagnetism.
Physical Review **54** (1937) 79.
van Vleck, J.H. 1941.
On the Theory of Antiferromagnetism.
Journal of Chemical Physics **9** (1941) 85.
[369] Brouwer, L.E.J. 1912.
Uber Abbildung von Mannigfaltigkeiten.
*Mathematische Annalen***71** (1912) 97.
Milnor, J. 1978.
Analytic Proofs of the 'Hairy Ball Theorem' and the Brouwer Fixed Point Theorem.
The American Mathematical Monthly **85** (1978) 521.
[370] Dirac, P. 1931.
Quantised Singularities in the Electromagnetic Field.
Proceedings of the Royal Society (London) **A133** (1931) 60.
[371] Landau, L.D., and Lifshitz, E.M. 1935.
Theory of the dispersion of magnetic permeability in ferromagnetic bodies.
Physikalische Zeitschrift der Sowjetunion **8** (1935) 153.
Herring, C. and Kittel, C. 1951.
On the Theory of Spin Waves in Ferromagnetic Media.
*Physical Review***81** (1951) 869.
[372] Brockhouse, B. N. 1957.
Scattering of Neutrons by Spin Waves in Magnetite.
*Physical Review***106** (1957) 859.
[373] Moorhouse, R.G. 1951.
Slow Neutron Scattering by Ferromagnetic Crystals.
Proceedings of the Physical Society (London) **A64** 1097.
[374] Elliott, R.J. and Lowde, R.D. 1955.
The Inelastic Scattering of Neutrons by Magnetic Spin Waves.
Proceedings of the Royal Society (London) **A230** 73.
[375] For a more recent review see *e.g.*: Zaliznyak, I. and Lee, S. 2005.
Magnetic neutron scattering.
Modern Techniques for Characterizing Magnetic Materials pp 3–64 (Springer, 2005).
[376] Wightman, A.S. 1956.
Quantum field theory in terms of vacuum expectation values.
Physical Review **101** (1956) 860.
[377] Bloch, F. 1930.
Zur Theorie des Ferromagnetismus.
Zeitschrift für Physik **61** (1930) 206.
[378] Argyle, B.E., Charap, S.H. and Pugh, E.W. 1963.
Deviations from $T^{3/2}$ Law for Magnetization of
Ferrometals: Ni, Fe, and Fe +3% Si.
Physical Review **132** (1963) 2051.
[379] Onnes, H.K. 1911.
The resistance of pure mercury at helium temperatures.

Communications from the Laboratory of Physics at the University of Leiden **12** (1911) 120.
[380] Meissner, W. and Ochsenfeld, R. 1933.
Ein neuer Effekt bei Eintritt der Supraleitfähigkeit.
Naturwissenschaften **21** (1933) 787.
[381] London, F. 1948.
On the Problem of the Molecular Theory of Superconductivity.
Physical Review **74** (1948) 562.
[382] Deaver, B. and Fairbank, W. 1961.
Experimental Evidence for Quantized Flux in Superconducting Cylinders.
Physical Review Letters **7** (1961) 43.
Doll, R. and Näbauer, M. 1961.
Experimental Proof of Magnetic Flux Quantization in a Superconducting Ring.
*Physical Review Letters***7** (1961): 51.
[383] Bardeen, J., Cooper, L.N. and Schrieffer, J.R. 1957.
Theory of Superconductivity.
Physical Review **108** (1957) 1175.
[384] Bednorz, J. G. and Müller, K. A. 1986.
Possible high TC superconductivity in the Ba-La-Cu-O system.
Zeitschrift für Physik **B64** (1986) 189.
[385] Weinberg, S. 1986.
Superconductivity for Particular Theorists.
Progress in Theoretical Physics (Supplement) **86** (1986) 43.
[386] London, F. and London, H. 1935.
The Electromagnetic Equations of the Supraconductor.
Proceedings of the Royal Society **A149** (1935) (866) 71.
[387] Josephson, B.D. 1962.
Possible new effects in superconductive tunnelling.
Physics Letters **1** (1962) 251.
[388] Anderson, P.W. and Rowell, J.M. 1963.
Probable Observation of the Josephson Tunnel Effect.
Physical Review Letters **10** (1963) 230.
[389] Shapiro, S. 1963.
Josephson Currents in Superconducting Tunneling:
the Effects of Microwaves and Other Observations.
Physical Review Letters **11** (1963) 80.
[390] Ginzburg, V.L. and Landau, L.D. 1950.
Zhurnal Eksperimentalnoi i Teoreticheskoi Fiziki **20** (1950) 1064.
Abrikosov, A.A. 1957.
Zhurnal Eksperimentalnoi i Teoreticheskoi Fiziki **32** (1957) 1442.
Gor'kov, L.P. 1959.
Zhurnal Eksperimentalnoi i Teoreticheskoi Fiziki **36** (1959) 1364.
[391] Rjabinin, J. N. and Schubnikow, L.W. 1935.
Magnetic properties and critical currents of superconducting alloys.

Physikalische Zeitschrift der Sowjetunion **7** (1935), no.1, pp. 122125.
Magnetic Properties and Critical Currents of Supra-conducting Alloys.
*Nature***135** (1935) 581.

[392] Abrikosov, A. A. 1957.
The magnetic properties of superconducting alloys.
*Journal of Physics and Chemistry of Solids***2** (1957) 199.

[393] Leutwyler, H. 1996.
Phonons as goldstone bosons.
Helvetica Physica Acta **70** (1997) 275 (hep-ph/9609466).

[394] DeWitt, B. 1984.
in *Relativity, Groups and Topology II* (proceedings of the Les Houches School, ed. C. DeWitt and B. DeWitt) (Elsevier 1984).

[395] Girvin, S.M. and Yang K. 2019.
Modern Condensed Matter Physics.
(Cambridge Press, 2019).

[396] Brown, J.D. 1993.
Action functionals for relativistic perfect fluids.
Classical and Quantum Gravity **10** (1993) 1579 (gr-qc/9304026).

[397] Endlich, S., Nicolis, A., Rattazzi, R. and Wang, J. 2010.
The Quantum mechanics of perfect fluids.
Journal of High Energy Physics **1104** (2011) 102 (arXiv:1011.6396 (hep-th)).

[398] Dubovsky, S., Hui, L., Nicolis, A. and Son, D.T. 2011.
Effective field theory for hydrodynamics:
thermodynamics, and the derivative expansion.
Physical Review **D85** (2012) 085029 (arXiv:1107.0731 (hep-th)).

[399] Misner, C.W., Thorne, K.S. and Wheeler, J.A. 1973.
Gravitation.
(Freeman – Princeton Press, 1973).

[400] Weinberg, S. 1972.
Gravitation and Cosmology: Principles and
Applications of the General Theory of Relativity.
(John Wiley and Sons, 1972).

[401] Wald, R.M. 1984.
General Relativity.
(University of Chicago Press, 1984).

[402] Crossley, M., Glorioso, P. and Liu, H. 2015.
Effective field theory of dissipative fluids.
Journal of High Energy Physics **1709** (2017) 095 (arXiv:1511.03646 [hep-th]).

[403] Mohr, P.J., Newell, D.B. and Taylor, B.N. 2014.
CODATA Recommended Values of the Fundamental Physical Constants: 2014.
Reviews of Modern Physics **88** (2016) 035009 (arXiv:1507.07956 (physics.atom-ph)).

[404] Landau, L. D. 1956.
The Theory of a Fermi Liquid.

Zhurnal Éksperimental'noĭ i Teoreticheskoĭ Fiziki **30** (1956) 1058
(*Soviet Physics JETP* **3** (1957) 920).
[405] Polchinski, J. 1992.
Effective field theory and the Fermi surface.
In proceedings of the TASI school *Recent directions in particle theory*
(hep-th/9210046).
[406] Shankar, R. 1993.
Renormalization group approach to interacting fermions.
Reviews of Modern Physics **66** (1994) 129 (cond-mat/9307009).
[407] Wichmann, E. H. and Crichton, J. H. 1963.
Cluster Decomposition Properties of the S Matrix.
Physical Review **132** (1963) 2788.
[408] Weinberg, S. 1997.
What is quantum field theory, and what did we think it is?
In *Conceptual foundations of quantum field theory*, 241-251,
Boston 1996, (hep-th/9702027).
[409] Weinberg, S. 2000.
The Quantum Theory of Fields, vol I.
(Cambridge Press, 2000).
[410] Migdal, A.B. 1958.
Interaction between Electrons and Lattice Vibrations in a Normal Metal.
Zhurnal Éksperimental'noĭ i Teoreticheskoĭ Fiziki **34** 1438
(*Soviet Physics JETP* **7** (1958) 996).
[411] Tinkham, M. 1975.
Introduction to Superconductivity.
(McGraw-Hill Press, 1975).
[412] Kittel, C. 2004.
Introduction to Solid State Physics, 8th Edition.
(Wiley, 2004).
[413] Willett, R., Eisenstein, J.P., Störmer, H.L., Tsui, D.C., Gossard, A.C. and English J.H. 1987.Observation of an even-denominator quantum number in the fractional quantum Hall effect.
Physical Review Letters **59** (1987) 1776.
[414] Girvin, S.M. 1999.
The Quantum Hall Effect: Novel Excitations and Broken Symmetries.
Lectures delivered at *École d'Éte Les Houches*, July 1998
(arXiv:cond-mat/9907002 (cond-mat.mes-hall)).
[415] v. Klitzing, K., Dorda, G. and Pepper, M. 1980.
New method for high-accuracy determination of
the fine-structure constant based on quantized Hall resistance.
Physical Review Letters **45** (1980) 494.
[416] Tsui, D.C., Störmer, H.L. and Gossard, A.C. 1982.
Two-Dimensional Magnetotransport in the Extreme Quantum Limit.
Physical Review Letters **48** (1982) 1559.

[417] Ando, T., Matsumoto, Y. and Uemura, Y. 1975.
Theory of Hall effect in a two-dimensional electron system.
Journals of the Physical Society of Japan **39** (1975) 279.

[418] Tong, D. 2016.
Lectures on the Quantum Hall Effect.
(arXiv:1606.06687 (hep-th)).

[419] Fradkin, E. 2013.
Field Theories of Condensed Matter Physics.
(Cambridge Press, 2013).

[420] Laughlin, R. B. 1983.
Anomalous Quantum Hall Effect: An Incompressible
Quantum Fluid with Fractionally Charged Excitations.
Physical Review Letters **50** (1983) 1395.

[421] Laughlin, R.B. 1981.
Quantized Hall conductivity in two dimensions.
Physical Review **B23** (1981) 5632.

[422] Thouless, D.J., Kohomoto, M., Nightingale M.P. and den Nijs, M. 1982.
Quantized Hall Conductance in a Two-Dimensional Periodic Potential.
Physical Review Letters **49** (1982) 405.

[423] Luther, A. and Peschel, I. 1974.
Single-particle states, Kohn anomaly, and pairing fluctuations in one dimension.
Physical Review **B9** 2911.

[424] Coleman, S. 1975.
Quantum sine-Gordon equation as the massive Thirring model.
Physical Review **D11** 2088.

[425] Mandelstam, S. 1975.
Soliton operators for the quantized sine-Gordon equation.
Physical Review **D11** 3026.

[426] Burgess, C.P. and Quevedo, F. 1993.
Bosonization as duality.
Nuclear Physics **B421** 373,[arXiv:hep-th/9401105 [hep-th]].

[427] Floreanini, R. and Jackiw, R. 1987.
Self-dual fields as charge-density solitons.
Physical Review Letters **59** (1987) 1873.

[428] Aharonov, Y. and Bohm, D. 1959.
Significance of electromagnetic potentials in quantum theory.
*Physical Review***115** (1959) 485.

[429] Leinaas, J.M. and Myrheim, J. 1977.
On the Theory of Identical Particles.
Il Nuovo Cimento **B37** (19977) 1.
Wilczek, F. 1982.
Quantum Mechanics of Fractional-Spin Particles.
Physical Review Letters **49** (1982) 957.

[430] Zhang, S.C., Hansson, T. and Kivelson, S. 1989.
Effective-Field-Theory Model for the Fractional Quantum Hall Effect.
Physical Review Letters **62** (1989) 82.

[431] Jain, J.K. 1989.
Composite-fermion approach for the fractional quantum Hall effect.
Physical Review Letters **63** (1989) 199.

[432] Lee, D.H. and Fisher, M.P.A. 1989.
Anyon Superconductivity and the Fractional Quantum Hall Effect.
Physical Review Letters **63** (1989) 903.

[433] Burgess, C.P. and Dolan, B.P. 2001.
Particle vortex duality and the modular group:
Applications to the quantum Hall effect and other 2-D systems.
Physical Review **B63** (2001) 155309 (hep-th/0010246).

[434] Kivelson, S., Lee, D.H. and Zhang, S.C. 1992.
Global phase diagram in the quantum Hall effect.
Physical Review **B46** (1992) 2223.

[435] Lutken, C.A. and Ross, G.G. 1992.
Duality in the quantum Hall system.
Physical Review **B45** (1992) 11837.

[436] Witten, E. 2003.
SL(2,Z) action on three-dimensional conformal field theories with Abelian symmetry.
In *Shifman, M. (ed.) et al. *From fields to strings, vol. 2*
pp 1173-1200 (hep-th/0307041).
Seiberg, N., Senthil, T., Wang, C. and Witten, E. 2016.
A Duality Web in 2+1 Dimensions and Condensed Matter Physics.
Annals of Physics **374** (2016) 395 (arXiv:1606.01989 (hep-th)).
Karch, A., Tong, D. and Turner, C. 2019.
A Web of 2d Dualities: $\mathbf{Z}_2$ Gauge Fields and Arf Invariants.
(arXiv:1902.05550 (hep-th)).

[437] Bayntun, A., Burgess, C.P., Dolan, B.P. and Lee, S.S.
AdS/QHE: Towards a Holographic Description of Quantum Hall Experiments.
New Journal of Physics **13** (2011) 035012 (arXiv:1008.1917 (hep-th)).
Lutken, C.A. and Ross, G.G.
Experimental probes of emergent symmetries in the quantum Hall system.
Nuclear Physics **B850** (2011) 321 (arXiv:1008.5257 (cond-mat.str-el)).

[438] See for example, Kreuzer, H.R. 1984.
Non-Equilibrium Thermodynamics and its Statistical Foundations,
(Monographs on the Physics and Chemistry of Materials, Oxford Press 1984.)

[439] For classic textbook treatments see for example:
Batchelor, G. K. 1967.
An Introduction to Fluid Dynamics.
(Cambridge Press, 1967).
Landau, L. D. and Lifshitz, E. M. 1987.

Fluid mechanics.
A Course of Theoretical Physics (2nd revised ed.) Vol 6, (Pergamon Press, 1987).
[440] Herglotz, G. 1911.
Annalen der Physik **341** (1911) 493.
[441] Taub, A.H. 1954.
General Relativistic Variational Principle for Perfect Fluids.
Physical Review **94** (1954) 1468.
[442] Salmon, R. 1988.
Hamilton's Principle and the Vorticity Laws for a Relativistic Perfect Fluid.
Geophysical and Astrophysical Fluid Dynamics **43** (1988) 167.
[443] Jackiw, R., Nair, V.P., Pi, S.Y. and Polychronakos, A.P. 2004.
Perfect Fluid Theory and its Extensions.
Journal of Physics **A 37** (2004) R327 [arXiv:hep-ph/0407101].
[444] Andersson, N. and Comer, G. 2007.
Relativistic Fluid Dynamics: Physics for Many Different Scales.
Living Reviews of Relativity **10** (2007) 1 [arXiv:gr-qc/0605010].
[445] Nicolis, A. 2011.
Low-energy effective field theory for finite-temperature relativistic superfluids.
(arXiv:1108.2513 (hep-th)).
[446] For a classic discussions of dissipation in relativistic fluids see:
Tolman, R.C. 1934.
Relativity, Thermodynamics, and Cosmology.
(Oxford: Clarendon Press,1934. Reissued Dover, New York, 1984).
For a more recent view see for example:
Arnold, P., Romatschke, P. and van der Schee, W. 2014.
Absence of a local rest frame in far from equilibrium quantum matter.
Journal of High Energy Physics **1410** (2014) 110 (arXiv:1408.2518 (hep-th)).
[447] For textbook discussions see:
Carmichael, H. 1991.
An Open Systems Approach to Quantum Optics.
(Springer Verlag, 1991).
Breuer, H.-P. and Petruccione, F. 2002.
The Theory of Open Quantum Systems.
(Oxford Press, 2002).
Alicki, R. and Lendi, K. 2007.
Quantum Dynamical Semigroups and Applications.
(Springer, 2007).
[448] See for example, Burgess, C.P. and Michaud, D. 1996.
Neutrino propagation in a fluctuating sun.
Annals of Physics **256** (1997) 1 (hep-ph/9606295).
[449] Liouville, J. 1838.
Journal de Mathématiques **3** (1838) 349.
[450] This is textbook material:
Bahcall, J.N. 1989.

Neutrino Astrophysics. (Cambridge Press, 1989).
Kayser, B., Gibrat-Debu, F. and Perrier, F. 1989.
Physics of massive neutrinos. World Sciientific Lecture Notes in Physics **25** (1989) 1.
Raffelt, G.G. 1996).
Stars as laboratories for fundamental physics:
The astrophysics of neutrinos, axions, and other weakly interacting particles.
(Chicago Press, 1996).
Fukugita, M. and Yanagida, T. 2003.
Physics of neutrinos and applications to astrophysics. (Springer, 2003).
Mohapatra, R.N. and Pal, P.B. 2004.
Massive neutrinos in physics and astrophysics. Second edition.
World Scientific Lecture Notes in Physics **72** (2004) 1.
Giunti, C. and Kim, C.W. 2007.
Fundamentals of Neutrino Physics and Astrophysics. (Oxford Press, 2007).
Zuber, K. 2012.
Neutrino physics. (CRC Press, 2012).

[451] For a recent discussion see: Janka, H.T. 2017.
Neutrino Emission from Supernovae.
(arXiv:1702.08713 (astro-ph.HE)).

[452] Wolfenstein, L. 1978.
Neutrino oscillations in matter.
Physical Review **D17** (1978) 2369.
Mikheyev, S. P. and Smirnov, A. Yu. 1985.
Resonance enhancement of oscillations in matter and solar neutrino spectroscopy.
Soviet Journal of Nuclear Physics **42** (1985) 913.

[453] Burgess, C.P., N.Z., Maltoni, M., Rashba, T.I.,
Semikoz, V.B., Tortola, M.A. and Valle, J.W.F. 2003.
Cornering solar radiative zone fluctuations with KamLAND and SNO salt.
Journal of Cosmology and Astroparticle Physics **0401** (2004) 007 (hep-ph/0310366).
Semikoz, V.B., Burgess, C.P., Dzhalilov, N.Z., Rashba, T.I. and Valle, J.W.F. 2004.
MHD origin of density fluctuations deep within the sun and their
influence on neutrino oscillation parameters in LMA MSW scenario.
Yadernaya Fizika **67** (2004) 1172;
(*Physics of Atoms and Nuclei* **67** (2004) 1147).

[454] Ibn Sahl. 984.
On Burning Mirrors and Lenses (Baghdad).
For a textbook treatment see:
Born, M. and Wolf, E. 1959.
Principles of Optics.
(Cambridge 1959, latest reprint 2002).

[455] Landau, L.D. and Lifshitz, E.M. 1960.
Electrodynamics of Continuous Media.
in *A Course of Theoretical Physics* Vol 8, (Pergamon Press, 1960).

[456] Bragg, W.H. and Bragg, W.L. 1913.

The Reflexion of X-rays by Crystalss.
Proceedings of the Royal Society of London **A88** (1913) 428.

[457] Misra, B. and Sudarshan, E.C.G. 1977.
The Zenos paradox in quantum theory.
Journal of Mathematical Physics **18** 756 .

[458] Nielsen, M.A. and Chuang, I.L. 2001.
Quantum Computation and Quantum Information. (Cambridge Press, 2001).

[459] Nakajima, S. 1958.
On Quantum Theory of Transport Phenomena.
Progress in Theoretical Physics **20** (1958) 948.
Zwanzig, R. 1960.
Ensemble Method in the Theory of Irreversibility.
*Journal of Chemical Physics***33** (1960) 1338.

[460] Davies, E. 1974.
Markovian Master Equations.
Communications in Mathematical Physics **39** (1974) 91.
Davies, E. 1976.
Markovian Master Equations II.
Mathematische Annalen **219** (1976) 147.
Dumcke, R. and Spohn, H. 1979.
Proper Form of the Generator in the Weak Coupling Limit.
Zeitschrift für Physik **B34** (1979) 419.

[461] Kaplanek, G. and Burgess, C.P. 2019.
Hot Accelerated Qubits: Decoherence, Thermalization, Secular Growth and Reliable Late-time Predictions.
Journal of High Energy Physics **03** (2020) 008 [arXiv:1912.12951 [hep-th]].

Kaplanek, G. and Burgess, C.P. 2019.
Hot Cosmic Qubits: Late-Time de Sitter Evolution and Critical Slowing Down.
Journal of High Energy Physics **02** (2020) 053 [arXiv:1912.12955 [hep-th]].

[462] Kossakowski, A. 1972.
On quantum statistical mechanics of non-Hamiltonian systems.
Reports on Mathematical Physics **3** (1972) 247.
Lindblad, G. 1976.
On the generators of quantum dynamical semigroups.
Communications in Mathematical Physics **48** (1976) 119.
Gorini, V. , Kossakowski, A. and Sudarshan, E.C.G. 1976.
Completely positive semigroups of N-level systems.
Journal of Mathematical Physics **17** (1976) 821.

[463] Belavin, A.A., Zel’dovich, B. Ya., Perelomov, A.M. and Popov, V.S. 1969.
Relaxation of Quantum Systems with Equidistant Spectra.
Zhurnal Éksperimental’noǐ i Teoreticheskoǐ Fiziki **56** 264
(*Soviet Physics JETP* **29** (1969)145). Boyanovsky, D. and de Vega, H.J. 2003.

Dynamical renormalization group approach to relaxation in quantum field theory.
Annals of Physics **307** (2003) 335 (hep-ph/0302055).
[464] Kubo, R. 1957.
Statistical-Mechanical Theory of Irreversible Processes I.
General Theory and Simple Applications to Magnetic and Conduction Problems.
*Journal of the Physical Society of Japan***12** (1957) 570.
Martin, P.C., Schwinger, J. 1959.
Theory of Many-Particle Systems I.
*Physical Review***115** (1959) 1342.
Haag, R., Winnink, M. and Hugenholtz, N. M. 1967.
On the equilibrium states in quantum statistical mechanics.
Communications in Mathematical Physics **5** (1967) 215.
[465] Einstein, A. 1910.
Theorie der Opaleszenz von homogenen Flüssigkeiten und
Flüssigkeitsgemischen in der Nähe des kritischen Zustandes.
(The Theory of the Opalescence of Homogeneous Fluids
and Liquid Mixtures near the Critical State.)
Annalen der Physik **33** (1910) 1275.
[466] Rayleigh, Lord 1881.
On the Electromagnetic Theory of Light.
The London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science
12 (1881) 81.
Rayleigh, Lord 1899.
On the transmission of light through an atmosphere containing
small particles in suspension, and on the origin of the blue of the sky.
The London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science
47 (1899) 375.
[467] Fulling, S. A. 1973.
Nonuniqueness of Canonical Field Quantization in Riemannian Space-Time.
Physical Review **D7** (1973) 2850.
Unruh, W. G. 1976.
Notes on black-hole evaporation.
Physical Review **D14** (1976) 870.
DeWitt, B.S. 1979.
Quantum Gravity: The New Synthesis.
in *General Relativity, An Einstein Centenary Survey*, edited by S. W. Hawking and W. Israel (Cambrdige Press, 1979).
[468] Sciama, D.W., Candelas, P. and Deutsch, D. 1981.
Quantum Field Theory, Horizons and Thermodynamics.
Advances in Physics **30** (1981) 327.
[469] Weinberg, S. 1964.
Feynman Rules for Any Spin.
Physical Review **133** (1964) B1318.
[470] Scadron, M. 1968.

Covariant Propagators and Vertex Functions for Any Spin.
Physical Review **165** (1968) 1640.

[471] Yang, C.N. and Mills, R. 1954.
Conservation of Isotopic Spin and Isotopic Gauge Invariance.
Physical Review **96** (1954) 1.

[472] N. Arkani-Hamed, F. Cachazo and J. Kaplan, JHEP **1009** (2010) 016 doi:10.1007/JHEP09(2010)016 [arXiv:0808.1446 [hep-th]].

[473] Stueckelberg, E.C.G. and Petermann, A. 1953.
La renormalisation des constants dans la théorie de quanta".
Helvetica Physica Acta **26** (1953) 499.

[474] Gell-Mann, M. and Low, F. E. 1954.
Quantum Electrodynamics at Small Distances.
Physical Review **95** (1954) 1300.

[475] Kadanoff, L. P. 1966.
Scaling laws for Ising models near T_c.
Physics **2** (1966) 263.

[476] Wilson, K.G. 1971.
Renormalization group and critical phenomena 1.
Renormalization group and the Kadanoff scaling picture.
Physical Review **B4** (1971) 3174.
Renormalization group and critical phenomena 2.
Phase space cell analysis of critical behavior.
Physical Review **B4** (1971) 3184.

[477] Wilson, K.G. and Fisher, M.E. 1972.
Critical exponents in 3.99 dimensions.
Physical Review Letters **28** (1972) 240.

[478] Reuter, M. and Wetterich, C. 1994.
Effective average action for gauge theories and exact evolution equations.
Nuclear Physics **B417** (1994) 181.

[479] Salam, A. 1951.
Overlapping divergences and the S-matrix.
Physical Review **82** (1951) 217.

[480] Weinberg, S. 1959.
High-energy behavior in quantum field theory.
Physical Review **118** (1959) 838.

[481] Wess, J. and Zumino, B. 1971.
Consequences of anomalous Ward identities.
Physics Letters **37B** (1971) 95.

[482] Bardeen, W.A. and Zumino, B. 1984.
Consistent and Covariant Anomalies in Gauge and Gravitational Theories.
Nuclear Physics **B244** (1984) 421.

[483] Manes, J., Stora, R. and Zumino, B. 1985.
Algebraic Study of Chiral Anomalies.
Communications in Mathematical Physics **102** (1985) 157.

[484] Smoot, G.F. *et al.* (COBE Collaboration). 1992.
Structure in the COBE differential microwave radiometer first year maps.
Astrophysical Journal **396** (1992) L1.
[485] Burgess, C.P. 2017.
Intro to Effective Field Theories and Inflation.
In the proceedings of the Les Houches Summer School, "Effective Field Theory in Particle Physics and Cosmology", (arXiv:1711.10592 (hep-th)).
[486] Achucarro, A. Gong, J.O., Hardeman, S., Palma, G.A. and Patil, S.P. 2010.
Mass hierarchies and non-decoupling in multi-scalar field dynamics.
Physical Review **D84** (2011) 043502 (arXiv:1005.3848 (hep-th)).
[487] 't Hooft, G. 1986.
How Instantons Solve the U(1) Problem.
Physics Reports **142** (1986) 357.
[488] Gasser, J. and Leutwyler, H. 1982.
Quark masses.
Physics Reports **87** (1982) 77.
Meissner, U.G. 1993.
Recent developments in chiral perturbation theory.
Reports on Progress in Physics **56** (1993) 903 (hep-ph/9302247).
Leutwyler H. 1994.
in the proceedings of Hadron Physics 94, (hep-ph/9406283)
Kaplan D. 1995.
in the proceedings of the 7th Summer School in Nuclear Physics Symmetries, Seattle, WA, 1995, (nucl-th/9506035)
Georgi H. 1995.
Effective Field Theory.
Annual Review of Nuclear and Particle Science **43** (1995) 205
Pich A. 1998.
Effective Field Theories.
in the proceedings of the Les Houches Summer School in Theoretical Physics: Probing the Standard Model of Particle Interactions, (hep-ph/9806303);
Rothstein, IZ. 2003.
TASI Lectures on Effective Field Theories. (hep-ph/0308266);
Manohar, A. 2017.
Introduction to Effective Field Theories.
in the proceedings of the 2017 Les Houches Summer School on Effective Field Theories (arXiv:1804.05863).

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