Texts and References

Strongly Recommended:

R. Kulsrud; "Plasma Physics for Astrophysics," Princeton University Press

S. Galtier, "Introduction to Modern Magnetohydrodynamics," Cambridge University Press

References:

a) *General Plasma Physics*

i.) P. Sturrock; "Plasma Physics" - excellent physical insights, readable

ii.) N. Krall and A. Trivelpiece; "Principles of Plasma Physics" - encyclopedia

iii.) E. Lifshitz and L. Pitaevski; "Physical Kinetics" (Volume 10 of Landau and Lifshitz series) - good treatment of kinetic theory

* iv.) B.B. Kadomtsev; "Tokamak Plasma: A Complex Physical System" - superb integrative approach to tokamak dynamics, but of general interest

v.) T. Boyd and J. Sanderson; "The Physics of Plasmas"

* vi.) B.B. Kadomtsev; "Cooperative Effects in Plasmas" in Reviews of Plasma Physics, Vol. 22 – see Supplementary Materials

vii.) M. Kikuchi; "Frontiers in Fusion Research" – a theoretical look at practical issues in tokamak physics

viii.) Keith Moffat, E. Dormy, 2019; "Self-Exciting Fluid Dynamos"; Cambridge University Press

b) Lite Reading

i.) E.N. Parker, "Conversations on Electric and Magnetic Fields in the Cosmos," Princeton University Press

c) *General and Astrophysical MHD*

* i.) D. Biskamp ; "Nonlinear Magnetohydrodynamics" - broad, solid and easily accessible, focused on laboratory applications

* ii.) H.K. Moffatt; "Magnetic Field Generation in Electrically Conducting Fluids" - superb treatment of basic dynamo theory and related topics

available online at http://www.igf.fuw.edu.pl/KB/HKM/.

iii.) A.R. Choudhuri; “The Physics of Fluids and Plasmas” - good elementary text, deals with lab and astro

* iv.) L. Mestel; “Stellar Magnetism” - excellent in-depth study of the subject

v.) E.N. Parker; “Cosmical Magnetic Fields” - broad but insightful coverage of all aspects of solar and galactic MHD, well written

* vi.) P.A. Davidson; “An Introduction to Magnetohydrodynamics”

vii.) R.B. White, “Theory of Tokamak Plasmas”

viii.) Goedbloed and Poedts; "Principles of Magnetohydrodynamics", Vol. 1, 2 - good basic MHD text with considerable detail provided

ix.) K. Itoh, S.-I. Itoh, A. Fukuyama, "Transport and Structural Formation in Plasmas" - modern perspective on aspects of MHD

x.) J.P. Freidberg, "Ideal Magnetohydrodynamics" - in depth coverage of applications to laboratory plasmas

d) *General References*

* i.) L.D. Landau and E.M. Lifshitz; “Fluid Mechanics” - a classic

* ii.) L.D. Landau and E.M. Lifshitz; “Electrodynamics of Continuous Media” - ditto

iii.) G.K. Batchelor; “An Introduction to Fluid Dynamics” - three in a row..., complements Landau

* iv.) G.B. Whitman; “Linear and Nonlinear Waves” - yet another great one

* v.) J. Lighthill; “Waves in Fluids” - excellent and accessible

vi.) T.H. Stix; “Waves in Plasmas” - encyclopedia

* vii.) F. Shu; “The Physics of Astrophysics, Vol. I, II” - good basic graduate text on MANY topics, including fluids, MHD and plasmas

viii.) J. Binney and S. Tremaine; “Galactic Dynamics” - super text on galactic dynamics, no MHD or plasma but treatment of self-gravitating matter makes it relevant. Try the problems :).....

* ix.) U. Frisch; “Turbulence-The Legacy of A.N. Kolmogorov” – classic book on turbulence ala’ K41

x.) A. Townsend; “The Structure of Turbulent Shear Flow” – classic book on turbulence in real systems