Bibliography

General references

Batchelor, G.K. (2000) An Introduction to Fluid Mechanics. Cambridge University Press.

Faber, T.E. (1995) Fluid Dynamics for Physicists. Cambridge University Press.

Feynman, R.P., Leighton, R. and Sands, M. (1964) *The Feynman Lectures on Physics*. Volume 2, Chapters 40 "The flow of dry water" and 41 "The flow of wet water." Addison-Wesley.

Kundu, P.K., Cohen, L.M. and Dowling, D.R. (2011) Fluid Mechanics, 5th edition, Academic Press.

Lamb, H. (1993) Hydrodynamics. Cambridge University Press.

Landau, L.D. and Lifschitz, E.M. (1987) Fluid Mechanics. 2nd edition. Chapters 1 to 4. Pergamon Press.

Books and multimedia documents giving an approach of fluid mechanics based on images

Guyon, E., Hulin, J-P. and Petit, L. (2011) Ce que disent les fluides, la science des écoulements en images, 2nd edition. Belin.

Guyon, E. and Guyon, MY. (2014). "Taking fluid mechanics to the general public" Annual Review of Fluid Mechanics. 46, 1-22.

Homsy, G. (2008) Multimedia Fluid Mechanics (MMFM) second edition. Cambridge University Press.

Paterson, A.R. (1983) A First Course in Fluid Dynamics. Cambridge University Press.

Samimy, K.S., Breuer, K.S., Leal, L.G. and Steen, P.H. (2004) A Gallery of Fluid Motion. Cambridge University Press.

Shapiro, A.H. (1961–1972) National Committee for Fluid Mechanics Films (NCFMF) and its companion book: Illustrated Experiments in Fluid Mechanics (IEFM, 1974). MIT Press. For internet access to all these films use Shapiro and NCFMF as search keywords.

Tritton, D.J. (1988) Physical Fluid Dynamics. 2nd edn. Oxford Science Publications.

Van Dyke, M. (1982) An Album of Fluid Motion (AFM). Parabolic Press.

History of hydrodynamics

Darrigol, O. (2008) Worlds of Flows: A History of Hydrodynamics from the Bernoullis to Prandtl. Oxford University Press.

In addition to the above general references, we provide below, chapter by chapter, more specialized ones which are arranged as follows:

- References relevant to the chapter: review articles in scientific journals or fluid mechanics textbooks discussing in greater depth some content of the chapter.
- Specific references dealing with specific ideas discussed in a particular section of the chapter.
- Films from the NCFMF series: see above.

Chapter 1

Adamson, W.A. and Gast, A.P. (1997) Physical Chemistry of Surfaces. John Wiley & Sons.

Bird, B.R., Stewart, W.E. and Lightfoot, E.N. (2006) Transport Phenomena. John Wiley & Sons.

Carslaw, H.S. and Jaeger, J.C. (1959) Conduction of Heat in Solids. Oxford University Press.

Egelstaff, P.A. (1994) An Introduction to the Liquid State. Oxford University Press.

Guyon, E. et al. (2010) Matière et matériaux. De quoi est fait le monde. Belin.

McQuarrie, D. (1976) Statistical Mechanics. Harper and Row.

Reif, F. (1972) Statistical Physics. McGraw-Hill. See bibliography of Chapter 8.

Specific references

Barker, J. and Henderson, D. (1981) "Numerical simulations of two-dimensional phase transitions." Scientific American. 180, Nov. 130–138.

Charmet, J., Cloitre, M., Fermigier, M., Guyon, E.; Jenffer, P.; Limat, L.; Petit, L. (1986). "Application of forced Rayleigh scattering to hydrodynamic measurements." *IEEE Journal of Quantum Electronics*. **QE-22**, 1461–1468.

Betrencourt, C., Guyon, E. and Giraud, L.G. (1980) "Teaching physics out of a bag of marbles." European Journal of Physics. 1, 206–211. Pieranski, P. (1984) "An experimental model of a classical many body problem." American Journal of Physics. 52, 68–73.

Chapter 2

Specific references

Koplik, J., Banavar, J. and Willemsen, J.F. (1988) "Molecular dynamics of Poiseuille flow and moving contact lines." *Physical Review Letters*. **60**, 1282–1285.

Provansal, M., Mathis, C. and Boyer, L. (1987) "Bénard-von Kármán instability: transient and forced regimes." Journal of Fluid Mechanics. 182, 1–22.

Miedzik, J., Gumowski, K., Goujon-Durand, S., Jenffer, P. and Wesfreid, J.E. (2008) "Wake behind a sphere in early transitional regimes." *Physical Review E*. 77, 055308.

Reynolds, O. (1883) "An experimental investigation on the circumstances which determine whether the motion of water shall be direct or sinuous and the law of resistance in a parallel channel." *Philosophical Transactions of the Royal Society.* 174, 935–982.

Rott, N. (1990) "Note on the history of the Reynolds number." Annual Review of Fluid Mechanics. 22, 1-20.

Chapter 3

Adrian, R.J. (1991) "Particle imaging techniques for experimental fluid mechanics." *Annual Review of Fluid Mechanics*. 23, 261–304. Merzkirch, W. (1979) *Flow Visualization*. Academic Press.

Specific references

Bartol, I.K., Kruger, K.S., Stewart, W.S. and Thomson, J.T. (2009) "Hydrodynamics of pulsed jetting in juvenile and adult brief squid Lolliguncula brevis: evidence of multiple jet 'modes' and their implications for propulsive efficiency." Journal of Experimental Biology. 212, 1889–1903.

Taylor, G.I. (1934) "The formation of emulsions in definable fields of flow." Proceedings of the Royal Society A. 146, 501–523.

NCFMF film

Kline, S.J. (1966) Flow Visualization (IEFM, p. 34).

Lumley, J.L. (1963) Deformation of Continuous Media (IEFM, p. 11).

Chapter 4

Byron Bird, R. and Hassager, O. (1987) Dynamics of Polymeric Liquids. John Wiley & Sons.

Coussot, P. (2005) Rheometry of Pastes, Suspensions and Granular Materials. John Wiley & Sons Ltd.

Larson, R.G. (1999) The Structure and Rheology of Complex Fluids. Oxford University Press.

Oswald, P. (2009) Rheophysics: The Deformation and Flow of Matter. Cambridge University Press.

Specific references

Allain, C., Cloitre, M. and Perrot, P. (1997) "Experimental investigation and scaling laws of die swelling in semi-dilute polymer solutions." Journal of Non-Newtonian Fluid Mechanics. 73, 51–66.

Berret, J-F., Porte, G. and Decruppe J-P. (1997) "Inhomogeneous shear flows of wormlike micelles." Physical Review E. 55, 1668–1676.

Charlaix, E., Kushnick, A.P. and Stokes, J.P. (1989) "Experimental study of the dynamic permeability of porous media." *Physical Review Letters*. **61**, 1595–1598.

Cottin-Bizonne, C., Cross, B., Steinberger, A. and Charlaix, E. (2005) "Boundary slip on smooth hydrophobic surfaces." *Physical Review Letters*. 94, 056102.

Reiner, M. (1964) "The Deborah number." Physics Today. 17 n°1, 62.

504 Bibliography

NCFMF films

Markovitz, H. (1964) Rheological Behaviour of Fluids (IEFM, p. 18).

Trefethen, L. (1967) Surface Tension in Fluid Mechanics (IEFM, p. 26).

Chapter 5

Middleman, S. (1995) Modeling Axisymmetric Flows: Dynamics of Films, Jets and Drops. Academic Press. Milne-Thomson, L.M. (1996) Theoretical Hydrodynamics. Dover Publications.

NCFMF film

Shapiro, A.H. (1962) Pressure Fields and Fluid Acceleration (IEFM, p. 39).

Chapter 6

Lighthill, M.J. (2001) Waves in Fluids, 2nd edition. Cambridge University Press.

Stoker, J.J. (1957) Water Waves, The Mathematical Theory with Applications. John Wiley & Sons.

Specific references

Davies, R.M. and Taylor, G.I. (1950) "The mechanics of large bubbles rising through extended liquids and through liquids in tubes." Proceedings of the Royal Society of London A. 200, 375–390.

NCFMF film

Bryson, A.E. (1964) Waves in Fluids (IEFM, p. 105).

Chapter 7

Childress, S. (1981) Mechanics of Swimming and Flying. Cambridge University Press.

Cushman-Roisin, B. (1994) Introduction to Geophysical Fluid Dynamics. Prentice Hall.

Greenspan, H.P. (1990) The Theory of Rotating Fluids. Breukelen Press.

Holton, J.R. (2004) An Introduction to Dynamic Meteorology, 4th edition, Academic Press.

Saffman, P.J. (1995) Vortex Dynamics. Cambridge University Press.

Specific references

Cortet, P-P., Lamriben, C. and Moisy, F. (2010) "Viscous spreading of an inertial wave beam in a rotating fluid." *Physics of Fluids.* 22 086603.

Donnelly, R.J., Glaberson, W.I. and Parks, R. (1967) Experimental Superfluidity. University of Chicago Press.

Donnelly, R.J. (1993) "Quantized Vortices and Turbulence in Helium II." Annual Review of Fluid Mechanics. 25, 327-371.

Godoy-Diana, R., Aider, J-L. and Wesfreid, J.E. (2008) "Transitions in the wake of a flapping foil." Physical Review Letters E. 77, 016308.

Guyon, E., Kojima, H., Veitz, W. and Rudnick, I. (1972) "Persistent current states in rotating superfuid He." Journal of Low Temperature Physics. 9, 187–193.

Williams, G. and Packard, R.E. (1980) "A technique for photographing vortex positions in rotating superfluid He." Journal of Low Temperature Physics. 39, 553–577.

arearchonyokinic Carl Daccuration During the Late and

NCFMF films

Shapiro, A.H. (1961) Vorticity (IEFM, p. 63).

Fultz, D. (1969) Rotating Flows (IEFM, p. 143).

Chapter 8

De Gennes, P.G., Brochard, F. and Quéré, Y. (2004) Capillarity and Wetting Phenomena: Drops, Bubbles, Pearls, Waves. Springer.

Specific references

Cazabat, A.M. and Cohen Stuart, M. (1986) "Dynamics of wetting: effects of surface roughness." Journal of Physical Chemistry. 90, 5845–5849.

Fermigier, M. and Jenffer, P. (1991) "An experimental investigation of the dynamic contact angle." Journal of Colloid and Interface Science. 146, 226–241.

Mora, S., Abkarian, M., Tabuteau, H. and Pomeau, Y. (2011) "Surface instability of soft solids under strain." Soft Matter. 7, 10612–10619.

Ribe, N.M. (2004) "Coiling of viscous jets." Proceedings of the Royal Society of London A. 460, 3223-3239.

Trouton, F.T. (1906) "On the coefficient of viscous traction and its relation to that of viscosity." *Proceedings of the Royal Society of London A.* 77, 426–440.

Chapter 9

Bear, J. (1989) Dynamics of Fluids in Porous Media. Dover Publications.

Dullien, F.A. (1992) Porous Media; Fluid Transport and Pore Structure. Academic Press.

Guazzelli, E. and Morris, J.F. (2012) A Physical Introduction to Suspension Dynamics. Cambridge University Press.

Happel, J. and Brenner, H. (1983) Low Reynolds Number Hydrodynamics (with special applications to particulate media). Kluwer Academic Publishers.

Hinch, E.J. (1988) "Hydrodynamics at Low Reynolds Number: a brief and elementary introduction" in *Disorder and Mixing*. Guyon, E., Nadal, J.P. and Pomeau, Y. eds., N.A.T.O. A.S.I. E series, Kluwer Academic Publishers. 152, 43–55.

Moffatt, K. (1977) "Six lectures on fluid dynamics" in: Fluid Dynamics, les Houches 1973. Balian, R. and Peube, J.L. eds., Gordon and Breach, 149–234.

Scheidegger, A.E. (1979) The Physics of Flow Through Porous Media. University of Toronto Press.

Specific references

Katz, A.J. and Thompson, A.H. (1986) "Quantitative prediction of permeability in porous rocks." Physical Review B. 34, 8179-8181.

Lliboutry, L.A. (1987) Very Slow Flows of Solids. Ch. 7. M. Nijjhoff Publishers.

Purcell, E.M. (1977) "Life at low Reynolds number." American Journal of Physics. 45, 3-11.

Tabeling, P. (2005) Introduction to Microfluidics. Oxford University Press.

Wong, P., Koplik, J. and Tomanic, J.P. (1984) "Conductivity and permeability of rocks." Physical Review B. 30, 6606–6614.

NCFMF film

Taylor, G.I. (1964) Low Reynolds Number Flows (IEFM, p. 47).

Chapter 10

Levich, V.G. (1962) Physicochemical Hydrodynamics. Prentice Hall.

Prandtl, L. and Tietjens, O.G. (1957) Fundamentals of Hydro- and Aerodynamics. Dover Publications.

Probstein, R.F. (1994) Physicochemical Hydrodynamics, An Introduction. 2nd edition, Wiley-Blackwell.

Schlichtling, H. and Gersten, K. (2000) Boundary Layer Theory. 8th edition, Springer.

Specific references

Comte-Bellot, G. (1976) "Hot-wire anemometry". Annual Review of Fluid Mechanics. 8, 209–231.

Freymuth, P., Bank, W. and Palmer, M. (1984) "First experimental evidence of vortex splitting." Physics of Fluids. 27, 1045–1046.

Minguez, M., Pasquetti, R. and Serre, E. (2008) "High-order large-eddy simulation of flow over the 'Ahmed body' car model." *Physics of Fluids*. 20, 095101.

Quinard, J., Searby, G., Denet, B. and Graña-Otero, J. (2011) "Self turbulent flame speed." Flow, Turbulence and Combustion. 89, 231–247. Werle, H. (1974) The Uses of a Hydrodynamic Wind Tunneling Space Research. ONERA publication # 156, p. 43; ibid. publication #1303, p. 343.

NCFMF film

Abernathy, F.H. (1968) Fundamentals of Boundary Layers (IEFM, p. 75).

Chapter 11

Berge, P., Pomeau, Y. and Vidal, C. (1987) Order within Chaos. Wiley-VCH.

Charru, F. (2011) Hydrodynamic Instabilities. Cambridge University Press.

Lin, C.C. (1955) The Theory of Hydrodynamic Stability. Cambridge University Press.

Manneville, P. (2010) Instabilities, Chaos and Turbulence: An Introduction to Nonlinear Dynamics and Complex Systems, 2nd edition, Imperial College Press.

Mutabazi, I., Wesfreid, J.E. and Guyon, E. (2006) Dynamics of Spatio-temporal Structures. Springer.

Specific references

Andereck, C.D., Liu, S.S. and Swinney, H.L. (1986) "Flow regimes in a circular Couette system with independently rotating cylinders," *Journal of Fluid Mechanics*. **164**, 155–183.

Fellouah, H., Castelain, C., Ould El Moktar, A. and Peerhossani, H. (2006) "A criterion for detection of the onset of Dean instability," European Journal of Mechanics. B/Fluids. 46, 505–531.

Guyon, E. and Pieranski, P. (1974) "Convective instabilities in nematic liquid crystals." Physica. 73, 184-194.

Heslot, F., Castaing, B. and Libchaber, A. (1987) "Transitions to turbulence in helium gas." Physical Review. A 36, 5870-5873.

Libchaber, A., Fauve, S. and Laroche, C. (1983) "Two-parameter study of the routes to chaos." Physica D. 7, 73-84.

Schatz, M.F., Van Hook, S.J., McCormick, W.D., Swift, J.B. and Swinney, H.L. (2008) "Onset of surface-tension-driven Bénard instability," *Physical Review Letters*. 75, 1938–1941.

Thorpe, S.A. (1969) "Experiments on the instability of stratified shear flows: immiscible fluids." Journal of Fluid Mechanics. 39, 25–48. Thorpe, S.A. (1971) "Experiments on the instability of stratified shear flows: miscible fluids." Journal of Fluid Mechanics. 46, 299–319.

NCFMF film

Mollo-Christensen, E.L. (1972) Flow Instabilities (IEFM, p. 113).

Chapter 12

Davidson, P.A. (2004) Turbulence: An Introduction for Scientists and Engineers. Oxford University Press.

Frisch, U. (1996) Turbulence: The legacy of A.N. Kolmogorov. Cambridge University Press.

Lesieur, M. (1997) Turbulence in Fluids. Kluwer Academic Publishers.

Pope, S.B. (2000) Turbulent Flows. Cambridge University Press.

Tennekes, M. and Lumley, J.M. (1972) A First Course in Turbulence. Cambridge University Press.

Specific references

Catrakis, H.J. and Dimotakis, P.E. (1996) "Mixing in turbulent jets: scalar measures and isosurface geometry." Journal of Fluid Mechanics. 317, 369–406.

Kahlerras, H., Malecot, Y. and Gagne, Y. (1998) "Intermittency and Reynolds number," Physics of Fluids. 10, 910-921.

Moisy, F., Morize, C., Rabaud, M. and Sommeria, J. (2011) "Decay laws, anisotropy and cyclone-anticyclone asymmetry in decaying rotating turbulence." Journal of Fluid Mechanics. 666, 5–35.

(1974) The Uses of a Hydrodynamic Wind Tunneling Space Research. ONERA publication # 156, p. 43; ibid. publications#18031

NCFMF film

Stewart, L.W. (1966) Turbulence (IEFM, p. 82).