Some suggested references.

Books and journal articles:

***Multidimensional NMR in Liquids. Basic Principles and Experimental Methods.*
F.J.M. van de Ven, VCH, New York, 1995.

Spin Dynamics: Basics of Nuclear Magnetic Resonance.** Malcolm H. Levitt, John Wiley & Sons New York, 2001.

Understanding NMR Spectroscopy, James Keeler, John Wiley & Sons New York, 2005.
(see www-keeler.ch.cam.ac.uk/lectures/index.html)

Modern NMR Spectroscopy J.K.M. Saunders and B. K. Hunter Oxford University Press, New York, 1993

Protein NMR Spectroscopy: Principles & Practice by John Cavanagh, Wayne Fairbrother, Arthur Palmer and Nicholas Skelton Academic Press, 1996.

Web sites:

mutuslab.cs.uwindsor.ca/schurko/nmrcourse/downloads.htm
www.cis.rit.edu/htbooks/nmr/

Nobel Lectures in NMR and related fields

Physics 1952
Felix Bloch - The Principle of Nuclear Induction
nobelprize.org/nobel_prizes/physics/laureates/1952/index.html
Edward M.. Purcell - Research in Nuclear Magnetism
nobelprize.org/nobel_prizes/physics/laureates/1952/index.html

Chemistry 1991
Richard R. Ernst - Nuclear Magnetic Resonance Fourier Transform Spectroscopy
nobelprize.org/nobel_prizes/chemistry/laureates/1991/index.html

Chemistry 2002
Kurt Wuthrich - NMR Studies of Structure and Function of Biological Macromolecules
nobelprize.org/nobel_prizes/chemistry/laureates/2002/index.html
shared ½ with Koichi Tanaka (1/4) and John B. Fenn (1/4)

Physiology or Medicine 2003 - MRI
Paul Lauterbur - All Science is Interdisciplinary - from Magnetic Moments to Molecules to Men
nobelprize.org/nobel_prizes/medicine/laureates/2003/index.html
Sir Peter Mansfield - Snap-Shot MRI
nobelprize.org/nobel_prizes/medicine/laureates/2003/index.html

Basic NMR

Saunders and Hunter, *Modern NMR Spectroscopy*, Oxford University Press, New York, (1987).

Andrew E. Derome, Modern NMR techniques for chemistry research, Pergamon Press, Oxford, UK: 1987

Intermediate and Advanced Treatises

Carrington and McLachlan, *Introduction to Magnetic Resonance*, Chapman and Hall, New York (1980).

Slichter, *Principles of Magnetic Resonance*, Springer, Berlin (1978).

Goldman, M. *Quantum Description of High-Resolution NMR in Liquids* Oxford University Press, (1988) [also reprinted in paperback]

Abragam, *The Principles of Nuclear Magnetism*, Oxford University Press, New York (1961). [also reprinted in paperback]

Product Operators and density matrix

Ernst, Bodenhausen, and Wokaun, *Principles of Nuclear Magnetic Resonance in One and Two Dimensions*, Clarendon Press, Oxford (1987).

Edison et al, *Methods in Enzymology*, 239, 3-79 (1994).

Protein structure determination

Wider, G "Structure Determination of Biological Macromolecules in Solution Using NMR spectroscopy" *BioTechniques* **29**, 1278–1294 (2000).

Ferentz, A. E., and Wagner, G, "NMR spectroscopy : a multifaceted approach to macromolecular structure" *Quarterly Reviews of Biophysics* **33**, 29-65 (2000).

Dotsch, Volker "NMR strategies for protein assignments. *Methods and principles in medicinal chemistry* **16**, 79-94 2003

Kanelis V; Forman-Kay J D; Kay L E "Multidimensional NMR methods for protein structure determination" *IUBMB life* **52**, 291-302 (2001)

Clore, G. M. and Gronenborn, A. M., "Appications of Three- and Four-Dimensional Heteronuclear NMR Spectroscopy to Protein Structure Determination," *Prog. NMR Spectros.* **23**, 43-92 (1991).

Other topics

Line shapes in 2D spectra

Keeler and Neuhaus J. Magn. Res. **63,** 454-472 (1985)

Vector descriptions (reviews)

Turner, *Prog. NMR Spect.*,.**16**, 311-370 (1984).

Benn and Gunther, *Angew. Chem. Int. Ed. Engl.*,.**22**, 350-380 (1983).

Phase Cycling

Bain, *J. Magn. Reson.*.**56** 418-427 (1984).

Bodenhausen et al., *J. Magn. Reson.*.**58**, 370-388 (1984).

Instrumentation, data collection, and processing

Hoult, *Prog. NMR Spect.*,.**12**, 41-77 (1978).

Lindon and Ferrige, *Prog. NMR Spect.*.**14**, 27-66 (1980).

Relaxation

Nagarajan Murali, V.V. Krishnan *Concepts in Magnetic Resonance Part A* **17A**, 86-116 (2003) Pages:

Noggle and Schirmer, "The Nuclear Overhauser Effect", Academic Press, New York (1971).

Solomon, *Phys. Rev*..**99**, 559-565 (1955).

Macura et al., *J. Magn. Reson.*,.**43**, 259-281 (1981).

Sudmeier et. al. *Concepts in Magnetic Resonance*, **2** 197-212 (1990).

Coupling constants

V. F. Bystrov, *Prog. NMR Spect.*. **13**, 41-80 (1976).

Andrew J. Dingley, Florence Cordier, Stephan Grzesiek "An introduction to hydrogen bond scalar couplings" *Concepts in Magnetic Resonance*, **13**, 103-127 2001

Journal articles are shorter than books and written about very specific topics. A journal is a collection of articles (like a magazine) that is published regularly throughout the year. Journals present the most recent research, and journal articles are written by experts, for experts. They may be published in print or online formats, or both. Sample images. The front cover of a sample academic journal (PORTAL: Journal of Multidisciplinary International Studies). Note that it includes a year, as well as "Vol." (for "Volume") and "No." (for "Number"). Beca