BIBLIOGRAPHY

This list consists of all the books I know on infrared, radiometry, and detectors. Some I have even loved. Because most were published some time ago, they do not cover some of the modern techniques that use arrays and computer techniques. Many are also out of print, and require a good bookseller (or a good library) to obtain.

Hudson[1] is still probably the best all-around treatment of infrared system design, even though it was written many years ago. Unfortunately it does not deal with arrays and real-time imagers. The book arose from an educational program he ran at Hughes and therefore has much of input from the Hughes infrared engineers. It is distinguished by a fine compendium of applications, many from the patent literature.

Lloyd[2] is still the best book on real-time imagers; it arose from his experiences at the Army Night Vision Lab and the Honeywell Radiation Center. It includes good information on the properties of the eye, MRTDs, and similar figures of merit, and a nice treatment of the transfer-function approach to design.

The next three books all were published at just about the same time. They are a little older than the Hudson volume, but provide good information on both components and design approaches. The text by Kruse, McGlauchlin, and McQuistan[3] at the Honeywell Research Center has the best treatment of detectors; that by Jamieson, McFee, Plass, Grube, and Richards[4] at Aerojet deals more with detection probabilities and system analysis; that by Holter, Suits, Nudelman, Wolfe, and Zissis[5] at the University of Michigan, dubbed the purple peril, is the most balanced.

One of the earliest books on infrared systems, and still a good one, is the treatise by Smith, Jones, and Chasmar.[6]

Seyrafi[7] is a more general treatment of both infrared and electro-optics. It was printed by his own company and therefore did not have the benefit of independent review. It is good.

Ghys[8] and Wallace[9] are discussions of medical thermography, largely from the clinical point of view. Unfortunately for most, Ghys is in French, Canadian French.

Two new additions are Spiro and Schlesinger[10] and Holst.[11] Spiro and Schlesinger both worked at Aerospace, and the book has a resultant spacey flavor that incorporates considerations of staring space systems and their comparisons with scanners. The book by Holst on testing is devoted mostly to testing of real-time imagers, including MRTDs and others figures of merit and performance. It too was published by his own company, but was refereed by several independent authorities.

Four modest books are the ones by Morten et al.,[12] Kemp,[13] Burnay, [14] and Vanzetti.[15] The first of these is a compilation of applications by Mullard employees, published by Mullard, perhaps to help sell detectors. The second is one of the once-famous Sams series for technicians. The third is a compendium of chapters by different authors on a variety of thermal-imaging applications. The fourth is a collection of nondestructive testing applications. Each of these makes an interesting evening's reading.

Two good books on laboratory techniques are those by Conn and Avery[16] and Simon.[17]

A good book, albeit in French, is the one by Hadni.[18] It deals with the long wave infrared in hundreds of micrometers, tenths of millimeters.

Arams,[19] Hudson and Hudson,[20] and Johnson and Wolfe[21] are all collections of significant papers. The first two concentrate on detectors; the third is a more comprehensive treatment of infrared technology. The papers in all of them are historical yet still useful.

The best all-around book on detectors is by Dereniak and Crowe.[22] The two by Willardson and Beer[23] are collections of articles by authorities on specific detectors. There is more solid-state physics in these for some system designers.

A fine book on the electronics for and testing of infrared detectors has been written relatively recently by Vincent.[24]

The best overall book on radiometry is by Grumm and Becherer.[25] Wyatt[26] has written two. They both show his hands-on familiarity with the subject. He is the one author who embraced the Nicodemus system of nomenclature. Boyd's book[27] is probably just right for his course at Rochester, but it falls short of discussing calibration, standards, and normalization. Hengtsberger[28] wrote a detailed account on the use of radiometry based on electrical equivalency. It is specialized and is good in its specialty.

There are three handbooks pertinent to infrared technology. The first was compiled by Wolfe[29] in 1969. It was completely revised in 1984 by Wolfe and Zissis.[30] A still newer version, edited by Accetta and Shumaker,[31] covers electro-optics and a variety of applications as well. Although the IR and EO Handbook covers some of the same material as the previous versions, it treats detectors, for instance, with greater depth and includes the applications. The Optical Society of America has recently published a two-volume handbook of optics[32] that has several pertinent chapters.

There are surely more to come, and there are other books that are pertinent—some, for instance, on optical design, solid-state physics, and electronics. There are many interesting patents, especially on scanning systems, and there have been a few special issues of journals on infrared. These include two in *Applied Optics* and two more recent ones in *Optical Engineering* and one in the Proceedings of the Institute of Radio Engineers[33] (now the IEEE). One of the best of these is a critical review by Smith.[34] There is also a journal, *Infrared Physics and Technology,* devoted solely to infrared developments.

1. R. D. Hudson, *Infrared System Engineering,* Wiley, 1969. I understand this can be obtained from OpAmp Technical Books, 800/468-4322, for over $100.

2. J. M. Lloyd, *Thermal Imaging Systems,* Plenum Press, 1975.

3. P. W. Kruse, L. D. McGlauchlin, and R. R. McQuistan, *Elements of Infrared Technology,* Wiley, 1962.

4. J. A. Jamieson, R. H. McFee, G. N. Plass, R. H. Grube, and R. G. Richards, *Infrared Physics and Engineering,* McGraw-Hill, 1963.

5. M. R. Holter, S. Nudelman, G. H. Suits, W. L. Wolfe, and G. J. Zissis, *Fundamentals of Infrared Technology,* Macmillan, 1962.

6. R. A. Smith, F. E. Jones, R. P. Chasmar, *The Detection and Measurement of Infrared Radiation,* Clarendon Press, 1968.

7. K. Seyrafi, *Electro-Optical Systems Analysis,* Electro-Optical Research Company, 1973.

8. R. Ghys, *Thermographie Medicale,* Somabed, Ltee, 1973.

9. J. D. Wallace and C. M. Cade, *Clinical Thermographie,* CRC Press, 1975.

10. I. J. Spiro and M. Schlesinger, *Infrared Technology Fundamentals,* Marcel Dekker, 1989.

11. G. C. Holst, *Testing and Evaluation of Infrared Imaging Systems,* JCD Publishing Company and SPIE Press, 1995.

12. F. D. Morten, T. J. Jarratt, P. R. D. Coleby, R. A. Lockett, M. H. Jervis, and R. J. Hutchinson, *Applications of Infrared Detectors,* Mullard, 1971.

13. B. Kemp, *Infrared,* Sams, 1972.

14. S. G. Burnay, T. L. Williams, C. H. Jones, *Applications of Thermal Imaging,* Adam Hilger, 1988.

15. R. Vanzetti. *Practical Applications of Infrared Techniques,* Wiley, 1972.

16. G. K. T. Conn and D. G. Avery, *Infrared Methods,* Academic Press, 1960.

17. I. Simon, *Infrared Radiation,* Van Nostrand, 1966.

18. A. Hadni, *L'infrarouge lointain,* Presses Universitaires de France, 1969.

19. F. R. Arams, *Infrared and Millimeter Wave Detectors,* Artech House, 1973.

20. R. D. Hudson and J. W. Hudson, *Infrared Detectors,* Dowden, Hutchison and Ross, 1975.

21. R. B. Johnson and W. L. Wolfe, *Selected Papers on Infrared Design,* SPIE Press, 1985.

22. E. L. Dereniak and D. Crowe, *Optical Radiation Detectors,* Wiley, 1984.

23. R. Willardson and R. Beer, Semiconductors and Semimetals, *Infrared Detectors,* **5**, 1970 and **12**, 1977.

24. D. Vincent, *Fundamentals of Infrared Detector Operation and Testing,* Wiley, 1989.

25. F. Grumm and R. J. Becherer, *Radiometry, Optical Radiation Measurements,* **1**, Academic Press, 1979.

26. C. Wyatt, *Radiometry,* Macmillan, 1975; *Radiometric System Design,* Macmillan 1987.

27. R. Boyd, *Radiometry and the Detection of Optical Radiation,* Wiley, 1982.

28. H. Hengstberger, *Absolute Radiometry,* Academic Press, 1989.

29. W. L. Wolfe, ed., *Handbook of Military Infrared Technology,* U. S. Government Printing Office, 1969.

30. W. L. Wolfe and G. J. Zissis, eds., *The Infrared Handbook,* U. S. Government Printing Office, 1984 (Available from SPIE).

31. J. Accetta and D. Shumaker, eds., *The Infrared and Electro-Optics Handbook,* ERIM and SPIE Press, 1993.

32. M. Bass, ed., D. Palmer, E. van Stryland and W. L. Wolfe, assoc. eds., *Handbook of Optical Principles and Practices,* McGraw-Hill, 1994.

33. Proceedings of the Institute of Radio Engineers, September 1959.

34. W. Smith and R. Fischer, eds., *Critical Review of Infrared Technology,* SPIE Press, 1993.

INDEX

WILLIAM L. WOLFE was born in Yonkers, New York, at a very early age. He received his B.S. in physics from Bucknell University, cum laude. He did graduate work at the University of Michigan, where he received an M.S. in physics and an M.S.E. in electrical engineering. He held positions of Research Engineer and Lecturer at the University of Michigan. He was later Chief Engineer and Department Manager at the Radiation Center of Honeywell, in Lexington, Massachusetts. In 1969 he became Professor of Optical Sciences at the University of Arizona Optical Sciences Center, where he taught infrared techniques and radiometry. In 1995 he became Professor Emeritus. He has been a fellow and on the board of directors of the Optical Society of America; a senior member of the IEEE; and a fellow, life member, and past president of SPIE—The International Society for Optical Engineering. He is the coeditor of *The Infrared Handbook* and associate editor of the second edition of the *Handbook of Optics*. Present activities include ophthalmological instruments and optical techniques for cancer detection. He is the proud father of three wonderful children and as many grandchildren. In his spare time he fly fishes, sings, gardens, and uses his wife's telephone.