

T. M. Sanders, CV

October 17, 2001

I Vital statistics

A Name

T. Michael Sanders

B Birth

September 14, 1927, New York

C Education

1948 A.B. (cum laude), Harvard University

1951 M.A. Columbia University

1954 Ph.D. Columbia University

II Positions

1949–51 Teaching Assistant, Columbia University

1951–53 RCA Fellow, Columbia

1953–55 Research Associate, Stanford University

1957 Visiting Scientist, Bell Laboratories, Murray Hill (Summer)

1955–59 Assistant Professor, University of Minnesota

1959–62 Associate Professor, University of Minnesota

1962–63 Professor, University of Minnesota
1963–2000 Professor, University of Michigan
2000– Professor Emeritus, University of Michigan

A National/professional service, awards and honors

1957–61 Sloan Foundation Research Fellow
1961 Guggenheim Fellow (declined)
1961– Fellow, American Physical Society
1972 U.S.Organizing Committee, XIIIth International
Conference on Low Temperature Physics
1973 Chairman, Gordon Conference on Quantum Fluids and Solids
1978–83 Member, Cottrell Program Advisory Committee, Research Corporation
1980 National Organizing Committee, 16th International
Conference on Low Temperature Physics
1980–81 Guggenheim Fellow
1993– North American Editor *Contemporary Physics*

B Professional societies

1948– Member, Fellow American Physical Society
1952 Member, Sigma Xi
1972 Nominating Committee, Division of Solid State Physics,
American Physical Society

C University and departmental service (partial list)

1964–65 Member, First Committee for Advising Graduate Students
1965–67 Chairman, First Committee for Advising Graduate Students
1966–69 Member, Physics Executive Committee
1967–69 Wednesday Colloquium
1970–71 Chairman , Physics Room Committee
1971–72 Physics Curriculum Committee
1972–73 Search Committee for Assistant Professor in Solid State
1972–74 University Research Policies Committee

| | |
|---------|---|
| 1973 | Physics Shop Committee |
| 1973–74 | Search Committee for Low Energy Assistant Professor and for Condensed Matter Assistant Professor |
| 1973–75 | Physics Executive Committee |
| 1975–76 | Search Committee for Low Energy Assistant Professor |
| 1976–78 | LSA–Natural Science Promotions Committee |
| 1976–79 | Physics Graduate Examinations Committee |
| 1977–79 | Search Committee for Condensed Matter Assistant Professor |
| 1979–80 | Physics Executive Committee |
| 1980 | Distinguished Faculty Achievement Award |
| 1981–82 | Graduate Examinations Committee Search Committee for Condensed Matter Assistant Professor |
| 1982–83 | Wednesday Colloquium |
| 1982–84 | University Committee on Computer Policy and Utilization |
| 1984–85 | Microcomputer Policy Committee |
| 1984–87 | Senate Assembly |
| 1985–88 | LSA Executive Committee |
| 1985–88 | Executive Committee Center for Western European Studies |
| 1986,87 | Nominated for SACUA (declined) |
| 1986–88 | Physics Executive Committee |
| 1989–91 | Steering Committee, Office of International Programs |
| 1990–91 | Review Committee, Office of International Programs |
| 1990–93 | Qualifying Exam Committee |
| 1994– | Computer Committee |
| 1995– | Executive Committee |

III Publications

A Refereed journal articles

- [1] T. M. Sanders, Jr., A. L. Schawlow, G. C. Dousmanis, and C. H. Townes. A microwave spectrum of the free OH radical. *Phys. Rev.*, 89L:1158–1159, 1953.
- [2] G. C. Dousmanis, T. M. Sanders, Jr., C. H. Townes, and H. J. Zeiger. Structure of HNCS from microwave spectra. *J. Chem. Phys.*, 21L:1416–

1417, 1953.

- [3] T. M. Sanders, Jr., A. L. Schawlow, G. C. Dousmanis, and C. H. Townes. Examination of methods for detecting OH. *J. Chem. Phys.*, 22:245–246, 1954.
- [4] G. C. Dousmanis, T. M. Sanders, Jr., and C. H. Townes. Microwave spectra of the free radicals OH and OD. *Phys. Rev.*, 100:1735–1754, 1955.
- [5] W. E. Lamb, Jr. and T. M. Sanders, Jr. Fine structure of $n = 3$ hydrogen by a radio-frequency method. *Phys. Rev.*, 103:313–314, 1956.
- [6] Gabriel Weinreich, T. M. Sanders, Jr., and H. G. White. Acoustoelectric effect in n-type germanium. *Phys. Rev.*, 114:33–44, 1959.
- [7] G. Filipovich and T. M. Sanders, Jr. $^{16}\text{O}^{18}\text{O}$ molecules as intensity standards in electron spin resonance spectroscopy. *Rev. Sci. Instr.*, 30:293–294, 1959.
- [8] W. E. Lamb, Jr. and T. M. Sanders, Jr. Fine structure of short-lived states of hydrogen by a microwave-optical method. *Phys. Rev.*, 119:1901–1914, 1960.
- [9] R. E. Pontinen and T. M. Sanders, Jr. New electron spin resonance spectrum in antimony-doped germanium. *Phys. Rev. Lett.*, 5:311–313, 1960.
- [10] Bailey Donnally and T. M. Sanders, Jr. Simple transistor marginal oscillator for magnetic resonance. *Rev. Sci. Instr.*, 31:977–978, 1960.
- [11] James Levine and T. M. Sanders, Jr. Anomalous electron mobility and complex negative ion formation in low-temperature helium vapor. *Phys. Rev. Lett.*, 8:159–161, 1962.
- [12] G. Gamota and T. M. Sanders, Jr. Direct measurement of the size of charged quantized vortex rings in HeII. *Phys. Rev. Lett.*, 15:949–951, 1965.
- [13] Arnold J. Dahm and T. M. Sanders, Jr. Relaxation time, effective mass, and structure of ions in liquid helium. *Phys. Rev. Lett.*, 17:126–130, 1966.

- [14] R. E. Pontinen and T. M. Sanders, Jr. Simple cryostat conversion for operation above normal boiling point of refrigerant. *Rev. Sci. Instr.*, 37:1615, 1966.
- [15] Richard E. Pontinen and T. M. Sanders, Jr. Electron-spin-resonance experiments on antimony-doped germanium. *Phys. Rev.*, 152:850–857, 1966.
- [16] James L. Levine and T. M. Sanders, Jr. Mobility of electrons in low-temperature helium gas. *Phys. Rev.*, 154:138–149, 1967.
- [17] J. A. Northby and T. M. Sanders, Jr. Photoejection of electrons from bubble states in liquid helium. *Phys. Rev. Lett.*, 18:1184–1186, 1967.
- [18] W. H. Wing and T. M. Sanders, Jr. FET operational amplifiers as fast electrometers. *Rev. Sci. Instr.*, 38:1341–1342, 1967.
- [19] T. M. Sanders, Jr. and Gabriel Weinreich. Vortex wheels in superfluid helium. *Phys. Lett.*, 27A:172, 1968.
- [20] G. Gamota and T. M. Sanders, Jr. Vortex-ring interactions in superfluid liquid helium. *Phys. Rev. Lett.*, 21:200–202, 1968.
- [21] Richard E. Packard and T. M. Sanders, Jr. Detection of single quantized vortex lines in rotating He II. *Phys. Rev. Lett.*, 22:823–826, 1969. Reprinted in “Adventures in Experimental Physics,” B. Maglich, ed. 1972.
- [22] G. G. Ihas and T. M. Sanders, Jr. Injection and mobility of potassium ions in liquid helium. *Phys. Lett.*, 31A:502–503, 1970.
- [23] A. J. Dahm and T. M. Sanders, Jr. Relaxation time and effective mass of ions in liquid helium. *J. Low Temp. Phys.*, 2:199–222, 1970.
- [24] G. G. Ihas and T. M. Sanders, Jr. Exotic negative carriers in liquid helium. *Phys. Rev. Lett.*, 27:383–386, 1971.
- [25] G. Gamota and T. M. Sanders, Jr. Size of quantized vortex rings in liquid Helium II. *Phys. Rev. A*, 4:1092–1099, 1971.
- [26] Richard E. Packard and T. M. Sanders, Jr. Observations on single vortex lines in rotating superfluid helium. *Phys. Rev. A*, 6:799–807, 1972.

- [27] J. H. Magerlein and T. M. Sanders, Jr. Digitally programmable ratio transformer bridge. *Rev. Sci. Instr.*, 46:1653–1655, 1975.
- [28] J. H. Magerlein and T. M. Sanders, Jr. Surface tension of ^4He near T_λ . *Phys. Rev. Lett.*, 36:258–261, 1976.
- [29] T. M. Sanders, Jr. and Gabriel Weinreich. Energies of external electron surface states on liquid helium. *Phys. Rev. B*, 13:4810–4814, 1976.
- [30] J. H. Magerlein and T. M. Sanders, Jr. Apparatus for high-resolution surface tension measurement. *Rev. Sci. Instr.*, 49:94–100, 1978.
- [31] S. R. Forrest and T. M. Sanders, Jr. GaAs junction field effect transistors for low-temperature environments. *Rev. Sci. Instr.*, 49:1603–1604, 1978. Reprinted in “Low Temperature Electronics”, Randall K. Kirschman, ed., IEEE Press, 1986.
- [32] S. C. Whitmore, S. R. Ryan, and T. M. Sanders, Jr. Mutual inductance bridge for low-temperature thermometry and susceptibility measurements. *Rev. Sci. Instr.*, 49:1579–1582, 1978.
- [33] T. M. Sanders, Jr. and G. G. Ihas. Nature of exotic negative carriers in superfluid ^4He . *Phys. Rev. Lett.*, 59:1722, 1987. See “Comment on ‘Nature of Exotic Carriers in Superfluid ^4He ’ ” *Phys. Rev. Lett.* **60**, 865 (1988).
- [34] T. M. Sanders, Jr. and G. G. Ihas. Reply to “Comment on ‘nature of exotic carriers in superfluid ^4He ’ ”. *Phys. Rev. Lett.*, 60:866, 1988.
- [35] T. M. Sanders, Jr., S. R. Forrest, and Gabriel Weinreich. Gross magnetic resonance in small ferromagnetic particles. *Phys. Rev. B*, 36:8629–8631, 1987.
- [36] T. M. Sanders, Jr. On the sign of the static susceptibility. *Am. J. Phys.*, 56:448–451, 1988.
- [37] T. M. Sanders, Jr. and S. R. Forrest. Small particle size distributions from mobility measurements. *J. Appl. Phys.*, 66:3317–3323, 1989.
- [38] R. K. Sears, B. G. Orr, and T. M. Sanders, Jr. A scanning tunneling microscope for undergraduate laboratories. *Computers in Physics*, 4:427–430, 1990.

- [39] T. M. Sanders, Jr. Comment on “Dynamics of the Interactions of Rotons with Quantized Vortices in Helium II”. *Phys. Rev. Lett.*, 66:241, 1991.
- [40] T. M. Sanders, Jr. Semiclassical mechanics of rotons. *Contemp. Phys.*, 42(3):151–157, May 2001.

B Book contribution

“Small Metallic Clusters” Chapter in Future Trends in Material Sciences, J. Keller, ed. Advanced Series in Surface Science, v. 2, World Scientific, 1988, pp 271–284.

C Invited papers

1. Experiments on Dynamic Polarization of Protons in Polyethylene by the Solid Effect — A Proposed Polarized Proton Target, (Invited Paper) (with C. Hwang) Proceedings of the VIIth International Conference on Low Temperature Physics, Toronto (1960).
2. Experiments on Dynamic Polarization of Protons in Polyethylene by the Solid Effect — A Proposed Polarized Proton Target (Invited Paper) (with C. Hwang) Basel Conference on Polarization Phenomena of Nucleons, *Helv. Phys. Acta*, Suppl. VI (1960), p. 122.
3. Electrons in Helium Vapor and Liquid, (Invited Paper) APS Meeting, (December 28, 1962) *Bull. Am. Phys. Soc.*
4. New Experiments on Charged Quantized Vortex Rings in He II, (Invited Paper) *Bull. Am. Phys. Soc.* **11**, (1966) p. 410.
5. Electron Bubbles in Liquid Helium, (Invited Paper) *Bull. Am. Phys. Soc.* **14**, (1969) p. 32.
6. Small Metallic Clusters, Symposium: Future Trends in Material Sciences, Mexico City, June, 1985.
7. Mechanics of Rotons, (Invited Paper) *Bull. Am. Phys. Soc.* **36**, (1991), p. 697

IV Dissertation committee chairmanships

A University of Michigan

| Student | Ph.D. year |
|---------------------|-----------------|
| Gamota, George | 1966 |
| Wang, Shou-yih | 1967 |
| Zipfel, Christie L | 1969 |
| Brody, Burton | 1970 |
| Packard, Richard E | 1970 |
| Ihas, Gary G | 1971 |
| Ryan, Stewart R | 1971 |
| Schofield, George | 1972 |
| Landee, Christopher | 1975 (co-chair) |
| Magerlein, John H | 1975 |
| Forrest, Stephen R | 1979 |
| Sears, Robert K | 1996 |
| Davis, Brian | 1998 (co-chair) |

B University of Minnesota

| | |
|---------------------|------|
| Pontinen, Richard E | 1962 |
| Levine, James L | 1964 |
| Dahm, Arnold J | 1965 |
| Northby, Jan A | 1966 |

C Teaching (recent)

| Term | Course | Title |
|------|--------|-------------------------|
| F00 | 214 | Physicists and the Bomb |
| F99 | 214 | Physicists and the Bomb |
| W98 | 214 | Physicists and the Bomb |
| W97 | 106 | Everyday Physics |
| F96 | 214 | Physicists and the Bomb |
| W96 | 214 | Physicists and the Bomb |
| F95 | 106 | Everyday Physics |
| W95 | 214 | Physicists and the Bomb |
| F94 | 160 | Honors Physics I |
| W94 | 214 | Physicists and the Bomb |

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|-----|-----|--|
| W93 | 108 | Controversial Scientific Ideas... |
| F92 | RC | Physicists and the Bomb |
| W92 | 108 | Controversial Scientific Ideas... |
| F91 | 260 | Honors Physics II |
| W91 | 108 | Controversial Scientific Ideas... |
| F89 | 406 | Thermal and Statistical Physics |
| W89 | 140 | General Physics I |
| W89 | 140 | General Physics I |
| W89 | 140 | General Physics I |
| F88 | 240 | General Physics II |
| W88 | 406 | Thermal and Statistical Physics |
| F87 | 406 | Thermal and Statistical Physics |
| W87 | 406 | Thermal and Statistical Physics |
| F86 | 406 | Thermal and Statistical Physics |
| W84 | 405 | Intermediate Electricity and Magnetism |
| W82 | 406 | Thermal and Statistical Physics |