

## CURRICULUM VITAE

### **Dale Paul Winebrenner**

**Personal:** Born 10 November 1957, Gary, Indiana, USA

**Education:** Ph.D. in Electrical Engineering, 1985, University of Washington  
M.S. in Electrical Engineering (Applied Physics), 1980, University of California, San Diego  
B.S. (with Highest Distinction) in Physics, 1979, Purdue University

#### **Positions:**

- 1994 - present Research Associate Professor, Department of Electrical Engineering, University of Washington; Seattle, Washington, USA
- 1991 - present Senior Research Scientist, Polar Science Center, Applied Physics Laboratory, University of Washington; Seattle, Washington, USA
- 1995 - 1996 Academic Visitor, Mullard Space Sciences Laboratory, University College London; London, UK
- 1986 - 1994 Research Assistant Professor, Department of Electrical Engineering, University of Washington; Seattle, Washington, USA
- 1986 - 1991 Research Scientist, Polar Science Center, Applied Physics Laboratory, University of Washington; Seattle, Washington, USA
- 1985 - 1986 Post-doctoral Fellow, Max-Planck-Institut fuer Meteorologie; Hamburg, Federal Republic of Germany
- 1980 - 1985 Research Assistant, Applied Physics Laboratory, University of Washington; Seattle, Washington, USA

#### **Honors and Awards:**

Sigma Xi  
Senior Member, Institute of Electrical and Electronics Engineers  
International Union of Radio Science Young Scientist Award, 1987  
Regents Fellow, University of California, San Diego, 1979-1980

#### **Professional Societies:**

American Physical Society  
International Glaciological Society  
American Geophysical Union  
Institute of Electrical and Electronic Engineers  
Commissions B and F, International Union of Radio Science

#### **Professional Service Committees:**

Chair, Accumulation Remote Sensing Team for the NASA Program on Arctic Regional Climate Assessment, 1998 - present

Co-Chair, Technical Program Committee, 1998 International Geoscience and Remote Sensing Symposium

Session Chair, International Geoscience and Remote Sensing Symposia, 1989, 1990, 1992, 1994, 1998

Member, Organizing Committee, 1997 Workshop on the Remote Sensing of Planetary Ices

Member, Technical Committee, 1997 International Geoscience and Remote Sensing Symposium

Member, Organizing Committee, IEEE Antennas and Propagation Society Meeting, 1994

Member, Organizing Committee, Scintillation Conference, 1992

Host, Planning Workshop for Office of Naval Research Accelerated Research Initiative on Sea Ice Electromagnetics, 1991

#### **Review Panels and Reviews:**

NASA Topographic Satellite Announcement of Opportunity Proposal Review Panel, 1994

NASA Mission to Planet Earth Review Panels, 1995 and 1996

Reviewer, proposals to the NASA Earth Science Enterprise and the NSF Office of Polar Programs, 1990 - present

Reviewer, Journal of Glaciology, IEEE Transactions on Geoscience and Remote Sensing, Radio Science, Physical Review, Journal of the Optical Society of America, Applied Optics, Journal of Geophysical Research, and others, 1985 - present

#### **Editorships and Editorial Board Memberships:**

Guest Editor, with Y. Kuga, 1998 International Geoscience and Remote Sensing Symposium special issue of the IEEE Transactions on Geoscience and Remote Sensing

Member, Editorial Board, American Geophysical Union Monograph on the Microwave Remote Sensing of Sea Ice, 1991 - 1992.

#### **Field Experience:**

Program on Regional Arctic Climate Assessment Expedition, Greenland Summit, 1998

Electromagnetic Properties of Sea Ice Experiment, Barrow, AK, 1994

Cold Regions Research and Engineering Laboratory Joint Experiments, Hanover, NH,  
1988 -1994

**Committee Chair for Students Granted Advanced Degrees:**

Ian Joughin, Ph.D., University of Washington, 1995

Eric Nelson, M.S.E.E., University of Washington, 1993

**Supervisory Committee Memberships:**

John Moe, Ph.D., University of Washington, 1996

Lisa Zurk, Ph.D., University of Washington, 1996

Lynn Sengers, Ph.D., University of Washington, 1996

Anders Carlstrom, Ph.D., Chalmers University of Technology, Gothenborg, Sweden,  
1995

Mark Wensnahan, Ph.D., University of Washington, 1995

Richard West, Ph.D., University of Washington, 1995

**Recent Invited Presentations:**

Arthern, R.J., D.L. Goldsby, E.D. Waddington, D.P. Winebrenner, and J.R. McConnell: "Firn densification: Mechanisms and grain size dependence," Fall Meeting of the American Geophysical Union, San Francisco, CA, 12-16 December 1999.

Sylvester, J., and D.P. Winebrenner: "Linear and nonlinear scattering, or layer stripping via the Hilbert transform," International Congress on Industrial and Applied Mathematics, Edinburgh, Scotland, UK, 5-9 July 1999.

Arthern, R.J., and D.P. Winebrenner: "Satellite observations of ice sheet accumulation rate," International Geoscience and Remote Sensing Symposium, Seattle, WA, 6-10 July 1998.

Wismann, V., K. Boehnke, and D.P. Winebrenner: "Comparison of snow accumulation rates derived from NSCAT and ERS scatterometer data over Greenland," International Geoscience and Remote Sensing Symposium, Seattle, WA, 6-10 July 1998.

Winebrenner, D.P., and R.J. Arthern: "Satellite observation of Antarctic ice sheet accumulation rates and comparison with regressions commonly used in ice sheet modeling," Arctic Climate System Study Conference on Polar Processes and Global Climate, Rosario, Orcas Island, WA, 3-6 November 1997.

**Peer-Reviewed Publications:**

- Winebrenner, D.P., and A. Ishimaru, Investigation of a surface field phase perturbation technique for scattering from rough surfaces, *Radio Science* **20**(2), pp. 161-170, 1985.
- Winebrenner, D.P., and A. Ishimaru, Application of the phase-perturbation technique to randomly rough surfaces, *Journal of the Optical Society of America (A)* **2**(12), pp. 2285-2294, 1985.
- Jackson, D.R., D.P. Winebrenner, and A. Ishimaru, Application of the composite Roughness model to high-frequency bottom backscattering, *Journal of the Acoustical Society of America* **79**(5), pp. 1410-1422, 1986.
- Winebrenner, D.P., and A. Ishimaru, On the far-field approximation for scattering from randomly rough surfaces, *IEEE Transactions on Antennas and Propagation* **AP-34**(6), pp. 847-849, 1986.
- Jackson, D.R., D.P. Winebrenner, and A. Ishimaru, Comparison of perturbation theories for rough-surface scattering, *Journal of the Acoustical Society of America* **83**(3), pp. 961-969, 1988.
- Winebrenner, D.P., and K. Hasselmann, Specular point scattering contribution to the mean SAR image of the ocean surface, *Journal of Geophysical Research* **93**(C8), pp. 9281-9294, 1988.
- Winebrenner, D.P., L. Tsang, and B. Wen, Sea ice characterization measurements needed for testing of microwave remote sensing models, *IEEE Journal of Oceanic Engineering* **14**(2), pp. 149-158, 1989.
- Wen, B., L. Tsang, D.P. Winebrenner, and A. Ishimaru, Dense medium radiative transfer theory: Comparison with experiment and applications to microwave remote and sensing and polarimetry, *IEEE Transactions on Geoscience and Remote Sensing* **28**(1), pp. 46-59, 1990.
- Thorsos, E.I., and D.P. Winebrenner, An examination of the 'Full-wave' method for rough surface scattering in the case of small roughness, *Journal of Geophysical Research* **96**(C9), pp. 17,107-17,121, 1991.
- Drinkwater, M.R., R. Kwok, D.P. Winebrenner, and E. Rignot, Multi-frequency polarimetric SAR observations of sea ice, *Journal of Geophysical Research* **96**(C11), pp. 20,679-20,698, 1991.
- Winebrenner, D.P., J. Bredow, M.R. Drinkwater, A.K. Fung, A.J. Gow, T.C. Grenfell, H.C. Han, J.A. Kong, J.K. Lee, S. Mudaliar, S. Nghiem, R.G. Onstott, D.K. Perovich, L. Tsang, and R.D. West, Microwave sea ice signature modeling, in *Microwave Remote Sensing of Sea Ice*, F. Carsey, ed., American Geophysical Union, 1992.
- Hallikainen, M., and D.P. Winebrenner, The physical basis for sea ice remote sensing, in *Microwave Remote Sensing of Sea Ice*, F. Carsey, ed., American Geophysical Union, 1992.
- Grenfell, T.C., D.J. Cavalieri, J.C. Comiso, M.R. Drinkwater, R.G. Onstott, I. Rubinstein, K. Steffen, and D.P. Winebrenner, Microwave signatures of new and young sea ice, in *Microwave Remote Sensing of Sea Ice*, F. Carsey, ed., American Geophysical Union, 1992.

- M.R. Drinkwater, H. Israelson, R. Kwok, R.G. Onstott, and D.P. Winebrenner, Potential applications of polarimetry to the classification of sea ice, in *Microwave Remote Sensing of Sea Ice*, F. Carsey, ed., American Geophysical Union, 1992.
- West, R., L. Tsang, and D.P. Winebrenner, Dense medium radiative transfer theory for two scattering layers with a Rayleigh distribution of particle sizes, *IEEE Transactions on Geoscience and Remote Sensing* **31**(2), pp. 426-437, 1993.
- Wensnahan, M., T.C. Grenfell, D.P. Winebrenner, and G.A. Maykut, Observations and theoretical studies of microwave emission from thin saline ice, *Journal of Geophysical Research* **98**(C5), pp. 8531-8546, 1993.
- Wensnahan, M., G.A. Maykut, T.C. Grenfell, and D.P. Winebrenner, Passive microwave remote sensing of thin sea ice using principal component analysis, *Journal of Geophysical Research* **98**(C7), pp. 12,453-12,468, 1993.
- Joughin, I.R., D.B. Percival, and D.P. Winebrenner, Maximum likelihood estimation of K distribution parameters for SAR data, *IEEE Transactions on Geoscience and Remote Sensing* **31**(5), pp. 989-999, 1993.
- Grenfell, T.C., M.R. Wensnahan, and D.P. Winebrenner, Passive microwave signatures of simulated pancake ice and young pressure ridges, *Remote Sensing Reviews* **9**, pp. 51-64, 1994.
- Joughin, I.R., D.P. Winebrenner, and D.B. Percival, Probability density functions for multi-look polarimetric signatures, *IEEE Transactions on Geoscience and Remote Sensing* **32**(3), pp. 562-574, 1994.
- Ishimaru, A., L. Ailes-Sengers, P. Phu, and D. Winebrenner, Pulse broadening and two-frequency mutual coherence function of the scattered wave from rough surfaces, *Waves in Random Media* **4**, pp. 139-148, 1994.
- Ishimaru, A., L. Ailes-Sengers, P. Phu and D. Winebrenner, Pulse broadening of enhanced backscattering from rough surfaces, *Waves in Random Media* **4**, pp. 453-465, 1994.
- Winebrenner, D.P., E.D. Nelson, R. Colony, and R.D. West, Observation of melt onset on multiyear Arctic sea ice using the ERS-1 synthetic aperture radar, *Journal of Geophysical Research* **99**(C11), pp. 22,425-22,441, 1994.
- Winebrenner, D.P., L.D. Farmer, and I.R. Joughin, On the response of polarimetric SAR signatures at 24-cm wavelength to sea ice thickness in Arctic leads, *Radio Science* **30**(2), pp. 373-402, 1995.
- Joughin, I.R., D.P. Winebrenner, and M.A. Fahnestock, Observations of ice sheet motion in Greenland using satellite radar interferometry, *Geophysical Research Letters* **22**(5), pp. 571-574, 1995.
- Zurk, L.M., L. Tsang, K.H. Ding, and D.P. Winebrenner, Monte Carlo simulations of the extinction rate of densely packed spheres with clustered and non-clustered geometries, *Journal of the Optical Society of America (A)* **12**(8), pp. 1772-1781, 1995.

- Tsang, L., D.T. Davis, R. West, Z. Chen, J.-N. Hwang, and D.P. Winebrenner, Passive microwave remote sensing of snow: volume scattering in snow and parametric inversion of snow parameters with an artificial neural network, in *Passive Microwave Remote Sensing of Land-Atmosphere Interactions*, B.J. Choudhury, Y.H. Kerr, E.G. Njoku, and P. Pampaloni, VSP, Utrecht, The Netherlands, 1995.
- West, R.D., D.P. Winebrenner, L. Tsang, and H. Rott, Microwave emission from density-stratified Antarctic firn at 6 cm wavelength, *Journal of Glaciology* **42**(140), pp. 63-76, 1996.
- Joughin, I., D. Winebrenner, M. Fahnestock, R. Kwok, and W. Krabill, Measurement of ice sheet topography using satellite radar interferometry, *Journal of Glaciology* **42**(140), pp. 10-22, 1996.
- Sylvester, J., D.P. Winebrenner and F. Glys-Colwell, Layer-Stripping for the Helmholtz equation, *SIAM Journal of Applied Mathematics* **56**(3), pp. 736-754, 1996.
- Winebrenner, D.P., B. Holt, and E.D. Nelson, Observation of Autumn freeze-up in the Beaufort Sea using the ERS-1 synthetic aperture radar, *Journal of Geophysical Research* **101**(C7), pp. 16,401-16,419, 1996.
- Zurk, L.M., L. Tsang, and D.P. Winebrenner, Scattering properties of dense media from Monte Carlo simulations with application to active remote sensing of snow, *Radio Science* **31**(4), pp. 803-819, 1996.
- Winebrenner, D.P., D.G. Long, and B. Holt, Mapping the progression of melt onset and freeze-up on Arctic sea ice using SAR and scatterometry, in *Analysis of SAR Data of the Polar Oceans*, C. Tsatsoulis and R. Kwok, eds., Springer Verlag, 1998.
- Sylvester, J., and D.P. Winebrenner, Linear and nonlinear inverse scattering, *SIAM Journal of Applied Mathematics* **59**(2), pp. 669-699, 1998.
- Golden, K.M., M. Cheney, K.-H. Ding, A.K. Fung, T.C. Grenfell, D. Isaacson, J.A. Kong, S.V. Nghiem, J. Sylvester, and D.P. Winebrenner, Forward electromagnetic models for sea ice, *IEEE Transactions on Geoscience and Remote Sensing* **36**(5), pp. 1655-1674, 1998.
- Golden, K.M., D. Borup, M. Cheney, E. Cherkaeva, M.S. Dawson, K.-H. Ding, A.K. Fung, D. Isaacson, S.A. Johnson, A.K. Jordan, J.A. Kong, R. Kwok, S.V. Nghiem, R.G. Onstott, J. Sylvester, D.P. Winebrenner, and I.H. Zabel, Inverse electromagnetic models for sea ice, *IEEE Transactions on Geoscience and Remote Sensing* **36**(5), pp. 1675-1704, 1998.
- R. Kwok, S.V. Nghiem, S. Martin, D.P. Winebrenner, A.J. Gow, D.K. Perovich, C.T. Swift, D.G. Barber, K.M. Golden, and E.J. Knapp, Laboratory measurements of sea ice: Connections to microwave remote sensing, *IEEE Transactions on Geoscience and Remote Sensing* **36**(5), pp. 1716-1730, 1998.
- Barabanenkov, Yu.N., M.Yu. Barabanenkov, and D.P. Winebrenner, Effect of pulse entrapping on diffuse reflection from a resonant random medium: Exact solution to the scalar albedo problem, *Waves in Random Media* **8**, pp. 451-463, 1998.
- Morse, D.L., E.D. Waddington, H.-P. Marshall, T.A. Neumann, E.J. Steig, J.E. Dibb, D.P. Winebrenner, and R.J. Arthern, Accumulation rate measurements at Taylor Dome,

- East Antarctica: Techniques and strategies for mass balance measurements in polar environments , *Geografiska Annaler* **81** A, pp. 683-694, 1999.
- Arthern, R.J., D.P. Winebrenner, and E.D. Waddington, Densification of water ice deposits on the residual north polar cap of Mars , *Icarus* **144**, pp. 367-381, 2000.
- Fahnestock, M.A., T.A. Scambos, C.A. Shuman, R.J. Arthern, D.P. Winebrenner, and R. Kwok,  
Snow megadune fields on the East Antarctic Plateau: extreme atmosphere-ice interaction , *Geophysical Research Letters* **27**(22), pp. 3719-3722, 2000.
- Winebrenner, D.P., R.J. Arthern, and C.A. Shuman, Mapping Greenland accumulation rates using observations of thermal emission at 4.5 cm wavelength , *Journal of Geophysical Research* 106(D24), pp. 33,919-33,934, 2001.
- Fisher, D.A., D.P. Winebrenner, and H. Stern, Measurements and modeling of the cottage cheese lineations on the north cap of Mars , submitted to *Icarus*, 2001.

**Dissertation:**

A Surface Field Phase Perturbation Method for Scattering from Rough Surfaces,  
University of Washington, 1985.