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Space Sciences Laboratory Publications and Presentations January 1–December 31, 1998

Compiled by
F.G. Summers
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June 1999

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TECHNICAL MEMORANDUM

NASA REPORTS

Special Publications

1. Models of Plumes: Their Flow, Their Geometric Spreading, and Their Mixing with Interplume Flow. ESA SP–421, "Solar Plumes & Coronal Jets," June 1, 1998. S.T. Suess (ES82).

2. Mir Glovebox Facility. NASA CP (Johnson Space Center), Proceeding of the Second Phase 1 Research Results Symposium, Mountain View, CA, March 31–April 2, 1998, pp. 1–2, 10–65. R.L. Kroes and D.A. Reiss (ES76).

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1. An Overview of Electrodynamic Tether Performance in the Jovian System. NASA/CP—1998–206900, pp. 335–344, 1998. D.L. Gallagher, F. Bagenal, J. Moore, and L. Johnson (ES83).

2. Life and Microgravity Spacelab (LMS) Final Report. NASA/CP—1998–206960, 1998. J.P. Downey (ES75).

3. Tropospheric Wind Measurement from Space: The SPARCLE Mission and Beyond. NASA/CP—1998–207671/PT2, p. 553, 1998. Proceedings of 19th International Laser Radar Conference, Annapolis, MD, July 6–10, 1998. M.J. Kavaya and G.D. Emmitt (HR20).

4. Microgravity Science Laboratory (MSL–1) Final Report. NASA/CP—1998–208868, November 1998. M.B. Robinson (ES75).

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1. Third United States Microgravity Payload: One Year Report. NASA/TM—1998–207891, April 1998. P.A. Curreri, D. McCauley, and C. Walker (ES75).

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6. Deciphering the Long-Term Trend of Atlantic Basin Intense Hurricanes: More Active Versus Less Active During the Present Epoch. NASA/TP—1998–209008, December 1998. R.M. Wilson (ES82).

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13. Global Superthermal Electron Transport in the Inner Magnetosphere. 1998 Spring Meeting of the American Geophysical Union, Boston, MA, May 26–29, 1998; *Eos, 79(17)*, 288, 1998. G.V. Khazanov and M.W. Liemohn (ES83/NRC).

14. Investigation of Magneto-Optical Effects (An). 1998 Spring Meeting of the American Geophysical Union, Boston, MA, May 26–29, 1998; *Eos, 79(17)*, 265, 1998. M.L. Adams, M.J. Hagyard, and E.A. West (ES82).

15. Laboratory Study of Micron-Size Particles in a Dusty Plasma (A). 1998 Spring Meeting of the American Geophysical Union, Boston, MA, May 26–29, 1998; *Eos, 79(17)*, 293, 1998. C.C. Venturini, J.F. Spann, Jr., and R.H. Comfort (ES83).

16. Low-Energy Electron Effects on the Polar Wind Observed by the POLAR Spacecraft. 1998 Fall Meeting of the American Geophysical Union, San Francisco, CA, December 6–10, 1998, *Eos, 79(45)*, F770, 1998; J.L. Horwitz, Y.-J. Su, E.E. Dors, T.E. Moore, B.L. Giles, M.O. Chandler, P.D. Craven, S.-W. Chang, and J. Scudder (ES83).

17. Multi-Instrument, Multi-Spacecraft Analysis of the June 20, 1996 Cusp Crossing by the Polar Spacecraft During Northward IMF Conditions. 1998 Spring Meeting of the American Geophysical Union, Boston, MA, May 26–29, 1998; *Eos, 79(17)*, 311, 1998. J.U. Kozyra, P. Song, M.O. Chandler, T.E. Moore, M.P. Wuest, C.T. Russell, and R.R. Anderson (ES83).

18. Multi-Spacecraft Observations in the Polar Cusp. 1998 Spring Meeting of the American Geophysical Union, Boston, MA, May 26–29, 1998; *Eos, 79(17)*, 307, 1998. J.S. Pickett, D.A. Gurnett, J.D. Menietti, L.A. Frank, J.D. Scudder, J.B. Sigwarth, K.L. Ackerson, B.T. Tsurutani, C.M. Ho, J. Chen, T.A. Fritz, C.T. Russell, Y. Kasahara, S. Watanabe, H. Fukunishi, W.K. Peterson, R.F. Pfaff, S. Kokubun, I. Kimura, T. Mukai, and M.O. Chandler (ES83).

19. Neutralization of Photoelectric Charging to Enable Core Plasma Measurements. 1998 Spring Meeting of the American Geophysical Union, Boston, MA, May 26–29, 1998; *Eos, 79 (17)*, 233, 1998. T.E. Moore, P.D. Craven, N. Singh, R.H. Comfort, and D. Thompson (ES83).

20. Nightside Auroral Gap: Implications for Magnetosphere-Ionosphere Coupling in the Midnight Auroral Zone (The). 1998 Fall Meeting of the American Geophysical Union, San Francisco, CA, December 6–10, 1998; *Eos 79(45)*, F761, 1998. D. Chua, M.J. Brittnacher, G.K. Parks, G.A. Germany, and J.F. Spann, Jr. (ES83).

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21. Nonlinear Kinetic Modeling of Plasmaspheric Refilling. 1998 Fall Meeting of the American Geophysical Union, San Francisco, CA, December 6–10, 1998; *Eos, 79(45)*, F768, 1998. M.W. Liemohn, G.V. Khazanov, J.U. Kozyra, and P.D. Craven (ES83).

22. Observations of the Plasmasphere With POLAR/TIDE, POLAR/TIMAS and LANL/MPS Instruments. 1998 Spring Meeting of the American Geophysical Union, Boston, MA, May 26–29, 1998; *Eos, 79(17)*, 306, 1998. P.D. Craven, T.E. Moore, M.F. Thomsen, J.E. Borovsky, W.K. Peterson, and R.H. Comfort (ES83).

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24. On the Predictability of Substorms Following Sharp Northward Turnings of the IMF. 1998 Fall Meeting of the American Geophysical Union, San Francisco, CA, December 6–10, 1998; *Eos, 79(45)*, F778, 1998. G.T. Blanchard, L.R. Lyons, and J.F. Spann, Jr. (ES83).

25. On the Total Energy Deposition Between Periodically Occurring Activations of the Aurora. 1998 Fall Meeting of the American Geophysical Union, San Francisco, CA, December 6–10, 1998; *Eos; 79(45)*, F784, 1998. J.F. Spann, Jr., G.A. Germany, G.K. Parks, M.J. Brittnacher, and R.W. Winglee (ES83).

26. Paradox of Filamented Coronal Hole Flow but Uniform High Speed Wind (The). 1998 Spring Meeting of the American Geophysical Union, Boston, MA, May 26–29, 1998; *Eos, 79(17)*, 271, 1998. S.T. Suess, S. Parhi, and R.L. Moore (ES82).

27. Polar Wind and Low-Energy Electron Variations at POLAR Apogee. 1998 Spring Meeting of the American Geophysical Union, Boston, MA, May 26–29, 1998; *Eos, 79(17)*, 318, 1998. Y.-J. Su, J.L. Horwitz, X.-Y. Wu, T.E. Moore, B.L. Giles, M.O. Chandler, P.D. Craven, S.-W. Chang, and J. Scudder (ES83).

28. Polar Wind Measurements with TIDE/PSI and HYDRA on the Polar Spacecraft. 1998 Western Pacific AGU Meeting, Taipei, Taiwan, July 17, 1998; *Eos, 79(24)*, 96, 1998. Y.-J. Su, J.L. Horwitz, T.E. Moore, B.L. Giles, M.O. Chandler, P.D. Craven, S.-W. Chang, and J. Scudder (ES83).

29. POLAR/TIDE Survey of Thermal O+ Characteristics Near 5000 km Altitude Over the Polar Cap. 1998 Fall Meeting of the American Geophysical Union, San Francisco, CA, December 6–10, 1998; *Eos, 79(45)*, F770, 1998. B.A. Stevenson, J.L. Horwitz, Y.-J. Su, H.A. Elliott, R.H. Comfort, T.E. Moore, B.L. Giles, P.D. Craven, M.O. Chandler, and C.J. Pollock (ES83).

30. Recent Results from a Laboratory Study of Charging Mechanisms in a Dusty Plasma. 1998 Fall Meeting of the American Geophysical Union, San Francisco, CA, December 6–10, 1998; *Eos, 79(45)*, F692, 1998. C.C. Venturini, J.F. Spann, Jr., and R.H. Comfort (ES83).

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31. Role of Superthermal Electrons in Potential Structure Formation (The). 1998 Spring Meeting of the American Geophysical Union, Boston, MA, May 26–29, 1998; *Eos, 79(17)*, 287 1998. M.W. Liemohn and G.V. Khazanov (ES83/NRC).

32. Scale in Remote Sensing and GIS: An Advancement in Methods Towards a "Science of Scale." Abstracts, p. A–13, AAAS Annual Meeting and Science Exposition, Philadelphia, PA, February 12-17, 1998. D.A. Quattrochi (HR20).

33. Search for Giant Convection Cells on the Sun (A). 1998 Spring Meeting of the American Geophysical Union, Boston, MA, May 26–29, 1998; *Eos, 79(17)*, 281 1998. D.H. Hathaway (ES82).

34. Search for Vector Magnetic Field Variations Associated with the M–Class Flares of 1991 June 10 in AR 6659 (A). 1998 Spring Meeting of the American Geophysical Union, Boston, MA, May 26–29, 1998; *Eos, 79(17)*, 258, 1998. M.J. Hagyard, B.A. Stark, and P. Venkatakrishnan (ES82).

35. Simultaneous Ion Convection in the Polar Magnetosphere and Ionosphere. 1998 Spring Meeting of the American Geophysical Union, Boston, MA, May 26–29, 1998; *Eos, 79(17)*, S302 1998. H.A. Elliott, R.H. Comfort, P.D. Craven, M.O. Chandler, and T.E. Moore (ES83).

36. Spacecraft Motion Effects on Current Collection in LEO Space. 1998 Spring Meeting of the American Geophysical Union, Boston, MA, May 26–29, 1998; *Eos, 79(17)*, 234, 1998. T.X. Zhang, K.S. Hwang, S.T. Wu, N.H. Stone, K.H. Wright, C.L. Chang, and A. Drobot (ES83).

37. Sun in Time (The). 1998 Fall Meeting of the American Geophysical Union, San Francisco, CA, December 6–10, 1998, *Eos, 79(45)*, F740, 1998. M.L. Adams, T.L. Sever, and E. Bero (ES82).

38. Survey of Substorm Onset Signatures Using Automated Morphology Techniques. 1998 Spring Meeting of the American Geophysical Union, Boston, MA, May 26–29, 1998; *Eos, 79(17)*, 309, 1998. G.A. Germany, H. Ranganath, W. Swift, P.G. Richards, J.F. Spann, Jr., M. Brittnacher, and G.K. Parks (ES83).

39. Survey of Warm Pancake-Shaped Ion Distributions at Geosynchronous Orbit. 1998 Spring Meeting of the American Geophysical Union, Boston, MA, May 26–29, 1998; *Eos, 79(17)*, 292, 1998. D. Ober, M.F. Thomsen, D.L. Gallagher, S.P. Gary, and D.J. McComas (ES83).

40. What the Polar Cap Tells Us About the Substorm Growth Phase. 1998 Fall Meeting of the American Geophysical Union, San Francisco, CA, December 6–10, 1998, *Eos, 79(45)*, F779–F780, 1998. M.J. Brittnacher, M.O. Fillingim, D. Chua, M. Wilber, G.K. Parks, G.A. Germany, and J.F. Spann, Jr. (ES83).

PRESENTATIONS

1. 3-D Modeling of Directional Solidification of a Non-Dilute Alloy with Temperature and Concentration Fields Coupling via Materials Properties Dependence and via Double-Diffusive Convection. Materials Research Soc. Spring Meeting, San Francisco, CA, April 13, 1998. A.V. Bune, D.C. Gillies, and S.L. Lehoczky (ES75).

2. 3-D Modeling of Double-Diffusive Convection During Directional Solidification of a Non-Dilute Alloy with Application to the HgCdTe Growth Under Microgravity Conditions. Twelfth International Conference on Crystal Growth, Jerusalem, Israel, July 27, 1998. A.V. Bune, D.C. Gillies, and S.L. Lehoczky (ES75).

3. Aerogel: A Housewarming for Future Space Missions. NASA/National Alliance of University Research Centers 1998 Conference, Huntsville, AL, February 24, 1998. D.A. Noever (ES76).

4. Application of Rotating Magnetic Fields to THM Growth Process: Te-CdTe. Twelfth International Conference on Crystal Growth, Jerusalem, Israel, July 26–31, 1998. M. LeClair, A. Worlikar, S. Motakef, and D.C. Gillies (ES75).

5. Assimilation of GOES-derived Skin Temperature Tendencies Into Mesoscale Models to Improve Forecasts of Near Surface Air Temperature and Mixing Ratio. Twelfth Conference on Numerical Weather Prediction, Phoenix, AZ, January 11–16, 1998. W.M. Lapenta, R.T. McNider, R. Suggs, G.J. Jedlovec, and F.R. Robertson (HR20).

6. Beta in Streamers. Solar Wind 9 Conference, Nantucket Island, MA, October 1, 1998. S.T. Suess, G.A. Gary, and S. Nerney (ES82).

7. Beta-Adrenergic Receptor Population is Up-Regulated in Chicken Skeletal Muscle Cells Treated with Forskolin. American Society for Gravitational and Space Biology, Houston, TX, October 26, 1998. K.Y. Bridge, R.B. Young, and J.R. Vaughn (ES76).

8. Bridgman Growth of GeSi Alloys in a Static Magnetic Field. Twelfth International Conference on Crystal Growth, Jerusalem, Israel, July 26–31, 1998. M.P. Volz, F.R. Szofran, L. Vujisic, and S. Motakef (ES75).

9. Characteristics of Dynamic Activity in the Dayside Aurora. Thirty-second COSPAR—Advances in Auroral Plasma Physics, Nagoya, Japan, July 12–19, 1998. M.J. Brittnacher, G.K. Parks, D. Chua, R. Elsen, M.O. Fillingim, G.A. Germany, and J.F. Spann, Jr. (ES83).

10. Characterizing Hyperspectral Imagery (AVIRIS) Using Fractal Techniques. AAG Annual Meeting, Boston, MA, March 25–29, 1998. H.-I. Qiu, N. S.-N. Lam, and D.A. Quattrochi (ES41).

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11. Charging of Single Micron-Sized Dust Grains: A Laboratory Study Seventh Workshop on the Physics of Dusty Plasmas, Boulder, CO, April 5–10, 1998. J.F. Spann, Jr. and C.C. Venturini (ES83).

12. CIIs During the May 98 CMEs. Rutherford Appleton Laboratory, Chilton Didcot, Oxfordshire, England, September 23, 1998. M.O. Chandler and P.D. Craven (ES83).

13. Cloud Filtering Using a Bi-Spectral Spatial Coherence Approach. Ninth Conference on Satellite Meteorology and Oceanography, Paris, France, May 23–29, 1998. A.R. Guillory, J.M. Lecue, G.J. Jedlovec, and B.N. Whitworth (HR20).

14. Commercial Production of Heavy Metal Fluoride Glass Fiber in Space. Space Technology & Applications International Forum, Albuquerque, NM, January 25–29, 1998. D.S. Tucker G.L. Workman, and G.A. Smith (ES75).

15. Comparisons Between Total Lightning Data, Mesocylone Strength, and Storm Damage Associated with the Florida Tornado Outbreak of February 23, 1998. Nineteenth Conference on Severe Local Storms, Minneapolis, MN, September 14–18, 1998. S. Hodanish, D. Sharp, E. Williams, B. Boldi, S.J. Goodman, R. Raghavan, A. Matlin, and M. Weber (HR20).

16. Computational Microbial Morphometry and NASA Astrobiology Initiatives. International Conference on Pattern Formation and Dev. Biology, Dundee, Scotland, September 20, 1998. D.A. Noever (ES76).

17. Coronal Heating by Magnetic Explosions. SOHO 7 Workshop, Northeast Harbor, ME, September 28–October 2, 1998. R.L. Moore, D.A. Falconer, J.G. Porter, and S.T. Suess (ES82).

18. Crystal Growth of ZnSe and Related Ternary Compound Semiconductors by Vapor Transport. Microgravity Materials Science Conference, Huntsville, AL, July 14–16, 1998. C.-H. Su, R.F. Brebrick, A. Burger, M. Dudley, R.J. Matyi, N. Ramachandran, Y.-G. Sha, M. Volz, and H.-D. Shih (ES75).

19. Crystal Growth of ZnSe by Physical Vapor Transport—A Modeling Study. ICCG Conference, Jerusalem, Israel, July 26–31, 1998. N. Ramachandran and C.-H. Su (ES76).

20. Crystallization of Chicken Egg White Lysozyme from Sulfate Salts. Seventh International Conference on the Crystallization of Biological Macromolecules, Granada, Spain, May 3, 1998. E.L. Forsythe and M.L. Pusey (ES76).

21. The Design and Evaluation of the Lightning Imaging Sensor Data Applications Display (LISDAD). Nineteenth Conference on Severe Local Storms, Minneapolis, MN, September 14–18, 1998. B. Boldi, S. Hodanish, D. Sharp, E. Williams, S.J. Goodman, R. Raghavan, A. Matlin, and M. Weber (HR20).

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22. Determining the Molecular Growth Mechanisms of Tetragonal Lysozyme Crystals. Seventh International Conference on the Crystallization of Biological Macromolecules, Granada, Spain, May 3, 1998. H. Li, A. Nadarajah, J.H. Konnert, and M.L. Pusey (ES76).

23. Differential Thermal Analysis of Hg(1-x)MnxTe Alloys in the X=0 to 0.3 Range. Twelfth International Conference on Crystal Growth, Jerusalem, Israel, July 26–31, 1998. M.W. Price, R.N. Scripa, F.R. Szofran, S.L. Lehoczky, and C.-H. Su (ES75).

24. Diffraction Resolution Limit and Weak Data: Mosaicity and Disorder. International Conference on the Crystallization of Biological Macromolecules (ICCBM), Granada, Spain, May 7, 1998. E.H. Snell and J.R. Helliwell (ES76).

25. Directional Solidification and Characterization of Hg0.89Mn0.11Te. Twelfth International Conference on Crystal Growth, Jerusalem, Israel, July 26–31, 1998. M.W. Price, R.N. Scripa, F.R. Szofran, S.L. Lehoczky, and C.-H. Su (ES75).

26. Directional Solidification of Mercury Cadmium Telluride in Microgravity. Tenth International Symposium on Experimental Methods for Microgravity Materials Science, 127th TMS Annual Meeting, San Antonio, TX, February 16–19, 1998. S.L. Lehoczky, D.C. Gillies, F.R. Szofran, and D.A. Watring (ES71).

27. Effect of Increased Cyclic AMP Concentration on Muscle Protein Synthesis and beta-Adrenergic Receptor Expression in Chicken Skeletal Muscle Cells in Culture. 1998 Congress on In Vitro Biology, Las Vegas, NV, May 30–June 4, 1998. R.B. Young, J.R. Vaughn, K.Y. Bridge, and C.K. Smith (ES76).

28. Effect of Percolation on the Cubic Susceptibility of Metal Nanoparticle Composites. Nonlinear Optics ’98, Princeville, Kauai, HI, August 10–14, 1998. D.D. Smith, M.W. Bender, and R.W. Boyd (ES76).

29. The Effect of Solution Conditions on the Nucleation Kinetics of Tetragonal Lysozyme Crystals. Seventh International Conference on the Crystallization of Biological Macromolecules, Granada, Spain, May 3, 1998. R.A. Judge, J.K. Baird, and M.L. Pusey (ES76).

30. The Effect of Solution Parameters on Lysozyme Nucleation Rates and Crystal Quality. The American Crystallographic Association Conference, Washington, DC, July 18–23, 1998. R.A. Judge and E.H. Snell (ES76).

31. Effects of Gravity on Crystallization of Fluorozircante Optical Fibers. Eighteenth International Congress on Glass, San Francisco, CA, July 5–10, 1998. D.S. Tucker, R.N. Scripa, B. Wang, and J.M. Rigsbee (ES75).

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32. The Effects of Ground and Space Processing on the Properties of Organic, Polymeric, and Colloidal Materials. Fall 1998 Materials Research Society Conference, Boston, MA, November 30–December 4, 1998. D.O. Frazier, M.S. Paley, B.G. Penn, H.A. Abdeldayem, W.K. Witherow, and D.D. Smith (ES01).

33. Environmental Remote Sensing: New Development and Applications. American Association for the Advancement of Science (AAAS), Philadelphia, PA, February 12–17, 1998. D.A. Quattrochi (ES41).

34. Evidence for Microfossils in Ancient Rocks and Meteorites. GSFC System Lecture, GSFC, MD, October 2, 1998. R.B. Hoover (ES82).

35. An Experimental Study of the Effects of a Rotating Magnetic Field on Electrically Conducting Aqueous Solutions. First Pan Pacific Basin Workshop on Microgravity Sciences, Tokyo, Japan, July 8–11, 1998. N. Ramachandran and K. Mazuruk (ES76).

36. Experiments on Nucleation in Different Flow Regimes. Microgravity Materials Science Conference, Huntsville, AL, July 14, 1998. R.J. Bayuzick, W.H. Hofmeister, C.M. Morton, and M.B. Robinson (ES75).

37. The Feasibility of Bulk Crystallization as an Industrial Purification and Production Technique for Proteins. Seventh International Conference on the Crystallization of Biological Macromolecules, Granada, Spain, May 3, 1998. R.A. Judge, E.L. Forsythe, M.R. Johns, M.L. Pusey, and E.T. White (ES76).

38. Fluorescence Studies of Lysozyme Nucleation. Seventh International Conference on the Crystallization of Biological Macromolecules, Granada, Spain, April 30–May 8, 1998. M.L. Pusey and L. Smith (ES76).

39. The Fundamental Gain Limitation of High-Rate Gaseous Detectors and Optimum Designs for High-Rate Applications. 1998 IEEE Nuclear Science Symposium and Medical Imaging Conference, Toronto, Canada, November 8–14, 1998. P. Fonte, V. Peskov, and B.D. Ramsey (ES84).

40. Galactic Superluminal Sources. Third Integral Workshop, Taormina, Sicily, Italy, September 13–18, 1998. B.A. Harmon (ES84).

41. Galaxy Cluster Shapes and Systematic Errors in the Hubble Constant as Determined by the Sunyaev-zel'dovich Effect. 191st American Astronomical Society Meeting, Washington, DC, January 6–10, 1998. M.E. Sulkanen, M.K. Joy, and S.K. Patel (ES84).

42. Gamma Ray Bursts—Afterglows and Counterparts. American Astronomical Society Conference, San Diego, CA, June 7–13, 1998. G.J. Fishman (ES81).

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43. The Generation of Smooth High-Speed Solar Wind from Plume-Interplume Mixing. Solar Wind 9 Conference, Nantucket, MA, October 5–9, 1998. S. Parhi, S.T. Suess, and M.E. Sulkanen (ES82).

44. Global Auroral Energy Deposition During Substorm Onset Compared with Local Time and Solar Wind IMF Conditions. 1998 Cambridge Symposium Workshop on the Physics of Space Plasmas, Lisbon, Portugal, June 22–July 3, 1998. J.F. Spann, Jr., M. Brittnacher, M.O. Fillingim, G.A. Germany, and G.K. Parks (ES83).

45. Global Imaging Mission. Huntsville 98 Meeting, Guntersville, AL, October 26–30, 1998. D. Lummerzheim, J.F. Spann, Jr., and G.K. Parks (ES83).

46. Global Observation of Substorm Growth Phase Processes in the Polar Caps. Huntsville 98 Meeting, Guntersville, AL, October 26–30, 1998. M.J. Brittnacher, M.O. Fillingim, D. Chua, G.K. Parks, G.A. Germany, and J.F. Spann, Jr. (ES83).

47. Global Plasmaspheric Issues. Geospace Environment Modeling Conference, Snowmass, CO, June 15–19, 1998. D.L. Gallagher and D.L. Carpenter (ES83).

48. Global Ultraviolet Imaging of the Aurora from Space. Yosemite Conference, Toward Solar Max 2000, Yosemite National Park, CA, February 11, 1998. M.J. Brittnacher, R. Elsen, G.K. Parks, M.O. Fillingim, D. Chua, G.A. Germany, D. Lummerzheim, and J.F. Spann, Jr. (ES83).

49. Global Ultraviolet Imaging of the Aurora From Space. Fourth International Conference on Substorms, Lake Hamana, Japan, March 9–13, 1998. M.J. Brittnacher, R. Elsen, G.K. Parks, M.O. Fillingim, D. Chua, G.A. Germany, D. Lummerzheim, and J.F. Spann, Jr. (ES83).

50. Green Fluorescent Protein as a Model for Protein Crystal Growth Studies. Seventh International Conference on the Crystallization of Biological Macromolecules, Granada, Spain, May 3, 1998. S. Agena, L. Smith, L.J. Karr, and M.L. Pusey (ES76).

51. The Growth of Protein Crystals Using McDUCK. Seventh International Conference on the Crystallization of Biological Macromolecules, Granada, Spain, May 3, 1998. F. Ewing, L.J. Wilson, A. Nadarajah, and M.L. Pusey (ES76).

52. Hard X-ray Observation of Cygnus X-1 by the Marshall Imaging X-ray Experiment (MIXE2). Thirty-second COSPAR Scientific Assembly, Nagoya, Japan, July 12–19, 1998. T. Minamitani, J.A. Apple, R.A. Austin, K.L. Dietz, J.J. Kolodziejczak, B.D. Ramsey, and M.C. Weisskopf (ES84).

53. Helicity of Photospheric Magnetic Fields in Solar Cycle 21. Chapman Conference on Magnetic Helicity, Boulder, CO, July 28, 1998. M.J. Hagyard, A.A. Pevtsov, and R.C. Canfield (ES82).

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54. Highlights of the "Catch-On to Space Science and Astronomy" (COTSA) Workshop. Southern Area Convention, Birmingham, AL, November 19–21, 1998. B.A. Harmon and M. Sahi (ES84).

55. IMAGE Mission Science. Conference, Yosemite, CA, February 9–14, 1998. D.L. Gallagher, M.-C. Fok, S. Fuselier, G.R. Gladstone, J.L. Green, S.F. Fung, J. Perez, P. Reiff, E.C. Roelof, and G. Wilson (ES83).

56. Inert Gases in Crystal Growth Systems: Their Origin, Magnitude, Composition, and Diffusion Through the Ampoule Walls. Twelfth International Conference on Crystal Growth, Jerusalem, Israel, July 26–31, 1998. W. Palosz (ES75).

57. Intercomparisons of Total Precipitable Water from Satellite and Other Long-Term Data Sets. Ninth Conference on Satellite Meteorology and Oceanography, Paris, France, May 25–29, 1998, pp, 26–29 1998. F.-C. Chang, G.J. Jedlovec, R.J. Suggs, and A.R. Guillory (HR20).

58. Ion Signatures of Reconnection. Yosemite Conference, Towards Solar Max 2000, Yosemite National Park, CA, February 9–14, 1998. M.O. Chandler, T.E. Moore, F.S. Mozer, and C.T. Russell. (ES83).

59. Large-Scale Coronal Heating, Clustering of Coronal Bright Points, and Concentration of Magnetic Flux. SOHO 7, Northeast Harbor, ME, September 23, 1998. D.H. Hathaway, R.L. Moore, J.G. Porter, and D.A. Falconer (ES82).

60. Locations of Halide Ions in Tetragonal Lysozyme Crystals. Seventh International Conference on the Crystallization of Biological Macromolecules, Granada, Spain, May 3, 1998. K. Lim, G. Adimurthy, A. Nadarajah, E.L. Forsythe, and M.L. Pusey (ES76).

61. Long-Term Variability and Transient Behavior of Some Galactic Hard X-ray Sources as Observed with BATSE. Third INTEGRAL Workshop, Taormina, Italy, September 16, 1998. G.J. Fishman (ES81).

62. Magnetic Damping of Solid Solution Semiconductor Alloys. Microgravity Materials Science Conference, Huntsville, AL, July 15, 1998. F.R. Szofran, K.W. Benz, A. Croll, P. Dold, S.D. Cobb, M.P. Volz, and S. Motakef (ES75).

63. Magnetic Field Effects on Convective Fluid Flow in a Vertical Bridgman System. Alabama Materials Research Conference, Birmingham, AL, September 8, 1998. J.C. Wang, S.L. Lehoczky, and D.A. Watring (ES71).

64. The Magnetic Roots of Enhanced Coronal Heating. Meeting on Solar Jets and Polar Plumes, Pointe a Pitre, Guadelope, France, February 23–27, 1998. J.G. Porter (ES82).

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65. Magnetospheric Response to the Arrival of the Shock Wave in Front of the Magnetic Cloud Event of January 10, 1997. COSPAR 32nd Scientific Assembly, Nagoya, Japan, July 12–19, 1998. M. Wuest, M. Huddleston, J.L. Burch, D.L. Dempsey, P.D. Craven, M.O. Chandler, J.F. Spann, Jr., W.K. Peterson, H.L. Collin, and W. Lennartsson (ES83).

66. The Marshall Automated Wind Algorithm for Geostationary Satellite Wind Applications. Ninth Conference on Satellite Meteorology and Oceanography, Paris, France, May 25, 1998. R.J. Atkinson and G.J. Jedlovec (HR20).

67. Mechanics of Granular Materials (MGM) Microgravity Experiment. Third Phase 1 Research Program Results Symposium, Huntsville, AL, November 5, 1998. K.A. Alshibli and S. Sture (ES71).

68. Mesogranulation as a Distinct Scale of Convection in the Sun. Amer. Astron. Soc. Meeting, Washington, DC, January 6, 1998. K.T. Bachmann, D.H. Hathaway, G. Khatri, and J.M. Petitto (ES82).

69. Microgravity Glovebox Program: Pioneering Partnerships in the Development of Space Glovebox Technology. Defense and Civil Space Programs Conference and Exhibit, Huntsville, AL, October 28–30, 1998. R.P. Chassay, D.W. Jex, D.A. Reiss, B.Q. Musick, D. Collins, and R.C. Darty (HR20).

70. Microgravity Materials and Biotechnology Experiments. Project Re-entry Workshop at UCLA, Los Angeles, CA, March 18–20, 1998. M. Vlasse (ES76).

71. Microstructural Development of Directionally Solidified HgZnSe Alloys. 1998 U.S. Workshop on the Physics and Chemistry of II–VI Materials, Charleston, SC, October 20–22, 1998. S.D. Cobb, S.L. Lehoczky, F.R. Szofran, and K.S. Jones (ES75).

72. *Mir* Glovebox Facility. Proceedings of the Research Program Results Symposium, San Jose, CA, April 1, 1998. R.L. Kroes and D.A. Reiss (ES76).

73. Modeling Electric Field Influences on Plasmaspheric Refilling. Sixth Huntsville Modeling Workshop/Guntersville, AL, October 26, 1998. M.W. Liemohn, J.U. Kozyra, G.V. Khazanov, and P.D. Craven (ES83).

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