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Science Directorate Publications and Presentations, January 1–December 31, 2002

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F.G. Summers
Marshall Space Flight Center, Marshall Space Flight Center, Alabama

July 2003

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44. Cross Scale Coupling of Alfvén Turbulence in the Polar Wind Region, European Geophysical Society General Assembly, Nice, France, April 21–26, 2002. G.V. Khazanov.

PRESENTATIONS (Continued)

45. Crystal Growth of ZnSe and Related Ternary Compound Semiconductors by Vapor Transport, Microgravity Materials Science Conference, Huntsville, AL, June 25–26, 2002. C.-H. Su, R.F. Brebrick, A. Burger, M. Dudley, and N. Ramachandran.

46. Current-Produced Magnetic Field Effects on Current Collection, Space Technology and Applications International Forum, Albuquerque, NM, February 3–6, 2002. G.V. Khazanov and N.H. Stone.

47. Decades of Data: Extracting Trends from Microgravity Crystallization History, 223rd American Chemical Society Meeting, Orlando, FL, April 7–11, 2002. R.A. Judge, E.H. Snell, R. Kephart, and M. van der Woerd.

48. Detached Bridgman Growth of Germanium and Germanium-Silicon Alloy Crystals, Fourteenth American Conference on Crystal Growth and Epitaxy, Seattle, WA, August 4–11, 2002. F.R. Szofran, M.P. Volz, M. Schweizer, S.D. Cobb, S. Motakef, A. Croell, and P. Dold.

49. The Detached Bridgman Process: Application for the Growth of Low-Defect Germanium Crystals, Annual Meeting of the German Society for Crystal Growth, Idar-Oberstein, Germany, March 20, 2002. M. Schweizer, M.P. Volz, S.D. Cobb, A. Croell, P. Dold, and F.R. Szofran.

50. Detection of High Energy Cosmic Rays with Advanced Thin Ionization Calorimeter (ATIC), Coral Gables Conference on High Energy Physics and Cosmology, Fort Lauderdale, FL, December 11–15, 2002. J.H. Adams, Jr., E.J. Ahn, G. Bashindzhagyan, G. Case, J. Chang, M. Christl, et al.

51. The Development of Hard-X-Ray Optics at MSFC, SPIE Astronomical Telescopes and Instrumentation Conference, Waikoloa, HI, August 22–28, 2002. B.D. Ramsey, R.F. Elsner, D.E. Engelhaupt, J.J. Kolodziejczak, S.L. O'Dell, C.O. Speegle, and M.C. Weisskopf.

52. Development of High Resolution Mirrors and Cd-Zn-Te Detectors for Hard X-Ray Astronomy, Optical Society of America Conference on Optics in the Southeast, Huntsville, AL, October 24–25, 2002. B.D. Ramsey, C.O. Speegle, J.A. Gaskin, D.P. Sharma, and D. Engelhaupt.

53. Developments in Hollow Graphite Fiber Technology, Second Annual Technology Days, Huntsville, AL, May 22–24, 2002. M. Stallcup.

54. Developments in Ultra Lightweight Membrane Optical Elements, Second Annual Technology Days, Huntsville, AL, May 22–24, 2002. B. Patrick and J.D. Moore.

55. Diurnal Cycle of Convection in the East Pacific ITCZ During EPIC–2001, American Meteorological Society 25th Conference on Hurricanes and Tropical Meteorology, San Diego, CA, April 29–May 3, 2002. D.J. Boccippio, W.A. Petersen, R. Cifelli, and S.A. Rutledge.

PRESENTATIONS (Continued)

56. Earth Occultation Techniques, International Advanced School Leonardo da Vinci Summer Course on Space Science, Bologna, Italy, July 1–12, 2002. C.A. Wilson.

57. Effect of Residual Accelerations on the Crystal Growth of II-VI Semiconductors in Low-Earth Orbit, Fourteenth American Conference on Crystal Growth and Epitaxy, Seattle, WA, August 4–8, 2002. D.C. Gillies, C.-H. Su, F.R. Szofran, R. Scripa, S.D. Cobb, and S.L. Lehoczky.

58. Effect of the Chemical State of the Surface on the Relaxation of the Surface Shell Atoms in SiC and GaN Nanocrystals, XIX Congress of International Union of Crystallography, Geneva, Switzerland, August 6–15, 2002. B. Palosz, E. Grzanka, S. Gierlotka, S. Stel'makh, R. Pielaszek, U. Bismayer, H.-P. Weber, J.F. Janik, and W. Palosz.

59. Effective Gravitational Temperature in Sedimentation of Spheres, Physics Colloquium, Brown University, Providence, RI, March 5, 2002. P.N. Segre.

60. Effects of Two-Pulse Sequencing on Characteristics of Elementary Propellants for Ablative Laser Propulsion, First International Symposium on Beamed Energy Propulsion, Huntsville, AL, November 5–7, 2002. M.S. Thompson, A.V. Pakhomov, and K.A. Herren.

61. Energy Dispersive Spectrometry and Quantitative Analysis, Introduction to X-Ray Energy Dispersive Spectrometry and Quantitative Analysis—Short Course, Quebec, Canada, August 4, 2002. P.K. Carpenter.

62. Equilibrium Kinetics Studies and Crystallization Aboard the *International Space Station (ISS)* Using the Protein Crystallization Apparatus for Microgravity (PCAM), American Crystallographic Association Annual Meeting, San Antonio, TX, May 25–30, 2002. A. Achari, D.F. Roeber, C.L. Barnes, and C.E. Kundrot.

63. Evolution of Local Microstructures (ELMS): Spatial Correlations in Coarsening Clusters, Microgravity Materials Science Conference, Huntsville, AL, June 25–26, 2002. J.R. Rogers, D.O. Frazier, M. Glicksman, W.K. Witherow, B. Facemire, R. Inguva, K. Wang, and T. Allen.

64. EXIST: The Next Large GRB Observatory, Rome Gamma-Ray Burst Conference, Rome, Italy, September 17–22, 2002. G.J. Fishman.

65. Experiments and Modeling of G-Jitter Fluid Mechanics, 40th AIAA Aerospace Sciences Meeting & Exhibit, Reno, NV, January 14–17, 2002. N. Ramachandran and F.W. Leslie.

66. Extreme Lightning Flash Rates as an Early Indicator of Severe Storms, 2002 AAAS Annual Meeting and Science Innovation Exposition, Boston, MA, February 14–19, 2002. S.J. Goodman.

PRESENTATIONS (Continued)

67. Fabrication and Characterization of Tilted Fiber-Optic Bragg Gratings Filters Over Various Wavelengths, 2002 OSA Annual Meeting and Exhibit/LS-XVIII, Orlando, FL, September 29–October 3, 2002. J. Grant, K.V. Jackson, Y. Wang, and A. Sharma.

68. Fabrication of Fiber-Optic Tilted Bragg Gratings Filter in 40 nm Range with a Single Phase Mask, SPIE's 5th International Conference on Applications of Photonic Technology, Quebec, Canada, June 2–6, 2002. J. Grant, Y. Wang, and A. Sharma.

69. Fabry-Perot Interferometer-Based Electro-Optic Modulator Using $LiNbO_3$ and Organic Thin Films, 5th International Conference on Applications of Photonic Technology, Quebec City, Quebec, Canada, June 2–6, 2002. C.E. Banks, D.O. Frazier, B.G. Penn, H.A. Abdeldayem, A. Sharma, C. Yelleswarapu, A. Leyderman, and M. Correa.

70. Finding the Cold Needle in a Warm Haystack: Infrared Imaging Applied to Locating Cryocooled Crystals in Loops, Automation for High Throughput Structure Determination Workshop, Lawrence Berkeley National Laboratory, Berkeley, CA, December 6–8, 2002. E.H. Snell and M.J. van der Woerd.

71. First Commercial Operations on the *International Space Station*, 40th AIAA Aerospace Sciences Meeting & Exhibit, Reno, NV, January 14–17, 2002. M.E. Nall and R.K. Robinson.

72. First Materials Science Research Facility Rack Capabilities and Design Features, The World Space Congress, Houston, TX, October 10–19, 2002. S.D. Cobb, D. Higgins, and L. Kitchens.

73. Flight Planning for the *International Space Station*—Levitation Observation of Dendrite Evolution in Steel Ternary Alloy Rapid Solidification, Microgravity Materials Science Conference, Huntsville, AL, June 25–26, 2002. M.C. Flemings, D.M. Matson, W. Loser, R.W. Hyers, and J.R. Rogers.

74. Flow in Streamer Boundaries and Streamer Stability, 34th COSPAR Scientific Assembly/ The World Space Congress, Houston, TX, October 10–19, 2002. S.T. Suess and S. Nerney.

75. The Focal Surface of EUSO Telescope, SPIE Astronomical Telescopes and Instrumentation Conference, Waikoloa, HI, August 22–28, 2002. H. Shimizu, Y. Kawasaki, Y. Takizawa, N. Sakaki, M. Teshima, T. Ebisuzaki, Y. Takahashi, J.H. Adams, Jr., O. Catalano, L. Scarisi, A. Petrolini, P. Nedelec, and P. Gorodetzky.

76. Forecasting Coronal Mass Ejections From Vector Magnetograms, NASA's Living with a Star Science Workshop, Laurel, MD, November 13–15, 2002. R.L. Moore, G.A. Gary, D.A. Falconer, and M.J. Hagyard.

77. Gamma-Ray Bursts, 91st Spring Meeting of the AAVSO and the 2nd High-Energy Astrophysics Workshop for Amateur Astronomers, Waikoloa Beach, HI, June 30–July 6, 2002. C.A. Meegan.

PRESENTATIONS (Continued)

78. Gamma-Ray Burst Observations with BATSE, 34th COSPAR Scientific Assembly/The World Space Congress, Houston, TX, October 10–19, 2002. G.J. Fishman and M.S. Briggs.

79. Global Plasmaspheric Imaging—A New "Light" Focusing on Familiar Questions, UAH Physics Department Seminar, Huntsville, AL, January 22, 2002. M.L. Adrian.

80. Goodrich Electro-Optical Systems AMSD Progress Update and Test Plans, Second Annual Technology Days, Huntsville, AL, May 22–24, 2002. E. Garcia and M. Furber.

81. Ground-Based Research Within NASA's Materials Science Program, The World Space Congress, Houston, TX, October 10–19, 2002. D.C. Gillies.

82. High Spatial Resolution Thermal Remote Sensing of the Urban Heat Island Effect: Assessment of Risks to Human Health and Development of Mitigation Strategies for Sustainable Cities, North American Urban Heat Island Summit, Toronto, Ontario, Canada, May 1–4, 2002. D.A. Quattrochi, J.C. Luvall, D.L. Rickman, M.G. Estes, C.A. Laymon, W.L. Crosson, B.F. Howell, and N. Gillani.

83. Highlights From Three Years of the Chandra X-Ray Observatory, Meeting of the Southeast Section of the American Physical Society, Auburn, AL, October 31–November 2, 2002. M.C. Weisskopf.

84. IMAGE EUV and RPI Derived Distributions of Plasmaspheric Plasma and Plasmaspheric Modeling, Magnetospheric Imaging Workshop, Yosemite National Park, CA, February 5–8, 2002. D.L. Gallagher, D. Ober, and M.L. Adrian.

85. The Impact of Trust on Organization Commitment, 23rd Annual Conference of the American Society for Engineering Management, Tampa, FL, October 2–5, 2002. K.F. Robinson.

86. Improving the Representation of Snow Hydrology in Global and Regional Climate Models, 59th Annual Meeting of the Eastern Snow Conference, Stowe, VT, June 5–7, 2002. S. Marshall and R. Oglesby.

87. Initiation of Coronal Mass Ejections by Tether-Cutting Reconnection, SHINE 2002 Summer Workshop, Banff, Alberta, Canada, August 18–22, 2002. R.L. Moore, A.C. Sterling, and D.A. Falconer.

88. Inter-Comparison of CHARM Data and WSR–88D Storm Integrated Rainfall, American Meteorological Society Annual Meeting, 16th Conference on Hydrology, Orlando, FL, January 13–18, 2002. G.J. Jedlovec, P.J. Meyer, A.R. Guillory, K. Stellman, and A. Limaye.

89. An Introduction to High-Energy Astrophysics: Detectors, Techniques and Missions, 2nd High-Energy Astrophysics Workshop for Amateur Astronomers, Waikoloa Beach, HI, June 30–July 6, 2002. G.J. Fishman.

PRESENTATIONS (Continued)

90. Investigation of Structural Properties of Carbon-Epoxy Composites Using Fiber-Bragg Gratings, 5th International Conference on Application of Photonic Technology, Quebec, Quebec City, Canada, June 2–6, 2002. J. Grant, R. Kaul, S. Taylor, K. Jackson, and A. Sharma.

91. Irradiated HMEC from A–T Heterozygous Breast Tissue, Era of Hope Department of Defense Breast Cancer Research Program Meeting, Orlando, FL, September 25–28, 2002. R.C. Richmond, K. Bors, A. Cruz, and O. Pettengil.

92. Issues in Informal Education: Event-Based Science Communication Involving Planetaria and the Internet, 114th Annual Meeting of the Astronomical Society of the Pacific, September 28–29, 2002. M.L. Adams, D.L. Gallagher, and A. Whitt.

93. Kinetic Studies of Human Pyruvate Dehydrogenase and Its Mutants: Interactions with TPP, International Conference on Thiamin, Its Biochemistry and Structural Biology, Newark, NJ, May 18–21, 2002. M. Patel, L. Korotchkina, E. Ciszak, S. Jacobia, and P. Dominiak.

94. Kodak AMSD Cryogenic Test Plans, Second Annual Technology Days, Huntsville, AL, May 22–24, 2002. G. Matthews, J. Hannon, and D. Barrett.

95. Kodak AMSD Mirror Development Program, Second Annual Technology Days, Huntsville, AL, May 22–24, 2002. G. Matthews, R. Dahl, D. Barrett, and J. Bolton.

96. Laboratory Studies of the Optical Properties and Condensation Processes of Cosmic Dust Particles, NASA Laboratory Astrophysics Workshop, San Jose, CA, May 1–3, 2002. M.M. Abbas, P.D. Craven, J.F. Spann, Jr., and D. Tankosic.

97. Land Surface Data Assimilation and the Gulf Coast Sea Breeze, American Meteorological Society Meeting, Orlando, FL, January 13–17, 2002. W.M. Lapenta, K. Blackwell, R.J. Suggs, R.T. McNider, and G.J. Jedlovec.

98. Land Surface Data Assimilation and the Northern Gulf Coast Land/Sea Breeze, American Meteorological Society's Symposium on Observations, Data Assimilation, and Probabilistic Prediction, Orlando, FL, January 13–17, 2002. W.M. Lapenta, K. Blackwell, R.J. Suggs, R.T. McNider, G.J. Jedlovec, and S. Kimball.

99. Large-Scale Flows Through the Solar Cycle, Local and Global Helioseismology: The Present and Future, Big Bear Lake, CA, October 27–November 2, 2002. D.H. Hathaway.

100. Leica Absolute Distance Meter, Second Annual Technology Days, Huntsville, AL, May 22–24, 2002. J.B. Hadaway and R. Eng.

PRESENTATIONS (Continued)

101. The Living With a Star Geospace Investigations, 4th Oersted International Workshop, Copenhagen, Denmark, September 23–27, 2002. J.F. Spann, Jr. and P.M. Kintner.

102. Low-Energy Calibration for Multi-Spacecraft Missions. International Space Science Institute Workshop on "Calibration Techniques for In Situ Plasma Instrumentation," Bern, Switzerland, September 30–October 4, 2002. V.N. Coffey.

103. Low-Temperature Deformable Mirror Technology, Large, Low-Temperature Silicon Carbide Mirrors, Second Annual Technology Days, Huntsville, AL, May 22–24, 2002. R. Bagwell, M.L. Mulvhill, and M. Ealey.

104. Macromolecular Crystal Growth by Means of Microfluidics, XIX Congress of the International Union of Crystallography, Geneva, Switzerland, August 6–15, 2002. M. van der Woerd, D.S. Ferree, S. Spearing, L. Monaco, J. Molho, M. Spaid, and M.M. Brasseur.

105. Magnetic Microspheres for Therapeutical Applications, SPIE Conference on Crystal Materials for Nonlinear Optical Devices and Microgravity Science, Seattle, WA, July 8–9, 2002. K. Mazuruk and N. Ramachandran.

106. Magnetic TRAnsition Region Probe (MTRAP), NASA's Living with a Star Science Workshop, Laurel, MD, November 13–15, 2002. R.L. Moore, J.M. Davis, and D.H. Hathaway.

107. Managing Radiation Degradation of CCDs on the Chandra X-Ray Observatory, SPIE Astronomical Telescopes and Instrumentation Conference, Waikoloa, HI, August 22–28, 2002. S.L. O'Dell, W.C. Blackwell, J.I. Minow, R.A. Cameron, D.C. Morris, and S.N. Virani.

108. Managing Risk on a Technology Development Project/Advanced Mirror System Demonstrator, Fourth National Symposium on Space System Risk Management, McLean, VA, May 21–24, 2002. A. Byberg and J.K. Russell.

109. Mapping the Ancient Maya Landscape From Space, NASA Remote Sensing and Archaeology Conference, Strasbourg, France, November 4, 2002. T.L. Sever.

110. Materials Properties Research at MSFC, Second Annual Technology Days, Huntsville, AL, May 22–24, 2002. J.B. Presson.

111. Materials Science Research in the Microgravity Department of the Marshall Space Flight Center, Seminar at the Kiwanis Club, Huntsville, AL, December 5, 2002. J.R. Rogers.

112. Maximizing Macromolecule Crystal Size for Neutrol Diffraction Experiments, XIX Congress of the International Union of Crystallography, Geneva, Switzerland, August 6–15, 2002. R.A. Judge, R. Kephart, R. Leardi, D.A. Myles, E.H. Snell, and M. van der Woerd.

PRESENTATIONS (Continued)

113. Mechanisms for the Dissipation of Alfvén Waves in Near-Earth Space Plasma, 2002 Western Pacific Geophysics Meeting, Wellington, New Zealand, July 9–12, 2002. N. Singh, G.V. Khazanov, and E.N. Krivorutsky.

114. Microfossils in the Murchison and Rainbow Carbonaceous Meteorites, Proceedings of SPIE Astronautical Telescopes and Instruments Conference, Waikoloa, HI, August 22–28, 2002. R.B. Hoover, A.Y. Rozanov, G. Jerman, and P.C. Davies.

115. Micro-Meteoroids Effects on Glass and Beryllium Optics, Second Annual Technology Days, Huntsville, AL, May 22–24, 2002. L.M. Cohen.

116. Mie Scattering by Concentric Multilayers, Conference on Lasers and Electro-Optics/Quantum Electronics and Laser Science Conference, Long Beach, CA, May 19–24, 2002. D.D. Smith and K.A. Fuller.

117. The Most Extreme Thunderstorms on Earth, 17th International Lightning Detection Conference, Tucson, AZ, October 16–18, 2002, CD–ROM. S.J. Goodman and D.J. Cecil.

118. MSFC ESL Facility and Beamline Studies, Microgravity Materials Science Conference, Huntsville, AL, June 25–26, 2002. J.R. Rogers, R.W. Hyers, T.J. Rathz, M.B. Robinson, K.F. Kelton, A.K. Gangopadhyay, G.L. Woo, G. Fountain, D. Huie, T. Allen, D.J. Schult, and P.M. Doty.

119. MSFC Test Results for Selected Mirrors: Brush-Wellman/Goodrich 0.5-Meter Joined-Beryllium Mirror, IABG 0.5-Meter C/SiC Mirror, Xinetics 0.5-Meter SiC Mirror, Kodak 0.23-Meter SiO_2 Mirror, Second Annual Technology Days, Huntsville, AL, May 22–24, 2002. J.B. Hadaway, L. Blackwell, G. Matthews, R. Eng, H.P. Stahl, J. Hraba, and G. Thornton.

120. MSFC/Ball Space-Act Test Results of SBMD, Second Annual Technology Days, Huntsville, AL, May 22–24, 2002. J.B. Hadaway, B. Brown, R. Eng, and H.P. Stahl.

121. MSFC/UAH Full Aperture Cryo-Figure AMSD Modal Characterization, Second Annual Technology Days, Huntsville, AL, May 22–24, 2002. T. Rogers, J.M. Geary, and H.P. Stahl.

122. The NASA Thunderstorm Observations and Research (ThOR) Mission: Lightning Mapping from Space to Improve the Short-Term Forecasting of Severe Storms, 2002 NWA Annual Meeting, Fort Worth, TX, October 21–25, 2002. S.J. Goodman, H.J. Christian, D.J. Boccippio, W.J. Koshak, and D. Cecil.

123. NASA Marshall Space Flight Center's Contributions to Space Plasma Physics, Meeting of the Southeast Section of the American Physical Society, Auburn, AL, October 31–November 2, 2002. M.L. Adrian.

PRESENTATIONS (Continued)

124. NASA/MSFC/NSSTC Communication Roundtable, *Astronomical Society of the Pacific Conference Proceedings Series*, 2002. M.L. Adams, D.L. Gallagher, and R.J. Koczor.

125. NASA's Commercial Space Centers: Bringing Together Government and Industry for "Out of this World" Benefits, Institute of Electrical and Electronics Engineering Aerospace Conference, Big Sky, MT, March 9–16, 2002. R.K. Robinson.

126. Neutron Stars and Pulsar: Three Years of Chandra Operations, 34th COSPAR Scientific Assembly/ The World Space Congress, Houston, TX, October 10–19, 2002. M.C. Weisskopf.

127. New and Improved Integrated Optical Design Analysis (IODA) Software Features, Second Annual Technology Days, Huntsville, AL, May 22–24, 2002. J.D. Moore and E. Troy.

128. New Cryogenic Optical Test Capability at Marshall Space Flight Center's Space Optics Manufacturing Technology Center, Second Annual Technology Days, Huntsville, AL, May 22–24, 2002. J. Kegley.

129. New Cryogenic Optical Test Capability at Marshall Space Flight Center's Space Optics Manufacturing Technology Center, SPIE Astronomical Telescopes and Instrumentation Conference, Waikoloa, HI, August 22–28, 2002. J. Kegley.

130. A New Direction for the NASA Materials Science Research Using the *International Space Station*, *ISS* Utilization—The Microgravity Environment/The World Space Congress, Houston, TX, October 10–19, 2002. R.A. Schlagheck.

131. Nine Years of Observations of Hard X-Rays From Relativistic Jet Objects with BATSE, Fourth Microquasar Workshop, Corsica, France, May 27–June 1, 2002. M.L. McCollough, B.A. Harmon, and G.J. Fishman.

132. A Novel Method for Electroplating Ultra-High-Strength Glassy Metals, Second Annual NASA Advanced Materials Symposium, Cleveland, OH, May 29–31, 2002. B.D. Ramsey and D. Engelhaupt.

133. Nucleation and Growth According to Lysozyme, 9th International Conference on the Crystallization of Biological Macromolecules, Jena, Germany, March 23–38, 2002. M.L. Pusey.

134. On Determination of 3D Morphology and Plasma Properties of the Solar Corona, First STEREO Conference, Paris, France, March 18–20, 2002. G.A. Gary, J.M. Davis, and R.L. Moore.

135. Optics for Extreme Universe Space Observatory, OSA Conference on Optics in the Southeast, Huntsville, AL, October 24–25, 2002. R. Young and Y. Takahashi.

PRESENTATIONS (Continued)

136. Origin of the Bandgap Bowing in $ZnSe_{1-x}Te_x$ Alloys, March Meeting of the American Physical Society, Indianapolis, IN, March 18–20, 2002. W. Walukiewicz, J. Wu, K. Yu, J.W. Ager, E.E. Haller, I. Miotkowski, A. Ramdas, and C.-H. Su.

137. Overview of MSFC AMSD Integrated Modeling and Analysis, Second Annual Technology Days, Huntsville, AL, May 22–24, 2002. R. Cummings.

138. Overview of the Fourth Convection and Moisture Experiment (CAMEX–4), American Meteorological Society 25th Conference on Hurricanes and Tropical Meteorology, San Diego, CA, April 29–May 3, 2002. R.E. Hood, R. Kakar, E. Zipser, T.N. Krishnamurti, and F. Marks.

139. Partial Wave Analysis of Coupled Photonic Structures, OSA Conference on Optics in the Southeast, Huntsville, AL, October 24–25, 2002. K.A. Fuller and D.D. Smith.

140. Photoluminescence of CdTe Crystals Grown by "Contactless" PVT Method, International Symposium on Optical Science and Technology, SPIE's 47th Annual Meeting, Seattle, WA, July 7–11, 2002. W. Palosz, K. Grasza, P.R. Boyd, Y. Cui, G. Wright, U.N. Roy, and A. Burger.

141. Photoluminescence of CdTe Crystals Grown by Physical Vapor Transport, U.S. Workshop on the Physics and Chemistry of II–VI Materials, San Diego, CA, November 13–15, 2002. W. Palosz, K. Grasza, P.R. Boyd, Y. Cui, G. Wright, U.N. Roy, and A. Burger.

142. Photonic Bandgaps in Photonic Molecules, OSA Conference on Optics in the Southeast, Huntsville, AL, October 24–25, 2002. D.D. Smith, H. Chang, A.L. Gates, K.A. Fuller, D.A. Gregory, W.K. Witherow, M.S. Paley, and D.O. Frazier.

143. Plasmasphere Empirical Modeling with the IMAGE Mission, XXVIIth General Assembly of the International Union of Radio Science, Maastricht, the Netherlands, August 17–24, 2002. D.L. Gallagher, M.L. Adrian, S.F. Fung, J.L. Green, and B.R. Sandel.

144. Plasmaspheric Density Troughs: Global IMAGE EUV Observations and Analysis via Global Core Plasma Modeling, Magnetospheric Imaging Workshop, Yosemite National Park, CA, February 5–8, 2002. M.L. Adrian, D.L. Gallagher, J.L. Green, and B.R. Sandel.

145. Pore Formation and Mobility (PFMI)—An *International Space Station* Glovebox Investigation, Microgravity Materials Science Conference, Huntsville, AL, June 25–26, 2002. R.N. Grugel, A. Anilkumar, L. Jeter, P. Luz, M.P. Volz, R. Spivey, and G.A. Smith.

146. Predicting Print-Thru for the Sub-Scale Beryllium Mirror Demonstrator (SBMD), Second Annual Technology Days, Huntsville, AL, May 22–24, 2002. L. Craig.

PRESENTATIONS (Continued)

147. Primary Mirror Figure Maintenance of the Hobby-Eberly Telescope Using the Segment Alignment Maintenance System, SPIE Astronomical Telescopes and Instrumentation Conference, Waikoloa, HI, August 22–28, 2002. J. Rakoczy, D. Hall, R. Howard, W. Ly, J. Weir, and E.E. Montgomery.

148. Production of Ultra-Light Normal Incidence Mirrors. SPIE Astronomical Telescopes and Instrumentation Conference, Waikoloa, HI, August 22–28, 2002. R. Jones, J. Muntele, C. Muntele, R.L. Zimmerman, and D. Ila.

149. Progress Report on The University of Arizona NMSD, Second Annual Technology Days, Huntsville, AL, May 22–24, 2002. D. Baiocchi, J. Burge, and B. Cuerden.

150. The Propagation and Formation of Electron Holes, Geospace Environment Modeling Workshop, Telluride, CO, June 23–28, 2002. V.N. Coffey.

151. A Proposed Model for Protein Crystal Nucleation and Growth, Seminar, The University of Alabama in Huntsville, Huntsville, AL, August 30, 2002. M.L. Pusey.

152. A Proposed Pathway for the Nucleation and Crystal Growth of the Tetragonal Form of Lysozyme, 46th Biophysical Society Annual Meeting, San Francisco, CA, February 23–27, 2002. M.L. Pusey.

153. Protein Crystal Growth With the Aid of Microfluids, Materials and Crystal Growth Seminar, Marshall Space Flight Center, AL, December 16, 2002. M. van der Woerd.

154. QMI: Rising to the Space Station Design Challenge, *ISS* Utilization Conference/The World Space Congress, Houston, TX, October 10–19, 2002. W.E. Carswell, J. Farmer, C. Coppens, S. Breeding, and F. Rose.

155. Radiation Effect on Human Tissue, 40th AIAA Aerospace Sciences Meeting & Exhibit, Reno, NV, January 14–17, 2002. R.C. Richmond, A. Cruz, and K. Bors.

156. Radius of Curvature Measurements: An Independent Look at Accuracy Using Novel Optical Metrology, Second Annual Technology Days, Huntsville, AL, May 22–24, 2002. B. Taylor and M. Kahan.

157. Radius of Curvature of Off-Axis Paraboloids, Second Annual Technology Days, Huntsville, AL, May 22–24, 2002. B. Robinson, P. Reardon, J.B. Hadaway, and J.M. Geary.

158. Rapid Maturation of Edge Sensor Technology and Potential Application in Large Space Telescopes with Segmented Primary Mirrors, SPIE Astronomical Telescopes and Instrumentation Conference, Waikoloa, HI, August 22–28, 2002. E.E. Montgomery IV.

PRESENTATIONS (Continued)

159. Raytracing for Multi-Spacecraft Missions, International Space Science Institute Workshop on "Calibration Techniques for In Situ Plasma Instrumentation," Bern, Switzerland, September 30–October 4, 2002. V.N. Coffey.

160. Reducing the Requirements and Cost of Astronomical Telescopes, SPIE Astronomical Telescopes and Instrumentation Conference, Waikoloa, HI, August 22–28, 2002. W.S. Smith.

161. A Regional Monitoring and Visualization System for Decision Support and Disaster Management Applications for the Mesoamerican Biological Corridor and Beyond, Central American Commission for Environment and Development Donors and Partners Conference on the Mesoamerican Biological Corridor, Paris, France, December 12–13, 2002. D. Irwin.

162. Relation Between Polar Plumes and Fine Structure in the Solar Wind from Ulysses High-Latitude Observations, Solar Wind 10 Conference, Pisa, Italy, June 17–21, 2002. Y. Yamauchi, S.T. Suess, and T. Sakurai.

163. The Relationship of Tropical Cyclone Convective Intensity to Passive Microwave Observations, American Meteorological Society 25th Conference on Hurricanes and Tropical Meteorology, San Diego, CA, April 29–May 3, 2002. R.E. Hood, A.R. Guillory, F.J. LaFontaine, D. Cecil, and G. Heymsfield.

164. Robust Low-Cost Liquid Rocket Combustion Chamber by Advanced Vacuum Plasma Process, 39th Space Congress, Cape Canaveral, FL, April 29–May 2, 2002. R.R. Holmes, S.K. Elam, T. McKechnie, and R. Hickman.

165. Science Capabilities of the GLAST Burst, April Meeting of the American Physical Society, Albuquerque, NM, April 20–24, 2002. C.A. Meegan.

166. Science@NASA: Direct to People! Best Practices for Communicating Science and Technology to the Public Conference, Gaithersburg, MD, March 6–8, 2002. R.J. Koczor, M.L. Adams, and D.L. Gallagher.

167. SD46 Facilities and Capabilities, Microgravity Materials Science Conference, Huntsville, AL, June 25–26, 2002. N. Ramachandran.

168. Search for Spin Filtering by Electron Tunneling Through Ferromagnetic EuS Barriers in PbS, Second International Conference on Physics and Application of Spin Related Phenomena in Semiconductors, Wurzburg, Germany, July 23–26, 2002. T. Figielski, A. Morawski, T. Wosinski, S. Wrotek, A. Makosa, E. Husakowska, T. Story, A.Y. Sipatov, A. Szczerbakow, J. Wrobel, K. Grasza, and W. Palosz.

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169. Self-Consistent Magnetosphere-Ionosphere Coupling and Associated Plasma Energization Processes, Astrophysical Particle Acceleration in Geospace and Beyond Meeting, Chattanooga, TN, October 6–10, 2002. G.V. Khazanov.

170. Sensitivity of the Tropical Atmospheric Energy Balance to ENSO-Related SST Changes: How Well Can We Quantify Hydrologic and Radiative Responses? 13th Symposium on Global Changes and Climate Variations, Orlando, FL, January 13–17, 2002. F.R. Robertson, D.E. Fitzjarrald, and B.-J. Sohn.

171. Ship Radar Observations of a Developing Tropical Storm in the East Pacific, American Meteorological Society 25th Conference on Hurricanes and Tropical Meteorology, San Diego, CA, April 29–May 3, 2002. R. Cifelli, W.A. Petersen, D.J. Boccippio, C.W. Fairall, and S.A. Rutledge.

172. Silicon Lightweight Mirrors (SLMS) for Ultraviolet and Extreme Ultraviolet Imaging Mirrors, Second Annual Technology Days, Huntsville, AL, May 23–24, 2002. W.A. Goodman.

173. Slow Light in Coupled Resonator Optical Waveguides, OSA Conference on Optics in the Southeast, Huntsville, AL, October 24–25, 2002. H. Chang, A.L. Gates, K.A. Fuller, D.A. Gregory, W.K. Witherow, M.S. Paley, D.O. Frazier, and D.D. Smith.

174. Small Particle Response to Fluid Motion Using Tethered Particles to Simulate Microgravity, Microgravity Materials Science Conference, Huntsville, AL, June 25–26, 2002. J.D. Trolinger, R. Rangel, C. Coimbra, W.K. Witherow, J.R. Rogers, and R.B. Lal.

175. Soft X-Ray Emissions From Planets and Moons, ESLAB 36 Earth-Like Planets and Moons Symposium, Noordwijk, the Netherlands, June 3–8, 2002. A. Bhardwaj, G.R. Gladstone, R.F. Elsner, J.H. Waite, Jr., D. Grodent, W.S. Lewis, F.J. Crary, M.C. Weisskopf, R.R. Howell, R.E. Johnson, P.G. Ford, A.E. Metzger, K.C. Hurley, E.D. Feigelson, G.P. Garmire, T. Majeed, J.T. Clarke, D.T. Young, M.K. Dougherty, S.A. Espinosa, T.E. Cravens, A.F. Tennant, and J.M. Jahn.

176. Software for Processing Flight and Simulated Data of the ATIC Experiment, European Cosmic Ray Conference, Moscow, Russia, July 8–12, 2002. A. Panov, J.H. Adams, Jr., H. Ahn, G. Bashindzhagyan, K. Batkov, G. Case, M.J. Christl, J. Chang, A. Fazely, O. Ganel, D. Granger, R. Gunasingha, T. Guzik, Y. Han, J. Isbert, H. Kim, K. Kim, S. Kim, E. Kouznetsov, S. Naqvi, M. Panasyuk, B. Price, G. Samsonov, W. Schmidt, E. Seo, R. Sina, N. Sokolskaya, M. Stewart, A. Voronin, J. Wang, J. Wefel, J. Wu, and V. Zatsepin.

177. Soil Moisture and Snow Cover: Active or Passive Elements of Climate, International Environmental Modelling and Software Society, Lugano, Switzerland, June 24–27, 2002. R.J. Oglesby, S. Marshall, D.J. Erickson III, F.R. Robertson, and J.O. Roads.

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178. Solar Wind Characteristics From SOHO-Sun-Ulysses Quadrature Observations, Solar Wind 10 Conference, Pisa, Italy, June 17–21, 2002. G. Poletto and S.T. Suess.

179. Space Product Development: NASA Partnering With Industry for Out of This World Results, 23rd International Symposium on Space Technology and Science, Matsue, Japan, May 26–June 2, 2002. M.E. Nall, C.B. Powers, and J.C. Casas.

180. Spatial Metadata for Global Change Investigations Using Remote Sensing, Second International Conference on Geographic Information Science, Boulder, CO, September 25–28, 2002. C.W. Emerson, D.A. Quattrochi, and N. Lam.

181. Spin-Up Instability of a Levitated Molten Drop in MHD-Flow Transition to Turbulence, Progress in Electromagnetics Research Symposium, Cambridge, MA, July 1–5, 2002. B. Abedian and R.W. Hyers.

182. SSG SiC Optical Systems in Space, Second Annual Technology Days, Huntsville, AL, May 22–24, 2002. J. Robichaud.

183. Status of NASA Mirror Technology Development for Large Space Telescopes, OSA Optical Fabrication and Testing Meeting, Tucson, AZ, June 3–5, 2002. H.P. Stahl.

184. Status of NASA Mirror Technology Development for Large Space Telescopes, Second Annual Technology Days, Huntsville, AL, May 22–24, 2002. H.P. Stahl.

185. Status of NASA Mirror Technology Development for Large Space Telescopes, OSA Conference on Optics in the Southeast, Huntsville, AL, October 24–25, 2002. H.P. Stahl.

186. Status of NASA Mirror Technology Development for Large Space Telescopes, SPIE Astronomical Telescopes and Instrumentation Conference, Waikoloa, HI, August 22–28, 2002. H.P. Stahl.

187. Structural Fluctuations and Thermophysical Properties of Molten II–VI Compounds, Microgravity Materials Science Conference, Huntsville, AL, June 25–26, 2002. C.-H. Su, S. Zhu, C. Li, R. Scripa, S.L. Lehoczky, Y. Kim, J.K. Baird, B. Lin, H. Ban, C. Benmore, and S. Feth.

188. Structural Health Monitoring of Composite Materials Using Distributed Fiber Bragg Sensors, 2002 OSA Annual Meeting and Exhibit/LS-XVIII, Orlando, FL, September 29–October 3, 2002. J. Grant, R. Kual, S. Taylor, K.V. Jackson, G. Myers, Y. Wang, and A. Sharma.

189. Structural Studies of Human Pyruvate Dehydrogenase, International Conference on Thiamin, Its Biochemistry and Structural Biology, Newark, NJ, May 18–21, 2002. E. Ciszak, L. Korotchkina, P. Dominiak, S. Sidhu, and M. Patel.

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190. Studies of Nucleation and Growth, Specific Heat and Viscosity of Undercooled Melts of Quasicrystals and Polytetrahedral-Phase-Forming Alloys, Microgravity Materials Science Conference, Huntsville, AL, June 25–26, 2002. K.F. Kelton, A.K. Gangopadhyay, G.W. Lee, R.W. Hyers, J.R. Rogers, M.B. Robinson, T.J. Rathz, and S. Krishnan.

191. Study of Fluid Flow Control in Protein Crystallization Using Strong Magnetic Fields, Sixth Microgravity Fluid Physics and Transport Phenomena Conference, Cleveland, OH, August 14–16, 2002. N. Ramachandran, F.W. Leslie, and E. Ciszak.

192. Study of Lightweight Ni-Co Alloy Mirrors Obtained by Electroforming Techniques, SPIE Astronomical Telescopes and Instrumentation Conference, Waikoloa, HI, August 22–28, 2002. R. Jones, J. Muntele, C. Muntele, R.L. Zimmerman, and D. Ila.

193. Summary of Quantitative Interpretation of Image Far Ultraviolet Auroral Data, 34th COSPAR Scientific Assembly/The World Space Congress, Houston, TX, October 10–19, 2002. H. Frey, T. Immel, S. Mende, J. Gerard, B. Hubert, S. Habraken, J.F. Spann, Jr., G.R. Gladstone, D. Bisikalo, and V. Shematovich.

194. The Sun—Our Nearest Star, 2nd High-Energy Astrophysics Workshop for Amateur Astronomers, Waikoloa, HI, June 30–July 6, 2002. M.L. Adams.

195. Supergranule Rotation Rates and Lifetimes, 200th Meeting of the American Astronomical Society, Albuquerque, NM, June 2–6, 2002. D.H. Hathaway.

196. Surface Kinetics and Stability of Faceted Crystal Growth, Fourteenth American Conference on Crystal Growth and Epitaxy, Seattle, WA, August 4–8, 2002. A. Chernov.

197. Surface Processes of Faceted Growth, Fourteenth American Conference on Crystal Growth and Epitaxy, Seattle, WA, August 4–8, 2002. A. Chernov.

198. Synthesis and Characterization of Carbon Nanotubes for Reinforced and Functional Applications, Nano and Microsystems Technology and Metrology Conference, Huntsville, AL, December 4–5, 2002. S. Zhu, C.-H. Su, S.L. Lehoczky, and M. Watson.

199. Synthesis and Characterization of Carbon Nanotubes for Reinforced and Functional Applications, 5th Aerospace Materials, Processes, and Environmental Technology Conference, Huntsville, AL, September 16–18, 2002. S. Zhu.

200. Technique for Determining the Viscosity and Electrical Conductivity of Semiconducting Liquids, International Conference on Modern Materials & Technologies, Florence, Italy, July 14–18, 2002.

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201. Tetragonal Lysozyme Nucleation and Crystal Growth: The Role of the Solution Phase, Sixth Microgravity Fluids Physics and Transport Phenomena Conference, Cleveland, OH, August 14–16, 2002. M.L. Pusey, E. Forsythe, J. Sumida, D. Maxwell, and S. Gorti.

202. Tetragonal Lysozyme, From Monomer to Crystal, 223rd American Chemical Society National Meeting, Orlando, FL, April 7–11, 2002. M.L. Pusey.

203. Thaumatin Crystallization Aboard the *International Space Station* Using Liquid-Liquid Diffusion in the Enhanced Gaseous Nitrogen Dewar (EGN), Macromolecular Biotechnology Strategic Planning Committee Meeting, Washington, DC, March 5–6, 2002. C.E. Kundrot, C.L. Barnes, and E.H. Snell.

204. Theory and Simulation of a Novel Viscosity Measurement Method for High-Temperature Semiconductor, 2002 International Mechanical Engineering Congress & Exposition, New Orleans, LA, November 17–22, 2002. B. Lin, C. Li, H. Ban, R. Scripa, S. Zhu, C.-H. Su, and S.L. Lehoczky.

205. Thermophysical Property Measurements in the MSFC ESL, 40th AIAA Aerospace Sciences Meeting & Exhibit, Reno, NV, January 14–17, 2002. R.W. Hyers, J.R. Rogers, M.B. Robinson, and T.J. Rathz.

206. Three Years of Operations of the Chandra X-Ray Observatory, SPIE Astronomical Telescopes and Instrumentation Conference, Waikoloa, HI, August 22–28, 2002. M.C. Weisskopf.

207. Toward Understanding Pore Formation and Mobility During Controlled Directional Solidification in a Microgravity Environment Investigation (PFMI), Microgravity Materials Science Conference, Huntsville, AL, June 25–26, 2002. R.N. Grugel, A. Anilkumar, P. Luz, L. Jeter, M.P. Volz, R. Spivey, and G.A. Smith.

208. Transient Torque Technique for Determining the Viscosity and Electric Conductivity Determination of Semiconducting Liquids, International Conference on Modern Materials & Technologies, Florence, Italy, July 14–18, 2002. C. Li, R.N. Scripa, H. Ban, B. Lin, C.-H. Su, S.L. Lehoczky, S.T. Feth, and S. Zhu.

209. Two Types of Transpolar Arc Development, Event Studies with Data of ASTRID–2, DMSP, FAST, and SuperDARN, European Geophysical Society XXVII General Assembly, Nice, France, April 21–26, 2002. Y. Narita, K. Maezawa, A. Kullen, N. Ivchenko, G. Marklund, R. Frederick, C. Carlson, J.F. Spann, Jr., G.K. Parks, R.A. Greenwald, G. Sofko, J. Villain, M. Lester, T. Mukai, N. Sato, and H. Yamagishi.

210. Two Years of Chandra Observations: Neutron Stars and Pulsars with Emphasis on the Pulsar in the Crab Nebula, Seminar on Neutron Stars, Pulsars, and Supernova Remnants, Bad Honnef, Germany, January 21–25, 2002. M.C. Weisskopf.

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211. Ultralightweight Space Deployable Primary Reflector Demonstrator, 43rd AIAA/ASME/ASCE/ AHS/ACS Structures, Structural Dynamics, and Materials Conference, Denver, CO, April 22–25, 2002. E.E. Montgomery IV and G.W. Zeiders.

212. Urban Surface Radiative Energy Budgets Determined Using Aircraft Scanner Data, North American Urban Heat Island Summit, Toronto, Canada, May 1–4, 2002. J.C. Luvall, D.A. Quattrochi, D.L. Rickman, and M.G. Estes.

213. Use of Yohkoh SXT in Measuring the Net Current and CME Productivity of Active Regions, Multiwavelength Observations of Coronal Structure and Dynamics—Yohkoh 10th Anniversary Meeting, Kona, HI, January 21–24, 2002. D.A. Falconer, R.L. Moore, and G.A. Gary.

214. Uses of Computed Tomography in the NASA Materials Science Program, The World Space Conference, Houston, TX, October 10–19, 2002. H.P. Engel and D.C. Gillies.

215. The Zero-Degree Detector System, Space Radiation Shielding Technology Workshop, Hampton, VA, April 3–5, 2002. J.H. Adams, Jr. and E. Kouznetsov.

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13. ABSTRACT *(Maximum 200 words)*

This Technical Memorandum lists the significant publications and presentations of the Science Directorate during the period January 1–December 31, 2002. Entries in the main part of the document are categorized according to NASA Reports (arranged by report number), Open Literature, and Presentations (arranged alphabetically by title). Most of the articles listed under Open Literature have appeared in refereed professional journals, books, monographs, or conference proceedings. Although many published abstracts are eventually expanded into full papers for publication in scientific and technical journals, they are often sufficiently comprehensive to include the significant results of the research reported. Therefore, published abstracts are listed separately in a subsection under Open Literature. Questions or requests for additional information about the entries in the report should be directed to Dr. A.F. Whitaker (SD01, 256–544–2481) or one of the authors.

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