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Millimeter, Submillimeter, and Far-Infrared Detectors and Instrumentation for Astronomy V

Wayne S. Holland
Jonas Zmuidzinas
Editors

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B. S. Karasik, S. V. Pereverzev, Jet Propulsion Lab. (United States); D. Olaya, National Institute of Standards and Technology (United States); M. E. Gershenson, Rutgers Univ. (United States); R. Cantor, STAR Cryoelectronics (United States); J. H. Kawamura, P. K. Day, B. Bumble, H. G. LeDuc, S. P. Monacos, D. G. Harding, Jet Propulsion Lab. (United States); D. Santavicca, F. Carter, D. E. Prober, Yale Univ. (United States)

7741 1A **Finline-integrated cold electron bolometer** [7741-46]
E. Otto, Oxford Univ. (United Kingdom); M. Tarasov, Chalmers Univ. of Technology (Sweden) and Kotel'nikov Institute of Radio Engineering and Electronics (Russian Federation); P. K. Grimes, Oxford Univ. (United Kingdom); N. S. Kaurova, Chalmers Univ. of Technology (Sweden) and Moscow State Pedagogical Univ. (Russian Federation); H. Kuusisto, L. S. Kuzmin, Chalmers Univ. of Technology (Sweden); G. Yassin, Oxford Univ. (United Kingdom)

7741 1B **NbN hot electron bolometer mixer at 5.3 THz** [7741-47]
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SESSION 12 CMB INSTRUMENTS I: CURRENT AND NEAR TERM I

7741 1C **EBEX: a balloon-borne CMB polarization experiment** [7741-48]
B. Reichborn-Kjennerud, Columbia Univ. (United States); A. M. Aboobaker, Univ. of Minnesota (United States); P. Ade, Cardiff Univ. (United Kingdom); F. Aubin, McGill Univ. (Canada); C. Baccigalupi, Scuola Internazionale Superiore di Studi Avanzati (Italy); C. Bao, Univ. of Minnesota (United States); J. Borrill, C. Cantalupo, Lawrence Berkeley National Lab. (United States); D. Chapman, J. Didier, Columbia Univ. (United States); M. Dobbs, McGill Univ. (Canada); J. Grain, Univ. Paris-Sud (France); W. Grainger, Cardiff Univ. (United Kingdom); S. Hanany, Univ. of Minnesota (United States); S. Hillbrand, Columbia Univ. (United States); J. Hubmayr, National Institute of Standards and Technology (United States); V A. Jaffe, Imperial College London (United Kingdom); B. Johnson, Univ. of California, Berkeley (United States); T. Jones, Univ. of Minnesota (United States); T. Kisner, Lawrence Berkeley National Lab. (United States); J. Klein, Univ. of Minnesota (United States); A. Korotkov, Brown Univ. (United States); S. Leach, Scuola Internazionale Superiore di Studi Avanzati (Italy); A. Lee, Univ. of California, Berkeley (United States); L. Levinson, Weizmann Institute of Science (Israel); M. Limon, Columbia Univ. (United States); K. MacDermid, McGill Univ. (Canada); T. Matsumura, California Institute of Technology (United States); X. Meng, Univ. of California, Berkeley (United States); A. Miller, Columbia Univ. (United States); M. Milligan, Univ. of Minnesota (United States); E. Pascale, Cardiff Univ. (United Kingdom); D. Polsgrove, Univ. of Minnesota (United States); N. Ponthieu, Univ. Paris-Sud (France); K. Raach, I. Sagiv, Univ. of Minnesota (United States); G. Smecher, McGill Univ. (Canada); F. Stivoli, Univ. Paris Sud France); R. Stompor, Lab. Astroparticule et Cosmologie, CNRS, Univ. Paris Diderot (France); H. Tran, Univ. of California, Berkeley (United States); M. Tristram, Lab. de l'Accélérateur Linéaire, CNRS, Univ. Paris Sud (France); G. S. Tucker, Y. Vinokurov, Brown Univ. (United States); A. Yadav, M. Zaldarriaga, Institute for Advanced Study (United States); K. Zilic, Univ. of Minnesota (United States)

7741 1D **Q/U Imaging Experiment (QUIET): a ground-based probe of cosmic microwave background polarization** [7741-49]
I. Buder, Univ. of Chicago (United States)

7741 1E **The POLARBEAR CMB polarization experiment** [7741-50]
K. Arnold, Univ. of California, Berkeley (United States); P. A. R. Ade, Univ. of Cardiff (United Kingdom); A. E. Anthony, Univ. of Colorado (United States); F. Aubin, McGill Univ. (Canada); D. Boettger, Univ. of California, San Diego (United States); J. Borrill, Lawrence Berkeley National Lab. (United States) and Univ. of California, Berkeley (United States); C. Cantalupo, Lawrence Berkeley National Lab. (United States); M. A. Dobbs, McGill Univ. (Canada); J. Errard, Lab. Astroparticule et Cosmologie. Univ. Paris 7 (France); D. Flanigan, A. Ghribi, Univ. of California, Berkeley (United States); N. Halverson, Univ. of Colorado (United States); M. Hazumi, High Energy Accelerator Research Organization (Japan); W. L. Holzapfel, J. Howard, Univ. of California, Berkeley (United States); P. Hyland, McGill Univ. (Canada); A. Jaffe, Imperial College (United Kingdom); B. Keating, Univ. of California, San Diego (United States); T. Kisner, Lawrence Berkeley National Lab. (United States); Z. Kermish, Univ. of California, Berkeley (United States); A. T. Lee, Univ. of California, Berkeley (United States) and Lawrence Berkeley National Lab. (United States); E. Linder, Lawrence Berkeley National Lab. (United States); M. Lungu, Univ. of California, Berkeley (United States); T. Matsumura, High Energy Accelerator Research Organization (Japan); N. Miller, Univ. of California, San Diego (United States); X. Meng, M. Myers, Univ. of California, Berkeley (United States); H. Nishino, High Energy Accelerator Research Organization (Japan); R. O'Brient, Univ. of California, Berkeley (United States); D. O'Dea, Imperial College (United Kingdom); C. Reichardt, Univ. of California, Berkeley (United States); I. Schanning, Univ. of California, San Diego (United States); A. Shimizu, High Energy Accelerator Research Organization (Japan); C. Shimmin, Univ. of California, Berkeley (United States); M. Shimon, Univ. of California, San Diego (United States); H. Spieler, Lawrence Berkeley National Lab. (United States); B. Steinbach, Univ. of California, Berkeley (United States); R. Stompor, Lab. Astroparticule et Cosmologie. Univ. Paris 7 (France); A. Suzuki, Univ. of California, Berkeley (United States); T. Tomaru, High Energy Accelerator Research Organization (Japan); H. T. Tran, Univ. of California, Berkeley (United States); C. Tucker, Univ. of Cardiff (United Kingdom); E. Quealy, P. L. Richards, Univ. of California, Berkeley (United States); O. Zahn, Univ. of California, Berkeley (United States) and Lawrence Berkeley National Lab. (United States)

7741 1G **The BICEP2 CMB polarization experiment** [7741-52]
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H. T. Nguyen, Jet Propulsion Lab. (United States); A. Orlando, California Institute of Technology (United States); C. L. Pryke, The Univ. of Chicago (United States); C. Reintsema, National Institute of Standards and Technology (United States); S. Richter, Harvard-Smithsonian Ctr. for Astrophysics (United States); J. E. Ruhl, Case Western Reserve Univ. (United States); M. C. Runyan, California Institute of Technology (United States); C. D. Sheehy, The Univ. of Chicago (United States) and Univ. of Minnesota (United States); Z. K. Staniszewski, California Institute of Technology (United States); S. A. Stokes, Stanford Univ. (United States) and Kavli Institute for Particle Astrophysics and Cosmology (United States); R. V. Sudiwala, Cardiff Univ. (United Kingdom); G. P. Teply, California Institute of Technology (United States); J. E. Tolan, Stanford Univ. (United States) and Kavli Institute for Particle Astrophysics and Cosmology (United States); A. D. Turner, P. Wilson, Jet Propulsion Lab. (United States); C. L. Wong, Harvard Smithsonian Ctr. for Astrophysics (United States)

SESSION 13 CMB INSTRUMENTS I: CURRENT AND NEAR TERM II

7741 1H **Initial performance of the BICEP2 antenna-coupled superconducting bolometers at the South Pole** [7741-53]
J. A. Brevik, R. W. Aikin, California Institute of Technology (United States); M. Amiri, The Univ. of British Columbia (Canada); S. J. Benton, Univ. of Toronto (Canada); J. J. Bock, Jet Propulsion Lab. (United States) and California Institute of Technology (United States); J. A. Bonetti, Jet Propulsion Lab. (United States); B. Burger, The Univ. of British Columbia (Canada); C. D. Dowell, Jet Propulsion Lab. (United States) and California Institute of Technology (United States); L. Duband, Service des Basses Temperatures, DRFMC, CEA-Grenoble (France); J. P. Filippini, S. R. Golwala, California Institute of Technology (United States); M. Halpern, M. Hasselfield, The Univ. of British Columbia (Canada); G. Hilton, National Institute of Standards and Technology (United States); V. V. Hristov, California Institute of Technology (United States); K. Irwin, National Institute of Standards and Technology (United States); J. P. Kaufman, B. G. Keating, Univ. of California, San Diego (United States); J. M. Kovac, Harvard-Smithsonian Ctr. for Astrophysics (United States); C. L. Kuo, Stanford Univ. (United States) and Kavli Institute for Particle Astrophysics and Cosmology (United States); A. E. Lange, California Institute of Technology (United States); E. M. Leitch, The Univ. of Chicago (United States); C. B. Netterfield, Univ. of Toronto (Canada); H. T. Nguyen, Jet Propulsion Lab. (United States) and California Institute of Technology (United States); R. W. Ogburn IV, Stanford Univ. (United States) and Kavli Institute for Particle Astrophysics and Cosmology (United States); A. Orlando, California Institute of Technology (United States) and Jet Propulsion Lab. (United States); C. Pryke, Univ. of Minnesota (United States); C. Reintsema, National Institute of Standards and Technology (United States); S. Richter, Harvard-Smithsonian Ctr. for Astrophysics (United States); J. E. Ruhl, Case Western Reserve Univ. (United States); M. Runyan, California Institute of Technology (United States); C. Sheehy, The Univ. of Chicago (United States) and Univ. of Minnesota (United States); Z. Staniszewski, California Institute of Technology (United States) and Jet Propulsion Lab. (United States); R. Sudiwala, Univ. of Wales (United Kingdom); J. E. Tolan, Stanford Univ. (United States) and Kavli Institute for Particle Astrophysics and Cosmology (United States); A. D. Turner, P. Wilson, Jet Propulsion Lab. (United States); C. L. Wong, Harvard-Smithsonian Ctr. for Astrophysics (United States)

7741 1I **The C-Band All-Sky Survey: instrument design, status, and first-look data** [7741-54]
O. G. King, California Institute of Technology (United States); C. Copley, Univ. of Oxford (United Kingdom) and Hartebeesthoek Radio Astronomy Observatory (United Kingdom); R. Davies, R. Davis, C. Dickinson, Univ. of Manchester (United Kingdom); Y. A. Hafez, KACST (Saudi Arabia); C. Holler, Hochschule Esslingen (Germany); J. J. John, Univ. of Oxford (United

Kingdom); J. L. Jonas, Rhodes Univ. (South Africa); M. E. Jones, Univ. of Oxford (United Kingdom); J. P. Leahy, Univ. of Manchester (United Kingdom); S. J. C. Muchovej, T. J. Pearson, A. C. S. Readhead, M. A. Stevenson, California Institute of Technology (United States); A. C. Taylor, Univ. of Oxford (United Kingdom)

SESSION 14 CRYO-MECHANICAL DESIGN

7741 1K **SCUBA-2: engineering and commissioning challenges of the world's largest sub-mm instrument at the JCMT** [7741-105]
S. C. Craig, Joint Astronomy Ctr. (United States); H. M. McGregor, E. Atad-Ettedgui, D. Montgomery, UK Astronomy Technology Ctr. (United Kingdom); D. Bintley, T. C. Chuter, Joint Astronomy Ctr. (United States); W. S. Holland, D. W. Lunney, M. J. MacIntosh, UK Astronomy Technology Ctr. (United Kingdom); E. Starman, J. G. Webb, Joint Astronomy Ctr. (United States)

7741 1L **The cryomechanical design of MUSIC: a novel imaging instrument for millimeter-wave astrophysics at the Caltech Submillimeter Observatory** [7741-56]
M. I. Hollister, N. G. Czakon, California Institute of Technology (United States); P. K. Day, Jet Propulsion Lab. (United States); T. P. Downes, R. Duan, California Institute of Technology (United States); J. Gao, National Institute of Standards and Technology (United States); J. Glenn, Univ. of Colorado at Boulder (United States); S. R. Golwala, California Institute of Technology (United States); H. G. LeDuc, Jet Propulsion Lab. (United States); P. R. Maloney, Univ. of Colorado at Boulder (United States); B. A. Mazin, Univ. of California, Santa Barbara (United States); H. T. Nguyen, Jet Propulsion Lab. (United States); O. Noroozian, California Institute of Technology (United States); J. Sayers, Jet Propulsion Lab. (United States); J. Schlaerth, Univ. of Colorado at Boulder (United States); S. Siegel, California Institute of Technology (United States); J. E. Vaillancourt, SOFIA/USRA, NASA Ames Research Ctr. (United States); A. Vayonakis, California Institute of Technology (United States); P. Wilson, Jet Propulsion Lab. (United States); J. Zmuidzinas, California Institute of Technology (United States)

7741 1M **Thermal architecture for the SPIDER flight cryostat** [7741-57]
J. E. Gudmundsson, Princeton Univ. (United States); P. A. R. Ade, Cardiff Univ. (United Kingdom); M. Amiri, The Univ. of British Columbia (Canada); S. J. Benton, Univ. of Toronto (Canada); R. Bihary, Case Western Reserve Univ. (United States); J. J. Bock, Jet Propulsion Lab. (United States) and California Institute of Technology (United States); J. R. Bond, Univ. of Toronto (Canada); J. A. Bonetti, Jet Propulsion Lab. (United States); S. A. Bryan, Case Western Reserve Univ. (United States); B. Burger, The Univ. of British Columbia (Canada); H. C. Chiang, Princeton Univ. (United States); C. R. Contaldi, Imperial College London (United Kingdom); B. P. Crill, O. Doré, Jet Propulsion Lab. (United States) and California Institute of Technology (United States); M. Farhang, Univ. of Toronto (Canada); J. Filippini, California Institute of Technology (United States); L. M. Fissel, N. N. Gandilo, Univ. of Toronto (Canada); S. R. Golwala, California Institute of Technology (United States); M. Halpern, M. Hasselfield, The Univ. of British Columbia (Canada); G. Hilton, National Institute of Standards and Technology (United States); W. Holmes, Jet Propulsion Lab. (United States); V. V. Hristov, California Institute of Technology (United States); K. D. Irwin, National Institute of Standards and Technology (United States); W. C. Jones, Princeton Univ. (United States); C. L. Kuo, Stanford Univ. (United States); C. J. MacTavish, Univ. of Cambridge (United Kingdom); P. V. Mason, California Institute of Technology (United States); T. E. Montroy, Case Western Reserve Univ. (Canada); T. A. Morford, California Institute of Technology (United States); C. B. Netterfield, Univ. of Toronto (Canada); D. T. O'Dea, Imperial College London

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SESSION 15 CMB INSTRUMENTS II: LONGER TERM

7741 1N **SPIDER: a balloon-borne CMB polarimeter for large angular scales** [7741-58]
J. P. Filippini, California Institute of Technology (United States); P. A. R. Ade, Cardiff Univ. (United Kingdom); M. Amiri, The Univ. of British Columbia (Canada); S. J. Benton, Univ. of Toronto (Canada); R. Bihary, Case Western Reserve Univ. (United States); J. J. Bock, California Institute of Technology (United States) and Jet Propulsion Lab. (United States); J. R. Bond, Univ. of Toronto (Canada); J. A. Bonetti, Jet Propulsion Lab. (United States); S. A. Bryan, Case Western Reserve Univ. (United States); B. Burger, The Univ. of British Columbia (Canada); H. C. Chiang, Princeton Univ. (United States); C. R. Contaldi, Imperial College London (United Kingdom); B. P. Crill, O. Doré, California Institute of Technology (United States) and Jet Propulsion Lab. (United States); M. Farhang, L. M. Fissel, N. N. Gandilo, Univ. of Toronto (Canada); S. R. Golwala, California Institute of Technology (United States); J. E. Gudmundsson, Princeton Univ. (United States); M. Halpern, M. Hasselfield, The Univ. of British Columbia (Canada); G. Hilton, National Institute of Standards and Technology (United States); W. Holmes, Jet Propulsion Lab. (United States); V. V. Hristov, California Institute of Technology (United States); K. D. Irwin, National Institute of Standards and Technology (United States); W. C. Jones, Princeton Univ. (United States); C. L. Kuo, Stanford Univ. (United States); C. J. MacTavish, Imperial College London (United Kingdom); P. V. Mason, California Institute of Technology (United States); T. E. Montroy, Case Western Reserve Univ. (United States); T. A. Morford, California Institute of Technology (United States); C. B. Netterfield, Univ. of Toronto (Canada); D. T. O'Dea, Imperial College London (United Kingdom); A. S. Rahlin, Princeton Univ. (United States); C. D. Reintsema, National Institute of Standards and Technology (United States); J. E. Ruhl, Case Western Reserve Univ. (United States); M. C. Runyan, M. A. Schenker, California Institute of Technology (United States); J. A. Shariff, J. D. Soler, Univ. of Toronto (Canada); A. Trangsrud, California Institute of Technology (United States); C. Tucker, Imperial College London (United Kingdom); R. S. Tucker, California Institute of Technology (United States); A. D. Turner, Jet Propulsion Lab. (United States)

7741 1O **Design and performance of the SPIDER instrument** [7741-59]
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7741 1P **The Primordial Inflation Polarization Explorer (PIPER)** [7741-60]
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7741 1Q **5,120 superconducting bolometers for the PIPER balloon-borne CMB polarization experiment** [7741-61]
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7741 1R **The Keck Array: a pulse tube cooled CMB polarimeter** [7741-62]
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7741 1S **ACTPol: a polarization-sensitive receiver for the Atacama Cosmology Telescope** [7741-63]
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