

Theodore Kisner

Curriculum Vitæ

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Those who do not understand UNIX are condemned to reinvent it, poorly. –Henry Spencer, Usenet, 1987.

Projects and Experience

- July 2006 – Present **System Tools for HPC, LBNL and Space Science Lab, Berkeley, CA.**
Unified the management, building and installation of many disparate software packages used for Cosmic Microwave Background research. Enabled the deployment of consistent software versions across machines at [NERSC](#) and elsewhere. Conducted research into techniques for accelerating calculations on emerging many-core architectures.
- July 2006 – Present **Planck Satellite, LBNL and Space Science Lab, Berkeley, CA.**
Created and tested software for use in the analysis of data from the PLANCK satellite. Developed a software library for on-the-fly detector pointing reconstruction based on the satellite orientation. Conducted research and testing into low-resolution, exact power spectrum estimation using massively parallel algorithms (MADspec). Created a unified software build system and modules environment in order compile, install, and manage general CMB and PLANCK specific software across all the supercomputers at NERSC and elsewhere.
- June 2000 – March 2008 **BOOMERanG Telescope, UCSB, CWRU, and Space Science Lab.**
Assisted in the construction and characterization of the polarization sensitive receiver used in the 2003 flight of BOOMERanG. Developed a set software tools used for the cleaning and postprocessing of the detector timestreams. Wrote serial and parallel codes to facilitate the CMB power spectral analyses of simulated and real data using existing parallel software (MADCAP).
- January 2003 – July 2008 **HPIC Software Suite, Personal Project.**
Primary developer for the [HPIC](#) implementation of the HEALPix algorithm for pixelizing the sphere.
- September 2005 – Present **KST Visualization Tools, Personal Project.**
Member of the development team for the [KST](#) data visualization program. Responsible for adding generalized support for displaying some FITS formats, including HEALPix. Also worked on a new rendering subsystem to allow for different geometric projections.
- January 2002 – March 2008 **System Administrator, UCSB and CWRU.**
Responsible for installation and maintenance of 7 GNU/Linux computers used as both servers and workstations. Configured a variety of services including web, email, mailing lists, NFS, and Lam/MPI plus Scalapack. Created custom scripts for performing various system-level tasks, including networked backups to a tape library.

Education

- March 2008 **Doctor of Philosophy in Physics, University of California, Santa Barbara, CA.**
- March 2002 **Masters of Science in Physics, University of California, Santa Barbara, CA.**
- June 1998 **Bachelors of Science with Honors in Physics, Pennsylvania State University, State College, PA.**

Awards and Recognition

- May 2010 **NASA Public Service Group Achievement Award**, *Given to Planck Supercomputing Infrastructure Team*, Washington, DC.
"For outstanding achievement in developing the supercomputing infrastructure for the U.S. Planck team."
- May 2010 **NASA Group Achievement Award**, *Given to Planck Data Analysis Pipeline Development Team*, Washington, DC.
"For outstanding participation as a partner with European Colleagues in conceiving and implementing the overall data analysis strategy for the Planck mission."

Publications and Talks

T. Kisner. [Trends in High Performance Computing and their Impact on Astrophysical Data Processing](#). Invited talk at GRITS 2010 (IPAC/Caltech), 2010.

M. Milligan, P. Ade, F. Aubin, C. Baccigalupi, C. Bao, J. Borrill, C. Cantalupo, D. Chapman, J. Didier, M. Dobbs, W. Grainger, S. Hanany, S. Hillbrand, J. Hubmayr, A. Jaffe, B. Johnson, T. Kisner, J. Klein, A. Korotkov, S. Leach, A. Lee, L. Levinson, M. Limon, K. MacDermid, T. Matsumura, A. Miller, E. Pascale, D. Polsgrove, N. Ponthieu, K. Raach, B. Reichborn-Kjennerud, I. Sagiv, H. Tran, G. S. Tucker, Y. Vinokurov, A. Yadav, M. Zaldarriaga, and K. Zilic. [Software systems for operation, control, and monitoring of the EBEX instrument](#). *ArXiv e-prints*, June 2010.

I. Sagiv, A. M. Aboobaker, C. Bao, S. Hanany, T. Jones, J. Klein, M. Milligan, D. E. Polsgrove, K. Raach, K. Zilic, A. Korotkov, G. S. Tucker, Y. Vinokurov, T. Matsumura, P. Ade, W. Grainger, E. Pascale, D. Chapman, J. Didier, S. Hillbrand, B. Reichborn-Kjennerud, M. Limon, A. Miller, A. Jaffe, A. Yadav, M. Zaldarriaga, N. Ponthieu, M. Tristram, J. Borrill, C. Cantalupo, T. Kisner, F. Aubin, M. Dobbs, K. MacDermid, G. Hilton, J. Hubmayr, K. Irwin, C. Reintsema, C. Baccigalupi, S. Leach, B. Johnson, A. Lee, H. Tran, and L. Levinson. [The EBEX Cryostat and Supporting Electronics](#). *ArXiv e-prints*, May 2010.

N. Mandolesi, M. Bersanelli, R. C. Butler, E. Artal, C. Baccigalupi, A. Balbi, A. J. Banday, R. B. Barreiro, M. Bartelmann, K. Bennett, P. Bhandari, A. Bonaldi, J. Borrill, M. Bremer, C. Burigana, R. C. Bowman, P. Cabella, C. Cantalupo, B. Cappellini, T. Courvoisier, G. Crone, F. Cuttaia, L. Danese, O. D'Arcangelo, R. D. Davies, R. J. Davis, L. De Angelis, G. de Gasperis, A. De Rosa, G. De Troia, G. de Zotti, J. Dick, C. Dickinson, J. M. Diego, S. Donzelli, U. Dörl, X. Dupac, T. A. Enßlin, H. K. Eriksen, M. C. Falvella, F. Finelli, M. Frailis, E. Franceschi, T. Gaier, S. Galeotta, F. Gasparo, G. Giardino, F. Gomez, J. Gonzalez-Nuevo, K. M. Górski, A. Gregorio, A. Gruppuso, F. Hansen, R. Hell, D. Herranz, J. M. Herreros, S. Hildebrandt, W. Hovest, R. Hoyland, K. Huffenberger, M. Janssen, T. Jaffe, E. Keihänen, R. Keskitalo, T. Kisner, H. Kurki-Suonio, A. Lähteenmäki, C. R. Lawrence, S. M. Leach, J. P. Leahy, R. Leonardi, S. Levin, P. B. Lilje, M. López-Caniego, S. R. Lowe, P. M. Lubin, D. Maino, M. Malaspina, M. Maris, J. Marti-Canales, E. Martinez-Gonzalez, M. Massardi, S. Matarrese, F. Matthai, P. Meinhold, A. Melchiorri, L. Mendes, A. Mennella, G. Morgante, G. Morigi, N. Morisset, A. Moss, A. Nash, P. Natoli, R. Nesti, C. Paine, B. Partridge, F. Pasian, T. Passvogel, D. Pearson, L. Pérez-Cuevas, F. Perrotta, G. Polenta, L. A. Popa, T. Poutanen, G. Prezeau, M. Prina, J. P. Rachen, R. Rebolo, M. Reinecke, S. Ricciardi, T. Riller, G. Rocha, N. Roddis, R. Rohlf, J. A. Rubiño-Martin, E. Salerno, M. Sandri, D. Scott, M. Seiffert, J. Silk, A. Simonetto, G. F. Smoot, C. Sozzi, J. Sternberg, F. Stivoli, L. Stringhetti, J. Tauber, L. Terenzi, M. Tomasi, J. Tuovinen, M. Türler, L. Valenziano, J. Varis, P. Vielva, F. Villa, N. Vittorio, L. Wade, M. White, S. White, A. Wilkinson, A. Zacchei, and A. Zonca. [Planck pre-launch status: the Planck-LFI programme](#). *ArXiv e-prints*, January 2010.

M. Veneziani, P. A. R. Ade, J. J. Bock, A. Boscaleri, B. P. Crill, P. de Bernardis, G. De Gasperis, A. de Oliveira-Costa, G. De Troia, G. Di Stefano, K. M. Ganga, W. C. Jones, T. S. Kisner, A. E. Lange, C. J. MacTavish, S. Masi, P. D. Mauskopf, T. E. Montroy, P. Natoli, C. B. Netterfield,

- E. Pascale, F. Piacentini, D. Pietrobon, G. Polenta, S. Ricciardi, G. Romeo, and J. E. Ruhl. [Properties of Galactic Cirrus Clouds Observed by BOOMERANG](#). *ApJ*, 713:959–969, April 2010.
- C. M. Cantalupo, J. D. Borrill, A. H. Jaffe, T. S. Kisner, and R. Stompor. [MADmap: A Massively Parallel Maximum-Likelihood Cosmic Microwave Background Map-Maker](#). *ArXiv e-prints (submitted to Astrophysical Journal Supplement)*, June 2009.
- R. Keskitalo, M. A. J. Ashdown, P. Cabella, T. Kisner, T. Poutanen, R. Stompor, J. G. Bartlett, J. Borrill, C. Cantalupo, G. de Gasperis, A. de Rosa, G. de Troia, H. K. Eriksen, F. Finelli, K. M. Gorski, A. Gruppuso, E. Hivon, A. Jaffe, E. Keihänen, H. Kurki-Suonio, C. R. Lawrence, P. Natoli, F. Paci, G. Polenta, and G. Rocha. [Residual noise covariance for Planck low-resolution data analysis](#). *ArXiv e-prints (submitted to Astronomy and Astrophysics)*, May 2009.
- P. Natoli, G. De Troia, C. Hikage, E. Komatsu, M. Migliaccio, P. A. R. Ade, J. J. Bock, J. R. Bond, J. Borrill, A. Boscaleri, C. R. Contaldi, B. P. Crill, P. de Bernardis, G. de Gasperis, A. de Oliveira-Costa, G. Di Stefano, E. Hivon, T. S. Kisner, W. C. Jones, A. E. Lange, S. Masi, P. D. Mauskopf, C. J. MacTavish, A. Melchiorri, T. E. Montroy, C. B. Netterfield, E. Pascale, F. Piacentini, G. Polenta, S. Ricciardi, G. Romeo, J. E. Ruhl, M. Tegmark, M. Veneziani, and N. Vittorio. [BOOMERanG Constraints on Primordial Non-Gaussianity from Analytical Minkowski Functionals](#). *ArXiv e-prints (submitted to Monthly Notices of the Royal Astronomical Society)*, May 2009.
- M. Veneziani, A. Amblard, A. Cooray, F. Piacentini, D. Pietrobon, P. Serra, P. A. R. Ade, J. J. Bock, J. R. Bond, J. Borrill, A. Boscaleri, P. Cabella, C. R. Contaldi, B. P. Crill, P. de Bernardis, G. De Gasperis, A. de Oliveira-Costa, G. De Troia, G. Di Stefano, K. M. Ganga, E. Hivon, W. C. Jones, T. S. Kisner, A. E. Lange, C. J. MacTavish, S. Masi, P. D. Mauskopf, A. Melchiorri, T. E. Montroy, P. Natoli, C. B. Netterfield, E. Pascale, G. Polenta, S. Ricciardi, G. Romeo, J. E. Ruhl, P. Santini, M. Tegmark, and N. Vittorio. [Sub-Degree Sunyaev-Zel'dovich Signal from Multi-Frequency BOOMERanG observations](#). *ArXiv e-prints (submitted to Astrophysical Journal Letters)*, April 2009.
- M. A. J. Ashdown, C. Baccigalupi, J. G. Bartlett, J. Borrill, C. Cantalupo, G. de Gasperis, G. de Troia, K. M. Górski, E. Hivon, K. Huffenberger, E. Keihänen, R. Keskitalo, T. Kisner, H. Kurki-Suonio, C. R. Lawrence, P. Natoli, T. Poutanen, G. Prézeau, M. Reinecke, G. Rocha, M. Sandri, R. Stompor, F. Villa, B. Wandelt, and The Planck Ctp Working Group. [Making maps from Planck LFI 30 GHz data with asymmetric beams and cooler noise](#). *A&A*, 493:753–783, January 2009.
- G. de Troia, P. A. R. Ade, J. J. Bock, J. R. Bond, J. Borrill, A. Boscaleri, P. Cabella, C. R. Contaldi, B. P. Crill, P. de Bernardis, G. de Gasperis, A. de Oliveira-Costa, G. di Stefano, P. G. Ferreira, E. Hivon, A. Jaffe, T. Kisner, M. Kunz, W. C. Jones, A. E. Lange, S. Masi, P. D. Mauskopf, C. MacTavish, A. Melchiorri, T. Montroy, P. Natoli, C. B. Netterfield, E. Pascale, F. Piacentini, D. Pogoyan, G. Polenta, S. Prunet, S. Ricciardi, G. Romeo, J. E. Ruhl, P. Santini, M. Tegmark, M. Veneziani, and N. Vittorio. [Searching for non-Gaussian signals in the BOOMERanG 2003 CMB map: Preliminary results](#). *New Astronomy Review*, 51:250–255, March 2007.
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F. Piacentini, P. A. R. Ade, J. J. Bock, J. R. Bond, J. Borrill, A. Boscaleri, P. Cabella, C. R. Contaldi, B. P. Crill, P. de Bernardis, G. De Gasperis, A. de Oliveira-Costa, G. De Troia, G. di Stefano, E. Hivon, A. H. Jaffe, T. S. Kisner, W. C. Jones, A. E. Lange, S. Masi, P. D. Mauskopf, C. J. MacTavish, A. Melchiorri, T. E. Montroy, P. Natoli, C. B. Netterfield, E. Pascale, D. Pogosyan, G. Polenta, S. Prunet, S. Ricciardi, G. Romeo, J. E. Ruhl, P. Santini, M. Tegmark, M. Veneziani, and N. Vittorio. [A Measurement of the Polarization-Temperature Angular Cross-Power Spectrum of the Cosmic Microwave Background from the 2003 Flight of BOOMERANG](#). *ApJ*, 647:833–839, August 2006.

C. J. MacTavish, P. A. R. Ade, J. J. Bock, J. R. Bond, J. Borrill, A. Boscaleri, P. Cabella, C. R. Contaldi, B. P. Crill, P. de Bernardis, G. De Gasperis, A. de Oliveira-Costa, G. De Troia, G. di Stefano, E. Hivon, A. H. Jaffe, W. C. Jones, T. S. Kisner, A. E. Lange, A. M. Lewis, S. Masi, P. D. Mauskopf, A. Melchiorri, T. E. Montroy, P. Natoli, C. B. Netterfield, E. Pascale, F. Piacentini, D. Pogosyan, G. Polenta, S. Prunet, S. Ricciardi, G. Romeo, J. E. Ruhl, P. Santini, M. Tegmark, M. Veneziani, and N. Vittorio. [Cosmological Parameters from the 2003 Flight of BOOMERANG](#). *ApJ*, 647:799–812, August 2006.

W. C. Jones, P. A. R. Ade, J. J. Bock, J. R. Bond, J. Borrill, A. Boscaleri, P. Cabella, C. R. Contaldi, B. P. Crill, P. de Bernardis, G. De Gasperis, A. de Oliveira-Costa, G. De Troia, G. di Stefano, E. Hivon, A. H. Jaffe, T. S. Kisner, A. E. Lange, C. J. MacTavish, S. Masi, P. D. Mauskopf, A. Melchiorri, T. E. Montroy, P. Natoli, C. B. Netterfield, E. Pascale, F. Piacentini, D. Pogosyan, G. Polenta, S. Prunet, S. Ricciardi, G. Romeo, J. E. Ruhl, P. Santini, M. Tegmark, M. Veneziani, and N. Vittorio. [A Measurement of the Angular Power Spectrum of the CMB Temperature Anisotropy from the 2003 Flight of BOOMERANG](#). *ApJ*, 647:823–832, August 2006.

P. de Bernardis, P. A. R. Ade, A. Balbi, J. J. Bock, J. R. Bond, J. Borrill, A. Boscaleri, P. Cabella, C. R. Contaldi, B. P. Crill, G. De Gasperis, A. De-Oliveira Costa, G. De Troia, K. Ganga, M. Giacometti, E. Hivon, V. V. Hristov, T. Kisner, A. Iacoangeli, A. H. Jaffe, W. C. Jones, A. E. Lange, S. Masi, P. Mason, P. D. Mauskopf, C. MacTavish, A. Melchiorri, T. Montroy, F. Nati, P. Natoli, C. B. Netterfield, E. Pascale, F. Piacentini, D. Pogosyan, G. Polenta, S. Prunet, S. Ricciardi, G. Romeo, J. E. Ruhl, M. Tegmark, and N. Vittorio. [Maps of the millimetre sky from the BOOMERanG experiment](#). *ArXiv Astrophysics e-prints*, November 2003.

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