

Alex G. Kim

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Education	Ph.D., Physics, University of California, Berkeley, Dec. 17 1996. <i>The Discovery of High-Redshift Supernovae and Their Cosmological Implications</i> , Richard Muller & Saul Perlmutter advisors M.A., Physics, University of California, Berkeley, 1994. B.S., Physics, Mathematics, University of Michigan, Ann Arbor, 1991.
Professional Experience	2003– Staff Scientist, Physics Division, Lawrence Berkeley National Laboratory 2002–2003 Term Scientist, Physics Division, Lawrence Berkeley National Laboratory 1999–2002 Research Assistant, Center for Particle Astrophysics and Lawrence Berkeley National Laboratory 1997–1999 Research Associate, Laboratoire de Physique Corpusculaire et Cosmologie, Collège de France 1992–1997 Research Assistant, Center for Particle Astrophysics and Lawrence Berkeley Laboratory 1989–1991 Research Assistant, Physics Department, University of Michigan
Honors and Awards	2014 Breakthrough Prize 2007 Cosmology Prize, Gruber Foundation 1991 Phi Beta Kappa 1989–1990 Northern Telecom Scholarship, Northern Telecom Inc., Vienna, Va. 1988–1990 Franklin Tillery Scholarship 1988–1989 David Aspland Scholarship 1988 William Branstrom Freshman Prize 1987–1991 Angell Scholar
Teaching Experience	2013 University of California, Berkeley. Astro 260 Guest Lecturer 2000–2002 Tutor, Malcolm X Elementary School, Berkeley CA 1991–1992 University of California, Berkeley. Teaching assistant
Professional Memberships	American Astronomical Society
Relevant Committees, and Service	Future Sky Surveys and Big Data, Scientific Organizing Committee, 2016 DES Publications Committee, 2015 – LSST-DESC Collaboration Council, 2014 – DOE National Lab Day Committee, 2014 LSST Cadence Workshop, Supernova Working Group co-Chair, 2014 LBNL Diversity and Inclusion Committee, 2014– OzDES Executive Committee, 2013 – Distances Task Leader, Snowmass, 2013 LSST-DESC SN Ia Working Group Co-Chair, 2012–2015 DES Spring 2013 Collaboration Meeting, Local Organizing Chair, 2012–2013 Publications Committee, Nearby Supernova Factory, 2012– SN Ia Working Group Leader, LSST DESC, 2012–2014 DES Spectroscopy Task Force Co-Chair, 2011– 2014 DES Collaboration Meeting Steering Committee, 2011– Referee for DOE-Office of Science proposals, 2010– Referee for Astrophysical Journal, Astroparticle Physics, Journal of Cosmology and Astroparticle Physics, Publications of the Astronomical Society of the Pacific, Publications of the Astronomical Society of Australia, Astrophysical Journal Letters 1997– Research supervisor for numerous students and postdocs, 1997–

Member of several doctoral thesis committees 2008–
 SN Ia Spectroscopy Group leader, DES collaboration, 2008–2012
 Joint Dark Energy Mission Interim Science Working Group, 2010–2011
 Science Fair Judge, North School Hillsdale, CA Mar 2 2010
 SN Ia Working Group leader, SNAP Collaboration, 2001–2009
 Simulation Working Group leader, SNAP Collaboration, 1999–2009
 System Managers Group member, SNAP Collaboration, 2001–2008
 Review Presentation, Particle Physics Project Prioritization Panel (P5), Stanford, CA
 Friday, Feb. 22, 2008
 Organizing Committee, Key Approaches to Dark Energy, Barcelona, Aug, 2006
 Internal Review Committee, Supernova Factory, 2004

Research Activities

1999–present — Lawrence Berkeley National Laboratory

- Dark Energy Spectroscopic Instrument – Identifying non-BAO science applications for DESI. Target selection.
- Large Synoptic Survey Telescope - Dark Energy Science Collaboration – Leading preparations for exploitation of supernovae discovered by LSST. Optimization of observing strategy.
- Euclid Consortium – Developing hardware and mission requirements for the SN Ia/transient survey.
- OzDES – Forming member of the collaboration formed to get spectra of targets identified by DES. Collecting DES targets and furnishing them to the observers.
- Dark Energy Survey – Working on the optimization of the DES supernova survey and setting requirements on external spectroscopic observations. Leading the spectroscopy component of the full collaboration.
- Nearby Supernova Factory – Improving the calibration of Type Ia supernovae as distance indicators. Developing a toolkit for generalized spectroscopy pipelines including high-performance computing and forward-modeling.
- Joint Dark Energy Mission – Developing science requirements, survey strategies, and mission configurations for a NASA and DOE interagency satellite experiment intended to probe dark energy. Participation as a member of the JDEM-Interim Science Working Group charged with designing mission concepts for the two agencies.
- Supernova Acceleration Probe (SNAP) Collaboration– Developed and implemented a simulation package, science requirements, survey strategies, and mission configurations for a proposed satellite experiment designed to probe dark energy. Led two collaboration working groups. Contributions led to the successful passing of scientific reviews and advocacy by national committees. Work on the supernova error budget and systematic uncertainties has resulted in several published papers with more in progress.
- Baryon Oscillation Spectroscopic Survey – Developed and implemented the spectroscopic reduction pipeline for the BOSS experiment. The software is currently processing nightly observations.
- Supernova Cosmology Project – Working on the statistical analysis for high-redshift supernova cosmology presented in several papers.

1997–1999 — Collège de France

- AGAPE – Applied HST archival data to analyze the gravitational microlensing of unresolved source stars within the AGAPE collaboration and to search for new events, resulting in a published paper.

- EROS – Discovering and studying supernovae at low ($z < 0.2$) and high ($z > 0.4$) redshifts as part of the EROS supernova search and the Supernova Cosmology Project. The supernovae are used to measure cosmological parameters. Work has led to papers on supernova rates and the cosmological distance scale.
- Planck – Developing algorithms and software simulating the data expected from the Planck mission, a satellite that measures CMB temperature anisotropies. My focus was in determining hardware constraints, optimized scanning strategies, and data processing methods for polarization measurements. Findings have been published.

1992–1997 — Lawrence Berkeley National Laboratory

- Deepsearch (SCP) – Discovered and studied over 28 distant supernovae, $0.35 < z < 0.85$, in a project aimed at measuring the mass density of the universe and the Cosmological constant. Involved in developing search software, observing, and data analysis. Resulted in the discovery of the accelerated expansion of the Universe.

Invited Talks

Keynote Speech, Slurm User Group Meeting, LBNL, Sep 25, 2017
 Lecturer, SLAC Summer Institute, SLAC, Menlo Park, CA, Aug 23, 2017
 RPM, Physics Division, Lawrence Berkeley National Laboratory, Berkeley, CA, Oct 18, 2016
 Colloquium, Laboratoire de Physique Corpusculaire de Clermont-Ferrand, Aubiere, France, Sep 30, 2016
 Southern Spectroscopic Survey Instrument Workshop, Argonne, IL, Aug 22, 2016
 Invited Talk, Future Sky Surveys and Big Data, Daejeon, Korea, Apr 25, 2016
 Invited Talk, CAASTRO Annual Retreat, Sydney, Australia, Nov 16, 2015
 Speaker, Innovative Cosmological Simulations with Machine Learning and Statistics in the era of LSST, Pittsburgh, PA Jun 5, 2015
 Colloquium, University of Oklahoma, Norman, OK, Jan 22, 2015
 Colloquium, ATPC, Dec 23, 2014
 Speaker, LSST Project and Community Workshop, Phoenix, AZ, Aug 14, 2014
 Lecture, Santa Fe Cosmology Workshop, Santa Fe, NM, Jul 22, 2014
 Speaker, DES-LSST Workshop, Fermi National National Laboratory, IL, Mar 26, 2014
 Panel Discussion, Snowmass, Minneapolis MN, July 29, 2013
 Seminar, LineA Seminar, Brazil, June 20, 2013
 Colloquium, Herzberg Institute of Astronomy, Victoria, Canada, March 12, 2013
 Lecture, IX Mexican School on Gravitation and Mathematical Physics, Puerto Vallarta, Mexico, Dec 5, 2012
 Speaker, Korean Physical Society, Oct 26, 2012
 Colloquium, Yonsei University, Oct 25, 2012
 Seminar, Asia Pacific Center for Theoretical Physics, Pohang Korea, Oct 22, 2012
 Speaker, 13th Marcel Grossmann Meeting, Stockholm, Sweden, July 1, 2012
 Speaker, Nobel Prize Panel, University of Stockholm, Sweden, Nov 12, 2011
 Lecturer, Azores School on Observational Cosmology, Angra do Heroismo, Portugal, Aug 31- Sep 6, 2011
 Seminar, Astronomy Department, Yonsei University, Seoul, May 6, 2011
 Seminar, Institute for the Early Universe, Ewha University, Seoul, May 3, 2011
 Seminar, Korea Institute for Advanced Study, Seoul, May 2, 2011
 Workshop, The Return of de Sitter, NORITA, Stockholm, March 15, 2011
 Seminar, Center for Particle Astrophysics, Fermilab, May 17, 2010
 Seminar, National Astronomy Observatory of China, Beijing, Apr 8 2010
 Seminar, Institute of High Energy Physics, Beijing, Apr 7 2010
 Seminar, Institute for the Early Universe, Ewha University, Seoul, Apr 5, 2010

Workshop, First Berkeley-Paris Dark Energy Cosmology Workshop, Paris, Sep 19, 2009
 Conference, Frontiers of Cosmology at Dome A Antarctica, Suzhou, China, Jul 21, 2009
 Speaker, Particle Physics Project Prioritization Panel (P5), Stanford, CA Friday, Feb. 22, 2008
 Workshop, International Workshop on the Interconnection Between Particle Physics and Cosmology, Texas A&M, May 14, 2007
 Cosmology Seminar, University of California, Davis, Dec 7 2006
 Workshop, Key Approaches to Dark Energy, Barcelona, Aug, 2006
 Workshop, European Dark Energy Network in Paris, Paris, Dec 9, 2005
 Workshop, Probing the Dark Universe with Subaru and Gemini, Waikoloa, HI, Nov 8, 2005
 Colloquium, University of Missouri, Columbia, Oct 3, 2005
 Seminar, Laboratoire d'Astrophysique de Marseille, Apr 3, 2003
 Astrophysics Seminar, University of California Riverside, Mar 24, 2003
 Seminar, University of Florida, Mar 17, 2003
 Colloquium, Florida Atlantic University, Mar 14, 2003
 Astrophysics Seminar, Los Alamos National Laboratory, Feb 27, 2002
 Colloquium, Purdue University, Oct 25, 2001
 San Mateo Astronomical Society, May 3, 2001
 Journal Club, Department of Astronomy, UC Berkeley, Apr 27, 2001
 Colloquium, Collège de France, Mar 18, 2001
 Colloquium, Centre de Physique des Particules de Marseille, Mar 15, 2001
 Workshop, Frontiers in Contemporary Physics-II at Vanderbilt University, Mar 9, 2001
 Colloquium, Indiana University, March 2001
 Colloquium, Observatoire de Meudon, Feb 2000
 Colloquium, Universidad de La Serena, Chile, Sep 21, 1998
 Conference, XXXIIIrd Rencontres de Moriond "Fundamental Parameters in Cosmology", Les Arcs 1800, France, Jan 17-24, 1998
 Conference, NATO Advanced Study Institute on Thermonuclear Supernovae, Aiguablava, Spain, June 20-30, 1995

Refereed Publications

- [1] H. K. Fakhouri et al. Improving Cosmological Distance Measurements Using Twin Type Ia Supernovae. *ApJ*, 815:58, December 2015.
- [2] F. Yuan et al. OzDES multifibre spectroscopy for the Dark Energy Survey: first-year operation and results. *MNRAS*, 452:3047–3063, September 2015.
- [3] D. A. Goldstein et al. Automated Transient Identification in the Dark Energy Survey. *AJ*, 150:82, September 2015.
- [4] U. Feindt et al. Measuring cosmic bulk flows with Type Ia supernovae from the Nearby Supernova Factory (Corrigendum). *A&A*, 578:C1, June 2015.
- [5] M. Rigault et al. Confirmation of a Star Formation Bias in Type Ia Supernova Distances and its Effect on the Measurement of the Hubble Constant. *ApJ*, 802:20, March 2015.
- [6] A. G. Kim et al. Distance probes of dark energy. *Astroparticle Physics*, 63:2–22, March 2015.
- [7] A. G. Kim, E. V. Linder, J. Edelstein, and D. Erskine. Giving cosmic redshift drift a whirl. *Astroparticle Physics*, 62:195–205, March 2015.
- [8] M. Sasdelli et al. A metric space for Type Ia supernova spectra. *MNRAS*, 447:1247–1266, February 2015.

- [9] C. Saunders et al. Type Ia Supernova Distance Modulus Bias and Dispersion from K-correction Errors: A Direct Measurement Using Light Curve Fits to Observed Spectral Time Series. *ApJ*, 800:57, February 2015.
- [10] M. Banerji et al. Combining Dark Energy Survey Science Verification data with near-infrared data from the ESO VISTA Hemisphere Survey. *MNRAS*, 446:2523–2539, January 2015.
- [11] C. Sánchez et al. Photometric redshift analysis in the Dark Energy Survey Science Verification data. *MNRAS*, 445:1482–1506, December 2014.
- [12] P. Astier et al. Extending the supernova Hubble diagram to $z \sim 1.5$ with the Euclid space mission. *A&A*, 572:A80, December 2014.
- [13] R. Scalzo et al. Type Ia supernova bolometric light curves and ejected mass estimates from the Nearby Supernova Factory. *MNRAS*, 440:1498–1518, May 2014.
- [14] A. G. Kim et al. Type Ia Supernova Hubble Residuals and Host-galaxy Properties. *ApJ*, 784:51, March 2014.
- [15] U. Feindt et al. Measuring cosmic bulk flows with Type Ia supernovae from the Nearby Supernova Factory. *A&A*, 560:A90, December 2013.
- [16] M. Rigault et al. Evidence of environmental dependencies of Type Ia supernovae from the Nearby Supernova Factory indicated by local $H\alpha$. *A&A*, 560:A66, December 2013.
- [17] A. Hojjati, A. G. Kim, and E. V. Linder. Robust strong lensing time delay estimation. *Phys. Rev. D*, 87(12):123512, June 2013.
- [18] K. Fourspring, Z. Ninkov, B. Fodness, M. Robberto, S. Heap, and A. Kim. Proton radiation testing of digital micromirror devices for space applications. *Opt. Eng.*, 52:091807, May 2013.
- [19] M. Childress et al. Host Galaxy Properties and Hubble Residuals of Type Ia Supernovae from the Nearby Supernova Factory. *ApJ*, 770:108, June 2013.
- [20] M. Childress et al. Host Galaxies of Type Ia Supernovae from the Nearby Supernova Factory. *ApJ*, 770:107, June 2013.
- [21] A. G. Kim et al. Standardizing Type Ia Supernova Absolute Magnitudes Using Gaussian Process Data Regression. *ApJ*, 766:84, April 2013.
- [22] A. Shafieloo, A. G. Kim, and E. V. Linder. Model independent tests of cosmic growth versus expansion. *Phys. Rev. D*, 87(2):023520, January 2013.
- [23] J. P. Bernstein et al. Supernova Simulations and Strategies for the Dark Energy Survey. *ApJ*, 753:152, July 2012.
- [24] A. Shafieloo, A. G. Kim, and E. V. Linder. Gaussian process cosmography. *Phys. Rev. D*, 85(12):123530, June 2012.
- [25] L. Faccioli, A. G. Kim, et al. Reducing zero-point systematics in dark energy supernova experiments. *Astroparticle Physics*, 34:847–857, July 2011.
- [26] A. G. Kim and E. V. Linder. Correlated supernova systematics and ground based surveys. *JCAP*, 6:20, June 2011.
- [27] J. Samsing and A. G. Kim. Dithering Strategies and Point-Source Photometry. *PASP*, 123:470–480, April 2011.
- [28] A. G. Kim. Type Ia Supernova Intrinsic Magnitude Dispersion and the Fitting of Cosmological Parameters. *PASP*, 123:230–236, February 2011.

- [29] R. Amanullah et al. Spectra and Hubble Space Telescope Light Curves of Six Type Ia Supernovae at $0.511 < z < 1.12$ and the Union2 Compilation. *ApJ*, 716:712–738, June 2010.
- [30] A. Kim et al. Prospective Type Ia supernova surveys from Dome A. *Astroparticle Physics*, 33:248–254, May 2010.
- [31] S. Nobili et al. Constraining Dust and Color Variations of High- z SNe Using NICMOS on the Hubble Space Telescope. *ApJ*, 700:1415–1427, August 2009.
- [32] M. Kowalski et al. Improved Cosmological Constraints from New, Old, and Combined Supernova Data Sets. *ApJ*, 686:749–778, October 2008.
- [33] N. Kuznetsova et al. A New Determination of the High-Redshift Type Ia Supernova Rates with the Hubble Space Telescope Advanced Camera for Surveys. *ApJ*, 673:981–998, February 2008.
- [34] A. G. Kim and R. Miquel. Measuring type Ia supernova distances and redshifts from their multi-band light curves. *Astroparticle Physics*, 28:448–455, December 2007.
- [35] G. Garavini et al. Quantitative comparison between type Ia supernova spectra at low and high redshifts: a case study. *A&A*, 470:411–424, August 2007.
- [36] G. Aldering, A. G. Kim, M. Kowalski, E. V. Linder, and S. Perlmutter. Snapping supernovae at $z > 1.7$. *Astroparticle Physics*, 27:213–225, March 2007.
- [37] J. B. James, T. M. Davis, B. P. Schmidt, and A. G. Kim. Spectral diversity of Type Ia supernovae. *MNRAS*, 370:933–940, August 2006.
- [38] A. Conley et al. Measurement of Ω_m , Ω_Λ from a Blind Analysis of Type Ia Supernovae with CMAGIC: Using Color Information to Verify the Acceleration of the Universe. *ApJ*, 644:1–20, June 2006.
- [39] T. M. Davis, B. P. Schmidt, and A. G. Kim. Ideal Bandpasses for Type Ia Supernova Cosmology. *PASP*, 118:205–217, February 2006.
- [40] A. G. Kim and R. Miquel. Optimal extraction of cosmological information from supernova data in the presence of calibration uncertainties. *Astroparticle Physics*, 24:451–458, January 2006.
- [41] I. M. Hook et al. Spectra of High-Redshift Type Ia Supernovae and a Comparison with Their Low-Redshift Counterparts. *AJ*, 130:2788–2803, December 2005.
- [42] G. Garavini et al. Spectroscopic Observations and Analysis of the Unusual Type Ia SN 1999ac. *AJ*, 130:2278–2292, November 2005.
- [43] S. Nobili et al. Restframe I-band Hubble diagram for type Ia supernovae up to redshift $z \sim 0.5$. *A&A*, 437:789–804, July 2005.
- [44] C. Lidman et al. Spectroscopic confirmation of high-redshift supernovae with the ESO VLT. *A&A*, 430:843–851, February 2005.
- [45] D. Huterer, A. Kim, L. M. Krauss, and T. Broderick. Redshift Accuracy Requirements for Future Supernova and Number Count Surveys. *ApJ*, 615:595–602, November 2004.
- [46] G. Blanc et al. Type Ia supernova rate at a redshift of ~ 0.1 . *A&A*, 423:881–894, September 2004.
- [47] G. Garavini et al. Spectroscopic Observations and Analysis of the Peculiar SN 1999aa. *AJ*, 128:387–404, July 2004.
- [48] R. Ansari et al. Variable stars towards the bulge of M 31: The AGAPE catalogue. *A&A*, 421:509–518, July 2004.

- [49] A. G. Kim, E. V. Linder, R. Miquel, and N. Mostek. Effects of systematic uncertainties on the supernova determination of cosmological parameters. *MNRAS*, 347:909–920, January 2004.
- [50] J. Rhodes et al. Weak lensing from space I: instrumentation and survey strategy. *Astroparticle Physics*, 20:377–389, January 2004.
- [51] R. A. Knop et al. New Constraints on Ω_M , Ω_Λ , and w from an Independent Set of 11 High-Redshift Supernovae Observed with the Hubble Space Telescope. *ApJ*, 598:102–137, November 2003.
- [52] C. Afonso et al. Bulge microlensing optical depth from EROS 2 observations. *A&A*, 404:145–156, June 2003.
- [53] M. Sullivan et al. The Hubble diagram of type Ia supernovae as a function of host galaxy morphology. *MNRAS*, 340:1057–1075, April 2003.
- [54] R. Pain et al. The Distant Type Ia Supernova Rate. *ApJ*, 577:120–132, September 2002.
- [55] P. Nugent, A. Kim, and S. Perlmutter. K-Corrections and Extinction Corrections for Type Ia Supernovae. *PASP*, 114:803–819, August 2002.
- [56] B. Goldman et al. EROS 2 proper motion survey: Constraints on the halo white dwarfs. *A&A*, 389:L69–L73, July 2002.
- [57] F. Derue et al. Observation of periodic variable stars towards the Galactic spiral arms by EROS II. *A&A*, 389:149–161, July 2002.
- [58] C. Afonso et al. Photometric constraints on microlens spectroscopy of EROS-BLG-2000-5. *A&A*, 378:1014–1023, November 2001.
- [59] G. Goldhaber, D. E. Groom, A. Kim, et al. Timescale Stretch Parameterization of Type Ia Supernova B-Band Light Curves. *ApJ*, 558:359–368, September 2001.
- [60] F. Derue et al. Observation of microlensing toward the galactic spiral arms. EROS II 3 year survey. *A&A*, 373:126–138, July 2001.
- [61] D. Hardin et al. Type Ia supernova rate at $z \sim 0.1$. *A&A*, 362:419–425, October 2000.
- [62] C. Afonso et al. Combined Analysis of the Binary Lens Caustic-crossing Event MACHO 98-SMC-1. *ApJ*, 532:340–352, March 2000.
- [63] B. Revenu, A. Kim, R. Ansari, F. Couchot, J. Delabrouille, and J. Kaplan. De-striping of polarized data in a CMB mission with a circular scanning strategy. *A&AS*, 142:499–509, March 2000.
- [64] T. Lasserre et al. Not enough stellar mass Machos in the Galactic halo. *A&A*, 355:L39–L42, March 2000.
- [65] A. Goobar et al. The Acceleration of the Universe: Measurements of Cosmological Parameters from Type Ia Supernovae. *Physica Scripta Volume T*, 85:47, 2000.
- [66] B. Goldman et al. EROS 2 proper motion survey: a field brown dwarf, and an L dwarf companion to LHS 102. *A&A*, 351:L5–L9, November 1999.
- [67] F. Derue et al. Observation of microlensing towards the galactic spiral arms. EROS II. 2 year survey. *A&A*, 351:87–96, November 1999.
- [68] F. Bauer et al. A slope variation in the period-luminosity relation for short period SMC Cepheids. *A&A*, 348:175–183, August 1999.
- [69] S. Perlmutter et al. Measurements of Ω and Λ from 42 High-Redshift Supernovae. *ApJ*, 517:565–586, June 1999.
- [70] C. Afonso et al. Microlensing towards the Small Magellanic Cloud EROS 2 two-year analysis. *A&A*, 344:L63–L66, April 1999.

- [71] R. Ansari et al. AgapeZ1: a large amplification microlensing event or an odd variable star towards the inner bulge of M31. *A&A*, 344:L49–L52, April 1999.
- [72] C. Afonso et al. EROS 2 intensive observation of the caustic crossing of microlensing event MACHO SMC-98-1. *A&A*, 337:L17–L20, September 1998.
- [73] S. Perlmutter et al. Discovery of a supernova explosion at half the age of the universe. *Nature*, 391:51, January 1998.
- [74] S. Perlmutter et al. Measurements of the Cosmological Parameters Ω and Λ from the First Seven Supernovae at $z \geq 0.35$. *ApJ*, 483:565, July 1997.
- [75] A. G. Kim et al. Implications for the Hubble Constant from the First Seven Supernovae at $z \geq 0.35$. *ApJ*, 476:L63, February 1997.
- [76] R. Pain et al. The Type Ia Supernova Rate at z approximately 0.4. *ApJ*, 473:356, December 1996.
- [77] A. Kim, A. Goobar, and S. Perlmutter. A Generalized K Correction for Type IA Supernovae: Comparing R-band Photometry beyond $z = 0.2$ with B, V, and R-band Nearby Photometry. *PASP*, 108:190, February 1996.
- [78] S. Perlmutter et al. A supernova at $z = 0.458$ and implications for measuring the cosmological deceleration. *ApJ*, 440:L41–L44, February 1995.