

Robert A. Knop Jr.
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Work Experience

- 2009–Present **Contract work in computational astrophysics.** Maintaining websites, organizing virtual meetings, developing software, installing servers and demonstration software.
- 2007–2009 **Linden Lab.** Production Operations Engineer (Aug. 2007–Sep. 2008), Server Release Manager (Oct. 2008–May 2009).
- 2001–2007 **Assistant Professor of Physics & Astronomy, Vanderbilt University.** Taught college and graduate classes, performed astrophysics research. Developed data analysis software in C++ and Perl.
- 1996–2001 **Postdoctoral Fellow with the Supernova Cosmology Project** at the Lawrence Berkeley National Laboratory. Led the software and lightcurve data analysis effort for four years of successful supernova searches; developed code in IDL, C++, and Perl.
- 1991–1996 **Graduate Student Research Assistant, California Institute of Technology.** Astronomical instrument development, data acquisition and analysis. Wrote the data analysis software (in C and Perl) used to reduce and plot all of the data in a Ph.D. thesis.

Education

- 1997 **Ph.D., Physics, California Institute of Technology.**
Thesis Title: “Spatially Resolved Infrared Spectroscopy of Seyfert Galaxies”
Advisor: B. T. Soifer
- 1992 **M.S., Physics, California Institute of Technology.**
- 1990 **B.S., Physics, Harvey Mudd College.**

Honors and Awards

- 2004 Chancellor’s Award for Research, Vanderbilt University
- 1991-1994 Kodak Fellow, Caltech.
- 1990 Graduated with Honors in Physics and in Humanities/Social Sciences, Harvey Mudd College.
- 1990 Radley Prize in Humanities and Social Sciences, Harvey Mudd College.
- 1987 Platt Prize for outstanding Freshman, Harvey Mudd College.

Computer Skills

• **Programming Languages**

- C (10 years, 1989–1999)
- C++ (10 years, 1999–present)
- Perl (15 years)
- Python (2 years)
- Java (intermittent, 10 years)
- Bash Scripting (intermittent, 7 years)
- PHP (<1 year)
- SQL (10 years, primarily MySQL and PostgreSQL)
- LSL (3 years)
- Familiar with C#, FORTRAN, IDL, Pascal, 6502 & 68000 assembly
- Able to pick up computer languages quickly

• **Programming Utilities & Environments**

- Revision control packages (SVN, Mercurial, CVS)
- GNU autoconf, GNU make, GNU compiler collection
- Linux (13 years)
- Solaris (1991-2000)
- Libraries: CGI, MPI, postgresql, mysql, gtk+, gtkmm, gdome, gsl, others

• **Operations**

- Administering Linux Systems (13 years)
- Linux system software: bind, cups, dhcp, exim, nfs, openssl, samba, ssh, xorg, etc.
- Linux distributions: Debian & Ubuntu (6 years)
- Linux distributions: Previously experienced with Red Hat, Slackware
- Managing Apache 1.3/2 (9 years), including apache tomcat
- Managing MySQL (4 years)
- Managing PostgreSQL (intermittent, 10 years)
- Managing and using large clusters (10 years), including pbs, lsf, mpi

- **Project Experience**

- 2008–2009: Oversaw and managed release of the server software for Second Life. This included managing the merging of disparate development branches of C++, Python, Perl, and PHP code into a single release branch (in an SVN archive), coordinating with QA on the final release testing of that server, and deploying that server software to the thousands of machines that make up the production Second Life environment. This job also included communicating internally and externally about the status of server releases, as well as leading some internal education about our software and about general Linux and networking topics. I also maintained and developed some of the software used by the server, as well software used in the release and deploy process.
- 2007–2008: Was part of the team responsible for daily monitoring of the several-thousand cluster of machines used to run Second Life. This included system administration tasks, monitoring of the server software, and development of scripts and utilities to maintain and monitor this cluster.
- 1998–2003: Rewrote from scratch, twice, the software used for image subtraction and the user interface for scanning image subtractions used to find the supernovae that led to the discovery of the accelerating Universe. This software took multiple telescope images taken in different sky conditions at different times. Images from a “reference” and “search” run were first aligned (by finding objects and performing image transformations), and then summed. The atmospheric blurring of the summed reference and summed search image had to be matched; I did algorithm development to improve this matching. The two images are subtracted, and the difference is scanned for residuals. A user interface (first in IDL, later using C++/gtkmm) then provides scientists with information and images about each of the residuals, and allows updating of a supernova candidate database. The database interface software was written almost entirely by me in C++ and Perl, and used a PostgreSQL backend.
- 1997–2003: Rewrote the basic framework for image reduction and SQL database software, converting the software from IDL to a set of C++ classes. Initially, this database existed as a flat-file that was read and searched in memory whenever anybody would start IDL. Because IDL is a continuing environment, this means that changes made to the database by others before one started the environment weren’t seen. Additionally, while in-memory searches were fast, they did not scale. I converted the database to an SQL database of information about supernova candidates, objects on fields, and header information for images. Combined with a filesystem database of images (indexed by the SQL database), this provided a system that scaled better and allowed for global access to the real-time updated information that was common during a supernova search campaign. Later, I created a CGI interface that allowed remote sites to keep local mirrors of the image data files synced with what is in the database; initially, only those who were able to NFS mount the data disks could make full use of the database.
- 1996–2001: Maintained and oversaw the group of people who worked on the large data analysis package used by the Supernova Cosmology Project, a combination C/IDL package.

- **Cluster Experience**

- For a little more than year, I was a member of the team at Linden Lab who was primarily responsible for day-to-day monitoring and management of the production Second Life environment. This included basic system administration of the ~6,000 Linux machines in the environment, as well as responding to service outages and problems that customers were experiencing with part of the Second Life service. During my second year, I was responsible for the deploy of server software to this cluster of machines, and remained active in the management of it.
- Conversant with MPI. Wrote a fully parallel data analysis program, and a fully parallel cosmology fitting package used to determine estimates of cosmological parameters (mass density, dark energy density) from supernova data. Ran this software in queue environments (e.g. using PBM) on 16 and 32 nodes simultaneously on server farms at Vanderbilt and LBNL.
- Utilized a 32-node cluster as a “node farm” to run single-processor jobs as more data became available. Have built and individually maintained smaller scale clusters, including a 4-node cluster of laptops put together in an ad-hoc fashion at an observatory in Chile for rapid data analysis.

- **Administration, OS, and Other Computer Experience**

- Linden Linux administration detailed above. In addition to regular post-doc duties, was sysadmin for 20-30 Linux servers and workstations (plus a 5-node cluster) for the Supernova Cosmology Project at LBNL. Much of the time these machines used a custom kernel rather than the one packaged with the distribution. I also adapted and rewrote a system for keeping track of configuration files modified from the distribution. With that system, I could wipe a disk, reinstall the operating system, and have all of the configuration file customizations unique to that system reinstalled in little more time than it took to run through the Linux distribution install.
- Closely familiar with the Debian and Ubuntu distributions. Have used Slackware and Red Hat Linux distributions in the past. Have used Knoppix (primarily as a system administration aid), even though the “Knop” does not refer to me.
- Familiar with installing, compiling, and using kernels and system libraries on Linux.
- Familiar with web programming, including HTML and XHTML, CSS, Java applets, CGI; have created and maintained web services using all of those technologies. Have administered Apache web servers. Passingly familiar with PHP and with Javascript/AJAX, but have not yet used it seriously.
- Familiar with OpenOffice.org (Writer, Impress, Draw, Calc), Blender, the Gimp, LaTeX, Xfig, standard Unix shell utilities, and others.
- Past co-creator of the website “The Dramatic Exchange,” and past volunteer webmaster for Grey Ghost Press, Inc.
- Passingly familiar with Solaris (10 years ago), Windows, MacOS, Samba servers for Windows file and printer sharing from Unix.

References

- Piet Hut, Professor of Interdisciplinary Studies, Institute for Advanced Study
- George Djgorovski, Professor of Astronomy, California Institute of Technology
- David Weintraub, Professor of Physics & Astronomy, Vanderbilt University
- Paul Sheldon, Professor of Physics, Vanderbilt University
- Bob Scherrer, Chair, Department of Physics and Astronomy, Vanderbilt University
- Saul Perlmutter, Professor, University of Berkeley and the Lawrence Berkeley National Lab
- C. Richard Chappell, Vanderbilt University
- Robert Stokstad, (retired) Lawrence Berkeley National Lab
- Josh Bell, Linden Lab

Students Advised

- Cameron Pittman, Undergraduate Honors Thesis, Vanderbilt University, 2009
- Anders Jensen, Undergraduate Honors Thesis, Vanderbilt University, 2008 (High Honors)
- Katie Chynoweth, Graduate Student, Vanderbilt University, entered 2005
- Cameron Pittman, Undergraduate Research Student, 2006-present
- Andrew Collazzi, Undergraduate Honors Thesis, Vanderbilt University, 2006
- Eric Smith, MS, Physics, Vanderbilt University, 2005
- Naved Mahmud, Undergraduate Honors Thesis, Vanderbilt University, 2005 (High Honors)
- Jonathan Stricker, Undergraduate Honors Thesis, Vanderbilt University, 2005 (High Honors)
- James Schlaerth, Undergraduate Honors Thesis, Vanderbilt University, 2004 (High Honors)
- René Ortmann, MS, Physics, Vanderbilt University, 2003
- Jessica Hodges, Undergraduate Research, Vanderbilt University, 2002
- K. Sterling Garmond, Summer Undergraduate Research, LBNL, 2000

Professional Activities and Society Memberships

2008–present	The Meta-Institute of Computational Astronomy (www.mica-vw.org)
2006–2007	AAS Shapley Lecturer
2007	Member, AAS Small Research Grants Panel (January)
2005–2007	Member, Extragalactic Time Allocation Committee, NOAO
2004–2005	Referee for <i>The Astrophysical Journal</i>
1999	Referee for <i>The Astronomical Journal</i>
1990–Present	Member, The American Physical Society
1992–Present	Member, The American Astronomical Society
2002–Present	Member, The Astronomical Society of the Pacific
2007–Present	Member, American Association of Physics Teachers

Additional Skills and Experience

- **Music:** Violinist since the age of five, violist since 1995. Was principal second violinist for the Occidental–Caltech Symphony Orchestra, 1990-1996. Currently playing viola with the all-volunteer Nashville Philharmonic.
- **Theatre:** Accomplished amateur actor. Numerous roles acting in, directing, stage managing, and producing community theater productions. Presently involved with a virtual worlds acting group (<http://www.avreptheater.com>)
- **Blogging:** One-time mildly recognized science blogger (<http://www.scienceblogs.com/interactions>); the blog was a combination of personal views on news events, and popular-level descriptions of recent scientific results and basic concepts in physics and astronomy. Current blog: <http://www.sonic.net/~rknop/blog>
- **Unicycle:** Can ride a unicycle forwards, but not backwards.

Invited Talks, Seminars, and Colloquia

- “Dark Energy and the Accelerating Universe.” Belmont University, October, 2009.
- “Dark Energy: The Big Question in Modern Cosmology.” Colgate University physics colloquium, November, 2008.
- “The Discovery of the Accelerating Universe.” Keynote talk at the North Carolina section meeting of the American Association of Physics Teachers, October, 2007.
- “High-Velocity and Relativistic Gas Near the Supermassive Black Holes at the Cores of Galaxies”:
 - East Carolina University, April, 2007.
 - The University of Missouri at Rolla, April, 2007.
 - Texas Tech, Lubbock, TX, March, 2007.
 - Western Kentucky University, February, 2007.
- “Galaxies in Collision”, High Point University, March, 2006.
- “Measuring Cosmology with Type Ia Supernovae”, Division of Particles and Fields, American Physical Society, UCLA, January, 1999.
- “Measuring the Expansion of the Universe with Supernovae”, Harvey Mudd College, November, 1998.

Invited AAS Shapley Lectures

- “The Power of the Dark Side: The Exotic Material That Makes Up Most Of Our Universe” :
 - East Carolina University, April, 2007
 - Univ. of Missouri at Rolla, April, 2007
- “A Modern View of the Expanding Universe”
 - Texas Tech, March, 2007
 - Guilford Technical Community College, March, 2006.
- “Galaxies in Collision”, Westfield State College, May, 2006.

Recent and Selected Outreach Activities

- “Dr. Knop Talks Astronomy,” a bi-weekly public outreach astronomy lecture series given in Second Life in association with MICA, the Meta-Institute of Computational Astronomy. A list of talks given is here: http://www.mica-vw.org/wiki/index.php/Popular_Talks_2008-present.
- Talks at Hypericon V (science fiction convention in Nashville, TN): “How We Know That Dark Matter Exists” and “Constructing a Space Combat Game That Obeys Newton’s Laws”, June, 2009.
- Three podcasts for *365 Days of Astronomy*: January 21, “Observing Quasars with Nature’s Telescope”; February 14, “Astronomical References in Shakespeare”; March 17, “Echoes From a 430-Year-Old Supernova”. 2009.
- Talk at Hypericon IV: “Quantum Teleportation: Entangled States and ‘Spooky Action at a Distance’ ”, June, 2008.
- Talk at Hypericon III: “Newtonian Physics in Science Fiction Movies and TV: the Good, the Bad, and the Ugly”, June, 2007.
- Presentation on the expanding Universe to over 700 high school students over four different sessions to three different schools in and near Greenville, NC, April, 2007.
- “Why ‘Was Einstein Wrong?’ Is the Wrong Question”, the Tennessee Spring Star Party, March, 2007.
- Leader, workshop on “active learning” techniques for introductory astronomy, High Point University, March, 2006.
- “Supermassive Black Holes at the Cores of Galaxies”, the Tennessee Spring Star Party, March, 2006.
- Public-outreach lecture to the Atlanta Astronomy Club on interacting galaxies, May, 2006.
- Public-outreach lecture at Hypericon II, “Black Holes: Misconceptions, and the Even More Startling Truth”, June, 2006.

- Public-outreach lecture at Hypericon II, “A Modern View of the Expanding Universe”, June, 2006.
- A three-part podcast on the expansion of the Universe as part of Dyer Observatory’s “Stellar Conversations” (http://www.vanderbilt.edu/news/stellar_conversations?archive_month=&archive_year=2006&archives=Go), Spring, 2006.
- Talks at Dyer Observatory public nights (2003-2006).
- Talk to the Tennessee Spring Star Party on March 12, 2005: “Interacting Galaxies, the Evolution of Galaxies, the Formation of the Elements, and How All of it Is Necessary for You”
- Featured talk at the Dyer Observatory 50th Anniversary Celebration, December 12, 2003: “From Seyfert Galaxies to the Expansion of the Universe.”

PUBLICATIONS

Refereed Journal Articles

1. S. Nobili, V. Fadeyev, G. Aldering, R. Amanullah, K. Barbary, M. S. Burns, K. S. Dawson, S. E. Deustua, L. Faccioli, A. S. Fruchter, G. Goldhaber, A. Goobar, I. Hook, D. A. Howell, A. G. Kim, R. A. Knop, C. Lidman, J. Meyers, P. E. Nugent, R. Pain, N. Panagia, S. Perlmutter, D. Rubin, A. L. Spadafora, M. Strovink, N. Suzuki, and H. Swift (The Supernova Cosmology Project), “Constraining dust and color variations of high-z SNe using NICMOS on HST.” *The Astrophysical Journal*, 2008, 2009, **700**, 1415–1427
2. S. G. Djorgovski, P. Hut, S. McMillan, E. Vesperini, R. A. Knop, W. Farr, and M. J. Graham, “Exploring the Use of Virtual Worlds as a Scientific Research Platform: The Meta-Institute for Computational Astrophysics (MICA).” FaVE 2009; Lehmann-Grube, F., *et. al.*, eds., ICST Lecture Notes Ser., Berlin: Springer Verlag. astro-ph 0907.3520
3. M. Kowalski, D. Rubin, G. Aldering, R. J. Agostinho, A. Amadon, R. Amanullah, C. Balland, K. Barbary, G. Blanc, P. J. Challis, A. Conley, N. V. Connolly, R. Covarrubias, K. S. Dawson, S. E. Deustua, R. Ellis, S. Fabbro, V. Fadeyev, X. Fan, B. Farris, G. Folatelli, B. L. Frye, G. Garavini, E. L. Gates, L. Germany, G. Goldhaber, B. Goldman, A. Goobar, D. E. Groom, J. Haissinski, D. Hardin, I. Hook, S. Kent, A. G. Kim, R. A. Knop, C. Lidman, E. V. Linder, J. Mendez, J. Meyers, G. J. Miller, M. Moniez, A. M. Mourão, H. Newberg, S. Nobili, P. E. Nugent, R. Pain, O. Perdureau, S. Perlmutter, M. M. Phillips, V. Prasad, R. Quimby, N. Regnault, J. Rich, E. P. Rubenstein, P. Ruiz-Lapuente, F. D. Santos, B. E. Schaefer, R. A. Schommer, R. C. Smith, A. M. Soderberg, A. L. Spadafora, L. G. Strolger, M. Strovink, N. B. Suntzeff, N. Suzuki, R. C. Thomas, N. A. Walton, L. Wang, M. M. Wood-Vasey, and J. L. Yun, “Improved Cosmological Constraints from New, Old, and Combined Supernova Data Sets.” *The Astrophysical Journal*, 2008, **686**, 749–778
4. T. Morokuma, M. Doi, N. Yasuda, M. Akiyama, K. Sekiguchi, H. Furusawa, Y. Ueda, T. Totani, T. Oda, T. Nagao, N. Kashikawa, T. Murayama, M. Ouchi, M. G. Watson, M. W. Richmond, C. Lidman, S. Perlmutter, A. L. Spadafora, G. Aldering, L. Wang, I. M. Hook, and R. A. Knop, “The Subaru/XMM-Newton Deep Survey (SXDS). V. Optically Faint Variable Object Survey.” *The Astrophysical Journal*, 2008, **676**, 163–183.

5. N. Kuznetsova, K. Barbary, B. Connolly, A. G. Kim, R. Pain, N. A. Roe, G. Aldering, R. Amanullah, K. Dawson, M. Doi, V. Fadeyev, A. S. Fruchter, R. Gibbons, G. Goldhaber, A. Goobar, A. Gude, R. A. Knop, M. Kowalski, C. Lidman, T. Morokuma, J. Meyers, S. Perlmutter, D. Rubin, D. J. Schlegel, A. L. Spadafora, V. Stanishev, M. Strovink, N. Suzuki, L. Wang, L., and N. Yasuda, “A New Determination of the High-Redshift Type Ia Supernova Rates with the Hubble Space Telescope Advanced Camera for Surveys.” *The Astrophysical Journal*, 2008, **673**, 981–998.
6. A. Conley, G. Goldhaber, L. Wang, G. Aldering, R. Amanullah, E. D. Commins, V. Fadeyev, G. Folatelli, G. Garavini, R. Gibbons, A. Goobar, D. E. Groom, I. Hook, D. A. Howell, A. G. Kim, R. A. Knop, M. Kowalski, N. Kuznetsova, C. Lidman, S. Nobili, P. E. Nugent, R. Pain, S. Perlmutter, E. Smith, A. L. Spadafora, V. Stanishev, M. Strovink, R. C. Thomas, W. M. Wood-Vasey, “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.” *The Astrophysical Journal*, 2006, **644**, 1–20.
7. M. Sullivan, D. A. Howell, K. Perrett, P. E. Nugent, P. Astier, E. Aubourg, D. Balam, S. Basa, R. G. Carlberg, A. Conley, S. Fabbro, D. Fouchez, J. Guy, I. Hook, H. Lafoux, J. D. Neill, R. Pain, N. Palanque-Delabrouille, C. J. Pritchett, N. Regnault, J. Rich, R. Taillet, G. Aldering, S. Baumont, J. Bronder, M. Filiol, R. A. Knop, S. Perlmutter, C. Tao, “Photometric Selection of High-Redshift Type Ia Supernova Candidates.” *The Astronomical Journal*, 2006, **131**, 960–972.
8. D. A. Howell, M. Sullivan, K. Perrett, T. J. Bronder, I. M. Hook, P. Astier, E. Aubourg, D. Balam, S. Basa, R. G. Carlberg, S. Fabbro, D. Fouchez, J. Guy, H. Lafoux, J. D. Neill, R. Pain, N. Palanque-Delabrouille, C. J. Pritchett, N. Regnault, J. Rich, R. Taillet, R. A. Knop, R. G. McMahon, S. Perlmutter, N. A. Walton, “Gemini Spectroscopy of Supernovae from the Supernova Legacy Survey: Improving High-Redshift Supernova Selection and Classification.” *The Astrophysical Journal*, 2005, **634**, 1190–1201.
9. I. M. Hook, D. A. Howell, G. Aldering, R. Amanullah, M. S. Burns, A. Conley, S. E. Deustua, R. Ellis, S. Fabbro, V. Fadeyev, G. Folatelli, G. Garavini, R. Gibbons, G. Goldhaber, A. Goobar, D. E. Groom, A. G. Kim, R. A. Knop, M. Kowalski, C. Lidman, S. Nobili, P. E. Nugent, R. Pain, C. R. Pennypacker, S. Perlmutter, P. Ruiz-Lapuente, G. Sainton, B. E. Schaefer, E. Smith, A. L. Spadafora, V. Stanishev, R. C. Thomas, N. A. Walton, L. Wang, W. M. Wood-Vasey, “Spectra of High-Redshift Type Ia Supernovae and a Comparison with Their Low-Redshift Counterparts.” *The Astronomical Journal*, 2005, **130**, 2788–2803.
10. G. Garavini, G. Aldering, A. Amadon, R. Amanullah, P. Astier, C. Balland, G. Blanc, A. Conley, T. Dahln, S. E. Deustua, R. Ellis, S. Fabbro, V. Fadeyev, X. Fan, G. Folatelli, B. Frye, E. L. Gates, R. Gibbons, G. Goldhaber, B. Goldman, A. Goobar, D. E. Groom, J. Haissinski, D. Hardin, I. Hook, D. A. Howell, S. Kent, A. G. Kim, R. A. Knop, M. Kowalski, N. Kuznetsova, B. C. Lee, C. Lidman, J. Mendez, G. J. Miller, M. Moniez, M. Mouchet, A. Mouro, H. Newberg, S. Nobili, P. E. Nugent, R. Pain, O. Perdureau, S. Perlmutter, R. Quimby, N. Regnault, J. Rich, G. T. Richards, P. Ruiz-Lapuente, B. E. Schaefer, K. Schahmaneche, E. Smith, A. L. Spadafora, V. Stanishev, R. C. Thomas, N. A. Walton, L. Wang, W. M. Wood-Vasey, “Spectroscopic Observations and Analysis of the Unusual Type Ia SN 1999ac.” *The Astronomical Journal*, 2005, **130**, 2278–2292.

11. S. Nobili, R. Amanullah, G. Garavini, A. Goobar, C. Lidman, V. Stanishev, G. Aldering, P. Antilogus, P. Astier, M. S. Burns, A. Conley, S. E. Deustua, R. Ellis, S. Fabbro, V. Fadeyev, G. Folatelli, R. Gibbons, G. Goldhaber, D. E. Groom, I. Hook, D. A. Howell, A. G. Kim, R. A. Knop, P. E. Nugent, R. Pain, S. Perlmutter, R. Quimby, J. Raux, N. Regnault, P. Ruiz-Lapuente, G. Sainton, K. Schahmaneche, E. Smith, A. L. Spadafora, R. C. Thomas, L. Wang, “Restframe I-band Hubble diagram for type Ia supernovae up to redshift $z \sim 0.5$.” *Astronomy & Astrophysics*, 2005, **437**, 789–804.
12. C. Lidman, D. A. Howell, G. Folatelli, G. Garavini, S. Nobili, G. Aldering, R. Amanullah, P. Antilogus, P. Astier, G. Blanc, M. S. Burns, A. Conley, S. E. Deustua, M. Doi, R. Ellis, S. Fabbro, V. Fadeyev, R. Gibbons, G. Goldhaber, A. Goobar, D. E. Groom, I. Hook, N. Kashikawa, A. G. Kim, R. A. Knop, B. C. Lee, J. Mendez, T. Morokuma, K. Motohara, P. E. Nugent, R. Pain, S. Perlmutter, V. Prasad, R. Quimby, J. Raux, N. Regnault, P. Ruiz-Lapuente, G. Sainton, B. E. Schaefer, K. Schahmaneche, E. Smith, A. L. Spadafora, V. Stanishev, N. A. Walton, L. Wang, W. M. Wood-Vasey, and N. Yasuda, “Spectroscopic confirmation of high-redshift supernovae with the ESO VLT.” *Astronomy & Astrophysics*, 2005, **430**, 843-851.
13. G. Garavini, G. Folatelli, A. Goobar, S. Nobili, G. Aldering, A. Amadon, R. Amanullah, P. Astier, C. Balland, G. Blanc, M. S. Burns, A. Conley, T. Dahlén, S. E. Deustua, R. Ellis, S. Fabbro, X. Fan, B. Frye, E. L. Gates, R. Gibbons, G. Goldhaber, B. Goldman, D. E. Groom, J. Haissinki, D. Hardin, I. M. Hook, D. A. Howell, D. Kasen, S. Kent, A. G. Kim, R. A. Knop, B. C. Lee, C. Lidman, J. Mendez, G. J. Miller, M. Moniez, A. Mourão, H. Newberg, P. E. Nugent, R. Pain, O. Perdureau, S. Perlmutter, V. Prasad, R. Quimby, J. Raux, N. Regnault, J. Rich, G. T. Richards, P. Ruiz-Lapuente, G. Sainton, B. E. Schaefer, K. Schahmaneche, E. Smith, A. L. Spadafora, V. Stanishev, N. A. Walton, L. Wang, and W. M. Wood-Vasey, “Spectroscopic Observations and Analysis of the Peculiar SN 1999aa.” *The Astronomical Journal*, 2004, **128**, 387–404.
14. R. A. Knop, G. Aldering, R. Amanullah, P. Astier, G. Blanc, M. S. Burns, A. Conley, S. E. Deustua, M. Doi, R. Ellis, S. Fabbro, G. Folatelli, A. S. Fruchter, G. Garavini, S. Garmond, K. Garton, R. Gibbons, G. Goldhaber, A. Goobar, D. E. Groom, D. Hardin, I. Hook, D. A. Howell, A. G. Kim, B. C. Lee, C. Lidman, J. Mendez, S. Nobili, P. E. Nugent, R. Pain, N. Panagia, C. R. Pennypacker, S. Perlmutter, R. Quimby, J. Raux, N. Regnault, P. Ruiz-Lapuente, G. Sainton, B. Schaefer, K. Schahmaneche, E. Smith, A. L. Spadafora, V. Stanishev, M. Sullivan, N. A. Walton, L. Wang, W. M. Wood-Vasey, and N. Yasuda, “New Constraints on Ω_M and Ω_Λ , and w from an Independent Set of 11 High-Redshift Supernovae Observed with the Hubble Space Telescope.” *The Astrophysical Journal*, 2003, **598**, 102–137.
15. S. Nobili, A. Goobar, R. A. Knop, and P. Nugent, “The intrinsic colour dispersion in Type Ia supernovae.” *Astronomy & Astrophysics*, 2003, **404**, 901–912.
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- R. A. Knop, “Textbooks as Intellectual Activity? Supporting Textbooks Without Outlawing Used Books.” *Astronomy Education Review*, 2006, vol. 5.

Selected Contributed Talks and Presentations

- K. M. Chynoweth, R. A. Knop, & R. A. Gibbons, “An Optical Datacube of Seyfert/Starburst Composite Galaxy NGC1365,” the American Astronomical Society, January, 2007 (BAAS 209.217.06)
- R. A. Knop, K. M. Chynoweth, R. A. Gibbons, N. Mahmud, & J. Stricker, “Optical Datacubes of Luminous Infrared Galaxies NGC 7130 and VV 114,” the American Astronomical Society, January, 2006.
- R. A. Knop, “Three-Dimensional Animations for Introductory Astronomy,” the American Astronomical Society, January, 2005 (BAAS 205.9507)
- R. A. Gibbons, R. A. Knop, N. Kuznetsova, & the Supernova Cosmology Project, “Supernovae at $z > 1.2$ Discovered with ACS on HST”
- R. A. Knop, “Application of Active Learning Techniques to an Advanced Course,” the American Astronomical Society, June, 2004 (BAAS 204.2602)
- J. A. Schlaerth, R. A. Knop, & the Supernova Cosmology Project, “High Redshift Type Ia Supernova Lightcurves,” the American Astronomical Society, June, 2004 (BAAS 204.6316) (J. Schlaerth was a senior undergraduate advisee of Robert Knop)
- E. Smith, *et al.*, “Optical Spectroscopy of High-Redshift Supernovae Used in Determination of Cosmological Parameters,” the American Astronomical Society, January, 2004 (BAAS 203.4505) (E. Smith is a graduate student advisee of Robert Knop)
- R.A. Knop, *et al.*, “A New High-Redshift SN Ia Dataset that Addresses Extinction Questions in Cosmology Measurements,” the American Astronomical Society, May, 2003 (BAAS 202.5403)
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