

Stéphane Blondin

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Education

- 2002-2005** **Ph.D. in Astronomy** (*magna cum laude*)
European Southern Observatory (ESO), Ludwig-Maximilians-Universität München
International Max-Planck Research School on Astrophysics (IMPRS)
Thesis: *Optical Spectra of Thermonuclear Supernovae in the Local and Distant Universe* (Supervisor: Bruno Leibundgut)
- 1998-2002** **Master of Physics** (*First class honours*)
University of Southampton (UK)
- 1997** **French Scientific Baccalauréat with International Option** (*70% average*)
Lycée International de Saint Germain en Laye (France)

Research Activities

- Nov. 2005-** **Postdoctoral Fellow, Harvard-Smithsonian Center for Astrophysics**
- Leader of the *CfA Supernova Program* for spectral identification and follow-up of supernovae,
 - Creator of the *CfA Supernova Archive* of supernova observations,
 - Lead spectroscopist in the *ESSENCE* project; co-author of the Supernova Identification (SNID) code to determine the type, redshift, and age of SN spectra.
- 2002-2005** **Ph.D. Thesis, European Southern Observatory**
- Manager of *VLT* data for the *ESSENCE* project,
 - New spectral extraction method based on the Richardson-Lucy algorithm,
 - NLTE modeling of spectral line profiles in SN Ia to compare physical properties of these objects at different redshifts.

Research Interests

Cosmology Cosmology and Type Ia supernovae; SN Ia evolution with redshift; Dark Energy
Supernovae Supernova spectra, observation and modeling
Algorithms Spectral restoration and cross-correlation algorithms

Awards

- 2007** “Initiative Postdoc” Grant from the French Ministry of Research
2003 NATO Advanced Study Institute Grant
2002-2005 ESO-IMPRS Studentship
2002 University of Southampton Physics and Astronomy Departmental Prize
2001 University of Southampton Physics and Astronomy Departmental Prize

Student Supervision

Ph.D.	<i>Optical Light Curves of Local Type Ia Supernovae</i> (Malcolm Hicken, Harvard University Physics Department; from 2006)
Bachelor	<i>Characterization of Atmospheric Transmission for the LSST</i> (Bailes Brown, Harvard University Physics Department; 2006)

Observing Experience

Programs	PI on ESO-VLT program <i>Host Galaxies of High-Redshift Type Ia Supernovae</i> Co-I on several ESO-VLT, Gemini, Magellan, MMT, NOAO, FLWO proposals
Observations	VLT+FORIS1/2; Gemini+GMOS; Magellan+LDSS2/3; FLWO 1.5m+FAST

Professional Activities

AAS	Full member since 2005
ESO	Cosmology panel secretary for the <i>ESO Observing Programmes Committee</i> (2003,2004)
Referee	<i>Astronomy & Astrophysics</i> (2 papers in 2006)

Computer Knowledge

Programming	Fortran, IDL, C, shell, awk, perl
Astronomy	IRAF, Pyraf
OS	UNIX & Linux, Mac OS X

Languages

French	mother tongue
English	bilingual
Spanish	excellent oral and written comprehension
German	good oral and written comprehension

References

Prof. Robert Kirshner (Harvard, CfA)
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Prof. Christopher Stubbs (Harvard, CfA)
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Prof. John Tonry (IfA, Hawaii)
Institute for Astronomy, 2680 Woodlawn Dr., Honolulu, HI 96822, Hawaii
e-mail: jt@ifa.hawaii.edu; Phone: +1 (808) 956-8701

Dr. Jeremy Walsh (ESO)
Karl-Schwarzschild-Strasse 2, D-85748 Garching bei München, Germany
e-mail: jwalsh@eso.org; Phone: +49 (0) 89 320 06 248

Refereed Publications

- 2008+** [19] *Constraining Cosmic Evolution of Type Ia supernovae*
Foley, R. J., Filippenko, A. V., Aguilera, C., Becker, **Blondin, S.**, Challis, P., Clocchiatti, A., Covarrubias, R., Davis, T. M., Garnavich, P. M., Jha, S., Kirshner, R. P., Krisciunas, K., Leibundgut, B., Li, W., Matheson, T., Miceli, A., Miknaitis, G., Pignata, G., Rest, A., Riess, A. G., Schmidt, B. P., Smith, R. C., Sollerman, J., Spyromilio, J., Stubbs, C. W., Suntzeff, N. B., Tonry, J. L., Wood-Vasey, W. M., Zenteno, A. 2007. Submitted to ApJ on 11 October 2007 (astro-ph/0710.2338).
- [18] *Optical Spectroscopy of Type Ia Supernovae*
Matheson, T., Kirshner, R. P., Challis, P., Jha, S., Garnavich, P. M., Berlind, P., Calkins, M., **Blondin, S.**, Balog, Z., Bragg, A. E., Caldwell, N., Dendy Concannon, K., Falco, E. E., Graves G. J. M., Huchra, J. P., Kuraszkiewicz, J., Mader, J. A., Mahdavi, A., Phelps, M., Rines, K., Song, I., Wilkes, B. J. 2007. Submitted to AJ on 20 August 2007.
- [17] *Using Quantitative Spectroscopic Analysis to Determine the Properties and Distances of Type II-Plateau Supernovae: SNe 2005cs and 2006bp*
Dessart, L., **Blondin, S.**, Brown, P. J., Hicken, M., Hillier, J. L., Holland, S. T., Immler, S., Kirshner, R. P., Milne, P., Modjaz, M., Roming, P. W. A. 2007. Submitted to ApJ on 12 July 2007.
- [16] *Spectral Identification of an Ancient Supernova using Light Echoes in the LMC*
Rest, A., Matheson, T., **Blondin, S.**, Bergmann, M., Welch, D. L., Suntzeff, N. B., Smith, R. C., Olsen, K., Prieto, J. L., Garg, A., Challis, P., Stubbs, C. W., Hicken, M., Modjaz, M., Wood-Vasey, W. M., Zenteno, A., Damke, G., Newman, A., Huber, M., Cook, K. H., Nikolaev, S., Becker, A. C., Miceli, A., Covarrubias, R., Morelli, L., Pignata, G., Clocchiatti, A., Minniti, D. 2007. Submitted to ApJ on 9 July 2007.
- 2007** [15] *The Luminous and Carbon-Rich Supernova 2006gz: A Double Degenerate Merger?*
Hicken, M., Garnavich, P. M., Prieto, J. L., **Blondin, S.**, DePoy, D. L., Kirshner, R. P., Parrent, J. 2007. Accepted for publication in ApJ Letters (astro-ph/0709.1501).
- [14] *Towards More Precise Survey Photometry for PanSTARRS and LSST: Measuring Directly the Optical Transmission Spectrum of the Atmosphere*
Stubbs, C. W., High, F. W., George, M. R., DeRose, K. L., **Blondin, S.**, Tonry, J. L., Chambers, K. C., Granett, B. R., Burke, D. L., Smith, R. C. 2007. Accepted for publication in PASP (astro-ph/0708.1364).
- [13] *Determining the Type, Redshift, and Age, of a Supernova Spectrum*
Blondin, S. & Tonry, J. L. 2007. ApJ, 666, 1024.
- [12] *Scrutinizing exotic cosmological models using ESSENCE data combined with other cosmological probes*
Davis, T. M., Mörtzell, E., Sollerman, J., Aguilera, C., Becker, A. C., Blackman, J. W., **Blondin, S.**, Challis, P., Chornock, R., Clocchiatti, A., Covarrubias, R., Filippenko, Foley, R. J., A. V., Garg, A., Garnavich, P. M., Hicken, M., Jha, S., Krisciunas, K., Kirshner, R. P., Leibundgut, B., Li, W., Matheson, T., Miceli, A., Miknaitis, G., Narayan, G., Prieto, J. L., Rest, A., Riess, A. G., Salvo, M. E., Schmidt, B. P., Smith, R. C., Spyromilio, J., Stubbs, C. W., Suntzeff, N. B., Tonry, J. L., Wood-Vasey, W. M., Zenteno, A. 2007. ApJ, 666, 716.
- [11] *The ESSENCE Supernova Survey: Survey Optimization, Observations, and Supernova Photometry*
Miknaitis, G., Pignata, G., Rest, A., Wood-Vasey, W. M., **Blondin, S.**, Challis, P., Smith, R. C., Stubbs, C. W., Suntzeff, N. B., Foley, R. J., Matheson, T., Tonry, J. L., Aguilera, C., Blackman, J. W., Becker, A. C., Clocchiatti, A., Covarrubias, R., Davis, T. M., Filippenko, A. V., Garg, A., Garnavich, P. M., Hicken, M., Jha, S., Krisciunas, K., Kirshner, R. P., Leibundgut, B., Li, W., Miceli, A., Narayan, G., Prieto, J. L., Riess, A. G., Salvo, M. E., Schmidt, B. P., Sollerman, J., Spyromilio, J., Zenteno, A. 2007. ApJ, 666, 694.

- [10] *Observational Constraints on the Nature of the Dark Energy: First Cosmological Results from the ESSENCE Supernova Survey*
Wood-Vasey, W. M., Miknaitis, G., Stubbs, C. W., Jha, S., Riess, A. G., Garnavich, P. M., Kirshner, R. P., Aguilera, C., Becker, A. C., Blackman, J. W., **Blondin, S.**, Challis, P., Clocchiatti, A., Conley, A., Covarrubias, R., Davis, T. M., Filippenko, A. V., Foley, R. J., Garg, A., Hicken, M., Krisciunas, K., Leibundgut, B., Li, W., Matheson, T., Miceli, A., Narayan, G., Pignata, G., Prieto, J. L., Rest, A., Salvo, M. E., Schmidt, B. P., Smith, R. C., Sollerman, J., Spyromilio, J., Tonry, J. L., Suntzeff, N. B., Zenteno, A. 2007. *ApJ*, 666, 674.
- [9] *Early Ultraviolet, Optical and X-Ray Observations of the Type IIP SN 2005cs in M51 with Swift*
Brown, P. J., Dessart, L., Holland, S. T., Immler, S., Landsman, W., **Blondin, S.**, Blustin, A. J., Breeveld, A., Dewangan, G. C., Gehrels, N., Hutchins, R. B., Kirshner, R. P., Mason, K. O., Mazzali, P. A., Milne, P., Modjaz, M., Roming, P. W. A. 2007. *ApJ*, 659, 1488.
- [8] *Light Curves of Type Ia Supernovae from Near the Time of Explosion*
Garg, A., Stubbs, C. W., Challis, P., Wood-Vasey, W. M., **Blondin, S.**, Huber, M. E., Cook, K., Nikolaev, S., Rest, A., Smith, R. C., Olsen, K., Suntzeff, N. B., Aguilera, C., Prieto, J. L., Becker, A., Miceli, A., Miknaitis, G., Clocchiatti, A., Minniti, D., Morelli, L., Welch, D. L. 2007. *AJ*, 133, 403.
- 2006 [7] *Early-Time Photometry and Spectroscopy of the Fast Evolving SN 2006aj Associated with GRB 060218*
Modjaz, M., Stanek, K. Z., Garnavich, P. M., Berlind, P., **Blondin, S.**, Brown, W., Calkins, M., Challis, P., Diamond-Stanic, A. M., Hao, H., Hicken, M., Kirshner, R. P., Prieto, J. L. 2006. *ApJ*, 645, L21.
- [6] *Using Line Profiles to Test the Fraternity of Type Ia Supernovae at High and Low Redshifts*
Blondin, S., Dessart, L., Leibundgut, B., Branch, D., Höflich, P., Tonry, J. L., Matheson, T., Foley, R. J., Chornock, R., Filippenko, A. V., Sollerman, J., Spyromilio, J., Kirshner, R. P., Wood-Vasey, W. M., Clocchiatti, A., Aguilera, C., Barris, B., Becker, A. C., Challis, P., Covarrubias, R., Davis, T. M., Garnavich, P., Hicken, M., Jha, S., Krisciunas, K., Li, W., Miceli, A., Miknaitis, G., Pignata, G., Prieto, J. L., Rest, A., Riess, A. G., Salvo, M. E., Schmidt, B. P., Smith, R. C., Stubbs, C. W., Suntzeff, N. B. 2006. *AJ*, 131, 1648.
- 2005 [5] *Hubble Space Telescope Observations of Nine High-Redshift ESSENCE Supernovae*
Krisciunas, K., Garnavich, P. M., Challis, P., Prieto, J. L., Riess, A. G., Barris, B., Aguilera, C., Becker, A. C., **Blondin, S.**, Chornock, R., Clocchiatti, A., Covarrubias, R., Filippenko, A. V., Foley, R. J., Hicken, M., Jha, S., Kirshner, R. P., Leibundgut, B., Li, W., Matheson, T., Miceli, A., Miknaitis, G., Rest, A., Salvo, M. E., Schmidt, B. P., Smith, R. C., Sollerman, J., Spyromilio, J., Stubbs, C. W., Suntzeff, N. B., Tonry, J. L., Wood-Vasey, W. M. 2005. *AJ*, 130, 2453.
- [4] *Spectroscopy of High-Redshift Supernovae from the ESSENCE Project: The First 2 Years*
Matheson, T., **Blondin, S.**, Foley, R. J., Chornock, R., Filippenko, A. V., Leibundgut, B., Smith, R. C., Sollerman, J., Spyromilio, J., Kirshner, R. P., Clocchiatti, A., Aguilera, C., Barris, B., Becker, A. C., Challis, P., Covarrubias, R., Garnavich, P., Hicken, M., Jha, S., Krisciunas, K., Li, W., Miceli, A., Miknaitis, G., Prieto, J. L., Rest, A., Riess, A. G., Salvo, M. E., Schmidt, B. P., Stubbs, C. W., Suntzeff, N. B., Tonry, J. L. 2005. *AJ*, 129, 2352.
- [3] *Extracting clean supernova spectra. Towards a quantitative analysis of high-redshift Type Ia supernova spectra*
Blondin, S., Walsh, J. R., Leibundgut, B., Sainon, G. 2005. *A&A*, 431, 757.

[2] *The Hubble Higher z Supernova Search: Supernovae to $z \sim 1.6$ and Constraints on Type Ia Progenitor Models*

Strolger, L.-G., Riess, A. G., Dahlen, T., Livio, M., Panagia, N., Challis, P., Tonry, J. L., Filippenko, A. V., Chornock, R., Ferguson, H., Koekemoer, A., Mobasher, B., Dickinson, M., Giavalisco, M., Casertano, S., Hook, R., **Blondin, S.**, Leibundgut, B., Nonino, M., Rosati, P., Spinrad, H., Steidel, C. C., Stern, D., Garnavich, P. M., Matheson, T., Grogin, N., Hornschemeier, A., Kretchmer, C., Laidler, V. G., Lee, K., Lucas, R., de Mello, D., Moustakas, L. A., Ravindranath, S., Richardson, M., Taylor, E. 2004. ApJ, 613, 200.

[1] *Twenty-Three High-Redshift Supernovae from the Institute for Astronomy Deep Survey: Doubling the Supernova Sample at $z > 0.7$*

Barris, B. J., Tonry, J. L., **Blondin, S.**, Challis, P., Chornock, R., Clocchiatti, A., Filippenko, A. V., Garnavich, P., Holland, S. T., Jha, S., Kirshner, R. P., Krisciunas, K., Leibundgut, B., Li, W., Matheson, T., Miknaitis, G., Riess, A. G., Schmidt, B. P., Smith, R. C., Sollerman, J., Spyromilio, J., Stubbs, C. W., Suntzeff, N. B., Aussel, H., Chambers, K. C., Connelley, M. S., Donovan, D., Henry, J. P., Kaiser, N., Liu, M. C., Martín, E. L., Wainscoat, R. J. 2004. ApJ, 602, 571.

Non-Refereed Publications

2006 [4] *Determining the Type, Redshift, and Phase of a Supernova Spectrum*
Blondin, S., & Tonry, J. L. 2006. Proceedings of “The Multicoloured Landscape of Compact Objects and their Explosive Progenitors: Theory vs Observations”, Cefalù, Sicily, June 2006 (astro-ph/0612512).

2005 [3] *Supernova Cosmology and the ESSENCE project*
 Sollerman, J., Aguilera, C., Becker, A., **Blondin, S.**, Challis, P., Clocchiatti, A., Filippenko, A., Foley, R., Garnavich, P. M., Hicken, M., Jha, S., Kirshner, R., Krisciunas, K., Leibundgut, B., Li, W., Matheson, T., Miknaitis, G., Rest, A., Riess, A. G., Salvo, M. E., Schmidt, B. P., Smith, C., Spyromilio, J., Stubbs, C., Suntzeff, N. B., Tonry, J. L., Wood-Vasey, M., Barris, B., Davis, T., Mortsell, E. 2005. Proceedings of the 13th General Conference of the European Physical Society, EPS-13, “Beyond Einstein – Physics for the 21st Century”, Bern, Switzerland, July 2005, (astro-ph/0510026).

2003 [2] *Evidence for dark energy from Type Ia supernovae*
 Leibundgut, B., & **Blondin, S.** 2003. Proceedings of the 8th International Workshop on Topics in Astroparticle and Underground Physics (TAUP), University of Washington, Seattle, September 2003.

2002 [1] *Spectroscopy of High-Redshift Type Ia Supernovae – Impacts on Cosmology*
Blondin, S. 2003. Proceedings of the Laboratoire d’Astrophysique de Marseille (LAM) IVth International Cosmology Conference, “Where Cosmology and Fundamental Physics Meet”, Marseille, France, June 2003.

Including 123 IAU circulars; 12 conference posters.

Invited Seminars

2007 [11] *The CfA Supernova Program and Supernova Identification*
 Type Ia Supernovae and Dark Energy Workshop, ASC / Alliance Center for Astrophysical Thermonuclear Flashes at the University of Chicago, IL, USA, October 2007.

[10] *The diversity of Type Ia Supernovae*
 Invited talk at the Dark Energy Workshop, Niels Bohr Institute, Copenhagen, Denmark, August 2007

- [9] *Determining the Type, Redshift, and Age of a Supernova Spectrum*
Seminar at the Observatoire Astronomique de Marseille Provence, Marseille, France, May 2007
- [8] *Determining the Type, Redshift, and Age of a Supernova Spectrum*
Harvard-Smithsonian Center for Astrophysics Optical and Infrared Division Lunch Talk, Cambridge, MA, USA, April 2007
- [7] *How to Classify Spectra of Exploding Stars (?)*
Harvard Astrostatistics seminar, Harvard University, Cambridge, MA, USA, March 2007
- 2006** [6] *Determining the Type, Redshift, and Phase, of a Supernova Spectrum*
Fermilab Particle Astrophysics Seminar, Fermilab, Batavia, IL, USA, November 2006.
- [5] *How to Determine the Type, Redshift, and Phase, of a Supernova Spectrum*
GEPI Seminar, Meudon, France, October 2006.
- [4] *The CfA Supernova Program*
Type Ia Supernovae and Dark Energy Workshop, ASC / Alliance Center for Astrophysical Thermonuclear Flashes at the University of Chicago, IL, USA, September 2006.
- 2005** [3] *Using line profiles to test the fraternity of Type Ia supernovae at high and low redshifts*
Harvard-Smithsonian Center for Astrophysics Optical and Infrared Division Lunch Talk, Cambridge, MA, USA, September 2005.
- 2004** [2] *Job Possibilities in Astronomy*
Lecture at the 1st NEON Archive Observing School, ESO, Garching, Germany, July 2004.
- 2003** [1] *High-Redshift Type Ia Supernova Search – Current Status of the ESSENCE Project*
Seminar at the Observatoire Astronomique de Marseille Provence, Marseille, France, October 2003.