Timothy R. Young

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Education:

University of Wisconsin-Madison	Physics and Astrophysics	B.S.	1987
University of Oklahoma	Physics and Astrophysics	PhD	1994
Wichita State University	Synthetic Stellar Spectra		1994 – 1995
University of Tokyo	Supernova Hydrodynamics		1995 – 1998
University of Arizona	Supernova Neutrino Transport		1998 – 2000

Professional Experience:

2006-present	Associate Professor, Department of Physics, University of North Dakota
2000-2006	Assistant Professor, Department of Physics, University of North Dakota
1998-2000	Postdoctoral Research, Supernova/Neutrino research, Department of Astronomy, Steward Observatory, University of Arizona
3/1-11/1 1998	NSF-JSPS Postdoctoral Fellowship, Supernova research, University of Tokyo, Japan
1997-1998	COE Postdoctoral Fellowship, Supernova research, NAO, Japan
1995-1997	NSF-JSPS Postdoctoral Fellowship, Supernova research, University of Tokyo, Japan
1994-1995	Postdoctoral Research, Red Giant Atmospheres, Wichita State University, KS
1987-1994	Supernova research, Graduate Student, University of Oklahoma
1986-1987	Independent research of the HI Warp of the Galaxy, University of Wisconsin-Madison

Teaching:

2000-present	Assoc. Professor: Introductory Astronomy, Astrophysics I & II, Computational Physics, Nuclear Physics, University of North Dakota
Summer 2000	Instructor: Natural Science 102, University of Arizona
Spring 2000	Instructor: Astronomy lecture and laboratory, Pima Community College, Tucson, AZ

Awards and Honors:

2003	New Faculty Award, UND
1998 & 1995	NSF-JSPS Postdoctoral Fellowship, University of Tokyo, Japan

Professional Society Memberships

American Astronomical Society, Sigma Xi

Areas of Expertise

Supernovae, Numerical Radiation Hydrodynamics, Cool Star Atmospheres, Core Collapse, Neutrino Physics, Multi-dimensional Hydrodynamics, Robotic Telescopes, Image Analysis

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Selected Relevant Refereed Publications and Observations:

1. Lawlor, T, Young, T, Johnson, T, MacDonald, J, "Single and Binary Evolution of Population III stars and their Supernova Explosions, Accepted MNRAS 2007.
2. Young, T.R., "Shockwave Caught On Camera", Nature, **449**, 992, 2006.
3. Branch, D., Jeffery, D., Young, T.R., Baron, E., "Hydrogen in Type Ic Supernovae?", PASP, **118**, 791, 2006.
4. Young, T.R., Smith, D., & Johnson, T.A.., "An Optical Afterglow Model for the Bright Type II – Linear Supernovae", ApJL, **625**, L87, 2005.
5. Young, T.R., "A Parameter Study of Type II Supernova Light Curves Using 6 Solar Mass Cores", ApJ, **617**, 1233, 2004.
6. Turatto, M., et al., ``The Properties of Supernova 1997cy associated to GRB970514", ApJL, **534**, L57, 2000.

Significant Refereed Publications:

1. Burrows, A., Young, T., et al., ``Supernova neutrinos and a new algorithm for neutrino transport", ApJ, **539**, 865, 2000.
2. Galama, T.J., et al., ``An Unusual Supernovae in the Error Box of the gamma-ray Burst of 25 April 1998", Nature, **395**, 670, 1998.
3. Young, T.R., and Shigeyama, T., "Binary Supernova: A theoretical study of double explosions", Astronomische Nachrichten, **320**, 345, 1999.
4. Turatto, M., et al., ``The Peculiar Type II Supernova 1997D: a case for very low Ni mass", ApJL, **498**, L129, 1998.
5. Iwamoto, K., et al., ``A hypernova model for the supernova associated with the gamma-ray burst of 25 April 1998", Nature, **395**, 672, 1998.

Synergistic Activities:

1. ND-STRIPE Workforce for Student Rocket and Payloads, funded NASA SGC.
2. Co-PI on funded NSF-REU site for Physics at University of North Dakota.
3. Sun Earth Moon System – Changing Misconceptions In Astronomy, NSF Pending proposal, 4 Co-PI's working with Informal Education Groups.
4. Initiated Cluster Computing Laboratory – Hands-on development and experimentation lab for undergraduates, 16-node, 8-node, 5-node clusters.
5. Developed TOAST/CRUST – Two remote, robotic telescopes, extrasolar transit planets, gamma-ray burst afterglows, supernovae photometry, asteroid astrometry.
6. Multi-group Radiation hydrodynamic code development using Sutherland code.

Collaborators:

Timothy Lawlor – Penn State University, Delaware County, James MacDonald – University of Delaware, Ronald Marsh, Dean Smith, and Tricia Johnson - University of North Dakota

<u>Postdoctoral Advisors:</u>

David Alexander – Wichita State University

Ken Nomoto – University of Tokyo, Japan, Adam Burrows – University of Arizona

<u>Thesis Advisors:</u>

David Branch, Eddie Baron – University of Oklahoma

Refereed Publications

1. Young, T.R., Branch, D., 1988, "Supernovae 1909A: A Precedent for SN 1987A?", Nature, 333, 305.

2. Young, T.R., Branch, D., 1989, "Absolute Light Curves of Type II Supernovae", ApJ, 342, L79.

3. Baron, E., Young, T.R., Branch, D., 1993, "On The Progenitor of SN 1984L", ApJ, 409, 417.

4. Young, T.R., Baron, E., Branch, D., 1993, "SN 1984L and its Problematic Progenitor" in *First Symposium On Nuclear Physics in the Universe*, ed. M.R. Strayer (IOP Publishing Ltd,).

5. Young, T.R., 1994, "A Parameter Study of Absolute Type II Supernova Light Curves", Ph.D., University of Oklahoma.

6. Young, T.R., Baron, E., Branch, D., 1994, "The Light Curves of SN 1993J and SN 1994I", ApJ, 449, L51.

7. Baron, E., Hauschidt, P.H., Young, T.R., 1995, "Supernova 1993J: One year later", Physics Reports, 256, 23.

8. Young, T.R., Nomoto, K., Shigeyama, T., Iwamoto, I., 1996, "SN Ia light curve models vs. observations", Cosmological Constant and the Evolution of the Universe, eds. Sato, K., Suginhara, T., Sugiyama, N., 315.

9. Nomoto, K., Iwamoto, K.,Nakasato, N., Thieleman, F.-K., Brachwitz, F., Young, T., *et al.*, 1997, "Type Ia supernovae: Nucleosynthesis and constraints on progenitors", Thermonuclear Supernovae, eds. Ruiz-Lapuente, P., Canal, R., Isern, J., NATO ASI 486, 349.

10. Nomoto, K., Iwamoto, K., Young, T.R., Nakasato, N., Suzuki, T., 1997, "Type Ib-Ic-IIb-IIL supernovae: Common envelope evolution, instabilities, and circumstellar interaction", Thermonuclear Supernovae, eds. Ruiz-Lapuente, P., Canal, R., Isern, J., NATO ASI 486, 839.

11. Iwamoto, K., Young, T.R., Nakasato, N., Shigeyama, T., Nomoto, K., Hachisu, I., Saio, H., 1997, "Instabilities and Mixing in SN 1993J", ApJ, 477, 865.

12. Young, T.R., Shigeyama, T., Suzuki, T., 1997, "A double supernova model for the Vela supernova remnant", X-ray Imaging and Spectroscopy of Cosmic Hot Plasmas", eds. Makino, F. and Mitsuda, K., 405.

13. Young, T.R., Nomoto, K., Mazzali, P.A., Iwamoto, K., Turatto, M., 1998, "Low ^{56}Ni Ejection in Type II Supernovae", Origin of Matter and Evolution of Galaxies, eds. Kubono, S., Kajino, T., Nomoto, K., Tanihata, I., 318.

14. Turatto, M., Mazzali, P.A., Young, T.R., Nomoto, K., Koichi, K., *et al.*, 1998, "The Peculiar Type II Supernova 1997D: a case for very low Ni mass", ApJ, 498, L129.

15. Galama, T.J., Vreeswijk, P.M., van Paradijs, J., Kouveliotou, Augusteijn, T., Böhnhardt, H., Brewer, J.P., Doublier, V., Gonzalez, J.-F., Leibundgut, B., Lidman, C., Hainaut, O.R., Patat, F., Heise, J., in't Zand, J., Hurley, K., Groot, P.J., Strom, R.G., Mazzali, P.A., Iwamoto, K., Nomoto, K., Umeda, H., Nakamura, T., Young, T.R., *et al.*, 1998, "An Unusual Supernovae in the Error Box of the γ-ray Burst of 25 April 1998", Nature, 395, 670.

16. Iwamoto, K., Mazzali P.A., Nomoto, Umeda, H., Nakamura, T., Patat F., Danziger, I.J., Young, T.R., *et al.*, 1998, "A hypernova model for the supernova associated with the γ-ray burst of 25 April 1998", Nature, 395, 672.

17. Young, T.R., Shigeyama, T., 1999, "Binary supernova: A theoretical study of double explosions", Astronomische Nachrichten, 320, 345. August.

18. Turatto, M., Suzuki, T. Mazzali, P. A., Benetti, S., Cappellaro, E., Danziger, I. J., Nomoto, K., Nakamura, T., Young, T. R., Patat, F. Turatto, M., 1999 "The Properties of Supernova 1997CY Associated with GRB 970514", ApJL, 534, L57

19. Burrows, A., Young, T., Pinto, P., Eastman, R., Thompson, T., 2000, "Supernova neutrinos and a new algorithm for neutrino transport", ApJ, 539, 865.

20. Burrows, A. & Young, T., 2000, "Supernova Neutrinos", Physica Scripta, T85, 127.

21. Burrows, A. & Young, T., 2000, "Neutrinos and Supernova Theory", Physics Reports, 333, 63.

22. Mazzali, P. A., Cappellaro, E., Turatto, M., Benetti, S., Patat, F., Danziger, I. J., Nomoto, K., Young, T. R., Iwamoto, K, 2000, "Inhomogeneity of SN types: results, implications and future prospects", Mem. Soc. Astron. Ital., 71, 411.

23. Marsh, R., Young, T.R., Johnson, T., Smith, D., 2004, "Enhancement of Small Telescope Images Using Super Resolution Techniques", PASP, 116, 477.

24. Young, T.R., 2004, "A Parameter Study Of Type II Light Curves Using 6 $M_\odot$ Cores", ApJ, 617, 1233.

25. Young, T.R., Smith, D. & Johnson, T.A., 2005, "An Optical Afterglow Model for Bright Linear Type II Supernovae", ApJLetters, 625, L87.

26. Young, T.R., 2006, Shockwave Caught On Camera", Nature, 449, 992, 2006.

27. Branch, D., Jeffery, D., Young, T.R., Baron, E., 2006, "Hydrogen in Type Ic Supernovae?", PASP, 118, 791.

28. Lawlor, T, Young, T, Johnson, T, MacDonald, J, 2007, "Single and Binary Evolution of Population III stars and their Supernova Explosions, Accepted MNRAS.

29. Lawlor, T. & Young, T.R., 2008, "The Ancient Moon: A Simple Time Dependent Calculation of the Earth-Moon System. Journal of Physics Education submitted November 2007.

30. Young, T.R. & Johnson, T.A., 2008, "Statistical Equations To Calculate Supernovae Type II-P Progenitor Characteristics, To be Submitted Jan.