Curriculum Vitae

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1 Education

1999—2004: The University of Arizona, Ph.D. Astronomy

1995—1998: The University of Texas at Austin, B.A. Astronomy, B.S. Physics

2 Employment

2017–Present: Associate Director for Community Outreach, School of Earth and Space Exploration, Arizona State University

2013–Present: Associate Professor, School of Earth and Space Exploration, Arizona State University

2007–2013: Assistant Professor, School of Earth and Space Exploration, Arizona State University

2005–2007: Director's Postdoctoral Fellow, Los Alamos National Laboratory (with Q clearance); Adjunct Instructor & Visiting Scholar, Steward Observatory, University of Arizona

2004–2005: Postdoctoral Research Associate, Steward Observatory

3 Publications

3.1 Refereed

Current and former student/popstdoc authors in bold.

1. “The Sirius System and Its Astrophysical Puzzles: Hubble Space Telescope and Ground-based Astrometry", Bond, Howard E.; Schaefer, Gail H.; Gilliland, Ronald L.; Holberg, Jay B.; Mason, Brian D.; Lindenblad, Irving W.; Seitz-McLeese, Miranda; Arnett, W. David; Demarque, Pierre; Spada, Federico; Young, Patrick A.; Barstow, Martin A.; Burleigh, Matthew R.; Gudehus, Donald, 2017, ApJ, 840, 70

2. “The Supernovae Analysis Application (SNAP)", Amanda J. Bayless, Chris L. Fryer, Brandon Wiggins, Wesley Even, Ryan Wollaeger, Janie de la Rosa, Peter W. A. Roming, Lucy Frey, Patrick A. Young, Rob Thorpe, Luke Powell, Rachel Landers, Heather D. Persson, Rebecca Hay, 2017, ApJ, 846, 101

3. “The Elemental Abundances of 518 FGK Stars and Planetary Implications", **Pagano, Michael**, Young, Patrick A., **Challa, Priya**, ApJ, in review

4. “Expanding the Catalog: Considering the Importance of Carbon, Magnesium, and Neon in the Evolution of Stars and Habitable Zones", **Truitt, Amanda** & Young, Patrick A., 2017, ApJ, 835, 87

5. “A Comparison of Stellar Elemental Abundance Techniques and Measurements", **Hinkel, Natalie R.**; Young, Patrick A.; **Pagano, Michael D.**; Desch, Steven J.; Anbar, Ariel D.; Adibekyan, Vardan; Blanco-Cuaresma, Sergi; Carlberg, Joleen K.; Delgado Mena, Elisa; Liu, Fan; Nordlander, Thomas; Sousa, Sergio G.; Korn, Andreas; Gruyters, Pieter; Heiter, Ulrike; JofrŐ, Paula; Santos, Nuno C.; Soubiran, Caroline, 2016 ApJS, 226, 4

6. “NuGrid Stellar Data Set. I.Stellar Yields from H to Bi for Stars with Metallicities Z = 0.02 and Z = 0.01", Pignatari, M.; Herwig, F.; Hirschi, R.; Bennett, M.; Rockefeller, G.; Fryer, C.; Timmes, F. X.; Ritter, C.; Heger, A.; Jones, S.; Battino, U.; Dotter, A.; Trappitsch, R.; Diehl, S.; Frischknecht, U.; Hungerford, A.; Magkotsios, G.; Travaglio, C.; Young, P., 2016 ApJS, 224, 23

7. “The Effect on Supernova Shock Breakout and Swift Lightcurves Due to the Mass of the Hydrogen Rich Envelope", Bayless, Amanda, Evan, Wesley, Frey, Lucille H., Fryer, Chris L., & Young, Patrick A., 2015 ApJ, 805, 98

8. “A Catalog of Stellar Evolution Profiles and the Effects of Variable Composition on Habitable Systems", **Truitt, Amanda**, Young, Patrick A., **Spacek, Alex, Probst, Luke, & Dietrich, Jeremy**, 2015 ApJ, 804, 145

9. “The Chemical Composition of τ Ceti and Possible Effects on Terrestrial Planets", **Pagano, Michael, Truitt, Amanda**, Young, Patrick A., & Shim, Sang-Heon, 2015 ApJ, 803, 90

10. “Carbon atom in intense magnetic fields", **Thirumalai, Anand**, Desch, Steven J., & Young, Patrick A., 2014 Phys Rev A, 90, 2501

11. “Stellar Abundances in the Solar Neighborhood: The *Hypatia* Catalog", Hinkel, Natalie R., Young, Patrick A., Timmes, F. X., & Turnbull, Margaret, 2014 AJ, 148, 54

12. “Astrobiological Stoichiometry", Young, Patrick A., Desch, Steven J., Anbar, Ariel D., Barnes, Rory, Hinkel, Natalie R., Kopparapu, Ravikumar, Madhusudhan, Nikku, Monga, Nikhil, **Pagano, Michael D.**, Riner, Miriam A., Scannapieco, Evan, Shim, Sang-Heon, & **Truitt, Amanda** Astrobiology, 2014, 14, 553

13. “Report on a NASA Astrobiology Institute-Funded Workshop Without Walls: Stellar Stoichiometry" Desch, Steven J.; Young, Patrick A.; Anbar, Ariel D.; Hinkel, Natalie; **Pagano, Michael; Truitt, Amanda**; Turnbull, Margaret, 2014, *Astrobiology*, 14, 271

14. "First Simulations of Core- Collapse Supernovae to Supernova Remnants with SNSPH", **Ellinger, Carola I.**, , Fryer, Rockefeller, Gabriel, Christopher L., & Young, Patrick A., 2013 arXiv:1305.4137

15. “The Effect on Supernova Shock Breakout and Swift Lightcurves Due to the Mass of the Hydrogen Rich Envelope", Bayless, Amanda, Even, Wesley, Frey, Lucille H., Fryer, Chris L., & Young, Patrick A., ApJ, in press

16. “Can Stellar Mixing Explain the Lack of Type Ib Supernovae in Long-duration Gamma-Ray Bursts?", Frey, Lucille H., Fryer, Chris L., & Young, Patrick A., 2013, ApJL, 773, 7

17. “NuGrid stellar data set. I. Stellar yields from H to Bi for stars with metallicities Z = 0.02 and Z = 0.01", Pignatari, M., Herwig, F., Hirschi, R., Bennett, M., Rockefeller, G., Fryer, C., Timmes, F. X., Heger, A., Jones, S., Battino, U., Ritter, C., Dotter, A., Trappitsch, R., Diehl, S., Frischknecht, U., Hungerford, A., Magkotsios, G., Travaglio, C., & Young, P., 2013, ApJ, in press

18. “The Age and Stellar Parameters of the Procyon Binary System", Liebert, James, Fontaine, Gilles, Young, Patrick A., Williams, Kurtis A., & Arnett, David, 2013 ApJ, 769, 7

19. “On the Reality of the AB DOR Moving Group: Kine-Chemical Tagging", Barenfeld, Scott A., Bubar, Eric, J., Mamajek, Eric E., & Young, Patrick A. 2013, ApJ, 766, 6

20. “The Impact of Stellar Abundance Variations on Stellar Habitable Zone Evolution", **Young, Patrick A., Liebst, Kelley, & Pagano, Michael**, 2012, ApJL, 755, 31

21. “A Case Study of Small Scale Structure Formation in 3D Supernova Simulations", **Ellinger, Carola I., Young, P. A.**, Fryer, C. L., & Rockefeller, G. 2012, ApJ, 755, 160

22. “Keeping Theorists Honest", Young, Patrick A. 2012, Proceedings of the Astronomical Society of the Pacific

23. “The effect of 12C + 12C rate uncertainties on s-process yields", Bennett, M. E.; Hirschi, R.; Pignatari, M.; Diehl, S.; Fryer, C.; Herwig, F.; Hungerford, A.; Magkotsios, G.; Rockefeller, G.; Timmes, F.; Wiescher, M.; Young, P., 2010, Journal of Physics: Conference Series, 2020, 012023

24. "Trends in Ti44 and Ni56 from Core-Collapse Supernovae", Georgios Magkotsios, Francis X. Timmes, Aimee L. Hungerford, Christopher L. Fryer, Patrick A. Young, Michael Wiescher, 2010, ApJS, 191, 66

25. "Convection Theory and Sub-photospheric Stratification", Arnett, David, Meakin, Casey, & Young, Patrick A. 2010, ApJ, 710, 1619

26. "Solar System Shifts in Oxygen Isotopes Associated with Supernova Injection of ^{26}Al", **Ellinger, Carola I.**, Young, Patrick A., & Desch, Steve, 2010, ApJ, 2010, 725, 1495

27. "Spectra and Lightcurves of Failed Supernovae", Fryer, Chris L.; Brown, Peter J.; Bufano, Filomena; Dahl, Jon A.; Fontes, Christopher J.; Frey, Lucille H.; Holland, Stephen T.; Hungerford, Aimee L.; Immler, Stefan; Mazzali, Paolo; Milne, Peter A.; Scannapieco, Evan; Weinberg, Nevin; Young, Patrick A., 2009, ApJ, 707, 193

28. "Solar System Shifts in Oxygen Isotopes Associated with Supernova Injection of Aluminum 26", **Ellinger, Carola I.**, Young, Patrick A., & Desch, Steve 2009, Meteoritics and Planetary Science Supplement, 72, 5383

29. "Binary Orbit, Physical Properties, and Evolutionary State of Capella (α Aurigae)" Torres, Guillermo; Claret, Antonio; **Young, Patrick A.**, 2009, ApJ, 700, 1349

30. "Accounting for the Iron in Cassiopeia A I: New Reddening Measurements", Eriksen, Kristoffer A., Arnett, David, McCarthy, Donald W., & Young, Patrick A. 2009, ApJ, 697, 29

31. "Understanding Compact Object Formation and Natal Kicks: II. The case of XTE J1118+480", Fragos, T., Willems, B., Kalogera, V., Ivanova, N., Rockefeller, G., Fryer, C. L., & Young, P. A. 2009, ApJ, 697, 1057

32. "Finding Tracers for Supernova-Produced ^{26}Al", Young, Patrick A., **Ellinger, Carola I.**, Arnett, David, Fryer, Chris L., & Rockefeller, Gabriel R. 2009, ApJ, 699, 938

33. "Turbulent Convection in Stellar Interiors. II. The Velocity Field", Arnett, David, Meakin, Casey, & Young, Patrick A. 2009, ApJ, 690, 1715

34. "Constraints on Type Ib/c Supernovae and Gamma-Ray Burst Progenitors", Fryer, Chris L., Mazzali, Paolo A., Prochaska, Jason, Cappellaro, Enrico, Panaitescu, Alin, Berger, Edo, van Putten, Maurice, van den Heuvel, Ed P. J., Young, Patrick, Hungerford, Aimee, Rockefeller, Gabriel,Yoon, Sung-Chul, Podsiadlowski, Philipp, Nomoto, Ken'ichi, Chevalier, Roger, Schmidt, Brian, & Kulkarni, Shri, 2007, PASP, 119, 1211

35. "The Local Environments of Long-Duration Gamma-Ray Bursts", Young, Patrick A. & Fryer, Chris L., 2007, ApJ, 670, 584

36. "Light-Curve Calculations of Supernovae from Fallback Gamma-Ray Bursts", Fryer, Chris L., Hungerford, Aimee L., & Young, Patrick A. 2007, ApJ, 622L, 55

37. "Uncertainties in Supernova Yields I: 1D Explosions", Young, Patrick A. & Fryer, Chris L. 2007, ApJ, 644, 1033

38. "Late Time Convection in the Collapse of a 23 Solar Mass Star", Fryer, Chris L. & Young, Patrick A. 2007, ApJ, 659, 1438

39. "Explosive Nucleosynthesis from GRB and Hypernova Progenitors: Direct Collapse versus Fallback", Fryer, Christopher L., Young, Patrick A., & Hungerford, Aimee L. 2007, ApJ, 650, 1028

40. "The Environments Around Long Duration Gamma-Ray Burst Progenitors", Fryer, Chris L., Rockefeller, Gabriel, & Young, Patrick A. 2006, ApJ, 647, 1269

41. "Constraints on the Progenitor of Cassiopeia A", Young, Patrick A., Fryer, Chris L., Hungerford, Aimee, Arnett, David, Rockefeller, Gabriel, Timmes, F. X., Voit, Benedict, Meakin, Casey, & Eriksen, Kristoffer L. 2006, ApJ, 640

42. "The Age and Progenitor Mass of Sirius B", Liebert, James, Young, Patrick A., Arnett, David, Holberg, J. B., & Williams, Kurtis A. 2005, ApJL, 630, 69

43. "The Impact of Hydrodynamics on Supernova Progenitors", Young, Patrick A., Meakin, Casey, Arnett, David, & Fryer, Christopher L., 2005, ApJL, 629, 101

44. "Observational Tests and Predictive Stellar Evolution II: Improvements from Hydrodynamic Simulations", Young, Patrick A. & Arnett, David 2005, ApJ 618, 908

45. "A Model for the Formation of High Density Clumps in Proto-Planetary Nebulae", Young, Patrick A., Highberger, J. L., Arnett, David, & Ziurys, L. M. 2003, ApJ, 597, L53

46. "The Salty Scrambled Egg", Highberger, J. L., Thomson, K. J., Young, P. A., Arnett, D., & Ziurys, L. M., 2003, ApJ, 593, 393

47. "Stellar Hydrodynamics in Radiative Regions", Young, Patrick A., Knierman, Karen A., Rigby, Jane R., & Arnett, David 2003, ApJ, 595, 1114

48. "Observational Tests and Predictive Stellar Evolution", Young, P. A., Mamajek, E. E., Arnett, David, & Liebert, James 2002, ApJ 556, 230

49. "Observations of Lyα; Absorption in a Triple Quasar System", Young, P. A., Impey, C. D., & Foltz, C. B. 2001, ApJ, 549, 76

50. "The Orbital Light Curve of Aquila X-1", Welsh, William F., Robinson, Edward L., & Young, Patrick 2000, AJ, 120, 943

51. "Giant, Repeating, Optical Bursts from the Soft X-Ray Transient Aquila X-1", Robinson, Edward L. & Young, Patrick 1998, ApJL, 491, L89

3.2 Books and Conference Proceedings

1. “Stellar Composition, Structure and Evolution: Impact on Habitability", Young, Patrick A., 2017 *The Handbook of Exoplanets*, ed. Hans Deeg and Juan Antonio Belmonte, Springer:Heidelberg

2. “Diagnostics of the Supernova Engine", Fryer, Chris L.; Ellinger, Carola; Young, Patrick A.; Vance, Gregory, 2017, Supernova 1987A:30 years later - Cosmic Rays and Nuclei from Supernovae and their aftermaths, Proceedings of the International Astronomical Union, IAU Symposium, Volume 331, pp. 86-95

3. “Un-earth-like Interiors of Earth-like Exoplanets", Shim, S.-H.; Nisr, C.; Chen, H.; Ko, B.; Pagano, M. D.; Desch, S.; Young, P. A., 2015, Comparative Tectonic and Geodynamics of Venus, Earth and Rocky Exoplanets, held May 4-6, 2015 in Pasadena, California: LPI Contribution No. 1839, p.5020

4. “The Impact of Abundance Variations on Stellar Habitable Zones", Young, Patrick A., 2012, Astrobiology Science Conference 2012: Exploring Life: Past and Present, Near and Far, April 16-20 2012.

5. “Creating a Database of Stellar Elemental Abundances", Pagano, Michael & Young, Patrick A., 2012, Astrobiology Science Conference 2012: Exploring Life: Past and Present, Near and Far, April 16-20 2012.

6. “Structure Formation in Supernova Explosions", Young, P. A. & Ellinger, C. I. 2012, Proceedings of IAU Symposium 279, p. 479

7. “Delivery of SN Material to the ISM through Ejecta Knots", Ellinger, C. I., Young, P. A., Rockefeller, G., & Fryer, C. L. 2010, to appear in Proceedings of 11th Symposium on Nuclei in the Cosmos

8. “Isotopic Effects of SN Al-26 Injected into the Forming Solar System and Observable Proxies for Al-26 in Supernova Remnants", Ellinger, C. I., Young, P. A., & Desch, S. J. 2010 Astrobiology Science Conference 2010: Evolution and Life: Surviving Catastrophes and Extremes on Earth and Beyond, held April 26-20, 2010 in League City, Texas. LPI Contribution No. 1538, p.5453

9. “Delivery Mechanism of Supernova Produced 26Al, 60Fe, and Oxygen to the Forming Solar System", Ellinger, C. I. & Young, P. A. 2010Astrobiology Science Conference 2010: Evolution and Life: Surviving Catastrophes and Extremes on Earth and Beyond, held April 26-20, 2010 in League City, Texas. LPI Contribution No. 1538, p.5441

10. “Constructing an Updated Catalog of Nearby Habitable Stellar Systems with Elemental Ratios", tr’Ehnl, N., Timmes, F. X., Turnbull, M., Young, P. A., & Schmidt, S. 2010, Astrobiology Science Conference 2010: Evolution and Life: Surviving Catastrophes and Extremes on Earth and Beyond, held April 26-20, 2010 in League City, Texas. LPI Contribution No. 1538, p.5399

11. “The Turbulent Origin of the Elements: Dynamical/Chemical Evolution and Explosions of Massive Stars and Implications for Astrobiology", tr’Ehnl, N., Timmes, F. X., & Young, P. A. 2010, Astrobiology Science Conference 2010: Evolution and Life: Surviving Catastrophes and Extremes on Earth and Beyond, held April 26-20, 2010 in League City, Texas. LPI Contribution No. 1538, p.5395

12. “The Composition of Dwarfs in the Solar Neighborhood", Pagano, M., Young, P. A., Timmes, F. X., & Bond, J. C. 2010, Astrobiology Science Conference 2010: Evolution and Life: Surviving Catastrophes and Extremes on Earth and Beyond, held April 26-20, 2010 in League City, Texas. LPI Contribution No. 1538, p.5157

13. “The effect of 12C + 12C rate uncertainties on s-process yields", Bennett, M E; Hirschi, R; Pignatari, M; Diehl, S; Fryer, C; Herwig, F; Hungerford, A; Magkotsios, G; Rockefeller, G; Timmes, F; Wiescher, M; & Young, P. A. 2010, Journal of Physics: Conference Series, Volume 202, Issue 1, pp. 012023

14. *LSST Science Book, Version 2.0* LSST Science Collaborations, 2010, arXiv:0912.0201

15. “An Era of Precision Astrophysics: Connecting Stars, Galaxies and the Universe," an Astro2010 Science White Paper, Olling, Rob P.; Allen, Ron J.; Anderson, Jay; Chaboyer, Brian C.; Freedman, Wendy; Guhathakurta, Puragra; Johnston, Kenneth; Kulkarni, Shri; Lepine, Sebastien; Makarov, Valeri V.; Mamajek, Eric E.; Quillen, Alice C.; Sahu, Kailash S.; Sarajedini, Ata; Shaya, Ed J.; Terndrup, Donald; Young, Patrick A. 2010submission for the US 2010 Decadal Review, arXiv:0902.3197

16. “Comparisons of Spatially Resolved Nucleosynthesis in 3D Simulations and Cassiopeia A", Patrick A. Young, Carola Ellinger, David Arnett, Chris Fryer, & Gabe Rockefeller 2008, Conference Proceedings for the "10th Symposium on Nuclei in the Cosmos (NIC X)", July 27 - August 1 2008, Mackinack Island, Michigan, USA

17. “Complete nucleosynthesis calculations for low-mass stars from NuGrid", Pignatari, Marco; Herwig, Falk; Bennett, Michael; Diehl, Steven; Fryer, Christopher L.; Hirschi, Raphael; Hungerford, Aimee; Magkotsios, Georgios; Rockefeller, Gabriel; Timmes, Francis X.; Young, Patrick, Conference Proceedings for the "10th Symposium on Nuclei in the Cosmos (NIC X)", July 27 - August 1 2008, Mackinack Island, Michigan, USA

18. “NuGrid: s Process in Massive Stars", Hirschi, Raphael; Frischknecht, Urs; Thielemann, F. -K.; Pignatari, Marco; Bennett, Michael; Diehl, Steven; Fryer, Christopher L.; Herwig, Falk; Hungerford, Aimee; Magkotsios, Georgios; Rockefeller, Gabriel; Timmes, Francis X.; Young, Patrick, Conference Proceedings for the "10th Symposium on Nuclei in the Cosmos (NIC X)", July 27 - August 1 2008, Mackinack Island, Michigan, USA

19. “Nucleosynthesis simulations for a wide range of nuclear production sites from NuGrid", Herwig, Falk; Bennett, Michael; Diehl, Steven; Fryer, Christopher L.; Hirschi, Raphael; Hungerford, Aimee; Magkotsios, Georgios; Pignatari, Marco;

Rockefeller, Gabriel; Timmes, Francis X.; Young, Patrick, Conference Proceedings for the "10th Symposium on Nuclei in the Cosmos (NIC X)", July 27 - August 1 2008, Mackinack Island, Michigan, USA

20. "^{44}Ti and ^{56}Ni in core-collapse supernovae", Magkotsios, Georgios; Timmes, Francis X.; Wiescher, Michael; Fryer, Christopher L.; Hungerford, Aimee; Young, Patrick; Bennett, Michael; Diehl, Steven; Herwig, Falk; Hirschi, Raphael; Pignatari, Marco; Rockefeller, Gabriel, Conference Proceedings for the "10th Symposium on Nuclei in the Cosmos (NIC X)", July 27 - August 1 2008, Mackinack Island, Michigan, USA

21. "Nucleosynthetic Yields from "Collapsars"",Rockefeller, Gabriel; Fryer, Christopher L.; Young, Patrick; Bennett, Michael; Diehl, Steven; Herwig, Falk; Hirschi, Raphael; Hungerford, Aimee; Pignatari, Marco; Magkotsios, Georgios; Timmes, Francis X., Conference Proceedings for the "10th Symposium on Nuclei in the Cosmos (NIC X)", July 27 - August 1 2008, Mackinack Island, Michigan, USA

22. "Nucleosynthesis Calculations from Core-Collapse Supernovae", Fryer, Christopher L.; Young, Patrick; Bennett, Michael; Diehl, Steven; Herwig, Falk; Hirschi, Raphael; Hungerford, Aimee; Pignatari, Marco; Magkotsios, Georgios; Rockefeller, Gabriel; Timmes, Francis X., Conference Proceedings for the "10th Symposium on Nuclei in the Cosmos (NIC X)", July 27 - August 1 2008, Mackinack Island, Michigan, USA

23. "NuGrid: Toward High Precision Double-Degenerate Merger Simulations with SPH in 3D", Diehl, Steven; Fryer, Christopher L.; Hungerford, Aimee; Rockefeller, Gabriel; Bennett, Michael; Herwig, Falk; Hirschi, Raphael; Pignatari, Marco; Magkotsios, Georgios; Timmes, Francis X.; Young, Patrick; Clayton, Geoffrey C.; Motl, Patrick; Tohline, Joel E., Conference Proceedings for the "10th Symposium on Nuclei in the Cosmos (NIC X)", July 27 - August 1 2008, Mackinack Island, Michigan, USA

24. "Difficulties in Probing Nuclear Physics: A Study of ^{44}Ti and ^{56}Ni", Hungerford, Aimee; Fryer, Christopher L.; Timmes, Francis X.; Young, Patrick; Bennett, Michael; Diehl, Steven; Herwig, Falk; Hirschi, Raphael; Pignatari, Marco; Magkotsios, Georgios; Rockefeller, Gabriel, Conference Proceedings for the "10th Symposium on Nuclei in the Cosmos (NIC X)", July 27 - August 1 2008, Mackinack Island, Michigan, USA

25. "Theory and Numerics: New Results on Convection in Stars", Arnett, David; Meakin, Casey; Starrfield, Sumner; Timmes, Frank; Young, Patrick, 2008, IXTH Torino Workshop on Evolution and Nucleosynthesis in AGB Stars and the 2nd Perugia Workshop on Nuclear Astrophysics. AIP Conference Proceedings, 1001, 287

26. "A Splinter Session on the Thorny Problem of Stellar Ages", Mamajek, Eric et al. 2007, in ASP Conference Series v.363, *Cool Stars and Stellar Systems XIV*, ed. G van Belle, 2007

27. "Stellar Convection with Nuclear Burning", Arnett, Meakin, & Young 2006, IAU Symposium 239 "Convection in Stars", ed. Krupa, Roxburgh, & Chan, 2007

28. "The Lambert Problem", Arnett, D., Meakin, C., Young, P. A. 2005, in *Cosmic Abundances as Records of Stellar Evolution and Nucleosynthesis*, ASP Conference Series, Vol. 336

29. "Improved Nucleosynthetic Yields", Arnett, David, Meakin, Casey, & Young, Patrick 2005, in *From Lithium to Uranium: Elemental Tracers of Early Cosmic Evolution, IAU Symposium Proceedings of IAU 228*, pp.151-156, Ed. Hill, Francois, & Primas, (Cambridge: Cambridge University Press)

30. "Stellar Evolution with Hydrodynamic Ejection", Young, Patrick A. 2005, in *The Fate of the Most Massive Stars*, ASP Conference Series, Vol. 332

31. "Simulations of a Supernova Impostor", Arnett, David, Meakin, Casey, & Young, Patrick A. 2005, in *The Fate of the Most Massive Stars*, ASP Conference Series, Vol. 332

32. "Massive Star Evolution", Young, Patrick A. & Arnett, David 2004, in *Stellar Collapse*, p. 5, Ed. C. L. Fryer, (Dordrecht: Kluwer)

33. "Scientific Results from the MMT Natural Guide Star Adaptive Optics System", Kenworty et al. 2005, Proc. SPIE, 5490, 351, Advancements in Adaptive Optics

34. "Boundary Conditions for Stellar Convection (invited review)", Arnett, D., Young, P. A., Knierman, K. A., & Rigby, J. R. 2003, in *CNO in the Universe*, ASP Conference Series, Vol. 304

35. "Boundary Conditions on Stellar Convection", Young, Patrick A., Knierman, Karen A., Rigby, Jane R., & Arnett, David 2003, in *3D Stellar Evolution* eds. S. Turcotte et al. (San Francisco: PASP), 157

36. "Dynamically refocused Rayleigh laser beacons for atmospheric tomography", Lloyd-Hart, Michael, Georges, James A., Angel, James Roger P., Brusa, Guido, & Young, Patrick 2002, Proc. SPIE, 4494, 259, Adaptive Optics Systems and Technology II

37. "The Orbital Light Curve of Aquila X-1", Robinson, E. L., Welsh, W. F., & Young, P. 2001, AIP conference proceedings, 599, 902

4 Invited Talks

"Supernovae: Life and Death among the Stars", New Discoveries Lecture Series, Arizona State University, September 2017

"Supernova Synthesis and Structure: From Explosion to Remnant", ICRANet Summer Workshop, Pescara, Italy, June 2016

"Building Habitable Planets", Lowell Observatory Colloquium, August 2015

"On the Trail of the Elements: Astrobiology From a Stellar Perspective", University of Alabama Colloquium, October 2013

"Supernova Delivery of Nucleosynthesis Products", Nuclear Astrophysics Workshop, University of Michigan FRIB, August 2013

"On the Trail of the Elements: Astrobiology From a Stellar Perspective", SESE Colloquium, August 2012

"The Impact of Abundance Variations on Stellar Habitable Zones", Astrobiology Science Conference 2012, April 2012

"Keeping Theorists Honest", MRO 2011 Interferometry Workshop, May 2011

"On the Trail of Supernova Enrichment", Rochester PAS Colloquium, Rochester, NY, April 2010

"New Frontiers in the Synthesis of the Elements", NRAO Colloquium, Socorro, NM, February 2007

"Uncertainties in Stellar Evolution Calculations and Theoretical Ages", Cool Stars XIV, Pasadena, CA, November 2006

"New Constraints on GRB Progenitors", Black Holes: Power Behind the Scenes, Kathmandu, Nepal, October 2006

"Constraints on the Progenitor of Cassiopeia A", Supernovae and γ-ray Bursts, Kavli Institute for Theoretical Physics, Sanata Barbara, CA, February 2006

"New Physics and Old Uncertainties in Stellar Evolution", Observatorie de Genève Seminar, Geneva, Switzerland, September 2005

"The Dramatic Impact of Hydrodynamic Mixing on Supernova Progenitors", HEAD Colloquium, Center for Astrophysics, Cambridge, MA, August 2005

"The Dramatic Impact of Hydrodynamics on Supernova Progenitors", IPAM Supernova Workshop, UCLA, Los Angeles, CA, May 2005

"Stellar Evolution with Hydrodynamic Ejection", Fates of the Most Massive Stars, Jackson Hole, WY, May 2004

"Mass Loss in SNIb/c Progenitors", 201st AAS, Seattle, WA, Jan. 2003

5 Contributed Talks and Posters

"Large Scale Supernova Structure from Pre- and Post-Explosion Convection", Young, Patrick A.; Vance, Gregory; Ellinger, Carola; Fryer, Chris, 2017, American Astronomical Society, AAS Meeting #230, id.207.05

"SuperNovae Analysis aPplication (SNAP): A new analysis tool for understanding the physics of supernovae", Roming, Peter; Bayless, Amanda J.; De La Rosa, Janie; Even, Wesley P.; Frey, Lucille; Fryer, Chris; Wiggins, Brandon Kerry; Wollaeger, Ryan; Young, Patrick A.; Hay, Rebecca; Landers, Rachel; Persson, Heather; Powell, Luke; Thorpe, Rob, 2017, American Astronomical Society, AAS Meeting #229, id.434.03

"The Diversity of Chemical Composition and the Effects on Stellar Evolution and Planetary Habitability", Truitt, Amanda & Young, Patrick A., 2017, American Astronomical Society, AAS Meeting #229, id.433.08

"Supernovae from Explosion to Remnant", Supernovae Through the Ages, Rapa Nui, August 2016

"SuperNovae Analysis aPplication (SNAP): A new analysis tool for understanding the physics of supernovae", Roming, Peter; Bayless, Amanda J.; De La Rosa, Janie; Even, Wesley P.; Frey, Lucille; Fryer, Chris; Wiggins, Brandon Kerry; Wollaeger, Ryan; Young, Patrick A.; Hay, Rebecca; Landers, Rachel; Persson, Heather; Powell, Luke; Thorpe, Rob, 2017, American Astronomical Society Meeting #229, #434.34

"The Diversity of Chemical Composition and the Effects on Stellar Evolution and Planetary Habitability", Truitt, Amanda & Young, Patrick A. 2017, American Astronomical Society Meeting #229, #433.08

"A Catalog Of Stellar Evolution Profiles And The Effects Of Variable Composition On Habitable Planetary Systems", Truitt, Amanda & Young, Patrick A. 2016, The 19th Cambridge Workshop on Cool Stars, Stellar Systems, and the Sun (CS19), Uppsala, Sweden, 06-10 June 2016, id.51

"Stellar Abundances as a Window on Planetary Properties and Habitability", Young, Patrich A., Pagano, Michael, & Truitt, Amanda 2015, Astrobiology Science Conference #7434

"A CATALOG OF STELLAR EVOLUTION PROFILES AND THE EFFECTS OF VARIABLE COMPOSITION ON HABITABLE SYSTEMS. Amanda Truitt, Patrick A. Young, Alex Spacek, Luke Probst, and Jeremy Dietrich, 2015, Astrobiology Science Conference #7049

"Variation in Stellar Mg/Si and Its Implication for Mineralogy and Convection", Pagano M. D., Shim S-H., Desch S., & Young P. A 2015 Astrobiology Science Conference #7534

"A case study of nucleosynthesis in multi-dimensional supernova simulations", Sexton, Jack; Young, Patrick A.; Ellinger, Carola I.; Fryer, Chris; Rockefeller, Gabriel, 2015, American Astronomical Society Meeting #225, #140.30

"Chemical Abundances in Exoplanet Host Stars", Hernandez, Luis, Bubar, E. J., Mamajek, E. E., & Young, P. A., 2014 American Astronomical Society Meeting #223, #441.34

"Searching for Local Evidence of Supernova Enrichment in the Scorpius Centaurus OB Association", Bubar, Eric J., Mamajek, E. E., & Young, P. A. 2014 American Astronomical Society Meeting #223, #441.28

"Variability of Elemental Abundances in the Local Neighborhood and its Effect on Planetary Systems", Pagano, Michael D., & Young, P. A. 2014 American Astronomical Society Meeting #223, #415.03

"Elemental Abundances of Nearby Exoplanet Host Stars: A Look at Planetary Composition Assumptions", Pagano, Michael D., Young, P. A., Shim, S., Challa, P., & Gonzales, A. 2013 American Astronomical Society Meeting #221, #334.07

"3D Simulations of Supernovae into the Young Remnant Phase", Ellinger, Carola I., Young, P. A., Fryer, C. L., Rockefeller, G., & Park, S. 2013 American Astronomical Society Meeting #221, #214.06

"The Impact of Stellar Compositional Anomalies on the Evolution of Stellar Habitable Zones", Young, Patrick A. & Liebst, Kelley 2012 American Astronomical Society Meeting #219, #339.03

"Formation and Initial Evolution of Rayleigh-Taylor Clumps in the Ejecta of Supernova Simulations", Ellinger, Carola I., Young, P. A., Desch, S. J., Fryer, C. L., & Rockefeller, G. 2012 American Astronomical Society Meeting #219, #203.02

"The AB Dor Moving Group: A Chemically Heterogeneous Kinematic Stream?", Barenfeld, Scott A., Bubar, E. J., Mamajek, E. E., & Young, P. A. 2012 American Astronomical Society Meeting #219, #151.30

"Nurturing The STEM Pipeline: Graduate Student Leadership In NIRCam's Ongoing E/PO Mission For JWST", Schlingman, Wayne M.; Stock, N.; Teske, J.; Tyler, K.; Biller, B.; Donley, J.; Hedden, A.; Knierman, K.; Young, P. 2011 American Astronomical Society Meeting #217, #431.01

"Expanding our Knowledge of the Chemical Composition of Nearby Stars", Pagano, Michael D.; Young, P.; Butler, P. 2011 American Astronomical Society Meeting #217, #153.02

"Development of Structure in Supernova Simulations From the Explosion out to Late Times", Ellinger, Carola I.; Young, P. A.; Fryer, C. L.; Rockefeller, G. R. 2011 American Astronomical Society Meeting #217, #423.05

"Modeling Supernova Remnant Interactions With Dense Molecular Clouds Using The Smooth Particle Hydrodynamics Codes TYCHO And SNSPH", Rutkowski, Michael J.; Young, P. A. 2009 American Astronomical Society Meeting #213, #488.02

"New Observational and Theoretical Insights on Cassiopeia A", Eriksen, Kristoffer A.; Arnett, D.; Raymond, J. C.; Young, P. A., 2009, American Astronomical Society Meeting #213, #359.06

"Turbulent Convection in Stellar Interiors and Stellar Ages", Patrick A. Young, David Arnett, & Casey Meakin 2008, The Ages of Stars

"Comparisons of Spatially Resolved Nucleosynthesis in 3D Simulations and Cassiopeia A", Patrick A. Young, Carola Ellinger, David Arnett, Chris Fryer, & Gabe Rockefeller 2008, Nuclei in the Cosmos X

"The Birthplaces of Gamma-ray Bursts", Patrick A. Young & Chris Fryer 2008, Gamma-Ray Bursts 2007

"Collaboration for Education with the Apple Learning Interchange", Patrick A. Young, Terry Zimmerman, & Karen A. Knierman 2007, AAS/AAPT Joint Meeting, #094.01

"Uncertainties in Supernova Yields", Patrick A. Young & Chris L. Fryer 2007, AAS/AAPT Joint Meeting, #150.04

"New Outreach Activities for Stellar Astronomy", Patrick A. Young, Abigail S. Hedden, & Karen A. Knierman 2005, Building Community: The Emerging EPO Profession (Tucson)

"High Energy Density Laboratory Astrophysics, Observational Tests, and Stellar Evolution", Young, Patrick A. & Arnett, David, 2004, 5th High Energy Density Laboratory Astrophysics Conference (Tucson)

"NIRCam/JWST Outreach: Girl Scout Leaders at Astronomy Camp", Knierman, Karen A., Young, Patrick A., McCarthy, Donald W., & Reike, Marcia 2004, in *Women in Astronomy II: Ten Years After*

"Mass Loss From SN Ib/c Progenitors", Young, Patrick A. & Arnett, David 2003, American Astronomical Society Meeting 201, #22.09

"A Strictly Hydrodynamic Treatment of Convective Overshooting in Stars", Young, Patrick A. & Arnett, David 2002, American Astronomical Society Meeting 200, #07.15

"Observational Tests and Predictive Stellar Evolution", Young, P., Mamajek, E., Arnett, D., & Liebert, J. 2000, American Astronomical Society Meeting 197, #114.01

"Ellipsoidal Variations in the Soft X-Ray Transient AQL X-1", Young, P., Welsh, W. F., & Robinson, E. L. 1997 American Astronomical Society, 193rd AAS Meeting, #43.08

6 Teaching

Table 1: Classes Taught

Course Number	Course Title	Notes
AST 111	Introduction to Solar System Astronomy	online
AST 113	Astronomy Laboratory I	online
AST 112	Introduction to Stars, Galaxies, and Cosmology	
AST 114	Astronomy Laboratory II	
AST 321	Intro to Stellar and Planetary Astrophysics	
AST 322	Intro to Galactic and Extragalactic Astrophysics	
AST 522	Stars and Interstellar Medium II	
	Messages in the Stars: Astronomy in Literature and Language	CosmoQuest online

7 Advising

8 Graduate Students: Kristoffer Eriksen, Univ. of Arizona (thesis advisor David Arnett, currently LANL); Brian Gleim, ASU (MNS May 2010 currently Glendale Community College); Carola Ellinger, ASU (Ph.D. September 2011, currently Global Geophysical Services); Bryce Carande, ASU (MS November 2013, currently GroupHigh Corp.); Michael Pagano, ASU (Ph.D. April 2014, currently NExSS postdoc at ASU); Amanda Truitt, ASU; Abhi Rajan, ASU; Gregory Vance, ASU.

3 Postdocs: Natalie Hinkel (ASU, currently Vanderbilt); Michael Pagano (ASU, currently faculty, Colby College); Anand Thirumalai (ASU, currently DigiPen Institute of Technology)

Mentor for undergraduates (last three years only) Priya Challa (currently at Stanford and Virgin Galactic), Joshua Gonzales (Barrett Honors College Thesis), Jack Sexton (SESE Capstone), Brooke Kubby, Alexandra Smith, Cierra Huff (SESE Capstone), Kelly Johnson, Charlotte Johnson (Space Grant)

8 Service

1. **University Service**

   SESE Undergraduate Recruiting Committee fall 2016-2017

SESE Undergraduate Oversight Committee fall 2013-2016 (Chair 2015/16)

SESE Faculty Search Committee 2012-2013

Graduate Student Oversight Committee from fall 2008 - 2011

Graduate Student Oversight Committee Chair from fall 2009 - 2011

SESE Exploration Postdoc Selection Committee 2011

Obama Scholars Program Mentor from fall 2010

2. **National and International Service**

NExSS Winter School Organizing Committee, 2016

Science Team, SARUX Phase A Explorer concept study

NSF Proposal Review

NASA Proposal Review

Organizer for Stellar Stoichiometry Workshop Without Walls, April 2013

Session organizer and chair for Astrobiology Science Conference 2012 topical session

Referee for the Astrophysical Journal

Referee for Astrophysics and Space Science

9 Community Resources and Outreach

TYCHO stellar evolution code: open source, freely available sate-of-the-art code for simulations of stellar evolution and nucleosynthesis. http://bahamut.sese.asu.edu/ payoung/AST_522_TYCHO.html

TYCHO stellar model repository: Web interface to stellar evolutionary track database for community use. http://bahamut.sese.asu.edu/ payoung/AST_522/Evolutionary_Tracks_database.h

Local television interview on 2017 eclipse, August 2016

ASU Now featured interview on "Planet 9", 2016

Biltmore Preparatory Academy Starlab and astronomy teacher training, 2016 (Minority serving institution)

Salt River Pima-Maricopa Indian Community Starlab and astronomy teacher training, 2013-2016

El Grenado Middle School Starlab and astronomy teacher training (Title I school in Alhambra Unified School District)

Navajo County Schools Starlab and astronomy teacher training

Earth and Space Exploration Day: 1500-200 visitor annual outreach event from 2008

“Building Habitable Planets" Saguaro Astronomy Club October 2015

“On the Trail of the Elements" Missoula Astronomy Club May 2015

Arizona Republic Astronomy Consultant from 2014

Interviews and press releases in Quanta, MSNBC, Space.com, ScienceNow, other outlets

Faculty sponsor for Earth and Space Open House (2010-present) and Astro Devils (2011-present) student organizations

PI, “Southwestern Earth and Skies Through Time" Earthwatch Student Challenge Awards Program: 2 week research experience for high school students from around the country. Developed and oversaw program including proposal for competitive selection. 2009-2011.

Navajo Nation Astronomy Day May

“Forging the Elements", Arizona Science Center International Year of Astronomy Public Talk

“Searching for Habitable Stars" Astrobiology Teaching Module

Mars Education Teacher Workshops 2008 – 2010

Steward Observatory Public Evening Lecture “Planets, People, and Other Products of Stellar Evolution” 10/10/2005

Ph.D. Program Consultant, Sahuaro Girl Scout Council May 2004-Present

Press Release: “Astronomers at MMTO Capture Planetary Nebula in Glowing Detail”, featured image on space.com 01/19/04

JWST NIRCam E/PO program “Linking Girls with the Sky” 2003–2007

University of Arizona Alumni Association Astronomy Camp counselor, 2000—2007

Graduate Teaching Assistant, U of A graduate course in stellar evolution, 2002

Graduate Teaching Assistant, U of A introductory astronomy, 2000—2001

Public star parties and K-12 outreach through University of Texas Astronomy Students Association, 1995—1999, U of A 1999—2007, ASU and private 2007–present

Table 2: Grants (**Total Funding to Date: $1.8M**)

Title	Agency	Amount	Duration	%	Role
Spatially Resolved Nucleosynthesis in Core Collapse Supernovae	NSF Division of Astronomical Sciences	$300K	3 years 7/2016 - 6/2019	100	PI
Exploration Connection	NASA SMD	In Negotiation, ~5M	5 years	5	Co-I (Lindy Elkins-Tanton PI)
Exoplanetary Ecosystems	NASA Nexus for Exoplanet System Science	$6.8M	5 years 2/2015-1/202020	6	Science Team Lead, Co-I (Steven Desch PI)
Impact on Supernova Observables from Progenitor Evolution	DOE	$15K	1 year 12/2014-9/2015	100	PI
Supernova Progenitors and Supernovae	DOE	$13.3K	1 year 9/2011 - 9/2012	100	PI
Chemical Self-Enrichment in the Nearest OB Association	NSF Division of Astronomical Sciences	$225K	3 years 1/2011 - 12/2014	30	Co-I (PI Eric Mamajek, U of Rochester, subcontracts not awarded)
Follow the Elements	NASA Astrobiology Institute	$5M	5 years 4/2009 - 3/2014	5	Co-I (Ariel Anbar PI)
The Turbulent Origin and Injection of the Elements	NSF Division of Astronomical Sciences	$523K	5 years 7/2008 - 6/2013	80	PI (Co-I Frank Timmes)