

Timothy F. Slater, Ph.D.

University of Wyoming, College of Education, Department of Secondary Education

Excellence in Higher Education Endowed Chair of Science Education

Professor of Secondary Education

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PROFESSIONAL PREPARATION

- Ph.D. 1993 University of South Carolina - Geological Sciences
MS 1991 Clemson University - Physics & Astronomy
BS 1989 Kansas State University - Physical Science
BS Ed 1989 Kansas State University - Secondary Science Education
Professional Teaching Certificate: Physics, Chemistry, Earth/Space Science (Kansas)

PROFESSIONAL APPOINTMENTS

- 2008-present University of Wyoming
Excellence in Higher Education Endowed Chair of Science Education & Professor of Secondary Education
- 2001-2008 University of Arizona
Associate Professor of Astronomy & Director of UA Science and Mathematics Education Center
- 1996-2001 Montana State University
Research Associate Professor of Physics
- 1994-1996 Pittsburg State University
Assistant Professor of Physics & Director of PSU Planetarium and Science Education Center

PROFESSIONAL AFFILIATIONS

- National Science Teachers Association (*elected to Board, 2010-2011*)
Society of College Science Teachers (*elected to the Board, 2006-2007*)
International Planetarium Society (*Education Committee, 2015-2017*)
American Association of Physics Teachers (*Life member, National Astro. Educ. Comm. Chair, 1996-2002*)
American Astronomical Society (*elected to the Board 2006-2009, 2009-2012*)
Astronomical Society of the Pacific (*elected to the Board 2003-2006, 2006-2009*)
Association of Astronomy Educators (*President, 1998-2001, 2001-2004*)
American Physical Society (*Education Board, 2013-2015*)
Association of Science Teacher Educators (*Co-Editor: Sci. Educ., Contemporary Issues in Technology and Teacher Education*)
National Society of Hispanic Physicists (*Life member*)
National Association for Research in Science Teaching

RECENT AWARDS AND HONORS

- Textbook & Academic Authors' Association—McGuffey Longevity Award, 2017
American Association of Physics Teachers Lifetime Distinguished Service Citation *Nominated 2015*
NASA Hubble Space Telescope Education Innovation Award: Gold Star Award, 2011
NASA Hubble Space Telescope Innovation Award: Top Stars Award, 2010
Project ASTRO Astronomy Educator of the Year, 2007

SCHOLARSHIP

EXAMPLES OF BOOKS (24) ([HTTPS://WWW.AMAZON.COM/TIMOTHY-F.-SLATER/E/B001HD44HO](https://www.amazon.com/TIMOTHY-F.-SLATER/E/B001HD44HO))

1. Slater, T. F., & Tatge, C. B. (2017, *in press for June*). Research on Learning in the Planetarium. Netherlands: Springer, ISBN: 978-3-319-57200-0
2. Tillery, B., Slater, S.J., & Slater, T.F. (2016). Physical Science, 2016, 11th edition. Dubuque: McGraw Hill, ISBN 978-0077862626
3. Slater, T. F., & Schleigh, S. P., *Editors* (2016, July). Proceedings of the 2016 National Astronomy Teaching Summit. Hawai'i: Pono Publishing, ISBN: 978-1534968974
4. Slater, S.J., Slater, T.F., Palma, C., & Kregenow, J. (2016). Introduction to Research in Astronomy and Planetary Sciences. Hilo, Hawai'i: Pono Publishing, ISBN: 978-1515190530
5. Bryan, E.H., Crowe, R.A., Slater, T.F. (2015). Stars over Hawai'i. Hilo, Hawai'i: Petroglyph Press, ISBN: 978-0912180731
6. Slater, S.J., Slater, T.F., Heyer, I., & Bailey, J.M. (2015, 2011). Discipline-Based Science Education Research. New York: W.H. Freeman Publishing, ISBN 1429265868.
7. Slater, T.F & Freedman, R. (2014). Investigating Astronomy: A Conceptual View of the Universe, 2nd edition. W.H. Freeman Publishing and Company, New York: ISBN: 978-1-429-21063-8.

BOOKS/PROCEEDINGS UNDER CONTRACT

1. Tillery, B., Slater, T.F., & Slater, S.J. (in press for 2018, completed March 2017). Integrated Science, 7th Edition. Dubuque, IA: McGraw Hill Publishing.
2. Slater, S.J., Baybayan, C. K. & Slater, T.F. (in preparation for 2017). Kilohoku o'Kele (Stars of the Pacific Wayfinders). Hilo, Hawai'i: Pono Publishing
3. Cole, C. C., & Slater, T. F., *Editors* (in preparation for 2017). Proceedings of the Popular Cultures, Science, & Science Fictions Conference, September, 2017.
4. Slater, T. F. & Schleigh, S. P., *Editors* (in preparation for 2017). Proceedings of the 2017 National Astronomy Teaching Summit, August, 2017.

EXAMPLES OF BOOK CHAPTERS (7)

1. Slater, T. F. (in press for 2017). Chapter 1: Introduction - The Promises of Cultural Archeoastronomy Across the Pacific Basin. An invited Chapter in Introduction to Cultural Archeoastronomy Across the Pacific Basin (Edited by S. P. Schleigh, East Carolina University).
2. Slater, T. F. (2014). Chapter 3: Astrobiology Education and Public Outreach. An invited Chapter in Astrobiology: An Evolutionary Approach (Edited by Vera M. Kolb), *CRC Press*, 978-1466584617, pp. 49-62.
3. "Revising Astronomy Class from Teacher-Centered Instruction to Student-Centered Learning," a chapter by T.F. Slater in Teaching of Astronomy in school - interfaces between research and practice pedagogical, (Marcos Daniel Longhini, Ed.) published by FAPEMIG - Fundação de Amparo à Pesquisa do Estado de Minas Gerais (Processo nº SHA-APQ-01879-10), 2013.
4. "Creating Worlds People Where People Want to Be: Academic Leadership in Scholarly Research Groups" a chapter by T.F. Slater, 2011, in Discussions in Leadership Theory, (Helen Barker and Michael Gibbs, *Editors*), published by Capital College Innovation and Leadership Institute. ISBN: 9780984579624.
5. "Complexity and Uncertainty as Drivers for a Ph.D. In Mathematics Education and Science Education" a chapter by R. Mayes, P. McClurg, and T.F. Slater, 2011, Callejo Pérez, D., S.M. Fain & J.J. Slater (Eds.). Higher Education and Human Capital: Re/thinking the Doctorate in America. Rotterdam: Sense Publishers.

EXAMPLES OF RECENT PUBLICATIONS (116)

> **300** GoogleScholar Entries @ <http://tinyurl.com/oyqld7t> with >**1600** citations, h-index **23**, i10-index **45**

NOTE: Student co-authors listed in **ALL CAPS**

1. **GUFFEY, S. K.**, & Slater, T. F. (*in review*) Geology misconceptions targeted by US national standards and frameworks. *International Journal of Science Education*. *In review*.
2. **KATTNER, S.**, Burrows, A. C., & Slater, T. F. (*in review*). Establishing a relationship between students' spatial ability and eclipse pedagogy. Submitted to *Latin American Journal of Astronomy Education*. *In review*.
3. **BERRYHILL K. J.**, Slater, T. F., & Slater, S. J. (*in review*). Opportunity to Learn: Investigating Possible Predictors for Pre-Course *Test Of Astronomy Standards* TOAST Scores. Submitted to *Journal of College Teaching and Learning*. *In review*.
4. **GUFFEY, S. K.**, Slater, S. J., & Slater, T. F. (*in review*). Forming a consensus of core geology concepts from national education reforms. Submitted to *Journal of Geoscience Education*. *In review*.
5. Slater, T. F., & Gelderman, R. (2017). Addressing students' misconceptions about eclipses. *The Physics Teacher*, 55(5). 314-315.
6. Slater, T. F., & Field, T. C. (2017). What's so hard about understanding eclipses? *Sky & Telescope Magazine* (commissioned paper, not peer-reviewed). <http://www.skyandtelescope.com/2017-total-solar-eclipse/whats-so-hard-about-understanding-eclipses/>
7. **KASZA, P.**, & Slater, T. F. (2017). A Survey of best practices and key learning objectives for successful secondary school STEM academy settings. *Contemporary Issues in Education Research*, 10(1), 53-66.
8. **GUFFEY, S. K.**, Slater, S. J., Schleigh, S. P., Slater, T. F., & Heyer, I. (2016). Surveying geology concepts in education standards for a rapidly changing global context. *Contemporary Issues in Education Research*, 9(4) 167-188.
9. Slater, T. F. (2016). Undiscovered value of grey astronomy education research results. *The Grey Journal*, 12(3), 153-155.
10. Slater, T.F. (2016). Teaching astronomy with dry erase white boards. *The Physics Teacher*, 54(6), 377-378.
11. LoPresto, M., & Slater, T.F. (2016). Comparison of collaborative-learning lecture-tutorial activities and formative assessment-driven visual-assessment activities to traditional lectures for learning college astronomy. *Journal of Astronomy & Earth Sciences Education*, 3(1), 59-76.
12. Slater, S.J., **TATGE, C.B.**, Bretones, P.S., Slater, T.F., Schleigh, S.P., Mckinnon, D., & Heyer, I. (2016). *iSTAR* first light: Characterizing astronomy education research dissertations in the *iSTAR* database. *Journal of Astronomy & Earth Sciences Education*, 3(2), 125-140.
13. Slater, T. F. (2015). Quickly creating interactive astronomy illustrations. *The Physics Teacher*, 53(1), 54-55.
14. Schleigh, S. P., Slater, S. J., Slater, T. F., & **STORK, D. J.** (2015). Novos parâmetros curriculares para astronomia nos estados unidos da América (*Astronomy in the US Next Generation Science Standards*). *Revista Latino-Americana de Educação em Astronomia (Latin American Journal of Astronomy Education)*, v20, p. 131-151. <http://www.relea.ufscar.br/relea/index.php/relea/article/download/229/313>
15. Slater, S. J., & Slater, T. F. (2015). Questioning the Fidelity of the Next Generation Science Standards For Astronomy And Space Sciences Education. *Journal of Astronomy & Earth Sciences Education*, 2(1), 51-64.
16. Slater, T. F. (2015). Quickly creating interactive astronomy illustrations. *The Physics Teacher*, 53(1), 54-55.
17. Slater, T. F., Burrows, A. C., **FRENCH, D. A.**, **SANCHEZ, R. A.**, & **TATGE, C. B.** (2014). A Proposed Astronomy Learning Progression for Remote Telescope Observation. *Journal of College Teaching & Learning (TLC)*, 11(4), 197-206.

18. **GERSHUN, D.C.**, Slater, T.F., & **BERRYHILL, K.J.** (2014). Mixed-Methods Study that Examines Nine Science Teachers' Perceptions of Slooh Robotic Telescope for Teaching Astronomy. *Latin American Journal of Astronomy Education (RELEA)*, 17, 7-37.
19. Haynes, J. C., Gill, B. E., Chumbley, S. B., & Slater, T. F. (2014). A cross-case comparison of the academic integration human capital pre-service agricultural educators retain prior to their teaching internship. *Journal of Agricultural Education*, 55(5), 191-206.
20. **HEYER, I.**, Slater, S.J., & Slater, T.F. (2013). Establishing the empirical relationship between non-science majoring undergraduate learners' spatial thinking skills and their conceptual astronomy knowledge. *Latin American Journal of Astronomy Education RELEA*, 16, 45-61.
21. Burrows, A.C., Borowczak, M., Slater, T. F., & Haynes, J. C. (2012). Teaching computer science & engineering through robotics: Science & art form. *International Scientific Journal: Problems of Education in the 21st Century*, 47, 6-15.
22. **JENSEN, A.**, Janak, E., & Slater, T.F. (2012). Changing course: exploring impacts of "Waiting for Superman" video documentary on future teachers' perspectives on the state of education. *Contemporary Issues in Education Research*, 5(1), 23-32.
23. Kapp, J.L., Slater, T.F., Slater, S.J., **LYONS, D.J.**, **MANHART, K.**, **WEHUNT, M.** & Richardson, R.M. (2011). Impact of redesigning a large-lecture introductory earth science course to increase student achievement and streamline faculty workload. *Journal of College Teaching and Learning*, 8(4), 23-36.
24. Slater, S.J., Slater, T.F. & **LYONS, D.J.** (2011) Teaching scientific inquiry with GalaxyZoo. *The Physics Teacher*, 49(2), 94-96.
25. **HEYER, I.**, Slater, S.J. & Slater, T.F. (2011). A 3-D model of the Orion constellation. *Mercury*, 40(4), 21.
26. **HEYER, I.**, Slater, T.F., & Slater, S.J. (2011). The solar system ballet: a kinesthetic spatial astronomy activity. *The Classroom Astronomer*, 3(1), 20-24.

RECENT PROFESSIONAL PRESENTATIONS

I: INVITED PLENARY AND KEYNOTE LECTURES

1. Slater, T. F. (2017). *What's So Hard about Understanding Eclipses?* Astronomical League AstroCon Solar Eclipse Conference, August 17, 2017, Casper WY.
2. Slater, T. F. (2017). *Practical Strategies to Use Popular Media in Your Teaching Effectively*. American Association of Physics Teachers Conference, July 24, 2017, Cincinnati, OH
3. Slater, T. F. (2017). *A Contemporary Look at Astronomy Education Research*. Robotic Telescopes, Student Research and Education Conference, June 22, 2017, San Diego, CA
4. Slater, T. F. (2017, March). *The modern professor's teaching toolkit*. Presented at the Joint Meeting of the Texas Section of the American Physical Society & Texas Section of American Association of Physics Teachers, March 10, 2017, San Antonio College, San Antonio, TX.
5. Slater, T. F. (2017, February). *New Lessons from the Last 200 Planetarium Education Research Dissertations*. Invited presentation GA01 at the American Association of Physics Teachers Conference, February 21, 2017.
6. Slater, T. F. (2017). *The modern professor's new toolkit for interactive teaching*. Plenary at International Science Education Conference, January 1-5, 2017, Maui, Hawaii.
7. Slater, T. F. (2016). *A STEM Picture is Worth 1,000 STEM Words* for Just in Time: Excellence in ESL Teaching Wyoming Spring 2016 English as a Second Language Conference, April 30, 2016 in Casper, WY
8. Slater, T. F. (2016). *Finding Time to Do It: New Lessons in Time Management for Busy Professors*. International Education Conference, March 7, 2016, New Orleans, LA

9. Slater, T. F. (2016). *Where Do You Sit on the Teaching Spectrum?* Georgia Science Teachers Association, February 5, 2016.
10. Slater, T. F. (2016). *Science Professors' Teaching Toolkit*. Columbia College, February 16, 2016.
11. Slater, T. F. (2015). *The Modern Physics Professor's Teaching Toolkit*, Florida Gulf Coast University, December 4, 2015, Ft. Myers, FL
12. Slater, T. F. (2015), *Modern Astronomy Education*, Global Hands On Universe Conference, University of Hawai'i, August 3, 2015.
13. Slater, T.F. (2014). *The Astronomy Teaching Spectrum*. National Astronomy Education Symposium of Brazil, October 21, 2014, Curitiba
14. Slater, T.F. (2014). *What Research on Memory Says to Planetarium Designers*. Great Lakes Planetarium Association Annual Conference, October 30, 2014, Muncie (www.youtube.com/watch?v=Vu9MzFIwJMM)
15. Slater, T.F. (2014). *Extending the Teaching Continuum*. Central Michigan University, April 3, 2014.
16. Slater, T.F. (2014). *Discipline-based Education Research*. Penn State University, April 22, 2014.
17. Slater, T.F. & Slater, S.J. (2012). *Actively Scaffolding Students Engagement with Scientific Data*. Australian Science Teachers Association National Conference, Canberra, July 9, 2012.
18. Slater, T.F. (2012). *Dramatically Improving Instruction through Systematic Astronomy Education Research*. Astronomical Society of Australia held at the University of New South Wales, Sydney, July 1-6, 2012
19. Kimura, K., Slater, T.F., Hamilton, J. & Takata, V. (2012). *Evolving Perspectives on Astronomy Education and Public Outreach in Hawai'i*. Invited talk 105.05 presented at the 219th American Astronomical Society winter meeting in Austin, TX, January 8-12, 2012

II: RECENT PROFESSIONAL CONFERENCE CONTRIBUTIONS (50)

1. Slater, T. F. (2017, March). *Lessons learned from the last 200 published planetarium education research studies*. Contributed talk presented at the Joint Meeting of the Texas Section of the American Physical Society & Texas Section of American Association of Physics Teachers, March 10, 2017, San Antonio College, San Antonio, TX.
2. **GUFFEY, S. K.**, Slater, T. F., & Burrows, A. C. (2017, March). *Misconceptions in the geosciences targeted by national standards and frameworks*. Research presentation at the University of Wyoming College of Education Research Symposium, Laramie, WY, March 3, 2017.
3. Slater, T. F. (2017, February). *Rapidly changing landscape of publishing astronomy education research*. Oral presentation EA10 at the American Association of Physics Teachers Conference, February 20, 2017.
4. Slater, S. J., Schleigh, S. P., & Slater, T. F. (2017, February). *Analyzing astronomy concepts in the NGSS Next Generation Science Standards*. Oral presentation EA02 at the American Association of Physics Teachers Conference, February 20, 2017.
5. **GUFFEY, S. K.**, Slater, S. J., Slater, T. F., Burrows, A. C., & Schleigh, S. P. (2017). The development of a conceptual diagnostic survey to gauge students' knowledge in the geosciences. Presentation at the Association of Science Teacher Educators International Conference, January 12-14, 2017, Des Moines, Iowa.
6. Slater, S. J., Slater, T. F., Bretones, P. S., **TATGE, C. B.**, & Schleigh, S. P. (2017). *Surprising insights from the iSTAR International Study of Astronomy education Research database*. Presentation at International Science Education Conference, January 1-5, 2017, Maui, Hawaii.
7. **GUFFEY, S. K.**, Slater, T. F., Slater, S. J., & Schleigh, S. P. (2017). *First results from administering the Exam of Geology Standards, EGGS*. Presentation at International Science Education Conference, January 1-5, 2017, Maui, Hawaii.
8. **BERRYHILL, K.**, Slater, T. F., Slater, S. J., Harbour, C. P., & Forrester, J. H. (2016, December). *Re-evaluating traditional predictors of incoming knowledge in Astronomy 101 and implications for course revitalization*. Research poster presentation at the American Geophysical Union meeting, San Francisco, CA.

9. **GUFFEY, S. K.**, Slater, S. J., Slater, T. F., & Schleigh, S. P. (2016, December). *Establishing reliability and validity of the criterion referenced Exam of Geology Standards EGGS*. Research poster presentation at the American Geophysical Union meeting, San Francisco, CA.
10. Slater, S. J., **TATGE, C. B.**, Slater, T. F., Bretones, P. S., & Schleigh, S. P. (2016, December). *Construction of the first iSTAR international Study of Astronomical Reasoning Database*. Research poster presentation at the American Geophysical Union meeting, San Francisco, CA.
11. **TATGE, C. B.**, Slater, T. F., Slater, S. J., Schleigh, S. P. & McKinnon, D. (2016, December). *Astronomy education research observations from the iSTAR international Study of Astronomical Reasoning Database*. Research poster presentation at the American Geophysical Union meeting, San Francisco, CA.
12. Slater, T. F., **TATGE, C. B.**, Slater, S. J., & Ratcliffe, M. (2016, December). *Insights for planetarium and museum educators revealed by the iSTAR international Study of Astronomical Reasoning Database*. Research poster presentation at the American Geophysical Union meeting, San Francisco, CA.
13. **BERRYHILL, K.**, Slater, T. F., & Slater, S. J. (2016, July). *Impact of prior astronomy learning experiences on TOAST scores*. Presentation at the American Association of Physics Teachers Meeting in Sacramento, July, 2016.
14. Slater, S. J., **TATGE, C. B.**, Slater, T. F., Schleigh, S. P., & Bretones, P. S. (2016, July). *Overview of U.S. Astronomy Education Research Dissertations in the iSTAR Database*. Presentation at the American Association of Physics Teachers Meeting in Sacramento, July, 2016.
15. **GUFFEY, S. K.**, Slater, S. J., Schleigh, S. P., & Slater, T. F. (2016). *Development of the Exam of Geology Standards (EGGS)*. Paper presented at the *National Astronomy Teaching Summit*, August 3, 2016, San Francisco, CA.
16. **BERRYHILL, K. J.**, Slater, T. F., & Slater, S. J. (2016). *Investigation into Possible Predictors for Pre-Course Test Of Astronomy Standards TOAST Scores*. Paper presented at the *National Astronomy Teaching Summit*, August 3, 2016, San Francisco, CA.
17. **TATGE, C. B.**, Slater, S. J., & Slater, T. F. (2016). *Analysis and characterization of planetarium education research in the iSTAR International Studies of Astronomical Reasoning Database*. Paper presented at the *National Astronomy Teaching Summit*, August 3, 2016, San Francisco, CA.
18. Slater, T. F., **TATGE, C. B.**, Slater, S.J., Schleigh, S. P., Bretones, P. S., & McKinnon, D. (2016, June). *Expanding the reach of the iSTAR International Study of Astronomical Reasoning*. Presentation at the *International Science Education Conference*, Venice, Italy, June 6, 2016.
19. Slater, T.F., & Slater, S.J. (2016, January). *Revitalizing Introductory Earth Science Survey Courses with Modern Active Learning Tutorials*. Poster presentation #180 at the *American Meteorological Society – 25th Symposium on Education*, <https://ams.confex.com/ams/96Annual/webprogram/Paper291448.html>, New Orleans, LA.
20. Slater, S., Slater, T. F., & Baybayan, K. C. (2016, January). *Kilohoku Ho’okele Wa’a---Na’Ohana Hoku’Eha (The Astronomy of the Hawaiian Navigators—The Four Star Families)*. In *American Astronomical Society Meeting Abstracts* (Vol. 227). Presented at AAS meeting in Orlando, FL, January.
21. **TATGE, C. B.**, Slater, S., Slater, T. F., Bretones, P. S., McKinnon, D., & Schleigh, S. (2016, January). *First Light Observations from the international Study of Astronomy Reasoning (iSTAR) Database*. In *American Astronomical Society Meeting Abstracts* (Vol. 227). Presented at AAS meeting in Orlando, FL, January.
22. Slater, T. F. (2016, January). *Status and Evolution of the Journal of Astronomy & Earth Science Education's First Year*. In *American Astronomical Society Meeting Abstracts* (Vol. 227). Presented at AAS meeting in Orlando, FL, January.
23. Slater, T. F., & Slater, S. (2016, January). *Enhancing ASTRO101 Student Engagement Using Student-Created Science SKETCHES*. In *American Astronomical Society Meeting Abstracts* (Vol. 227). Presented at AAS meeting in Orlando, FL, January.

24. Schleigh, S. P., Slater, S., & Slater, T. F. (2016, January). Teaching ASTRO 101 Students the Art of Scientific Argumentation. In *American Astronomical Society Meeting Abstracts* (Vol. 227). Presented at AAS meeting in Orlando, FL, January.
25. Slater, S.J., **STORK, D.**, Schleigh, S.P., & Slater, T.F., (2016). K-12 Teachers Scores on the Test Of Astronomy STAndards TOAST. Presented at the American Association of Physics Teachers Conference, New Orleans, LA, on January, 10, 2016.
26. Slater, T.F., **TATGE, C.B., & BRANDT, K.C.** (2016). Strategies for Avoiding Information Overload in the Planetarium. Presented at the American Association of Physics Teachers Conference, New Orleans, LA, on January, 10, 2016.
27. Slater, T.F., (2016). Publishing Pathways in the Journal of Astronomy & Earth Sciences Education. Presented at the American Association of Physics Teachers Conference, New Orleans, LA, on January, 11, 2016.
28. **FRENCH, D.A.**, Burrows, A.C., & Slater, T. F. (2016). Shifting from Core Concepts to Integrated Topics in ASTRO 101. Presented at the American Association of Physics Teachers Conference, New Orleans, LA, on January, 12, 2016.
29. **FRENCH, D.A.**, Burrows, A.C., & Slater, T.F. (2016). Exploring NITARP's Impacts on Teacher's Knowledge, Attitudes, and Teaching. Presented at the International Conference of the Association of Science Teacher Educators, Reno, NV. January, 2016.
30. Slater, T. F., & Slater, S. J. (2015). Refocusing International Astronomy Education Research Using a Cognitive Focus. Hawai'i meeting of the *International Astronomical Union General Assembly*, 22, 57397.
31. Slater, T. F. (2015). Publishing in the Refereed International Journal of Astronomy & Earth Sciences Education JAESE. Hawai'i meeting of the *International Astronomical Union General Assembly*, 22, 57380.
32. Slater, S. J., Slater, T. F., **TATGE, C. B.**, & **GUFFEY, S. K.** (2015). Expanding Astronomy Education Innovations to the International Community. Hawai'i meeting of the *International Astronomical Union General Assembly*, 22, 57332.
33. Slater, S. J., & Slater, T. F. (2015). *Reexamining the Underrepresentation of Indigenous Peoples in Astronomy: A Hawaiian Case Study*. Hawai'i meeting of the *International Astronomical Union General Assembly*, 22, 57314.
34. **TATGE, C. B.**, Slater, T. F., & Slater, S. J. (2015). *iSTAR: The international Study on Astronomy Reasoning*. Hawai'i meeting of the *International Astronomical Union General Assembly*, 22, 57436.
35. **DYE, A. G.**, Hao, C., Slater, T. F., & Slater, S. J. (2015). *Reclaiming Celestial Navigation Using a Contemporary Hawaiian Worldview of the Heavens*. Hawai'i meeting of the *International Astronomical Union General Assembly*, 22, 57387.
36. Hao, C., **DYE, A. G.**, Slater, S. J., Slater, T. F., & Baybayan, K. (2015). *Kilohoku Ho'okele Wa'a: Astronomy of the Modern Hawaiian Wayfinders*. Hawai'i meeting of the *International Astronomical Union General Assembly*, 22, 57418.
37. **DYE, A. G.**, Ha'o, C., Slater, T. F., & Slater, S. J. (2015). *Observations of an indigenous Hawaiian planetarium operator: Astronomy content knowledge of Hawaiian school children*. Hawai'i meeting of the *International Astronomical Union General Assembly*, 22, 57360.
38. **GUFFEY, S. K.**, Slater, S. J., & Slater, T. F. (2015). *New Contemporary Criterion-Referenced Assessment Instruments for Astronomy & Geology: TOAST & EGGS*. Hawai'i meeting of the *International Astronomical Union General Assembly*, 22, 57417.
39. **STORK, D.J.**, Slater, S.J., Slater, T.F., & Hayes, J.C. (2015). *A Modern Measurement of K-12 Teachers Understanding of NGSS Astronomy Concepts*. Presented at the International Conference of the Association of Science Teacher Educators, Portland, OR, January 8, 2015
40. **TATGE, C. B.**, & Slater, S. J. (2015, January). Design of the iSTAR international Study on Astronomy Reasoning. In *American Astronomical Society Meeting Abstracts* (Vol. 225). Presented at AAS meeting in Seattle, WA, January.
41. Slater, T. F. (2015, January). Modern Publishing Approach of Journal of Astronomy & Earth Sciences Education. In *American Astronomical Society Meeting Abstracts* (Vol. 225). Presented at AAS meeting in Seattle, WA, January.

42. Slater, S., **DYE, A.**, Ha'o, C., Slater, T. F., Baybayan, K. C., Johnson, R., ... & Ruggles, C. (2015, January). Hawaii and the Real-Time Evolution of Cultural Astronomy. In *American Astronomical Society Meeting Abstracts* (Vol. 225). Presented at AAS meeting in Seattle, WA, January.
43. **DYE, A.**, Ha'o, C., Slater, T. F., & Slater, S. (2015, January). Kilohoku-Hookele Waa: Hawaiian Navigational Astronomy. In *American Astronomical Society Meeting Abstracts* (Vol. 225). Presented at AAS meeting in Seattle, WA, January.
44. Slater, T. F., Slater, S., & **STORK, D. J.** (2015, January). Test Of Astronomy STandards TOAST Survey of K-12 Teachers. In *American Astronomical Society Meeting Abstracts* (Vol. 225). Presented at AAS meeting in Seattle, WA, January.
45. **TATGE, C. B.**, Slater, S. J., & Slater, T. F. (2015, January). First Results from the iSTAR International Study on Astronomy Reasoning. In *American Astronomical Society Meeting Abstracts* (Vol. 225). Presented at AAS meeting in Seattle, WA, January.
46. Slater, S., & Slater, T. F. (2014, June). Leveraging Cognitive Science Underpinnings to Enhance NGSS Astronomy Concepts. In *American Astronomical Society Meeting Abstracts* (Vol. 224).
47. Burrows, A.C., Slater, T.F., & Borowczak, M. (2014, January). Integrated STEM: What Does it Mean to Educators. Presentation at the International Association of Science Teacher Educators Conference, January 16, 2014, San Antonio, TX
48. **ALI, T.I.**, & Slater, T.F. (2014, October). Interpretive Reflections on Learning Motivations in Bangladesh as Revealed by Poetry. Presentation to the Annual Himalayan Policy Research Conference, Madison, WI, October 16, 2014.
49. Slater, T. F., Slater, S., Marshall, S. S., **STORK, D.**, & Pomeroy, J. R. R. (2014, June). New FINESSE Faculty Institutes for NASA Earth and Space Science Education. In *American Astronomical Society Meeting Abstracts* (Vol. 224).
50. **SCHWORTZ, A. C., FRENCH, D. A., GUTIERREZ, J. V., SANCHEZ, R. L.**, Slater, T. F., & **TATGE, C.** (2014, June). Initial Development and Pilot Study Design of Interactive Lecture Demonstrations for ASTRO 101. In *American Astronomical Society Meeting Abstracts* (Vol. 224).
51. **SCHWORTZ, A. C., FRENCH, D. A., GUTIERREZ, J. V., SANCHEZ, R. L.**, Slater, T. F., & **TATGE, C.** (2014, March). A Review of Educational Computer Simulations for Interactive Lecture Demonstrations in Introductory Astronomy Survey Courses. *Presented at the North Eastern Section of the American Association of Physics Teachers Conference.*
52. **BERRYHILL, K., BRANDT, K.**, & Slater, T.F. (2014). Evolving Best Practices in Online Astronomy Teaching. Poster Abstract ED53A-3474 presented at the Fall Meeting of the American Geophysical Union, December 19, 2014, San Francisco.
53. **ALI, T.I.** & Slater, T.F. (2013). *Valuing a multi-voiced perspective on comparative urban Bangladesh physics learning experiences.* Presentation at the Comparative & International Education Society conference in New Orleans, March, 2013.
54. Gershun, D., **BERRYHILL, K.**, & Slater, T.F. (2013). *Evaluation of SLOOH Space Telescope for Educational Merit.* Presentation FD03 at the winter national meeting of the American Association of Physics Teachers, New Orleans, January, 2013.
55. Haynes, J. C., Gill, B. E., Chumbley, S. B. & Slater, T. F. (2013). Uncovering academic emphasis through agricultural education: Knowledge of pre-service teachers in STEM integration – A cross-case comparison of three agricultural education pre-service teacher education programs. *2013 AAAE Southern Region Conference, Feb. 2-5, 2013, Orlando, FL.*
56. Slater, T.F., Slater, S.J., **LYONS, D.J., BERRYHILL, K.**, & Sibbersen, K. (2012). Using Backwards Faded Scaffolding to Support Inquiry Teaching in ASTRO 101. Presentation at the American Association of Physics Teachers Conference, Ontario, CA, February, 2012.

57. Slater, S.J., **HEYER, I.**, & Slater, T.F. (2012). Exploring the Impact of Students' Spatial Thinking Levels and Ability to Learn Astronomy Concepts. Presentation at the American Association of Physics Teachers Conference, Ontario, CA, February, 2012.
58. **BERRYHILL, K.**, Slater, T.F. & Slater, S.J. (2012). Rationale and Initial Design for a Virtual Undergraduate Internship in Astronomy. Poster 147.06 presented at the 219th American Astronomical Society winter meeting in Austin, TX, January 8-12, 2012
59. **BERRYHILL, K.**, Slater, T.F. & Armstrong, J.D. (2012). First Steps Toward K-12 Teacher Professional Development Using Internet-based Telescopes. Poster ED43A-0711 presented at the Fall Meeting of the American Geophysical Union in San Francisco, CA, December 6, 2012.
60. **HEYER, I.**, Slater, S.J. & Slater, T.F. (2011). Preliminary correlational data on the relationships between undergraduates' spatial reasoning skills and their ability to learn space science concepts. Abstract ED13C-0827 poster presented at American Geophysical Union Fall Meeting, San Francisco, Dec 5-9, 2011.
61. **LYONS, D.J.**, Slater, S.J. & Slater, T.F. (2011). Impact on Scientific Inquiry of a Backwards-Faded Scaffolding Approach to Inquiry-based Space Science for Non-Science Majoring Undergraduates. Abstract ED13C-0832 poster presented at American Geophysical Union Fall Meeting, San Francisco, Dec 5-9, 2011.
62. **HEYER, I.**, Slater, T.F., & Slater, S.J. (2011). Spatial Sense and Perspective: A 3-D Model of the Orion Constellation. Poster presented at the Astronomical Society of the Pacific Annual Conference, July 31-August 3, 2011, Baltimore, MD.
63. **LYONS, D.J.**, Slater, S.J. & Slater T.F. (2011). Impact on Scientific Inquiry of a Backwards-Faded Scaffolding Approach to Inquiry-based Space Science for Non-Science Majoring Undergraduates. Abstract ED13C-0832 poster presented at American Geophysical Union Fall Meeting, San Francisco, Dec 5-9, 2011.
64. **LYONS, D.J., REISER, M.**, Slater, T.F. & Slater, S.J (2011). Get Out From Behind the Podium: Creating Your Own Lecture-Tutorial Style Activities That Work. Proceedings of the Astronomical Society of the Pacific Conference, COSMOS in the Classroom, Boulder, CO, August 2010.

VI: OTHER PRESENTATIONS

1. Presented a campus-lecture, "The Science of Harry Potter" as part of the UW College of Education Noyce SWARMS Program April 4, 2017
2. Slater, T. F. (2016, November). Invited Speaker for Ellbogen Center for Teaching and Learning and the Outreach School Teaching 'n Technology TNT" Program: *Constant Engagement Teaching Through Free SMS/Text Messaging*, November 16, 2017
3. HawaiiCon Science & Science Fiction Convention, *Invited Speaker*: [1] Radio Astronomy in the Classroom (50 min.); [2] Review of 2016 Science Breakthroughs (50 min.); and [3] Giant Telescopes around the World (50 min.). Kona, Hawaii. September 14-18, 2016.
4. Slater, T. F. & Slater, S. J. (2016). What Do Astronomers See When They Watch *Star Trek*? Paper presented at the *ShoreLeave Science & Science Fiction Convention*, July 15, 2016, Baltimore, MD.
5. Slater, T. F. (2016). The Hogwarts O.W.L. Astronomy Test Prep-Class. Paper presented at the *Myths & Legends Science & Science Fiction Convention*, August 13, 2016, Denver, CO.
6. Presented a campus-lecture, "The Science of Harry Potter" as part of the UW College of Education Noyce SWARMS Program April 26, 2016
7. Presented a campus-lecture, "Is Pluto a Planet Again?" as part of the UW College of Education Noyce SWARMS Program March 22, 2016
8. Presented a lecture, "The Science of Science Fiction" as part of the UW College of Education Noyce SWARMS Program February 23, 2016
9. Presented a lecture, "Science Teaching as an Important STEM Career Pathway Option" as part of the UW College of Education Noyce SWARMS Program November 17, 2015

10. Slater, T.F., & Slater, S.J. (2014, February). Star Wars: Who Shot First and Why it Matters. GalaxyFest Science Fiction Conference, Colorado Springs, CO, February 21-23, 2014
11. Slater, T.F. (2014, February). The Sky Tonight: 8 Planetarium Lectures at GalaxyFest Science Fiction Conference, Colorado Springs, CO, February 21-23, 2014
12. Slater, T.F. (2014, May). The Sky Tonight: 3 Planetarium Lectures at Lewis Palmer Middle School, Monument, CO, May 19, 2014.
13. Slater, T.F. (2014, August). The Physics of Dr. Who. Lecture at the Shore Leave Conference, August 1, 2014, Baltimore.
14. Slater, T.F. (2014, August). The Astronomy of Harry Potter. Lecture at the Myths And Legends Conference, August 9, 2014, Denver
15. Slater, T.F. (2014, August). Astronomy for Muggles: 6 Planetarium Lectures at the Myths And Legends Conference, August 8-10, 2014, Denver
16. Slater, T.F., & Slater, S.J. (2014, September). Comic Book Superheroes Across the Spectrum. Presentation at the HawaiiCon Science Fiction Conference, September 13, 2014, Kona
17. Burrows, A.C., Haynes, J.C., **SANCHEZ, R.** & **HAYNES, A.**, & Slater, T.F., (2012). Robotics Institute for K-12 Teachers. A two-week, intensive summer workshop for teachers on energy education using robotics, funded by MSP, Buffalo, WY, June 18-29, 2012.
18. Slater, T.F., **SANCHEZ, R.** & Dale, D. (2011). Robotics Institute for K-12 Teachers. A two-week, intensive summer workshop for teachers on energy education using robotics, funded by MSP, Riverton, WY, June 6-19, 2011.

IV: NON-REFEREED & COMMISSIONED ACADEMIC WRITING

Dr. Slater serves as lead monthly columnist for *Society of College Science Teachers* blog at <http://www.scst.org/blog>

1. Slater, T. F. (2017, March). Five secrets and grading hacks to keep up with grading. *Society of College Science Teachers Blog*, 2(8).
2. Slater, T. F. (2017, February). Get the vote out: New options for polling and soliciting students' ideas. *Society of College Science Teachers Blog*, 2(7).
3. Slater, T. F. (2017, January). Online office hours: The "Dr. is (virtually) in". *Society of College Science Teachers Blog*, 2(6).
4. Slater, T. F. (2016, December). Practical strategies to use popular movies effectively. *Society of College Science Teachers Blog*, 2(5).
5. Slater, T. F. (2016, November). Re-imagining your teaching by focusing on constant student feedback. *Society of College Science Teachers Blog*, 2(4).
6. Slater, T. F. (2016, October). Ready to revise your class attendance policy? *Society of College Science Teachers Blog*, 2(3).
7. Slater, T. F. (2016, September). Strategies to get feedback from students about your teaching. *Society of College Science Teachers Blog*, 2(2).
8. Slater, T. F. (2016, August). Getting students to understand your syllabus. *Society of College Science Teachers Blog*, 2(1).
9. Slater, T. F. (2016, April). Creating the most effective final exam review sheet, if you must. *Society of College Science Teachers Blog*, 1(9).
10. Slater, T. F. (2016, March). Remember to explain WHY you assign homework. *Society of College Science Teachers Blog*, 1(8).
11. Slater, T. F. (2016, February). Checklist to help you avoid these common PPT mistakes. *Society of College Science Teachers Blog*, 1(7).

12. Slater, T. F. (2016, January). Get better student buy-in using a ‘Negotiated Syllabus’ *Society of College Science Teachers Blog*, 1(6).
13. Slater, T. F. (2015, December). Higher level exam questions that are still quick to grade. *Society of College Science Teachers Blog*, 1(5).
14. Slater, T. F. (2015, November). The secret to improving your future course evaluations now. *Society of College Science Teachers Blog*, 1(4).
15. Slater, T. F. (2015, October). Using text messages to better communicate with students. *Society of College Science Teachers Blog*, 1(3).
16. Slater, T. F. (2015, September). Tips for managing email from students. *Society of College Science Teachers Blog*, 1(2).
17. Slater, T. F. (2015, August). Simple moves to immediately improve your syllabus. *Society of College Science Teachers Blog*, 1(1).

GRANT EXPERIENCE

RECENT PROPOSALS FUNDED

1. Research Experiences for Undergraduates in Astronomy, PI Danny Dale & External Evaluator Tim Slater to NSF AST REU for \$1.2M, funded, 2015.
2. PhysTec at UW – Recruiting Physics Teachers, \$19, 841. Dale, D., Slater, T.F., & Burrows, A.C. (Funded 2014). From American Physical Society. (<http://www.uwyo.edu/uw/news/2015/03/uws-dale-among-professors-selected-to-recruit-physics-teachers.html>)
3. LaunchPad Science for Science Fiction Writers Workshop, \$20,000. Brotherton, M., Slater, S.J., & Slater, T.F. (Funded 2014), from NASA.
4. NASA SMD NNH11ZDA001N-EPOESS: Slater, T.F., Stork, D., Slater, S.J., Pomeroy, J.R., & Marshall, S. (2011). Faculty INstitutes for Earth and Space Science Education (FINESSE)- *A Collaborative Effort to Improve Diversity by Enhancing Earth and Space Science Teacher Preparation*, January 2012-September 2016, \$675,000 Award
5. NSF ITEST #069690956: Leonard, Hamann, Jafari, & Slater (2012). Visualization Basics: UGame - ICompute. \$1.2M
6. NSF Noyce #1339853: Burrows, Slater, Jafari, & Dale (2013). Wyoming Science and Mathematics Teacher (WSMT) Training Program. \$1.1M.
7. SkyWatchers-Track 1 Planning Grant: Bringing New Students to GeoScience Through Observing the Sky: NSF GeoEd Opportunities for Enhancing Diversity in the Geosciences (NSF – OEDG 10-599 #1108238). \$80,000 (July 2011-February 2014).
8. Engaging Non-Science Majors in Inquiry through Backwards Faded Scaffolding Approach to Learning. (NSF CCLI/TUES #1044482). *A curriculum development project for introductory science laboratory courses*. S.J. Slater is PI. \$197,063 (July 2011-June 2013).
9. Robotics for 21st Century Students. Award for summer teacher workshop programs and equipment, Wyoming Math Science Partnership (MSP) Program. T.F. Slater, S.J. Slater, D. Dale, Co-I’s. March 1, 2010 –Dec 2011; T.F Slater, A. Burrows, D. Dale, J.C. Haynes, Co-Is 2012-2013. \$600K over three years.
10. Advancing Mentor and Novice Teachers in Space Science (AMANTISS). Subcontract from lead institution UC Berkeley, PI/PD Traci Weirman, to NASA Research Announcement “Opportunities in Science Mission Directorate Education and Public Outreach” (NNH08ZDA001N-EPO) for \$107,749 to University of Wyoming, March 1, 2009 – February 28, 2013. Slater, T.F, CoPI
11. Energy Education in Wyoming Schools. Award for three 2-year Ph.D. student graduate assistantships from the School of Energy Resources. \$150,000, August 1, 2009 – July 31, 2011.
12. Quantitative Reasoning in STEM Education (QR-STEM). Grant from the Wyoming Department of Education – Mathematics & Science Partnership (MSP) Program. \$232,603, January 1, 2009-September 30, 2010. Robert Mayes and Tim Slater, Co-PIs.

13. Improving Astronomy in Schools Using Online Professional Development. Award for 1-year Ph.D. student graduate assistantship from Wyoming Space Grant Consortium. \$25,000, August 1, 2009 – July 31, 2010.

I. PREVIOUS GRANTS RECORD - NSF

- PI CATS: Community of Astronomy Teaching Scholars (NSF CCLI Phase 3 #0715517). *A four year project to build a community of college and university faculty into a cadre of education researchers. Transferred PI-ship to Chris Impey when moved from UAz to UW, \$2M (July 2008-June 2012).*
- Co-I ClassAction: A Model Rapid-Feedback and Dynamic Formative Assessment System (NSF DUE CCLI ASA # 0404988). A three year project to develop rapid, metacognitive feedback tools via computer-aided instructional approaches for non-science majors. Primary award to University of Nebraska – Lincoln for \$ 359,768 (Kevin Lee, PI). Sub-award to University of Arizona - Steward Observatory (T. Slater) for \$42,526 (July 1, 2004 – June 30, 2007).
- Co-I Interactive Simulation Environments for Inquiry Astronomy Teaching (NSF DUE CCLI 0231270). A three-year project to develop computer simulations for astronomy teaching. Primary award to University of Nebraska – Lincoln for \$336,572 (Kevin Lee, PI). Sub-award to University of Arizona - Steward Observatory (T. Slater) for \$42,526 (April 15, 2003 – March 31, 2006).
- PI Development of Interactive Materials for Large-Enrollment Introductory Astronomy. (NSF EAR Geoscience Education 99077755). Initial development of collaborative learning materials for large lecture courses for non-science majors. \$79,967 (June 2000 – August 2001).
- Co-I Institutional Reform: Building a Teaching and Learning Community (NSF DUE 9850116). Development of faculty fellows program, faculty portfolio assessments, and campus assessment procedures. \$200,000 (May 1999 – August 2001).
- PI Development of Active Learning Materials for Undergraduate Introductory Astronomy for Non-Science Majors (NSF DUE CCLI 9952232). A three-year project to fully develop collaborative learning materials for large lecture courses for non-science majors. \$147,902 (August 2000 – August 2003).
- Co-I TOPS Leadership Teacher Enhancement Program (NSF TE 9731083). Five summer workshops for Pacific Rim secondary astronomy teachers in Hawaii. NSF TE - \$938,400 (August 1998 – August 2003).
- Co-I Project STAR: Student and Teachers as Researchers (NSF TE 9726571). Summer workshops for 8-12 gifted and talented students to conduct scientific research projects throughout the year. NSF TE - \$359,480 (Aug. 1997 - Aug. 2000).
- PI Integrating Portable Planetaria into Science Methods for Elementary Education Majors Courses (NSF ILI 9552314). Developed 25 inquiry-based activities for use with a STARLAB planetarium. \$6,555 (Jan. 1995 - Jan. 1996).

II. PREVIOUS GRANTS RECORD - NASA AWARDS

- Co-I NASA Earth Science Institute for Elementary Educators (ESIEE) to create an earth and space distance learning program for elementary educators in the Midwest. Awarded to PI D. Gosselin, University of Nebraska, \$356,094 (August 1, 2005 to August 1, 2008)
- Co-I NASA Astrobiology Institute Award to the University of Arizona and NOAO Life and Planets LAPLACE Research Center, (N. Woolf, PI; T Slater serves as Co-I and EPO Lead). \$5M (November 2003 – June 2008).
- PI NASA JPL/Navigator EPO Support: Teaching Excellence Workshops for College Faculty for the Center for Astronomy Education. Developing curriculum materials and delivering ten college teaching workshops nationally. Under contract to the NASA JPL/Navigator EPO program. \$481,000 (June 2003 – September 2008). URL: <http://astronomy101.jpl.nasa.gov>

- PI Development of Education Modules, Distance Learning Courses, and College Faculty Workshops for the NASA Sptizer/SIRTF Education and Public Outreach Effort at JPL. Conducted research on student difficulties and developed curriculum modules. \$370,000 (Sept. 2000 – September 2007).
- Co-I NASA NGST NirCAM EPO: Linking Girl Scouts with the Sky. Developing a national partnership with Girl Scouts to provide updated curriculum materials in astronomy and developing a scientist-Girl Scout-mentoring program. The NIRCAM E/PO program is funded by NASA under prime contract, NAS502105, with Goddard Space Flight Center to The University of Arizona. D.McCarthy, PI, L. Lebofsky and T.Slater, Co-Is. (July 2002 – July 2007)
- Co-I NASA CERES Center for Educational Resources Project. Developed technology-based instructional units and three distance learning courses delivered via the Internet combining National Science Education Standards and on-line NASA resources. NASA HQ #NAG5-4576 - \$1.0 M (Jan. 1997 – June 2001).
- PI Space After School Virtual Field Trips, Montana Space Grant Consortium. Arranged five virtual field trips for middle school students via satellite video link. \$24,000 (January 2000 – August 2000)
- PI Developing Distance Learning Courses to Support NASA SIRTF EPO at JPL/IPAC. Development of Internet delivered distance learning courses for teachers. \$199,000 (September 2000 – Jan. 2004).
- PI Integrated Mathematics and Astronomy by Hands-On for Elementary Students Project, NASA IDEAS Program. \$17,500 (Dec. 1999 – Sept 2000). URL: <http://solar.physics.montana.edu/astromath/>
- PI Internet Workshop for Space Scientists, NASA Broker Facilitator Program and Ohio Aerospace Institute, \$4,872, (Feb 1999 – Aug 1999) Ref# 428095.
- PI Development of Classroom Modules to Support NASA's SOFIA EPO Effort, SETI Institute and NASA Ames Research Center. \$12,563 (Dec. 1999 – Sept 2000) Ref#428320.
- Co-I The Dynamic Sun Planetarium Project, NASA IDEAS Program. Develop a planetarium show highlighting the active nature of the solar corona. \$30,000 (Aug. 1998 – Aug. 2000) NASA Ref# ED-90151.01-A
- PI Starlab Workshops for Portable Planetariums, NASA IDEAS Program. Developed and delivered a workshop for K-12 teachers on using portable planetariums. \$8,000 (Jan. 1996 - Aug. 1996).

III. PREVIOUS GRANTS RECORD - STATE-LEVEL AWARDS

- PI SOLSTIC Online Teacher Preparation for the Arizona Universities Network (AZUN). \$45,000 AZ Board of Regents Award (June 2006 – June 2007)
- PI Online Teacher Preparation for the Arizona Regents University (ARU). \$264,000 AZ Board of Regents Award (June 2003 – June 2006)
- PI Assessment of an Internet-Delivered Learner-Centered Education (LCE) Approach to Introductory Astronomy for Non-Science Majors. \$25,000 AZ Board of Regents Award (April 2002 – December, 2002)
- Co-I Teaching Concepts: From Consumer to Practitioner. H. Larson, PI, L. Lebofsky & T.F. Slater, Co-Is. \$34K AZ Board of Regents Award (July 2002-June 2003)

IV. PREVIOUS GRANTS RECORD - NCLB AND D.D. EISENHOWER SCIENCE AND MATHEMATICS EDUCATION ACT TITLE II AWARDS

- PI ECIST Early Career Institute for Science Teachers program to support science teachers in their first three years of science teaching. \$450,000 AZ Dept. of Ed. NCLB Award (June 2006 – June 2009)

- PI Developing a Accountability Model for Science and Mathematics Education in Rural Montana Elementary Schools. Trained and coordinated teachers conducting collaborative action research projects. \$47,600 (July 1999-July 2001).
- PI Research in Montana Schools RIMS Project. Summer workshops for middle and secondary teachers to conduct scientific research projects throughout the year. \$24,000 (May 1999 - Aug. 2001).
- PI Development of an On-Line Professional Development Guide in Mathematics, Science, and Technology for Montana Office of Public Instruction. D.D. Eisenhower - \$11,120 (August 1998 – August 1999).
- PI Project Connections: Problem Solving Activities for Integrating Mathematics and Science. Three-year project conducted over video-teleconferencing (CoDec) networks to create and deliver 24 workshops for grades 3-8 teachers by training project lead teachers. \$217,000 (Jan. 1995 - Aug. 1997).
- PI Science Picnics for a Life-Long Learning Community. One year project to support 16 K-8 teachers in creating a series of evening science carnivals for local community focusing on the National Science Education Standards. \$22,000 (Aug. 1995 - May 1996).

V. PREVIOUS GRANTS RECORD - OTHER AWARDS

- PI NSF Sponsored - Earth System Science Education Alliance (ESSA) award for “An Online Earth System Science Teacher Education Program sub award to the University of Arizona and then to University of Wyoming for \$40,000 (July 2007 – July 2009).
- Co-I Templeton Foundation Award for *Astrobiology and the Sacred: Implications of Life Beyond Earth* (C. Impey, PI; R Poss and T Slater, Co-Is) for \$470,000 (July 2004 – June 2008).
- PI NASA Astrobiology Institute award to provide four Internet-based *Astrobiology for Teachers* courses through the NSTA Professional Development Institute for \$109,268 (August 2003 – July 2007).
- PI Howard Hughes Medical Institute Sub-Award from University of Arizona Department of Molecular and Cellular Biology (Michael Wells, PI) for \$11,000 to create and deliver an Astrobiology course for life sciences majoring undergraduates during the summer of 2003.
- PI Howard Hughes Medical Institute Sub-Award from University of Arizona Department of Molecular and Cellular Biology (Michael Wells, PI) for \$5,000 to support the Southern Arizona Science and Mathematics Education Conference on Teaching, April, 2003.
- Co-PI DoEd – Arizona Teacher Excellence Coalition. Serving as Co-I, this project ties together teacher recruiting, pre-service, beginning teacher programs statewide. \$13M awarded to Arizona, approximately \$1.7M spent through UofA (T. Slater) to support museum docent programs, new teacher support programs, and statewide collaboration (August 2001 – June 2005).
Sub Awards:
- AzTEC Management – *Statewide Collaboration Efforts*
 - GEMS – *Regional GEMS Curriculum and Professional Development Program*
 - ASIST – *Early Career Science Teacher Induction Support Program*
 - PIMAS – *Secondary Student Museum Docent Training Program*
- PI NASA Astrobiology Institute award to provide an Internet-based Astrobiology for Teachers course through the National Teachers Enhancement Network (NTEN): for \$10,000 for Fall Semester 2002 by NAI Central and \$88,000 for fall 2003, 2004, and 2005 by JPL Virtual Planet Laboratory EPO Program.
- PI Equipment Grant to Upgrade the Montana State University AJM Astronomical Observatory from the MSU Equipment Fee Allocation Committee (EFAC) for \$24,546 (Fall Semester 2000).

- Co-PI Assessment of Gender Equity in Collaborative Group Learning Activities in a Large-lecture Astronomy Course from the Science and Engineering for All Project for \$4,800 (Jan. 1998 - Jan. 1999).
- Co-PI Student Retention in Gateway SMET Courses at Montana State University by the Provost's Office for \$7,435 (Jan. 1999 - Jan. 2000).
- Co-I Implementing Focus Groups for Large Lecture Course Improvement by the Montana State University Teaching and Learning Committee for \$1180 (Jan. 1998 - Jan. 1999).
- PI Montana State University Big Sky Institute Professional Development Visitor Series to organize a campus-wide series of workshops on improving student assessment strategies for \$5,000 (Feb. 1997 - Aug. 1997).

EXAMPLES OF PROFESSIONAL DEVELOPMENT WORKSHOPS

1. Slater, T. F. (2017, March). *Implementing Small Group Learning Activities to Teach Astronomy*. Professional development workshop conducted at the Joint Meeting of the Texas Section of the American Physical Society & Texas Section of American Association of Physics Teachers, March 10, 2017, San Antonio College, San Antonio, TX.
2. Slater, S. J., Morgan, W., & Slater, T. F. (2017, February). *Faculty Professional Development Workshop: Teaching Introductory Astronomy Using Quantitative Reasoning Activities (4 hrs)*. Presented at Georgia Tech, February 17, 2017.
3. Slater, T. F. (2016, July). *Finding Time To Do It: New Lessons in Time Management for Busy Faculty*. Workshop at the American Association of Physics Teachers Meeting in Sacramento, July, 2016.
4. American Astronomical Society Pre-Conference Workshop, Gaylord Palms Resort, Orlando, FL. *Teaching Introductory Astronomy Using Quantitative Reasoning Activities*, Teaching Workshop held on January 3, 2016 (8 hrs)
 - *Astronomy is a Verb-Teaching Introductory Astronomy Students Using Data-Rich, Research-Oriented Labs*. Teaching Workshop held on Tuesday, August 4, 2015, 12:30pm-3:30pm in Room 327 at the Hawaii Convention Center as part of the International Astronomical Union General Assembly, Honolulu, HI.
 - *Publishing Your Astronomy Education & Outreach Research and Evaluation Results: A Panel of International Journal Editors*, Wednesday, August 5, 2015, 1030am-Noon in Room 318A at the Honolulu Convention Center as part of the International Astronomical Union General Assembly, Honolulu, HI.
 - *Teaching the Art of Scientific Argumentation to Improve Students Understanding of Astronomy*. Teaching Workshop held on Wednesday, Thursday, August 6, 2015, 10:30am-Noon in Room 328 at the Honolulu Convention Center as part of the International Astronomical Union General Assembly, Honolulu, HI.
 - *Hawaiian, Oceanic and Global Cultural Astronomy: Tangible and Intangible Heritage*. An International Conference in Hilo, on the Big Island of Hawai'i, August 16–20, 2015. Conference Co-Hosts: Clive Ruggles, Stephanie Slater, Tim Slater, and Sharon Schleigh.
 - *A Modern Approach to Teaching Introductory Astronomy for Diverse College Students*. Teaching Workshop held at Thomas Nelson Community College, Hampton, VA, April 25, 2015
 - *Engaging College Astronomy Students with Lecture-Tutorials*. A Teaching Workshop given at the American Association of Physics Teachers- San Diego, CA January 3, 2015
 - *Astronomy is a Verb-Teaching Introductory Astronomy Students Using Data-Rich, Research-Oriented Labs*. A Teaching Workshop given at the American Association of Physics Teachers- San Diego, CA January 3, 2015
 - *A Modern Approach to Teaching Introductory Astronomy for Diverse College Students*. An 8-hr teaching workshop given at Seattle Pacific University- Seattle, WA , January 4, 2015
 - *Engaging Astronomy Students with Lecture Tutorials*, ½ day workshop, American Association of Physics Teachers Conference, January 5, 2014, Orlando

5. Improving Science Methods Courses with NASA Data, 2-day workshop, prior to International Association for Science Teacher Education Conference, January 14-15, 2014, San Antonio
6. Fostering Student Success, 1-day workshop, Hampton University, Hampton VA for the National Association of Black Physicists, April 5, 2014
7. Fostering Student Success, 1-day workshop, University of the District of Columbia for the National Association of Black Physicists, May 3, 2014
8. College Teaching Excellence Workshop, 2-day workshop, Massachusetts Institute of Technology, May 31-June 1, 2014, Boston
9. College Teaching Excellence Workshop, 2-day workshop, Tougaloo College (Touglao, Mississippi), June 7-8, 2014, Mississippi
10. Workshop for New Faculty, 3-day workshop, American Center for Physics, College Park, Maryland, June 23-26, 2014
11. LaunchPad Science for Science Fiction Writers Workshop, University of Wyoming, Laramie, July 17, 2014.
12. Workshop for Physics Faculty, 3-day workshop, American Association of Physics Teachers, University of Minnesota, July 24-26, Minneapolis
13. College Teaching Excellence Workshop, 2-day workshop, San Francisco City College, October 17 & 18, 2014, San Francisco
14. Workshop for New Faculty, 3-day workshop, American Center for Physics, College Park, Maryland, November 13-16, 2014

PROFESSIONAL SERVICE

(I) UNIVERSITY OF WYOMING

1. Faculty Senate (Senator)
2. C&I Graduate Admissions Committee (Chair, 2012-2016)
3. Academic Council Graduate Education
4. UW College of Education –Various Search Committee
5. Junior Faculty Mentoring Committee for Andrea C. Burrows and J. Chris Haynes
6. Faculty Co-Advisor with Burrows for UW Science Teaching Club (a local affiliate of NSTA)

(II) RECENT PROFESSIONAL CONFERENCE SESSIONS ORGANIZED AND CONVENED

- *Pacific-basin Science Teaching Conference* at Kona, Hawai'i, September 13-17, 2017. Conference Organizer, Tim Slater
- *National Astronomy Teaching Summit* at Florida Gulf Coast University. August 7-9, 2017. Conference Organizer, Tim Slater.
- *National Astronomy Teaching Summit* at City College of San Francisco. August 1-3, 2016. Conference Organizer, Tim Slater.
- *Hawaiian, Oceanic and Global Cultural Astronomy: Tangible and Intangible Heritage*. An International Conference in Hilo, on the Big Island of Hawai'i, August 16–20, 2015. Conference Co-Hosts: Clive Ruggles, Stephanie Slater, Tim Slater, and Sharon Schleigh.
- American Association for the Advancement of Science Annual Meeting – Invited Session Organizer: Rebooting Our Approach to Increasing Indigenous STEM Participation: Lessons from Hawai'i, February 15, 2014, Chicago <https://aaas.confex.com/aaas/2014/webprogram/Session7346.html>
- American Association of Physics Teachers – Invited Session Organizer: Session GB: Mentoring Graduate Students for Careers Outside of Academia <http://www.aapt.org/Conferences/wm2015/upload/final-program-12-23-14-2.pdf>

- American Association of Physics Teachers Regional Conference, Co-Organizer – Richmond, KY, March 13-14, 2015, <http://ngpt.aaptsections.org/>
- American Physical Society – Invited Session Organizer: Invited Session: Moving Astronomy Education Research Results into Teaching, <http://meetings.aps.org/Meeting/APR15/Session/H8>
- UNESCO World Heritage Conference Science Organizing Committee Member: Hawaiian, Oceanic and Global Cultural Astronomy: Tangible and Intangible Heritage, Hilo, on the Big Island of Hawai‘i, August 16–20, 2015 <http://www2.astronomicalheritage.net/index.php/community/news-events/cultural-astronomy-meeting-big-island>

(III) EDITOR/REFEREE/REVIEWER

Slater, T.F., Editor-in-Chief, *Journal of Astronomy & Earth Sciences Education*, www.JAESE.org

Slater, T.F., & Burrows, A.C., Co-Editors, Science Education Section of *Contemporary Issues in Technology and Teacher Education*

NSF & NASA grant proposal reviewer

Journal of College Science Teaching, *Journal of Geoscience Education*, *The Physics Teacher Journal* reviewer

External Reviewer for American Public University System – Undergraduate Degree Program in Space Sciences

(IV) OTHER

International Planetarium Society – Committee on Education (2015-2018)

American Physical Society – National Education Committee (2013-2015)

National Academy of Sciences – Board on Science Education – Discipline Based Educ. Research Committee (2010-11)

American Institute of Physics – Liaison Committee on Physics Education, Chair, (2010-2011)

National Academy of Sciences – Board on Science Education – Core Ideas Commissioned Presenter (2009)