

**MICHELLE LACCHIA PANTOYA**

2703 7<sup>th</sup> Street  
 Mechanical Engineering Department  
 Texas Tech University  
 Lubbock, Texas 79409-1021  
 Office Phone: 806-834-3733  
 Email: [michelle.pantoya@ttu.edu](mailto:michelle.pantoya@ttu.edu)  
<http://www.depts.ttu.edu/combustionlab/>

**EDUCATION**

Ph. D. Mechanical Engineering, University of California, Davis (1999).  
 M. S. Mechanical Engineering, University of California, Davis (1994).  
 B. S. Aeronautical Engineering, University of California, Davis (1992).

**SUMMARY**

Dr. Michelle Pantoya received her MS and PhD degrees in Mechanical Engineering from the University of California, Davis. She worked as the Combustion Program Manager for the California Energy Commission in 1999-2000 before joining the faculty of Texas Tech University in Mechanical Engineering in Fall 2000. At Texas Tech, Dr. Pantoya established the energetic material Combustion Lab which has grown to over 4,000 sq ft of lab space for energetic material synthesis and testing. She graduated over 30 PhD students and 50 MS students and 90% of her graduates work in the field of energetic materials. She maintains externally funded grants through the DoD, DOE, NSF, and industry to support a group of 20 graduate and undergraduate research students throughout the calendar year.

Her group's vision is to promote the development of safer and more effective energetic materials through formulation development and rigorous combustion characterization analyses. She has developed in-house diagnostics as well as procured capital equipment to synthesize formulations and characterize reaction kinetics, combustion mechanisms, ignition sensitivity, and energy generation, and performance. Dr. Pantoya has developed an education model focused on training the next generation of engineers with energetic materials expertise to smoothly transition into the DOE and DOD workforce upon graduation. Her goal is to prepare innovative engineers and scientists that will develop new technologies to enhance national security. She jointly authored over 200 archival journal publications with her students and has 4 patents; 4 technical books; 5 book chapters.

With support from STEM grants, Dr. Pantoya has established *Growing STEMS*, a partnership with DOD and DOE scientists enabling mentorships that promote professional workforce development. Dr. Pantoya is an advocate for early engineering education and an award-winning children's book author of engineering stories such as *Engineering Elephants*, *Designing Dandelions*, and *Optimizing an Octopus*. She developed PBS Kids segments: *Dr. Michelle the Engineer*, she is a certified Engineering is Elementary (EiE) teacher educator, and routinely instructs professional development workshops for K-8<sup>th</sup> grade teachers interested in integrating engineering into their science and math instruction.



**EXPERIENCE**

- 1/14 – Present J.W. Wright Regents Endowed Chair Professor, Mechanical Engineering Department, Texas Tech University
- 9/17 – 6/18 Department Chair, Mechanical Engineering Department, Texas Tech University, Lubbock, TX.
- 9/10-12/13 Professor, Mechanical Engineering Department, Texas Tech University, Lubbock, Texas.
- 9/05 – 9/10 Associate Professor, Mechanical Engineering Department, Texas Tech University, Lubbock, Texas.
- 9/00 – 9/05 Assistant Professor, Mechanical Engineering Department, Texas Tech University, Lubbock, Texas.
- 6/01 – 9/01 Visiting Scholar, Los Alamos National Laboratory, Combustion and Energetic Materials Division
- 1/99 - 8/00 Combustion R&D Program Manager, California Energy Commission, Sacramento, California.
- 9/98 - 7/00 Part-Time Faculty, Mechanical Engineering Department, California State University, Sacramento, California.
- 6/94 - 1/99 Graduate Research Assistant, University of California, Davis and Lawrence Livermore National Laboratory, Livermore, California (Supervisor: Dr. Benjamin Shaw).
- 1/92 - 6/94 Graduate Research Assistant, University of California, Davis and NASA Ames Research Center, Moffett Field, California (Supervisor: Dr. Bruce White).
- 1/97 - 6/98 Graduate Teaching Assistant, University of California, Davis.
- 5/92 - 10/92 Combustion Engineer Intern, Sandia National Laboratory, Combustion Research Facility, Livermore, California.

**Publications**

**Overall Publication Metrics** (Google Scholar 07/21/2023; *h-index* 43):

*Summary: ~200 archival journal publications; 4 patents.*

**Patents**

1. Antibacterial metallic nanofoam and related methods, Emily Hunt and Michelle Pantoya filled with US Patent Office October 2011 (filed jointly by Texas A& M University and Texas Tech University). US Patent Number 9,512,324, December, 2016
2. Energetic Materials and Methods of Tailoring Electrostatic Discharge Sensitivity of Energetic Materials, Inventors: Michael A. Daniels, Ronald J. Heaps, Ronald S. Wallace, Michelle L. Pantoya and Eric Collins, filled with US Patent office October 2013. US Patent Number 9,481,614. Nov. 2016
3. Methods of Reducing Ignition Sensitivity of Energetic Materials, Methods of Forming Energetic Materials Having Reduced Ignition Sensitivity, and Related Energetic Materials; Inventors: Michael A. Daniels, Ronald, J. Heaps, and Michelle L. Pantoya, US Patent 20,160,031,769. July 2018
4. Iodinated Polymers for Biological Agent Defeat. Inventors: R. Carl Brothers, Rebecca M. Wilson, Michelle L. Pantoya. US Patent No. 10342232, Publication date 09/07/2019.

**Books – Juvenile**

1. Emily Hunt and Michelle Pantoya, Optimizing an Octopus, Published by Texas Tech University Press, 2019, ISBN: 978-1-68283-033-8, Library of Congress Control Number: 2017945190. Available online ([www.amazon.com](http://www.amazon.com)) and at book stores.
2. Emily Hunt and Michelle Pantoya, Designing Dandelions, Published by Texas Tech University Press, 2016, ISBN: 978-0-89672-849-3, Library of Congress Control Number: 2013938821. Available online ([www.amazon.com](http://www.amazon.com)) and at book stores.
3. E. M. Hunt and M. L. Pantoya, Engineering in Space: Adventures of an Astronaut Engineer, Authorhouse Publishing, 2014. ISBN-13: 978-149187-2536. Sku: 266641707.
4. E.M. Hunt and M.L. Pantoya, Pride by Design, Westcom Press, 2011, ISBN 13:978-0-9835003-4-6. Available for purchase at Texas Tech University, Office of the President and the Science Spectrum.
5. E.M. Hunt and M.L. Pantoya, Engineering Elephants, AuthorHouse publishing, 2010. ISBN: 978-1-4490-5816-6. Available online ([www.amazon.com](http://www.amazon.com)) and at book stores.

**Books from Student Dissertations/Theses**

1. E. Collins, M.L. Pantoya and M.A.Daniels, Ignition of Composite Energetic Materials to Electrostatic Discharge: Exploring Ignition Sensitivity and Energy Generation of Composite Energetic Materials, Lambert Academic Publishing, (an imprint of AV Akademikerverlag GmbH & Co.), Saarbrucken, Germany. ISBN 978-3-639-66529-1 (2014).
2. C.M. Weir, M.L. Pantoya and M.A. Daniels, Electrostatic Discharge Sensitivity of Composite Energetic Materials, Lambert Academic Publishing, (an imprint of AV Akademikerverlag GmbH & Co.), Saarbrucken, Germany. ISBN 978-3-659-22065-4 (2012).
3. E. M. Hunt and M. L. Pantoya, Nanostructured Metallic Alloys: Synthesis, Properties and Applications, ISBN: 978-3-8364-3438-6, VDM Verlag Dr. Muller publisher 2007.
4. S.W. Dean and M. L. Pantoya, Effects of Gas Generation on Nano-Al Fueled Energetic Materials: A comparative study of two nanothermites, VDM Verlag, ISBN-10:3639174240, July, 2009.

**Book Chapters**

1. K. Kappagantula, M. L. Pantoya, “Fast-Reacting Nanocomposite Energetic Materials: Synthesis and Combustion Characterization,” Chapter 2 in Energetic Nanomaterials Synthesis, Characterization and Application, Edited by V. E. Zarko and A. A. Gromov, Elsevier, Cambridge, MA, USA, 2016 (ISBN 978-0-12-802710-3).
2. O. Mulamba and M.L. Pantoya, “Combustion Characterization of Energetic Fluoropolymer Composites,” In Handbook of Fluoropolymer Science and Technology, Smith, D. W., Jr.; Iacono, S. T.; Iyer, S., Eds. Wiley, 2014. (ISBN 978-0-47-007993-5).
3. M. Pantoya, K. Kappagantula, C. Farley, “Characterizing Metal Particle Combustion In Situ”, Chapter 11 In: Metal Nanopowders. Production, Characterization, Applications and Safety, Editor: Alexander Gromov. Wiley in Press 2013.
4. E. Hunt, P. Lockwood-Cooke and M. L. Pantoya, Mechanical Engineering Education: Preschool to Graduate School, Chapter 5 in Mechanical Engineering, Editor: Murat Gokcek, Published by InTech Publishing, ISBN: 978-953-51-0505-3, 2012.
5. M. Pantoya, S. Son, W. Danen, B. Jorgensen, B. Asay, J. Busse, and J. Mang, “Characterization of Metastable Intermolecular Composites (MICs),” Chapter 16 in

Defense Applications of Nanomaterials, ACS Symposium Series 891, Miziolek, A. W., Karna, S. P., Mauro, J. M., and Vaia, R. A. Editors, Copyright American Chemical Society, pp. 227-240, 2005.

### Books Edited

1. Energetic Materials: Advanced Processing Technologies for Next-Generation Materials, Edited by: M.J. Mezger, M. Pantoya, D. Kalyon, L. Groven, K.J. Tindle, CRC Press Taylor & Francis Group, New York, NY, ISBN: 978-1-3151-6686-5, 2017.

### Advisor Panels, Boards, and Review Panels

1. Panel Member for Engineering Sciences External Review Board, Engineering Science Research Foundation (ESRF), Sandia National Laboratory, 2021-Present.
2. Panel on Propulsion Sciences at Army Research Laboratory. 2019-2020 Assessment of the Army Research Laboratory (2021). National Academies of Science, Engineering, Medicine. Washington, DC: National Academies Press, 2020. PDF is available at <http://nap.edu/26325>
3. Panel on Ballistics Science and Engineering at the Army Research Laboratory Sciences for Lethality and Protection. National Academies of Science, Engineering, Medicine. National Academies Press, 2018.
4. Chair of the University of California Davis External Advisor Board 2019-Present.
5. Board Member, Science Spectrum, Lubbock, TX 2016-Present

### Archival Journal Publications (in chronological order)

1. Greeley, R., R. N. Leach, M. B. Lacchia (Pantoya), B.R. White, D.E. Trilling, and J.B. Pollack, New Estimates of Minimum Wind Speeds for Raising Dust on Mars, *Bull. Amer. Astron. Sci*, 26:1129-1133 (1994).
2. White, B.R., M. B. Lacchia (Pantoya), R. Greeley, and R. N. Leach, Aeolian Behavior of Dust in a Simulated Martian Environment, *Journal of Geophysical Research* 102 no. E11, Nov. 25, pp. 25629-25640 (1997).
3. M. B. Lacchia (Pantoya) and B. D. Shaw, Studies of Energetic and Non-energetic Materials Immersed in Molten Salts, *Combustion Science and Technology* 139: pp. 59-73 (1998).
4. M. B. Lacchia (Pantoya), B. D. Shaw, and E. A. Megas, High-Speed Imaging of LX-04 and LX-17 Decomposition in Molten Salts, *Propellants, Explosives, Pyrotechnics* 25(1), 19-25 (2000).
5. B. D. Shaw and M. L. Pantoya, Growth and Potential Applications of Large Spherical Bubbles Using Reactive Gases, *International Communications in Heat and Mass Transfer* 27(6), 807-814 (2000).
6. M. L. Pantoya and B. D. Shaw, Molten Salt Destruction of Energetic Materials: Emission and Absorption Measurements, *Journal of Energetic Materials* 20(1), (2002).
7. J. Granier, T. Mullen and M. L. Pantoya, Non-Uniform Laser Ignition in Energetic Materials, *Combustion Science and Technology* 175(11), 1929-1951, (2003).
8. J. J. Granier and M. L. Pantoya, The Effect of Size Distribution on Burn Rate in Nanocomposite Thermites: A Probability Density Function Study, *Combustion Theory and Modelling* 8(3), 555-565 (2004).

9. J. J. Granier, K. B. Plantier and M. L. Pantoya, The Role of the Al<sub>2</sub>O<sub>3</sub> Passivation Shell Surrounding Nano-Aluminum Particles in the Combustion Synthesis of NiAl, *Journal of Materials Science* 39(21), 6421-6431 (2004).
10. E. M. Hunt, J. J. Granier, K. B. Plantier and M. L. Pantoya, Nickel Aluminum Superalloys Created by the Self-propagating High-temperature Synthesis (SHS) of Nano-particle Reactants, *Journal of Materials Research* 19(10), 3028-3036 (2004).
11. E. Hunt, K. Plantier, M. Pantoya, Nano-scale Reactants in the Self-Propagating High-Temperature Synthesis of Nickel Aluminide, *Acta Materialia* 52(11), 3183-3191 (2004).
12. J. Granier and M. Pantoya, Laser Ignition of Nanocomposite Thermites, *Combustion and Flame* 138(4), 373-383 (2004) [DOI: 10.1016/j.combustflame.2004.05.006].
13. E. M. Hunt and M. L. Pantoya, A Laser Induced Diagnostic Technique for Velocity Measurements Using Liquid Crystal Thermography, *International Journal of Heat and Mass Transfer* 47(19/20), 4285-4292 (2004).
14. T. A. Mullen and M. L. Pantoya, A Spreadsheet-Based Analysis for Two-Dimensional Transient Laser Heating of a Cylindrical Solid, *Heat Transfer Engineering* 26(2), 63-74 (2005).
15. D. Prentice, M. L. Pantoya, B. Clapsaddle, The Effect of Nanocomposite Synthesis on the Combustion Performance of a Ternary Thermite, *Journal of Physical Chemistry B* 109(43), 20180-20185 (2005).
16. E. F. Talantsev, M. L., Pantoya, C. Camagong, B. Lahlouh, S. M. Nicolich, and S. Gangopadhyay, Ferrihydrite Gels Derived in the Fe(NO<sub>3</sub>)<sub>3</sub>·9H<sub>2</sub>O-C<sub>2</sub>H<sub>5</sub>OH-CH<sub>3</sub>CH<sub>2</sub>O Ternary System, *Journal of Non-Crystalline Solids* 351(16-17), 1426-1432 (2005).
17. E. M. Hunt and M. L. Pantoya, Ignition Dynamics and Activation Energies of Metallic Thermites: From Nano- to Micron-scale Particulate Composites, *Journal of Applied Physics* 98(3), 034909 (2005). [DOI:10.1016/j.combustflame.2004.10.009]
18. K. B. Plantier, M. L. Pantoya and A. E. Gash, Combustion Wave Speeds of Nanocomposite Al/Fe<sub>2</sub>O<sub>3</sub>: The Effects of Fe<sub>2</sub>O<sub>3</sub> Particle Synthesis Technique, *Combustion and Flame* 140(4), 299-309 (2005) [DOI: 10.1016/j.combustflame.2004.10.009].
19. Bockmon, B.S., Pantoya, M.L., Son, S.F., Asay, B.W., Mang, J.T., Combustion Velocities and Propagation Mechanisms of Meta-stable Intermolecular Composites, *J. of Appl. Phys.* 98(6), 064903 (2005) [DOI: 10.1063/1.2058175].
20. M. L. Pantoya and J. J. Granier, Combustion Behaviors of Highly Energetic Thermites: Nano versus Micron Composites, *Propellants, Explosives, Pyrotechnics* 30(1), 53-62 (2005) [DOI: 10.1002/200400085].
21. J. Sun, M. L. Pantoya, and S. L. Simon, Dependence of size and size distribution on reactivity of aluminum nanoparticles in reactions with oxygen and MoO<sub>3</sub>, *Thermochimica Acta* 444(2), 117-127 (2006). [DOI:10.1016/j.tca.2006.03.001]
22. E. M. Hunt, M. L. Pantoya and R. J. Jouet, Combustion Synthesis of Metallic Foams from Nanocomposite Reactants, *Intermetallics* 14 (6), 620-629 (2006).
23. J. J. Granier and M. L. Pantoya, The Effect of Slow Heating Rates on the Reaction Mechanisms of Nano and Micron Composite Thermite Reactions, *Journal of Thermal Analysis and Calorimetry* 85(1), 37-43 (2006).
24. Moore, K. and Pantoya, M.L., Combustion Effects of Environmentally Altered Molybdenum Trioxide Nanocomposites, *Propellants Explosives Pyrotechnics* 31(3), 182-187 (2006).

25. Moore, K., Pantoya, M.L., and Son, S.F., Combustion Behaviors Resulting from Bimodal Aluminum Size Distributions in Thermites, *Journal of Propulsion and Power* 23(1), 181-185 (2007). [DOI: 10.2514/1.20754]
26. Levitas, V. I., Asay, B. W., Son, S. F., and Pantoya, M. L., Melt Dispersion Mechanism for Fast Reaction of Nanothermites, *Applied Physics Letters* 89(7), 071909 (2006). [DOI: 10.1063/1.2335362] (Reprod. in *Virtual J. Nanoscale Sci. & Techn.*, 2006, Aug.)
27. E. B. K. Washington, D. Aurongzeb, J. M. Berg, D. Osborne, M. Holtz, M. Pantoya, H. Temkin, A New Mechanism for Formation of Spatial Oscillations in SHS of Ni/Al Bilayer Foils, *International Journal of SHS* 15(2), 121-132 (2006).
28. Prentice, D., Pantoya, M.L., and Gash, A.E., Combustion Wave Speeds of Sol-gel Synthesized Tungsten Trioxide and Nano-Aluminum: The Effect of Impurities on Flame Propagation, *Energy & Fuels* 20(6), 2370-2376 (2006). [DOI:10.1021/ef060210i].
29. Osborne, D.T. and Pantoya, M.L., Effect of Aluminum Particle Size on the Thermal Degradation of Al/Teflon Mixtures, *Combustion Science and Technology* 179(8), 1467-1480 (2007). [DOI: 10.1080/00102200601182333]
30. Levitas, V.I., Asay, B.W., Son S.F., and Pantoya, M.L., Mechanochemical Mechanism for Fast Reaction of Metastable Intermolecular Composites Based on Dispersion of Liquid Metal, *Journal of Applied Physics* 101(8), 083524 (2007). [DOI: 10.1063/1.2720182]
31. White, R.B., Dean, S.W., Pantoya, M.L., Hirschfeld, D.A., Gill, W., and Erikson, W.W., The Effect Of Aluminum On The Heat Flux From A Simulated Rocket Propellant Flame, *Journal of Prop. and Power* 23(6), 1255-1262 (2007). [DOI: 10.2514/1.28161].
32. Hammons, J.A., Wang, W., Ilavsky, J., Pantoya, M.L., Weeks\*, B.L., and Vaughn, M.W., Small Angle X-ray Scattering Analysis of the Effect of Cold Compaction of Al/MoO<sub>3</sub> Thermite Composites, *Physical Chemistry Chemical Physics* 10, 193-199 (2008). [DOI:10.1039/b711456g]
33. Jackson, M., Pantoya, M.L., and Gill, W., Characterization of a gas burner to simulate a propellant flame and evaluate aluminum particle combustion, *Combustion and Flame* 153(1-2), 58-70 (2008). [DOI:10.1016/j.combstflame.2007.11.014]
34. Levitas, V.I., Pantoya, M. L., B. Dikici, Melt-Dispersion versus Diffusive Oxidation Mechanism for Aluminum Nanoparticles: Critical Experiments and Controlling Parameters, *Applied Physics Letters* 92(1), 0011921 (2008). [DOI:10.1063/1.2824392]
35. Levitas, V. I., Pantoya, M. L.; Watson, K. W., Melt-dispersion mechanism for fast reaction of aluminum particles: Extension for micron scale particles and fluorination, *Applied Physics Letters*, v 92, n 20, 2008, p 201917
36. Levitas, V. I., Pantoya, M. L., "Mechanochemical Mechanism for Fast Reaction of Metastable Intermolecular Composites Based on Dispersion of Liquid Metal, *International Journal of Energetic Materials and Chemical Propulsion* 7(1), 2008.
37. Watson, K.W., Pantoya, M.L., Levitas, V.I., "Fast reactions with nano and micron aluminum: a study on oxidation versus fluorination," *Comb and Flame* 155(4); 619-634 (2008).
38. Schniederjans, M.J., Pantoya, M.L., Hoffmann, J.J., and Willauer, D.L., "A Multi-Objective Modeling Approach for Energetic Material Evaluation Decisions," *European Journal of Operational Research* 194(3), 629-636, May 1, 2009.
39. Pantoya, M.L., Levitas, V.I., Granier, J.J., Henderson, J.B., "The effect of bulk density on the reaction dynamics in nano and micron particulate thermites," *Journal of Propulsion and Power* 25(2); March-April (2009).

40. Hunt, A., Purl, A., Hunt, E.M., and Pantoya, M.L., "Impact Ignition of nano and micron composite energetic materials," *International Journal of Impact Engineering* 36(6), 842-846 (2009).
41. Rivero, I.V., Rajamani, K., Pantoya, M.L., Hsiang, S.M., Fitts, E.P., "Correlation of reactant particle size on residual stresses of nanostructured NiAl generated by self-propagating high temperature synthesis," *J. of Mat. Res.* 24(6), 2079-2088 (2009).
42. Dean, S.W., and Pantoya, M.L., "The influence of alumina passivation on nano-Al/Teflon reactions," *Thermochimica Acta* 493(1-2), 109-110 (2009).
43. Dikici, B., Pantoya, M.L., Levitas, V.I., Jouet, R.J., "The Influence of Aluminum Passivation on the Reaction Mechanism: Flame Propagation Studies", *Energy & Fuels* 23, p4231-4235 (2009). DOI:10.1021/ef801116x.
44. Stacy, S.C, Pantoya, M.L., Prentice, D.J., Daniels, M.A., Steffler, E.D., "Aluminum Fueled Nanocomposites for Underwater Reaction Propagation," *Advanced Materials and Processes* 167(10) p 33-35, Aug 2009 [DOI: 10.1361/amp16710p33].
45. Levitas\*, V.I., Pantoya, M.L., Chauhan, G., and Rivero, I., "Effect of the alumina shell on the melting temperature depression for nano-aluminum particles," *Journal of Physical Chemistry C*, 113(2), 14088-14096, 2009.
46. EP Nixon, ML Pantoya\*, DJ Prentice, ED Steffler, MA Daniels, and SP D'Arche, A Diagnostic for Quantifying Heat Flux from a Thermite Spray, *Measurement Science and Technology*, 21: 025202; 2010.
47. Pantoya, M.L., and Hunt\*, E.M., Nanochargers: Energetic Materials for Energy Storage, *Applied Physics Letters* 95; 253101 (2009). (Reprod. in *Virtual J. Nanoscale Sci. & Techn.*, 21(2) 2010, Jan. 11.
48. Dean, S.W., Pantoya, M.L., Gash, A.E., Stacy, S.C., Hope-Weeks, L., "Enhanced Convective Heat Transfer from Non-gas Generating Nanoscale Thermite Reactions," *Journal of Heat Transfer* 132(11), 2010; DOI: 10.1115/1.4001933.
49. Dikici, B., Pantoya, M.L., Levitas, V.I., The Effect of Pre-heating on Flame Propagation Behavior in Nanocomposite Thermites, *Combustion and Flame* 157(8); 1581-1585 (2010).
50. Farley, C., and Pantoya, M.L., Reaction Kinetics of Nanometric Aluminum and Iodine Pentoxide, *Journal of Thermal Analysis and Calorimetry* 102(2), 609-613 (2010) DOI: 10.10007/s10973-010-0915-5.
51. Hunt, E.M., Pantoya, M.L., Impact Sensitivity of Intermetallic Nanocomposites: A Study on Compositional and Bulk Density, *Intermetallics*, v18(8); 1612-1616 (2010).
52. Clark, B.R., Pantoya, M.L., The aluminum and iodine pentoxide reaction for the destruction of spore forming bacteria, *Physical Chemistry Chemical Physics* 12(39); 12653-12657, 2010. DOI:10/1039/c0cp00473a.
53. Crane, C.A., Pantoya, M.L., Dunn, J., Evaluating Energy Transfer from Energetic Materials to Steel Substrates, *International Journal of Thermal Science* 49(10) 1877-1885, 2010.
54. Farley, C, Turnbull, T., Pantoya, M.L., Hunt, E.M., Semi Self Propagating High Temperature Synthesis of Nanostructured Titanium Aluminide Alloys with Varying Porosity, *Acta Materialia* 59(6); 2447-2454, 2011.
55. R. Russell, S. Bless, M. Pantoya, Impact driven thermite reactions with iodine pentoxide and silver oxide, *Journal of Energetic Materials*, 29(2), 175-192, 2011.



56. Crane, C.A., Collins, E.S., Pantoya, M.L. and Weeks, B.L., Nanoscale Investigation of surfaces exposed to a thermite spray, *Applied Thermal Engineering* 31(6-7) pp 1286-1292 (2011).
57. Levitas, V.I., Dikici, B., Pantoya, M.L., Toward Design of the Prestressed Nano- and Microscale Aluminum Particles Covered by Oxide Shell, *Combust. Flame* 158(7), 1413-1417, 2011. doi:10.1016/j.combustflame.2010.12.002
58. Datta, S., Dikici, B., Pantoya, M.L., Ekwaro-Osire, S., Reaction dynamics of aluminum-viton-acetone droplets, *Journal of Propulsion and Power* 27(2), 396-401, 2011.
59. Kappagantula, K.S., Clark, B., Pantoya, M.L., Analyzing Energy Propagation in Non-Gas Generating Nanocomposite Reactive Materials, *Energy and Fuels* 25(2), 640-646, 2011. Also featured online in Renewable Energy Global Innovations (<http://reginnovations.com/>), October 2011.
60. Nixon, E., Pantoya, M.L., Sivakumar, G., Vijayasai, A., Dallas, T., Superhydrophobic Coatings for Nanoenergetic Material Combustion, *Surface Coatings and Technology* 205, 5103-5108, 2011.
61. Dikici, B., Shaw, B., Pantoya, M.L., Analysis of the influence of nanometric aluminum particle vaporization on flame propagation in bulk powder media, *Combustion Theory and Modelling*, 16(3), 465-481, June 2012.
62. Kappagantula, K. S., Pantoya, M.L., Experimentally Measured Thermal Transport Properties of Aluminum-Polytetrafluoroethylene Nanocomposites with Graphene and Carbon Nano Tube Additives, *International Journal of Heat and Mass Transfer*, 55(4), 817-824, 2012
63. Collins, E., Pantoya, M., Daniels, M., Prentice, D.J., Steffler, E.D., "Heat Flux Analysis of a Reacting Thermite Spray Impinging on a Substrate," *Energy and Fuels* 26(3), 1621-1628, 2012.
64. Gordon, A., Kappagantula, K. and Pantoya, M.L., Thermal Property Measurements of Reactive Materials: The Macroscopic Behavior of a Nanocomposite, *Journal of Heat Transfer* 134 (11), 2012.
65. Gesner, J., Pantoya, M.L., Levitas, V., Effect of Oxide Shell Growth on nano-Aluminum Thermite Propagation Rates, *Combustion and Flame*, 159(1), pp 3448-3453, 2012.
66. Collins, E., Pantoya, M.L., Vijayasai, A., Dallas, T., Comparison of Engineered Nanocoatings on the Combustion of Aluminum and Copper Oxide Nanothermites, *Surface Coatings and Technology*, 205, 5103-5108, 2012.
67. Kappagantula, K., Pantoya, M.L., Hunt, E.M., The Influence of Nano Structured Carbon Additives on the Impact Ignition of Energetic Materials, *Journal of Applied Physics* 112(2), 2012.
68. Kappagantula, K., Farley, C., Pantoya, M., Horn, J., Tuning Energetic Material Reactivity Using Surface Functionalization of Aluminum Fuels, *Journal of Physical Chemistry C* 116(46), 24469-24475, 2012.
69. Shaw, B., Pantoya, M.L., Dikici, B., Detonation Models of Fast Combustion Waves in Nanoscale Al-MoO<sub>3</sub> Bulk Powder Media, *Combustion Theory and Modeling*, 17 (1), pp 25-39, 2013. DOI: 10.1080/13647830.
70. Weir, C. Pantoya, M.L., G. Ramachandran, T. Dallas, D. J. Prentice, M. A. Daniels, Electrostatic Discharge Sensitivity and Electrical Conductivity of Composite Energetic Materials, *Journal of Electrostatics* 71(1), 77-83, 2013.



71. Stacy, S., Pantoya, M.L., Laser Ignition of Nano-Composite Energetic Loose Powders, *Propellants, Explosives, Pyrotechnics*, 35, pp 1-7, 2013. DOI: 10.1002/prop.201200157
72. Weir, C., Pantoya, M.L., Daniels, M.A., The Role of Aluminum Particle Size in Electrostatic Ignition Sensitivity of Composite Energetic Materials, *Combustion and Flame*, 160, pp. 2279-2281, 2013. DOI:10.1016/j.combustflame.2013.05.005
73. Stacy, S., Massad, R., Pantoya, M.L., Pre-Ignition Laser Ablation of Nanocomposite Energetic Materials, *Journal of Applied Physics*, 113(21), 213107, 2013. DOI: 10.1063/1.4808458.
74. Farley, C.W., Pantoya, M.L., Losada, M., Chaudhuri, S., Linking Molecular Level Chemistry to Macroscopic Combustion Behavior for Nano-energetic Materials with Halogen Containing Oxides, *Journal of Chemical Physics*, 139 (7), 074701, 2013. DOI: 10.1063/1.4818167.
75. Crane, C., Pantoya, M.L., Weeks, B., Spatial Observation and Quantification of Microwave Heating in Materials, *Review of Scientific Instruments*, 84(8), 084075, 2013.
76. Mulamba, O., Pantoya, M.L., Hunt, E.M., Neutralizing bacterial spores using halogenated energetic reactions, *Biotechnology and Bioprocess Engineering*, 18(5), 918-925, 2013.
77. Kappagantula, K.S., Pantoya, M.L., Horn, J., Effect of surface coatings on aluminum fuel particles toward nanocomposite combustion, *Surface Coatings and Technology*, 215, 476-484, 2013.
78. Kappagantula, K.S., Crane, C., Pantoya, M.L., Determination of Spatial Distribution of Temperature from Combustion Reactions: A Diagnostic Study, *Review of Scientific Instruments*, 84(10), 084705, 2013.
79. Tringe, J.W., Letant, S.E., Dugan, L.C., Levie, H.W., Kuhl, A.L., Murphy, G.A., Vandersall, K.S., Pantoya, M.L., Comparison of Bacillus atrophaeus spore viability following exposure to detonation of C4 and to deflagration of halogen containing thermites, *Journal of Applied Physics* 113(23), 234903, 2013.
80. Pantoya, M.L., Hughes, P.C., and Hughes, J.S., A Case Study in Active Learning: Teaching Undergraduate Research in the Classroom Setting, *Engineering Education* 8(2), 53-64, 2013.
81. Stacy, S.C., Pantoya, M.L., Laser Ignition Properties of Composite Nanometric Energetic Materials, *International Journal of Energetic Materials and Chemical Propulsion* 38(3), 441-447, 2013.
82. Collins, E., Pantoya, M.L., Neuber, A., Daniels, M., Prentice, D., Piezoelectric Ignition of Nanocomposite Energetic Materials, *Journal of Propulsion and Power* 30(1), 15-18, 2014.
83. Clayton, N.A., Kappagantula, K.S., Pantoya, M.L., Kettwich, S.C., Iacono, S.T., Fabrication, Characterization and Energetic Properties of Metallized Nanofibers, *ACS Applied Materials and Interfaces* 6, 6049, 2014.
84. Crane, C.A., Pantoya, M.L., Weeks, B. Saed, M., Utilizing Microwave susceptors to Visualize Hot Spots in TNT, *Journal of Microwave Power and Electromagnetic Energy*, 48(1), 5-12, 2014.
85. Levitas, V.I., Pantoya, M.L., Dean, S., Melt Dispersion Mechanism for Fast Reaction of Aluminum Nano- and Micron-scale Particles: Flame Propagation and SEM Studies, *Combustion and Flame* 161, 1668-1677, 2014.
86. Farley, C., Pantoya, M.L., Levitas, V.I., A Mechanistic Perspective of Atmospheric Oxygen Sensitivity on Composite Energetic Material Reactions, *Combustion and Flame*, 161(4), 1131-1134, 2014.

87. Meeks, K.A., Pantoya, M.L., Apblett, C., Deposition and Characterization of Energetic Thin Films, *Combustion and Flame*, 161(4), 1117-1124, 2014.
88. Collins, E., Gesner, J., Pantoya, M.L., Daniels, M., Synthesizing Aluminum Particles Toward Controlling Electrostatic Discharge Ignition Sensitivity, *Journal of Electrostatics* 72(1), 28-32, 2014.
89. Mulamba, O., Pantoya, M.L., Oxygen Scavenging Enhances Exothermic Behavior of Aluminum Fueled Energetic Composites, *Journal of Thermal Analyses and Calorimetry*, 115(2), 2014.
90. Crane, C.A., Pantoya, M.L., Weeks, B. Saed, M., The effects of particle size on microwave heating of metal and metal oxide powders, *Powder Technology*, 256, 113-117, 2014.
91. Mulamba, O., Pantoya, M.L., Exothermic surface reactions in alumina-aluminum shell-core nano particles with iodine oxide decomposition fragments, *Journal of Nanoparticle Research*, 16, 2309-2318, 2014.
92. Crane, C.A., Pantoya, M.L., Weeks, B.L., Investigating the Trade-Offs of Microwave Susceptors in Energetic Composites: Microwave Heating versus Combustion Performance, *Journal of Applied Physics* 115, 104106, 2014.
93. Kappagantula, K., Crane, C., Pantoya, M.L., Factors Influencing Temperature Fields During Combustion Reactions, *Propellants, Explosives, Pyrotechnics* 39(3), 434-443, June 2014.
94. Maienschein, J., Pantoya, M., Safety in Energetic Materials Research and Development – Approaches in Academia and a National Laboratory, *Propellants, Explosives, Pyrotechnics*, 39(4), 483-485, 2014.
95. Stacy, S.C., Zhang, X., Pantoya, M.L., Weeks, B., Effect of Density on Thermal Conductivity and Absorption Coefficient for Consolidated Aluminum Nanoparticles, *International Journal of Heat and Mass Transfer*, 73, 595-599, 2014.
96. Mulamba, O., Pantoya, M.L., "Exothermic Surface Chemistry Promoting Reactivity of Aluminum Particles", *Applied Surface Science* 315, 90-94, 2014.
97. Kettwich, S.C., Kappagantula, K., Kusel, B.S., Avjian, E.K., Danielson, S.T., Miller, H.A., Pantoya, M.L., Iacono, S.T., Thermal Investigations of NanoAluminum/Perfluoropolyether Core-Shell Impregnated Composites for Structural Energetics, *Thermochimica Acta*, 519, 45-50, 2014.
98. Poper, K., H., Collins, E.S., Pantoya, M.L., Daniels, M.A., Controlling the Electrostatic Discharge Ignition Sensitivity of Composite Energetic Materials Using Carbon Nanotube Additives, *Journal of Electrostatics* 72(5), 428-432, 2014.
99. Levitas, V.I., McCollum, J., Pantoya, M.L., Pre-Stressing Micron-Scale Aluminum Core-Shell Particles to Improve Reactivity, *Scientific Reports* 5, 7879, 2015.
100. Collins, E., Skelton, B., Pantoya, M., Irin, F., Green, M., Daniels, M., Ignition Sensitivity and Electrical Conductivity of a Composite Energetic Material with Conductive Nanofillers, *Combustion and Flame*, 162(4), 1417-1421, 2015.
101. Steelman, R., Clark, B., Pantoya, M.L., Heaps, R.J., Daniels, M.A., Desensitizing Nano Powders to Electrostatic Discharge Ignition, *Journal of Electrostatics* 76, 102-107, 2015.
102. Poper, K., Clark, B.R., Pantoya, M.L., Heaps, R., Daniels, M.A., Desensitizing Ignition of Energetic Materials, *Fire Safety Journal*, 76, 39-43, 2015.
103. McCollum, J., Pantoya, M.L., Iacono, S.T., Activating Aluminum Reactivity with Fluoropolymer Coatings for Improved Energetic Composite Combustion, *Applied Materials and Interfaces*, 33(7), 18742-18749, 2015.

104. Levitas, V.I., McCollum, J., Pantoya, M.L., Tamura, N., Internal stresses in pre-stressed micron-scale aluminum core-shell particles and their improved reactivity, *Journal of Applied Physics*, 118(9), 094305, 2015.
105. Clark, B.R., McCollum, J., Pantoya, M.L., Heaps, R., Daniels, M.A., Development of Flexible, Free Standing Thin Films for Additive Manufacturing and Localized Energy Generation, *AIP Advances* 5(8), 087128, 2015.
106. Smith, D., Pantoya, M.L., Effect of Nanofiller Shape on Effective Thermal Conductivity of Fluoropolymer Composites, *Composites Science and Technology*, 118, 251-256, 2015.
107. Meeks, K.A., Clark, B.R., Canos, J.E., Apblett, C.A., Pantoya, M.L., Effects of Rheological Properties on Reactivity of Energetic Thin Films, *Combustion and Flame* 162, 3288-3293, 2015.
108. Bello, M., Pantoya, M.L., Kappagantula, K., Wang, W.S., Vanapalli, S.A., Irvin, D.J., Wood, L.M., Reaction Dynamics of Rocket Propellant with Magnesium Oxide Nanoparticles, *Energy & Fuel*, 29(9), 6111-6117, 2015.
109. Pantoya, M.L., Aguirre-Munoz, Z., Hunt, E.M., Developing an Engineering Identity in Early Childhood,” *American Journal of Engineering Education* 6(2), 61-70, December 2015.
110. McCollum, J., Pantoya, M.L., Iacono, S.T., Catalyzing Aluminum Particle Reactivity with Fluorine Oligomer Surface Coating for Energy Generation Applications, *Journal of Fluorine Chemistry* 108, 265-271, 2015.
111. Clark, B.R., Pantoya, M.L., Hunt, E.M., Kelly, T.J., Allen, B.F., Heaps, R.J., Daniels, M.A., Synthesis and Characterization of Flexible, Free-Standing, Energetic Thin Films, *Surface Coatings and Technology* 284, p. 422-426, 2015.
112. Padhye, R., McCollum, J., Pantoya, M.L., Korzeniewski, C., Examining hydroxyl – alumina bonding toward aluminum reactivity, *Journal of Physical Chemistry C* 119(47), 26547-26533, 2015.
113. McCollum, J., Pantoya, M.L., Tamura, N., Improving Aluminum Particle Reactivity by Annealing and Quenching Treatments: Synchrotron X-ray Diffraction Analysis of Strain, *Acta Materialia* 103, 495-501, 2016.
114. Vargas, E., Pantoya, M.L., Saed, M.A., Weeks, B.L., Advanced Susceptors for Microwave Heating of Energetic Materials, *Materials & Design*, 90, 47-53, 2016.
115. Padhye, R., Aquino, A.J.A., Tunega, D., Pantoya, M.L., Identifying Reactive Sites on the Aluminum Oxide Shell Surrounding Aluminum Particles: Simulations of Surface Hydroxyl Bonding and Charge, *Applied Materials and Interfaces* 8(22), 13926-13933, 2016.
116. Levitas, V.I., McCollum, J., Pantoya, M.L., Tamura, N., Stress relaxation in pre-stressed aluminum core-shell particles: X-Ray Diffraction study, modeling and improved reactivity, *Combustion and Flame*, 170 (30-36), 2016.
117. Smith, D.K., McCollum, J., Pantoya, M.L., Effect of Iodine Oxidation State on Reactivity with Aluminum, *Physical Chemistry Chemical Physics* 18, 11243-11250, 2016.
118. Smith, D.K., Pantoya, M.L., Parkey, J.S., Kesmez, M., Reaction kinetics and combustion dynamics of I<sub>4</sub>O<sub>9</sub>, *Journal of Visualized Experiments* 117, e54661, 2016.
119. Smith, D.K., Hill, K., Pantoya, M.L., Parkey, J.S., Kesmez, M., Reactive Characterization of Anhydrous Iodine (v) Oxide (I<sub>2</sub>O<sub>5</sub>) with Aluminum: Amorphous versus Crystalline Microstructures, *Thermochimica Acta* 641, 55-62, 2016.

120. Aguirre-Munoz, Z., Pantoya, M.L., Engineering Literacy and Engagement in the Early Years, *Journal of Engineering Education* 105(4), 630-654, 2016.
121. McCollum, J., Pantoya, M.L., Warzywoda, J., N. Tamura, A Slice of an Aluminum Particle: Examining Grains, Strain and Reactivity, *Combustion and Flame* 173, 229-234, 2016.
122. Clark, B., Zhang, Z., Christopher, G., Pantoya, M.L., Synthesis and characterization of acrylonitrile butadiene styrene (ABS) energetic thin films: 3D processing of energetic materials. *Journal of Materials Science* 52(2), 993-1004, 2016.
123. Su, S., Vargas, E., Wang, J., Wei, J., Martinez-Zaguilan, R., Sennoune, S., Pantoya, M., Wang, S., Chaudhuri, J., Qiu, J., Porphyrin Immobilized Nano-Graphene Oxide for Enhanced and Targeted Photothermal Therapy of Brain Cancer, *ACS Biomaterials Science & Engineering* 2(8), 1357-1366, 2016.
124. Thomas, Donya, Su, Siheng, Jingjing Qiu, Michelle Pantoya, Microwave Synthesis of Functionally Graded Tricalcium Phosphate for Osteoconduction, *Materials Today Communications* 9, 47-53, 2016.
125. Meeks, K., Tencer, J., Pantoya, M.L., Percolation of Binary Disk Systems: Modeling and Theory, *Physical Reviews E- Statistical, Nonlinear, and Soft Matter Physics* 95(1), 012118, 2017.
126. Padhye, R., Smith, D., Pantoya, M.L., Tailoring surface conditions for enhanced reactivity of aluminum powders with solid oxidizing agents, *Applied Surface Science* 402, 225-231, 2017.
127. Meeks, K., Pantoya, M.L., Green, M., Berg, J., Extending the excluded volume for percolation threshold estimates in polydisperse systems: The binary disk system. *Applied Mathematical Modelling* 46, 116-125, 2017.
128. Smith, D. K., Pantoya, M. L., Parkey, J. S., & Kesmez, M., The water-iodine oxide system: a revised mechanism for hydration and dehydration. *RSC Advances* 7(17), 10183-10191, 2017.
129. Meeks, K., Clark, B., Smith, D.K., Pantoya, M.L., Percolation of a Metallic Binder in Energy Generating Composites, *Journal of Materials Chemistry A* 5, pp. 7200-7209, 2017.
130. Zepper, E.T., Pantoya, M.L., Bhattacharya, S., Marston, J.O., Neuber, A. A., Heaps, R.J., Peering through the flames: imaging techniques for reacting aluminum particles, *Applied Optics* 56(9), pp 2535-2542, 2017.
131. Smith, D.K., Bello, M.N., Unruh, D.K., Pantoya, M.L., Synthesis and Reactive Characterization of Aluminum Iodate Hexahydrate Crystals  $(Al(IO_3)_3(HIO_3)_2(H_2O)_6)$ , *Combustion and Flame* 179, pp. 154-156, 2017.
132. Smith, D. K., Cano, J., Kappagantula, K., Pantoya, M.L., Thermal and Combustion Properties of Energetic Thin Films with Carbon Nanotubes, *AIAA Journal of Thermophysics and Heat Transfer* 31(3), 646-650, 2017
133. Padhye, R., Aquino, A.J.A., Tunega, D., Pantoya, M.L., Fluorination of an Alumina Surface: Modeling Aluminum - Fluorine Reaction Mechanisms, *ACS Applied Materials and Interfaces* 9(28), 24290-24297, 2017.
134. Sweeney, M., Campbell, L.L., Hanson, J., Pantoya, M.L., Christopher, G.F., Processing Wet Granular Materials for 3D Printing, *Journal of Material Science*, 52:13040–13053, 2017.

135. Hill, K.J., Warzywoda, J., Pantoya, M.L., Levitas, V. I., Dropping the hammer: examining impact ignition and combustion using pre-stressed aluminum powder, *Journal of Applied Physics*, 122, 125102, 2017.
136. Mulamba, O., Karnjanapiboonwong, A., Kasumba, J., Anderson, T., Jackson, W., Pantoya, M. L., Preliminary Toxicity Evaluation of Aluminum/Iodine Pentoxide on Terrestrial and Aquatic Invertebrates, *Water, Air and Soil Pollution* 228(11), 2017.
137. Smith, D.K., Unruh, D.K., Wu, C.C., Pantoya, M.L., Replacing the Al<sub>2</sub>O<sub>3</sub> shell on Al particles with an energetic salt, aluminum iodate hexahydrate (AIH). Part I: Reactivity, *Journal of Physical Chemistry C* 121(41), p. 23184-23191, 2017.
138. Smith, D.K., Unruh, D.K., Pantoya, M.L., Replacing the Al<sub>2</sub>O<sub>3</sub> shell on Al particles with an energetic salt, aluminum iodate hexahydrate (AIH). Part II: Synthesis, *Journal of Physical Chemistry C* 121(41), p. 23192-23199, 2017.
139. Gottfried, J.L., Smith, D.K., Wu, C.C., Pantoya, M.L., Improving explosive performance of Aluminum Nanoparticles with Aluminum Iodate Hexahydrate, *Scientific Reports* 8:8036, 2018. DOI: 10.1038/s41598-018-26390-9.
140. Bello, M.N., Smith, D.K., Pantoya\*, M.L., Horn, J.M., Jouet, R. J., Surface Engineered Nanoparticles Dispersed in Kerosene: The Effect of Oleophobicity on Droplet Combustion, *Combustion and Flame*, 188, p. 243-249, 2018.
141. Smith, D.K., Unruh, D.K., Pantoya\*, M.L., Confirmation of β-HIO<sub>3</sub>: A Metastable Polymorph of HIO<sub>3</sub>, *Advances in Materials Physics and Chemistry* 8, 246-256, 2018.
142. Hill, K.J., Tamura, N., Levitas, V.I., Pantoya, M.L., Impact Ignition and Combustion of Micron-Scale Aluminum Particles Pre-Stressed with Different Quenching Rates, *Journal of Applied Physics* 124, 115903, 2018.
143. Uzun, C., Meduri, C., Kahler, N., Grave de Peralta, L., McCollum, J., Pantoya, M.L., Kumar, G., Bernussi, A., Photo-Induced Heat Conversion Enhancement in Metallic Glass Nanowire Arrays, *J. Appl. Phys.* **125**, 015102 (2019).
144. Sweeney, M.A., Bratton, K.R., Woodruff, C., Cagle, C., Hill, K.J., Pantoya, M.L., Christopher, G. F., Effects of Shear Rate During Energetic Material Processing on Reactivity, *Adv. Eng. Mat.* 1801342, 2019.
145. Jacob, R.J., Hill, K.J., Yang, Y., Pantoya, M.L., Zachariah, M.R., Pre-stressing aluminum nanoparticles as a strategy to enhance reactivity of nanothermite composites, *Comb. Flame* **205**, 33-40, 2019.
146. Wu, C.-C., Miller, K.K., Walck, S.D., Pantoya, M.L., Atmospheric Plasma Surface Passivation of Aluminum Nanoparticles as Novel Energetic Materials, *MRS Advances* **159**, 2019.
147. Kalman, J., Smith, D.K., Miller, K.K., Bhattacharia, S.K., Bratton, K.R., Pantoya, M.L., A strategy for increasing the energy release rate of aluminum by replacing the alumina passivation shell with aluminum iodate hexahydrate (AIH), *Comb. Flame* **205**, 327-335, 2019.
148. Miller, K., Gottfried, J.L., Pantoya, M.L., Wu, C.C., Plasma surface treatment of aluminum nanoparticles for energetic material applications, *Comb. Flame* **206**, 211-213, 2019.
149. Shancita, I., Campbell, L.L., Wu, C.C., Walck, S.D., Aquino, A., Tunega, D., Pantoya, M.L., The effect of hydration on promoting oxidative reactions with aluminum oxide and oxyhydroxide nanoparticles, *Journal of Physical Chemistry C* 123, 15017-15026, 2019.
150. Hill, K.J., Pantoya, M.L., Washburn, E., Kalman, J., Single Particle Combustion of Pre-stressed Aluminum, *Materials* 12, 1737-1742, 2019

151. Hill, K.J., Pantoya, M.L., Highly Reactive Pre-Stressed Aluminum under High Velocity Impact Loading: Processing for Improved Energy Conversion, *Advanced Engineering Materials* 1900492, pp.1-7, 2019.
152. Lucas, M., Ahreum, M., Brotton, S., Pantoya, M.L., Kaiser, R., Oxidation of levitated exo-tetrahydrodicyclopentadiene (JP-10) droplets doped with aluminum nanoparticles, *Journal of Physical Chemistry Letters* 10, 5756-5753, 2019.
153. Woodruff, C., Wainwright, E.R., Bhattacharia, S., Lakshman, S.V., Weihs, T.P., Pantoya, M.L., Thermite Reactivity with Ball Milled Aluminum-Zirconium Fuel Particles, *Combustion and Flame* 211, 195-201, 2019.
154. Bello, M., Williams, A.M., Levitas, V.I., Tamura, N., Warzywoda, J., Pantoya, M.L., Highly Reactive Energetic Films by Pre-Stressing Nano-Aluminum Particles, *RSC Advances*, 9, 40607-40617, 2019
155. Bratton, K.R., Woodruff, C., Campbell, L.L., Heaps, R.J., Pantoya, M.L., A Closer Look at Determining Flame Speeds with Imaging Diagnostics, *Optics and Lasers in Engineering* 124, 105841, 2020.
156. Cagle, C.B., Hill, K. J., Woodruff, C., Pantoya, M. L., Abraham, J., Meakin, C., Target Penetration and Impact Testing of Intermetallic Projectiles, *Int. J Impact Eng.* 136, 103427, 2020.
157. Lucas, M., Brotton, S.J., Min, A., Woodruff, C., Pantoya, M.L., Kaiser, R.I., Effects of Size and Pre-stressing of Aluminum Particles on the Oxidation of Levitated exo-Tetrahydrodicyclopentadiene Droplets, *J. Phys. Chem. A* 124(8), 1489-1507, 2020.
158. Bratton, K.R., Hill, K.J., Woodruff, C. Campbell, L.L., Cagle, C.B., Pantoya, M.L., Magallanes, J., Abraham, J., Meakin, C., High-Velocity Impact Testing of Intermetallic Projectiles, *J. Dynamic Behavior Materials* 6, 236-245, 2020.
159. Shancita, I., Miller, K. K., Silverstein, P.D., Kalman, J., Pantoya, M.L., Synthesis of Metal Iodates from Aluminum Iodate Hexahydrate Salt, *RSC Advances*, 10, 14403, 2020.
160. Campbell, L.L., Hill, K. J., Smith, D.K., Pantoya, M.L., Thermal Analysis of Microscale Aluminum Particles Coated with Perfluorotetradecanoic (PFTD) Acid, *Journal of Thermal Analysis and Calorimetry*, 2020. <https://doi.org/10.1007/s10973-020-09742-4>
161. Williams, A., Shancita, I., Vaz, N., Tran-Ngo, T., Demko, A., Altman, I., Hill, K.J., Tunega, D., Aquino, A.J.A., Pantoya, M.L., Stress-Altered Aluminum Powder Dust Combustion, *Journal of Applied Physics* 127, 175110, 2020.
162. Altman, I., Demko, A., Hill, K.J., Pantoya, M.L., On the possible coexistence of two different regimes of metal particle combustion, *Combustion and Flame* 221, 416-419, 2020.
163. Shancita, I., Woodruff, C., Campbell, L.L., Pantoya, M.L., An Iodine Rich Binder for Energetic Material Applications, *Thermochemica Acta* 690, 178701, 2020.
164. Bello, M., Williams, A., Hoque, N., Qi, L. Christopher, G., Aquino, A., Tunega, D., Pantoya, M.L., Promoting Fluorination Reactions by Annealing and Quenching Aluminum Powders, *Journal of Materials Science* 55:14229-14242, 2020.
165. Walzel, R. K., Levitas, V.I., Pantoya, M.L., Aluminum particle reactivity as a function of the alumina shell structure: amorphous versus crystalline, *Powder Technology*, 374, 33-39, 2020.
166. Aguirre-Munoz, Z. Pando, M. Pantoya, M., (Invited Paper) (2020). Fostering Enthusiasm for Engineering from an Early Age. *Scientia*. DOI:<https://doi.org/10.33548/SCIENTIA506>

167. A. Williams, I. Shancita, I. Altman, N. Tamura, M.L. Pantoya, On the Pressure Generated by Thermite Reactions Using Stress-Altered Aluminum Particles, *Propellants Explosives Pyrotechnics* 46(1), 99-106, 2020.
168. Bratton, K, Hill, K.J., Woodruff, C., Cagle, C., Pantoya, M.L., Abraham, J., Wei, L., Dube, P., Tailoring Impact Debris Dispersion Using Intact or Fragmented Thermite Projectiles, *Journal of Applied Physics* 128(15), 2020.
169. C.-C. Wu, J.L. Gottfried, K.K Miller, R.A Pesce-Rodriguez, S.D Walck, L.Giri, J. Wen, M.L. Pantoya, I. Arslan, Plasma-Tailored Smart Surface Aluminum Nanoparticles, DEVCOM Army Research Laboratory (USA), Report No. ARL-TR-9167, March 2021.
170. I. Shancita, N. Vaz, G. Fernandes, A. Aquino, D. Tunega, M.L. Pantoya, Regulating Magnesium Combustion Using Surface Chemistry and Heating Rate, *Combustion and Flame* 226, 419-429, 2021.
171. N. Vaz, I. Shancita, M.L. Pantoya, Thermal Oxidation Analysis of Aerosol Synthesized Fuel Particles: Al versus Al-Si, *Powder Technology* 382; 532-540, 2021.
172. D. Tunega, M. L. Pantoya, R. Nieman, H. Lischka, A. Aquino, Reaction mechanism for fluorination reactions with hydroxylated alumina sites: pathways promoting aluminum combustion, *Journal of Chemical Physics* 154, 104308, 2021.
173. Shancita, I., Cagle, C., Kalish, I., Dube, P., Abraham, J., Hammond, B., Warzywoda, J., Pantoya, M.L., Tailoring Thermal Transport Properties by Inducing Surface Oxidation Reactions in Bulk Metal Composites, *Applied Materials & Interfaces* 13(15), 18358-18364, 2021.
174. Aguirre-Munoz, Z., Pantoya, M.L., Pando, M. Loria Garro, E.S., Engineering Integration in Elementary Science Classrooms: Effects of Disciplinary Language Scaffolds on English Learners' Content Learning and Engineering Identity, *Journal of Engineering Education* 110(3), 517-544, 2021.
175. Woodruff, C., Dean, S.W., Pantoya, M.L., A Comparison of Pyrometry and Thermography for Thermal Analysis of a Reacting Thermite, *Applied Optics*, vol. 60, No. 16, pp. 4976-4985, June 2021.
176. Pesce-Rodriguez, R.A., Gottfried, J.L., Giri, L, Miller, K.K., Pantoya, M.L., High-Pressure Thermal and Aging Behavior of Aluminum Iodate Hexahydrate, DEVCOM Army Research Laboratory (USA), Report No. ARL-TN-1072, August 2021.
177. Miller, K.K., Shancita, I., Bhattacharia, S.K., Pantoya, M.L., Surface Modifications of Atmospheric Pressure Plasma Surface Treatment on Aluminum Particles Towards Enhanced Reactivity, *Materials & Design*, 210, 110119, 2021.
178. Woodruff, C., Dean, S.W., Cagle, C., Croessmann, C.L., Pantoya, M.L., Pyrometry and Thermography in Ballistic Impact Experiments, *Measurement*, 110488, 2021.
179. Williams, A., Altman, I., Burnett, D., Zorrilla, E.G., Garcia, A.R., Cagle, C., Croessmann, C.L., Pantoya, M.L., Variations in aluminum particle surface energy and reactivity induced by annealing and quenching, *Applied Surface Science* 579, 152185, 2022.
180. Tran, Q., Dube, P., Malkoun, M., Altman, I., Sadangi, R., Koch, R., Pantoya, M.L., Direct Demonstration of Complete Combustion of Gas-Suspended Powder Metal Fuels Using Bomb Calorimetry, *Meas. Sci. Technol.* 33, 047002, 2022.
181. Woodruff, C., Dean, S.W., Cagle, C., Croessmann, C.L., Pantoya, M.L., Thermal Analysis of Thermite and Intermetallic Projectiles in Ballistic Impact Experiments, *Inter. J. of Heat and Mass Transfer* 187, 122565, 2022.



182. Aguirre-Muñoz, Z., Pando, M., & Pantoya, M., “Engineering make science beder.”: Developing primary students’ science & engineering literacy with targeted language scaffolds. *Journal of Latinos and Education*, 2022
183. Miller, C.J., Wainwright, E.R., Gottfried, J.L., Abraham, J., Liang, W., Pantoya, M.L., The influence of particle size on the fluid dynamics of a laser-induced plasma, *Physics of Fluids* 34, 053312, 2022
184. Vaz, N.G., Pantoya, M.L., Silicon Alloying Enhances Fast Heating Rate Combustion of Aluminum Particles, *Combustion and Flame* 241, 112156, 2022.
185. Miller, K.K., De Rezende Neto, A., Aquino, A., Tunega, D., Pantoya, M., Adsorption and Exchange Reactions of Iodine Molecules at the Alumina Surface: Modeling alumina-iodine reaction mechanisms, *Physical Chemistry Chemical Physics* 24, 11501-11509, 2022.
186. Altman, I. Pantoya, M.L., Comprehending Metal Particle Combustion: A Path Forward, *Propellants, Explosives, Pyrotechnics* 47(7), 2022.
187. Croessmann, C.L., Cagle, C., Dube, P., Abraham, J., Altman, I., Pantoya, M.L., Thermite and intermetallic projectiles examined experimentally in air and inert gas environments, *Journal of Applied Physics* 131, 175904, 2022.
188. Bhattacharia, S.K., Miller, K.K., Gottfried, J.L., Pantoya, M.L., Strategy for Enhancing Fast Energy Release from Aluminum Nanoparticles Based on Activation Energy Analysis, *J. Defense Res. Eng.*, 4(4), 81-94, 2022.
189. Malek, I.M., Wu, C.-C., Walck, S.D., Pantoya, M.L., Hydration of alumina (Al<sub>2</sub>O<sub>3</sub>) toward advancing aluminum particles for energy generation applications, *Colloids and Surfaces A: Physicochemical and Engineering Aspects* 652, 129740, 2022.
190. Tran, Q., Pantoya, M.L., Altman, I., Condense-Luminescence and Global Characterization of Metal Particle Suspension Combustion, *Applications in Energy and Combustion Science* 11, 100080, 2022.
191. Antonov, I., Chyba, A., Perera, S.D., Turner, A.M., Pantoya, M.L., Finn, M.T., Epshteyn, A., Kaiser, R.I., Discovery of Discrete Stages in the Oxidation of Exotetrahydrodicyclopentadiene (C<sub>10</sub>H<sub>16</sub>) Droplets Doped with Titanium-Aluminum-Boron Reactive Mixed Metal Nanopowder, *Journal of Physical Chemistry Letters* 13, 9777-9785, 2022.
192. Miller, K.K., Tran, Q., Pantoya, J.D., Hill, K.J., Creegan, S., Unruh, D., Pantoya, M.L., Acid-Base Precipitation Reaction for the Synthesis of Aluminum Iodate Hexahydrate: A Potential Propellant Oxidizer, *Chemical Engineering Journal* 453, 139953, 2022.
193. Rezende, A., Pantoya, M.L., Tunega, D., Fuchs, B., Demko, A.R., Aquino, A.J.A., A Density Functional Theory Analysis Identifying the Mechanism for Ignition Sensitivity of Ammonium Periodate Compared with Ammonium Perchlorate, *Journal of Physical Chemistry C*, 126, 21723-21733, 2022.
194. Jones, H., Dube, P., Tran, Q., Pantoya, M., Altman, I., Demonstrating the significance of radiant energy exchange during metal dust combustion, *Case Studies in Thermal Engineering* 48, 102809, 2023.
195. Tran, Q., Vaz, N., Pantoya, M.L., Altman, I., Effectiveness of Metal Particle Combustion Performance and Implications to Martian Missions, *Fuel* 342, 127805, 2023.
196. Rizzo, G.L., Biswas, S., Antonov, I., Miller, K.K., Pantoya, M.L., Kaiser, R.I., Exotic Inverse Kinetic Isotopic Effect in the Thermal Decomposition of Levitated Aluminum

- Iodate Hexahydrate Energetic Particles, *Journal of Physical Chemistry Letters* 14, 2722-2730, 2023
197. Shancita, I., Altman, I., Burnett, D., Zorrilla, E.G., Garcia, A.R., Hill, K.J., Pantoya, M.L., Demonstrating an Altered Metal Oxidation Reaction Mechanism Correlated with Variations in Surface Energy, *Thermochemica Acta*, 725, 179521, 2023.
  198. Williams, A., Short, M., Fah, T., Gupta, S., Pantoya, M.L., Advancing the Mechanical Integrity and Fragmentation Behavior of Reactive Projectiles, *Journal of Applied Physics* 133, 235901, 2023.
  199. Gottfried, J.L., Miller, K.K., Giri, L., Pantoya, M.L., Laser-Induced Plasma Physiochemistry of Propellant Oxidizers, *JANNAF Journal of Propulsion and Energetics* 13(1), 2023.
  200. Vaz, N.G., Pantoya, J.D., Miller, K.K., de Rezende, A., Aquino, A.J.A., Demko, A.R., Pantoya, M.L., A Metal Inorganic Framework (MIF) Designed as a Propellant Burn Rate Modifier, *Advanced Engineering Materials* 25(21), 2301099, 2023.
  201. Biswas, S., Paul, D., He, C., Dias, N., Ahmed, M., Pantoya, M., Kaiser, R., Counterintuitive Catalytic Reactivity of the Aluminum Oxide ‘Passivation’ Shell of Aluminum Nanoparticles Facilitating the Thermal Decomposition of exo-Tetrahydrodicyclopentadiene (JP-10), *Journal of Physical Chemistry Letters*, 14, 41, 9341-9350, 2023.
  202. Jaramillo, N., Ritchie, C., Pantoya, M.L., Altman, I., Establishing Calibration Free Pyrometry in Reactive Systems and Demonstrating its Advanced Capabilities, *Applications in Energy and Combustion Science* 16, 100230, 2023.
  203. Rezende, A., Pantoya, M.L., Tunega, D., Aquino, A.J.A., Prediction of phase transition and ignition sensitivity of ammonium periodate, *Journal of Physical Chemistry C* 128(5), 2205-2214, 2024.
  204. Biswas, S., Paul, D., Dias, N., Lu, W., Ahmed, M., Pantoya, M., Kaiser, R., Efficient Oxidative Decomposition of the Jet-Fuel Tetrahydrodicyclopentadiene (JP-10) by Aluminum Nanoparticles in a Catalytic Microreactor: An on-line Vacuum Ultraviolet Photoionization Study,” *Journal of Physical Chemistry A* 128(9), 1665-1684, 2024 2024.
  205. Altman, I., Pantoya, M.L., Energy Balance and Global Characteristics of Metal Dust Flames, *Combustion and Flame* 261, 113310, 2024.
  206. Biswas, S., Paul, D., Dias, N., Kunzler, K., Ahmed, M., Pantoya, M., Kaiser, R., Stress-Alteration Enhancement of the Reactivity of Aluminum Nanoparticles in the Catalytic Decomposition of Tetrahydro Dicyclopentadiene (JP-10), *Journal of Physical Chemistry A: Molecules, Clusters, and Aerosols* 128(18), 2024
  207. Malek, M.I., Benson, W., Pantoya, J.D., Collard, D., Son, S., Pantoya, M.L., Synthesis of Bayerite Passivated Aluminum Particles and their Combustion in Solid Propellants, *ACS Applied Engineering Materials*, 2(6), 1603-1611, 2024.
  208. Cagle, C., Pantoya, M.L., Fireball dimensionality and its influence on thermography data interpretation, *Measurement* 235, 115020, 2024.
  209. Micus, J.L., Wu, C.-C., Walck, S.D., Thapa, D., Pantoya, M.L., Hydration-Induced Plasma Surface Modification of Aluminum Nanoparticles for Power Generation in Oxygen Deficient Environments, *Surface & Coatings Technology* 488, 131054, 2024.
  210. Zamora, J., Rezende, A., Neeman, R., Vaz, N., Demko, A., Pantoya, M.L., Tunega, D., Aquino, A.J.A., Modeling adsorption reactions of ammonium perchlorate on rutile and anatase surfaces, *Journal of Computational Chemistry*, 1-10, 2024.

211. Jaramillo, N.R., Ritchie, C.A., Pantoya, M.L., Altman, I., Signature of Nano Alumina Condensation during Metal Combustion, *International Journal of Heat and Mass Transfer* 233, 126039, 2024.
212. Rizzo, G.L., Biswas, S., Pantoya, M.L., Kaiser, R.I., Unraveling the ignition chemistry of singly levitated aluminum iodate hexahydrate (AIH) particles, *Chemical Physics Letters* 842, 141212, 2024.
213. Malek, M.I., Collard, D., Son, S., Pantoya, M.L., Extending aluminum hydration surface treatments from nanoparticles to microparticles, *ACS Applied Engineering Materials*, 2024

### **Journal Publications Submitted**

1. Ritchie, C., Dean, S.W., McNesby, K.L., Benjamin, R. A., Pantoya, M.L., Thermal Behavior of Explosive Fireballs as a Function of Charge Size, Submitted to *Propellants, Explosives, Pyrotechnics*, September 2024.
2. Dey, M., Tran, Q., Zhang, J., Ngige, G., Javaid, S., Pantoya, M., Gupta, S., Rapid and Low Temperature Synthesis of MoAlB MAB Phase by Using Engineered Al-Particles, *International Journal of Ceramic Engineering and Science*, 2024.
3. Queen, L., Magallanes, J.M., Weaver, M.K., Davis, J., Pantoya, M.L., Ballistic Impact on Concrete and Asteroid Collision with Minerals Show Striking Commonalities, *International Journal of Impact Engineering*, 2024.
4. De Rezende, A., Zamora, J., Braga, L., Pantoya, M., Tunega, D., Demko, A., Aquino, A., The effects of TiO<sub>2</sub> anatase polymorph on ammonium perchlorate decomposition, *Journal of Physical Chemistry*, June 2024
5. Paul, D., Biswas, S., Yoem, H., Na, K., Pantoya, M., Kaiser, R., Unraveling the nanosheet zeolite-catalyzed combustion of aluminum nanoparticles-doped exo-Tetrahydrodicyclopentadiene (JP-10) energetic fuel, *ACS Applied Materials & Interfaces*, 2024.
6. Key, C.N., Kuhn, D.L., Harland, J.B., Altman, I., Pantoya, M.L., Lean Dust Combustion for Varied Surface Energy Aluminum Particles: Analyzing Dispersion and Light Emission, *Powder Technology*, 2024.

### **CONFERENCE PROCEEDINGS AND INVITED SEMINARS**

More than 400 and available upon request.

### **SYNERGISTIC ACTIVITIES**

1. Served on the Panel for Ballistics Science and Engineering at the Army Research Laboratory Sciences for Lethality and Protection, National Academies of Science, Engineering, Medicine, 2018, 2020.
2. Certified teacher educator for the Engineering is Elementary (EiE) curriculum (Boston Museum of Science). Conduct professional development workshops through the Texas Region 17 Education Service Center instructing EiE units to elementary school teachers, quarterly. Provide free consulting to local school districts implementing EiE or adapting EiE materials to their classrooms.

3. Coordinate engineering awards for the *South Plains Regional Science and Engineering Fair*. Recruit judges for engineering trophies of science fair projects. Solicit and award nearly \$20,000 in student scholarships. Organize awards for 3<sup>rd</sup> – 12<sup>th</sup> grade students. Yearly, February. Keynote speaker in 2016 for encouraging engineering among science fair participants.
4. Member of the Board of Directors for the Science Spectrum, Lubbock, TX. A local science museum (2012-Present). Actively develop engineering demonstrations that integrate with science exhibits. Wrote an informal engineering education proposal to develop engineering camps that was awarded in 2016, *Creativity Garden Grant* sponsored by **Disney**. Coordinated the engineering exhibit for this grant.
5. Script Writer and Actor for Local PBS series: ***Dr. Michelle the Engineer***. Series of 6 30-60 second segments that teach young children about technology and that engineers design technologies. Teaches about different engineering disciplines. Also, Lead Actor and Script Writer for ***Pride by Design***, a TTU Fox Sports production of a series of 60-second segments teaching engineering is a part of the Big VII athletics programs. Segments include: pole vaulting, soccer, volleyball, cross country, and softball. 2015-2016.
6. Board of Directors, Texas Tech University Press. Read manuscripts that proposed for publication at TTUP, advise on content and potential for successful books within the mission of TTUP. Meeting quarterly. 2015-2018.
7. Teach engineering in elementary school classrooms (during the last week of fall and spring semester, approximately 3 hours per day for four days). Various campuses in Lubbock ISD and Lubbock Cooper ISD. (2013- Present).
8. Key note speaker, lecturer, science and engineering education teacher advisor to local school districts (LISD, LCISD, FISD).
9. Co-author of *Engineering Everything* book series with Texas Tech University Press to develop a children's engineering book series for middle readers. TTUP Editor-in-Chief: Dr. Judith Keeling. First release in 2014: ***Designing Dandelions***. Second release ***Optimizing an Octopus*** 2020.
10. Coordinated and Developed a professional development workshop for elementary school teachers entitled Engineering Elephants: Story Books, Activities and Language Tools to Improve STEM Learning in the Early Years at the 2012 Annual ASEE Workshop on K-12 Engineering Education "Employing Engineers for STEM Learning" Saturday, June 9, 2012.
11. Developed a series of outreach seminars/ educational activities for local elementary schools introducing Pre-K – 3rd graders to fundamental engineering ideas using Engineering Elephants. These in-class book readings and associated activities are delivered throughout the year to selected classrooms.
12. Proposal Reviewer: Ongoing – Recent Reviews: DOE SERDP Review Panel (2010); NSR CAREER panel (CBET Division); NIST Proposal Review Panel; NSF CAREER panel (Combustion); ARO Proposal Reviewer: Energetic Materials; AFOSR Proposal Reviewer; NSF Unsolicited Proposal Reviewer (CBT Division); DTRA proposal reviewer (and panel).
13. Referee for: *Combustion Science and Technology, Combustion and Flame, Propellants Explosives Pyrotechnics, Metallurgical and Materials Transactions B, Heat Transfer Engineering, Advanced Materials, Journal of Materials Research, Journal of Materials Science, Journal of Heat Transfer, Chemistry of Materials, Journal of Applied Physics, Journal of Physical Chemistry, Journal of Alloys and Compounds, Journal of Thermophysics*

*and Heat Transfer, Journal of Propulsion and Power, Inorganic Chemistry, Journal of Materials Science*

### **COURSES TAUGHT**

| <b>Undergraduate</b>  | <b>Graduate</b>                               |
|---|---|
| Heat Transfer<br>Fluid Mechanics (Honors)<br>Thermal Fluid Laboratory<br>Combustion Engineering | Advanced Heat Transfer<br>Advanced Combustion |

### **CURRENT STUDENTS SUPERVISING**

Graduate Students, 14 Total: Connor Key, Armando Rezende, Ishrat Malek, Colton Cagle, Charles Luke Croessmann, Cole Ritchie, Jerimiah Zamora, Larry Queen, Tristan Fisher, Frank Muniz, Joseph Micus, Alex Muller, Kallista Kunzler, Hope Feltenberger.

Undergraduate Students, 3 Total: Joseph Pantoya, Vincent Micus, Wyatt Benson



### **STUDENTS GRADUATED**

M.S. Students (42 total): Bryan Bockman (May 03), John Granier (May 03), Kenneth Shifflet (May 03), Emily McFather Hunt (December 03), Keith Plantier (May 04), Mathew Jackson (May 05), Kevin Moore (May 05), Randy White (May 06), Daniel Prentice (May 06), Dustin Osborne (May 06), Kyle Watson (May 07), Andrew Francis (December 07), Jonathan Burkhard (December 07), Garima Chauhan (December 07), Shawn Stacy (May 08), Steven Dean (Dec. 2008), Kavya Balupari (Aug. 09), Eric Nixon (Aug. 09), Billy Clark (May, 2010), Sanjana Datta (May 2010), Keerti Kappagantula (August 2010), Amanda Gordon (May, 2011), Jeffrey Gesner (May, 2012), Chelsea Weir (May, 2012), Kelsey Meeks (August 2013), Kade Poper (August 2014), Richa Padhye (December 2014), Dylan Smith (August 2015), Neil Vaz (December 2015), Donya Thomas (May 2016), Ethan Zepper (August, 2016), Phoebe Lin (August 2017), Evan Vargas (May, 2018), Kevin Hill (May, 2018), Kenneth Ryan Bratton (December, 2018), Renita Walzel (May 2019), Connor Woodruff (May, 2019), Alan Williams (May, 2020), Colton Cagle (May, 2020), Nicholas Podany (May, 2021), Loudon Lee Campbell (May 2021), Charles Luke Croessmann (May 2022), Clayton Miller (May 2023)

PhD Students (22 total): John Granier (May 05), Emily Hunt (May 05), Matt Jackson (May 07), Birce Dikici (May 10), Charles Crane (May 2013), Shawn Stacy (May 2013), Cory Farley (May 2013),

Eric Collins (August, 2013), Oliver Mulamba (December, 2013), Keerti Kappagantula (August 2014), Jena McCollum (August 2015), Billy Clark (August 2016), Kelsey Meeks (December 2016), Richa Padhye (August 2017), Dylan Smith (August 2017), Kevin Hill (May, 2019), Michael Bello (May 2020), Connor Woodruff (May 2021), Shancita Islam (May 2021), Kelsea Miller (May 2022), Quan Tran (December 2022), Alan Williams (December 2022), Neil Vaz (May 2023), Armando Rezende (May 2024)

### ***AWARDS, HONORS, FELLOWSHIPS AND MEMBERSHIPS (selected)***

1. Susan G. Talkmitt Science Motivator Award, For outstanding and positive impact on STEM education for Texas Tech University undergraduate scholars 2019
2. Barnie E. Rushing Research Award, Texas Tech University 2017
3. Recipient of the *Creativity Garden Grant* by **Disney** – for development of informal engineering education at the Science Spectrum, Lubbock, TX 2016
4. YWCA Women of Excellence Award 2015
5. Outstanding Research, Texas Tech University 2012-2013
6. Texas Tech Today Article: Honored by a TTU Mother’s Day article entitled *Engineering Balance: A day in the life of Michelle Pantoya*, Texas Tech Today, May 13, 2012 by Karin Slyker.  
<http://today.ttu.edu/2012/05/engineering-balance-a-day-in-the-life-of-michelle-pantoya/>
7. F.A.C.E. Award (Faculty Academic Contribution Exhibit) 2010-2011  
<http://www.facebook.com/video/video.php?v=838340042838>
8. Award Winning Finalist in the Children’s Non-Fiction category of the “Best Books 2010” Awards, sponsored by USA Book News 2010  
<http://www.usabooknews.com/bestbooks2010.html>  
<http://today.ttu.edu/2010/04/elephants-build-future-engineers/>  
[http://www.youtube.com/watch?v=8NBok0nKPLU&feature=player\\_embedded](http://www.youtube.com/watch?v=8NBok0nKPLU&feature=player_embedded)
9. Integrated Scholars Award, Texas Tech University 2010  
See You-Tube movie: <http://www.youtube.com/watch?v=iCGftWdk4I8>
10. Ed and Linda Whitacre Faculty Fellow, Texas Tech University 2008-2011
11. Excellence in Research Award, College of Engineering, TTU(external funding \$ 250-500k) 2008
12. Excellence in Research Award, College of Engineering, TTU(external funding \$ 250-500k) 2007
13. Raymond B. Davis Award, Citizen Hero Award, University Medical Center & City of Lubbock 2007
14. Texas Tech Outstanding Researcher Award 2006
15. **U. S. Presidential Early Career Award for Scientists and Engineers (PECASE) 2004**
16. **Young Investigator Program Award U.S. Department of Defense 2002**
17. Alumni Association’s New Faculty Award, Texas Tech 2002
18. Best Professor Award, Mechanical Engineering Department, Pi Tau Sigma, Texas Tech 2001
19. Teaching Learning and Technology Center Faculty Teaching Award 2001
20. NRC ASEE Summer Faculty Fellowship, AFA 2001
21. UC Davis Fellowships, UC Davis 1993-1998

**Professional Memberships** (some may have lapsed): Sigma Xi, Society of Women Engineers (SWE), American Institute of Aeronautics and Astronautics (AIAA), American Society of Mechanical Engineers (ASME), The Combustion Institute, Materials Research Society (MRS), honorary member of Pi Tau Sigma, and the Cal Aggie Alumni Association.

**Community Memberships:** Lubbock Science Spectrum

**SECURITY CLEARANCE:** DOE Q-Clearance Inactive-Status

## ***INTERNATIONAL COLLABORATIONS***

DEVCOM CCDC-AC (Picatinny Arsenal) has provided a pathway for our international collaborations with allied countries in energetic materials. With their support (via MSRDC funding, below) I have been working with European academic scientists and hosting foreign summer students in our lab annually. The goal is to advance allied capabilities in reactive materials fundamental science, specifically for ballistic impact applications, but extending to fundamental science of metal oxidation. All publications with Dr. Daniel Tunega (i.e., 115, 133, 149, 161, 164, 170, 172, 185, 193, 203) are an example of our international collaboration.

## ***PROPOSALS FUNDED***

### ***Current***

1. Growing STEMS Consortium: Training the Next Generation of Engineers for the DOE NNSA Workforce; PI: Michelle L. Pantoya (Texas Tech University), Co-PIs: Dr. Michael Hargather (New Mexico Tech), Dr. Linda Muniz (Amarillo College), Dr. Zenaida Aguirre-Munoz (University of California, Merced); Source: US DOE/NNSA, 1000 Independence Ave, S.W. Washington, DC 20585; Program Manager: Dr. Betsy Snell; Project Locations: Texas Tech University/New Mexico Tech/Amarillo College/University of California, Merced; Award No. DE NA0003988, Period of Performance 04/15/2021-04/15/2025 (4 years), Amount: \$3,000,000 (\$1,000,000/year). Person-Months Per Year Committed to the Project. Cal: 0.00, Acad: 0.00, Sumr: 2.00

Goal: This is a STEM education grant that supports students through scholarships that allow learning and training opportunities in a research laboratory environment specific to the DOE Enterprise.

2. Growing STEMS Partnership: Training the Next Generation of Engineers for the Naval Enterprise; PI: Michelle L. Pantoya; Source: Office of Naval Research, 875 N Randolph St. Arlington, VA 22217; Program Manager: Dr. Michael Simpson; Project Locations: Texas Tech University; Award No. N00014-21-1-2519, Period of Performance 06/23/2021-06/23/2025 (4 years), Amount: \$750,000 (\$250,000/year). Person-Months Per Year Committed to the Project. Cal: 0.00, Acad: 0.00, Sumr: 0.25

Goal: This is a STEM education grant that supports students through scholarships that allow learning opportunities in a research laboratory environment specific to the Navy mission centric challenges. There is no overlap with the proposed project and other projects listed.

3. Energetic Material Training for the Next Generation Naval Workforce; PI: Michelle L. Pantoya; Source: Office of Naval Research, 875 N Randolph St. Arlington, VA 22217; Program Manager: Dr. Trevor Headman; Project Location: Texas Tech University; Award No. N00178-24-1-0009; Period of Performance 08/01/2024 – 09/30/2027; Amount: (\$300,000); Person-Months Per Year Committed to this Project: Cal: 0.00, Acad: 0.00, Sumr: 0.25.



Goal: This is a STEM education grant that supports students through scholarships to learn research practices and energetic materials science relevant to Naval Surface Warfare Center, Indian Head mission needs. There is overlap with the project and other projects listed.

4. Synthesis and Characterization of Metal Fuels for Enhanced Reactivity; PI: Michelle L. Pantoya; Source: Office of Naval Research, 875 N Randolph St. Arlington, VA 22217; Program Manager: Dr. Chad Stoltz; Project Locations: Texas Tech University; Award No. N00014-22-1-2006, Period of Performance 11/01/2021-10/31/2025 (4 years), Amount: \$600,000 (\$200,000/year). Person-Months Per Year Committed to the Project. Cal: 0.00, Acad: 0.00, Sumr: 0.25

The **goal** is to modify surface energy of metal particles and study their energy release and conversion mechanisms in reactive environments. There is no overlap with the proposed project.

5. Novel Metal Surface Chemistry for Fast Reacting Fuel Particles; PI: Michelle Pantoya. Source: Army Research Office, 800 Park Office Drive, Durham, NC 27703; Program Manager, Dr. Ralph Anthenien; Project Location: Texas Tech University; Award No. W911NF-22-2-0168; Total Award: \$525,000; Period of Performance 09/30/2022-09/29/2025; Person-Months Per Year Committed to the Project. Cal: 0.0, Acad: 0.00, Sumr: 0.25.

The **goal** is to synthesize novel metal fuel particles through purposefully designed surface reactions that alter the particle's shell and core architecture to enable faster energy release rates. The focus is on aluminum (Al) particles and the *hypothesis* is that transforming the native alumina (Al<sub>2</sub>O<sub>3</sub>) shell into a hydrated phase Al(OH)<sub>3</sub> will promote controllable surface reactions that can be used to alter the shell chemistry and particle reactivity. There is no overlap with the proposed project.

6. Energetic Material Basic Research (EMBR) Center; Co-PI: Michelle Pantoya. Source: Army Research Office, 800 Park Office Drive, Durham, NC 27703; Program Manager, Dr. Ralph Anthenien; Project Location: Purdue (Lead Institution), MIT, UMD, TTU, Notre Dame; Award No. W911NF-22-2-0170; Texas Tech Total Award: \$579,655; Period of Performance 09/30/2022-09/29/2025; Person-Months Per Year Committed to the Project. Cal: 0.0, Acad: 0.00, Sumr: 0.25.

The **goal** is to synthesize novel inorganic materials that can be used for energetic material applications. Specifically, synthesizing metal-inorganic-framework materials towards the development of new solid oxidizers with tailored properties. There is no overlap with the proposed project.

7. Analyzing Equilibrium Kinetics of Surface Reactions in Energetic Materials; PI: Michelle Pantoya. Source: Army Research Office; Project Location: Texas Tech University; Total Award: \$105,072; Period of Performance 09/01/2023-08/31/2024; Person-Months Per Year Committed to the Project. Cal: 0.0, Acad: 0.00, Sumr: 0.0.

The **goal** is to purchase capital equipment, specifically a DSC-TGA to characterize energetic material reactions that will inform synthesis strategies. There is no overlap with the proposed project.

8. Advancing experimental diagnostics for obscurant testing; PI: Michelle Pantoya. Source: Department of Defense (DEVCOM CCDC AC, Picatinny Arsenal vis Excet Incorporated); DEVCOM Program Manager: Dr. Danielle Kuhn; Project Location: Texas Tech University; Total Award: \$83,236.50; Duration: 08/17/2023-02/28/2025. Cal: 0.0, Acad: 0.00, Sumr: 0.00.

The **goal** is to develop diagnostic capabilities to quantify powder suspension properties for obscurant applications. There is no overlap with the proposed project.

9. Material Property-Functional-Performance characterization studies for solid fuel combustion PI: Michelle Pantoya. Source: Department of Energy, Consolidated Nuclear Security, LLC; Program Manager: Mr. Caleb Heltenberg; Project Location: Texas Tech University; Total Award: \$100,000; Duration: 08/21/2-23-08/20/2024. Cal: 0.0, Acad: 0.00, Sumr: 0.00.

The **goal** is to train *undergraduate* students on energetic material science projects that develop analytical skills necessary for the NNSA-DOE proficiency at Pantex. There is no overlap with the proposed project.

10. Advancing engineering practices toward nuclear security purposes; PI: Michelle Pantoya. Source: Department of Energy, Consolidated Nuclear Security, LLC; Program Manager: Mr. Caleb Heltenberg; Project Location: Texas Tech University; Total Award: \$225,000; Duration: 08/21/23-08/20/2025. Cal: 0.0, Acad: 0.00, Sumr: 0.00.

The **goal** is to train *graduate* students on energetic material science projects that develop analytical skills necessary for the NNSA-DOE proficiency at Pantex. There is no overlap with the proposed project.

11. Pycnometer Testing and Redesign Support; Co-PI: Michelle Pantoya (PI: Dr. Jeff Hanson). Source: Department of Energy, Consolidated Nuclear Security, LLC; Program Manager: Ms. Ashley Rojas; Project Location: Texas Tech University; Total Award: \$84,129; Duration: 10/1/2022-09/30/2024. Cal: 0.0, Acad: 0.00, Sumr: 0.00.

The **goal** is to redesign the pycnometer to enable density testing of explosive samples. The current design top loads explosives, a practice that is prohibited by safety protocols for handling explosives. The redesign will side load explosive samples. This is an undergraduate Capstone project that supports a team of undergraduates guided by a faculty advisor (Dr. Jeff Hanson) on the redesign. There is no overlap with the proposed project.

12. Consumable Fragment Research and Development; PI: Michelle Pantoya. Source: MSI Stem Research and Development Consortium (MSRDC); Program Manager: Dr. Anne-Marie Petrock (DEVCOM CCDC AC, Picatinny Arsenal); Project Location: Texas Tech University; Award No. W911SR22F0047; Total Award: \$356,208; Duration: 10/09/2023 – 10/08/2025. Cal: 0.0, Acad: 0.00, Sumr: 0.00.

The **goal** is to perform fundamental research on reactive material projectile ballistic impact and collaborate with a delegation of German scientist to advance ordnance alternatives for decisive on-board action. There is no overlap with the proposed project.

13. Reactive Boron Fuel for Energetic Applications; Co-PI: Michelle Pantoya (PI: Dr. Adelia Aquino). Source: TDA Research, Inc.; Program Manager: Dr. Brady Clapsaddle; Project Location: Texas Tech University; Total Award: \$105,000; Duration: 12/16/2022-09/27/2024. Cal: 0.0, Acad: 0.00, Sumr: 0.00.

The **goal** is to perform modeling and simulation using computational chemistry calculations for boron interface reactions. There is no overlap with the proposed project.

## Pending

1. Growing STEMS Consortium: Training the Next Generation of Engineers for the DOE NNSA Workforce; PI: Michelle L. Pantoya (Texas Tech University), Co-PIs: Dr. Michael Hargather (New Mexico Tech), Dr. Emily Hunt (West Texas A&M University); Source: US DOE/NNSA, 1000 Independence Ave, S.W. Washington, DC 20585; Program Manager: Dr. Betsy Snell; Project

Locations: Texas Tech University/New Mexico Tech/West Texas A&M University, Period of Performance 08/15/2024-08/14/2029, Amount: \$5,000,000 (\$1,000,000/year). Person-Months Per Year Committed to the Project. Cal: 0.00, Acad: 0.00, Sumr: 1.00

Goal: This is a renewal application to our existing DOE NNSA MSIPP STEM education grant that supports students through scholarships that allow learning and training opportunities in a research laboratory environment.

2. Time Resolved Emission Spectroscopy for Nanosecond-Scale Analysis of Reactive Material Ballistic Impact Events; PI: Michelle Pantoya. Source: Office of Naval Research; Program Manager, Dr. Chad Stoltz; Project Location: Texas Tech University; Total Award: \$123,850; Period of Performance 09/01/2024-10/31/2025; Person-Months Per Year Committed to the Project. Cal: 0.0, Acad: 0.00, Sumr: 0.0.

Goal: This is an equipment proposal (DURIP) to obtain an imaging spectrometer to characterize radiant energy emission at early times relevant to metal oxidation from ballistic impact events. There is no overlap with the proposed project.

3. Control of Motor Performance by Ion-Mediated Amplification of Condensed Heat Release in Metalized Fuels/Propellants; PI: Dr. Michelle L. Pantoya (Texas Tech University), Co-PIs: Dr. Agranovski (Griffith University, Brisbane, Australia), Dr. Igor Altman (NAWCWD), and Dr. Eric Petersen (Texas A&M University, College Station, TX); Source: University Consortium for Applied Hypersonics; Period of Performance 05/01/2024 – 04/30/2027, Total Amount: \$1,500,000. Person-Months Per Year Committed to the Project. Cal: 0.00, Acad: 0.00, Sumr: 0.25

Goal: This effort will demonstrate performance control of metalized fuels/propellants by applying external ionization sources to promote condensation growth of metal oxide nanoparticles formed as a result of metalized fuel/propellant combustion. There is no overlap with the proposed project.

4. Energetic Material Training for the Next Generation Naval Workforce; PI: Michelle Pantoya. Source: Office of Naval Research; Program Manager, Dr. Trevor Headman; Project Location: Texas Tech University; Total Award: \$300,000; Period of Performance 05/01/2024-04/30/2027; Person-Months Per Year Committed to the Project. Cal: 0.0, Acad: 0.00, Sumr: 0.0.

Goal: This is a STEM education grant that supports students through scholarships that allow learning opportunities in the specialized field of energetic materials specific to reactive material and propellant applications. All activities proposed are in collaboration with NSWCIHD (Indian Head, MD). There is no overlap with the proposed project.

### ***Successfully Completed (Selected)***

1. Analyzing equilibrium kinetics of surface reactions in energetic materials; PI: Michelle Pantoya. Source: Army Research Office. Project Location: Texas Tech University; Total Award: \$108,071.00; Duration: 09/01/2023-08/31/2024; Goals: Acquire a DSC-TGA to pursue thermal equilibrium testing and analysis of energetic materials. Award: W911NF-23-1-0318
2. Advanced Imaging Diagnostics for thermography of Ballistic Impact of Reactive Materials, PI: Michelle Pantoya, U.S. Office of Naval Research; Project Location: Texas Tech University, Total

- Award \$172,000; 04/21-04/22; Goals: Procure new instrumentation to enable thermal measurements of reactive materials in extreme environments.
3. Modeling and Simulation of Complex Multiphase Interaction of Energetic Materials; PI: Joseph Abraham (Karagozian & Case), Co-PI: Michelle Pantoya; Source Air Force Research Lab (AFRL) Eglin AFB, SBIR Phase I & II; Total TTU Award: \$300,000; Duration 10/01/2017-05/31/2018 and 09/01/2018-05/01/2021; *Goals*: Perform high velocity impact ignition and combustion experiments on reactive materials using a propellant driven gun as validation data for modeling development by the PI.
  4. High speed thermal imaging diagnostics for ballistic impacts: a reactive material fundamental analysis; Source: Office of Naval Research; PI: M. Pantoya, Location: TTU; Total: \$194,872, 4/5/21-4/4/22. *Goals*: Acquire a high-resolution, high-speed imaging system for accurate temperature measurements of impact ignition and reaction events.
  5. Printing of Variable Density Materials, PI: Michelle L. Pantoya; Source: Leidos (for DEVCOM CCDC-AC, Picatinny Arsenal); Project Location: Texas Tech University; Total: ~\$200,000; 05/2019-12/2021; *Goals*: This is an export-controlled project.
  6. Prestressing Metal Fuel Particles for Enhanced Reactivity, PI: Michelle L. Pantoya; Co-PI: Valery Levitas; Source: Office of Naval Research; Project Location: Texas Tech University and Iowa State University; Total Award: \$450,000; Duration: 01/01/2018 – 12/31/2021 (3 years). *Goals*: Synthesize and characterize prestressed aluminum powders for their reactive potential.
  7. Synthesis and Characterization of Advanced Biocidal Energetic Materials; PI: Michelle Pantoya. Source: Defense Threat Reduction Agency; Project Location: Texas Tech University; Total Award: \$1,000,000; Duration 02/01/2015 – 01/31/2020 (5 years); *Goals*: Develop polymer coatings on fuel metal particles that exhibit biocidal potential.
  8. Modeling Thermite Reactions; PI: Michelle Pantoya; Source: Idaho National Laboratory (DOE); Project Location: Texas Tech University; Total Award: \$25,000; Project Duration: March 2016-August 2016; *Goals*: Examine visualization diagnostic approaches to quantifying energy propagation in thermites.
  9. Optimization of Micron-Scale Aluminum Reactivity for Dynamic Loading, PI: Michelle L. Pantoya; Co-PI: Valery Levitas; Source: Office of Naval Research; Project Location: Texas Tech University and Iowa State University; Total Award: \$450,000; Duration: January 2016 – December 2018. *Goals*: Synthesize and characterize prestressed aluminum powders for their reactive potential.
  10. Practices Promoting Engineering Education in the Early Years; Co-PI: Michelle Pantoya. Source: National Science Foundation (Research in Engineering Education – REE Program), NSF Award Number EEC-1463820; Project Location: Texas Tech University; Total Award: \$300,000; Duration: 11/15 – 10/18. *Goals*: Develop educational models that effectively communicate engineering to young children.
  11. Characterizing Ignition, Combustion, and Energy Transfer from Composite Energetic Materials; PI: Michelle Pantoya. Source: Army Research Office; Project Location: Texas Tech University; Total Award: \$378,656; Duration 10/01/2014 – 09/30/2017 (3 years).
  12. Imaging Diagnostics for Analysis of Energetic Material Reactions; PI: Michelle Pantoya; Source: Army Research Office; Project Location: Texas Tech University; Total Award: \$130,500; 04/01/2016-03/31/2017.
  13. Resolving the complexity of hot spots caused by weak energy concentration and coupling in composite energetic materials; PI: Brandon Weeks, Co-PIs: Greg McKenna, Michelle Pantoya and Louisa Hope-Weeks; Source: Office of Naval Research; Project Location: Texas Tech University; 05/11-06/17, \$1,000,000.
  14. High Velocity Impact Initiated Aluminum Combustion Studies, PI: Michelle Pantoya; Source: Office of Naval Research; Project Location: Texas Tech University; Total Award: \$61,995; 04/01/2016-03/31/2017.
  15. Characterizing thermite formulations for reservoir stimulation applications; PI: Michelle Pantoya; Source: Schlumberger; Project Location: Texas Tech; Total Award: \$25,000; March 2016- August 2016.

16. Effective Practices Integrating Engineering and Literacy in the Early Years; Co-PI: Michelle Pantoya. Source: National Science Foundation (Fostering Interdisciplinary Research In Engineering – FIRE program), NSF Award Number DRL – 1249874; Project Location: Texas Tech University; Total Award: \$400,000; Duration: June 2013- May 2016.
17. Additive Manufacturing of Composite Materials, PI: Michelle Pantoya, Gordon Christopher, Jeff Hanson, Source: Pantex/DOE; Project Location: Texas Tech University; \$150,000; Duration 04/01/2016-03/31/017.
18. Characterization of Nano-Silicon Combustion; PI: Michelle Pantoya; Source: Systems and Materials Research Corporation (SMRC); Project Location: Texas Tech University; Total Award: \$50,000; Project Duration: November 2015- February 2016.
19. Aluminum Combustion in Composite Metal Materials, PI: Michelle L. Pantoya; Co-PI: Valery Levitas; Source: Office of Naval Research; Project Location: Texas Tech University and Iowa State University; Total Award: \$625,000; Duration: June 2012 – December 2015.
20. Multiphase Combustion of Metalized Nanocomposite Energetic Materials; PI: Michelle Pantoya; Source: Army Research Office; Project Location: Texas Tech University; Total Award \$300,000, Duration May 2011-April 2014, Amount \$300,000.
21. Combustion Enhancement of Liquid Fuels via Nanoparticle Additions; PI: Michelle Pantoya; Source: Systems and Materials Research Corporation (SMRC); Project Location: Texas Tech University; Total Award: \$20,000; Project Duration: September 2013- September 2014.
22. Electrostatic Discharge Ignition, PI: Michelle Pantoya; Source: Idaho National Laboratory (Department of Energy), Total Award: \$20,000; Duration 10/01/2012-09/30/2014; Project Location: Texas Tech University.
23. Diagnostics for Analysis of Surface Reactions in Composite Energetic Material Combustion; PI: Michelle Pantoya. Source: Army Research Office; Project Location: Texas Tech University; Total Award: \$224,580; Duration 06/14/2014 – 06/13/2015 (1 year);
24. Characterizing Energetic Material Response to Microwave Energy, PI: M. L. Pantoya; Co-PIs: M. Saed, B. Weeks, Source: Air Force Research Laboratory, AFRL; TTU; \$390,000; 09/13 – 09/16.
25. Variable Effects Warhead for Tactical Missiles and Strike Weapons; PI: Michelle Pantoya; Source: Energetic Materials Products Inc.; Project Location: Texas Tech; Duration: 10/2010-6/2012; Amount \$79,000.
26. Energetic Thin Films, PI: Michelle Pantoya; Source: Sandia National Laboratory, \$60,000, 10/12-10/15.
27. Biocidal Energetic Materials; PI: Emily Hunt, Co-PI: Michelle Pantoya; Source: Defense Threat Reduction Agency (DTRA); Project Location: Texas Tech; Project Duration: 7/31/10-8/1/12; Amount: \$200,000.
28. Melt Dispersion Mechanism for Energetic Reactions of Aluminum Nanoparticles; PI: Valery Levitas (ISU), Co-PI: Michelle Pantoya (TTU); Source: National Science Foundation; Texas Tech; 05/08-04/12; \$300,000.
29. Impact Driven Reactions in Biocidal Reactive Materials for WMD Applications; PI: Stephen Bless (UTexas), Co-PI: Michelle Pantoya (TTU), Source: Defense Threat Reduction Agency (DTRA); Project Location: Texas Tech University; Duration: 03/08-02/12; TTU Amount \$265,000 (total award \$900,000).
30. Fundamental Understanding and Improvement of Energetic Reactions of Aluminum Particles with Oxidizers and Metals, PI: Valery Levitas, Co-PI: Michelle Pantoya, Office of Naval Research, 12/07-11/10, \$300,000.
31. Diagnostics for analyses of gas phase chemistry from novel propellant super igniter formulations, Army Research Office DURIP, PI: Michelle Pantoya, \$148,189, Duration 5/2009-4/2010.
32. Combustion Behaviors of Nanocomposite Energetic Materials, M. Pantoya, Department of Defense Army Research Office Presidential Early Career Award for Scientists and Engineers, PI: Michelle Pantoya, Project Duration: August 2004-July 2010, \$500,000. Additional \$37,000 awarded for July 2010 – December 2010.

33. NIRT: Nanocomposite Reactions in the Self-propagating High Temperature Synthesis of Materials, National Science Foundation; PI: M. Pantoya, Co-PIs: J. Berg, S. Gangopadhyay, M. Holtz, H. Temkin, Project duration August 2002 – July, 2006, \$1,000,000.
34. Cory Farley: Energetic Materials Center Fellowship, Lawrence Livermore National Laboratory, PI: Michelle Pantoya, Amount: \$46,000, Duration: 8/2009 – 12/2010.
35. Energetic and Thermal Behavior of Novel Nanostructured Composites, PI: M. Pantoya, Department of the Army TACOM-ARDEC Picatinny Arsenal, Project Duration 1/03-12/05, \$450,000.
36. Propagation Physics and Ignition of Nanocomposite Energetic Materials, M. Pantoya, Department of Defense Army Research Office Young Investigator Program, Project Duration: 8/02-10/05, \$150,000.
37. Improving the Performance Reliability of Metastable Intermolecular Composites, M.L. Pantoya, Department of Energy – Los Alamos National Laboratory, \$62,500, Project Duration 10/1/02-9/30/03.
38. Safety of Missile Components in High Temperature Combustion Environments, PI: M. Pantoya, Department of Energy - Sandia National Laboratory, \$80,000, Project Duration 10/1/02 – 9/30/04.
39. Infrared Diagnostics for Mesoscale Analyses of Munitions Under Extreme Conditions, PI: M. Pantoya, Department of Defense, DURIP, Army Research Office, 08/01/05-07/31/06, \$150,000.
40. Fundamental Understanding and Improvement of Energetic Reactions of Aluminum Particles with Oxidizers and Metals, PI: Valery Levitas, Co-PI: Michelle Pantoya, Office of Naval Research, Project Duration December 2006 - December 2007, \$150,000.
41. Diagnostics for Performance Evaluation of Nano-Engineered Energetic Materials, PI: M. Pantoya, Department of Defense Army Research Office, Project Duration 05/04-04/05, \$262,000.
42. Engineering Link: A Mentorship Program, M.L. Pantoya, Texas Tech University Teaching Learning and Technology Grant, \$5,000, Project duration January 2002-August 2002.
43. Propagation and Characterization of Nanocomposite Thermite Reactions, PI: M. Pantoya, Co-PI: M. Holtz, Texas Tech University Multidisciplinary Seed Grant, \$18,700, Project duration 06/02- 05/03.
44. Flame Physics: the impact of a space environment on combustion reactions, Texas Space Grant Consortium, PI: Michelle Pantoya, Project Duration: 9/07 – 8/09, \$15,000.
45. Examining the Combustion Behaviors of Nanocomposite Thermites in Aqueous Environments, Department of Energy via Idaho National Laboratory, PI: Michelle Pantoya, Project Duration 03/07 – 07/09, \$162,000.
46. Combustion Performance of Energetic Materials in Microgravity, M. Pantoya, Texas Space Grant Consortium, Project Duration 9/1/02 – 8/30/03, \$50,000.
47. Development and Implementation of Propellant Fire Plume Particulate Sampling Techniques, M. Pantoya, Department of Energy - Sandia National Laboratory, \$28,000, 10/1/04 – 9/30/05.
48. Energy transfer studies of pyrophoric iron for food heating applications, Texas Emerging Technology Fund, PI: Brendan Coffey (Ironbridge Inc.), Co-PI: Michelle Pantoya (TTU), TTU portion \$29,999, Duration 11/5/2008-11/4/2009.