

CV for David A. Roberson, Ph.D.

Department of Metallurgical, Materials and Biomedical Engineering

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EDUCATION

Ph.D. The University of Texas at El Paso, Materials Science and Engineering, 2012

Dissertation Title: A Novel Method for the Curing of Metal Particle Loaded Conductive Inks and Pastes

Advisor: Eric W. MacDonald

M.S. The University of Texas at El Paso, Metallurgical and Materials Engineering, 2001

Thesis Title: A Study of the Impact of Tungsten Carbide Projectiles into Hard and Soft Copper Targets

Advisor: Lawrence E. Murr

B.S. The University of Texas at El Paso, Metallurgical and Materials Engineering, 1999

Research Area: Corrosion of Aging Aircraft Skins

EXPERIENCE

- **Full-Time Academic Experience**

The University of Texas at El Paso, Associate Professor (Tenured)
Metallurgical, Materials and Biomedical Engineering, (9/2016 – Present)
Undergraduate Program Director, (1/2018 – 12/2019)

The University of Texas at El Paso, Assistant Professor
Metallurgical, Materials and Biomedical Engineering, (7/2012 – 9/2016)

- **Part-Time Academic Experience**

The University of Texas at El Paso, Ph.D. Research Assistant
W.M. Keck Center for 3D Innovation, (8/2009 – 5/2012)

- **Non-Academic Experience**

Qimonda NA, Sr. Defect Metrology Engineer, (11/2006 – 2/2009)

Intel Corporation, Defect Metrology Engineer, (5/2001 – 9/2006)

Awards

3 Intel Technology and Manufacturing Group Division Recognition Awards

PATENTS (2)

Patent no. 12187888 Development and Characterization of F-Gelatin Electrospun Scaffolds for Cardiac Tissue Modeling

Awarded 1/07/2025

Patent no. 10954369 Methods and Polymer Compositions for Material Extrusion 3D printing
Awarded 3/23/2021

PUBLICATIONS **Google Scholar h-index: 25; i10-index: 38; over 3700 citations**

Peer-reviewed Journals (47)

1. M. S. Mahmud, A. Delgadillo, J. E. M. Urbay, M. S. Hassan, S. Zaman, D. Dieguez, D. Fontes, D. Leyva, J. Dantzler, A. Lopez, S. N. Joyce, **D. A. Roberson**, K. Michael, Y. Lin, A. N. Marchi, & B. E. Schuster, Chemical aging and degradation of stereolithographic 3D-printed material: Effect of printing and post-curing parameters. *Polymer Degradation and Stability*, **232** (2025).
<https://doi.org/10.1016/j.polymdegradstab.2024.111151>.
2. B. L. Stark, M. Gamboa, A. Esparza, T. J. Cavendar-Word, D. Bermudez, L. Carlon, **D. A. Roberson**, B. Joddar, & S. Natividad-Diaz, Materials Characterization of Stereolithography 3D Printed Polymer to Develop a Self-Driven Microfluidic Device for Bioanalytical Applications. *ACS Applied Bio Materials*, **7** (2024) 7883–7894.
<https://doi.org/10.1021/acsabm.4c00059>.
3. S. P. Ramirez, I. Hernandez, Z. N. Dorado, C. D. Loyola, **D. A. Roberson**, & B. Joddar, Fibrin-Polycaprolactone Scaffolds for the Differentiation of Human Neural Progenitor Cells into Dopaminergic Neurons. *ACS Omega*, **9** (2024) 37063–37075.
<https://doi.org/10.1021/acsomega.4c03952>.
4. Gomez, B. Yelamanchi, A. Maurel, A. C. Martinez, T. Feldhausen, J. Shivakumar, E. Rojas, Y. Lin, P. Cortes, E. Macdonald, & **D. A. Roberson**, 3D Printed Alumina for Geometrically-Complex Electronic Substrates with High-Performance Printed Conductors. *IEEE Access*, **12** (2024) 92295–92305.
<https://doi.org/10.1109/ACCESS.2024.3421288>.
5. L. E. L. Carrillo, Y. O. Gonzalez, M. Parga, K. L. D. Ramos, N. Neparko, & **D. A. Roberson**, Development of binary and ternary polyester shape memory blends for additive manufacturing. *Journal of Materials Science*, **59** (2024) 8040–8057.
<https://doi.org/10.1007/s10853-024-09657-7>.
6. D. Bermudez, S. Moreno, & **D. A. Roberson**, The Effect of Elastomer Content and Annealing on the Physical Properties of Upcycled Polyethylene Terephthalate-Maleated Styrene Ethylene Butylene Styrene Blends for Additive Manufacturing. *Materials*, **17** (2024). <https://doi.org/10.3390/ma17246272>.
7. L. E. Lares Carrillo, J. F. Salazar, M. M. Hitter, V. C. Luna, D. E. Alvarez, M. Arana Contreras, V. G. Contreras Guerrero, J. S. Hitter, D. A. Morales, A. Nunez, A. Villegas, & **D. A. Roberson**, The Effect of Raster Pattern and Acetic Acid Exposure on the Mechanical and Failure Properties of Additively Manufactured PLA and PLA-wood Composite Specimens. *Journal of Failure Analysis and Prevention*, **23** (2023) 1298–

1312. <https://doi.org/10.1007/s11668-023-01681-0>.
8. T. J. Cavender-Word & **D. A. Roberson**, Development of a Resilience Parameter for 3D-Printable Shape Memory Polymer Blends. *Materials*, **16** (2023). <https://doi.org/10.3390/ma16175906>.
 9. J. M. Avila, T. J. Cavender-Word, & **D. A. Roberson**, Exploring the Effect of Moisture Exposure on Shape Memory Polymer Performance. *Journal of Polymers and the Environment*, **31** (2023) 3351–3362. <https://doi.org/10.1007/s10924-023-02818-w>.
 10. N. Nagiah, R. El Khoury, M. H. Othman, J. Akimoto, Y. Ito, **D. A. Roberson**, & B. Joddar, Development and Characterization of Furfuryl-Gelatin Electrospun Scaffolds for Cardiac Tissue Engineering. *ACS Omega*, **7** (2022) 13894–13905. <https://doi.org/10.1021/acsomega.2c00271>.
 11. T. J. Word, A. Guerrero, & **D. A. Roberson**, Novel polymer materials systems to expand the capabilities of FDMTM-type additive manufacturing. *MRS Communications*, **11** (2021) 129–145. <https://doi.org/10.1557/s43579-021-00011-5>. **INVITED PAPER**
 12. P. A. Quiñonez, L. Ugarte-Sanchez, D. Bermudez, P. Chinolla, R. Dueck, T. J. Cavender-Word, & **D. A. Roberson**, Design of shape memory thermoplastic material systems for fdm-type additive manufacturing. *Materials*, **14** (2021). <https://doi.org/10.3390/ma14154254>. **INVITED PAPER**
 13. F. A. Chávez, P. A. Quiñonez, & **D. A. Roberson**, Hybrid metal/thermoplastic composites for FDM-type additive manufacturing. *Journal of Thermoplastic Composite Materials*, **34** (2021) 1193–1212. <https://doi.org/10.1177/0892705719864150>.
 14. I. A. Carrete, P. A. Quiñonez, D. Bermudez, & **D. A. Roberson**, Incorporating Textile-Derived Cellulose Fibers for the Strengthening of Recycled Polyethylene Terephthalate for 3D Printing Feedstock Materials. *Journal of Polymers and the Environment*, **29** (2021) 662–671. <https://doi.org/10.1007/s10924-020-01900-x>.
 15. D. Bermudez, P. A. Quiñonez, E. J. Vasquez, I. A. Carrete, T. J. Word, & **D. A. Roberson**, A Comparison of the physical properties of two commercial 3D printing PLA grades. *Virtual and Physical Prototyping*, **16** (2021) 178–195. <https://doi.org/10.1080/17452759.2021.1910047>.
 16. C. A. Terrazas, L. E. Murr, D. Bermudez, E. Arrieta, **D. A. Roberson**, & R. B. Wicker, Microstructure and mechanical properties of Ti-6Al-4V-5% hydroxyapatite composite fabricated using electron beam powder bed fusion. *Journal of Materials Science and Technology*, **35** (2019) 309–321. <https://doi.org/10.1016/j.jmst.2018.10.025>.
 17. K. Schnittker, E. Arrieta, X. Jimenez, D. Espalin, R. B. Wicker, & **D. A. Roberson**,

Integrating digital image correlation in mechanical testing for the materials characterization of big area additive manufacturing feedstock. *Additive Manufacturing*, **26** (2019) 129–137. <https://doi.org/10.1016/j.addma.2018.12.016>.

18. M. N. Jahangir, K. M. M. Billah, Y. Lin, **D. A. Roberson**, R. B. Wicker, & D. Espalin, Reinforcement of material extrusion 3D printed polycarbonate using continuous carbon fiber. *Additive Manufacturing*, **28** (2019) 354–364. <https://doi.org/10.1016/j.addma.2019.05.019>.
19. I. A. Carrete, D. Bermudez, C. Aguirre, F. A. Alvarez-Primo, S. Anil-Kumar, P. Chinolla, M. Gamboa, S. A. Gonzalez, H. E. Heredia, A. M. Hernandez, E. Levario, J. R. Lindquist, V. C. Luna, L. M. Martinez, V. E. Mendez, J. J. Slager, L. Ugarte-Sanchez, Y. A. Urquidi, A. Zamora, & **D. A. Roberson**, Failure Analysis of Additively Manufactured Polyester Test Specimens Exposed to Various Liquid Media. *Journal of Failure Analysis and Prevention*, **19** (2019) 418–430. <https://doi.org/10.1007/s11668-019-00614-0>.
EDITOR'S CHOICE AWARD
20. C. O. Balderrama-Armendariz, E. MacDonald, **D. A. Roberson**, L. Ruiz-Huerta, A. Maldonado-Macias, E. Valadez-Gutierrez, A. Caballero-Ruiz, & D. Espalin, Folding behavior of thermoplastic hinges fabricated with polymer extrusion additive manufacturing. *International Journal of Advanced Manufacturing Technology*, **105** (2019) 233–245. <https://doi.org/10.1007/s00170-019-04196-x>.
21. F. Andrade Chávez, J. G. Siqueiros, I. A. Carrete, I. L. Delgado, G. W. Ritter, & **D. A. Roberson**, Characterisation of phases and deformation temperature for additively manufactured shape memory polymer components fabricated from rubberised acrylonitrile butadiene styrene. *Virtual and Physical Prototyping*, **14** (2019) 188–202. <https://doi.org/10.1080/17452759.2018.1550694>.
22. X. Yu, M. Liang, C. Shemelya, **D. A. Roberson**, R. Wicker, E. MacDonald, & H. Xin, 3-D Printed Parts for a Multilayer Phased Array Antenna System. *IEEE Antennas and Wireless Propagation Letters*, **17** (2018) 2150–2154. <https://doi.org/10.1109/LAWP.2018.2873116>.
23. S. Z. Uddin, L. E. Murr, C. A. Terrazas, P. Morton, **D. A. Roberson**, & R. B. Wicker, Processing and characterization of crack-free aluminum 6061 using high-temperature heating in laser powder bed fusion additive manufacturing. *Additive Manufacturing*, **22** (2018) 405–415. <https://doi.org/10.1016/j.addma.2018.05.047>.
24. J. G. Siqueiros & **D. A. Roberson**, In Situ Wire Drawing of Phosphate Glass in Polymer Matrices for Material Extrusion 3D Printing. *International Journal of Polymer Science*, **2017** (2017). <https://doi.org/10.1155/2017/1954903>.
25. C. Shemelya, A. De La Rosa, A. R. Torrado, K. Yu, J. Domanowski, P. J. Bonacuse, R. E. Martin, M. Juhasz, F. Hurwitz, R. B. Wicker, B. Conner, E. MacDonald, & **D. A. Roberson**, Anisotropy of thermal conductivity in 3D printed polymer matrix composites

- for space based cube satellites. *Additive Manufacturing*, **16** (2017) 186–196. <https://doi.org/10.1016/j.addma.2017.05.012>.
26. A. R. Torrado & **D. A. Roberson**, Failure Analysis and Anisotropy Evaluation of 3D-Printed Tensile Test Specimens of Different Geometries and Print Raster Patterns. *Journal of Failure Analysis and Prevention*, **16** (2016) 154–164. <https://doi.org/10.1007/s11668-016-0067-4>.
 27. J. G. Siqueiros, K. Schnittker, & **D. A. Roberson**, ABS-maleated SEBS blend as a 3D printable material. *Virtual and Physical Prototyping*, **11** (2016) 123–131. <https://doi.org/10.1080/17452759.2016.1175045>.
 28. H. Karim, M. R. H. Sarker, S. Shahriar, M. A. I. Shuvo, D. Delfin, D. Hodges, T.-L. Tseng, **D. Roberson**, N. Love, & Y. Lin, Feasibility study of thermal energy harvesting using lead free pyroelectrics. *Smart Materials and Structures*, **25** (2016). <https://doi.org/10.1088/0964-1726/25/5/055022>.
 29. A. R. Torrado, C. M. Shemelya, J. D. English, Y. Lin, R. B. Wicker, & **D. A. Roberson**, Characterizing the effect of additives to ABS on the mechanical property anisotropy of specimens fabricated by material extrusion 3D printing. *Additive Manufacturing*, **6** (2015) 16–29. <https://doi.org/10.1016/j.addma.2015.02.001>.
 30. C. M. Shemelya, A. Rivera, A. T. Perez, C. Rocha, M. Liang, X. Yu, C. Kief, D. Alexander, J. Stegeman, H. Xin, R. B. Wicker, E. MacDonald, & **D. A. Roberson**, Mechanical, Electromagnetic, and X-ray Shielding Characterization of a 3D Printable Tungsten–Polycarbonate Polymer Matrix Composite for Space-Based Applications. *Journal of Electronic Materials*, **44** (2015) 2598–2607. <https://doi.org/10.1007/s11664-015-3687-7>.
 31. **D. A. Roberson**, R. B. Wicker, & E. MacDonald, Ohmic curing of three-dimensional printed silver interconnects for structural electronics. *Journal of Electronic Packaging*, **137** (2015). <https://doi.org/10.1115/1.4030286>.
 32. **D. A. Roberson**, A. R. Torrado Perez, C. M. Shemelya, A. Rivera, E. MacDonald, & R. B. Wicker, Comparison of stress concentrator fabrication for 3D printed polymeric izod impact test specimens. *Additive Manufacturing*, **7** (2015) 1–11. <https://doi.org/10.1016/j.addma.2015.05.002>.
 33. **D. A. Roberson**, C. M. Shemelya, E. MacDonald, & R. Wicker, Expanding the applicability of FDM-type technologies through materials development. *Rapid Prototyping Journal*, **21** (2015) 137–143. <https://doi.org/10.1108/RPJ-12-2014-0165>.
 34. J. Mireles, C. Terrazas, S. M. Gaytan, **D. A. Roberson**, & R. B. Wicker, Closed-loop automatic feedback control in electron beam melting. *International Journal of Advanced Manufacturing Technology*, **78** (2015) 1193–1199. <https://doi.org/10.1007/s00170-014-6708-4>

35. A. R. Torrado Perez, **D. A. Roberson**, & R. B. Wicker, Fracture surface analysis of 3D-printed tensile specimens of novel ABS-based materials. *Journal of Failure Analysis and Prevention*, **14** (2014) 343–353. <https://doi.org/10.1007/s11668-014-9803-9>.
36. A. R. Torrado Perez, **D. A. Roberson**, & R. B. Wicker, Erratum: Fracture surface analysis of 3D-printed tensile specimens of novel ABS-based materials (Journal of Failure Analysis and Prevention (2014) 14 (343-353) DOI: 10.1007/s11668-014-9803-9). *Journal of Failure Analysis and Prevention*, **14** (2014) 549. <https://doi.org/10.1007/s11668-014-9844-0>.
37. C. R. Rocha, A. R. Torrado Perez, **D. A. Roberson**, C. M. Shemelya, E. Macdonald, & R. B. Wicker, Novel ABS-based binary and ternary polymer blends for material extrusion 3D printing. *Journal of Materials Research*, **29** (2014) 1859–1866. <https://doi.org/10.1557/jmr.2014.158>.
38. **D. A. Roberson**, D. Espalin, & R. B. Wicker, 3D printer selection: A decision-making evaluation and ranking model. *Virtual and Physical Prototyping*, **8** (2013) 201–212. <https://doi.org/10.1080/17452759.2013.830939>.
39. **D. A. Roberson**, R. B. Wicker, & E. MacDonald, Ohmic curing of printed silver conductive traces. *Journal of Electronic Materials*, **41** (2012) 2553–2566. <https://doi.org/10.1007/s11664-012-2140-4>.
40. **D. A. Roberson**, R. B. Wicker, & E. MacDonald, Microstructural characterization of electrically failed conductive traces printed from Ag nanoparticle inks. *Materials Letters*, **76** (2012) 51–54. <https://doi.org/10.1016/j.matlet.2012.02.032>.
41. M. Irwin, **D. Roberson**, Olivas, R. Wicker, E. MacDonald, Conductive polymer-coated threads as electrical interconnects in e-textiles. *Journal of Intelligence Community Research and Development* (2012) permanently available on Intelink
42. **D. A. Roberson**, R. B. Wicker, L. E. Murr, K. Church, & E. MacDonald, Microstructural and process characterization of conductive traces printed from Ag particulate inks. *Materials*, **4** (2011) 963–979. <https://doi.org/10.3390/ma4060963>.
43. M. D. Irwin, **D. A. Roberson**, R. I. Olivas, R. B. Wicker, & E. MacDonald, Conductive polymer-coated threads as electrical interconnects in e-textiles. *Fibers and Polymers*, **12** (2011) 904–910. <https://doi.org/10.1007/s12221-011-0904-8>.
44. **D. A. Roberson**, E. MacDonald, K. Church, & R. B. Wicker, Failure investigation of direct write pen tips. *Journal of Failure Analysis and Prevention*, **10** (2010) 504–507. <https://doi.org/10.1007/s11668-010-9387-y>.
45. **D. A. Roberson**, N. E. Martinez, L. E. Murr, & E. Trillo, Microstructural evaluation of thick copper targets impacted with high velocity tungsten carbide projectiles. *Scanning*,

22 (2000) 104–105.

46. A. L. Campuzano-Contreras, R. M. Arrowood, L. E. Murr, D. Little, **D. Roberson**, L. E. Murr, & C.-S. Niou, Characterization of fuselage skin lap joints. *ASM International, The Role of Characterization in Understanding Environmental Degradation of Materials. Microstructural Science*, **25** (1998) 139–145.
47. M. Posada, L. E. Murr, C.-S. Niou, **D. Roberson**, D. Little, R. Arrowood, & D. George, Exfoliation and related microstructures in 2024 aluminum body skins on aging aircraft. *Materials Characterization*, **38** (1997) 259–272. [https://doi.org/10.1016/s1044-5803\(97\)00083-1](https://doi.org/10.1016/s1044-5803(97)00083-1).

Book Chapter (1)

1. **Roberson, D. A.**; Martinez, N. E.; Stout, P.; Trillo, E. A.; Quinones, S. A.; Murr, L. E.; Hörz, F. Comparison of Tungsten Carbide Penetrator Impact Behavior in Soft and Hard Copper Targets. In *Fundamental Issues and Applications of Shock-Wave and High-Strain-rate Phenomena, Ch 57*, K.P. Staudhammer, L. E. Murr, and M. A. Meyers, eds., Elsevier Science Ltd., Oxford, 2001, pp., 447-454.

Conference Papers (15)

1. Katia Lizbeth Delgado Ramos, Ana Aranzola, Aaron Cervantes, Alejandra Castellanos, Mohamed El Mansori, Ijaz Akbar, Ana Martinez, Alexis Maurel, Eric MacDonald, **David A. Roberson**, “4D Printed Actuation with Spatially-varying Lattices,” Solid Freeform Fabrication 2024: Proceedings of the 35th Annual International Solid Freeform Fabrication Symposium – An Additive Manufacturing Conference, Austin, TX, August 11-14, 2024, pp., 2-18. **PEER-REVIEWED**
2. Jose Gonzalez, Gamaliel H. Martinez, Benjamin Estrada, Katia Lizbeth Delgado Ramos, Jose F. Salazar, Brian E. Schuster, and **David A. Roberson**, “Development and Characterization of Rigid Polyester Blends for 4D Printing,” Solid Freeform Fabrication 2024: Proceedings of the 35th Annual International Solid Freeform Fabrication Symposium – An Additive Manufacturing Conference, Austin, TX, August 11-14, 2024, pp., 74-88. **PEER-REVIEWED**
3. Paulina A. Quinonez, Diego Bermudez, Leticia Ugarte-Sanchez and **David A. Roberson**, “Tailoring Physical Properties of Shape Memory Polymers for FDM-type Additive Manufacturing”, Solid Freeform Fabrication 2019: Proceedings of the 30th Annual International Solid Freeform Fabrication Symposium – An Additive Manufacturing Conference, Austin, TX, August 12-14, 2019, pp., 843-855. **PEER-REVIEWED**
4. C. A. Diaz-Moreno C.A. Diaz-Moreno, C. Rodarte, S. Ambriz, D. Bermudez, **D. Roberson**, C. Terrazas, D. Espalin, R. Ferguson, E. Shafirovich, Y. Lin, R.B. Wicker., “Binder Jetting of High Temperature and Thermally Conductive (Aluminum Nitride)

Ceramic,” Solid Freeform Fabrication 2018: Proceedings of the 29th Annual International Solid Freeform Fabrication Symposium – An Additive Manufacturing Conference, Austin, TX, August 13-15, 2018, pp., 143-159.

5. **D.A. Roberson** and J. Gilberto Siqueiros Novel Polycarbonate/SEBS-g-MA Blend for FDM-Type 3D Printing ANTEC 2016, Indianapolis IN, May 22-26, 2016.
6. **D.A. Roberson**, Carmen R. Rocha, “Monica Piñon, Evaluation of 3D Printable Sustainable Composites, Proceedings of the 26th Annual International Solid Freeform Fabrication Symposium – An Additive Manufacturing Conference, Austin, TX, August 10-12, 2015, pp., 914-921.
7. **D. A. Roberson**, C.M. Shemelya, R.B. Wicker, E. MacDonald, “Expanding the Applicability of FDM-type Technologies through Materials Development,” Proceedings of the 25th Annual International Solid Freeform Fabrication Symposium – An Additive Manufacturing Conference, Austin, TX, August 4-6, 2014, pp. 514-524. **BEST PAPER AWARD**
8. M. Liang, X. Yu, C. Shemelya, D. Roberson, E. MacDonald, R. Wicker, and H. Xin, "Electromagnetic materials of artificially controlled properties for 3D printing applications," IEEE AP/URSI Symp., Memphis, July 2014.
9. Craig Kief, Jim Aarestad, Eric MacDonald, Corey Shemelya, **David Roberson**, Ryan Wicker, Andy M. Kwas, Mike Zemba, Keith Avery, Richard Netzer, William Kemp, “Printing Multi-Functionality: Additive Manufacturing for CubeSats,” Proceedings of the AIAA Space 2014 Conference and Exposition, San Diego, CA, August 4-7, 2014. (Conference)
10. Jorge Mireles, David Espalin, **David Roberson**, Bob Zinniel, Francisco Medina, Ryan Wicker, “Fused Deposition Modeling of Metals,” Proceedings of the 23rd Annual International Solid Freeform Fabrication Symposium – An Additive Manufacturing Conference, Austin, TX, Aug. 2012, pp. 836-845
11. Xudong Chen, Ken Church, Dan Muse, **David Roberson**, Miguel Alamillo, Eric MacDonald, Ryan Wicker, Helena Ronkainen, Simo Varjus, Jukka Paro, "Direct Print Technology for Fabricating Mechanical Sensors," In *42nd International Symposium on Microelectronics (IMAPS) Proceedings*, San Jose, CA Nov. 2009.
12. O. L. Valerio, **D. A. Roberson**, Stella A. Quinones, V. S. Hernandez, N. E. Martinez, E. Ferreyra, E. A. Trillo, and F. Hörz, "Study of the Low-Velocity-to-Hypervelocity Penetration Transition for Penetrator Densities Ranging from 2.3 to 15g/cm³ Impacting Aluminum and Copper Targets at Velocities Ranging from 0.5 to 6 km/s", Invited paper presented at THERMEC 2000 - Int. Conf. on Processing & Manufacturing of Advanced Materials, Las Vegas, Nev., Dec. 4-8, 2000, and published in CDROM, Section A1, vol. 117/3, Special Issue of Journal of Materials Processing Technology, Eds. T. Chandra, K.

Higashi, C. Suryanarayana, and C. Tome, Elsevier Science, UK (October, 2001).

13. L. E. Murr, C. Kennedy, **D. A. Roberson**, O.L. Valero, N. E. Martinez, V. S. Hernandez, A. A. Bujanda, E. A. Trillo, S. A. Quinones, and F. Horz, “Computer modeling and Validation of Ballistic and Hypervelocity Impact and Penetration Phenomena: Deformation Microstructures, Mechanical Performance, and Geometrical Issues.” In *Modeling the Performance of Engineering Structural Materials II*, Edited by D.R. Leseur and T.S. Srivatsan, TMS (The Minerals, Metals and Materials Society), 2001, Warrendale, PA, 2001, pp. 43-62.
14. **David A. Roberson**, R. M. Arrowood, and L. E. Murr. “Characterization of Exfoliation Corrosion in Al 2024 and Al 2524 Alloys”, in Proceedings of The Texas Society for Microscopy Spring, 1999 Meeting, April 8-10 in Waco, Texas.
15. M. Posada, L. E. Murr, C-S. Niou, R. M. Arrowood, D. Little and **D. Roberson**. “Exfoliation and Related Microstructures in 2024 Al Body Skins on Aging Aircraft”, in Proceedings of Texas Society for Electron Microscopy Spring Meeting, Fort Worth, Texas, April 18-19, 1997.

PRESENTATIONS (43, presenter underlined)

1. “4D Printed Actuation with Spatially-varying Lattices,” Katia Lizbeth Delgado Ramos, Ana Aranzola, Aaron Cervantes, Alejandra Castellanos, Mohamed El Mansori, Ijaz Akbar, Ana Martinez, Alexis Maurel, Eric MacDonald, **David A. Roberson**, 35th Annual Solid Freeform Fabrication Symposium, Austin, TX, August 11-14, 2024.
2. “Development and Characterization of Rigid Polyester Blends for 4D Printing,” Jose Gonzalez, Gamaliel H. Martinez, Benjamin Estrada, Katia Lizbeth Delgado Ramos, Jose F. Salazar, Brian E. Schuster, and **David A. Roberson**, 35th Annual Solid Freeform Fabrication Symposium, Austin, TX, August 11-14, 2024.
3. “Determination of Energy Stored in Shape Memory Polymers,” Benjamin Estrada, Gamaliel H. Martinez, Katia Lizbeth Delgado Ramos, Brian E. Schuster, **David A. Roberson**, 2024 CHRES Technical Forum, NETL, Morgantown, WV, July 22-23, 2024.
4. “Additive Manufacturing of Self-healing Polymers as a Pathway for Environmental Stability” David Roberson, 34th Annual International Solid Freeform Fabrication Symposium, Austin TX, August 14-16, 2023.
5. “Additive Manufacturing of High Entropy Shape Memory Polymer Blends” Katia Delgado Ramos, Luis Lares Carrillo, **David Roberson**, 34th Annual International Solid Freeform Fabrication Symposium, Austin TX, August 14-16, 2023.

6. **INVITED TALK** “Design of Novel Shape Memory and Self-healing Polymer Systems for Additive manufacturing: Potential Areas of High Impact” **David A. Roberson**, 32nd Rio Grande Symposium of Advanced Materials, Albuquerque, NM, October 24, 2022.
7. **INVITED TALK** “Tunable Polymeric Material Systems for the Advancement of Material Extrusion 3D Printing” **David A. Roberson**, 31st Rio Grande Symposium of Advanced Materials, Albuquerque, NM, September 16, 2019.
8. “Tailoring Physical Properties of Shape Memory Polymers for FDM-type Additive Manufacturing” **Paulina A. Quinonez**, Diego Bermudez, Leticia Ugarte-Sanchez and **David A. Roberson**, 30th Annual Solid Freeform Fabrication Symposium, Austin, TX, August 12-14, 2019.
9. "A Micro-Tailoring Technique to Alter the Spatial Distribution and Orientation of Particles in a Stereolithography Fabricated Composite Part and Quantification of Alignment in the Part," **L.J. Holmes** and **David A. Roberson** 28th Annual Solid Freeform Fabrication Symposium, Austin, TX, August 7-9, 2017.
10. “In-situ wire Drawing of Phosphate Glass in Polymer Matrixes for Fused Deposition Modeling,” **J. Gilberto Siqueiros** and **David A. Roberson**, 27th Annual Solid Freeform Fabrication Symposium, Austin, TX, August 8-10, 2016.
11. “3D Printable Thermoplastic Materials Reinforced with in-situ Drawn Metal Wires” **Francisco Andrade Chávez**, Adriana Ramirez, **David A. Roberson**, 27th Annual Solid Freeform Fabrication Symposium, Austin, TX, August 8-10, 2016.
12. “Advances in PLA Materials Development for Material Extrusion Additive Manufacturing,” **David A. Roberson**, Carmen R. Rocha, J. Gilberto Siqueiros, 27th Annual Solid Freeform Fabrication Symposium, Austin, TX, August 8-10, 2016.
13. **INVITED TALK** “Advanced Polymer Materials Development for Hybrid Additive Manufacturing Processes” **David A. Roberson**, Society of Manufacturing Engineers Smart Manufacturing Seminar Series, Youngstown, OH, August 10, 2016.
14. **INVITED TALK** “Advanced Polymer Additive Manufacturing and Characterization” **David A. Roberson**, NIST Polymer AM Roadmap Workshop Gaithersburg, MD, June 8-10, 2016.
15. “Novel Polycarbonate/SEBS-g-MA Blend for FDM-Type 3D Printing” **David A. Roberson** and J. Gilberto Siqueiros, ANTEC 2016, Indianapolis IN, May 22-26, 2016.
16. **INVITED TALK** “3D Printed Multi-functionality: Structures with Electronics and Keck Center Overview,” **David A. Roberson**, Expeditionary On-Demand Manufacturing Army Science Planning and Strategy Meeting, ARL Aberdeen Proving Ground January 21-22, 2016

17. "Development of a 3D Printable Elastomeric Blend Based on ABS," J. Gilberto Siqueiros and **David A. Roberson**, 26th Annual Solid Freeform Fabrication Symposium, Austin, TX, August 10-12, 2015.
18. "Evaluation of 3D Printable Sustainable Composites," **David A. Roberson**, Carmen R. Rocha, Monica Piñon, 26th Annual Solid Freeform Fabrication Symposium, Austin, TX, August 10-12, 2015.
19. "Characterization of Tungsten/Polycarbonate Polymer Matrix Composites for Mechanical, Electromagnetic, and Radiation Shielding Applications," Corey Shemelya, Armando Rivera, Angel Torrado Perez, Carmen Rocha, Min Liang, Craig Kief, Jim Aarestad, Jim Stegmann, David Alexander, Hao Xin, Ryan Wicker, Eric MacDonald, **David Roberson**, TMS 2015, Orlando, Florida, March 15-19, 2015.
20. "Improving the Engineering Properties of PLA for 3D Printing and Beyond", **David Roberson**, Carmen Rocha, Angel Torrado Perez, Joel English, Lauro Barberi, Ryan Wicker TMS 2015, Orlando, Florida, March 15-19, 2015.
21. "Sustainable 3D Printing: Recycled Polycarbonate and ABS for 3D Printing," Joel English, Angel Torrado Perez, Carmen Rocha, Eric MacDonald, Corey Shemelya, **David Roberson**, Materials Science & Technology 2014, Pittsburgh, PA, Oct. 12-16.
22. "Defeating Anisotropy in 3D Printed Structures with Polymer Matrix Composites," Angel Torrado Perez, Carmen Rocha, Eric MacDonald, Corey Shemelya, **David Roberson**, Materials Science & Technology 2014, Pittsburgh, PA, Oct. 12-16.
23. "Customizable Monofilaments to Advance Material Extrusion 3D Printing," **David Roberson**, Angel Torrado Perez, Carmen Rocha, Corey Shemelya, Ryan Wicker, Materials Science & Technology 2014, Pittsburgh, PA, Oct. 12-16, Pittsburgh, PA, Oct. 12-16.
24. "Overcoming Mechanical Property Degradation in Recycling 3D Printed Polymeric Specimens," Carmen Rocha, Angel Torrado Perez, **David Roberson**, Corey Shemelya, Ryan Wicker, Materials Science & Technology 2014, Pittsburgh, PA, Oct. 12-16.
25. "Composite Matrix Polymers for Improved Thermal Conductivity in 3D Printed Thermoplastic Materials," Corey Shemelya, Angel S. De la Rosa, Carmen Rocha, Angel Torrado Perez, Eric MacDonald, **David Roberson**, Materials Science & Technology 2014, Pittsburgh, PA, Oct. 12-16.
26. "Printing Multi-Functionality: Additive Manufacturing for CubeSats," Craig Kief, Jim Aarestad, Eric MacDonald, Corey Shemelya, **David Roberson**, Ryan Wicker, Andy M. Kwas, Mike Zemba, Keith Avery, Richard Netzer, William Kemp, Proceedings of the AIAA Space 2014 Conference and Exposition, San Diego, CA, August 4-7, 2014. (Conference)

27. "Expanding the Applicability of FDM-type Technologies through Materials Development," **D. A. Roberson**, C.M. Shemelya, R.B. Wicker, E. MacDonald, 25th Annual Solid Freeform Fabrication Symposium, Austin, TX, August 4-6, 2014.
28. "The Effects of Recycling on the Degradation of Polymer Matrix Composite Thermoplastics for use in Material Extrusion 3D Printing," **J. English**, **D. Roberson**, A.R. Torrado, C. Rocha, C. Shemelya, R. Wicker, 25th Annual Solid Freeform Fabrication Symposium, Austin, TX, August 4-6, 2014.
29. "Novel ABS-Based Blends and Multi Material Blends for Material Extrusion 3D Printing" **C. R. Rocha**, A. Torrado Perez, **D. A. Roberson**, C. Shemelya, E. MacDonald and R. B. Wicker, 25th Annual Solid Freeform Fabrication Symposium, Austin, TX, August 4-6, 2014
30. "ABS Based Composites and Blends for Application on 3D Extrusion Modeling: Mechanical Behavior and Fracture Analysis," **A.R. Torrado**, C.R. Rocha, **D.A. Roberson**, C.M. Shemelya, R.B. Wicker, 25th Annual Solid Freeform Fabrication Symposium, Austin, TX, August 4-6, 2014.
31. "Electromagnetic materials of artificially controlled properties for 3D printing applications," **M. Liang**, X. Yu, C. Shemelya, **D. Roberson**, E. MacDonald, R. Wicker, and H. Xin, IEEE AP/URSI Symp., Memphis, July 2014.
32. "Towards Greener Additive Manufacturing," **D. A. Roberson**, R. B. Wicker, International Symposium on Green Manufacturing and Applications (ISGMA) 2013, Waikiki, Oahu, HI, June 25-29, 2013.
33. "Overcoming substrate-imposed thermal limitations on the processing of conductive ink interconnects," **D. A. Roberson**, E. MacDonald, R. B. Wicker, MS&T 2011 Columbus, OH, October 16-20 2011.
34. "Direct Print Technology for Fabricating Mechanical Sensors," **Xudong Chen**, Ken Church, Dan Muse, **David Roberson**, Miguel Alamillo, Eric MacDonald, Ryan Wicker, Helena Ronkainen, Simo Varjus, Jukka Paro, 42nd International Symposium on Microelectronics (IMAPS) , San Jose, CA Nov. 2009.
35. "Computer Modeling and Validation of Ballistic and Hypervelocity Impact and Penetration Phenomena: Deformation Microstructures, Mechanical Performance, and Geometrical Issues" **L. E. Murr**, C. Kennedy, **D. A. Roberson**, O. L. Valerio, N. E. Martinez, V. S. Hernandez, A. A. Bujanda, E. A. Trillo, S. A. Quinones, and F. Hörz, , TMS Fall meeting (The Minerals, Metals, and Materials Society), November 4-8, 2001, Indianapolis, Indiana.
36. "Impact Crater Similitude and Related Issues for Metal Targets Impacted Below Hypervelocity" **L. E. Murr**, O. L. Valerio, **D. Roberson**, S. A. Quinones, V. S.

Hernandez, N. E. Martinez, E. A. Trillo, and F. Hörz, 130th Annual TMS (The Minerals, Metal, and Materials Society) Meeting, Feb. 11-16, 2001, New Orleans, LA.

37. "Study of the Low-Velocity-to Hypervelocity Penetration Transition for Penetration Densities Ranging from 2.3 to 15 g/cm³ Impacting Aluminum and Copper Targets at Velocities Ranging from 0.5 to 6 km/s" L. E. Murr, O. L. Valerio, **D. A. Roberson**, S. A. Quinones, V. S. Hernandez, N. E. Martinez, E. Ferreyra, E. A. Trillo, and F. Hörz, , THERMEC 2000 - International Conference on Processing & Manufacturing of Advanced Materials; Processing, Fabrication, Properties, Applications: Dec. 4-8, 2000 Las Vegas, NV. (Conference)
38. "Comparison of Tungsten Carbide Penetrator Impact Behavior in Soft and Hard Copper Targets," **D. Roberson**, N. Martinez, P. Stout, E. A. Trillo, S. A. Quinones, L. E. Murr, and F. Hörz, Explomet 2000 - International Conference on Fundamental Issues and Applications of Shock-Wave and High-Strain-Rate Phenomena, Albuquerque, New Mexico, June 18-22, 2000. (Conference)
39. "Microstructural Evaluation of Thick Copper Targets Impacted with High Velocity Tungsten Carbide Projectiles" **D. A. Roberson**, N. M. Martinez, L. E. Murr, and E. A. Trillo, , Scanning 2000 - 12th Int. Meeting/Texas Society for Microscopy, San Antonio, TX, May 9-12, 2000.
40. "Characterization of Exfoliation Corrosion in Al 2024 and Al 2524 Alloys" **David A. Roberson**, R. M. Arrowood, and L. E. Murr, The Texas Society for Microscopy Spring, 1999 Meeting, Waco, TX. April 8-10, 1999.
41. "Laboratory Exfoliation Experiments on 2024 Aluminum Alloy", **David Roberson**, Roy Arrowood, Lawrence E. Murr, and Elizabeth Trillo, Materials Research Congress - Cancun 98 and LATINCORR 98 (3rd NACE Latin American Region Corrosion Congress), Cancun, Mexico August 30-Sept. 4, 1998.
42. "Corrosive Degradation of Fuselage Skin Lap Joints" A. L. Campuzano-Contreras, R. M. Arrowood, L. E. Murr, D. Little, **D. Roberson**, and C-S. Niou, , 30th Annual International Metallographic Society Convention, Seattle, WA, July 20-23, 1997.
43. "Exfoliation and Related Microstructures in 2024 Al Body Skins on Aging Aircraft", M. Posada, L. E. Murr, C-S. Niou, R. M. Arrowood, D. Little and **D. Roberson**, Texas Society for Electron Microscopy Spring Meeting, Fort Worth, Texas, April 18, 19, 1997

Online Publications

D. A Roberson, D. Espalin, and Ryan B. Wicker "Expanding the Impact of Polymeric-based 3D Printing Technologies." *PlasticsTrends*. Available: <http://www.plasticstrends.net/index.php/component/content/article/1-this-month/370-expanding-the-impact-of-polymeric-based-3d-printing-technologies>. [Accessed: 20-Sep-2015].

FUNDED RESEARCH PROJECTS (*Completed and In-Progress*)

Total Career Support: \$7,707,408

1. UTEP URI Research Grant (\$5000) Goal: Materials Synthesis for Extrusion-based 3D printing. Role: PI Duration: 9/1/2013-12/31/2013
2. NASA Grant (Subcontract from UNM \$68,893) Goal: Printing a complete CubeSat. Role: Co-PI. Duration 9/9/2013-9/9/2015
3. NSF NUE (\$191,240) Goal: Developing a research and education program based on printing nanotechnology. Role: Co-PI Duration 10/1/2013-9/30/2015
4. AFOSR SBIR I (Subcontract from TXL Group \$45,000) Goal: To create bulk non equilibrium materials by shockwave consolidation. Role: UTEP PI Duration: 7/1/2014-11/10/2014
5. NSF (Subcontract from University of Arizona \$180,000) Goal: Investigating the use of additive manufacturing in the creation of arbitrary electromagnetic structures. Role: UTEP PI. Duration: 9/1/2014-8/31/2017
6. AFOSR YIP (\$360,000) Goal: To create 3D-printable thermoplastic composite materials. Role: PI. Duration: 9/1/2014-2/28/2018
7. NAMII (\$2,469,114) Goal: To create multifunctional aerospace components using additive manufacturing. Role: Co-PI. Duration: 12/1/2014-11/30/2015
8. El Paso Innovation Council Grant (\$50,000) Goal: To create a novel thermoplastic rubber blend. Role: PI. Duration: 1/5/2015-7/31/2015
9. NSF MRI (\$368,511) Goal: Acquisition of nanoscale deformation system with imaging capability. Role: Co-PI. Duration: 9/1/2015-8/31/2016
10. DURIP (\$391,979) Goal: Acquire polymeric processing and characterization equipment for the creation of novel high temperature polymeric materials for 3D printing of low density materials. Role: PI. Duration: 8/15/2015-8/15/2016
11. AFOSR SBIR (Subcontract from PPI, LLC), (\$81,919) Goal: Additive manufacturing of plastic materials with improved dielectric breakdown. Role: UTEP PI. Duration: 8/1/2015-5/1/2016
12. NASA Grant (\$845,000) Goal: Additively manufacture an innovative compact electric motor. Role: Co-PI. Duration: 2/1/2017-3/31/2019.
13. ARL Grant (\$290,000) Goal: Hybrid Additive Manufacturing in the context of ARL mission requirements. Role: Co-PI. Duration 1/15/2016-1/14/2019
14. NSF MRI (\$365,416) Goal: Acquisition of a microfluidic-based 3D printer for additive manufacturing of biomaterials for fabrication of tissue-on-a-chip models. Role: Co-PI. Duration: 9/1/2018-8/31/2021
15. DOE STTR (Subcontract from Radiabeam Technologies, LLC) (\$25,000) Goal: Development of 3D printable materials for neutron scattering collimators. Role: UTEP PI. Duration 2/26/2019-5/17/2019.
16. NASA Grant (Subcontracted through Jacobs Technology) (\$43,793) Goal: Provide student funding for a MS Student. Role: PI. Duration: 2/26/2019-4/30/2020.
17. ARL Equipment Grant (\$576,549) Goal: Acquisition of a two-photon polymerization 3D printer. Role: Co-PI. Duration: 8/2022-7/2023

18. NSF BRITE (\$599,994) Goal: Understand the benefits of additive manufacturing for the microstructural control of novel shape memory and self-healing polymers. Role: PI. Duration: 1/2023-12/2025
19. Los Alamos National Lab Project through Tech Source, Inc. (\$250,000) Goal: Material Engineering and Additive Manufacturing of Advanced materials for Nuclear Energy Needs. Role: Co-PI. Duration 1/2023-12/2025.
20. NCDMM Project. (\$500,000) Goal: Hybrid Manufacturing for Rapid Tooling and Repair. Role: Co-PI. Duration 9/12/2023-10/10/2025