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Education

Ph.D. in Materials Science, California Institute of Technology, 2013

Thesis: *Electronic structure and phonon thermodynamics of iron alloys*

M.S. in Materials Science, California Institute of Technology, 2009

B.S. in Physics, Applied Mathematics, The University of Texas at El Paso, 2007

Thesis: *Heat capacity and anharmonicity in vanadium and $V_{93}Co_7$*

Employment

Sept. 2018 -	Assistant Professor Department of Physics and Computational Science Program The University of Texas at El Paso El Paso, TX
April 2016 - Aug. 2018	Senior Research Scientist (Machine Learning) Algorithms Pathfinding Intel Corporation Hillsboro, OR
Aug. 2014 - April 2016	Research Scientist (Machine Learning) Algorithms Pathfinding Intel Corporation Hillsboro, OR
July 2013 - Aug. 2014	Engineer Components Research and Computer Aided Design Engineering Leadership Program Intel Corporation Hillsboro, OR

Research Fellowships

Air Force Research Lab Summer Faculty Fellowship Program Development of machine learning tools to study light propagation in atmospheric turbulence, with V. S. Rao Gudimetla, Maui High Performance Computing Center, 2019.

Caltech Summer Undergraduate Research Fellowship Calorimetry studies of phonon anharmonicity in metals, with Brent Fultz and Olivier Delaire, Caltech, 2006.

Caltech Summer Undergraduate Research Fellowship Calorimetry studies of phonon anharmonicity in metals, with Brent Fultz and Olivier Delaire, Caltech, 2005.

NSF Research Experience for Undergraduates Computational studies of crescent singularities in crumpled sheets (soft condensed matter), with Tom Witten, University of Chicago, 2004.

NASA Minority University Space Interdisciplinary Network Computational studies of the large-scale structure of the universe using data from the Sloan Digital Sky Survey, with Daniel Smith, South Carolina State University, 2003.

Awards

Gates Millennium Scholarship Bill and Melinda Gates Foundation. Full cost of attending the California Institute of Technology plus stipend, July 2007 - Sept. 2012, and full cost of attending The University of Texas at El Paso plus room and board. Aug. 2002 - May 2007.

Robert S. Hyer Undergraduate Research Award “For a study of the novel nuclear phenomenon termed isoscaling” (research done at UTEP with Jorge Lopez). Texas Section of the American Physical Society, Oct. 2009.

W. C. Clark Fellowship California Institute of Technology, Oct. 2007 - Sept. 2008.

National Physical Science Consortium Graduate Fellowship Full cost of attendance and stipend. Sponsoring partner: National Security Agency (NSA). May 2007. (Declined)

NSF Fellowship Honorable Mention National Science Foundation, May 2007.

Bio read by UTEP President at Commencement University of Texas at El Paso, May 2007.

Outstanding Undergraduate Thesis in Physics Research done at Caltech over two summers. College of Science at The University of Texas at El Paso, May 2007.

Outstanding Undergraduate Student Presentation Texas Section of the American Physical Society, Oct. 2006.

Louis Stokes Alliance for Minority Participation Scholarship National Science Foundation and University of Texas System, August 2005.

Service and Leadership

Co-organizer. 2020 TMS Computational Thermodynamics and Kinetics Symposium. March 2019 - February 2020.

Reviewer. 2019 SACNAS Conference Symposia proposals. June 2019.

Reviewer. NSF. March 2019.

Committee Member. Computational Science Program Faculty Search 2018-2019.

Founder and Director. Eureka Street Mentoring Coporation (nonprofit). October 2018 - Present

Member-at-Large. APS Forum on Physics and Society (elected nationally). Jan. 2018 - December 2020.

Reviewer. 2018 IEEE International Workshop on Machine Learning for Signal Processing. May 2018.

Committee Member. IEEE Computational Intelligence Society Industry Liaison Sub-committee. January 2018 - December 2018.

Reviewer. 2018 IEEE International Conference on Acoustics, Speech and Signal Processing (Machine Learning for Signal Processing Technical Committee), January 2018.

Committee Member. Intel System and Artificial Intelligence Software Patent Committee, Artificial Intelligence subcommittee. June 2017 - August 2018.

Organizer. Intel Data Science Center of Excellence Research Task Group. January 2017 - August 2018.

Reviewer. Intermetallics. August 2014.

Lead organizer. Intel Engineering Leadership Program Alumni Pillar. July 2013 - December 2014.

Member of the Board. National Society of Hispanic Physicists (NSHP). Graduate student representative (elected nationally). April 2008 - June 2013.

Reviewer. Victor M. Blanco Undergraduate Summer Research Fellowship (Caltech and LIGO). February 2013.

Committee Member. Caltech Moore-Hufstedler Fund for Student Life (\$3M endowment to improve student life). Oct. 2010 - Sept. 2012.

Co-founder and VP. Caltech Strong Ale Club. Brewed beer and trained members on the science/craft/art of brewing. October 2007 - Sept. 2008.

Founder and member. UTEP Chapter of $\Sigma\Pi\Sigma$ (the national physics honor society). April 2007.

President, VP, and member. UTEP Chapter of the Society of Physics Students (SPS). Personally led tens of “Physics Circuses” for an aggregate audience of more than 1,000 K-12 students. Aug. 2004 - May 2007.

Member of the National Council National Society of Physics Students, elected regionally to represent Zone 16. Contributed to the adoption of the SPS Statement on Diversity. Aug. 2005 - Aug. 2006.

Publications

Total number of citations: 795; h-index: 13; i-index: 15 (on [GoogleScholar](#) as of August 15, 2019).

Peer-reviewed

1. O. Delaire, M. Kresch, **J. A. Muñoz**, M. S. Lucas, J. Y. Y. Lin, and B. Fultz, “Electron-Phonon Interactions and High-Temperature Thermodynamics of Vanadium and its Alloys,” *Phys. Rev. B* 77, 214112 (2008).
2. O. Delaire, M. S. Lucas, **J. A. Muñoz**, M. Kresch, and B. Fultz, “Adiabatic Electron-Phonon Interaction and High-Temperature Thermodynamics of the A15 Compounds,” *Phys. Rev. Lett.* 101, 105504 (2008).
3. C. O. Dorso, C. M. Hernández, J. A. López, and **J. A. Muñoz**, “Isoscaling and the High-Temperature Limit,” *Phys. Rev. C* 78, 034613 (2008).
4. M. L. Winterrose, M. S. Lucas, A. F. Yue, I. Halevy, L. Mauger, **J. A. Muñoz**, J. Hu, M. Lerche, and B. Fultz, “Pressure-Induced Invar Behavior in Pd₃Fe,” *Phys. Rev. Lett.* 102, 237202 (2009).
5. J. A. López, **J. A. Muñoz**, and C. O. Dorso “Probabilistic Aspects of Isoscaling,” *Rev. Mex. Fis. S* 56, 85 (2010).
6. O. Delaire, M. S. Lucas, A. M. dos Santos, A. Subedi, A. S. Sefat, M. A. McGuire, L. Mauger, **J. A. Muñoz**, C. Tulk, Y. Xiao, M. Somayazulu, J. Zhao, W. Sturhahn, E. E. Alp, D. J. Singh, B. C. Sales, D. Mandrus, and T. Egami, “Temperature and Pressure Dependence of the Fe-specific Phonon Density of States in Ba(Fe_{1-x}Co_x)₂As₂,” *Phys. Rev. B* 81, 094504 (2010).
7. M. S. Lucas, **J. A. Muñoz**, L. Mauger, C. W. Li, A. O. Sheets, Z. Turgut, J. Horwath, D. L. Abernathy, M. B. Stone, O. Delaire, Y. Xiao, and B. Fultz, “Effects of chemical composition and *B2*-order on phonons in bcc Fe-Co alloys,” *J. Appl. Phys.* 108, 023519 (2010).
8. M. S. Lucas, **J. A. Muñoz**, O. Delaire, N. D. Markovskiy, M.B. Stone, D. L. Abernathy, I. Halevy, L. Mauger, J. B. Keith, M. L. Winterrose, Y. Xiao, M. Lerche, and B. Fultz, “Effects of composition, temperature, and magnetism on phonons in bcc Fe-V alloys,” *Phys. Rev. B* 82, 144306 (2010).
9. M. S. Lucas, L. Mauger, **J. A. Muñoz**, Y. Xiao, A. O. Sheets, S. L. Semiatin, J. Howarth, and Z. Turgut, “Magnetic and Vibrational Properties of High Entropy Alloys,” *J. Appl. Phys.* 109, 07E307 (2011).
10. M. L. Winterrose, L. Mauger, I. Halevy, A. Yue, M. S. Lucas, **J. A. Muñoz**, H. Tan, Y. Xiao, P. Chow, W. Sturhahn, T. S. Toellner, E. E. Alp, and B. Fultz “Dynamics of iron atoms across the pressure-induced Invar transition in Pd₃Fe,” *Phys. Rev. B* 83, 134304 (2011).
11. N. D. Markovskiy, **J. A. Muñoz**, M. S. Lucas, C. W. Li, O. Delaire, M. B. Stone, D. L. Abernathy, and B. Fultz, “Nonharmonic phonons in MgB₂ at elevated temperatures,” *Phys. Rev. B* 83, 174301 (2011).

12. **J. A. Muñoz**, M. S. Lucas, O. Delaire, M. L. Winterrose, L. Mauger, C. W. Li, A. O. Sheets, M. B. Stone, D. L. Abernathy, Y. Xiao, P. Chow, and B. Fultz, “Positive vibrational entropy of chemical ordering in FeV,” *Phys. Rev. Lett.* 107, 115501 (2011).
13. C. W. Li, X. Tang, **J. A. Muñoz**, J. B. Keith, S. J. Tracy, D. L. Abernathy, and B. Fultz, “The structural relationship between negative thermal expansion and quartic anharmonicity of cubic ScF₃,” *Phys. Rev. Lett.* 107, 195504 (2011).
14. M. S. Lucas, G. B. Wilks, L. Mauger, **J. A. Muñoz**, O. N. Senkov, E. Michel, J. Horwath, S. L. Semiatin, M. B. Stone, D. L. Abernathy, and E. Karapetrova, “Absence of long-range chemical ordering in equimolar FeCoCrNi,” *Appl. Phys. Lett.* 100, 251907 (2012).
15. **J. A. Muñoz**, M. S. Lucas, L. Mauger, I. Halevy, J. Horwath, S. L. Semiatin, Y. Xiao, P. Chow, M. B. Stone, D. L. Abernathy, and B. Fultz, “Electronic structure and vibrational entropies of fcc Au-Fe alloys,” *Phys. Rev. B* 87, 014301 (2013).
16. M. S. Lucas, L. Mauger, **J. A. Muñoz**, I. Halevy, J. Horwath, S. L. Semiatin, M. B. Stone, D. L. Abernathy, Y. Xiao, P. Chow, and B. Fultz, “Phonon densities of states of face-centered-cubic Ni-Fe alloys,” *J. Appl. Phys.* 113, 17A308 (2013).
17. F. Körmann, A. A-H. Breidi, S. L. Dudarev, N. Dupin, G. Ghosh, T. Hickel, P. Korzhavyi, **J. A. Muñoz**, I. Ohnuma, “Lambda transitions in materials science: Recent advances in calphad and first-principles modelling,” *Phys. Stat. Sol. (b)* 251, 53 (2014).
18. D. G. Abrecht, **J. A. Muñoz**, H. L. Smith and B. Fultz, “Spin-State Effects on the Thermal Dihydrogen Release from Solid-State [MH(η^2 -H₂)dppe₂]⁺ (M = Fe, Ru, Os) Organometallic Complexes for Hydrogen Storage Applications,” *J. Phys. Chem. C* 118, 1783 (2014).
19. L. Mauger, M. S. Lucas, **J. A. Muñoz**, S. J. Tracy, M. Kresch, Y. Xiao, P. Chow, and B. Fultz, “Nonharmonic phonons in α -iron at high temperatures ,” *Phys. Rev. B* 90, 064303 (2014).
20. S. J. Tracy, L. Mauger, H. J. Tan, **J. A. Muñoz**, Y. M. Xiao, and B. Fultz, “Polaron-Ion correlations in Li_xFePO₄ studied by x-ray nuclear resonant forward scattering at elevated pressure and temperature,” *Phys. Rev. B* 90, 094303 (2014).
21. C. W. Li, H. L. Smith, T. Lan, J. L. Niedziela, **J. A. Muñoz**, J. B. Keith, L. Mauger, D. Abernathy, and B. Fultz, “Phonon anharmonicity of monoclinic and yttrium-stabilized zirconia,” *Phys. Rev. B* 91, 144302 (2015).
22. **J. A. Muñoz** and B. Fultz, “Miscibility gap and phonon thermodynamics of Fe-Au alloys studied by inelastic neutron scattering and nuclear-resonant inelastic x-ray scattering,” *AIP Conf. Proc.* 1671, 020001 (2015).
23. T. Lan, C. W. Li, O. Hellman, **J. A. Muñoz**, H. L. Smith, D. L. Abernathy, and B. Fultz, “Phonon quarticity induced by lattice expansion, and the stabilization of rutile TiO₂,” *Phys. Rev. B* 92 054304 (2015).

24. K. L. Lin, G. L. W. Cross, P. Gleeson, J. P. de Silva, A. Levander, **J. A. Muñoz**, C. Pawashe, A. Potie, P. L. Theofanis, J. J. Boland, and K. J. Kuhn, “Adhesion Limits and Design Criteria for Nanorelays,” *IEEE Trans. Electron Devices* 63 465 (2016).
25. F. C. Yang, **J. A. Muñoz**, O. Hellman, L. Mauger, M. S. Lucas, S. J. Tracy, M. B. Stone, D. L. Abernathy, Y. Xiao, and B. Fultz, “Thermally-driven electronic topological transition in FeTi,” *Phys. Rev. Lett.* 117, 076402 (2016).
26. L. Mauger, J. E. Herriman, O. Hellman, S. J. Tracy, M. S. Lucas, **J. A. Muñoz**, Y. Xiao, J. Li, and B. Fultz, “Phonons and Elasticity of Cementite through the Curie Temperature,” *Phys. Rev. B* 95, 024308 (2017).
27. J. A. López and **J. A. Muñoz**, “Analytical expression and neural network study of the symmetry energy,” *CERN Proc.*, 1, 29 (2019).
28. **J. A. Muñoz** and R. Martinez, “Constant false alarm rate detection of beacons.” Submitted to *Big Data Res.* (2019)
29. J. A. López, **J. A. Muñoz**, C. O. Dorso, and G. A. Frank, “Machine learning Minkowski functionals of neutron star crusts.” Submitted to *J. Phys. Conf. Ser.* (2019)

Published manuscripts generally available on [GoogleScholar](#), also by request. Pre-prints and submitted papers are available by request.

Non-technical articles

1. **J. A. Muñoz**, “Mood disorders in graduate and undergraduate students: a personal, scientific and cultural perspective,” in *SACNAS News Magazine Winter/Spring 2015*), Volume 17, No. 2.

Patents

Grants

1. **J. A. Muñoz**, P. Theofanis, D. Nikonov, K. Kuhn, C. Pawashe, K. Lin, and S. Kim. “Magnetic nanomechanical devices for stiction compensation.”
Assignee: Intel Corporation.
Filed: June 27, 2014.
Taiwan Patent I564240 granted on 2017-1-1.
US Patent 9,926,193 B2 granted on 2018-3-27.

Applications

1. **J. A. Muñoz**, P. Theofanis, D. Nikonov, K. Kuhn, C. Pawashe, K. Lin, and S. Kim. “Magnetic nanomechanical devices for stiction compensation.”
Assignee: Intel Corporation.
Filed: June 27, 2014.
International Application PCT/US2014/044594 filed on 2014-6-27.
International Publication Number WO/2015/199721 published on 2015-12-30.
Korean Application 2017/0026346 published on 2017-3-8.

Chinese Application 2014/80079265 published on 2017-4-19.
European Application 2014/0896176 published on 2017-5-3. Withdrawn 2019-1-16.
Japanese Application 2017/523558 published on 2017-8-17.
US Application 15/301,337 published 2017-6-8.

2. **J. A. Muñoz**, J. A. Diggs, J. D. Miller, V. Sharma.
“Entropic classification of objects.”
Assignee: Intel Corporation.
Filed: April 1, 2016.
International Application PCT/US2016/025466 filed on 2016-4-1.
International Publication Number WO 2017/171826 published on 2017-10-5.
European Application 3436966 published on 2019-2-6.
US Application 16/083,108 published on 2019-3-14.

3. **J. A. Muñoz**.
“Entropic clustering of objects.”
Assignee: Intel Corporation.
Filed: June 26, 2018.
US Patent Application 16/018,136 published early on 2019-2-7.

Talks and such

1. J. Muñoz, D. Smith, S. Fleet, K. Teesdale. “Plotting and Analyzing Data Release 1 Galaxies from the Sloan Digital Sky Survey.” Texas Section of the American Physical Society Fall 2003 Meeting, Texas Tech University, Lubbock, Texas, October 2003.
2. J. Muñoz, D. Smith, S. Fleet, K. Teesdale. “Plotting and Analyzing Data Release 1 Galaxies from the Sloan Digital Sky Survey” The University of Texas at El Paso 2004 Student Research Expo, University of Texas at El Paso, El Paso, Texas, April 2004. (Poster)
3. J. Muñoz, T. Liang, T. Witten. “Curvature Behavior in a Crescent Singularity of a Deformed Elastic Sheet.” 2004 University of Texas System Louis Stokes Alliance for Minority Participation Annual Conference, University of Texas at El Paso, El Paso, Texas, September 2004.
4. J. Muñoz, T. Liang, T. Witten. “Curvature Behavior in a Crescent Singularity of a Deformed Elastic Sheet.” Texas Section of the American Physical Society Fall 2004 Meeting, Baylor University, Waco, Texas, October 2004.
5. J. Muñoz, T. Liang, T. Witten. “Curvature Behavior in a Crescent Singularity of a Deformed Elastic Sheet” The University of Texas at El Paso 2005 Student Research Expo, University of Texas at El Paso, El Paso, Texas, April 2005. (Poster)
6. J. Muñoz, O. Delaire, B. Fultz. “Vibrational Thermodynamics and Anharmonicity in Dilute Vanadium Alloys.” Summer Seminar Day, California Institute of Technology, Pasadena, California, August 2005.
7. J. Muñoz, O. Delaire, B. Fultz. “Thermodynamics and Anharmonicity in Dilute Vanadium Alloys.” Texas Section of the American Physical Society Fall 2005 Meeting, University of Houston, Houston, Texas, October 2005.

8. J. Muñoz, O. Delaire, B. Fultz. “Calorimetry Studies of Vanadium and Dilute Vanadium Alloys.” Joint Annual Meeting of the National Society of Black Physicists and the National Society of Hispanic Physicists, San Jose, California, February 2006.
9. J. Muñoz, O. Delaire, B. Fultz. “Anharmonicity in Vanadium and Dilute Vanadium Alloys.” Undergraduate Research Fellow Monday Meeting, California Institute of Technology, Pasadena, California, July 2006.
10. J. Muñoz, O. Delaire, B. Fultz. “Heat Capacity Anharmonicity in Elemental Vanadium and $V_{93}Co_7$.” Texas Section of the American Physical Society Fall 2006 Meeting, University of Texas at Arlington, Arlington, Texas, October 2006.
11. J. Muñoz, J. Lopez, C. Dorso, C. Hernandez. “Probabilistic Aspects of Isoscaling.” Texas Section of the American Physical Society Fall 2006 Meeting, University of Texas at Arlington, Arlington, Texas, October 2006.
12. J. Muñoz, O. Delaire, M. Lucas, M. Kresch, B. Fultz. “Adiabatic Electron-Phonon Interaction at High Temperature in A15 Compounds.” Texas Section of the American Physical Society Fall 2008 Meeting, University of Texas at El Paso, El Paso, Texas, October 2008.
13. J. Muñoz, C. Dorso, C. Hernandez, J. Lopez. “Isoscaling and the High Temperature Limit.” Texas Section of the American Physical Society Fall 2008 Meeting, University of Texas at El Paso, El Paso, Texas, October 2008.
14. “Panel discussion on getting into and staying in graduate school.” Texas Section of the American Physical Society Fall 2008 Meeting, University of Texas at El Paso, El Paso, TX, October 2008. (Invited)
15. J. A. Muñoz, M. L. Winterrose, L. Mauger, I. Halevy, and B. Fultz. “High-Pressure behavior of ordered and disordered FePd” Stewardship Science Academic Alliances Symposium, Washington, D.C., January 2010. (Poster)
16. J. Muñoz, M. Lucas, and B. Fultz. “Effects of Temperature and Chemical Order on phonons in Fe–V alloys.” Hume-Rothery Symposium in Honor of Didier de Fontaine at the Minerals, Metals, and Materials Society Annual Meeting, Seattle, Washington, February 2010.
17. J. A. Muñoz, L. Mauger, I. Halevy, H. Smith, Y. Xiao, and B. Fultz. “Phonon partial densities of states of C15 rare-earth-iron compounds at elevated temperatures” Advanced Photon Source Users Meeting 2010, Argonne National Lab, Argonne, Illinois, May 2010. (Poster)
18. J. A. Muñoz, M. S. Lucas, Chen W. Li, M. L. Winterrose, and B. Fultz. “Effect and Origin of the Change in Vibrational Entropy in the Disorder-Order Phase Transition in FeV.” American Conference on Neutron Scattering 2010, Ottawa, Ontario, Canada, June 2010.
19. “The role of vibrational entropy in order-disorder phase transitions.” Advancing Material Applications through Understanding the Basics (Scientific Symposium), 2010 Society for the Advancement of Chicanos and Native Americans in Science National Conference, Anaheim, CA, Oct. 2010. (Invited)
20. J. A. Muñoz, L. Mauger, and B. Fultz. “Large softening of the phonon partial densities of states of C15 rare-earth-iron compounds” Stewardship Science Academic Alliances Symposium, Washington, D.C., February 2011.
21. J. A. Muñoz, N. Markovskiy, and B. Fultz. “Phonon density of states and high temperature thermodynamics of MgB₂.” Computational thermodynamics symposium, session in honor of

- Brent Fultz, Minerals, Metals, and Materials Society Annual Meeting, San Diego, California, March 2011.
22. “Interplay of phonons and electrons and its effect on the phase stability of two systems.” Caltech Center for the Science and Engineering of Materials Research Luncheon Series, Pasadena, CA, July 2011. (Invited)
 23. J. A. Muñoz. “Positive vibrational entropy of chemical ordering in FeV.” 2011 Joint Annual Conference of the National Society of Black Physicists and the National Society of Hispanic Physicists, Austin, Texas, September 2011.
 24. “Dependence of the vibrational entropy of iron binary alloys on their atomic configurations.” University of Texas at El Paso Physics Department Seminar, El Paso, TX, April 2012. (Invited)
 25. J. A. Muñoz, M. S. Lucas, and B. Fultz. “Phonon stiffening due to hybridization of electronic states in Au–Fe alloys.” Computational thermodynamics and kinetics symposium, Minerals, Metals, and Materials Society Annual Meeting, San Antonio, Texas, March 2013.
 26. J. A. Muñoz, L. Mauger, M. S. Lucas, and B. Fultz. “Electronic structure and high-temperature lattice dynamics of B2-ordered FeTi.” American Physical Society March Meeting, Baltimore, Maryland, March 2013. (Poster)
 27. “Electronic and magnetic structure effects on the phonons of iron and iron-based systems.” University of Texas at El Paso Physics Department Seminar, El Paso, TX, Nov. 2014. (Invited)
 28. “Miscibility gap and phonon thermodynamics of Fe–Au alloys studied by inelastic neutron scattering and nuclear-resonant inelastic x-ray scattering.” XI International Symposium on Radiation Physics, Juarez, Mexico, Feb. 2015. (Invited)
 29. “Electronic structure and phonon thermodynamics of Fe–Au Alloys.” Hume-Rothery Award Symposium in Honor of Brent Fultz, TMS 2016 Annual Meeting, Nashville, TN, Feb. 2016.
 30. “Predictive analytics based on information entropy.” Intel Analytics Summit, Intel Corporation, Santa Clara, CA, March 2016.
 31. “Mimicking human identification patterns using information entropy and mathematical graphs.” Intel Data Science Center of Excellence Seminar, Intel Corporation, Webcast, April 2016. (Invited)
 32. “From atomistic simulations of materials to materials informatics.” University of Texas at El Paso Physics Department Seminar, El Paso, TX, Feb. 2018.
 33. “Thermodynamics-inspired unsupervised clustering of objects.” American Physical Society March Meeting 2018, Los Angeles, CA, March 2018.
 34. “A strategic overview of data science.” Data science workshop organized by the Department of Mathematical Sciences at The University of Texas at El Paso, El Paso, TX, October 2018. (Invited)
 35. “Demystifying neural networks.” The University of Texas at El Paso Data Science User Group, El Paso, TX, November 2018.
 36. “Machine learning for materials, and materials for machine learning.” The University of Texas at El Paso Computational Science Program Graduate Seminar, El Paso, TX, February 2019.

37. “Thermally-driven electronic topological transition in FeTi.” The University of Texas at El Paso Department of Physics Undergraduate Seminar, El Paso, TX, February 2019.
38. “Evolutionary computation for turbulence-degraded space images.” The Air Force Research Laboratory, Maui, Hawaii, August 2019.
39. “Chaos and entropy on the Playa.” Black Rock Observatory, Black Rock City, Nevada, August 2019. (Invited)
40. “Phonon thermodynamics from first principles.” The University of Texas at El Paso, Department of Physics Seminar, El Paso, TX, January 2020.
41. “State-dependent force constants for anharmonicity.” Computational thermodynamics and kinetics symposium, Minerals, Metals, and Materials Society Annual Meeting, San Diego, California, February 2020.

Teaching Experience

PHYS 3359 Astrophysics. Stellar structure and evolution, star formation, compact objects, high-energy astrophysics and cosmology. Fall 2019 (independent study).

PSCI 2303 Physical Science I. Introduction to the physical sciences for education majors. Fall 2019.

PHYS 2420 Introductory Mechanics. Introductory calculus-based mechanics for scientists and engineers. Fall 2018, Spring 2019 (for majors), Fall 2019.

Students supervised

1. Reynaldo Martinez (BS in Physics and CS, double major, 2019). Mentored August 2018 - May 2019. Currently employed at Microsoft Corporation, Charlotte, NC.
 - 9-week workshop on machine learning theory and tools [Github repository](#).
 - “Constant false alarm rate detection of beacons.” Submitted to Big Data Res.
2. Arturo Rodriguez (UG in ME). Mentored August 2018 - Present.
 - “Characterizing atmospheric turbulence effects through Large Eddy Simulations with a Recurrent Neural Network.” Poster presentation at UTEP COURI Symposium, Spring 2019.
 - Summer intern at Johns Hopkins Applied Physics Lab Summer, summer 2019.
3. Carlos Cuellar Rodriguez (UG in Physics and Math, double major). Mentored August 2018 - Present.
 - Summer intern at The University of Maryland, Tiwary Group, summer 2019.
4. Sofia Gomez (UG in ME). Mentored January 2019 - Present.
 - “Inspecting clusters of oil utilizing inner-structural analysis through non-destructive CT imaging techniques for carbon sequestration.” Poster presentation at UTEP COURI Symposium, Spring 2019.

5. Adrian De la Rocha Galan (UG in Physics and Math, double major). Mentored January 2019 - Present.
 - “Applied Laplace domain stabilization of a shock absorber on a numerical scheme solver.” Poster presentation at UTEP COURI Symposium, Spring 2019.
6. Marco Garcia (UG in Physics). Mentored January 2019 - Present.
 - “Maze solver algorithms inspired on Micromouse competition.” Poster presentation at UTEP COURI Symposium, Spring 2019.
7. Jose Terrazas (PhD in CPS). Mentored June 2019 - Present.
 - Summer intern at the Maui High Performance Computing Center, summer 2019.
 - “Reconstruction of turbulence- degraded space images using a genetic algorithm.” Submitted to J. Astronaut. Sci.

Research staff supervised

1. Dr. Bethuel Khamala. June 2019 - Present.

Thesis Committees

1. Chitra B. Karki, M.S. in Physics from UTEP. *Computational study of disease-related proteins from electrostatic point-of-view.* With Prof. Lin Li, August 2019.

Marathons

- 45th Annual Portland Marathon, Portland, OR October 9, 2016 - 4:23:11
Utah Valley Marathon 2017, Provo, UT June 10, 2017 - 4:35:42
46th Annual Portland Marathon, Portland, OR October 8, 2017 - 4:00:23
20th Flying Pig Marathon, Cincinnati, OH May 6, 2018 - 4:59:05
Tucson Marathon 2019, Tucson, AZ December 7, 2019 - TBD

Acronyms and abbreviations

- APS.** American Physical Society
Caltech. California Institute of Technology
IEEE. Institute of Electrical and Electronics Engineers
LIGO. Laser Interferometer Gravitational-Wave Observatory
NASA. National Aeronautics and Space Administration
NSA. National Security Agency
NSF. National Science Foundation
NSHP. National Society of Hispanic Physicists
NSBP. National Society of Black Physicists

SACNAS. Society for the Advancement of Chicanos and Native Americans in Science

SPS. Society of Physics Students

TMS. The Minerals, Metals & Materials Society

UTEP. The University of Texas at El Paso