Dr. Lucas Lindsay

Materials Science and Technology Division
Oak Ridge National Laboratory
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Research:

2014-pres. Research scientist, Materials Sciences and Technology Division, Oak Ridge National Laboratory

2011-2014 National Research Council Fellowship, U.S. Naval Research Laboratory

Computational materials physics:

- develop microscopic first-principles methods to predict vibrational and thermal properties of bulk and nanoscale materials for thermal management applications
- advance fundamental understanding of phonon-defect interactions

Education:

2010 Ph.D. in Physics, Boston College, Chestnut Hill, MA
Dissertation Title: *Theory of phonon thermal transport in single-walled carbon nanotubes and graphene (supervisor: Dr. David Broido)*

2004 B.S. in Physics, Magna Cum Laude, College of Charleston, Charleston, SC

Teaching Experience:

2009-2011 Instructor, Department of Physics, Computer Science and Engineering, Christopher Newport University, Newport News, VA

- planned and taught introductory physics courses for majors and non-majors

2004-2007 Teaching Assistant, Department of Physics, Boston College, Boston, MA

- guided students in introductory physics and physiology laboratory courses

Funding and Awards:

2022-2023 SEED project lead ($189k)
2021 Clarivate Highly Cited Researcher in Physics
2019-2024 DOE Early Career Award ($2500k)
2018 Outstanding Referee for the *Physical Review*
2017-2019 LDRD project lead ($839k)
2013-2014 NRC/ASEE Postdoctoral Research Publication Award, NRL
2011 NRC Research Associateship Award, NRL

Professional Service:

2023 MRS Spring Symposium Organizer
2022 MRS Fall Symposium Organizer
2022-2025 Editorial board member for *Physical Review B*
2021 Co-organized DOE-BES-TCMP PI meeting
2019 MRS Spring Symposium Organizer
2017 Breakout session lead at DOE HEATER workshop
2016 STEM outreach at USA Science and Engineering Festival
2015-2017 Knoxville Jewish Day School STEAM advisory board

Refereed proposals for NSF and DOE and numerous papers for *Science*, *Nature journals, Physical Review journals*, *Physics Today, Scientific Reports, European Physics Letters, Applied Physics Letters, ACS Nano*, *Carbon, Nanoscale, etc.*

Mentoring:

Postdoctoral fellows: Parul Raghuvanshi (2023-), Xun Li (2021-2023), Rinkle Juneja (2020-2023), Simon Thébaud (2019-2022), Carlos Polanco (2016-2019), Saikat Mukhopadhyay (2015-2017)

Graduate students: Rajmohan Muthaiah (Jivtesh Garg – University of Oklahoma), Wencong Shi (Lilia Woods – University of South Florida), Bradly Baer (Greg Walker – Vanderbilt University)

Patent:

2018 US Patent 9,986,663 B2, "*High Thermal Conductivity Materials for Thermal Management Applications*," D. A. Broido, T. L. Reinecke and **L. Lindsay**.

Publications:

(Web of Science: citations=9697, *h*-index=39)

2023 *102.* "*Remarkable heat conduction mediated by non-equilibrium phonon polaritons*," Z. Pan, G. Lu, X. Li, J. R. McBride, R. Juneja, M. Long, L. Lindsay, J. D. Caldwell, and D. Li, *Nature* 623, 307 (2023).

101. "*Nonperturbative determination of isotope-induced anomalous vibrational physics*," H. Wu, Z. Qin, S. Li, L. Lindsay, and Y. Hu, *Phys. Rev. B* 108, 140302 (2023).

100. "*Primitive to conventional geometry projection for efficient phonon transport calculations*," X. Li, S. Thébaud, and L. Lindsay, *npj Computational Materials* 9, 193 (2023).

99. "*Vibrations and phase stability in mixed valence antimony oxide*," D. H. Moseley, R. Juneja, L. L. Daemen, I. Sergeev, R. Steinbrügge, O. Leupold, Y. Cheng, V. R. Cooper, L. Lindsay, M. K. Kidder, M. E. Manley, and R. P. Hermann, *Inorganic Chemistry* 62, 16464 (2023).

98. "*Origins of heat transport anisotropy in $MoTe_2$ and other bulk van der Waals materials*," H. Li, T. Pandey, Y. Jiang, X. Gu, L. Lindsay, Y. K. Koh, *Materials Today Physics* 37, 101196 (2023).

97. "*Differential multi-probe thermal transport measurements of multi-walled carbon nanotubes grown by chemical vapor deposition*," Q. Jia, Y. Zhou, X. Li, L. Lindsay, and L. Shi, *International Journal of Heat and Mass Transfer* 216, 124535 (2023).

96. "*Breaking Rayleigh's law with spatially correlated disorder to control phonon transport*," S. Thébaud, L. Lindsay, and T. Berlijn, *Physical Review Letters* 131, 026301 (2023).

95. "*Atomic dynamics in liquids: Normal mode analysis revisited*," J. Moon, L. Lindsay, and T. Egami, *Physical Review E* 108, 014601 (2023).

94. "*Modeling phonons in nanomaterials*," L. Lindsay and T. Pandey, chapter in Modeling, Characterization, and Production of Nanomaterials: Electronics, Photonics, and Energy Applications, 2nd edition, pgs. 125-150, eds. V. K. Tewary and Y. Zhang (Woodhead Pub., Cambridge, 2023).

2022 *93.* "*Determination of single-crystal elastic moduli of $LiREF_4$ (RE=Y, Gd, and Tb) by resonant ultrasound spectroscopy*," A. Balodhi, J. Torres, R. Juneja, K. B. Chang, A. Brady, S. K. Chakrapani, L. Lindsay, R. P. Hermann, and A. Zevalkink, *Journal of Applied Physics* 132, 175110 (2022).

92. "*Exact results for the orbital angular momentum of magnons on honeycomb lattices*," R. S. Fishman, L. Lindsay, and S. Okamoto, *Journal of Physics: Condensed Matter* 51, 015801 (2022).

91. "*Origin of ultralow phonon transport and strong anharmonicity in the lead-free halide perovskites*," T. Pandey, M.-H. Du, D. S. Parker, and L. Lindsay, *Materials Today Physics* 28, 100881 (2022).

90. "*Phonons and phase symmetries in bulk $CrCl_3$ from scattering measurements and theory,*" X. Li, S.-H. Do, J. Yan, M. A. McGuire, G. E. Granroth, S. Mu, T. Berlijn, V. C. Cooper, A. D. Christianson, and L. Lindsay, *Acta Materialia* 241, 118390 (2022).

89. "*Phonons in complex twisted crystals: Angular momenta, interactions, and topology,*" R. Juneja, X. Li, S. Thébaud, D. H. Moseley, Y. Q. Cheng, M. E. Manley, R. P. Hermann, and L. Lindsay, *Physical Review B* 106, 094310 (2022).

88. "*Competing magnetic and nonmagnetic states in monolayer VSe_2 with charge density wave*," L. Yin, T. Berlijn, R. Juneja, L. Lindsay, and D. S. Parker, *Physical Review B* 106, 085117 (2022).

87. "*First principles thermal transport modeling in GaN and related materials*," L. Lindsay, chapter in Thermal Management of Gallium Nitride Electronics, pgs. 21-44, eds. Marko Tadjer and Travis Anderson (Elsevier, Cambridge, 2022).

86. "*Perturbation theory and thermal transport in mass-disordered alloys: Insights from Green's function methods,*" S. Thébaud, T. Berlijn, and L. Lindsay, *Physical Review B* 105, 134202 (2022).

85. "*Mesoscale interplay between phonons and crystal electric field excitations in quantum spin liquid candidate $CsYbSe_2$*," Y.-Y. Pai, C. E. Marvinney, L. Liang, J. Xing, A. Scheie, A. A. Puretzky, G. B. Halász, X. Li, R. Juneja, A. S. Sefat, D. Parker, L. Lindsay, and B. J. Lawrie, *Journal of Materials Chemistry C* 10, 4148 (2022).

84. "*Dislocation-limited thermal conductivity in LiF: Revisiting perturbative models,*" L. Lindsay, R. Hanus, and C. A. Polanco, *JOM* 74, 547 (2022).

2021 *83.* "*Phonon engineering of boron nitride via isotopic enrichment*," M. He, L. Lindsay, T. E. Beechem, T. Folland, J. Matson, K. Watanabe, A. Zavalin, A. Ueda, W. E. Collins, T. Taniguchi, and J. D. Caldwell, *Journal of Materials Research* 36, 4394 (2021).

82. "*Quasiparticle twist dynamics in non-symmorphic materials*," R. Juneja, S. Thébaud, T. Pandey, C. A. Polanco, D. H. Moseley, M. E. Manley, Y. Q. Cheng, B.

Winn, D. L. Abernathy, R. P. Hermann, and L. Lindsay, *Materials Today Physics* 21, 100548 (2021).

81. "*Thermal transport in defective and disordered materials,*" R. Hanus, R. Gurunathan, L. Lindsay, M. T. Agne, J. Shi, S. Graham, and G. J. Snyder, *Applied Physics Reviews* 8, 031311 (2021).

80. "*Intrinsic anharmonicity and thermal properties of ultralow thermal conductivity $Ba_6Sn_6Se_{13}$*," W. D. C. B. Gunatilleke, R. Juneja, O. P. Ojo, A. F. May, H. Wang, L. Lindsay, and G. S. Nolas, *Physical Review Materials* 5, 085002 (2021).

79. "*Acoustic cavities in 2D heterostructures*," M. K. Zalalutdinov, J. T. Robinson, J. J. Fonseca, S. W. LaGasse, T. Pandey, L. R. Lindsay, T. L. Reinecke, D. M. Photiadis, J. C. Culbertson, C. D. Kresse, and B. H. Houston, *Nature Communications* 12, 3267 (2021).

78. "*Vibrational properties and thermal transport in quaternary chalcogenides: The case of Te-based compositions*," W. Shi, T. Pandey, L. Lindsay, and L. M. Woods, *Physical Review Materials* 5, 045401 (2021).

77. "*Semihard iron-based permanent-magnet materials,*" L. Yin, R. Juneja, L. Lindsay, T. Pandey, and D. S. Parker, *Physical Review Applied* 15, 024012 (2021).

2020

76. "*Phonons, Q-dependent Kondo spin fluctuations, and 4f phonon resonance in $YbAl_3$*," A. D. Christianson, V. R. Fanelli, L. Lindsay, S. Mu, M. C. Rahn, D. G. Mazzone, A. H. Said, F. Ronning, E. D. Bauer, and J. M. Lawrence, *Physical Review B* 102, 205135 (2020).

75. "*Temperature dependent lattice dynamics in iridium*," D. H. Moseley, S. J. Thébaud, L. R. Lindsay, Y. Cheng, D. L. Abernathy, M. E. Manley, and R. P. Hermann, *Physical Review Materials* 4, 113608 (2020).

74. "*Lattice chain theories for dynamics of acoustic flexural phonons in nonpolar nanomaterials*," Y. Kuang, L. Lindsay, Q. Wang, and L. He, *Physical Review B* 102, 144301 (2020).

73. "*Space-time dependent thermal conductivity in nonlocal thermal transport*," C. Hua and L. Lindsay, *Physical Review B* 102, 104310 (2020).

72. "*Success and breakdown of the T-matrix approximation for phonon-disorder scattering*," S. Thébaud, C. A. Polanco, L. Lindsay, and T. Berlijn, *Physical Review B* 102, 094206 (2020).

71. "*GaN thermal transport limited by the interplay of dislocations and size effects*," H. Li, R. Hanus, C. A. Polanco, A. Zeidler, G. Koblmüller, Y. K. Koh, and L. Lindsay, *Physical Review B* 102, 014313 (2020).

70. "*Lattice instabilities and phonon thermal transport in TlBr*," T. Pandey, L. Lindsay, B. C. Sales, and D. S. Parker, *Physical Review Materials* 4, 045403 (2020).

69. "*Unfolding the complexity of phonon quasi-particle physics in disordered materials*," S. Mu, R. Olsen, B. Dutta, L. Lindsay, G. D. Samolyuk, T. Berlijn, E.

D. Specht, K. Jin, H. Bei, T. Hickel, B. C. Larson, and G. M. Stocks, *npj Computational Materials* 6, 4 (2020).

68. "*Defect-limited thermal conductivity in MoS_2*," C. A. Polanco, T. Pandey, T. Berlijn, and L. Lindsay, *Physical Review Materials* 4, 014004 (2020).

2019

67. "*Long mean free paths of room-temperature THz acoustic phonons in a high thermal conductivity material*," T.-H. Chou, L. Lindsay, A. A. Maznev, J. S. Gandhi, D. W. Stokes, R. L. Forrest, A. Bensaoula, K. A. Nelson, and C.-K. Sun, *Physical Review B* 100, 094302 (2019).

66. "*Generalized Fourier's law for non-diffusive thermal transport: Theory and experiment*," C. Hua, L. Lindsay, X. Chen, and A. J. Minnich, *Physical Review B* 100, 085203 (2019).

65. "*High-pressure nuclear inelastic scattering with backscattering monochromatization*," I. Sergueev, K. Glazyrin, M. G. Herrmann, P. Alexeev, H.-C. Wille, O. Leupold, A. F. May, T. Pandey, L. Lindsay, K. Friese, and R. P. Hermann, *Journal of Synchrotron Radiation* 26, 5 (2019).

64. "*Ab initio investigation of single-layer high thermal conductivity boron compounds*," H. Fan, H. Wu, L. Lindsay, and Y. Hu, *Physical Review B* 100, 085420 (2019).

63. "*Perspective on ab initio phonon thermal transport*," L. Lindsay, A. Katre, A. Cepellotti, and N. Mingo, *Journal of Applied Physics* 126, 050902 (2019).

62. "*Phonon interaction with ripples and defects in thin layered molybdenum disulfide*," B. Smith, L. Lindsay, J. Kim, E. Ou, R. Huang, and L. Shi, *Applied Physics Letters* 114, 221902 (2019).

61. "*Modulating the thermal conductivity in hexagonal boron nitride via controlled boron isotope concentration*," C. Yuan, J. Li, L. Lindsay, D. Cherns, J. W. Pomeroy, S. Liu, J. H. Edgar, and M. Kuball, *Communication Physics* 2, 43 (2019).

60. "*Phonons, magnons, and lattice thermal transport in antiferromagnetic semiconductor MnTe*," S. Mu, R. P. Hermann, S. Gorsse, H. Zhao, M. E. Manley, R.S. Fishman, and L. Lindsay, *Physical Review Materials* 3, 025403 (2019).

59. "*Phonon thermal conductance across GaN-AlN interfaces from first principles*," C. A. Polanco and L. Lindsay, *Physical Review B* 99, 075202 (2019).

58. "*Dislocation-induced thermal transport anisotropy in single-crystal group-III nitride films,*" B. Sun, G. Haunschild, C. A. Polanco, J. Ju, L. Lindsay, G. Koblmüller, and Y. K. Koh, *Nature Materials* 18, 136 (2019).

57. "*Phonon-induced multicolor correlations in hBN single-photon emitters,*" M. A. Feldman, A. Puretzky, L. Lindsay, E. Tucker, D. P. Briggs, P. G. Evans, R. F. Haglund, and B. J. Lawrie, *Physical Review B* 99, 020101(R) (2019).

2018

56. "*Survey of ab initio thermal transport calculations*," L. Lindsay, C. Hua, X. Ruan, and S. Lee, *Materials Today Physics* 7, 106 (2018).

55. "*Symmetry-driven phonon chirality and transport in one-dimensional and bulk Ba_3N-derived materials,*" T. Pandey, C. A. Polanco, V. R. Cooper, D. S. Parker, and L. Lindsay, *Physical Review B* 98, 241405(R) (2018).

54. "*Thermal transport by first-principles anharmonic lattice dynamics*," L. Lindsay and C. A. Polanco, book chapter in *Handbook of Materials Modeling*, Eds: W. Adreoni and S. Yip (Springer, Cham, Switzerland, 2020), pp. 735-765.

53. "*Fermi surface nesting and phonon frequency gap drive anomalous thermal transport*," C. Li, N. K. Ravichandran, L. Lindsay, and D. Broido, *Physical Review Letters* 121, 175901 (2018).

52. "*Antisite pairs suppress the thermal conductivity of BAs*," Q. Zheng, C. A. Polanco, M.-H. Du, L. Lindsay, M. Chi, J. Yan, and B. C. Sales, *Physical Review Letters* 121, 105901 (2018).

51. "*Thermal conductivity of InN with point defects from first principles*," C. A. Polanco and L. Lindsay, *Physical Review B* 98, 014306 (2018).

50. "*Two-channel model for ultralow thermal conductivity of crystalline Tl_3VSe_4,*" S. Mukhopadhyay, D. S. Parker, B. C. Sales, A. A. Puretzky, M. A. McGuire, and L. Lindsay, *Science* 360, 1455 (2018).

49. "*Anisotropic thermal transport in bulk hexagonal boron nitride*," P. Jiang, X. Qian, R. Yang, and L. Lindsay, *Physical Review Materials* 2, 064005 (2018).

48. "*Interfacial phonon scattering and transmission loss in >1 μm thick silicon-on-insulator thin films*," P. Jiang, L. Lindsay, X. Huang, and Y. K. Koh, *Physical Review B* 97, 195308 (2018).

47. "*Propagation of THz acoustic wave packets in GaN at room temperature,*" A. A. Maznev, T.-C. Hung, Y.-T. Yao, T.-H. Chou, J. S. Gandhi, L. Lindsay, H. D. Shin, D. W. Stokes, R. L. Forrest, A. Bensaoula, C.-K. Sun, and K. A. Nelson, *Applied Physics Letters* 112, 061903 (2018).

46. "*Ultralow-loss polaritons in isotopically pure boron nitride*," A. J. Giles, S. Dai, I. Vurgaftman, T. Hoffman, S. Liu, L. Lindsay, C. T. Ellis, N. Assefa, I. Chatzakis, T. L. Reinecke, J. G. Tischler, M. M. Fogler, J. H. Edgar, D. N. Basov, and J. D. Caldwell, *Nature Materials* 17, 134 (2018).

45. "*Ab initio phonon point defect scattering and thermal transport in graphene*," C. A. Polanco and L. Lindsay, *Physical Review B* 97, 014303 (2018).

2017 *44.* "*High temperature magneto-structural transition in van der Waals-layered α-$MoCl_3$,*" M. A. McGuire, J. Yan, P. Lampen-Kelly, A. F. May, V. R. Cooper, L. Lindsay, A. Puretzky, L. Liang, Santosh KC, E. Cakmak, S. Calder and B. C. Sales, *Physical Review Materials* 1*,* 064001 (2017) *"Editor's Suggestion"*.

43. "*Four-phonon scattering significantly reduces intrinsic thermal conductivity of solids*," T. Feng, L. Lindsay, and X. Ruan, *Physical Review B* 96, 161201(R) (2017).

42. "*Ab initio phonon thermal transport in monolayer InSe, GaSe, GaS and alloys*," T. Pandey, D. S. Parker, and L. Lindsay, *Nanotechnology* 28, 455706 (2017).

41. "*The curious case of cuprous chloride: Giant thermal resistance and anharmonic quasiparticle spectra driven by dispersion nesting*," S. Mukhopadhyay, D. Bansal, O. Delaire, D. Perrodin, E. Bourret-Courchesne, D. J. Singh and L. Lindsay, *Physical Review B* 96, 100301(R) (2017).

40. "*Phonon thermal transport in 2H, 4H and 6H silicon carbide from first principles,*" N. H. Protik, A. Katre, L. Lindsay, N. Mingo, and D. Broido, *Materials Today Physics* 1, 31 (2017).

39. "*Lattice thermal transport in $La_3Cu_3X_4$ (X=P, As, Sb, Bi) compounds: Interplay of anharmonicity and scattering phase space*," T. Pandey, C. A. Polanco, L. Lindsay and D. S. Parker, *Physical Review B* 95, 224306 (2017).

38. "*Hydrodynamic phonon drift and second sound in a (20,20) single-wall carbon nanotube*," S. Lee and L. Lindsay, *Physical Review B* 95, 184304 (2017).

37. "*Effects of functional group mass variance on thermal transport in graphene*," L. Lindsay and Y. Kuang, *Physical Review B* 95, 121404(R) (2017).

2016 *36.* "*Boron arsenide phonon dispersion from inelastic x-ray scattering: Potential for ultrahigh thermal conductivity*," H. Ma, C. Li, S. Tang, J. Yan, A. Alatas, L. Lindsay, B. C. Sales, and Z. Tian, *Physical Review B* 94, 220303(R) (2016).

35. "*Optic phonons and anisotropic thermal conductivity in hexagonal $Ge_2Sb_2Te_5$*," S. Mukhopadhyay, L. Lindsay, and D. J. Singh, *Scientific Reports* 6, 37076 (2016).

34. "*Isotope scattering and phonon thermal conductivity in light atom systems: LiH and LiF*," L. Lindsay, *Physical Review B* 94, 174304 (2016).

33. "*Physically founded phonon dispersions of few-layer materials and the case of borophene*," J. Carrete, W. Li, L. Lindsay, D. A. Broido, L. J. Gallego, and N. Mingo, *Materials Research Letters* 4, 204 (2016).

32. "*Basal-plane thermal conductivity of nanocrystalline and amorphized thin germanane*," G. Coloyan, N. Cultrara, A. Katre, J. Carrete, M. Heine, E. Ou, J. Kim, S. Jiang, L. Lindsay, N. Mingo, D. A. Broido, J. Heremans, J. Goldberger, and L. Shi, *Applied Physics Letters* 109, 131907 (2016).

31. "*First principles Peierls-Boltzmann thermal transport: A topical review*," L. Lindsay, *Nanoscale and Microscale Thermophysical Engineering* 20, 67 (2016).

30. "*Role of low-energy phonons with mean-free-paths >0.8 μm in heat conduction in silicon*," P. Jiang, L. Lindsay, and Y. K. Koh, *Journal of Applied Physics* 119, 245705 (2016).

29. "*Electronic structure and electron-phonon coupling in TiH_2*," K. V. Shanavas, L. Lindsay and D. S. Parker, *Scientific Reports* 6, 28102 (2016).

28. "*Thermal conductivity of graphene mediated by strain and size*," Y. Kuang, L. Lindsay, S. Shi, X. Wang, and B. Huang, *International Journal of Heat and Mass Transfer* 101, 772 (2016).

27. "*Optic phonon bandwidth and lattice thermal conductivity: the case of Li_2X (X=O, S, Se, Te)*," S. Mukhopadhyay, L. Lindsay and D. S. Parker, *Physical Review B* 93, 224301 (2016).

26. "*Tensile strains give rise to strong size effects for thermal conductivities of silicene, germanene and stanene*," Y. D. Kuang, L. Lindsay, S. Q. Shi, and G. P. Zhen, *Nanoscale* 8, 3760 (2016).

2015 *25*. "*Calculated transport properties of CdO: thermal conductivity and thermoelectric power factor*," L. Lindsay and D. Parker, *Physical Review B* 92, 144301 (2015).

24. "*Unusual enhancement in intrinsic thermal conductivity of multi-layer graphene by tensile strain*," Y. Kuang, L. Lindsay, and B. Huang, *Nano Letters* 15, 6121 (2015).

23. "*Reexamination of basal plane thermal conductivity of suspended graphene samples measured by electro-thermal micro-bridge methods*," I. Jo, M. T. Pettes, L. Lindsay, E. Ou, A. Weathers, A. L. Moore, Z. Yao, and L. Shi, *AIP Advances* 5, 053206 (2015).

22. "*Low-loss, infrared and terahertz nanophotonics using surface phonon polaritons*," J. D. Caldwell, L. Lindsay, V. Giannini, I. Vurgaftman, T. L. Reinecke, S. A. Maier, and O. J. Glembocki, *Nanophotonics* 4, 44 (2015).

21. "*Anomalous pressure dependence of thermal conductivity of large mass ratio compound materials*," L. Lindsay, D. A. Broido, J. Carrete, N. Mingo, and T. L. Reinecke, *Physical Review B* 91, 121202(R) (2015).

2014 *20.* "*The Seebeck coefficient and phonon drag in silicon*," G. D. Mahan, L. Lindsay, and D. A. Broido, *Journal of Applied Physics* 116, 245102 (2014).

19. "*Phonon thermal transport in strained and unstrained graphene from first principles*," L. Lindsay, W. Li, J. Carrete, N. Mingo, D. A. Broido, and T. L. Reinecke, *Physical Review B* 89, 155426 (2014).

18. "*Ab initio thermal transport*," chapter in *Length-Scale Dependent Phonon Interactions, Topics in Applied Physics*, Vol. 128, pp. 137-173, N. Mingo, D. A. Stewart, D. A. Broido, L. Lindsay, and W. Li, edited by S. L. Shinde and G. P. Srivastava (Springer, New York, 2014).

2013 *17.* "*Ab initio study of the unusual thermal transport properties of boron arsenide and related materials*," D. A. Broido, L. Lindsay, and T. L. Reinecke, *Physical Review B* 88, 214303 (2013).

16. "*Phonon-isotope scattering and thermal conductivity in materials with a large isotope effect: A first-principles study*," L. Lindsay, D. A. Broido, and T. L. Reinecke, *Physical Review B* 88, 144306 (2013).

15. "*First-principles determination of ultrahigh thermal conductivity of boron arsenide: A competitor for diamond?*," L. Lindsay, D. A. Broido, and T. L. Reinecke, *Physical Review Letters* 111*,* 025901 (2013) *"Editor's Suggestion"*.

Selected for a Viewpoint in *Physics* (http://physics.aps.org/articles/v6/76) and featured in *Physics Today* 67(8), 27 (2014).

14. "*Ab initio thermal transport in compound semiconductors*," L. Lindsay, D.A. Broido, and T. L. Reinecke, *Physical Review B* 87, 165201 (2013) *"Editor's Suggestion"*.

2012 *13.* "*Thermal conductivity of bulk and nanowire $Mg_2Si_xSn_{1-x}$ alloys from first principles*," W. Li, L. Lindsay, N. Mingo, D. A. Broido, and D. A. Stewart, *Physical Review B* 86, 195436 (2012).

12. "*Thermal conductivity of diamond under extreme pressure: A first principles study*," D. A. Broido, L. Lindsay, and A. Ward, *Physical Review B* 86, 115203 (2012).

11. "*Thermal conductivity and large isotope effect in GaN from first principles*," L. Lindsay, D. A. Broido, and T. L. Reinecke, *Physical Review Letters* 109, 095901 (2012).

10. "*Thermal conductivity of diamond nanowires from first principles*," W. Li, N. Mingo, L. Lindsay, D. A. Broido, D. A. Stewart, and N. A. Katcho, *Physical Review B* 85, 195436 (2012).

9. "*Theory of thermal transport in multilayer hexagonal boron nitride and nanotubes*," L. Lindsay and D. A. Broido, *Physical Review B* 85, 035436 (2012).

2011 *8.* "*Enhanced thermal conductivity and isotope effect in single-layer hexagonal boron nitride*," L. Lindsay and D. A. Broido, *Physical Review B* 84, 155421 (2011).

7. "*Flexural phonons and thermal transport in multilayer graphene and graphite*," L. Lindsay, D. A. Broido, and N. Mingo, *Physical Review B* 83, 235428 (2011).

2010 *6.* "*Diameter dependence of carbon nanotube thermal conductivity and extension to the graphene limit*," L. Lindsay, D. A. Broido, and N. Mingo, *Physical Review B* 82*,* 161402(R) (2010).

5. "*Flexural phonons and thermal transport in graphene*," L. Lindsay, D. A. Broido, and N. Mingo, *Physical Review B* 82, 115427 (2010) *"Editor's Suggestion"*.

4. "*Optimized Tersoff and Brenner empirical potential parameters for lattice dynamics and phonon thermal transport in carbon nanotubes and graphene*," L. Lindsay and D. A. Broido, *Physical Review B* 81, 205441 (2010).

3. "*Two-dimensional phonon transport in supported graphene*," J. H. Seol, I. Jo, A. L. Moore, L. Lindsay, Z. H. Aitken, M. T. Pettes, X. Li, Z. Yao, R. Huang, D. A. Broido, N. Mingo, R. S. Ruoff, and L. Shi, *Science* 328, 213 (2010).

2009 *2.* "*Lattice thermal conductivity of single-walled carbon nanotubes: Beyond the relaxation time approximation and phonon-phonon scattering selection rules*," L. Lindsay, D. A. Broido, and N. Mingo, *Physical Review B* 80, 125407 (2009).

2008 *1.* "*Three-phonon phase space and lattice thermal conductivity in semiconductors*," L. Lindsay and D. A. Broido, *Journal of Physics: Condensed Matter* 20, 165209 (2008).

Invited Presentations:

2023 "*Modeling phonon behaviors driven by symmetry*," invited talk at International Materials Research Congress (MRS-Mexico), Cancun, Mexico (August)

"*Vibrational dynamics driven by structural symmetries and complexities*," invited talk at APS March Meeting (March)

2021 "*Mentoring sneaks up on you*," invited virtual talk at ASME InterPACK 2021, virtual (October)

"*Phonons and twisting symmetries in non-symmorphic materials*," invited virtual talk at Materials Science and Technology 2021, Columbus, OH (October)

"*Phonons and symmetry in chiral and layered materials*," invited virtual talk at Rice University, Houston, TX (October)

"*Modeling phonon-defect interactions*," invited virtual talk at International Materials Research Congress, Cancun, Mexico (August)

"*Dislocation-limited thermal transport in III-Nitride materials*," invited talk at virtual TMS 2021 (March)

2020 "*Vibrations and transport governed by symmetry, chirality, and selection rules*," invited virtual talk at Dalhousie University, Nova Scotia, Canada (November)

"*Advancing insights into phonon thermal transport with theory/experiment interactions*," invited talk at the TMS annual meeting, San Diego, CA (February)

2019 "*Phonon thermal transport in 2D materials (and 1D and bulk)*," invited talk at the International Institute of Physics Workshop: *2D Materials: From Fundamentals to Spintronics*, Natal, Brazil (September)

"*My struggles with phonon transport*," invited talk at the Telluride Science Research Center, Thermal Transport at the Nanoscale workshop, Telluride, CO (June)

"*Phonon thermal transport in nanostructured materials*," invited talk at the International Workshop on Computational Nanotechnology, Evanston, IL (May)

"*Building understanding of phonon thermal transport – Calculations and experiment*," Tutorial at Materials Research Society spring meeting, Phoenix, AZ, (April)

"*Predicting thermal transport in materials: Challenges and insights*," invited colloquium at the University of South Florida, Tampa, FL (February)

"*Phonon thermal transport: Reconciling predictions with reality*," invited talk at the Electronic Materials and Applications conference (American Ceramics Society), Orlando, FL (January)

2018 "*Predicting anharmonic phonon lifetimes and lattice properties*," invited tutorial at American Physical Society March meeting, Los Angeles, CA (March)

"*Lattice thermal transport: Barriers and channels, challenges and insights,*" invited seminar at University of California, LA, Los Angeles, CA (March)

2017 "*Phonon thermal transport: Barriers and channels, challenges and insights*," invited seminar at Vanderbilt University, Nashville, TN (September)

"*Enhanced thermal conductivity in new materials*," invited talk at Highly Efficient Advanced Thermal Energy Research (HEATER) workshop, Berkeley, CA (July)

"*Nanoscale phonon thermal transport: insights and predictions*," invited talk at IEEE International Conference on Nanotechnology, Pittsburgh, PA (July)

"*First principles nanoscale phonon transport: insights and predictions*," invited talk at the 9th US-Japan Joint Seminar on Nanoscale Transport Phenomena, Tokyo, Japan (July)

"*Phonon thermal transport: barriers and channels, challenges and insights,*" invited colloquium at Missouri University of Science and Technology, Rolla, MO (April)

2016 "*Phonons from first principles: scattering and transport in bulk and nanoscale systems*," invited seminar/guest lecture at University of Texas at Austin, Austin, TX

"*First principles phonon thermal transport: from bulk to the nanoscale*," invited talk at the International Institute of Physics Workshop: *Thermal and Electronic Transport in Nanostuctures*, Natal, Brazil

2015 "*Lattice thermal transport from first principles: predictive power?*" invited seminar at Carnegie Mellon University, Pittsburgh, PA

"*First principles lattice thermal transport: nanoscale systems*," invited talk at Materials Research Society spring meeting, San Francisco, CA

2014 "*First principles phonon thermal transport*," invited talk at Stony Brook University, Stony Brook, NY

"*First principles phonon thermal transport*," invited talk at the University of Texas at Austin, Austin, TX