

Robert V. Duncan, Ph.D.

President's Distinguished Chair in Physics, Professor of Physics, Texas Tech University
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Education

- Ph.D.** Physics, University of California, Santa Barbara (UCSB), 1988
Thesis: *Development of Toroidal Magnetic Thermometry to Study New Phenomena Associated with the Superfluid Transition in Liquid ^4He*
Advisor: Professor Guenter Ahlers
- B.S.** Physics, Massachusetts Institute of Technology (MIT), 1982
Thesis: *Study of Energy Transfer Processes in Methyl Alcohol Using A Computer-Controlled IR-IR Double-Resonance Spectrometer*
Advisors: Professor Michael Feld and Dr. Ramchandra Dasari

Major Professional Appointments, Awards, and Activities

Defense TechConnect Innovation Award for our TTU-assigned patent application entitled, "Modular Respiratory Sensor Integration Block System", Washington, D.C., October, 2022
Fellow of the National Academy of Inventors (NAI, 2014)
Member of the Board of Directors of the NAI (2015 – date)
Sentinel Award for Excellent Service to the NAI, 2022
Chief Operating Officer of the New Mexico Consortium (NMC, 2006 – 2008)
Founding Director, NMC's Institute at Los Alamos National Laboratory (2006 – 2008)
Fellow (and Life Member) of the American Physical Society (2006)
The Gordon and Betty Moore Distinguished Scholar in the Physics, Mathematics, and Astronomy Division, Caltech (2004 – 2005)
International Steering Committee for Quantum Fluids and Solids (2003 – 2008),
Committee Chair in 2004, Symposium Chair in 2003)
Chair, Instrumentation and Measurement Topical Group, American Physical Society (2002)
Co-Chair, Science and Technology for Biothreat Reduction Conference Series (BTR'01, BTR'02, BTR'03, BTR'04, BTR'05)
NASA Flight Principal Investigator, *Critical Dynamics in Microgravity* (1992 – 2006)

National and International Advisory Panel Assignments

Member of the Scientific Advisory Board (SAB) of the United States Air Force (2018-date)
Member, National Academy of Sciences Decadal Survey on Biological and Physical Sciences in Space (2022-2023). Report titled "Thriving in Space – Ensuring the Future of of Biological and Physical Sciences Research 2023 – 2032" is available here: <https://www.nationalacademies.org/our-work/decadal-survey-on-life-and-physical-sciences-research-in-space-2023-2032>
Member of the University of Missouri System Commission, appointed by the Missouri Legislature (2016)
National Academy of Sciences Panel Member to Review the Experimental Program to Stimulate Competitive Research, EPSCoR (2012 – 2013)

Member of the Visiting Committee to Consider Curriculum Performance and Revisions at the United States Military Academy at West Point, NY (2012 – 2013)

Member of the Executive Committee of the Council on Research Policy and Graduate Education, Association of Public and Land-Grant Universities (APLU, 2011 – 2013)

Invitee to the Erice Seminars, World Federation of Scientists, Erice, Sicily (2009 – Date)

Chair, National Academy of Science’s Panel on Fundamental Physical Sciences in Space, for the Decadal Survey. Report published as Chapter 8 in Recapturing a Future for Space Exploration ISBN-10: 0-309-16384-6, ISBN-13: 978-0-309-16384-2 (National Research Council, 2011, see: http://www.nap.edu/catalog.php?record_id=13048)

Member of the Visiting Committee to Review the Materials Programs at the Naval Research Laboratories (2011)

Member of the Visiting Committee to Brief the Vice-Rectors of Universities throughout the Kingdom of Saudi Arabia regarding Research Strategy, Policies, and Administrative Best Practices in Research (2011)

Referee for Numerous Journals and Federal Funding Agencies (1986 – Date)

Academic Experience

2017 – Date President’s Distinguished Chair in Physics, Texas Tech University (TTU)

2016 – 2017 Vice President for Strategic Research Initiatives, TTU

2014 – 2016 Vice President for Research, TTU

2014 – Date Professor of Physics, TTU

2008 – 2013 Vice Chancellor for Research, MU

2008 – 2013 Professor of Physics, MU

2002 – 2006 Associate Dean for Research, College of Arts and Sciences, University of New Mexico (UNM)

2001 – 2008 Professor of Physics and Astronomy, UNM

2000 – 2008 Joint Associate Professor of Electrical and Computer Engineering (ECE), UNM

1998 – 2016 Visiting Associate in Physics, Caltech Faculty

1996 – 2001 Associate Professor of Physics and Astronomy, UNM

1983 – 1984 Head Teaching Assistant, Department of Physics, UCSB

1981 – 1982 Member of the MIT Committee on Educational Policy

I have taught throughout the UNM and TTU physics curriculum, including the introductory sequence of university physics, introduction to special relativity and to quantum physics, graduate condensed matter physics, graduate electromagnetism, interdisciplinary courses in self-organized criticality and in biological physics, and senior laboratory. I led the development of UNM’s new core curriculum course called “Chemistry and Physics at the Nanometer-Scale”, which I first taught during the Fall Semester, 2006 as part of our NSF IGERT-funded Nanoscience and Microsystems graduate degree program development. I have advised many post-docs, graduate students, and undergraduate students, primarily at UNM and TTU, but also at Caltech. Many of my former students now hold permanent positions in academia, industry, and in the national laboratories within the United States. At TTU I taught University Physics with Calculus from the Fall Semester, 2017, to the present time, alternating between teaching Newtonian Mechanics (Physics I, 1408) and Electromagnetism (Physics II, 2401). Recently, I developed an advanced graduate-level laboratory class titled “Nanoscience and Quantum Sensing” and taught it for the first time during the Fall Semester of 2022 at TTU. This course

has now been approved by the Texas Tech University Graduate School and the State of Texas to become part of our standard graduate curriculum, designated Physics 5337. It is the the first graduate laboratory class within the Physics Department at TTU. I have also advised Ph.D. students, and I have involved both undergraduates and graduate students as laboratory assistants within my research group.

National Laboratory Experience

2006 – 2008 Founding Director, New Mexico Consortium at Los Alamos National Laboratory
1995 – 1996 Distinguished Member of Technical Staff, Sandia National Laboratories (SNL)
1994 – 1996 Leader, Cryogenic and Superconducting Technologies Team, SNL
1988 – 1995 Member (later Senior Member) of Technical Staff, SNL
1988 – 1989 Visiting Scientist, Electricity Division, National Institute of Standards and Technology (formerly the National Bureau of Standards)

Intellectual Property, Industrial, and Economic Development Experience

2015 – Date Executive Board Member, National Academy of Inventors
2014 – 2017 Executive Board Member, Project Revolution, Bayer Crop Science and Texas Tech University
2008 – 2013 Executive Board Member, MU Life Sciences Incubator at Monsanto Place
2008 – 2013 Ex-Officio Board Member of Regional Economic Development, Inc. (Missouri)
2008 – 2013 Member of the UM President’s Economic Development Council
1981 – Date Consultant to numerous high-tech energy, pharmaceutical, and medical instrumentation companies.
2008 – 2012 Executive Board Member, Columbia, Missouri, Chamber of Commerce

I have assisted creatively in the establishment of a successful high-technology company (Cryodynamics, LLC) in minimally-invasive health care that we exited to become Adagio Medical in Laguna Hills, CA. I have worked during prior summers as a consultant to help establish this firm. I have assisted administratively in the formation of both Beyond Meat and Organovo when I served as Vice Chancellor for Research at the University of Missouri, and both are now major publicly-traded corporations. I have invented or co-invented thirteen (13) awarded U.S. Patents, and 31 international patents associated with the USPTO patents, and I have submitted numerous additional patent disclosures that are currently in progress. These awarded or pending US Patents include:

1. Utility Patent Application titled “Respirator designed to mitigate deep lung infections” by Robert V. Duncan, Annette L. Sobel, and Cuikun Lin (2020). This IP has already been licensed to a major medical instrumentation company, and royalty checks have been paid by this company to TTU.
2. Provisional / Utility Patent Application titled “Modular Respiratory Sensor Integration Block System” by Robert V. Duncan, Annette L. Sobel, Cuikun Lin, Shelby Lacouture, and Paul Walter (2022).
3. Two Provisional / Utility Patent Applications are in process between TTU and MU on the development of a light-isotope, fission / fusion nuclear cycle (2020 – 2022).

4. Utility Patent Application titled: "Open System Cold Plate Smart Differential Calorimeter" by Shelby L. Lacouture, Robert V. Duncan, Trevor Dardik, positive response from TTU's ORC market evaluation and patentability study (2020).
5. Utility Patent Application titled "Universal Power Supply and Network Analyzer by Shelby L. Lacouture, Robert V. Duncan, Trevor Dardik (2020).
6. Patent disclosure on a new method of production of Lithium Hydride and Lithium Deuteride by Cuikun Lin, Andrew Gillespie, Ian Jones, Christopher Cardy, and R. V. Duncan (2022)
7. Patent disclosure on a new method for producing ammonia using electrolytic process and nanocatalysts by Cuikun Lin, Peyton Thorn, Trevor Dardik, and R. V. Duncan (2022)
8. 15/131,200 Published patent application—expected to award soon
9. 11,764,013 B2 Apparatus and method for separating liquid oxygen from liquified air (2023)
10. 9,408,656 Cryotherapy probe (2016)
11. 8,740,891 Flexible multi-tubular cryoprobe (2014)
12. 8,591,503 Cryotherapy probe (2013)
13. 8,387,402 Methods and systems for cryogenic cooling (2013)
14. 8,087,256 Cooling methods and systems using supercritical fluids (2012)
15. 7,921,657 Methods and systems for cryogenic cooling (2011)
16. 7,507,233 Cryotherapy system (2009)
17. 7,499,745 Multidimensional bioelectrical tissue analyzer (2009)
18. 7,410,484 Cryotherapy probe (2008)
19. 7,273,479 Methods and systems for cryogenic cooling (2007)
20. 7,083,612 Cryotherapy system (2006)
21. 5,193,909 Quantitative method for measuring heat flux emitted from a cryogenic object (1993)

Refereed Publications in Journals, Books, and Book Chapters

1. "Singularity in the Kapitza Resistance between Gold and Superfluid ^4He " with Guenter Ahlers and Victor Steinberg, *Phys. Rev. Lett.* **58**, 377 (1987).
2. "Nonlinearity in the Kapitza Resistance Between Gold and Superfluid ^4He Near T_λ ", with G. Ahlers, *Jpn. J. Appl. Phys.* **26-3**, 363 (1987).
3. "Depression of the Superfluid Transition in ^4He by a Heat Current" with Guenter Ahlers and Victor Steinberg, *Phys. Rev. Lett.* **60**, 1522 (1988).
4. "Finite-Size Effects on the Thermal Conductivity of ^4He Near the Superfluid Transition" with Guenter Ahlers, *Phys. Rev. Lett.* **61**, 846 (1988).
5. "Recent Experiments near the Superfluid Transition in ^4He " with Guenter Ahlers, in Frontiers of Physics, Proceedings of the Landau Memorial Conference, E. Gotsman, Y. Ne'eman, and A. Voronel (eds.), p.219 (Oxford : Pergamon Press 1990).
6. "Thermal effects on the Josephson series-array voltage standard", *Physica B* **165-166**, 101 (1990).
7. "Singularity and Nonlinearity in the Kapitza Resistance Between Gold and Superfluid ^4He ", with G. Ahlers, *Phys. Rev.* **B 43**, 7707 (1991).
8. "Using a New Generation of Multimeters to Measure the Quantized Resistance" with M.E. Cage, D.Y. Yu, B.M. Jeckelmann, and R.L. Steiner, *IEEE Transactions on Instruments and Measurements* **40**, 262 (1991).

9. "A Refrigerated Dewar for the Josephson Array Voltage Calibration System" *IEEE Transactions on Instrumentation and Measurement* **40**, 326 (1991).
10. "Measurement accuracy of macroscopic quantum circuits with rf-biased Josephson junction arrays" with D. H. Dunlap, *Superconductor Science and Technology* **4**, 413 (1991).
11. "Proposed differential frequency readout system by hysteretic Josephson junctions" with L. Z. Wang, *Phys. Rev. A* **46**, 3617 (1992).
12. "Superconducting Instrumentation for Precision Measurement and Control", in Superconducting Devices and Their Applications, page 446, H. Koch and H. Lubbig, editors (Springer-Verlag, Berlin, 1992).
13. "Fundamental Measurement Accuracy of RF-Biased Josephson Device Comparisons" with D. H. Dunlap, *J. Appl. Phys.* **71**, 6177 (1992).
14. "A Superfluid-Transition Fixed-Point Temperature-Reference" with G. Ahlers, in Temperature : Its Control and Measurement in Science and Industry, Volume 6, page 243, J. F. Schooley, editor (American Institute of Physics Press, New York, 1992).
15. "A frequency to voltage converter based on Bloch oscillations in a capacitively-coupled GaAs-GaAlAs quantum well" with D. Dunlap, V. Kovanis, and J. Simmons, *Phys. Rev. B* **48**, 7975 (1993).
16. "Quantitative Method for Measuring Heat Flux Emitted from a Cryogenic Object", U.S. Patent No. 5,193,909, issued March 16, 1993.
17. "Dynamic measurements near the lambda-point in a low-gravity simulator on the ground" with U.E. Israelsson, D.M. Strayer, T.C.P. Chui, and M. Larson, *Physica B* **194-196**, 593 (1994).
18. "Sidewall thermometry perturbations to nonlinear heat transport near the superfluid transition" with R. Akau, S. Gianoulakis, U.E. Israelsson, and T.C.P. Chui, *Physica B* **194-196**, 603 (1994).
19. "Effect of Gravity on the Thermal-Conductivity Measurement of ^4He near T_λ ", with F-C. Liu, U. E. Israelsson, T.C.P. Chui, D. Hensinger, A. Nash, M.J. Adriaans, W.A. Moeur, *Czechoslovak Journal Of Physics* **46(S1)**, 87 (1996).
20. "Cryogenic Design Of The Liquid-Helium Experiment Critical-Dynamics In Microgravity" with M.J. Adriaans, W. A. Moeur, S.T.P. Boyd, and D. M. Strayer, *Cryogenics* **36**, 787 (1996).
21. "Critical-Dynamics In Microgravity" with S.T.P. Boyd, W.A. Moeur, S. Robinson, R. Akau, and S. Gianoulakis, *International Journal Of Thermophysics* **17**, 631 (1996).
22. "Observation of Self-Organized Criticality Near the Superfluid Transition in ^4He ", with W.A. Moeur, P.K. Day, F-C. Liu, S.T.P. Boyd, and M.J. Adriaans, *Phys. Rev. Lett.* **78**, 2421 (1997).
23. "Large Enhancement of Boron Carbide's Seebeck Coefficients through Vibrational Softening", with T. L. Aselage, D. Emin, and S. S. McCready, *Phys. Rev. Lett.* **81**, 2316 (1998).
24. "Breakdown of Fourier's Law near the Superfluid Transition in ^4He ", with P. K. Day, W. A. Moeur, S. McCready, D. Sergatskov, and F-C. Liu, *Phys. Rev. Lett.* **81**, 2474 (1998).
25. "Gravitational Effects on Nonlinear Heat Transport near the Superfluid Transition in ^4He ", with P. K. Day, S. McCready W. A. Moeur, F-C. Liu, and D. Sergatskov, *J. Low Temp. Phys.* **113**, 861 (1998).
26. "PdMn and PdFe: New Materials for Temperature Measurement Near 2K", with B. Klemme, M.J. Adriaans, P.K. Day, D.A. Sergatskov, and T.L. Aselage, *J. Low Temp. Phys.* **116**, 133 (1999).
27. "Onset of superfluidity far from equilibrium: dynamical effects on the correlation length", with D. Sergatskov, S. Boyd, T. McCarson, A. Babkin, P. Day, and D. Elliott, *Physica B* **280**, 45 (2000).

28. “Dynamic and Gravitational Effects on the Correlation Volume: Experimental Methods” with D.A. Sergatskov, S.T.P. Boyd, S.S. McCready, T.D. McCarson, A.V. Babkin, P.K. Day, F.-C. Liu, and D. Elliott, *J. Low Temp. Phys.* **119**, 265 (2000).
29. Science Requirements Document for Critical Dynamics in Microgravity, JPL Document Number D-18698, May 31, 2000.
30. “Gravitational alignment in ground-based measurements to support Critical Dynamics in Microgravity” with Sven Mueller, T. D. McCarson, and D. A. Sergatskov, AIP Conference Proceedings **504**, 701 (2000).
31. “The CQ Experiment”, with T.C.P. Chui, A.H Harter, R.A.M. Lee, A. Chatto, P.K. Day, and D.L. Goodstein, American Institute of Aeronautics and Astronautics, **AIAA 2001-4964** (2001).
32. “Critical Dynamics in Microgravity - Flight prototype and planned orbital measurements”, with D. Sergatskov, S. Boyd, A. Babkin, T. McCarson and P. Day, American Institute of Aeronautics and Astronautics **AIAA-2001-4936** (2001).
33. “Sampled DC technique for high precision resistance measurements” with P. R. Williamson, J. A. Lipa, and D. A. Sergatskov, American Institute of Aeronautics and Astronautics **AIAA-2001-4937** (2001).
34. “Numerical Analysis of a Cryogenic Bolometer for Space Radiation Measurement” with S.T.P. Boyd, W.A. Holmes, and P.R. Williamson, American Institute of Aeronautics and Astronautics **AIAA-2001-4969** (2001).
35. “New Measurement Technology for DYNAMX, and for Future Fundamental Physics Missions in Space” with D. A. Sergatskov, A. V. Babkin, S.T.P. Boyd, R. C. Nelson, P. K. Day, J. Dooley, and D. Elliott, FP-1067, *Proc. 2nd Pan Pacific Basin Workshop on Microgravity Science* (2001).
36. “The CQ Experiment: Enhanced Heat Capacity of Superfluid Helium in a Heat Flux”, with D. L. Goodstein, A. W. Harter, R. A. M. Lee, A. Chatto, T. C. P. Chui, and P. Day, FP-1025, *Proc. 2nd Pan Pacific Basin Workshop on Microgravity Science* (2001).
37. “New Paramagnetic Susceptibility Thermometers for Fundamental Physics Measurements” with D. A. Sergatskov, P. K. Day, A. V. Babkin, R. C. Nelson, T. D. McCarson, and S.T.P. Boyd, in Temperature : Its Control and Measurement in Science and Industry, **7**, 1009, Dean C. Ripple, editor (American Institute of Physics Press, New York, 2002).
38. “Self-Organized Heat Transport near the Superfluid Transition in ⁴He” with D.L. Goodstein, A.V. Babkin, and D.A. Sergatskov, *J. Low Temp. Phys.* **126**, 1529 (2002).
39. Proceedings of the 2002 Conference on Unified Science and Technology for Reducing Biological Threats and Countering Terrorism (BTR 2002), R. V. Duncan, Chair, University of New Mexico
40. “The Magnetic Properties of Sputtered Pd_{1-x}Mn_x Films for Thermometry and Bolometry”, with R.C. Nelson and D.A. Sergatskov, *J. Low Temp. Phys.* **127**, 173 (2002).
41. "The CQ Experiment: Enhanced Heat Capacity of Superfluid Helium in a Heat Flux", with R. A. M. Lee, A. W. Harter, A. Chatto, T. C. P. Chui, P. K. Day and D. L. Goodstein, Paper-2.0103, 2002 IEEE Aerospace Conference, 1-31 (2002).
42. “Ultrasound Imaging of Breast Tissue” with N. Duric, P. Littrup, E. Holsapple, A. Babkin, A. Kalinin, A. Pevzner, and A. Tokarev, *Proceedings of the SPIE: Medical Imaging 2003*; San Diego, California; Feb. 21-26, 2003. Ultrasonic Imaging and Signal Processing – Paper 5035-4.
43. “New Propagating Mode Near the Superfluid Transition in ⁴He”, with D.A. Sergatskov, A.V. Babkin, R.A.M. Lee, and S.T.P. Boyd, *Physica B* **329 – 333**, 208 (2003).

44. “New Paramagnetic Susceptibility Thermometers for Fundamental Physics Measurements” with D.A. Sergatskov, P.K. Day, A.V. Babkin, R.C. Nelson, T.D. McCarson, and S.T.P. Boyd, AIP Conference Proceedings 684, 1009 (2003).
45. Proceedings of the 2003 Conference on Unified Science and Technology for Reducing Biological Threats and Countering Terrorism (BTR 2003), R. V. Duncan, Chair, University of New Mexico
46. “‘Heat from Above’ heat capacity measurements in liquid ^4He ”, with R.A.M. Lee, A. Chatto, D.A. Sergatskov, A.V. Babkin, S.T.P. Boyd, A.M. Churilov, T.D. McCarson, T.C.P. Chui, P.K. Day, and D.L. Goodstein, *J. Low Temp. Phys.* **134**, 495 (2004).
47. “Preface to the Proceedings of QFS 2003” with S.T.P. Boyd and D. L. Goodstein, *J. Low Temp. Phys.* **134**, 1 (2004); “Welcome Address to QFS 2003, delivered by Louis Caldera, President of UNM”, *J. Low Temp. Phys.* **134**, 17 (2004).
48. “Experiments in ^4He Heated From Above, Very Near the Lambda Point”, with D.A. Sergatskov, A.V. Babkin, S.T.P. Boyd, and R.A.M. Lee, *J. Low Temp. Phys.* **134**, 517 (2004).
49. “Experiments in Fundamental Physics Scheduled and in Development for the ISS” with C. Lammerzahn, G. Ahlers, N. Ashby, M. Barmatz, P. Beirmann, H. Dittus, V. Dohm, K. Gibble, J. Lipa, N. Lockerbie, N. Mulders, and C. Salomon, *General Relativity and Gravitation* **36**, 615 (2004).
50. “Fundamental Physics: Long-range quantum order, interactions, and phase transitions” (Preface), *Advances in Space Research*, Elsevier, (2004).
51. Proceedings of the 2004 Conference on Unified Science and Technology for Reducing Biological Threats and Countering Terrorism (BTR 2004), R. V. Duncan, Chair, University of New Mexico.
52. “Demonstration of an Ultra-Stable Temperature Platform” with C. J. Green and D. A. Sergatskov, *J. Low Temp. Phys.* **138**, 871 (2005).
53. “Adaptive Optimal PI Controller for Use in Precision Low-Temperature Experiments” with Jinyang Liu and D. A. Sergatskov, *J. Low Temp. Phys.* **138**, 905 (2005).
54. “Dynamic Simulation of the Superfluid / Normal Fluid Interface Motion in ^4He ” with Z. Xie, N. C. Menicucci, S.T.P. Boyd, and D. A. Sergatskov, *J. Low Temp. Phys.* **138**, 79 (2005).
55. Proceedings of the 2005 Conference on Unified Science and Technology for Reducing Biological Threats and Countering Terrorism (BTR 2005), R. V. Duncan, Chair, University of New Mexico.
56. “CW Measurements of the Upward-Going Temperature Wave in the ^4He Self-Organized Critical State” with S.T.P. Boyd and D.A. Sergatskov, AIP Conference Proceedings **850**, 135 (ISBN 0-7354-0347-3; 2006).
57. “Effect of Inhomogeneous Heat Flow on the Enhancement of the Heat Capacity in He-II by Counterflow near T_λ ”, with S.T.P. Boyd, A. Chatto, R.A.M. Lee, and D. Goodstein, AIP Conference Proceedings **850**, 133 (ISBN 0-7354-0347-3; 2006).
58. “Measurement of the SOC State Specific Heat in ^4He ” with A.R. Chatto, R.A.M. Lee, P.K. Day and D.L. Goodstein, AIP Conference Proceedings **850**, 137 (ISBN 0-7354-0347-3; 2006).
59. “Magnetic Properties of Pd(96%)Mn(4%) Films for High Resolution Thermometry” with R. C. Nelson, C. Green, and D.A. Sergatskov, AIP Conference Proceedings **850**, 1123 (ISBN 0-7354-0347-3; 2006).
60. “Experiments on the Self-Organized Critical State of ^4He ” with A. Chatto, R.A.M. Lee, and D. Goodstein, *J. Low Temp. Phys.* **148**, 519 (2007).
61. “Noise Immunity of High-Precision Low-Temperature Experiments” with J. Liu and D.A. Sergatskov, *J. Low Temp. Phys.* **148**, 921 (2007).

62. “Critical phenomena in microgravity: Past, present, and future”, with Martin Barmatz, Inseob Hahn, and John Lipa, *Reviews of Modern Physics*, 79, pp. 1-52 (January – March, 2007).
63. “Immediate Communications in the CBRN Environment”, International Seminar on Nuclear War and Planetary Emergencies, 42rd Session (World Scientific Press, 2010) ISBN-13 978-981-4327-19-0 and ISBN-10 981-4327-19-0.
64. “Cell phones, texting, position reporting, and self-assembly in emergency response management”, International Seminar on Nuclear War and Planetary Emergencies, 43rd Session (World Scientific Press, 2011) ISBN-13 978-981-4365-92-5 and ISBN-10 981-4365-92-0.
65. “Planning for desperate Climate Intervention: Can it make sense?”, International Seminar on Nuclear War and Planetary Emergencies, 46rd Session (World Scientific Press, 2013) ISBN-13 978-981-4623-43-8.
66. “Texas programs and technologies for UAS”, International Seminar on Nuclear War and Planetary Emergencies, 48th Session (World Scientific Press, 2015) ISBN-13 978-981-3148-64-2.
67. “A solid-state, open-system, differential calorimeter” by Shelby Lacouture, Trevor Dardik, Dennis Van der Vliet, Jephthah Akene, Samuel Adeosun, and Robert V. Duncan, *Review of Scientific Instruments* **91**, 095102. DOI: 10.1063/5.0013591 (AIP Journal, 2020).
68. “A New Fast Response Cryogenic Evaporative Calorimeter” by Andrew K. Gillespie, Cuikun Lin, Robert P. Thorn Jr., Heather Higgins, Robert Baca, Andrew A. Durso, Django Jones, Ruth Ogu, Jeremy Marquis, and R. V. Duncan, *Review of Scientific Instruments* **91**, 085103, DOI:10.1063/5.0013713, and selected as an AIP “Editors’ Pick” article (2020).
69. Sobel A and Duncan R (2020) Aerospace Environmental Health: Considerations and Countermeasures to Sustain Crew Health Through Vastly Reduced Transit Time to/From Mars. *Front. Public Health* 8:327. doi: 10.3389/fpubh.2020.00327
70. “A Low-Cost, Quantitative Light-Isotope Measurement System for Climate and Energy Applications”, Robert P. Thorn, Jr., Andrew K. Gillespie, Cuikun Lin, Heather Higgins, Shelby LaCouture, Robert Baca, Baudilio Tejerina, Andy Durso, Django Ian Jones, Ruth Ogu, Brett Neurohr, Trevor Dardick, and Robert V. Duncan, *International Journal of Mass Spectrometry*, full text at <https://doi.org/10.1016/j.ijms.2021.116574> (ACS Journal), 2021.
71. “The Impact of the First Decade of the National Academy of Inventors”, Robert V. Duncan, *Technology and Innovation*, Vol. 22, pp. 257-268 (2021).
72. “Radiation characteristics of an aerogel-supported fission fragment rocket engine for crewed interplanetary missions”, Ryan Weed, R. V. Duncan, Matthew Horsley and George Chapline, *Front. Space Technol.* 4:1197347 doi: 10.3389/frspt.2023.1197347 (2023).
73. “The fission fragment rocket engine for Mars fast transit”, J. Gahl, A. K. Gillespie, R. V. Duncan, and C. Lin, *Front. Space Technol.*, 13 October 2023 Sec. Space Propulsion Volume 4 – 2023 <https://doi.org/10.3389/frspt.2023.1191300>
74. “The emergence and impact of regional research university collaborations: The rapidly changing landscape in university research and innovation”, R. V. Duncan, James P. Holloway, and Richard A. Lange, *Technology and Innovation*, Vol. 22, pp. 1-11, 2023.
- Five other publications are currently in preparation for publication in high-impact-factor, refereed journals.

In addition, I have published non-refereed articles on academic leadership strategy in the Proceedings of the Merrill Institute at the University of Kansas in 2009, 2010, 2011, and 2012, and a number of articles on research and education in the popular press. I have published or co-published over fifty abstracts, internal reports, and non-refereed articles.

Invited Talks and Presentations

Numerous invited talks over the last eleven years through my service as Vice Chancellor at MU, and as Vice President at TTU.

Inaugural Speaker at “MAM-12”: The Sixth International Symposium on Macro and Supra Molecular Architectures and Materials in Coimbatore, India (November 21-25, 2012).

Keynote Speaker at the 2012 National Instruments Days in Austin, Texas.

Invited presentation at the “Condensed Matter Meets Gravity” Workshop at the Lorentz Institute in Leiden, NL (August, 2007).

Invited presentation to the International Symposium on Quantum Fluids and Solids in Kyoto, Japan (2006).

Invited presentation at the “Self-Organized Criticality” Conference in Porto Alegre, Brazil (2004).

Invited presentation to the Fourth Annual “Pushing the Envelope: Medicine in Extreme Environments” conference at the University of Texas, Medical Branch in February, 2004.

Invited presentation to the International Symposium on Quantum Fluids and Solids (University of Minnesota, USA, 2000).

Two invited presentations to The American Physical Society’s March Meeting (1987 and 2000).

Invited presentation at the 22nd International Conference on Low-Temperature Physics (Helsinki, Finland, 1999).

Presented the Mechanical Engineering Colloquium at Yale University, October 17, 2007.

Delivered invited Physics Symposium Presentations or Condensed Matter Physics Seminars at Caltech, Stanford, University of Texas (El Paso), University of California (Santa Barbara), State University of New York (Buffalo), Purdue, Los Alamos National Laboratory, Sandia National Laboratories, Air Force Research Labs, Texas Tech University, Texas A&M University, and the University of New Mexico.

Professional Society Appointments and Service

Fellow and National Board Member of the National Academy of Inventors (2015 – date)

Fellow (and life member), American Physical Society (APS).

Executive Committee, APS Instrumentation and Measurement Topical Group (IMSTG), 1998 - 2002

Vice Chair, IMSTG, 1999

Chair of the APS Fellowship Nomination Committee of the IMSTG, 1999

Chair, IMSTG, 2001-2002

Active referee for the National Science Foundation, Physical Review Letters, multiple American Institute of Physics Journals (Rev. Mod. Phys., J. Appl. Phys., etc.), the Journal of Low Temperature Physics, and others on request.

Other Activities

President of the Great Rivers Council Eagle Scout Association, 2010 – 2013

Executive Board of the Great Rivers Council of the Boy Scouts of America, 2008 – 2013.

Distinguished Eagle Scout Alumnus Award, Pony Express Council, 2007.

Ultra-Marathon Runner, two finishes in the Leadville 100-Mile Mountain Run (1996,

1999).

Former Assistant Scoutmaster of the Great Southwest Council Troop 436, serving scouts with neurodevelopmental disabilities.

Former Private Pilot, with over 250 hours of total flight time

MIT Intercollegiate Crew Oarsman, and 1979 National Intercollegiate Rowing Association Championships competitor.

Former Director of Wilderness Survival Training, Boy Scouts of America, Pony Express Council

Former Youth President of the National Eagle Scout Association, Pony Express Council

Winner in the 1978 Westinghouse Science Talent Search ('Top 40')

Eagle Scout (1976)