

SUMMARY

Thermal science expert with experience in all aspects of heat transfer and fluid mechanics. Produced approximately 450 publications, books, book chapters, conference presentations, and patents in areas including biological heat transfer and fluid flow, biomedical device design, energy, burn injuries, climate change, fundamental heat transfer and fluid mechanics, and manufacturing processes. Author of approximately 350 popular press articles and has been in approximately 300 radio and television appearances.

ACADEMIC APPOINTMENTS

University of St. Thomas, St Paul, MN

Professor	2013-Present
Associate Professor	2008-2013
Assistant Professor	2002-2008

OTHER EMPLOYMENT

WTS. LLC

Vice President of Research	2023-present
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Responsible for directing solar-electrical-thermal research activities

EDUCATION

University of Minnesota - Twin Cities, Minneapolis, MN

Ph.D. , Mechanical Engineering (Thermal Sciences)	2002
M.S. , Mechanical Engineering, GPA 3.96/4.00	1999
B.S. , Mechanical Engineering, GPA 4.00/4.00, Minor : Mathematics	1997

PREVIOUS TEACHING EXPERIENCE

Adjunct Faculty , <i>University of St. Thomas, St Paul, MN</i>	2000-2002
Graduate Teaching Fellow , <i>University of Minnesota, Minneapolis, MN</i>	2001-2002
Teaching Assistant , <i>University of Minnesota, Minneapolis, MN</i>	1997-2001
Tutor , <i>University of Minnesota, Minneapolis, MN</i>	1993-1997

HONORS/AWARDS

- Advances in Atmospheric Sciences Notable paper award (2024).
- Journal of Forensic Sciences, Noteworthy paper award (2023).
- AAS Esteemed News and Views Paper Prize, (2023)
- Editor's Choice Award, Journal of Forensic Sciences, (2022).
- AAS Esteemed News and Views Paper Prize, (2022)
- Journal of Atmospheric and Oceanic Technology, Editor award (2020)
- National Center for Science Education, Friend of the Planet Award (2016)
- University of St. Thomas, Professor of the Year (2016)
- USA Green Deal of the Year business excellence award (2013)
- Composites Sustainability Award, American Composites Manufacturers Association Award for Composite Excellence, (2013)

- Nominated, George Mason University, Center for Climate Change Communication, Climate Change Communicator of the Year (2011)
- University of St. Thomas, John Ireland Award (2009)
- University of St. Thomas, Distinguished Educator Award (2008)
- University of St. Thomas, Engineering Professor of the Year (2005)
- Graduate Teaching Fellowship (2001/2002)
- Institute of Technology Teaching Assistant of the Year, awarded by Institute of Technology Student Board, University of Minnesota (1999/2000)
- Institute of Technology Teaching Assistant of the Year, awarded by Institute of Technology Student Board, University of Minnesota (2000/2001)
- Institute of Technology Teaching Assistant of the Year, awarded by Institute of Technology Student Board, University of Minnesota (2001/2002)
- Mechanical Engineering Teaching Assistant of the Year, Mechanical Engineering Department, University of Minnesota (1998/1999)
- Minnesota Professional Engineers Foundation Orion Buan Memorial Scholarship (1996)
- Walter and Margaret Pierce Endowment Fund Scholarship (1996)
- National Space Grant Consortium Scholarship (1996)
- Frank Louk Scholarship (1996)
- Citizens' Scholarship (1992-1995)
- Alfred O. Neir Scholarship (1994)
- Dean's List (1993-1997)

OTHER POSITIONS

Climate Blogger – Guardian Newspaper

2013-2020

PUBLICATIONS

(26 edited works, 3 books, 43 book chapters, 297 journal publications, 147 presentations, 20 granted patents, 11 patent applications, 2 granted trademarks)

TOP PUBLICATIONS BY ALTMETRIC

L. Cheng, J.P. Abraham, K.E. Trenberth, T. Boyer, M.E. Mann, J. Zhu, F. Wang, R. Locarnini, J. Fasullo, Y. Li, B. Zhang, L. Wan, X. Chen, D. Wang, L. Feng, X. Song, Y. Liu, F. Reseghetti, S. Simoncelli, V. Gouretski, G. Chen, A. Mishonov, J. Reagan, K. von Schuckmann, Y. Pan, Z. Tan, Y. Zhu, W. Wei, G. Li, Q. Ren, L. Cao, and Y. Lu, New Record Ocean Temperatures and Related Climate Indicators in 2023, *Advances in Atmospheric Sciences*, 2024, doi: 10.1007/s00376-024-3378-5. **Altmetric score = 1064, top 1% in all journals, January 2024. This altmetric score places the paper in the top 1% (top 168 out of 205963 papers) in all journals, and within the top 1% of papers in the publishing journal.**

L. Cheng, J.P. Abraham, K.E. Trenberth, J.T. Fasullo, T. Boyer, M.E. Mann, J. Zhu, F. Wang, R. Locarnini, Y. Li, B. Zhang, F. Yu, L. Wan, X. Chen, X. Song, Y. Liu, F. Reseghetti, S. Simoncelli, V. Gouretski, G. Chen, A. Mishonov, J. Reagan, and G. Li, Another Year of Record Heat for the Oceans, *Advances in Atmospheric Sciences*, Vol. 40, pp. 963-974, 2023. **Altmetric score = 1438, top 1% in all journals, January 2023. This altmetric score places the paper in**

the top 1% (top 100 out of 214000 papers) in all journals, and within the top 1% of papers in the publishing journal.

L. Cheng, J.P. Abraham, K.E. Trenberth, J. Fasullo, T. Boyer, M.E. Mann, J. Zhu, F. Wang, R. Locarnini, Y. Li, B. Zhang, Z. Tan, F. Yu, L. Wan, X. Chen, X. Song, Y. Liu, F. Reseghetti, S. Simoncelli, V. Gouretski, G. Chen, A. Mishonov, J. Reagan, Another Record Ocean Warming Continues Through 2021 Despite La Nina Conditions, *Advances in Atmospheric Sciences*, Vol. 39, 373-385, 2022). **Altmetric score = 4686, top 1% in all journals, January 2022. This altmetric score places the paper in the top 0.02% (top 57 out of 287000 papers) in all journals, and within the top 1% of papers in the publishing journal.**

L. Cheng, J.P. Abraham, K.E. Trenberth, J.T. Fasullo, T.L. Boyer, R. Locarnini, B. Zhang, F. Yu, L. Wan, X. Chen, X. Song, Y. Liu, M.E. Mann, F. Reseghetti, S. Simoncelli, V. Gouretski, G. Chen, and J. Zhu, Upper Ocean Temperatures Hit Record High in 2020, *Advances in Atmospheric Sciences*, Vol. 38, pp. 523-530, 2021. **Altmetric score = 1439, top 1% in all journals, August 2021.**

G. Li, L. Cheng, J. Zhu, K.E. Trenberth, M.E. Mann and J.P. Abraham, Increasing Ocean Stratification Over the Past Half Century, *Nature Climate Change*, Vol. 10, pp. 1116-1123, 2020. **Altmetric score = 726, top 1%, July 2021.**

J.P. Abraham, B. D. Plourde, and L. Cheng, Using Heat to Kill SARS-CoV-2, *Reviews in Medical Virology*, Vol. 30, e2115, 2020. **Altmetric score = 392, top 1%, July, 2021.**

L. Cheng, J.P. Abraham, J. Zhu, K.E. Trenberth, J. Fasullo, T. Boyer, R. Locarnini, B. Zhang, F. Yu, L. Wan, X. Chen, X. Song, Y. Liu, and M.E. Mann, Record-Setting Ocean Warmth Continued in 2019, *Advances in Atmospheric Sciences*, Vol. 37, 1-6, 2020. **This paper was in the top 100 of all published scientific papers in the year 2020, ranked by Altmetric. Also, second of all 2020 papers in the subject area of climate. Altmetric score = 3957, top 1%, January 2021.**

L. Cheng, J. Zhu, J.P. Abraham, K. E. Trenberth, J. T. Fasullo, B. Zhang, F. Yu, L. Wan, Z. Chen, X. Song, 2018 Continues record global warming, *Advances in Atmospheric Sciences*, 36, pp. 249-252, 2019. **Altmetric score = 646, top 1%, January 2021.**

L. Cheng, J.P. Abraham, Z. Hausfather, and K.E. Trenberth, How fast are the oceans warming?, *Science*, Vol. 363, pp. 128-129, 2019. **Altmetric score = 2853, top 1%, January 2021.**

L.J. Cheng, K.E. Trenberth, T. Boyer, J. T. Fasullo, L. Zhu, J.P. Abraham, Improved Estimates of Ocean Heat Content from 1960-2015, *Science Advances*, Vol. 4, paper no. e1601545, 2017. **Altmetric Score = 753, top 1%, January 2021.**

J.P. Abraham, M. Baringer, N.L. Bindoff, T. Boyer, L.J. Cheng, J.A. Church, J.L. Conroy, C.M. Domingues, J.T. Fasullo, J. Gilson, G. Goni, S.A. Good, J. M. Gorman, V. Gouretski, M. Ishii, G.C. Johnson, S. Kizu, J.M. Lyman, A. M. Macdonald, W.J. Minkowycz, S.E. Moffitt, M.D.

Palmer, A.R. Piola, F. Reseghetti, K. Schuckmann, K.E. Trenberth, I. Velicogna, and J.K. Willis, A Review of Global Ocean Temperature Observations: Implications for Ocean Heat Content Estimates and Climate Change, *Reviews of Geophysics*, Vol. 51, pp 450-483, 2013. **Altmetric score = 178, top 5%, January 2024.**

Editing Activities (26 editorial activities)

1. Editor, *Advances in Heat Transfer*, Vol. 59, (Forthcoming, 2025).
2. Editor, Special edition in *Numerical Heat Transfer B – Advanced Cooling Technologies Using Enhanced Nanofluids*, (2025, in preparation).
3. Editor, *Advances in Heat Transfer*, Vol. 58, (Forthcoming, 2024).
4. Editor, *Advances in Heat Transfer*, Vol. 57, (Forthcoming, 2024).
5. Editor, *Advances in Numerical Heat Transfer – Artificial Intelligence Methods*, (forthcoming 2024)
6. Editor, Special edition in *Numerical Heat Transfer B – AI methods in heat transfer* (2023)
7. Editor, *Advances in Heat Transfer*, Vol. 56, 2023.
8. Editor, *Advances in Heat Transfer*, Vol. 55, 2023.
9. Editor in Chief, *Numerical Heat Transfer A* (2022-present)
10. Editor in Chief, *Numerical Heat Transfer B* (2022-present)
11. Editor, *Advances in Atmospheric Sciences (AAS)*, 2022.
12. Editor, *Advances in Heat Transfer*, Vol. 54, Elsevier, 2022.
13. Editor, *Advances in Heat Transfer*, Vol. 53, Elsevier, 2021.
14. Editor, *Advances in Heat Transfer*, Vol. 52, Elsevier, 2020.
15. Editor, *Advances in Heat Transfer*, Vol. 51, Elsevier, 2019.
16. Editor, *Advances in Heat Transfer*, Vol. 50, Elsevier, 2018.
17. Editor, *Advances in Heat Transfer*, Vol. 49, Elsevier, 2017.
18. Editor, *Advances in Heat Transfer*, Vol. 48, Elsevier, 2016.
19. Editor, *Advances in Heat Transfer*, Vol. 47, Elsevier, 2015.
20. Editor, *Advances in Heat Transfer*, Vol. 46, Elsevier, 2014.
21. Editor, *Advances in Numerical Heat Transfer Vol. 5: Numerical Models of Heat Exchangers*, Taylor and Francis, New York, 2017.
22. Editor, *Small-Scale Wind Power – Design, Analysis, and Economic Impacts*, Momentum Press, 2014.
23. Editor, *Advances in Heat Transfer*, Vol. 45, Elsevier, 2013.
24. Editor, *Advances in Heat Transfer*, Vol. 44, Elsevier, 2012.
25. Editor, *Advances in Numerical Heat Transfer Vol. 4: Nanoscale Heat Transfer and Fluid Flow*, Taylor and Francis, New York, 2012.
26. Guest Editor, *Advances in Numerical Heat Transfer Vol. 3: Numerical Implementation of Biological Models and Equations*, Taylor and Francis, New York, 2009.
27. Guest Editor, Special Edition of the *International Journal of Heat and Mass Transfer: Bioheat and Biofluid Flow*, Elsevier, Vol. 51, 23-24, November, 2008.
28. Assistant Editor, *Handbook of Numerical Heat Transfer*, 2nd Ed. Editors: Sparrow, Minkowycz, and Murthy, John-Wiley & Sons, Inc., New York, 2006.

Editorial Board Member

1. Water Eng. & Sciences, 2023-present
2. Advances in Atmospheric Sciences, 2022-present
3. International Journal of Forensic Sciences, 2023-present
4. International Society of Cardiovascular Translational Research, 2020-present
5. Energies, Thermal Management, 2019-present
6. Cardiovascular Revascularization Medicine, 2018-present
7. Stem Cell Biology and Transplantation, 2015-present
8. Associate Editor, National Center for Science Education, Climate Science, 2012-present
9. International Journal of Mechanics and Energy, 2012-present
10. Open Mechanical Engineering Journal, 2007-present
11. Open Mechanical Engineering Reviews, 2007-present
12. Open Mechanical Engineering Letters, 2007-present
13. Open Medical Devices Journal, 2008-present
14. Creative Engineering Journal, 2009-present
15. ISRN Applied Mathematics, 2011-present
16. International Journal of Sustainable Energy, 2012 - present
17. International Journal of Materials, Methods, and Technologies, 2012- present

Books

1. K. Vajravelu, J.P. Abraham, S. Mukhopadhyay, and P. Lakshminarayana, Advances in Nanofluid Flow, Heat, and Mass Transfer at Moving/Stretching Surfaces, CRC Press, (in preparation).
2. J.P. Abraham and B.D. Plourde, Small-Scale Wind Power – Design, Analysis, and Environmental Impacts, *Momentum Press*, 2014.
3. J.P. Abraham, P.S. Ellis, M.C. MacCracken, and G.M. Woodwell, Climate controversy 2013. New York, NY: *AuthorHouse*, 2013.
4. J.P. Abraham, E.M. Sparrow, W.J. Minkowycz, R.Ramazani-Rend, and J.C.K. Tong, All Fluid-Flow-Regimes Simulation Model for Internal Flows, *Nova Science Publishers, Inc.*, Hauppauge, NY, 2011.

Book Chapters (author of 43 book chapters)

1. K. Vajravelu, J.P. Abraham, S. Mukhopadhyay, and P. Lakshminarayana, Advances in Nanofluid Flow, Heat, and Mass Transfer at a Moving/Stretching Surface, *Advances in Heat Transfer*, Vol. 58, 2024.
2. F. Salmasi and J.P. Abraham, New Perspectives on the Design of Stilling Basins, *Theory and Applications of Engineering Research*, 2024.
3. F. Salmasi and J.P. Abraham, Exploring Two-Phase Flow Dynamics: Experimental Investigations and Computational Modeling in Smooth and Stepped Chutes, *Theory and Applications of Engineering Research*, 2024.

4. F. Salmasi and J.P. Abraham, Ogee Crest Weir Head-Discharge Relationships, *Research Highlights in Science and Technology*, 2023.
5. F. Salmasi and J.P. Abraham, Hydraulic Performance of Sluice Gates: A Review of Head Loss Estimation and Discharge Coefficients for Optimal Flow Control and Design Considerations, *Dam Engineering – Design, Construction and Sustainability*, IntechOpen, 2023.
6. D.K. Vashwakarma, S. Bhattacharyya, M.L. Soni, and J.P. Abraham, Effect of Inlet Flat Obstruction on Thermohydraulic Characteristics in a Smooth Circular Tube in the Transitional Flow Regime, in Bhattacharya, Verma, Harikrishnan (eds), *Fluid Mechanics and Fluid Power, Vol. 3, Lecture Notes in Mechanical Engineering*, Springer, doi: 10.1007/978-981-19-6270-7_76.
7. F. Salmasi and J.P. Abraham, On the Finite Differences Method Using MS Excel, *Research Highlights in Mathematics and Computer Science* Vol. 6, pp 140-186, 2023.
8. F. Salmasi and J.P. Abraham, Boundary of Transition Flow Regime on Stepped Spillways by Physical Modeling, *Current Overview on Science and Technology Research*, (in press).
9. F. Salmasi and J.P. Abraham, Determination of Stilling Basin Invert Elevation and its Effect on Controlling Hydraulic Jumps, Chapter 5, *Techniques and Innovation in Engineering Research*, Vol. 2, 2022.
10. F. Salmasi and J.P. Abraham. Energy Loss at the Base of a Free Straight Drop Spillway, *Current Overview on Science and Technology Research*, Vol. 6, 2, 2022.
11. F. Salmasi and J.P. Abraham, Computation of Optimal Cross Section of Gravity Dams Using Genetic Algorithms, *Current Overview on Science and Technology Research*, Vol. 6, Chapter 1, 2022.
12. F. Salmasi and J.P. Abraham, Flow Characteristics of Skimming Regime Flow Over Stepped Spillways with Attention to Optimum Step Size, *Current Overview on Science and Technology Research*, Vol. 6, Chapter 3, 2022.
13. F. Salmasi and J.P. Abraham, Determination of Stilling Basin Invert Elevation and its Effect on Controlling Hydraulic Jumps, *Technological Innovation In Engineering Research*, (in press).
14. R. Daneshfaraz, E. Aminvash, and J.P. Abraham, Hydraulic Characteristics of Fish-Passes on Inclined Drops, *Research Developments in Science and Technology*, Vol. 4, pp. 108-123, 2022.

15. F. Salmasi, J.P. Abraham, and A. Salmasi, Design Considerations for Pumping Stations Using Variable Speed Pumps, *Novel Perspectives of Engineering Research*, Vol. 10, pp. 98-118, 2022.
16. F. Salmasi, J.P. Abraham, Drainage Gallery in Concrete Gravity Dams and its Effect on Reduction of Uplift Forces, *Novel Perspectives of Engineering Research*, Vol. 10 pp. 43-62, 2022.
17. F. Salmasi, and J.P. Abraham, Numerical Simulation Using the Finite Element Method to Investigate the Effect of Horizontal Drains and Cutoff Walls on Seepage and Uplift Pressure in Heterogeneous Earth Dams, *Novel Perspectives of Engineering Research*, Vol. 9, pp. 58-85, 2022.
18. F. Salmasi, J.P. Abraham, B. Nourani, Determining the Analysis of the Stability of Embankments Against Sliding and Prediction of Sliding and Critical Factor of Safety, *Novel Perspectives of Engineering Research*, pp. 98-125, 2022.
19. F. Salmasi and J.P. Abraham, Effect of Horizontal Drain Length and Cutoff Wall on Seepage and Uplift Pressure in Heterogeneous Earth Dam with Numerical Simulation, *Novel Perspectives of Engineering Research*, Vol. 9, pp. 58-85, 2022.
20. F. Salmasi and J.P. Abraham, Numerical Investigation of Reduction of Uplift Forces by Drain Pipes Under the Bed of a Canal, *Novel Perspectives in Engineering Research*, Vol. 7, pp. 117-139, 2022.
21. F. Salmasi and J.P. Abraham, A Case Study on the Weep Hole and Cutoff Wall Effect for Decreasing Uplift Pressure on Hydraulic Structures, *Innovations in Science and Technology*, Vol. 6, pp. 12-38, 2022.
22. F. Salmasi and J.P. Abraham, Comparison of Uplift Pressure and Hydraulic Gradient in Three Types of Dams: Concrete Gravity dams, Homogeneous, and Heterogeneous Earth-Filled Dams, *Innovations in Science and Technology*, Vol. 3, pp. 71-86, 2022.
23. F. Salmasi and J.P. Abraham, Geological Considerations in Dam Engineering, *Novel Perspectives of Engineering Research*, Vol. 6, pp. 97-125, 2022.
24. B.D. Plourde, J. Kilonzo, J. Kiplagat, J.P. Abraham, and L. Cheng, From Sunlight to Drinking Water – The Design and Validation of a Solar-Pasteurization System, Published in *Handbook of Research on Heat Transfer*, edited by S. Bhattacharyya and V. Goel, Chapter 16, 2022.
25. A. Salmasi, J.P. Abraham, and F. Salmasi, Prospects for Application of Nanotechnology in Marine Industries, *Innovations in Science and Technology*, Vol. 4, pp. 84-106, 2022.

26. F. Salmasi and J.P. Abraham, Validity of Schaffernak and Casangrande analytical solutions for Seepage Through a Homogeneous Earth Dam and Comparison with Numerical Solutions Based on the Finite Element Method, in *Novel Perspectives of Engineering Research*, Vol. 4, pp. 79-93, 2021.
27. F. Salmasi and J.P. Abraham, Effect of Embankment Soil Layers on Stress-Strain Characteristics, *Recent Progress in Plant and Soil Research*, Vol. 4, pp. 68-84, 2021
28. F. Salmasi and J.P. Abraham, Study on the Effect of Inclination of Cutoff Wall Beneath Gravity Dams on Uplift Force, in *Novel Perspectives of Engineering Research*, Vol. 1, pp. 38-57, 2021.
29. J.P. Abraham, S. Bhattacharya, L. Cheng, and J.M. Gorman, A Brief History of and Introduction to Computational Fluid Dynamics, in *Computational Fluid Dynamics*, edited by: Suvanjan Bhattacharya, published by IntechOpen, 2021.
30. F. Salmasi and J.P. Abraham, The Method of Characteristics Applied to the Sensitivity Analysis for Water Hammer Problems, *New Approaches in Engineering Research*, B.P. International, Vol. 9, pp. 50-63, 2021.
31. J. Gorman, S. Bhattacharya, J.P. Abraham,, L. Cheng, Turbulence Models Commonly used in CFD, in: *Computational Fluid Dynamics*, edited by: Suvanjan Bhattacharya, published by IntechOpen, 2021.
32. J.M. Gorman, M. Regnier, and J.P. Abraham, Heat Exchange Between the Human Body and the Environment – A Comprehensive, Multi-Scale Numerical Simulation, in: *Advances in Heat Transfer*, Vol. 52, 2020.
33. L.E. Olsen, J.P. Abraham, L.J. Cheng, J.M. Gorman, E.M. Sparrow, Summary of Forced-Convection Fluid Flow and Heat Transfer for Square Cylinders of Different Aspect Ratios Ranging from the Cube to a Two-Dimensional Cylinder, in: *Advances in Heat Transfer*, Vol. 51, pp. 351-457, 2019.
34. E.M. Sparrow, J.M. Gorman, A. Ghosh, J.P. Abraham, Enhancement of Jet Impingement Heat Transfer by Means of Jet Axis Switching, in: *Advances in Heat Transfer*, Vol. 50, 2018.
35. E.M. Sparrow, J.M. Gorman, J.P. Abraham, W.J. Minkowycz, Validation of Turbulence Models for Numerical Simulation of Fluid Flow and Convective Heat Transfer, in: *Advances in Heat Transfer*, Vol. 49, 397-421, 2017.
36. J.M. Gorman, E.M. Sparrow, J.P. Abraham, W.J. Minkowycz, Heat Exchangers and Their Fan/Blower Partners Modeled as a Single Interacting System by Numerical Simulation, in: *Advances in Numerical Heat Transfer Vol. 5*, Taylor and Francis, New York, 2017.

37. J.P. Abraham, B.D. Plourde, L.J. Vallez, B.B. Nelson-Cheeseman, J.R. Stark, J.M. Gorman, E.M. Sparrow, Skin Burn, in: *Theory and Application of Heat Transfer in Humans*, edited by Devashish Shrivastava, Wiley, June 2018.
38. M.W. Dewhirst, J.P. Abraham, B.L. Viglianti, Evolution of Thermal Dosimetry for Application of Hyperthermia Treatment to Cancer, in: *Advances in Heat Transfer*, Vol. 47, 397-421, 2015.
39. B.D. Plourde, E.D. Taylor, P.O. Okaka, and J.P. Abraham, Financial and Implementation Considerations for Small-Scale Wind Power, in: *Small-Scale Wind Power – Design, Analysis, and Economic Impacts*, Momentum Press, 2014.
40. B.D. Plourde, E.D. Taylor, W.J. Minkowycz, and J.P. Abraham, Introduction to Small-Scale Wind Power, in: *Small-Scale Wind Power – Design, Analysis, and Economic Impacts*, Momentum Press, 2014.
41. J.P. Abraham, E.M. Sparrow, W.J. Minkowycz, R. Ramazani-Rend, and J.C.K. Tong, Modeling Internal Flows by an Extended Menter Transition Model, in: *Turbulence: Theory, Types, and Simulation*, Nova Publishers, New York, 2011.
42. S. Ramadhyani, J.P. Abraham, and E.M. Sparrow, A Mathematical Model to Predict Tissue Temperatures and Necrosis During Microwave Thermal Ablation of the Prostate, in: *Advances in Numerical Heat Transfer Vol. 3: Numerical Implementation of Bioheat Models and Equations*, Taylor and Francis, New York, 2009.
43. J.P. Abraham and E.M. Sparrow, Heat-Transfer and Temperature Results for a Moving Sheet Situated in a Moving Fluid, in: *Heat-Transfer Calculations, 2nd ed.*, editor, Myer Kutz, McGraw-Hill, 2005.

Publications (author of 297 journal papers)

2024

1. L. Cheng, Y. Pan, Z. Tan, H. Zheng, Y. Zhu, W. Wei, J. Du, H. Yuan, G. Li, H. Ye, V. Gouretski, Y. Li, K.E. Trenberth, J.P. Abraham, Y. Jin, F. Reseghetti, X. Lin, J. Zhu, IAPv4 Ocean Temperature and Ocean Heat Content Gridded Dataset, *Earth System Science Data*, (accepted).
2. F. Salmasi and J.P. Abraham, Effect of Flywheels in Pump Stations for Reducing the Volume of Air Chambers, *Journal of Hydraulic Engineering*, (accepted).
3. S. Bhattacharyya, T. Bhatt, D. K. Vishwakarma, A.C. Benim, and J.P. Abraham, Effect of Mechanical Vibration and its Influence on Thermal Performance of a Nanofluid Heat Exchanger, *Numerical Heat Transfer Part A*, (in press), doi: 10.1080/10407782.2024.2331589.

4. H. Apaydin, S.N. Mousavi, M.T. Sattari, and J.P. Abraham, Extreme Pressure Coefficients – Modeling a Hydraulic Jump Using Deep-Learning Based Methods, *Sadhana*, Vol. 49, article number 151, 2024.
5. E. Aminvash, F. Kalateh, R. Daneshfaraz, and J.P. Abraham, Investigation of the Performance of Soft-Computing Methods in the Hydraulic Evaluation of the Slot Fishway on the Inclined Drop, *Journal of Hydraulic Structures*, Vol. 10, pp. 46-65, 2024.
6. Abraham, J.P., Cheng, L., and Gorman, J.M., CFD Simulation Models and Diffusion Models for Predicting Carbon Dioxide Plumes Following Tank and Pipeline Ruptures – Laboratory Test and a Real-World Case Study, *Energies*, Vol. 17, paper no. 1079, 2024.
7. R. Daneshfaraz, V. Sume, Mamidzadeh, J.P. Abraham, Experimental Investigation and Application of Soft Computing Models for Predicting Flow Energy Loss in Arch-Shaped Constrictions, *AQUA – Water Infrastructure, Ecosystems, and Society Production System*, (in press).
8. F. Kalateh, E. Aminvash, and J.P. Abraham, On the Effect of Flow Regime and Slope of the Channel Bed on the Hydraulic Performance of the Sharp-Crested Rectangular Side Weir: A Numerical Simulation, *European Journal of Environmental and Civil Engineering*, (in press), doi: 10.1080/19648189.2024.2314112.
9. H. Abbaszadeh, R. Daneshfaraz, V. Sume, and J.P. Abraham, Experimental Investigation and Application of Soft Computing Models for Predicting Flow Energy Loss in Arc-Shaped Constrictions, *Water Infrastructure, Ecosystems, and Society*, vol. 23, pp. 637-661, 2024.
10. E. Aminvash, F. Kalateh, R. Daneshfaraz, and J.P. Abraham, The Performance of KNN and SVM Algorithms in Evaluating the Hydraulic Parameters of Inclined Drop with the Presence of Fishways, *Journal of Hydraulic Structures*, (submitted).
11. L. Cheng, J.P. Abraham, K.E. Trenberth, T. Boyer, M.E. Mann, J. Zhu, F. Wang, R. Locarnini, J. Fasullo, Y. Li, B. Zhang, L. Wan, X. Chen, D. Wang, L. Feng, X. Song, Y. Liu, F. Reseghetti, S. Simoncelli, V. Gouretski, G. Chen, A. Mishonov, J. Reagan, K. von Schuckmann, Y. Pan, Z. Tan, Y. Zhu, W. Wei, G. Li, Q. Ren, L. Cao, and Y. Lu, New Record Ocean Temperatures and Related Climate Indicators in 2023, *Advances in Atmospheric Sciences*, 2024, doi: 10.1007/s00376-024-3378-5.
12. B. Nourani, F. Salmasi, A. Abbaspour, H. Arvanaghi, and J.P. Abraham, Determination of the Factor of Safety against Sliding of Finite Slopes Using Classical Regression and Soft Computing Approaches, *Geotechnical and Geological Engineering*, (submitted).
13. R. Salmasi, F. Salmasi, and J.P. Abraham, Flood Spreading Effects on Soil Chemical Properties: Case Study in Tasuj Station, Iran, *Water Supply*, Vol. 24, pp. 995-1004, 2024.

14. R. Daneshfaraz, H. Sadeghi, A. Ghaderi, and J.P. Abraham, Characteristics of Hydraulic Jump and Energy Dissipation in the Downstream of Stepped Spillways with Rough Steps, *Flow Measurement and Instrumentation*, Vol. 96, paper no. 102506, 2024.

2023

15. B. Nourani, H. Arvanaghi, F.A. Pourhosseini, M. Javidnia, and J.P. Abraham. Enhanced Support Vector Machine with Particle Swarm Optimization and Genetic Algorithm for Estimating Discharge Coefficients of Circular-Crested Oblique Weirs, Iranian Journal of Science and Technology, *Transactions of Civil Engineering*, Vol. 47, pp. 3185-3198, 2023.
16. V. Sume, R. Daneshfaraz, A. Kerim, H. Abbaszadeh, and J.P. Abraham, Investigation of Clean Energy Production in Drinking Water Networks, *Water Resources Management*, Vol. 38, pp. 2189-2208, 2024.
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1. J.P. Abraham, Heat Transfer in Forensics, VCU Forensics Seminar, December 6, 2022.

2. L. Cheng, and J.P. Abraham, Perspectives on Ocean sand Their Role in the Global Energy Budget and Water Cycle, *American Meteorological Society 102nd Annual Meeting, Houston, Kevin Trenberth Symposium*, January 23-27, 2022 (invited).
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5. J.P. Abraham, Introduction to the Computational Tools Available in Fluid Mechanics and Heat Transfer Research, *National Workshop on Research Methodology in Fluid Mechanics*, Pilani, India, June 7-9, 2021.
6. L. Cheng, K. Trenberth, N. Gruber, M.E. Mann, J.P. Abraham, and J. Fasullo, Improved Estimates of Changes in Upper Ocean Salinity and Water Cycle, *AGU Fall Meeting*, 2020.
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8. L. Cheng, K. Trenberth, K. von Schuckmann, J.P. Abraham, V. Gouretski, Oceanic Responses to the Climate: Recognizing Changes and Extremes, *AAAS Annual Meeting*, February 11, 2021.
9. J.P. Abraham, Advanced Methods in Thermal Engineering, *International Workshop on Recent Advances in Thermal Engineering*, India, June 29-July 3, 2020.
10. J.P. Abraham, L. Cheng, Kevin Trenberth – A Life of Research and Impact, *Trenberth Symposium*, Denver, CO, March 16, 2020.
11. J.P. Abraham, Modern Climate Change, *Threats to the Worlds Oceans – World Ocean Day*, Minneapolis, MN June 8, 2020.
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17. S. A. Mandia, J.P. Abraham, M. Ashley, and J.W. Dash, The Climate Rapid Response Team – An Effective Model for Engaging Media and Policymakers, *2018 AGU Fall Meeting*, Washington, DC, December 2018.
18. J.P. Abraham, Climate Change, the Evidence is in the Oceans, *Presented at the National Laboratory for Marine Science and Technology*, Qingdao, China, October 25, 2018.
19. J.P. Abraham, Progress in XBT simulations, *Presented at the Institute of Atmospheric Physics*, Beijing, October 23, 2018.
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 46. J.P. Abraham et al., A Novel Multi Lumen Compliant Balloon Catheter (ND[®] Infusion Catheter) Preserves Stem Cell Viability and Improves Dispersion When Compared to a Standard Single Lumen Balloon Angioplasty Catheter, *European Society of Cardiology*, 2015, (submitted).
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Granted Trademarks

1. US Trademark Registration Number 5656322, assignee: WTS LLC, Minnesota, USA. Trademark granted, January 15, 2019.

2. US Trademark Registration Number 5656323, assignee: WTS LLC, Minnesota, USA.
Trademark granted, January 15, 2019.

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<i>Starky</i>	2020
<i>Marvin Windows</i>	2020-2022
<i>Cardiovascular Systems, Inc.</i>	2019-2021
<i>ALS Consulting</i>	2019
<i>Medivator, MN</i>	2018-2019
<i>Medivators, MN</i>	2014-2015
<i>EKOS, MN</i>	2018
<i>Marcor</i>	2018
<i>Marvin Windows</i>	2018
<i>Medtronic, Fridley, MN</i>	2017-2020
<i>Orbital ATK</i>	2017-2018
<i>Pride Engineering, MN</i>	2017-2018
<i>Cargill, MN</i>	2016-2017
<i>EKOS, MN</i>	2016-2017
<i>Precision Air, MN</i>	2016
<i>3M, MN</i>	2015-2017
<i>Flourescence, Inc., MN</i>	2015

4232 29th Ave.
Minneapolis, MN 55406

John P. Abraham

jpabraham@stthomas.edu
612-963-2169

<i>Smiths Medical, MN</i>	2014-2015
<i>WTS LLC, MN</i>	2014-2022
<i>Somnetics, MN</i>	2014
<i>Lake Region Medical, MN</i>	2013-2014
<i>Amphora Medical, MN</i>	2013-2014
<i>ALS Consulting, MN</i>	2013-2016
<i>Medtronic, Fridley, MN</i>	2013-2016
<i>Devicix, MN</i>	2012-2013
<i>CriticCare, MN</i>	2012
<i>HRST, Inc., MN</i>	2012-2015
<i>QIG Group, OH</i>	2011-2013
<i>Phraxis, MN</i>	2011-2012
<i>Cardiovascular Systems, Inc., Roseville, MN</i>	2007-2015
<i>Translational Biologic Infusion, AZ</i>	2011-2013
<i>Galil Medical, Roseville, MN</i>	2011
<i>Imation, Oakdale, MN</i>	2010
<i>Medtronic, Fridley, MN</i>	2008-2011
<i>R4 Engineering, India</i>	2008-2009
<i>Horizontal Winds,</i>	2008-2009
<i>Lockheed Martin, Eagan, MN</i>	2007-2009
<i>St. Jude Medical, Minnetonka, MN</i>	2007-2009
<i>Arizant Medical, Eden Prairie, MN</i>	2006
<i>Johnson and Johnson, Newark, NJ</i>	2004-2005
<i>Cortron/XeteX, Fridley, MN</i>	2005
<i>MicroControl Company, MN</i>	circa 2001
<i>Donaldson Co., Bloomington, MN</i>	1999-2003
<i>Augustine Medical, Eden Prairie, MN</i>	2000-2003
<i>Midmac Systems Inc., St Paul, MN</i>	2002
<i>Remmele Engineering Inc., St Paul, MN</i>	2002-2005
<i>Urologix, Minneapolis, MN</i>	circa 2004
<i>Restore Medical, Minneapolis, MN</i>	circa 2002
<i>Jennio, Minnesota</i>	circa 2001
<i>Caterpillar, Minneapolis, MN</i>	circa 2000
<i>ADC telecom, Minneapolis, MN</i>	circa 2000
<i>Entropy Solutions</i>	circa 2000
<i>XeteX, Inc., Minneapolis, MN</i>	1996-2000
<i>Pneuseal, St. Paul, MN</i>	1996-1998
<i>Los Alamos National Laboratory, Los Alamos, NM</i>	1994

GRANTS (funding \$24.256 million)

USAID	2024
\$145,900 Funding through USAID's Health Electrification and Telecommunications Alliance (HETA program)	

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Department of Interior	2024
\$130,000 Funding for electrification of Wind River Reservation	
Bold Alliance	2023
~\$12K For research on pollution plumes from a rupture pipeline	
Varian Medical Systems, Inc.	2023
Brain thermal transport, oncology applications	
LEMA, LLC	2016-2022
\$20m for development and deployment of solar-power off grid systems. Part of Consolidated Appropriations Act, 2023	
HRST, Inc.	2021
\$34,000 for analysis of flow patterns in power plants	
Biotronik	2021
\$44k for simulation of heating caused by implanted medical devices	
Flotherm (SBIR award FAIN 2034065)	2020-2023
\$20k for simulation of body-heating devices	
\$48k for simulation of body-heating devices	
SBIR funding, NSF Small Business Innovative Research project	
Starky	2019-2020
\$6k for thermal modeling of hearing aid batteries	
National Science Foundation (Co-PI, FAIN = 2018403)	2020-2021
\$424k for engineering PIV instrumentation	
Intertek	2019-2020
\$13k for study of tissue surrogates for biological heating	
Cardiovascular Systems, Inc.	2019-2021
\$13k for thermal model of blower impellor for a dialysis pump	
\$9k for thermal model of blower impellor for a dialysis pump	
\$4k for thermal model of blower impellor for a dialysis pump	
\$20k for flow model of blower impellor for a dialysis pump	
\$5k for flow model of blower impellor for a dialysis pump	
ALS Consulting	2019
\$15k for thermal model of power plant	

Medivators	2019
\$12k for thermal model of thermal sterilization	
Marvin Windows	2019-2022
\$4k for thermal analysis of a tiny home	
\$5k for thermal model of manufacturing line	
\$4k for thermal model of manufacturing line	
Medtronic	2019
\$22k for simulation of tissue temperatures during transcatheter recharge	
\$25.5k for simulation of tissue temperatures during transcatheter recharge	
Medivators	2018
\$18k to research airflow in medical sterilization equipment.	
Marvin Windows	2018-2020
\$6k to research thermal processes during window ventilation	
\$4k to research thermal processes of natural lighting	
\$4k to research thermal processes of natural lighting	
Medtronic	2018
\$3k to research battery heating rates	
\$8k to research thermal tolerance of brain tissue	
EKOS	2018
\$14k for analysis of flow distribution within stents	
Marcor	2018
\$10k for fluid and heat transfer analysis	
Pride Engineering	2017
\$3k to calculate a metal stamping machine process	
Orbital ATK	2017-2018
\$30k to simulate fluid flow	
\$12k to simulate fluid flow	
Medtronic	2017
\$5k to research thermal tolerance of brain tissue	
\$14k to calculate cranial temperature increases during transcranial recharge	

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3M		2017
	\$14k to simulate airflow in ultra-clean operating rooms.	
Zoll Engineering		2017
	\$5.5k for design of flow through a ventilation medical device	
Cargill		2016-2017
	\$14k for analysis of food frier	
	\$15k for analysis of a food processing device	
EKOS		2017
	\$14k for analysis of flow distribution within stents	
	\$14k for analysis of flow distribution within stents	
	\$12k for analysis of flow distribution within stents	
ALS Consulting		2016
	\$15k for analysis of fluid flow in power plants	
Precision Air		2016
	\$1600 for simulation of airflow in operating rooms	
Medtronic		2016
	\$12k for simulation of tissue temperatures during transcutaneous recharge	
3M		2015
	\$12k to simulate airflow in ultra-clean operating rooms.	
Cardiovascular Systems, Inc.		2015-2016
	\$8,000 for the study of deformable arteries	
	\$6,000 for biological flows and impellor design	
AF Energy		2015
	\$3000 wind turbine calculations	
Intellectual Ventures Laboratory		2015
	\$2000 wall condensation calculations	
Medivators		2015
	\$4000 for flow and pressure calculations medical chamber.	
Flourescence, Inc.		2015
	\$2,000 designing biological heater for cell environments	
Mador Technologies		2015
	\$20,000 analyzing a liquid nitrogen water condensation device	

Koronis Biomedical Technologies	2015
\$5,000 simulation of fluid flow	
Mador Technologies	2014-2015
\$8,000 analyzing a liquid nitrogen water condensation device	
National Resources Defense Council	2015
\$10k for climate education work	
Medtronic	2014
\$12k for simulation of tissue temperatures during transcatheter recharge	
Smiths Medical	2014
\$9.5k for design and optimization of medical warming blankets	
\$10k for the design and improvement of medical fans	
\$12k for the design and analysis of human thermal analogs	
WTS LLC	2014-present
\$1.5m for the design of solar pasteurization systems	
Medivators	2014
\$4000 for flow and pressure calculations medical chamber.	
\$3000 for flow and pressure calculations medical chamber.	
Somnetics	2014
\$6000 for flow and pressure calculations in CPAP devices.	
Lake Region Medical	2013-2014
\$4500 for simulations of a guidewire manufacturing oven	
Amphora Medical	2013-2014
\$55.5k for design of RF probes for ablation of bladder tissue	
ALS Consulting	2013-2014
\$17.5k for analysis of fluid flow in power plants	
Medtronic, Inc.	2012-2013
\$13k for analysis of subdermal heating associated with recharge of neuromodulation systems.	
Phraxis	2013
\$2,250 for the analysis of blood flow through an AV shunt	
Translational Biologic Infusion Catheter	2011-2013

\$21.5k for the study of flow and pressure drop in a stem-cell delivery catheter	
Advanced Circulatory Systems, Inc.	2013
\$4200 for fluid flow modeling of medical-device blowers	
HRST, Inc.	2012-2015
\$11,250 for analysis of flow patterns in manifolds	
Devicix	2012
\$2000 for the analysis of medical-fluid injection devices	
Helical	2012-2013
\$18,200 for the design and analysis of rooftop wind turbines	
QiG Group	2012
\$7000 for study of thermoelectric technologies to power implants	
HRST, Inc.	2012
\$4300 for analysis of perforated plates for flow uniformity	
Energy Foundation	2012-2013
\$30k developing climate-science communication strategies	
CriticCare	2012
\$4,275 for numerical modeling of accelerated aging of medical devices.	
HRST, Inc.	2012
\$5,540 for research study on mixing efficiency in heat recovery plants.	
Windstrip, LLC	2009-2013
\$1m for development of vertical axis wind turbines to power cellular communication equipment.	
QiG Group	2011-2012
\$20k for study of implant heating of biological tissue	
Phraxis	2011-2012
\$8,000 for the analysis of blood flow through an AV shunt	
Energy Foundation	2011-2012
\$71k developing climate-science communication strategies	
Cardiovascular Systems, Inc.	2011
\$23k for the study of paclitaxel distribution techniques.	
Cardiovascular Systems, Inc.	2011
\$5,000 for the study of temperature management in palletted products	

Galil Medical	2011
\$9,000 for the kidney tumor cryosurgical devices.	
Multiple groups	2010
\$13,000 for installation of solar panels in Uganda	
Imation	2010
\$10k for the design of a polymeric extrusion die	
Cypress Wind	2010
\$30.6k for the development of a vertical axis, small-footprint wind turbine.	
Cypress Wind	2009
\$27k for the development of a vertical axis, small-footprint wind turbine.	
Cardiovascular Systems, Inc.	2009
\$80k for the study of cavitation and bolus formation during orbital atherectomy procedures.	
Medtronic, Inc.	2008-2011
\$65k for analysis of subdermal heating associated with recharge of neuromodulation systems.	
University of St. Thomas Faculty Development Grant	2009
\$4,200 for the purchase of a high-performance computer for numerical simulations.	
CSUMS: A computational Training and Interdisciplinary Research Program for Undergraduates in the Mathematical Sciences at the University of St. Thomas	2008-2013
Served as Senior Personnel on a \$716,836 NSF award for the development of applied research projects for undergraduates in mathematics.	
Lockheed Martin Innovative Program - Advanced Cooling Technology grant	2009
\$19.5k for the improvements to avionics heat pipe applications.	
Horizontal Winds	2008-2009
\$11k for research on vertical-axis wind turbines	
R4 Engineering	2008-2009
\$10k for analysis of building-support insulation systems	
Lockheed Martin Innovative Program - Advanced Cooling Technology grant	2007
\$53k for the development of advanced electronic-cooling methodologies.	
Arizant Medical	2006
Characterization of a forced-air patient warming device	

Johnson and Johnson, Newark, NJ Analysis of a uterine fibroid embolization device	2004-2005
Urologix Design of thermoelectric device for heating/cooling of urological catheter fluids	circa 2004
Donaldson Co. Analysis and characterization of a filter-manufacturing device	1999-2003
Augustine Medical Characterization of a forced-air patient warming device	2000-2003
Midmac Systems Inc. Thermal analysis of a polymeric sealing machine	2002
Restore Medical Characterization of sleep apnea treatment	circa 2002
Remmele Engineering Inc. Thermal analysis of a polymeric sealing machine for insulin packaging Thermal analysis of liquid-based cold plates for cooling naval radar	2002-2005
MicroControl Company Analysis of burn-in board devices	Circa 2001
Jenni-O Analyzed devices that handle, transport, and cool turkeys during processing.	circa 2001
Caterpillar Analysis of a screed heating machine	circa 2000
ADC Telecom Optimization of an AC/DC power converter	circa 2000
Viracon Glass Design and analysis of glass thermal processing method	2000
Entropy Solutions Design and Analysis of insulation and phase change thermal management for shipping containers	circa 2000
XeteX, Inc Design of an air-to-air heat exchanger Creation of a film processing machine for coating heat exchangers Construction and operation of a full-sized HVAC test facility	1996-2000

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Pneuseal **1996-1998**

Operation and optimization of a polymeric sealing device for medical packaging

Principal Investigator – Supercomputing Institute **2002-2012**

Served as PI for multi-year project dedicated to performing computational fluid dynamic studies. This grant awarded computing resources at the Supercomputing Institute for Digital Simulation and Advanced Computing.

Principal Investigator – ASHRAE Project Grant Program **2003**

Awarded a \$5,000 grant funded by ASHRAE to investigate the efficacy of rotating-wheel heat and moisture exchangers.

Faculty Advisor – Bush Grant, Young Scholars Program **2002**

Faculty advisor for a \$3,000 grant for undergraduate research of air-jet heat transfer for surgical applications.

Faculty Advisor – Bush Grant, Young Scholars Program **2002**

Faculty advisor for a \$3,000 grant for undergraduate research to encourage American Indian students to pursue careers in science and technology.

**A Multi-Function Heat Exchanger for Control of Temperature, Moisture,
and Air Quality** **1997-2000**

Project Engineer for \$475K SBIR grants awarded by NSF, grant nos. 9660900 and 9801062