BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF THE APPLICATION OF NAVIGATOR HEARTLAND GREENWAY, LLC FOR A PERMIT UNDER THE SOUTH DAKOTA ENERGY CONVERSION AND TRANSMISSION FACILITIES ACT TO CONSTRUCT THE HEARTLAND GREENWAY PIPELINE IN SOUTH DAKOTA	**HP22-002** **DR. JOHN ABRAHAM INITIAL PRE-FILED TESTIMONY IN SUPPORT OF LANDOWNER INTERVENORS**

Q: Please state your name and purpose for providing testimony in this proceeding.

A: My name is Dr. John Abraham. The purpose of my testimony is to provide the South Dakota Public Utilities Commission (Commission) with information that will be helpful when it considers Navigator's proposed hazardous carbon dioxide (CO_2) pipeline in South Dakota. Specifically, I have reviewed Navigator's "Heartland Greenway System Plume Modeling and Buffer Overview" and provide testimony regarding the shortcomings of the PHAST computer model used by Navigator in its preparation of this overview. I caution the Commission not to rely upon conclusions drawn from PHAST modeling, specifically as it relates to the "buffer" distances Navigator provides. My ultimate opinion is that PHAST modeling is not the gold standard, and should not be relied upon by the Commission for its review and decision making. It is not wise to rely upon PHAST modeling for assessments of risk or to determine impacts to safety, land use, or economic, environmental, social or general welfare concerns. Doing so would be a disservice to the people of South

Dakota. Relatedly, I provide opinions concerning the diffusion of CO_2 following a leak or rupture or other unintended release event.

Q: How did you become involved in these proceedings?

A: I was contacted by Brian Jorde who represented himself as legal counsel for many concerned South Dakota citizens and landowners. Mr. Jorde asked if I would review the Navigator "Plume Modeling and Buffer Overview" and provide an opinion on the methodology employed by Navigator in that report, discuss its shortcomings, if any, related to Navigator's analysis, and render an opinion to a reasonable degree of scientific certainty on whether or not the "Plume Modeling and Buffer Overview" contains accurate information that the Commission can rely upon. Mr. Jorde asked me to provide a general opinion on whether the Commission should consider PHAST modeling to be reasonably reliable, as well as a more specific opinion on whether the Commission should rely on and give weight to Navigator's Plume Modeling and Buffer Overview when it considers the potential impacts of a pipeline rupture on community safety, land use development, and economic, environmental, social and general welfare concerns of the directly affected current landowners, persons and businesses in proximity to the proposed pipeline route, as well as expected future inhabitants of the region. Additionally, I was told by Mr. Jorde that, to his knowledge, Navigator has not shared this overview with the public or first responders or others, so I do not divulge Navigator's specific buffer areas or amounts here and instead construct my testimony and render opinions without divulging Navigator's claimed "Confidential" buffer areas.

I will discuss different approaches for calculating plumes from CO_2 pipeline leaks. The calculations provide insight regarding how far a particular plume of CO_2 may reach given environmental conditions and local topography. I will discuss the origins, strengths, and weaknesses of two competing approaches (PHAST modeling and computational fluid dynamics (CFD) modeling), and why PHAST should not be used to assess the risk of harm from the rupture of a CO_2 pipeline.

Q: What experience, education, training, or background qualify you to provide opinions and your concerns as you have hearing?

A: In my professional capacity, I teach, consult with companies, and carry out research on a wide-range of engineering topics, in particular thermal-fluid sciences. The descriptor thermal-fluid sciences refers to the flow of heat and fluids (fluids include liquids, such as water; gases, such as air or other vapors; and supercritical fluids, such as supercritical CO_2).

I teach courses to both undergraduate and graduate students on topics related to thermal sciences; among my regular teaching duties are Heat Transfer (a senior-level engineering course) and Advanced Thermal Design (a graduate-level course).

As a researcher, I have produced 272 scientific journal publications, given approximately 150 scientific presentations, written 37 book chapters, obtained 16 patents, with 5 applications in process. I have also edited 21 major works and written 3 books.

I am the Editor in Chief at two scientific journals (Numerical Heat Transfer part A and Numerical Heat Transfer part B) that specialize in numerical modeling of thermal fluid problems. I am the series editor of Advances in Heat Transfer, which is the most prestigious book series in heat transfer. I am also the series editor of Advances in Numerical Heat Transfer. I have won numerous awards that are listed in my CV and I serve on multiple editorial advisory boards

My education, experience, training, and background is fully described in my CV of which a true and accurate copy is found in **Attachment No. 1**.

Additionally, I have consulted for industry for approximately three decades. In total, I have been retained by approximately 60 companies on a variety of subject matters in engineering, including the use of CFD modeling. CFD refers to a technique of flow prediction. The process involves the placement of computational grid cells throughout the fluid region, then fluid parameters such as velocity, pressure, turbulence level, temperature, density, etc. are calculated at each of these computational grid cells. When the elements are reviewed as a whole, the picture of the real flow patterns becomes apparent. I have authored two recent book chapters on CFD modeling that provide a background to the method:

- *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.*

- *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.*

I have also published many dozens of studies that use CFD modeling; these studies are listed in my CV. CFD is a mature science, it is easily accessible to trained enginees and the software is easily available.

Finally, I have been involved in numerous litigations and have been recognized multiple times as an expert in CFD modeling.

Q: What materials and data did you review and consider prior to rendering your expert opinions provided here?

A: I reviewed the following documents for this testimony:

Documents related to the Satartia rupture:

Navigator Heartland Greenway System Plume Modeling and Buffer Overview (undated)

PHMSA Failure Investigation Report - Denbury Gulf Coast Pipelines, LLC (May 26, 2022)

PHMSA Notice of Probable Violation (May 26, 2022)

PHMSA Notice of Probable Violation and Proposed Compliance Order (January 31, 2023)

Response of Denbury LLC to Proposed Compliance Order (March 2, 2023)

PHMSA Consent Order and Consent Agreement (March 24, 2023)

PHMSA Incident Database Entry for February 22, 2020 Rupture of Denbury Pipeline Near Satartia, Mississippi (last updated by Denbury on March 21, 2020)

Wunderground.com weather data for Jackson-Evers International Airport Station on February 22, 2020 (nearest National Weather Service Station to Satartia)

Scientific Papers:

Godbole, A., X. Liu, G. Michal, B. Davis, C. Lu, K. Armstrong, C. Medina, *Atmospheric Dispersion of CO2 following Full-Scale Burst Tests,* 14th International Conference on Greenhouse Gas Control Technologies, GHGT-14, October 21-25, 2018, Melbourne, Australia.

Huiru, W., Y. Zhanping, M. Fan, L. Bin, H. Peng, *Study on Dispersion of Carbon Dioxide over the Shrubbery Region*, Frontiers in Energy Research, Vol. 9, article 695224, 2021.

Liu, X., A.R. Godbole, C. Lu, G. Michal, *Investigation of Terrain Effects on the Consequence of Distance of CO2 Released from High-Pressure Pipelines*, Faculty of Engineering and Information Sciences – Papers: Part B, 995, 2017

Liu, X., A. Godhole, C. Lu, G. Michal, P. Venton, *Optimisation of Dispersion Parameters of Gaussian Plume Model for CO2 Dispersion*, Environmental Science and Pollution Research, Vol. 22, pp. 18288-18299, 2015.

Mack, A., M.P.N. Spruijt, *CFD Dispersion Investigation of CO2 Worst Case Scenarios Including Terrain and Release Effects*, 7th Trondheim CCS Conference TCSS-7, June 5-6, 2013, Trondheim, Norway.

Witlox, H.W.M., A. Holt, *A Unified Model for Jet, Heavy and Passive Dispersion Including Droplet Rainout and Re-evaporation*, CCPS 1999, UDM paper.

Witlox, H.W.M., M. Harper, A. Oke, *Modelling of Discharge and Atmospheric Dispersion for Carbon Dioxide Releases*, Journal of Loss Prevention in the Process Industries, Vol. 22, pp. 795-802, 2009.

Witlox, H.W.M., M. Harper, A. Oke, *PHAST Validation of Discharge and Atmospheric Dispersion for Pressurized Carbon Dioxide Releases*, Hazards XXIII Symposium Series 158, pp. 172-182, 2012.

Woolley, R.M., M. Fairweather, C.J. Wareing, et al., *CO@PipeHaz: Quantitative Hazard Assessment for Next Generation CO2 Pipeline*, GHGT-12, October, 2014, Austin, USA.

Q: Please describe PHAST modeling and its weaknesses as a predictive tool, if any.

A: PHAST modeling is a simplified approach to estimate where a plume will travel following a rupture or a leak. The method is discussed in publications such as Witlox and Holt, (1999). While parts of PHAST originated earlier than this publication, the 1999 paper provides a thorough discussion.

As revealed in the 1999 paper, the PHAST model is based on wind tunnel experiments from other researchers. These wind tunnel experiments were needed to obtain parameters that were used to force the model to match experimental results (termed "tunable parameters"). It is noteworthy that actual ruptures, such as the February 22, 2020 rupture of the Denbury pipeline near Satartia, Mississippi, are not in wind tunnels and so any wind-tunnel experiments would be irrelevant for Satartia or other real-world ruptures.

PHAST was also premised assuming a horizontal release, not a rupture like Satartia where a significant portion of the CO_2 was released vertically.

PHAST assumes that some plumes can take and maintain a perfectly spherical shape and that other plumes can maintain circular cross sections as they move downstream; this does not occur in real life.

Another weakness of PHAST is that it cannot account for changes in topography, which is an important factor for dense gases like CO_2 or for locations like Satartia that are in hilly topography.

Another feature of PHAST is that the cloud moves with a single velocity as it travels with the wind – this too is an unrealistic assumption.

It is noteworthy that when Witlox and Holt compared their calculations with experiments, they found errors of ~ 500% less than half a mile from the release site – with PHAST dramatically underestimating the concentration of released gases.

Other studies confirm that PHAST cannot be used to provide high fidelity plume calculations. In Witlox, Harper, and Oke, (2012), the calculations diverged from experiments after a distance of only about 30 m. Clearly, PHAST would be unable to calculate concentrations for a very different situation, for example over long distances (of about 1000 meters or more).

Based on my review of the enforcement documents prepared by the Pipeline and Hazardous Materials Safety Administration (PHMSA) for the Satartia rupture, I learned that a PHAST calculation was performed by Denbury prior to the Satartia rupture to determine if its pipeline posed a risk to the village. In its March 24, 2023 Consent Agreement with Denbury (available at:

https://primis.phmsa.dot.gov/Comm/reports/enforce/documents/42022017NOPV/42022017NOPV_Consent%20Agreement%20and%20Order_03242023_(20-176125).pdf), PHMSA reported that "the earlier PHAST dispersion analysis was wrong." Denbury's reliance on this pre-rupture dispersion model is also confirmed in PHMSA's May 26, 2022 Notice of Probable Violation (available at: https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/2022-05/42022017NOPV_PCO%20PCP_0526022_%2820-176125%29%20-%20Denbury%20Pipeline.pdf), and in PHMSA's May 26, 2022 Failure Investigation Report (available at: https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/2022-05/Failure%20Investigation%20Report%20-%20Denbury%20Gulf%20Coast%20Pipeline.pdf).
Consequently, from the information available to me, I conclude that Denbury – and unfortunately, every community where this particular pipeline was located – inappropriately relied upon a calculation approach that should have been known by Denbury, and its consultants, to be unable to incorporate critical factors necessary to determine the risks that its pipeline posed to Satartia and to vastly under-predict downstream gas concentrations.

Q: Is there a superior or preferred alternative to PHAST that is more accurate and reliable, and if so, please describe that superior modeling technique.

A: Yes, there is. The gold-standard and more accurate modeling technique and tool is known as CFD modeling, the computational fluid dynamics modeling referenced previously.

CFD modeling is becoming increasingly used in CO_2 pipeline rupture dispersion calculations (Huiru et al., 2021). This method has been effectively used and is able, for example, to handle different terrains (Godbole et la., 2018; Woolley et al., 2014; Mack and Sprujit, 2013; Liu, Godbole, Lu, and Michal, 2017).

CFD modeling does not suffer the same weaknesses as PHAST. There are no tunable parameters that need to be carefully set. It can handle the impacts of variable terrain and non-horizontal leaks; it is able to simulate plumes that are not perfectly spherical or that have non-circular cross sections. With CFD modeling, the cloud does not move with a single velocity. Since CFD modeling can account for these variables, whereas PHAST does not, CFD modeling can yield more accurate calculations and predictions than PHAST. The advantages of CFD over PHAST are known in the scientific community and are expressed, for example, by Liu et al., 2015, as follows:

> The above studies represent examples of the application of the three categories of dispersion models—Gaussian-based, similarity-profile and CFD-based. In general, CFD models are the most adaptable and are able to produce better prediction, as they use more detailed mathematical descriptions of the conservation principles. This allows the simulation of complex physical processes involving heat and mass transport in complicated computational domains (Pontiggia et al. 2009). The main drawback of CFD models is that they are often difficult and time-consuming to set up and run. Furthermore, detailed meteorological measurements and topographic data, which are essential inputs to the CFD model, are often unavailable. Gaussian and similarity-profile models are unable to model the flow over obstacles or across complex terrains (Sklavounos and Rigas 2004). However, their main advantage is that they are relatively easy to use and provide quick estimates of dispersion.

From Liu et al., 2015

Q: Given that Navigator is requesting Commission approval for a perpetual location of their proposed hazardous CO_2 pipeline, do you have an opinion as

to whether the Commission should rely when deciding on the Navigator Application upon Navigator's PHAST modeling data and the buffer areas it generated as discussed and described in Navigator's "Heartland Greenway System Plume Modeling and Buffer Overview", and if so, what is your opinion?

A: My opinion, which is provided to a reasonable degree of professional scientific certainty, is that the Commission should not rely upon Navigator's PHAST modeling or the data and buffers that such flawed modeling provides. CFD modeling should occur and that modeling should be further scrutinized. The Commission would be wise to take more robust, accurate and dynamic CFD modeling into account before approving or denying Navigator's Application. PHAST modeling is known to underestimate gas concentrations and is unable to deal with a number of critical factors including but not limited to topography and turbulence. Furthermore, newer, more accurate methods are available that can provide more accurate concentration calculations.

Had such CFD modeling been performed prior to construction of the Denbury Satartia pipeline, the citizens, landowners, local and state governments, and decision makers would have had more accurate data when considering the proposed location of the pipeline and when evaluating possible mitigation conditions. Further, the surrounding communities, first responders, and residents would have been empowered with the most reliable data and information available to prepare for a rupture and protect themselves by mitigating the known, predictable risks resulting from a rupture of this pipeline. CFD modeling calculations would have provided more accurate knowledge and awareness of the actual danger zones, such that the negative fallout and effects of a rupture on the residents and community would have been greatly minimized or prevented.

Translating this analysis to the current proposed Navigator CO_2 pipeline at issue here, the Commission, if empowered with accurate CFD modeling, would be in a position to determine whether the actual risks associated with the proposed pipeline are simply too great for the landowners, other residents, and businesses near the proposed route, and the State of South Dakota as whole, to bear.

Q: Do you have an opinion as to Navigator's buffer distances as listed in its "Heartland Greenway System Plume Modeling and Buffer Overview" and, if so, what are your opinions?

A: Yes, based on Navigator's modeling, it is more likely than not that all of Navigator's stated buffer distances including, initial routing, design and operations, emergency response, and public awareness are under reported, inaccurate, and unreliable for use in the major decisions the Commission will make.

Q: Do you have an opinion as to concepts of "aspirational buffers" applied "where feasible and practical" in relation to a pipeline company's proposed pipeline locating decisions, and specifically in relation to your review of Navigator's buffers, and if so, what are those opinions?

A: Buffer distances and setbacks should be driven by the best available scientific means and modeling. If the goal is to evaluate the potential impacts of a pipeline rupture on current and future residents, land uses, businesses, and other uses, the buffers and setbacks should not be "aspirational;" they should be grounded in science and established to best protect both existing and future inhabitants and land uses. The concept of "where feasible and practical," when defined in terms of a pipeline company's perspective, is not a best practice. I encourage the Commission to consider Navigator's Application in light of the most accurate scientific information available including CFD modeling, and to evaluate the proposed project based on consideration of whether or not all buffer zones and setbacks are supported by CFD modeling, and not based on Navigator's self-interested judgment about whether a buffer zone or setback is "feasible and practical."

Q: Have all of your opinions expressed herein been provided to a reasonable degree of scientific professional certainty and been informed by your education, training, background, and experience?

A: Yes, they have, and I reserve the right to amend or modify these opinions upon presentation of any additional information that may justify such a change, if any.

/s/ Dr. John Abraham

Dr. John Abraham

ATTACHMENT NO. 1

CV – DR. JOHN ABRAHAM

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 200 radio and television appearances.

APPOINTMENTS

University of St. Thomas, St Paul, MN

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

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, *University of St. Thomas, St Paul, MN*	**2000-2002**
Graduate Teaching Fellow, *University of Minnesota, Minneapolis, MN*	**2001-2002**
Teaching Assistant, *University of Minnesota, Minneapolis, MN*	**1997-2001**
Tutor, *University of Minnesota, Minneapolis, MN*	**1993-1997**

HONORS/AWARDS

- 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 **2013-2022**

PUBLICATIONS

(21 edited works, 3 books, 37 book chapters, 272 journal publications, 147 presentations,16 granted patents, 5 patent applications, 2 granted trademarks)

TOP PUBLICATIONS BY ALTMETRIC

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. Reseghettic, S. Simoncelli, V. Gouretski, G. Chen, A. Mishonoc, J. Reagan, and G. Li, Another Year of Record Heat for the Oceans, *Advances in Atmospheric Sciences*, (in press). **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. Abrahm, 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. Reserghetti, S. Simoncelli, V. Gouretski, G. Chen, and J. Zhu, Upper Ocean Temperatures Hit Record High in 2020, *Advances in Atmsopheric 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.**

Editing Activities (21 editorial activities)

1. Editor, Special edition in Numerical Heat Transfer B – AI methods in heat transfer (2023)
2. Editor, Advances in Heat Transfer, Vol. 56, (forthcoming, 2023).
3. Editor, Advances in Heat Transfer, Vol. 55, (forthcoming, 2023).
4. Editor in Chief, Numerical Heat Transfer A/B
5. Editor, Advances in Atmospheric Sciences (AAS), 2022.
6. Editor, Advances in Heat Transfer, Vol. 54, Elsevier, 2022.
7. Editor, Advances in Heat Transfer, Vol. 53, Elsevier, 2021.
8. Editor, Advances in Heat Transfer, Vol. 52, Elsevier, 2020.
9. Editor, Advances in Heat Transfer, Vol. 51, Elsevier, 2019.
10. Editor, Advances in Heat Transfer, Vol. 50, Elsevier, 2018.
11. Editor, Advances in Heat Transfer, Vol. 49, Elsevier, 2017.
12. Editor, Advances in Heat Transfer, Vol. 48, Elsevier, 2016.
13. Editor, Advances in Heat Transfer, Vol. 47, Elsevier, 2015.
14. Editor, Advances in Heat Transfer, Vol. 46, Elsevier, 2014.
15. Editor, Advances in Numerical Heat Transfer Vol. 5: Numerical Models of Heat Exchangers, Taylor and Francis, New York, 2017.
16. Editor, Small-Scale Wind Power – Design, Analysis, and Economic Impacts, Momentum Press, 2014.
17. Editor, Advances in Heat Transfer, Vol. 45, Elsevier, 2013.
18. Editor, Advances in Heat Transfer, Vol. 44, Elsevier, 2012.
19. Editor, Advances in Numerical Heat Transfer Vol. 4: Nanoscale Heat Transfer and Fluid Flow, Taylor and Francis, New York, 2012.
20. Guest Editor, Advances in Numerical Heat Transfer Vol. 3: Numerical Implementation of Biological Models and Equations, Taylor and Francis, New York, 2009.
21. Guest Editor, Special Edition of the International Journal of Heat and Mass Transfer: Bioheat and Biofluid Flow, Elsevier, Vol. 51, 23-24, November, 2008.
22. 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. J.P. Abraham and B.D. Plourde, Small-Scale Wind Power – Design, Analysis, and Environmental Impacts, *Momentum Press*, 2014.

2. J.P. Abraham, P.S. Ellis, M.C. MacCracken, and G.M. Woodwell, Climate controversy 2013. New York, NY: *AuthorHouse*, 2013.

3. 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 37 book chapters)

1. D.K. Vashwakarma, S. Bhattacharyya, M.L. Soni, and J.P. Abraham, Effect of Inlet Flat Obtruction 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.

2. F. Salamsi 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.

3. F. Salamsi and J.P. Abraham, Boundary of Transition Flow Regime on Stepped Spillways by Physical Modeling, *Current Overview on Science and Technology Research*, (in press).

4. F. Salamsi 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.

5. F. Salamsi 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.

6. F. Salamsi 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.

7. F. Salamsi 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.

8. F. Salamsi and J.P. Abraham, Determination of Stilling Basin Invert Elevation and its Effect on Controlling Hydraulic Jumps, *Technological Innovation In Engineering Research*, (in press).

9. 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.

10. F. Salamsi, J.P. Abraham, and A. Salamsi, Design Considerations for Pumping Stations Using Variable Speed Pumps, *Novel Perspectives of Engineering Research,* Vol. 10, pp. 98-118, 2022.

11. F. Salamsi, 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.

12. F. Salamsi, 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.

13. F. Salamsi, 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.

14. F. Salamsi 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.

15. F. Salamsi 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.

16. F. Salamsi 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.

17. F. Salamsi and J.P. Abraham, Comparison of Uplift Pressure and Hydraulic Gradient in Three Types of Dams: Concrete Gravity dams, Homogeneous, and Hetergogneous Earth-Filled Dams*, Innovations in Science and Technology*, Vol. 3, pp. 71-86, 2022.

18. F. Salamsi and J.P. Abraham, Geological Considerations in Dam Engineering, *Novel Perspectives of Engineering Research*, Vol. 6, pp. 97-125, 2022.

19. 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.

20. A. Salamsi, J.P. Abraham, and F. Salamsi, Prospects for Application of Nanotechnology in Marine Industries, *Innovations in Science and Technology*, Vol. 4, pp. 84-106, 2022.

21. F. Salamsi 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 Finited Element Method, in *Novel Perspectives of Engineering Research*, Vol. 4, pp. 79-93, 2021.

22. F. Salamsi 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

23. F. Salamsi 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.

24. 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.

25. F. Salamsi 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.

26. 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.

27. 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.

28. 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.

29. E.M. Sparrow, J.M. Gorman, A. Ghoash, J.P. Abraham, Enhancement of Jet Impingement Heat Transfer by Means of Jet Axis Switching, in: *Advances in Heat Transfer,* Vol. 50, 2018.

30. 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.

31. 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.

32. 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.

33. 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.

34. 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.

35. 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.

36. 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.

37. 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.

38. 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 271 journal papers)

2023

1. R. Daneshfaraz, E. Aminvash, S. Veli, M. Rezair, A. Ghaderi, and J.P. Abraham, Experimental Study of New Green and Non-Structual Materials Effects on Scour Reduction Downstream of a Screen, Water, Infrastructure, Ecosystems, and Society, (accepted).

2. S. Abbasi, M. Seifollahi, R. Daneshfaraz, F. Mohammadi, J.P. Abraham, and H. Abbaszadeh, Estimation of Vertical Settlement of Earthen Dams Caused by Earthquake Using ANN Model and Wavelet-ANN Composition, Geotechnical and Geological Engienering, (in press), 2023.

3. S. Abbasi, S. Ravaz, M. Heidapour, R. Daneshfaraz, J.P. Abraham, Investigating and Comparing the Performance of Collar and Cable Composition on Scouring of Cylindrical Bridge Piers, Sadhana Academy Processdings in Engineering Sciences, (accepted).

4. A. Aghdam, F. Salamsi, A. H. Zadeh Dalia, A. Abbaspoour, and J.P. Abraham, Experimental and Numerical Investigation of the Trajectories of Free and Pressurized Jets Through Storage Dams, *Water Supply*, Vol. 23, paper no. 1297, 2023.

5. Y. Pan L. Cheng. K. von Schuckmann, K.E. Trenberth, G. Li, J.P. Abraham, Y. Liu, V. Gouretski, Y.Yu, H. Liu, C. Liu, Annual Cycle in Upper Ocean Heat Content and the Global Energy Budget, *J. Climate*, (accepted).

6. M. Haghdoost, E. Lakzian, R. Norouzi, J.P. Abraham, S. Sajjadi, and J. Ahadiyan, Numerical Simulation Using the Finite Element Method to Investigate the Effect of Internal

Cutoff Walls on Seepage and Hydraulic Graients in Homogeneous Earth Dams, Modeling Earth Systems and Environment, (in press), doi: 10.1007/s40808-023-01755-w, 2023.

7. D.K. Vishwakarma, S. Bhattacharya, M.K. Sonja, and J.P. Abraham, Thermal and Flow Analysis of Air in a Uniformly Heated Channel with an Inlet Flap Obstruction in Laminar, Transitional, and Turbulent Flow Regimes, *Heat Transfer Engineering* (accepted).

8. F. Salamsi, F. Nahrain, J.P. Abraham, and A.T. Aghdam, Prediction of Discharge Coefficients for Broad-Crested Weirs Using Expert Systems, Journal of Hydraulic Engineering, Vol. 29, pp. 1-11, 2023.

9. J.P. Abraham, T. Wei, L. Cheng, Validation of a New Method of Providing Case-Specific Time-of-death Estimates Using Cadaver Temperatures, *Journal of Forensic Science*, (in press).

10. F. Salamsi and J.P. Abraham, Hydraulic Characteristics of Flow Over Stepped and Chute Spillwas (Case Study: Zirdan Dam), *Water Supply*, Vol. 23, pp. 851-866, 2023.

11. M. Seifollahi, S. Abbasi, A. Pourtaghi, R. Daneshfaraz, and J.P. Abraham, Performance Efficiency of Data-Based Hybrid Intellient Approaches to Predict Crest Settlement in Rockfill Dams, *Arabian Journal of Geosciences*, Vol. 15, paper 1701, 2023.

12. M. Naghavi, M. Mohammadi, G. Mahtabi, and J.P. Abraham, Experimental Assessment of Velocity and Bed Shear Stress in the Main Channel of a Meandering Compund Channel with One-Sided Blocks in Floodplain, *Journal of Hydrology*, (accepted).

13. T. Wei and J.P. Abraham, Comment on the Marshall-Hoare-Henssge Model for Estimating the Time Since Death, *Journal of Forensic Science*, (accepted).

14. R. Daneshfaraz, R. Norouzi, P. Ebadzadeh, S. Di Francesco, J.P. Abraham, Experimental Study of Geometric Shape and Sill of Sill Effects on the Hydraulic Performance of Sluice Gates, *Water*, Vol. 15, paper no. 314.

15. 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. Reseghettic, S. Simoncelli, V. Gouretski, G. Chen, A. Mishonoc, J. Reagan, and G. Li, Another Year of Record Heat for the Oceans, *Advances in Atmospheric Sciences*, (in press).

16. A.T. Aghdam, A. Hosseinzadeh, F. Salamsi, A. Abbaspour, and J.P. Abraham, Numerical and Experimental Study of Trajectory for Free Falling Jets, *Iranian Journal of Science and Techniology,* (in press).

17. Y. Pan, L. Cheng, K. von Schuckmann, K.E. Trenberth, B. Li, J.P. Abraham, Y. Li, V. Gouretski, Y Yu, H. Liu, and C. Lei, Annual Cycle in Upper Ocean Heat Budget Content and Global Energy Budget, *Journal of Climate* (submitted).

18. T. Wei, J.P. Abraham, and Y. Wang, New Temperature and Heat Loss Charts for One-Dimensional, Transient Heat Conduction, *Journal of Heat Transfer*, Vol. 145, paper no. 014502, 2023.

2022

19. L. Cheng, K. von Schuckmann, J.P. Abraham, K. Trenberth, M. Mann, L. Zanna, M.H. England, J. D. Zika, J. Fasullo, Y. Yu,, Y. Pan, J. Zhu, E. Newsom, B. Bronselaer, and X. Lin, Past and Future Warming, *Nature Reviews Earth and Environment*, Vol. 3, pp. 778-794 (**Altmetric – 595, May 2023, top 1% of similar papers**).

20. F. Salamsi, P. Sihag, J.P. Abraham M. Nouri, Experimental Investigation and Prediction of Free Fall Jet Scouring Using Machine Learning Models, *International Journal of Sediment Research*, Vol. 38, pp. 1-20, 2022.

21. R. Daneshfaraz and J.P. Abraham, Laboratory Study of Energy Dissipation on Gabion Vertical Drop, *Innovative Infrastructure Solutions*, Vol. 7, article number 328, 2022.

22. J.P. Abraham and L. Cheng, Intersection of Climate Change, Energy, and Adaptation, *Energies,* Vol. 15, paper no. 5886, 2022.

23. Y. Wang, H. Wan, T. Wei, and J.P. Abraham, Enhancement of Heat and Mass Transfer By Herringbone Microstructures in a Simple Shear Flow, *Physics of Fluids*, Vol. 34, paper no. 082012, 2022.

24. M. Seifollahi, S. Abbasi J.P. Abrahan, R. Norouzim R. Daneshfaraz, M-A. Lotfollahi-Yaghin, and A. Alkan, Optimization of Gravity Concrete Dams Using the Grasshopper Algorithm (Case Study: Koyna Dam), Geotechnical and Geological Engineering, Vol. 40, pp. 5481-5496, 2022.

25. T. Tian, L. Cheng, G. Wang, J.P. Abraham, J. Zhu, J. Song, and H. Leng, Reconstructing High-Resolution Ocean Subsurface Salinity State Using Machine Learning Approach, *Earth System Science Data* (in press).

26. J.P. Abraham, L. Cheng, M.E. Mann, K.E. Trenberth, K. von Schuckmann, The Ocean Response to Climate Change Guides Both Adaptation and Mitigation Efforts, *Atmospherical and Oceanic Science Letters*, Vol. 15, paper no. 100221, 2022.

27. R. Biabani, F. Salamsi, M. Npouri, and J.P. Abraham, Flow Over Embankment Gabion Weirs in Free Flow Conditions, *Journal of Hydro-Environmental Research*, Vol. 44, pp. 65-76, 2022.

28. B. Nourani, F. Salamsi, H. Arvanaghi, and J.P. Abraham, Development of Explicit Formulas for Estimating Seepage Characteristics Underneath Aprons with Equal and Unequal End Vertical Double-Piles, *International Journal of Geomechanics*, Vol. 22, paper no. 04022237, 2022.

29. L. Cheng, G. Foster, Z. Hausfather, K.E. Trenberth, J.P. Abraham, Improved Quantification of the Rate of Ocean Warming, *Journal of Climate*, Vol. 35, pp. 4827-4840, 2022.

30. F. Salamsi and J.P. Abraham, Effect of Slope on Energy Dissipation for Flow Over a Stepped Spillway, *Water Supply*, Vol. 22, pp. 5056-5069, 2022.

31. Y. Liu, L. Cheng, Y. Pan, Z. Tan, J.P. Abraham, B. Zhang, J. Zhu, and J. Song, How Well do CMIP6 and CMIP5 models simulate the climatological seasonal variations in ocean salinity, *Advances in Atmospheric Sciences*, doi: 10.1007/s00376-022-1381-2.

32. J.M. Gorman, W. Tan, and J.P. Abraham, Numerical Simulation of Microwave Ablation in the Human Liver, Heat Transfer in Biomedical Applications, edited by A. Andreozzi, M. Iasiello, V. Timochenko, and K. Vafai, published in *Processes*, Vol. 10, paper no. 361, 2022.

33. F. Salamsi, S. Shadkani, J.P. Abraham, F. Malekzadeh, Experimental Investigation For Determination of Discharge Coefficients for Inclined Slide Gates and Comparison with Data-Driven Models, *Iranian Journal of Science and Technology, Transactions of Civil Engineering*, Vol. 46, pp. 2495-2509, 2022.

34. F. Salamsi and J.P. Abraham, Multivariate Nonlinear Regression for Predicting Free Falling-Jet Scouring: An Experimental Study, Iranian Journal of Science and Technology, *Transactions of Civil Engineering*, (in press) doi: 10.1007/s40996-022-00817-w.

35. F. Salamsi, J.P. Abraham, A. Salamsi, Evaluation of Variable Speed Pumps in Pressurized Water Distribution Systems, *Applied Water Science*, Vol. 12, article no. 51, 2022.

36. J.P. Abraham, L. Cheng, P.L. Hudson, and A.N. Abraham, Assessing Burn Patterns and Severity Using IR Visualization – A Case Study Approach, *Journal of Forensic Science and Criminology,* Vol. 9, pp. 1-19, 2022.

37. J. P. Abraham, L. Cheng, L. Vallez, and T. Wei, Using Cadaver Temperatures to Estimate Time of Death, A Case-Specific Numerical Approach, *Journal of Forensic Sciences*, Vol. 67, pp. 1049-1059, 2022. (**Awarded JFS Noteworthy article of 2022**).

38. 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, pp. 373-385, 2022.

39. R. Daneshfaraz, S. Sadeghfam, E. Arminvash, and J.P. Abraham, Experimental Investigation of Multiple Supercritical Flow States and the Effect of Hysteresis on the Relative Residual Energy in Sudden and Gradual Contractions, *Iranian Journal of Science and Technology, Transactions of Civil Engineering*, doi: 10.1007/s40996-022-00818-9.

40. R. Daneshfaraz, E. Aminvash, R. Mirzaei, and J.P. Abraham, Predicting the Energy Dissipation of a Rough Sudden Expansion Rectangular Stilling Basin Using the SVM Algorithm, *Journal of Applied Research in Wastewater*, (in press). Doi: 10.22126/arww.2021.5886.1195.

41. A. Armanous, A. Negm, A. Javadi, J.P. Abraham, and T. Gado, Impact of Inclined Double-Cutoff Walls Under Hydraulic Structures on Uplift Forces, Seepage Discharge, and Exit Hydraulic Gradient, *Ain Shams Engineering Journal*, Vol. 13, paper no. 101531, 2022.

42. R. Daneshfaraz, S. Sadeghfam, V. Hasanniya, J.P. Abraham, and R. Norouzi, Experimental Investigation on Hydraulic Efficency of Vertical Droip Equipped with Vertical Screens, *Teknit Dergi*, Vol. 33, no. 5, 2022. DOI: 10.18400/tekderg.755938.

43. A. Ghaderi, M. Dasineh, R. Danesfaraz, and J.P. Abraham, Reply to the Discussion on Paper: 3-D Numerical Simulation of Water Flow over a Broad Created weir with Openings by Daneshfaraz et al 2019, *ISH Journal of Hydraulic Engineering*, Vol. 28,pp. 564-566, 2022.

44. F. Salamsi and J.P. Abraham, Discharge Coefficients for Ogee Spillways, Water Supply, Vol. 22, pp. 1255-1274, 2022.

45. R. Norouzi, P. Sihag, R. Daneshfaraz, J.P Abraham, and V. Hasanna, Predicting Relative Energy Dissipation for Vertical Drops Equipped with a Horizontal Screen Using Soft Computing Techniques, *Water Supply*, Vol. 22, pp. 1075-1093, 2022.

46. F. Malekzadeh, F. Salamsi, J.P. Abraham, and H. Arvanaghi, Numerical Investigation of the Effect of Geometric Parameters on Discharge Coefficients for Broad-Crested Weirs with Sloped Upstream and Downstream Faces, *Applied Water Science*, Vol. 12, paper no. 110, 2022.

47. F. Salamsi and J.P. Abraham, Genetic Algorithms to Optimizing Stepped Spillways to Maximize Energy Dissipation, *Water Supply*, Vol. 22, pp. 1255-1274, 2022.

48. Y. Liu, L. Cheng, Y. Pan, J.P. Abraham, B. Zhang, J. Zhu, and J. Song, Climatological seasonal variation of the upper ocean salinity, *International Journal of Climatology*, Vol. 42, pp. 3477-3498, 2022.

2021

49. M. Seifollahi, S, M. Lotfollahi-Yaghin, F. Kalateh, R. Daneshfaraz, S. Abbasi, and J.P. Abraham, Estimation of the Local Scour from a Cylindrical Bridge Pier Using a Compilation Wavelet Model and Artificial Neural Network, *Journal of Hydraulic Structures,* Vol. 7, pp. 1-22, 2021.

50. B. Ferry and J.P. Abraham, Mechanical Design of Long-Term Body-Adhered Medical Devices to Maximize On-Body Survival, *Journal of Biomedical Science and Engineering*, Vol. 19, pp. 325-337, 2021.

51. F. Salamsi, J.P. Abraham, and A. Salmasi, Effect of Stepped Spillways on Increasing Dissolved Oxygen in Water, an Experimental Study, *Journal of Environmental Management*, Vol. 299, paper 113600, 2021.

52. C. Garcia-Soto, L. Cheng, L. Caeser, E.B. Jewett, A. Cheripka, I.G. Rigor, A. Cabellero, S. Chiba, J.C. Baez, T. Zielinski, and J.P. Abraham, An Overview of Ocean Climate Change Indicators: Sea Surface Temperature, Ocean Heat Content, Ocean pH, Dissolved Oxygen Concentration, Artic Ice Extent, Thickness, and Volume, *Frontiers in Marine Science, Global Ocean and Future Ocean,* Vol. 8, paper 642372, 2022: doi: 0.3389/fmars.2021.642372, 2021.

53. J.P. Abraham, T. Wei, and Y. Wang, Layered Structure of Turbulent Natural Convection Over a Vertical Flat Plate, *International Journal of Heat and Mass Transfer*, Vol. 181, paper 121866, 2021.

54. F. Salamsi, F. Nahrain, J.P. Abraham, and A.T. Aghdam, Prediction of Discharge Coeefficients for Broad-Crested Weirs Using Expert Systems, *Journal of Hydraulic Engineering*, doi: 10.1080/09715010.2021.1983477.

55. F. Salamsi and J.P. Abraham, Closure to "Expert System for Determining Discharge Coefficients for Inclined Slide Gates Using Genetic Programming", *Journal of Irrigation and Drainage Engineering,* Vol. 147, paper no. 07021018, 2021.

56. L. Olsen, S. Bhattacharyya, L. Cheng, W. Minkowycz, and J. Abraham, Heat Transfer Enhancement for Internal Flows with a Centrally Located Circular Obstruction and the Impact of Buoyancy, *Heat Transfer Engineering* doi: 10.1080/01457632.2021.2016129.

57. F. Salamsi and J.P. Abraham, Closure to "Discharge Coefficients for Rectangular Broad-Crested Gabion Weirs: An Experimental Study", *Journal of Irrigation and Drainage Engineering*, Volume 147, 2021.

58. R. Daneshfaraz, E. Aminvash. S. Di Francesco, A. Najibi, and J.P. Abraham, Three-Dimensional Study of the Effect of Block Roughness Geometry on Inclined Drop, *Journal of Numerical Methods in Civil Engineering*, Vol. 6, pp. 1-9, 2021.

59. J.C.K. Tong, J.M.Y. Tse, J.P. Abraham, P.J. Jones, Correlation Between Simulations and Measuremants of an Eco-House Design for Mongolia, *Journal of Building Engineering*, Vol. 42, no. 10, paper no. 102774, 2021. DOI:10.1016/j.jobe.2021.102774.

60. R. Daneshfaraz, M. Abam, M. Heidarpour, S. Abbasi, M. Seifollahi, and J.P. Abraham, The Impact of Cables on Local Scouring of Bridge Piers Using Experimental Study and ANN, ANFIS Algorithms, *Water Supply* (in press). DOI:10.2166/ws2021.215

61. R. Daneshfaraz, E. Aminvash, A. Ghaderi, A. Kuriqi, and J.P. Abraham, Three-Dimensional Investigation of Hydraulic Properties of Vertical Drop in the Presence of Step and Grid Dissipators*, Symmetry, Computer Engineering Science and Symmetry Turbulence and Multiphase Flows*, Vol. 13, paper no. 895, 2021.

62. T. Wei, Y. Wang, and J.P. Abraham, Integral Properties of Turbulent Natural Convection over a Vertical Flat Plate, *International Communications in Heat and Mass Transfer*, Vol. 125, paper 105286, 2021.

63. R. Daneshfaraz, E. Aminvash, A. Ghaderi, M. Bagherzadeh, J.P. Abraham, SVM Performance in Predicting the Effect of Horizontal Screens on Vertical Hydraulic Performance of a Vertical Drop, *Applied Sciences*, Vol. 11, no. 9, paper no. 4238, 2021. DOI: 10.3390/app11094238.

64. F.Salamsi, M. Nouri, P. Sihag, and J.P. Abraham, Application of SVM, ANN, GRNN, RF, GP, and RT Models for Predicting Discharge Coefficients of Olique Sluice Gates Using Experimental Data, *Water Supply*, Vol. 21, pp. 232-248, 2021.

65. A. Aghdam, F. Salamsi, J.P. Abraham, and H. Arvanaghi, Effect of Drain Pipes on Uplift Force and Exit Hydraulic Gradient and the Design of Gravity Dams Using the Finite Element Method, *Geotechnical and Geological Engineering*, Vol. 39, pp. 3383-3399, 2021.

66. Z. Tan,F. Reseghetti, J.P. Abraham R. Cowley, K. Chen, J. Zhu, B. Zhang, and L. Cheng, Examining the Influence of Recording System on the Pure Temperature Error in XBT Data, *Journal of Atmospheric and Oceanic Technology,* Vol. 38, pp. 759-776, 2021.

67. R. Daneshfaraz, V. Hasannia, R. Norouzi, P. Sihag, S. Sadeghfam, and J.P. Abraham, Investigating the Effect of Horizontal Screen on Hydraulic Parameters of a Vertical Drop, Iranian Journal of Science and Technology, *Transactions of Civil Engineering*, Vol. 45, pp. 1909-1917, 2021.

68. 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. Reserghetti, 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 = 1057, top 1%, January 2021.**

69. M. Nouri, P. Sihag, F. Salamsi, and J.P. Abraham, Prediction of Homogeneous Earthen Slope Safety Factors Using the Forest and Tree Based Modeling, *Geotechnical and Geological Engineering*, Vol. 39, paper no. 04020148, 2021.

70. F. Salamsi, B. Nourani, J.P. Abraham, and R. Nouzi, Numerical Investigation of Relief Well Performance for Decreasing Uplift Pressure Under Embankment Dams, *International Journal of Environmental Science and Technology*, Vol. 18, pp. 2819-2830, 2021. doi: 10.1007/s13762-020-03030-2.

71. R. Daneshfaraz, M. Bagherzadeh, R. Esmaeeli, R. Norouzi, and J.P. Abraham, Study of the Performance of Support Vector Machine for Predicting Vertical Drop Hydraulic Parameters in the Presence of Dual Horizontal Screens, *Water Supply,* Vol. 21, pp. 217-231, 2021.

72. F. Salamsi, J.P. Abraham, Prediction of Discharge Coefficients for Sluice Gates Equipped With Different Geometry Sills Under the Gate Using Multiple Non Linear Regression (MNLR), *Journal of Hydrology*, Vol. 597, paper 125728, 2021. doi:10.1016/j.jhydrol.2020.125728.

73. F. Salamsi, N. Sabahi, and J. P. Abraham, Discharge Coefficients for Rectangular Broad Crested Gabion Weirs: An Expertimental Study, *Journal of Irrigation and Drainage Engineering,* Vol. 147, paper 04021001, 2021.

74. M. Asl, R. Daneshfaraz, J.P. Abraham, S. Valizadeh, Effects of Hydraulic Characteristics, Sedimentary Parameters, and Mining of Bed Material on Scour Depth of Bridge Pier Groups, *Joural of Performance of Constructed Facilities*, Vol. 35, paper no. 04020148, 2021.

75. 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 = 700, top 1%, July 2021.**

76. N. Sartipi, F. Salamsi, J. Abraham, and A.D. Dalir, Investigation of the Effect of Depth and Distance Between Cutoff Walls on Uplift Force for Gravity Dams, *International Journal of Environmental Science and Technology*, Vol. 18. pp. 1361-1378, 2021.

77. R. Daneshfaraz, R. Norouzi, M. Macedi, A. Bazyar, and J.P. Abraham, Laboratory Study of Energy dissipation in Inclined Drops with a Screen, *Journal of Applied Water Engineering and Research*, Vol. 9, pp. 184-193, 2021.

78. A. Ghaderi, R. Daneshfaraz, J.P. Abraham, and M. Torabi, Effect of Different Channels on Discharge Coefficient of Labyrinth Weirs, *Teknik Dergi*, Vol. 32 paper no. 626, pp. 11081-11096, 2021.

2020

79. A. Ghaderi, R. Daneshfaraz, S. Abbasi, and J.P. Abraham, Numerical Analysis of the Hydraulic Characteristics of Modified Labyrinth Weirs, *International Journal of Energy and Water Resources*, Vol. 4, pp. 425-436, 2020.

80. F. Salamsi and J.P. Abraham, An Expert System for Determining Discharge Coefficients for Inclined Slide Gates Using Genetic Programing, *Journal of Irrigation and Drainage Engineering*, Vol. 146, paper number 060200013, 2020.

81. A. Ghaderi, M. Shokri. J.P. Abraham, Estimation of Actual Evapotranspiration Using Remote Sensing Method and SEBAL Algorithm- A Case Study: Ein Khosh Plain, Iran, *Hydrology*, Vol. 7, doi: 10.3390/hydrology7020036, 2020.

82. F. Salamsi, M. Nouri, and J.P. Abraham, Upstream Cutoff and Downstream Filters to Control Seepage in Dams, *Water Resources Management*, Vol. 34, pp. 4271-4288, 2020.

83. L. Cheng, K.E. Trenberth, N. Gruber, M.E. Mann, J.P. Abraham, J.T Fasullo, G. Li, X. Zhao, and J. Zhu, Improved Estimates of Changes in Upper Ocean Salinity and the Hydrological Cycle, *Journal of Climate*,Vol.33, pp. 10357-10381, 2020.

84. F. Salamsi, R. Norouzi, J.P. Abraham, B. Nourani, S. Samadi, Effect of Inclined Clay Core on Embankment Dam Seepage and Stability Through LEM and FEM, *Geotechnical and Geological Engineering*, Vol. 38, pp. 6571-6586, 2020.

85. A. Ghaderi, R. Daneshfaraz, S. Abbasi, and J.P. Abraham, Numerical Analysis of the Hydraulic Characteristics of Modified Labyrinth Weirs, *International Journal of Energy and Water Resources,* Vol. 4, pp. 425-436, 2020.

86. 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 = 376, top 1%, July, 2021.**

87. A. Ghaderi, R. Daneshfaraz, M. Torabi, J.P. Abraham, and H.M. Azamathulla, Experimental Investigation on Effectiving Scouring Parameters Downstream from Stepped Spillways, *Water Supply*, Vol. 20, pp. 1988-1998, 2020.

88. F. Salamsi, and J.P. Abraham, Predicting Seepage from Unlined Earthen Channels Using the Finite Element Method and Multi Variable Nonlinear Regression, *Agriculatural Water Management*, Volume 234, Paper no. 106148, 2020.

89. F. Salamsi, B. Naourani, and J.P. Abraham, Investigation of the Effect of Different Configurations of Double-Cutoff Walls Beneath Hydraulic Structures on Uplift Forces and Exit Hydraulic Gradients, *Journal of Hydrology*, vol. 586, dpo: 10.1016/j.hydrol.2020.123858, 2020.

90. A. Ghaderi, S. Abbasi, J.P. Abraham, H. M. Azamathulla, Efficiency of Trapezoidal Labyrinth Shaped Stepped Spillways, *Flow Measurement and Instrumentation*, paper no. 101711, 2020, doi: 10.1016/j.flowmeasinst.2020.101711.

91. 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. Recipient of the 2022 AAS Esteemed News and Views Award).**

92. F. Salamsi, and J.P. Abraham, Discussion of "Hydrodynamics of Rectangular Broad-Crested Porous Weirs" by Akbar Safarzadeh and Seyed Hossein Mohajeri, *J. Irrig. Drain. Eng*. Vol. 146, paper no. 07020004, 2020.

93. R. Daneshfaraz, M.M. Asl, S. Razmi, R. Norouzi, and J.P. Abraham, Experimental Investigation of the Effect of Dual Horizontal Screens on the Hydraulic Performance of a Vertical Drop, *International Journal of Environmental Science and Technology*, Vol. 17, pp. 2927-2937, 2020.

94. J.M. Gorman, et al., Memoriam, Ephraim Sparrow, *International Journal of Heat and Mass Transfer*, Vol. 148, article no. 18755, 2020.

95. F. Salmasi, J.P. Abraham, Discharge Coefficients for Ogee Weirs Including the Effects of a Sloping Upstream Face, *Water Science and Engineering*, doi: 10.2166/ws.2020.064, 2020.

96. F. Salamsi, and Abraham J.P., Discussion of "Hydrodynamics of Retangular Broad-Crested Porous Weirs" by Akbar Safrazadeh and Seyed Moharjeri, *Journal of Irrigation and Drainage Engineering*, Vol. 146, doi: 10.1061/%28ASCE%29IR.1943-4774.0001450, 2020.

97. R. Daneshfaraz, E. Aminvash, R. Esmaeli, S. Sadeghfam, and J.P. Abraham Experimental and Numerical Investigation for Energy Dissipation of Supercritical Flow in Sudden Contractions*, Journal of Groundwater Science and Engineering*, Vol. 8, pp. 396-404, 2020.

98. R. Daneshfaraz, O. Minaeri, J.P. Abraham, and S. Dadashi, 3-D Numerical Simulation of Flow Over a Broad-Crested Weir with Opening, *Journal of Hydraulic Engineering*, Vol. 24, doi: 10.1080/09715010.1581098, 2020.

2019

99. A. Ghaderi, M. Dasineh, S. Abbasi, and J.P. Abraham, Investigation of Trapezoidal Sharp-Crested Weir Discharge Coefficients Under Subcritical Flow Regimes, *Applied Water Science*, Vol. 10, article no. 31, 2019.

100. G. Li, Y. Zhang, J. Xiao, J.P. Abraham, L. Cheng, and J. Zhu, Examining the Salinity change in the upper Pacific Ocean During the Argo Period, *Climate Dynamics* Vol. 53, pp. 6055-6074, 2019.

101. J.P. Abraham, K. Diller, A Review of Hot Beverages – Satisfying Consumer Preferences and Safety, *J. Food Science*, Vol. 84, pp. 2011-2014, 2019.

102. J.M. Gorman, et al., In Memoriam, Ephraim M. Sparrow (May 27, 1928 – August 1, 2019), *Numerical Heat Transfer Part A*, Vol. 76, pp. 181-184, 2019.

103. F. Jafari, F. Salamsi, and J.P. Abaham, Numerical Investigation of Granular Filer Under the Bed of a Canal, *Applied Water Science*, Vol. 9, Article no. 137, 2019

104. J. P. Abraham, Heat risks associated with synthetic fields, *International Journal of Hyperthermia*, Vol. 24, pp. 516-517, 2019.

105. T. Wei and J.P. Abraham, Heat Transfer Regimes in Fully Developed Circular tube flows, a map of flow regimes, *International Communications in Heat and Mass Transfer*, Vol. 104, 147-152, 2019.

106. B.D. Plourde, A. Gikling, T. Marsh, M.A. Riemenschneider, J.L. Fitzgerald, W.J. Minkowycz, J. Kiplagat, J.P. Abraham, Design and Evaluation of a Concentrated Solar-Powered Thermal-Pasteurization System, *Journal of Solar Energy Research*, Vol. 6, pp. 34-42, 2019.

107. E. Dodangeh, K. Shahedi, K. Solalani, J.T., Shiu, J.P. Abraham, Data-Based Bivariate Uncertainty Assessment of Extreme Rainfall-Runoff Using Copulas: Comparison Between Annual Maximum Series (AMS) and Peaks Over Threshold (POT), *Environmental Monitoring and Assessment*, Vol. 191:67, 2019.

108. F. Salamsi, M. Nouri, and J.P. Abraham, Laboratory Study of the Effect of Sills on Radial Gate Discharge Coefficient, *KSCE Journal of Civil Engineering*, Vol. 23, pp. 2117-2125, 2019.

109. Benoit et al., Measuring Global Ocean Heat Content to Estimate the Earth Energy Imbalance, *Frontiers in Marine Science*, *OceanObs'19: An Ocean of Opportunity*, Vol. 6, pp. 198-228, doi: 10.3389/fmars.2019.00432, 2019.

110. 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.**

111. L.Cheng, G. Wang, J.P. Abraham, G. Huang, Decadal Ocean Heat Redistribution Since the Late 1990s and its Association with Key Climate Modes, *Climate*, Vol. 6, 91, 2019 (editor's choice award winner).

112. 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, ranked 18 out of the top 30 papers in the field of Global Sustainabilty.**

113. J.P. Abraham, E.M. Sparrow, J.M. Gorman, Y. Zhao, and W.J. Minkowycz, Application of an Intermittency Model for Laminar, Transitional, and Turbulent Internal Flows, *Journal of Fluids Engineering*, Vol. 141, paper no. 071204, 2019.

114. J.P. Abraham, J. R. Stark, J.M. Gorman, E. M. Sparrow, W.J. Minkowycz, Tissue Burns Due to Contact Between a Skin Surface and Highly Conducting Metallic Media in the Presence of Inter-Tissue Boiling, *Burns*, Vol. 45, pp. 369-378, 2019.

115. J.M. Gorman, E. M. Sparrow, C.J. Smith, A. Ghoash, J.P. Abraham, R. Daneshfaraz, A. Rezazedeh Joudi, In-Bend Pressure Drop and Post-Bend Heat Transfer for a Bend with a Partial Blockage at its inlet, *Numerical Heat Transfer A*, Vol. 73, pp. 743-767, 2018.

116. A. Bahro, Z. Igyarto, C. Williams, J.P. Abraham, and B.J. Martinsen, Treatment of Critical Hand Schemia via Orbital Atherectomy and Focal Force Balloon Angioplasty: A Mini-Review, *Cardiovascular Revascularization Medicine*, Vol. 20, pp. 248-253, 2019.

2018

117. J.P. Abraham, R. Maki, Hydrodynamics of Laminar Flow Through Dimpled Pipes, *MOJ Civil Engineering*, Vol. 4, pp. 150-154, 2018.

118. L. Cheng, H. Luo, T. Boyer, R. Cowley, J. Abraham, V. Gouretski, F. Reseghetti, and J. Zhu, How Well Can We Correct Systematic Errors in Historical XBT Data? *Journal of Atmospheric and Oceanic Technology*, Vol. 35, pp. 1103-1125, 2018.

119. G. Wang, L. Cheng, J.P. Abraham, C. Li, Consensuses and Discrepancies of Basin-Scale Ocean Heat Content Changes in Different Ocean Analyses, *Climate Dynamics*, Vol. 50, pp. 2471-2487, 2018

120. R. Daneshfaraz, A.R. Joudi, J.P. Abraham, Numerical Investigation on the Effect of Sudden Contraction on Flow Behavior in a 90-Degree Bend, *Korean Journal of Civil Engineering*, Vol. 22, pp 603-612, 2018.

121. M. T. Sattari, A. Farkhondeh, and J.P. Abraham, Estimation of Sodium Adsorption Ratio Indicator Using Data Mining Methods: A Case Study in Urmia Lake Basin, Iran, *Environmental Science and Pollution Research*, Vol. 25, pp. 4776-4786, 2018.

122. M.T. Sattari, R. Misabbasi, R. S. Sushab, and J.P. Abraham, Prediction of Groundwater Level in the Ardebil Plain Using Support Vector Regression and the M5 Tree Model, *Groundwater Journal,* Vol. 56, pp. 636-646, 2018.

123. L. Cheng, K.E. Trenberth, J. T. Fasullo, J.P. Abraham, T.L. Boyer, K. von Schuckmann, and J. Zhu, Taking the Pulse of the Planet, *EOS,* Vol. 98, pp 14-15, 2018.

124. J.P. Abraham, B.D Plourde, L. J. Vallez, Comprehensive Review and Study of Buoyant Air Flow Within Positive-Pressure Hospital Operating Rooms, *Numerical Heat Transfer A*, Vol. 72, pp. 1-20, 2018.

125. M.R. Sattari, M. Pal, R. Mirabbasi, and J.P. Abraham, Ensemble of M5 Model Tree Based Modelling of Sodium Adsorption Ratio, *Journal of Artificial Intelligence and Data Mining*, Vol. 6, pp. 69-78, 2018.

2017

126. J.P. Abraham, A Global Warming Primer: Answering Your Questions about the Science, the Consequences, and the Solutions, *Physics Today*, Vol. 70, no. 3, 2017.

127. M.R. Sattari, Dodangeh, and J.P. Abraham, Estimation of Daily Soil Temperature Via Data Mining Techniques in Semi-Arid Climate Conditions, *Earth Sciences Research Journal*, Vol. 21, pp. 85-93, 2017.

128. J.P. Abraham, L. Cheng, M.E. Mann, Future Climate Projections Allow Engineering Planning, *Forensic Engineering*, Vol. 170, pp. 54-57, 2017.

129. B.D. Plourde, L.J. Vallez, B. B. Nelson-Cheeseman, J.P. Abraham, Transcutaneous Recharge: A Comparison of Numerical Simulation to In Vivo Experiments *Neuromodulation*, Vol. 20, pp. 613-621, 2017.

130. E.M. Sparrow, B.B Nelson-Cheeseman, W.J. Minkowycz, J.M. Gorman, and J.P. Abraham, Use of Multi-Lumen Catheters to Preserve Injected Stem Cell Viability and Injection Dispersion*, Cardiovascular Revascularization Medicine*, Vol. 18, pp. S49-S57, 2017.

131. L.J. Vallez, B.D. Plourde, J.E. Wentz, B. B. Nelson-Cheeseman, J.P. Abraham, A Review of Scald Burn Injuries, *Internal Medicine Review*, Vol. 3, pp. 1-18, 2017.

132. R. Daneshfaraz, H. Sadeghi, A. R. Joudi, J.P. Abraham, Experimental Investigation of Hydraulic Jump Characteristics in Contractions and Expansions, *Sigma Journal of Engineering and Natural Sciences*, Vol. 35, pp. 87-98, 2017.

133. 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.**

134. J.M. Gorman, E., M. Sparrow, J.P. Abraham, W.J. Minkowycz, Heat Transfer Design Methodology Treating a Heat Exchanger Device and its Fluid-Mover Partner as a Single System, *Heat Transfer Engineering*, Vol. 38, pp. 841-852, 2017.

135. R.T. Bourdon, B.B. Nelson-Cheeseman, and J.P. Abraham, Review on the Treatment and Avoidance of Scald Injuries, *World Journal of Dermatology*, Vol. 6, pp. 17-26, 2017.

2016

136. B.D. Plourde, J.R. Stark, J. P. Abraham, A New Catheter Technology to Deliver Vascular Stem-Cells, *Global Journal of Stem Cell Biology and Transplantation*, Vol. 2, pp. 7-16, 2016.

137. J.R. Stark, S.R. Romero, J.M. Gorman, J.P. Abraham, E.M. Sparrow, Modulated-Power Implantable Neuromodulation Devices and Their Impact on Surrounding Tissue Temperatures, *Journal of Biomedical Science and Engineering*, Vol. 9, pp. 545-562, 2016.

138. L. Cheng, K.E. Trenberth, M.D. Palmer, J. Zhu, and J.P. Abraham Observed and Simulated Full-Depth Ocean Heat Content Changes for 1970-2005, *Ocean Sciences*, Vol. 12, pp. 925-935, 2016.

139. J.M. Gorman, E.M. Sparrow, J.P. Abraham, W. J. Minkowycz, Evaluation of the Efficacy of Turbulence Models for Swirling Flows and Effect of Turbulence Intensity on Heat Transfer, *Numerical Heat Transfer B*, Vol. 70, pp. 485-502, 2016.

140. J.P. Abraham, B.B. Nelson Cheeseman, E. M. Sparrow, J.E. Wentz, J.M. Gorman, S. E. Wolf, Comprehensive Method to Predict and Quantify Scald Burns from Beverage Spills, *Int. J. Hyperthermia*, Vol. 32, pp. 900-910, 2016.

141. B.D. Plourde, L.J. Vallez, B. Sun, B.B. Nelson-Cheeseman, J.P. Abraham, Alterations of Blood Flow Through Arteries Following Atherectomy and the Impact on Pressure Variation and Velocity, *Cardiovascular Engineering and Technology*, Vol. 7, pp. 280-289, 2016.

142. N.K. Langat, T. Thorusa, J.P. Abraham, J. Wanyoko, Performance of an Improved Fluidized System for Processing Green Tea, *World Academy of Science Engineering and Technology*, Vol. 10, 1045-1050, 2016.

143. L. Cheng, J. Abraham, G. Goni, T. Boyer, S. Wijffels, R. Cowley, V. Gouretski, F. Reseghetti, S. Kizu, S. Dong, F. Bringas, M. Goes, L. Houpert, J. Sprintall, and J. Zhu, XBT Science: Assessment of XBT Biases and Errors, *Bulletin of the American Meteorological Society*, Vol. 97, pp. 924-933, 2016.

144. J.P. Abraham, R. Cowley, L. Cheng, Quantification of the Effect of Water Temperature on the Fall Rate of eXpendable BathyThermographs, *Journal of Atmospheric and Oceanic Technology*, Vol. 6, pp. 1271-1284, 2016.

145. R.T. Bourdon, B.B. Nelson-Cheeseman, and J.P. Abraham, Prediction, Identification, and Initial Treatment Guidelines for Scald Injuries, *Austin Journal of Emergency and Critical Care Medicine, Special Issue on Burns*, Vol. 3, pp. 1043-1049, 2016.

146. J.C.K. Tong, J.P. Abraham, J.M.Y. Tse, W.J. Minkowycz, and E.M. Sparrow, New Archive of Heat Transfer Coefficients from Square and Chamfered Cylinders in Crossflow, *International Journal of Thermal Sciences*, Vol. 105, pp. 218-223, 2016.

147. L. Cheng, K.E. Trenberth, M.D. Palmer, J. Zhu, and J.P. Abraham, Observed and Modeled Ocean Heat Content Changes Since 1970, *Ocean Sciences,* Vol 12, pp. 925-936, 2016.

148. R. Daneshfaraz, A. Ghahramanzadeh, A. Ghaderi, A. Rezazadeh Joudi, and J.P. Abraham, Investigation of the Effect of Edge Shape on Characteristics of Flow Under Vertical Gates, *Journal AWWA*, Vol. 8, pp. E425-432, 2016.

149. J.P. Abraham, B.D. Plourde, L.J. Vallez, and B.B. Nelson-Cheeseman, Correcting a Prevalent Misunderstanding of Burns, *Burns*, Vol. 42, pp. 715-716, 2016.

150. J. P. Abraham and B.D. Plourde, Validation of Numerically Simulated Tissue Temperatures During Transcutaneous Recharge of Neurostimulation Systems, *Journal of Neuromodulation*, Vol. 19, pp. 161-170. 2016.

151. L.J. Vallez, B.D. Plourde, and J.P. Abraham, A New Computational Thermal Model for the Whole Human Body: Applications to Patient Warming Blankets, *Numerical Heat Transfer A*, Vol. 69, pp. 227-241, 2016.

2015

152. J.P. Abraham, B.D. Plourde, B. Sun, L.J. Vallez, and C.S. Staniloae, The Effect of Plaque Removal on Pressure Drop and Flowrate Through a Stenotic Lesion*, Biology and Medicine,* Vol. 8, article no. 1000261, 2015.

153. L.J. Vallez, B. Sun, B.D. Plourde, J.P. Abraham, and C.S. Staniloae, Numerical Analysis of Arterial Plaque Thickness and its Impact on Artery Wall Compliance, *J. Cardiovascular Medicine and Cardiology*, Vol. 2, pp. 26-34, 2015.

154. D. Nguyen, J. M. Gorman, E.M. Sparrow, and J.P. Abraham, Convective Heat Transfer Enhancement Versus Disenhancement: Impact of Fluid-Mover Characteristics, *Applied Thermal Engineering,* Vol. 90, pp. 242-249, 2015.

155. B. Sun, L.J. Vallez, D.B. Plourde, J. R. Stark, and J.P. Abraham, Influence of Supporting Tissue on the Deformation and Compliance of Healthy and Diseased Arteries, *Journal of Biomedical Science and Engineering*, Vol. 8, pp. 490-499, 2015.

156. J.P. Abraham, B.D Plourde, L.J. Vallez, J.R. Stark, and K. R. Diller, Estimating the Time and Temperature Relationship for Causation of Deep-partial Thickness Skin Burns, *Burns*, Vol. 41, pp. 1741-1747, 2015.

157. G. Foster and J.P. Abraham, Lack of Evidence for a Slowdown in Global Temperature, US Climate Variability and Predictability Program (CLIVAR) Summer 2015, Vol. 13, pp. 6-9, 2015.

158. L. Cheng, J. Zhu, and J.P. Abraham, Global Upper Ocean Heat Content Estimation: Recent Progresses and the Remaining Challenges, *Atmospheric and Oceanic Science Letters*, Vol. 8, pp. 333-338, 2015.

159. M. Richardson, Z. Hausfather, D.A. Nuccitelli, K. Rice, and J.P. Abraham, Misdiagnosis of Earth Climate Sensitivity Based on Energy Balance Model Results, *Science Bulletin*, Vol. 60, pp. 1360-1377, 2015.

160. B.D. Plourde and J.P. Abraham, Design and Development of a New Cell Infusion Catheter, *World Biomedical Frontiers*, ISSN:2328-0166, 2015.

161. B.D. Plourde, J.P. Abraham, and W.J. Minkowycz, Continuous Flow Solar Thermal Pasteurization of Drinking Water: Methods, Devices, Microbiology, and Analysis, *Renewable Energy,* Vol. 81, pp. 795-803, 2015.

162. J.M. Gorman, M. Carideo, E.M. Sparrow, and J.P. Abraham, Heat Transfer and Pressure Drop Comparison of Louver- and Plain-finned Heat Exchangers Where One Fluid Passes Through Flattened Tubes, *Case Studies in Thermal Engineering,* Vol. 5, pp. 122-126, 2015.

163. J.C.K. Tong, J.P. Abraham, J.M.Y. Tse, and E.M. Sparrow, Impact of Chamfer Contours to Reduce Column Drag, *Engineering and Computational Mechanics*, Vol. 168, pp. 79-88, 2015.

164. D. Egbe, T. Mayah, E. Ebota, P. Egbe, J. Abraham, Performance Evaluation and Improvement on a Melon Seed Shelling Machine, *World Journal of Agricultural Sciences and Engineering*, Vol. 1, pp. 157-10, 2015.

165. A. Lundardelli, J.E. Wentz, J.P. Abraham, and B.D. Plourde, Shielding Nozzle Design and Analysis for Atomization-Based Cutting Fluid Systems in Micromachining, *ASME Journal of Micro- and Nano-Manufacturing*, Vol. 3, paper no. 024501, 2015.

166. N. Langat, T. Thoruwa, J. Wanyoko, J. Kiplagat, B.D Plourde, and J.P. Abraham, Models and Experiments for Energy Consumption and Quality of Green Tea Drying, *Energy Science and Engineering*, Vol. 3, 43-50, 2015.

167. T. Scambos and J.P. Abraham, Antarctic Ice Sheet Mass Loss and Future Sea Level Rise, *Forensic Engineering, Proceedings of the Institute of Civil Engineers*, Vol. 168, pp. 81-84, 2015.

168. J.P. Abraham, J.R. Stark, W.J. Minkowycz, Extreme weather: Observations of Precipitation Changes in the USA, *Forensic Engineering, Proceedings of the Institution of Civil Engineers*, Vol. 168, pp. 68-70, 2015.

2014

169. N. Dib, D.B. Schwalbach, B.D. Plourde, R.E. Kohler, D. Dana, and J.P. Abraham, Impact of Balloon Inflation Pressure on Cell Viability with Single and Multi Lumen Catheters, *Cardiovascular Translation Research*, Vol. 7, pp. 781-787, 2014.

170. J.P. Abraham, J.T. Fasullo, and G. Laden, Continued Global Warming in the Midst of Natural Climate Fluctuations, *Reports of the National Center for Science Communication*, 34(6), 2014.

171. N. Dib, J.P. Abraham, B.D. Plourde, D.B. Schwalbach, D. Dana, L. Myers, K. Hunkler, S.R. D'Silva, T.R. Flower, and R.E. Kohler, TCT-155 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, *Journal American College of Cardiology*, Vol. 64, 11, 2014.

172. J.P. Abraham, B.D. Plourde, and J.R. Stark, Cryosurgical Treatment of Cancer: The Importance of Modeling, *Journal of Cancer Science and Therapy,* Vol. 6, 2014 (abstract).

173. J.P. Abraham, S. Kumar, B.R. Bickmore, and J.T. Fasullo, Issues Related to the Use of One-Dimensional Ocean Diffusion Models for Determining Climate Sensitivity, *Journal of Earth Science and Climate Change*, Vol. 5, paper 1000220, 2014.

174. T. Shepard, J.P. Abraham, D.S. Schwalbach, S. Kane, D. Sigling, and T. Harrington, Velocity and Density Effect on Impact Force During Water Entry of Spheres, *Journal of Geophysics and Remote Sensing*, Vol. 3, paper no. 1000129, 2014.

175. D.S. Schwalbach, T. Shepard, S. Kane, D. Siglin, T. Harrington, and J.P. Abraham, Effect of Impact Velocity and Mass Ratio During Vertical Sphere Water Entry, *Developments and Applications of Oceanic Engineering*, Vol. 3, 55-62, 2014.

176. J.P. Abraham, B.D. Plourde, J.R. Stark, and W.J. Minkowycz, Improvements to the Quality and Quantity of Ocean Heat Content Measurements, *Journal of Earth Science and Climate Change,* Vol. 5, pp. 100, 2014 (abstract).

177. J.P. Abraham, B.D. Plourde, and K.E. Trenberth, Closing Earth's Energy Balance, *Journal of Earth Science and Climate Change*, Vol. 5, pp. 69, 2014 (abstract).

178. J.M. Gorman, E.M. Sparrow, and J.P. Abraham, Temperature Determination by Means of Optoacoustic Measurements, *Studies in Engineering and Technology*, Vol. 1, 15-20, 2014.

179. J.M. Gorman, E.M. Sparrow, and J.P. Abraham, Slot Jet Impingement Heat Transfer in the Presence of Jet Axis Switching, *International Journal of Heat and Mass Transfer,* Vol. 78, 50-57, 2014.

180. J.P. Abraham, A review of the HANDY Study, *Cosmopolis*, Vol. 2014-1, pp. 8-87, 2014.

181. J.P. Abraham, Climate Change in the Midwest: Impacts, Risks, Vulnerabilities, and Adaptation. A Review of New Biological Books, *The Quarterly Review of Biology*, Vol. 89, pp. 171-172, 2014.

182. B.D. Plourde, D.B. Schwalbach, J.P. Abraham, and R.E. Kohler, Intracoronary Injection of Medication from Multi-lumen Injection Catheters, *Journal of Medical Devices,* Vol. 8, paper number 020901, 2014.

183. J.P. Abraham, J. Cook, J. T. Fasullo, P. H. Jacobs, S. A. Mandia, and D. A Nuccitelli, Review of the Consensus and Asymmetric Quality of Research on Human-Induced Climate Change, *Cosmopolis*, Vol. 2014-1, pp. 3-18, 2014.

184. B.L. Viglianti, M.W. Dewhirst, J.M. Gorman, and J.P. Abraham, E.M. Sparrow, Rationalization of Thermal Injury Quantification Methods: Application to Skin Burns, *Burns*, Vol. 40, pp. 896-902, 2014.

185. N.M. Naughton, B.D. Plourde, J.R. Stark, S. Hodis, and J. P. Abraham, Impacts of Waveforms on the Fluid Flow, Wall Shear Stress, and Flow Distribution in Cerebral Aneurysms and the Development of a Universal Reduced Pressure, *J. Biomedical Science and Engineering*, Vol. 7, 7-14, 2014.

186. J.M. Gorman, J.P. Abraham, D. B. Schwalbach, T. S. Shepard, J.R. Stark, and F. Reseghetti, Experimental Verification of Drag Forces on Spherical Objects Entering Water, *Journal of Marine Biology and Oceanography*, Vol. 3, paper no. 1000126, 2014.

187. S. Beacher, E.M. Sparrow, J.M. Gorman, and J.P. Abraham, Theory and Numerical Simulation in Thermochemical Ablation, *Numerical Heat Transfer Part A*, Vol. 66, pp. 131-143, 2014.

188. J.P. Abraham, J.M. Gorman, F. Reseghetti, E.M. Sparrow, J.R. Stark, and T.G. Shepard, Modeling and Numerical Simulation of the Forces Action on a Sphere During Early-Water Entry, *Ocean Engineering,* Vol. 76, 1-9, 2014.

189. J.M. Gorman, J.P. Abraham, and E.M. Sparrow, A Novel, Comprehensive Numerical Simulation for Predicting Temperatures Within Boreholes and the Adjoining Rock Bed, *Geothermics*, Vol. 50, pp. 213-219, 2014.

2013

190. J.P. Abraham, B.D. Plourde, G.S. Mowry, and E.M. Sparrow, Experimental Test of Multi-Stage Vertical Axis Turbines for Cellular Communication Applications, *ASME Proceedings,* Paper Number ES2012-91025, pp. 1333-1339, 2013.

191. D.B. Schwalbach, B.D. Plourde, J.P. Abraham, and R.E. Kohler, Drug Dispersion for Single- and Multi-Lumen Catheters, *Journal of Biomedical Science and Engineering*, Vol. 6, pp. 1021-1028, 2013.

192. N. Dib, R.E. Kohler, J.P. Abraham, B.D. Plourde, D.B. Schwalbach, D. Dana, B.J. Baird, T.R. Flower, L. Myers, and K. Hunkler, TCT-811 Stem Cell Viabilitiy Significantly Reduced After Passing Through a Standard Single Lumen Over-the-Wire 0.014 Balloon Angioplasty Cather, *Journal of the American College of Cardiology*, Vol. 62, B246, 2013.

193. D.A. Nuccitelli, J.P. Abraham, R.E. Benestad, and S.A. Mandia, Comment on: Akasofu, S.-I. On The Present Halting of Global Warming, *Climate*, Vol. 1, pp. 76-83, 2013.

194. J.M. Gorman, E. M. Sparrow, and J.P. Abraham, Differences Between Measured Pipe Wall Surface Temperatures and Internal Fluid Temperatures, *Case Studies in Thermal Engineering,* Vol. 1, 13-16, 2013.

195. J.R. Stark, J.M. Gorman, E.M. Sparrow, J.P. Abraham, and R.E. Kohler, Controlling the Rate of Penetration of a Therapeutic Drug Into the Wall of an Artery by Means of a Pressurized Balloon, *Journal of Biomedical Science and Engineering*, Vol. 6, pp. 527-532, 2013.

196. 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 = 173, top 5%, January 2021.**

197. J.P. Abraham, J.R. Stark, J.M. Gorman, E.M. Sparrow, and R.E. Kohler, A Model of Drug Deposition Within Artery Walls, *J. Medical Devices*, Vol. 7, paper no. 020902, 2013.

198. E.M. Sparrow, N.T. Littlejohn, J.M. Gorman, and J.P. Abraham, Mass Transfer and Particle Separation by Swirl-Chamber and Swirl-Tube Devices, *Numerical Heat Transfer A,* Vol. 64, 611-620, 2013.

199. E.M. Sparrow, J. M. Gorman, and J.P. Abraham, Quantitative Assessment of the Overall Heat Transfer Coefficient U, *Journal of Heat Transfer*, Vol. 135, paper no. 061102, 2013.

200. J.P. Abraham, E.M. Sparrow, J.M. Gorman, J.R. Stark, and R. E. Kohler, A Mass Transfer Model of Temporal Drug Deposition in Artery Walls, *International Journal of Heat and Mass Transfer*, Vol. 58, pp. 632-638, 2013.

201. R.R. Rend, E. M. Sparrow, D. W. Bettenhausen, and J. P. Abraham, Parasitic Pressure Losses in Diffusers and in Their Downstream Piping Systems for Fluid Flow and Heat Transfer, *International Journal of Heat and Mass Transfer*, Vol. 61, pp. 56-61, 2013.

2012

202. E.M. Sparrow, J.M. Gorman, K.S. Friend, and J.P. Abraham, Flow Regime Determination for Finned Heat Exchanger Surfaces with Dimples/Protrusions, *Numerical Heat Transfer*, Vol. 63, pp. 245-256, 2012.

203. B.D. Plourde, J.P. Abraham, G.S. Mowry, and W.J. Minkowycz, Simulations of Three-Dimensional Vertical-Axis Turbines for Communications Applications, *Wind Engineering*, Vol. 36, pp. 443-454, 2012.

204. J.P. Abraham, B.D. Plourde, G.S. Mowry, and W.J. Minkowycz, Summary of Savonius Wind Turbine Development and Future Applications for Small-Scale Power Generation, *Journal of Renewable and Sustainable Energy*, Vol. 4, paper no. 042703, 2012.

205. J.M. Gorman, EM. Sparrow, J.P. Abraham, and G.S. Mowry, Operating Characteristics and Fabrication of a Uniquely Compact Helical Heat Exchanger, *Applied Thermal Engineering*, Vol. 5, pp. 1070-1075, 2012.

206. E.M. Sparrow, J.M. Gorman, A. Trawick, and J.P. Abraham, Novel Techniques for Measurements of Thermal Conductivity of Both Highly and Lowly Conducting Media, *International Journal of Heat and Mass Transfer*, Vol. 55, pp. 4037-4042, 2012.

207. J.P. Abraham, J.M. Gorman, F. Reseghetti, E.M. Sparrow, and W.J. Minkowycz, Drag Coefficients for Rotating Expendable Bathythermographs and the Impact of Launch Parameters on Depth Predictions, *Numerical Heat Transfer A*, Vol. 62, pp. 25-43, 2012.

208. M. Nelson and J.P. Abraham, Hemodynamics of AV Grafts for Hemodialysis Access, *Journal of Medical Devices,* Vol. 6, article no. 017553, 2012.

209. J.P. Abraham and J. Jeske, Cryosurgical Simulations for Ablation of Kidney Tumors, *Journal of Medical Devices,* Vol. 6, article no 017504, 2012.

210. J.P. Abraham, J.M. Gorman, F. Reseghetti, W.J. Minkowycz, and E. M. Sparrow, Turbulent and Transitional Modeling of Drag on Oceanographic Measurement Devices, *Computational Fluid Dynamics and its Applications* 2012, article ID 567864, doi:10.1155/2012/567864.

2011

211. J.P. Abraham, J.M. Gorman, F. Reseghetti, K.E. Trenberth, and W.J. Minkowycz, A New Method of Calculating Ocean Temperatures Using Expendable Bathythermographs*, Energy and Environment Research*, Vol. 1, pp. 2-11, 2011.

212. J.R. Stark, J.M. Gorman, M.P. Hennessey, F. Reseghetti, J. Willis, J. Lyman, J.P. Abraham, and M. Borghini, A Computational Method for Determining XBT Depths, *Ocean Sciences*, Vol. 7, pp. 733-743, 2011.

213. B.D. Plourde, J. P. Abraham, G.S. Mowry, and W.J. Minkowycz, Use of Small-Scale Wind Energy to Power Cellular Communication Equipment, *Sensors and Transducers*, Vol. 13, pp. 53-61, 2011.

214. J.P. Gorman, E.M. Sparrow, G.S. Mowry, and J.P. Abraham, Simulation of Helically Wrapped, Compact Heat Exchangers, *Journal of Renewable and Sustainable Energy*, Vol. 3, article no. 043120, 2011.

215. R.D. Lovik, J.P. Abraham, and E.M. Sparrow, Surrogate Human Tissue Temperatures Resulting from Misalignment of Antenna and Implant During Recharging of a Neuromodulation Device, *Journal of Neuromodulation*, Vol. 14, pp. 501-511, 2011.

216. K.E. Trenberth, J.T Fasullo, and J.P. Abraham, Issues in Establishing Climate Senstivity in Recent Studies, *Remote Sensing,* Vol. 3, pp. 2051-2055, 2011.

217. R.D. Lovik, E. M. Sparrow, J. P. Abraham, C. Zelmer, S. Oh, K. Friend, and D. K. Smith, Effect of Component Misalignment on Human Tissue Temperatures Associated with Recharged Nueromodulation Devices, *Journal of Medical Devices*, Vol. 5, 0207516, 2011.

218. T. Gebreegziabher, E.M. Sparrow, J.P. Abraham, E. Ayorinde, and T. Singh, High-Frequency Pulsatile Pipe Flows Encompassing All Flow Regimes, *Numerical Heat Transfer A*, Vol. 60, pp. 811-826, 2011.

219. J.P. Abraham, M.P. Hennessey, and W.J. Minkowycz A Simple Algebraic Model to Predict Burn Depth and Injury, *International Communications in Heat and Mass Transfer*, Vol. 38, pp. 1169-1171, 2011.

220. J.P. Abraham, B.D. Plourde, G.S. Mowry, E. M. Sparrow, and W.J. Minkowycz, Numerical Simulation of Fluid Flow Around a Vertical-Axis Turbine, *Journal of Renewable and Sustainable Energy*, Vol. 3, article no. 033109, 2011 (doi:10.1063/1.3588037).

221. B.M. Osende, J.P. Abraham, and G.S. Mowry, Small-Scale Use of Solar Power in Remote, Developing Regions: A Case Study, *Journal of Sustainable Development,* Vol. 4, pp. 3-9, 2011.

222. B.D. Plourde, J. P. Abraham, G. S. Mowry, and W. J. Minkowycz, An Experimental Investigation of a Large, Vertical-Axis Wind Turbine: Effects of Venting and Capping, *Wind Engineering,* Vol. 35, pp. 213-220, 2011.

223. N.N. Johnson, J.P. Abraham, Z.I. Helgeson, W.J. Minkowycz, and E. M. Sparrow, An Archive of Skin-Layer Thicknesses and Properties and Calculations of Scald Burns with Comparisons to Experimental Observations, *Journal of Thermal Science and Engineering Applications*, Vol. 3, paper no. 011003, 2011.

224. Z. Helgeson, J. Jenkins, J. Abraham, and E. Sparrow, Particle Trajectories and Agglomeration/Accumulation in Branching Arteries Subjected to Orbital Atherectomy, *Open Biomedical Engineering Journal*, Vol. 5, pp. 25-38, 2011.

225. L. Steck, E.M. Sparrow, and J.P. Abraham, Non-Invasive Measurement of the Human Core Temperature, *International Journal of Heat and Mass Transfer*, Vol. 54, pp. 949-982, 2011.

226. N. N. Johnson, J. P. Abraham, Z, I. Helgeson and M.P. Hennessey, Simulation of Embolization Particle Trajectories, *Frontiers in Heat Transfer*, Vol. 2, paper no. 023006, 2011.

227. G. Adams, P. Khanna, C. Staniloae, J.P. Abraham, and E.M. Sparrow, Optimal Techniques with the Diamondback 360 System Achieve Effective Results for the Treatment of Peripheral Arterial Disease, *Journal of Cardiovascular Translation Research*, Vol. 4, 220-229, 2011.

228. J.P. Abraham, E. M. Sparrow, and W. J. Minkowycz, Internal-Flow Nusselt Numbers for the Low-Reynolds-Number End of the Laminar-to-Turbulent Transition Regime, *International Journal of Heat and Mass Transfer*, Vol. 54, 584-588, 2011.

229. S. Chelikani, E.M. Sparrow, J.P. Abraham, and W.M. Minkowycz, Mass Transfer in Vascular Access Ports*, International Journal of Heat and Mass Transfer*, Vol. 54, pp. 949-958, 2011.

2010

230. R. Ramazani-Red, S. Chelikani, E. M. Sparrow, and J. P. Abraham, Experimental and Numerical Investigation of Orbital Atherectomy: Absence of Cavitation, *Journal of Biomedical Science and Engineering*, Vol. 3, pp. 1108-1116, 2010.

231. A.P. Thomas and J.P. Abraham, Sawtooth Vortex Generators for Underwater Propulsion, *Open Mechanical Engineering*, Vol. 4, pp. 1-7, 2010.

232. D. K. Smith, R.D. Lovik E. M. Sparrow, and J. P. Abraham, Human Tissue Temperatures Achieved During Recharging of New-Generation Neuromodulation Devices, *International Journal of Heat and Mass Transfer,* Vol. 53, 3292-3299, 2010.

233. J. P. Abraham, E. M. Sparrow, J. C. K. Tong, and D. W. Bettenhausen, Internal Flows which Transist from Turbulent Through Intermittent to Laminar, *International Journal of Thermal Sciences*, Vol. 49, 256-263, 2010.

234. E.M. Sparrow, J.P. Abraham, Y. Bayazit, R.D. Lovik, and D.K. Smith, Numerical and Experimental Simulations as Symbiotic Tools for Solving Complex Biothermal Problems, *Journal of Medical Devices*, Vol. 4, 027536, 2010.

2009

235. R.D. Lovik, J.P. Abraham, W.J. Minkowycz, and E.M. Sparrow, Laminarization and Turbulentization in a Pulsatile Pipe Flow, *Numerical Heat Transfer Part A*, Vol. 56, 861-879, 2009.

236. R.D. Lovik, J.P. Abraham, and E.M. Sparrow, Tissue-Damage Potential from Transcutaneous Recharge of Neuromodulation Implants, *International Journal of Heat and Mass Transfer*, Vol. 52, pp. 3518-3524, 2009.

237. E.M. Sparrow, J.P. Abraham, and W.J. Minkowycz, Flow Separation in a Diverging Conical Duct: Effect of Reynolds Number and Divergence Angle, *International Journal of Heat and Mass Transfer,* Vol. 52, pp. 3079-3083, 2009.

238. F.A. Hoover and J.P. Abraham, A Comparison of Corn-Based Ethanol with Cellulosic Ethanol as Replacements for Petroleum-Based Fuels, A Review*, International Journal of Sustainable Energy*, Vol. 28, pp. 171-182, 2009.

239. G.S. Mowry, R. Erickson, and J.P. Abraham, Computational Model of a Novel, Two-Cup Horizontal Wind-Turbine System, *Open Mechanical Engineering Journal*, Vol. 3, pp. 26-34, 2009.

240. J.C.K. Tong, E.M. Sparrow, and J. P. Abraham, Geometric Strategies for Attainment of the Identical Outflows Through all of the Exit Ports of a Distribution Manifold in a Manifold System, *Applied Thermal Engineering*, Vol. 29, 3552-3560, 2009.

241. W.J. Minkowycz, J.P. Abraham, and E.M. Sparrow, Numerical Simulation of Laminar Breakdown and Subsequent Intermittent and Turbulent Flow in Parallel Plate Channels: Effects of Inlet Velocity Profile and Turbulence Intensity, *International Journal of Heat and Mass Transfer*, 52, pp. 4040-4046, 2009.

242. J.P. Abraham, G.S. Mowry, R. Erickson, Analysis of Urban Wind Turbines, Clean Technology, pp. 13-16, 2009.

243. J.P. Abraham and A.P. Thomas, Induced Co-Flow and Laminar-to-Turbulent Transition with Synthetic Jets, *Computers and Fluids*, Vol. 38, pp. 1011-1017, 2009.

244. J.P. Abraham, E.M. Sparrow, and J.C.K. Tong, Heat Transfer in All Pipe Flow Regimes - Laminar, Transitional/Intermittent, and Turbulent, *International Journal of Heat and Mass Transfer,* Vol. 52, pp. 557-563, 2009.

2008

245. J.C. Tong, E.M. Sparrow, and J.P. Abraham, Unified Treatment of Natural Convection in Tall, Narrow, and Flat, Wide Rectangular Channels, *Numerical Heat Transfer A*, Vol. 54, pp. 763-776, 2008.

246. J.P. Abraham, J.C.K. Tong, and E.M. Sparrow, Breakdown of Laminar Pipe Flow into Transitional Intermittency and Subsequent Attainment of Fully Developed Intermittent or Turbulent Flow, *Numerical Heat Transfer B*, Vol. 54, pp. 103-115, 2008.

247. J.P. Abraham, E.M. Sparrow, and R.D. Lovik, Unsteady, Three-Dimensional Fluid Mechanic Analysis of Blood Flow in Plaque-Narrowed and Plaque-Free Arteries, *International Journal of Heat and Mass Transfer*, Vol. 51, 5633-5641, 2008.

248. E.M. Sparrow, J.C.K. Tong, and J.P. Abraham, Fluid Flow in a System with Separate Laminar and Turbulent Zones, *Numerical Heat Transfer A*, Vol. 53 (4), pp. 341-353, 2008.

2007

249. J.P. Abraham and C.M. George, Full-Building Radiation Shielding for Climate Control in Desert Regions, *International Journal of Sustainable Energy*, Vol. 26 (3) pp. 167-177, 2007.

250. J.P. Abraham and E.M. Sparrow, A Thermal Ablation Model Including Liquid-to-Vapor Phase Change, Necrosis-Dependent Perfusion, and Moisture-Dependent Properties, *International Journal Heat and Mass Transfer*, Vol. 50, pp. 2537-2544, 2007.

251. J.C.K. Tong, E.M. Sparrow, and J.P. Abraham, Attainment of Flowrate Uniformity in the Channels that Link a Distribution Manifold to a Collection Manifold*, Journal of Fluids Engineering*, Vol. 129 (9), pp. 1186-1192, 2007.

252. E.M. Sparrow and J.P. Abraham, A Simulation of Gas-Based, Endometrial-Ablation Therapy for the Treatment of Menorrhagia, *Annals of Biomedical Engineering,* Vol. 36 (1), pp. 171-183, 2008

2007

253. J.P. Abraham, E.M. Sparrow, and S. Ramadhyani, Numerical Simulation of a BPH Thermal Therapy – A Case Study Involving TUMT, *Journal of Biomechanical Engineering*, Vol. 129, pp. 548-557, 2007.

254. J.C.K. Tong, E.M. Sparrow, and J.P. Abraham, A Quasi-Analytical Method for Fluid Flow in a Multi-Inlet Collection Manifold, *Journal of Fluids Engineering*, Vol. 129, pp. 579-586, 2007.

255. J.C.K. Tong, E.M. Sparrow, and J.P. Abraham, Numerical Simulation of the Urine Flow in a Stented Ureter, *Journal of Biomechanical Engineering*, Vol. 129, pp. 187-192, 2007.

2006

256. J.P. Abraham, A Guide to Curing Processes, *Journal of Precision Manufacturing*, 6, pp. 16-17, 2006.

257. J.P. Abraham and C.M. George, Micro-Geothermal Devices for Low-Energy Air-Conditioning in Desert Climates, *GHC Bull.*, Vol. 27, (4), pp. 13-16, 2006.

258. P.W. Chevalier, J.P. Abraham, and E.M. Sparrow, The Design of Cold Plates for the Thermal Management of Electronic Equipment, *Journal of Heat Transfer Engineering*, Vol. 27, pp. 6-16, 2006.

2005

259. E. M. Sparrow and J. P. Abraham, Universal Solutions for the Streamwise Variation of the Temperature of a Moving Sheet in the Presence of a Moving Fluid, *International Journal of Heat and Mass Transfer*, Vol. 48, pp. 3047-3056, 2005.

260. E.M. Sparrow, J.P. Abraham, P.W. Chevalier, A DOS-Enhanced Numerical Simulation of Heat Transfer and Fluid Flow Through an Array of Offset Fins with Conjugate Heating in the Bounding Solid, *Journal of Heat Transfer*, Vol. 127, pp. 27-33, 2005.

261. J. P. Abraham and E. M. Sparrow, Friction Drag Resulting From the Simultaneous Imposed Motion of a Freestream and its Bounding Surface, *International Journal of Heat and Fluid Flow*, Vol. 26, pp. 289-295, 2005.

262. S.K. S. Boetcher, E.M. Sparrow, and J.P. Abraham, Numerical Simulation of the Radiative Heating of a Moving Sheet, *Numerical Heat Transfer*, Vol. 47, pp. 1-25, 2005.

2004

263. E.M. Sparrow, J.P. Abraham, and J.C. K. Tong, Archival Correlations for Average Heat Transfer Coefficients for Non-Circular and Circular Cylinders and for Spheres in Crossflow, *International Journal of Heat and Mass Transfer*, Vol. 47 (24), pp. 5285-5296, 2004.

264. J.P. Abraham and E.M. Sparrow, A Simple Model and Validating Experiments for Predicting the Heat Transfer to a Load Situated in an Electrically Heated Oven, *Journal of Food Engineering*, Vol. 62 (4) pp. 409-415, 2004.

265. J.P. Abraham, Teaching Case Studies to a Multi-Disciplinary Class - Bridging the Gap Between Engineering and the Biological Sciences, *Journal of College Science Teaching*, Vol. 33 (5), March/April 2004.

2003

266. E.M. Sparrow and J.P. Abraham, A Computational Analysis of the Radiative and Convective Processes Which Take Place in Preheated and Non-Preheated Ovens, *Journal of Heat Transfer Engineering*, Vol. 24, No. 5, pp. 25-37, 2003.

267. J.P. Abraham and E.M. Sparrow, Three Dimensional Laminar and Turbulent Natural Convection in a Continuously/Discretely Wall-Heated Enclosure Containing a Thermal Load, *Numerical Heat Transfer, A,* Vol. 44, pp. 105-125, 2003.

268. E. M. Sparrow and J. P. Abraham, A New Buoyancy Model Replacing the Standard Pseudo-Density Difference for Internal Natural Convection in Gases, *International Journal of Heat and Mass Transfer*, Vol. 46, pp. 3583-3591, 2003.

2002

269. J.P. Abraham and E.M. Sparrow, Experiments on discretely heated, vented/unvented enclosures for various radiation surface characteristics of the thermal load, enclosure temperature sensor, and enclosure walls*, International Journal of Heat and Mass Transfer*, Vol. 45, pp. 2255-2263, 2002.

270. J.P. Abraham and E.M. Sparrow, Fluid Flow and Heat Transfer in Multiply-Folded, Continuous Flow Passages Including Conjugate Thermal Interaction Between the Fluid and Bounding Walls, *Numerical Heat Transfer, A*, Vol. 42, pp. 327-344, 2002.

271. E.M. Sparrow, J.P. Abraham, and Molly K. Rolfsmeier, Fabric Ducts for Air Distribution and for Décor, *Fabric Architecture*, March/April 2002.

272. E.M. Sparrow and J.P. Abraham, Heat Transfer Coefficients and Other Performance Parameters for Variously Positioned and Supported Thermal Loads in Ovens With/Without Water-Filled or Empty Blockages, *International Journal of Heat and Mass Transfer*, Vol. 45, pp. 3597-3607, 2002.

2001

273. E.M. Sparrow, J.C.K. Tong, and J.P. Abraham, An Experimental Investigation on a Mass Exchanger for Transferring Water Vapor and Inhibiting the Transfer of Other Gases*, International Journal of Heat and Mass Transfer*, Vol. 44, pp. 4313-4321, 2001.

274. E.M. Sparrow, G.L. Martin, J.P. Abraham, and J.C.K. Tong, Air-to-Air Energy Exchanger Test Facility for Mass and Energy Transfer Performance, *Transactions of the ASHRAE*, Vol. 107, (2) 2001.

Conference Presentations and Public Lectures (147 presentations)

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).

3. L. E. Olsen and J.P. Abraham, New correlations for convective coefficients over square and cubical bodies, *48th National Conference on fluid mechanics and fluid power,* December 27-29, 2021.

4. D. Vishwakarma, S. Bhattacharyya, M. Soni and J.P. Abraham, Effect of Inlet Flat Obstructon on Thermohydraulic Characteristics in a Smooth Circular Tube in the Transition Flow Regime, *48th National Conference on fluid mechanics and fluid power,* December 27-29, 2021.

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.

7. J.P. Abraham, The Science of Global Warming – What do we really know? *Presented at New Mexico Tech. Lecture Series*, September 24, 2020.

8. L. Cheng, K. Trenberth, K. von Schukmann, 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.

12. L. Cheng, K.E. Trenberth, N. Gruber, M.E. Mann, J.P. Abraham, J. Fasullo, G. Li, X. Zaho, and J. Zhu, Ocean Subsurface Salinity Changes Yield an Anthropogenic Climate Change Signal, *Ocean Sciences 2020*, San Diego, CA, February 16-21, 2020.

13. J.P. Abraham, Climate Science, Projections for the Next Two Decades, *Code Blue, Health Care Professionals for a Healthy Climate*, Minneapolis, MN, April 4, 2020.

14. L. Cheng, G. Foster, Z. Hausfather, K.E. Trenberth, J.P. Abraham, Increase in the Rate of Ocean Warming, *2019 AGU Fall Meeting*, San Francisco, December, 9-13, 2019.

15. J.P. Abraham, G. Foster, Z. Hausfather, L. Cheng, K.E. Trenberth, Earth's Energy Imbalance abd Energy Flows Through the Climate System, *2019 AGU Fall Meeting*, San Francisco, December, 9-13, 2019.

16. L. E. Olsen and J.P. Abraham, Evaluation of CFD algorithms for solving a canonical problem of flow over a square cylinder, *4th Thermal and Fluids Engineering Conference*, Las Vegas, April 14-17, 2019.

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 Polictmakers, *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.

20. J.P. Abraham, B.D. Plourde, J.R. Stark, Modeling Hemodynamics Through Lesions *Cardiovascular Research Technologies Conference 18*, Washington DC., March 3-6, 2018.

21. G. Wang, L. Cheng, J.P. Abraham, C. Li, and H. Du, Consensuses and discrepancies of basin-scale ocean heat content changes in different ocean analysis, *AOGS 15th Annual Meeting*, June 3-8, Hawaii, USA, 2018.

22. K.E. Trenberth, C. Lijing, P. Jacobs, and J.P. Abraham, Are recent hurricane (Harvey, Irma, and Maria) disasters Natural? *AGU Fall 2017 Meeting*, New Orleans, December 11-15, 2017.

23. P. Jacobs, S. Akella, K.E. Trenberth, C. Lijing, and J.P. Abraham, The Historical Context of the 2017 Hurricane Season's Ocean Warmth, *AGU Fall 2017 Meeting*, New Orleans, December 11-15, 2017.

24. J.P. Abraham, P. Jacobs, L. Cheng, K.E. Trenberth, Are recent hurricane (Harvey, Irma, and Maria) disasters Natural? *AGU Fall 2017 Meeting*, New Orleans, December 11-15, 2017.

25. J.P. Abraham and B.D. Plourde, Using ANSYS for Multiphysics Design of a Water Treatment System, *ANSYS Innovation Conference 2017*, Minneapolis, MN, November 8, 2017.

26. J.P. Abraham, L.J. Cheng, K.E. Trenberth, Improved Estimates of Ocean Heat Content from 19602015, *NOAA Presentation*, Washington DC, June 22, 2017.

27. J.P. Abraham, Use of Computational Fluid Dynamics to Improve Oceanographic Measurements, *NOAA Presentation*, Washington DC, January 12, 2017.

28. J.P. Abraham, B.D. Plourde, Use of Multi-lumen Catheters to Preserve Injected Stem Cell Viability, *Cardiovascular Research Technologies Conference 17*, Washington DC., February 18-21, 2017.

29. L. Cheng, J. Zhu, K. Trenberth, J. Fasullo, M. Palmer, T. Boyer, J. Abraham, Improved Ocean Heat Content Estimation Since 1960, *AGU Fall Meeting 2016*, San Francisco, CA, 2016.

30. J.P. Abraham, B. D. Plourde, John Stark, L.J. Vallez, Using ANSYS to Reduce Costs and Speed Development Process, *ANSYS Upper Midwest Innovation Conference*, Bloomington, Minnesota, November 17, 2016 (Keynote).

31. N. Langat, T. Thoruwa, J. Abraham, J. Wanyoko, Performance of an Improved Fluidized System for Processing Green Tea, *ICEE 18th International Conference on Energy Engineerin*g, Toronto, Canada, 2016.

32. L. Cheng, R. Cowley. J.P. Abraham, Cold Water Biases in XBT Descent, *5th XBT Science Workshop*, Tokyo, Japan, October 3-7, 2016 (Invited).

33. L. Cheng, K. Trenberth, M. Palmer, J.P. Abraham, Historical Ocean Heat Content Estimation and the Implications for Assessing Historical Earth's Energy Budget, *Clivar 2016*, Qingdao, China, 2016.

34. R. Cowley, J.P. Abraham, L. Cheng, The Effect of Water Temperature on XBT Fall Rate, *Clivar Third IQuOD Workshop,* Hamburg, Germany, December 3-4, 2015.

35. R. Cowley, L. Cheng, G. Goni, T. Boyer, J.P. Abraham, S. Wijffels, V. Gouretski, F. Reseghetti, S. Kizu, S. Dong, F. Bringas, M. Goes, L. Houpert, J. Sprintall, J. Zhu, Towards Reducing Uncertainty in Historical XBT Data: An International Effort from the XBT Science Team, *2016 Ocean Sciences Meeting*, New Orleans, LA, February 21-26, 2016.

36. J.P. Abraham and B.D. Plourde, Novel Cost-Effective Solution for Potable Water in All Environments, *The Food-Energy-Water Nexus, 16th National Conference and Global Forum on Science, Policy, and the Environment*, Washington DC, January 18-21, 2016.

37. J.P. Abraham and B.D. Plourde, Off-Grid Wind Power Systems for the Developing World, *The Food-Energy-Water Nexus, 16th National Conference and Global Forum on Science, Policy, and the Environment*, Washington DC, January 18-21, 2016.

38. L.Cheng, J. Zhu, J.P. Abraham, An Updated Historical (1970-2014) Upper OHC Estimates and Implication for the Global Energy Budget, *Climate and Ocean Variability and Change (CLIVAR) 8th Session of the Global Synthesis*, Exeter, UK, September 28, 2015.

39. J.P. Abraham, Our Changing Climate, *Citizens Climate Lobby Conference*, Red Wing, MN, November 6, 2015.

40. J.P. Abraham, J.R. Stark, Advances in XBT Measurement and Bias Reduction, *Chinese Academy of Sciences*, Beijing, October 10, 2015.

41. G. Foster and J.P. Abraham, Lack of Evidence for a Slowdown in Global Temperature, *American Geophysical Union Fall Meeting*, San Francisco, CA, December 14-18, 2015.

42. L. Cheng, J. Zhu, and J.P. Abraham, An Updated Estimate on Global Upper Ocean Heat Content Change and the Remaining Challenges, *American Geophysical Union Fall Meeting*, San Francisco, CA, December 14-18, 2015.

43. G. Foster and J.P. Abraham, Lack of Evidence for a Slowdown in Global Temperature, *US Climate Variability and Predictability Program (CLIVAR) Summit*, Tucson, AZ, August 4-6, 2015.

44. J.P. Abraham, Small-scale Wind Turbines: Design, Analysis and Applications, *Hong Kong University*, January 28, 2015 (invited).

45. J.P. Abraham, The Science of Climate Change, What Do We Really Know, *Hong Kong University of Science and Technolog*y, January 26, 2015 (invited).

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).

47. J.P. Abraham, T.M. Shepard, W.J. Minkowycz, J.R. Stark, J. M. Gorman, Quantification of Near-Surface Impact Forces on XBTs, *The 4th XBT Workshop: XBT Science and the Way Forward,* Beijing, China, November 11-13, 2014.

48. J.P. Abraham, B.D. Plourde, S.A. Mandia, and K.E. Trenberth, Closing the Earth Energy Imbalance, *3rd International Conference on Earth Science and Climate Change,* San Francisco, CA, July 28-30, 2014.

49. J.P. Abraham, B.D. Plourde, J.R. Stark, and W.J. Minkowycz, Improvements to the Quality and Quantity of Ocean Heat Content Measurements, *3rd International Conference on Earth Science and Climate Change,* San Francisco, CA, July 28-30, 2014.

50. J.P. Abraham, B.D. Plourde, J.R. Stark, W.J. Minkowycz, Cryosurgical Treatment of Cancer: The Importance of Modeling, *4th World Congress on Cancer Science and Therapy*, Chicago, October 20-22, 2014.

51. N. Dib, J.P. Abraham, B. D. Plourde, D.B. Schwalbach, D. Dana, L. Myers, K. Hunkler, T. Flower, and R.E. Kohler, A Novel Multi-lumen Compliant Balloon Catheter Preserves Stem Cell Viability and Decreases Cellular Clumping When Compared to a Standard Single-lumen Balloon Angioplasty Catheter, *Transcatheter Cardiovascular Therapeutics (TCT 2014)*, Washington, DC, September 13-17, 2014.

52. N. Dib, J.P. Abraham, B. D. Plourde, D.B. Schwalbach, D. Dana, L. Myers, K. Hunkler, T. Flower, and R.E. Kohler, A Novel Multi-lumen Compliant Balloon Catheter Preserves Stem Cell Viability and Decreases Cellular Clumping When Compared to a Standard Single-lumen Balloon Angioplasty Catheter, *Complex Cardiovascular Therapeutics*, Orlando, FL, June 23-27, 2014.

53. J.P. Abraham, The Science of Climate Change (Keynote*), 2014 Summer Institute for Climate Change and Energy Education*, Sandstone, MN, August 4-6, 2014.

54. J.P. Abraham, D. B. Schwalbach, T. M. Shepard, J. M. Gorman, Calculating forces of impact as objects travel from air into water at high velocity, *ANSYS Regional Conference*, Minneapolis, MN, June 10, 2014.

55. B.D. Plourde, D.B. Schwalbach, J.P. Abraham, R.E. Kohler, and N.N. Johnson, Intracoronary Injection of Medication from multi-lumen injection Catheters, *Design of Medical Devices 2014*, April 7-14, Minneapolis, MN.

56. N. Dib, J. Abraham, B.D. Plourde, D.S. Schwalbach, D. Dana, D. Lester, T. Flowers, and R.E. Kohler, Comparison of the Stem Cell Viability and Shear Stress of Single Lumen and Multi Lumen Balloon Infusion Catheter for Intra-Arterial Stem Cell Infusion, *American Cardiology Conference 2014*, Washington, DC, March 29-31.

57. J.P. Abraham, The Science of Global Warming, What Do We Really Know (Keynote), *Audubon Society National Meeting*, October 6, 2013.

58. J.P. Abraham, Thawing Out Climate Science, IEEE 2013 Awards Banquet, St. Paul, MN, February 23, 2013.

59. J.P. Abraham, Using ANSYS to Model Rotating Oceanographic Devices, *ANSYS Regional Conference*, Minneapolis, June 6, 2013.

60. N. Dib, J.P. Abraham, B. Plourde, D. Schwalbach, D. Dana, L. Myers, T. Flowers, and R. Kohler, Stem Cell Viability Significantly Reduced After Passing Through a Standard Single Lumen Over-the-wire 0.014 inch Balloon Angioplasty Catheter, *TCT 2013 Conference*, October 27-November 1, 2013, San Francisco, CA.

61. J.P. Abraham, Measurements of the Earth's Climate System, *IEEE Conference on Instrumentation and Measurement Technology Conference*, Minneapolis, MN, May 6, 2013.

62. J.P. Abraham, Numerical Simulations of Drug Deposition of Paclitaxel, *Design of Medical Devices Conference*, 2013, Minneapolis, MN, April 8-11, 2013.

63. J.P. Abraham, J. Stark, J. Gorman, E. Sparrow, R. Kohler, A Model of Drug Deposition Within Artery Walls, *Design of Medical Devices Conference*, 2013, Minneapolis, MN, April 8-11, 2013.

64. J.L. Conroy, S.A. Mandia, J.P. Abraham, S.E. Moffitt, G. Tootle, Environmental Litigation and the Role of Climate Scientists, *AGU Winter Meeting 2012*, December 3-7, San Francisco, 2012.

65. S.A. Mandia, J. Abraham, J. Dash, M. Ashley, Filling the Knowledge Gap that Exists Between the Public and Its Leaders and Climate Science Experts, *AGU Winter Meeting 2012*, December 3-7, San Francisco, 2012.

66. S.A. Mandia, J.P. Abraham, J. Dash, and M. Ashley, Navigating Negative Conversations in Climate Change, *AGU Winter Meeting 2012*, December 3-7, San Francisco, 2012.

67. M.J. Kallock, A. Yevzlin, M. Nelson, and J.P. Abraham, Numerical Modeling of Blood Flow in a New Percutaneously Delivered Hemodialysis Shunt, *BMES 2012 Annual Meeting*, Atlanta Georgia, October 24-27, 2012.

68. J.P. Abraham, Understanding Climate Change's Common Myths, *Minnesota Broadcast Meteorologists Climate Change Science Seminar*, St. Paul, MN, October 5-6, 2012.

69. N.P. Sullivan, J.E. Wentz, J.P. Abraham, Multi-Scale Modeling of Tubular Cross-Flow Microfiltration of Metalworking Fluids, *ASME International Mechanical Engineering Congress and Exposition*, Houston, TX, November 9-15, 2012.

70. J.P. Abraham, M. Nelson, J. Jeske, J. Gorman, Simulation Tools for Design and Testing Substitution in Medical Devices, *Lifescience Alley Research Conference, Research and Development 101*, Minneapolis, MN, May 22, 2012.

71. M.J. Kallock, M. E. Nelson, J. P. Abraham, and A. S. Yevzlin, Fluid Mechanic Modeling of a Percutaneously Delivered Vascular Access Device, *American Society of Diagnostic and Interventional Nephrology, 8th Annual Meeting,* New Orleans, LA, February 24-26, 2012.

72. D. Dana, J.P. Abraham, R. Kohler, A. Campbell, B. Baird, M. Olson, and N. Dib, A Novel Catheter Delivery System (CardioDib) That May Enable Intracoronary Stem Cell Infusion by Possibly Minimizing Cellular Clumping and Distal Embolization (DE) While Preserving Cellular Viability, *9th International Symposium on Stem Cell Therapy and Cardiovascular Innovations*, Madrid, Spain, June 7-8, 2012.

73. K.E. Trenberth, K. Emanuel, J.P. Abraham, Climate Science and Meteorology, *AMS National Broadcast Meteorology Conference*, Boston, MA, August 24, 2012

74. J.P. Abraham, J. Jeske, and M. Nelson, Thermal and Fluid Flow Simulations in Health Care: Product Development and Safety Improvement, *Design of Medical Devices Conference*, Minneapolis, MN April 10-12, 2012.

75. J.P. Abraham, Climate Myths, Misconceptions, and Their Creators, American Chemical Society, St. Paul, MN, November 13, 2012.

76. I. Enting, J.P. Abraham, Detailed Debubnking of Denial, *AGU Winter Meeting 2012*, December 3-7, San Francisco, 2012.

77. B.D. Plourde, J.P. Abraham, G.S. Mowry, E.M. Sparrow, Experimental Test of Multi-Stage Vertical-Axis Turbines for Cellular Communication Applications, *ASME 6th International Conference on Energy Sustainability*, San Diego, CA, July 23-26, 2012.

78. M.N. Nelson and J.P. Abraham, Hemodynamics of AV Grafts for Hemodialysis Access, *Design of Medical Devices Conference*, Minneapolis, MN April 10-12, 2012.

79. J.P. Abraham and J.S. Jeske, Cryosurgical Simulations for Ablation of Kidney Tumors, *Design of Medical Devices Conference*, Minneapolis, MN April 10-12, 2012.

80. J.P. Abraham, J.R. Stark, and J.M. Gorman, Drag Calculations on Oceanographic Devices, *ANSYS Regional Conference,* Minneapolis, MN, October 20, 2011.

81. J.P. Abraham, B.D. Plourde, and G.S. Mowry, Fluid Dynamic Simulations of Wind Turbines, *ANSYS Regional Conference,* Minneapolis, MN, October 20, 2011.

82. S.A. Mandia, J.P. Abraham, R. Weymann, and M. Ashley, The Climate Science Rapid Response Team – A Model for Science Communication, *Geological Society of America Annual Meeting and Exposition,* Minneapolis, MN, October 9-12, 2011.

83. S.A. Mandia, J.P. Abraham, R.J. Weymann, and M. Ashley, The Climate Sciences Rapid Response Team – A Model for Science Communication, *American Geophysical Union Fall Meeting*, San Francisco, CA December 5-9, 2011.

84. J.P. Abraham, J. Stark, J. Gorman, F. Reseghetti, J. Willis, and J. Lyman, Preliminary Fluid Drag Calculations for Expendable Bathythermograph Devices, *American Geophysical Union Fall Meeting*, San Francisco, CA December 5-9, 2011.

85. S.A. Mandia, J.P. Abraham, R.A. Weymann, and M. Ashley, Scientists Shaping the Discussion, *American Geophysical Union Fall Meeting*, San Francisco, CA December 5-9, 2011.

86. J.P. Abraham, J.R. Stark, J.M. Gorman, F. Reseghetti, J. Willis, and J. Lyman, Computational Modeling of Probe Dynamics to Improve Ocean Heat Content Measurements, *American Geophysical Union Fall Meeting*, San Francisco, CA December 5-9, 2011.

87. B.M. Osende, J.P. Abraham, and G.S. Mowry, The Design, Installation, and Maintenance of a Village-Sized Solar Power System in Uganda, *Nanotech, Cleantech, Microtech 2011 Conference*, June 13-16, 2011, Boston, MA. Published in the Technical Proceedings of the 2011 NSTI Nanotechnology Conference and Expo, Vol. 3, pp. 755-758, 2011.

88. J.M. Gorman, E.M. Sparrow, G.S. Mowry, and J.P. Abraham, Simulation of Helically Wrapped, Compact Heat Exchangers, ASME 2011 Energy Sustainability *Conference*, Washington, DC, August 7-10, 2011.

89. B.D. Plourde, J.P. Abraham, G.S. Mowry, and W.J. Minkowycz, Vertical-Axis Wind Turbines for Powering Cellular Communication Towers, *Nanotech, Cleantech, Microtech 2011 Conference*, June 13-16, 2011, Boston, MA. *Published in the Technical Proceedings of the 2011 NSTI Nanotechnology Conference and Expo*, Vol. 3, pp. 750-753, 2011.

90. L. Tran, M.P. Hennessey, and J.P. Abraham, Simulation and Visualization of Dynamic Systems: Several Approaches and Comparisons, *ASME International Mechanical Engineering Congress and Expo*, Vancouver, Canada, November 12-18, 2011.

91. J.P. Abraham, Global Warming, What does the Science Tell Us?, *7th Annual Environmental Institute Conference* (KEYNOTE), Minneapolis, MN, April 21, 2010.

92. J.P. Abraham, G.S. Mowry, B.D. Plourde, and W.J. Minkowycz, Numerical Simulations of Vertical-Axis Wind Turbine Blades, *ASME 2011 Energy Sustainability Conference and Fuel Cell Conference*, Washington, DC, August 7-10, 2011.

93. J.P. Abraham, G.S. Mowry, B.D. Plourde, and W.J. Minkowycz, Wind Tunnel Tests of Vertical-Axis Wind Turbine Blades, *ASME 2011 Energy Sustainability Conference and Fuel Cell Conference*, Washington, DC, August 7-10, 2011.

94. R.D. Lovik, E.M. Sparrow, J.P. Abraham, C.L. Zelmer, S.K.S. Friend, and D.K. Smith, Effect of Component Misalignment on Human Tissue Temperatures Associated with Recharging Neuromodulation Devices, *Design of Medical Devices Conference*, Minneapolis, MN April 12-14, 2011.

95. N.N. Johnson, K. L. McCaffrey, K.M. Rose, and J.P. Abraham, Cryosurgical Treatments for Uterine Fibroids, *ASME 2010 International Congress and Expo*, Vancouver, CA, November 12-18, 2010.

96. R.D. Lovik, K. J. Kelly, E.M. Sparrow, and J.P. Abraham, Effect of Misalignment of Implant and Antenna on Heat Generation of Externally Recharged Neuromodulation Implants, *North American Neuromodulation Society 14th Annual Meeting*, Las Vegas, NV, December 2-5, 2010.

97. J.P. Abraham and S. Mandia, An Emerging Ethic of Responsibility: A Case Study for Engaging the Public, *American Geoephysical Union Fall Meeting*, San Francisco, CA December 13-17, 2010.

98. J.P. Abraham and G.S. Mowry, B.D. Plourde, Analysis of Thermal and Fluid Flow Problems, *Thermal Packaging and Small Business Innovation Workshop*, Eagan, MN, October 5-6, 2010.

99. N.N. Johnson, J.P. Abraham, Z.I. Helgeson, and M.P. Hennessey, Numerical Simulation of Blood Flow in the Presence of Embolizing Agents, *ASME 2010 International Congress and Expo*, Vancouver, CA, November 12-18, 2010.

100. N.N. Johnson, J.P. Abraham, and Z.I. Helgeson, Calculations of Scald Burns: Effects of Water Temperature, Exposure Duration, and Clothing, *ASME 2010 International Congress and Expo*, Vancouver, CA, November 12-18, 2010.

101. N.N. Johnson, M.P. Hennessey, and J.P. Abraham, Swept Arc Length Measure of Abrasive Wear, *ASME 2010 International Congress and Expo*, Vancouver, CA, November 12-18, 2010.

102. K.L. McCaffrey, K.M. Rose, and J.P. Abraham, Numerical Simulation of Cryosurgery as a Potential Treatment for Uterine Fibroids, *14th International Heat Transfer Conference*, Washington, D.C., August 8-13, 2010.

103. J.P. Abraham, E.M. Sparrow, J.C.K. Tong, and W.J. Minkowycz, Intermittent Flow Modeling. Part 1: Hydrodynamic and thermal Modeling of Steady, Intermittent Flows in Constant Area Ducts, *14th International Heat Transfer Conference*, Washington, D.C., August 8-13, 2010.

104. J.P. Abraham, E.M. Sparrow, J.C.K. Tong, and W.J. Minkowycz, Intermittent Flow Modeling. Part 2: Time-Varying Flows and Flows in Variable Area Ducts, *14th International Heat Transfer Conference*, Washington, D.C., August 8-13, 2010.

105. K.L. McCaffrey, K.M. Rose, and J.P. Abraham, Cryosurgery as an Alternative Treatment for Menorrhagia and Uterine Fibroids, *ASME Summer Biomedical Engineering Conference*, Naples, FL, June 16-19, 2010.

106. J.M. Gorman, N.K. Sherrill, J.P. Abraham, Analysis of Drag-Reducing Techniques for Olympic Skeleton Helmets, *ANSYS Users Conference*, Minneapolis, MN, June 11, 2010.

107. B. D. Plourde, J.P. Abraham, G.S. Mowry, Numerical Simulation of Vertical Axis Wind Turbines, *ANSYS Users Conference*, Minneapolis, MN, June 11, 2010.

108. J.P. Abraham, Z.I. Helgeson, N.N. Johnson, G.S. Mowry, Numerical Simulations and Medical Device Design, *ANSYS Users Conference*, Minneapolis, MN, June 11, 2010.

109. J.M. Gorman, N.K. Sherrill, J.P. Abraham, Drag-Reducing Vortex Generators and Olympic Skeleton Helmet Design, *ANSYS Users Conference*, Chicago, IL, June 7, 2010.

110. J.P. Abraham, Z.I. Helgeson, N.N. Johnson, G.S. Mowry, (Keynote), Numerical Simulations in Biomedical Design, *ANSYS Users Conference*, Chicago, IL, June 7, 2010.

111. J.P. Abraham, E.M. Sparrow, Y. Bayazit, R.D. Lovik, and D.S. Smith, Numerical and Experimental Simulations as Symbiotic Tools for Solving Complex Bio-Thermal Problems, *Design of Medical Devices Conference*, Minneapolis, MN April 13-15, 2010.

112. E.M. Sparrow and J.P. Abraham, Numerical Solutions of Biological Heat Transfer, *Design of Medical Devices Conference*, Minneapolis, MN April 13-15, 2010.

113. J.P. Abraham, R.D. Lovik, D.S. Smith, E.M. Sparrow, and K.J. Kelly, Heat Generation Measurements of Revised Neuromodeulation Devices and Calculations of Tissue Temperatures, *North American Neuromodulation Society 13th Annual Meeting*, Las Vegas, December 3-6, 2009.

114. J.P. Abraham and E.M. Sparrow, Numerical Simulation as a Tool for Assessing Thermal- and Fluid-Based Processes and Therapies, *Institute for Engineering in Medicine Innovation Showcase*, Minneapolis, MN, September 22, 2009.

115. J.P. Abraham, E.M. Sparrow, and R.D. Lovik, An Investigation of Tissue-Temperature Elevation Caused by Recharging of Transcutaneous Nueromodulation Devices, *31st Annual International Conference of the IEEE Engineering in Medicine in Biology Society*, Minneapolis, MN, September 2-7, 2009.

116. R.D. Lovik, J.P. Abraham, and E.P. Sparrow, Pulasting Fluid Flows Undergoing Transitions Between Laminar, Transitional, and Turbulent Regimes, *ASME 2009 Summer Bioengineering Conference*, Lake Tahoe, CA, June 17-21, 2009.

117. E.M. Sparrow, and J.P. Abraham, Case Studies on the Use of Numerical Simulation for design and Optimization of Medical Devices, *Design of Medical Devices Conference*, Minneapolis, MN April 14-16, 2009.

118. F. Hoover and J. Abraham Assessment of the Carbon Dioxide and Energy Balances of Biofuels, *Climate Change Technology Conference 2009*, Hamilton, Ontario, May 12-15, 2009.

119. J.P. Abraham, G.S. Mowry, and R.E. Erickson, Design and Analysis of a Small-Scale Vertical-Axis Wind Turbine for Rooftop Power Generation, *Climate Change Technology Conference 2009*, Hamilton, Ontario, May 12-15, 2009.

120. F. Hoover and J.P. Abraham, A review: Comprehensive Comparison of Corn-based and Cellulosic-based Ethanol as Biofuel Sources, *Clean Technology Conference and Expo 2009*, Houston, TX, May 3-7, 2009.

121. J.P. Abraham, G.S. Mowry, and R.E. Erickson, Design and Analysis of a Small-Scale Vertical-Axis Wind Turbine, Clean *Technology Conference and Expo 2009*, Houston, TX, May 3-7, 2009.

122. J.P. Abraham, R.D. Lovik, and E.M. Sparrow, Tissue Temperature Rises Due to Heat Generation in Neuromodulation Implants, North American Neuromodulation Society 12th Annual Meeting, Las Vegas, December 4-7, 2008.

123. G. Nelson, A. Majewicz, and J.P. Abraham, Numerical Simulation of Thermal Injury to the Artery Wall During Orbital Atherectomy, *ANSYS International*, Pittsburgh, PA, August 26-29, 2008.

124. J.P. Abraham, Integrating Integration of ANSYS/CFX into Classrooms, *ANSYS International*, Pittsburgh, PA, August 26-29, 2008.

125. J.P. Abraham, Pressure Drop and Heat Transfer Calculations for Laminar-Turbulent Intermittent Flows, *ANSYS International*, Pittsburgh, PA, August 26-29, 2008.

126. J.P. Abraham, J.C.K. Tong, and E.M. Sparrow, Prediction of Laminar-Turbulent Transition and Friction Factors in Transitional Flows, *ASME International Congress and Expo*, Boston, MA, October 31 – November 5, 2008.

127. R.D. Lovik, J.P. Abraham, and E.M. Sparrow, Assessment of Possible Thermal Damage of Tissue Due to Atherectomy by Means of a Mechanical Debulking Device, *ASME 2008 Summer Bioengineering Conference*, Marco-Island, FL, June 25-29, 2008.

128. J.P. Abraham and A.P. Thomas, Numerical Simulation of Induced Co-Flow and Laminar-to-Turbulent Transition Associated with Synthetic Jets, *Flucome 2007*, Tallahassee, FL, September 16-19, 2007.

129. J.P. Abraham and C.M. George, An Investigation of Radiation Shields for Full-Building Cooling in Desert Climates, *Solar 2007*, Cleveland, OH July 7-12, 2007.

130. A. Marchese, J.P. Abraham, C.S. Greene, L. Kizenwether, and J. Ochs, Toward a Common Standard Rubric for Evaluating Capstone Design Projects, *National Capstone Design Course Conference*, Boulder, CO June, 13-15, 2007 (Best Paper Award).

131. John Abraham, Chris Greene, Anthony Marchese, External Assessment Through Peer-to-Peer Evaluation of Capstone Projects, *Frontiers in Education*, Milwaukee, WI, October, 10-13, 2007.

132. John Abraham, Computation Fluid Dynamics Using ANSYS CFX, presented at the University of Minnesota Digital Technology Center, Sept. 12 and 14, 2006.

133. John Abraham, Application of the Finite Element Method, *LifeSciences Conference*, Minneapolis, October 5, 2006.

134. John Kim and John Abraham, Design of Experiments in the Medical Device Industry, *LifeSciences Conference*, Minneapolis, October 5, 2006.

135. Ephraim Sparrow, Nick Whitehead, and John Abraham, Fluid Flow Dynamics in the Urinary Tract – Impact on Device Design, Presented to the Department of Urologic Surgery, April 17, 2006.

136. John Abraham, Nick Whitehead, and Ephraim Sparrow, Numerical Simulation of Thermal Therapies, Presented to the Department of Urologic Surgery, April 17, 2006.

137. John Abraham, Nick Whitehead, and Ephraim Sparrow, Biomedical Applications Simulations/Experimental Investigations, *Biomedical Focus 2006*, Brooklyn Center, MN, March 20-21, 2006.

138. Nick Whitehead, Ephraim Sparrow, and John Abraham, A Role for Engineering in Medical Simulations, *Simulation in Healthcare*, Minneapolis, MN, November 28, 2005.

139. Ronald Major and John Abraham, The Application of Thermal Analysis on a Disk Array, *Fluent's 2005 CFD Summit*, Detroit, MI, June 7-8, 2005.

140. Camille George and John Abraham, A Sustainable Low-Energy Cooling System for Hot Dry Climates, *Sustainability as Security*, Austin, TX, October 5-9, 2005.

141. John P. Abraham and Ephraim M. Sparrow, Irrelevance of the Relative Velocity as the Characteristic Velocity When Both a Fluid and its Bounding Surface are in Motion, *Lorenz G. Straub Award*, Minneapolis, MN, November 13, 2004.

142. John P. Abraham and Ephraim M. Sparrow, An Unexpected U-Turn After an Eckert Straight Start, *Eckert Symposium*, Minneapolis, MN, September 13-14, 2004.

143. John P. Abraham and Ephraim M. Sparrow, Methodologies to Enhance the Numerical Simulations of Electronic Cooling, *Semi-Therm Conference,* San Jose, CA, March 9-10, 2004.

144. Ephraim M. Sparrow, John P. Abraham, and Paul Chevalier, A DOS-Enhanced Numerical Simulation of Heat Transfer and Fluid Flow Through an Array of Offset Fins with Conjugate Heating in the Bounding Solid, *ASME International Mechanical Engineering Congress and R & D Expo*, Washington, DC, November, 2003.

145. J. P. Abraham, Ephraim M. Sparrow, Student-Related Research "Thermal Design Capstone Projects", *ASME International Mechanical Engineering Congress and R & D Expo*, Washington, DC, November, 2003.

146. Sparrow, E.M., Martin, G.L., Abraham, J.P., and Tong, J.C., Air-to-Air Energy Exchanger Test Facility for Mass and Energy Transfer Performance. *American Society of Heating, Refrigeration, and Air-Conditioning Engineers Annual Meeting*, Inc., Cincinnati, OH, ASHRAE Symposium Paper, 2001.

147. Tamma, K.K., Zhou, X., Abraham, J., and Anderson, C.V.D.R., Constitutive Model Theories and Plausible Propositions/Challenges to Heat Transport Characterization. *ASME/JSME Joint Thermal Engineering Conference*, March, 1999.

Granted Patents (author of 16 patents)

1. Robert Monson and John Abraham, “Dual-phase thermal electricity generator”, U.S. Patent # 8,484,974.

2. Robert Monson and John Abraham, “Variable Orifice Valve”, U.S. Patent # 7,559,485

3. Robert Monson, John Abraham, Joseph Crimando, Joel Farley, Matthew Linder, and Joel Seipel, "Vehicle Energy Absorption Apparatus”, US Patent # 8,118,255.

4. B.D. Plourde and J.P. Abraham, “Rotor Blade for Vertical Axis Wind Turbine”, US Patent # 9,482,204/ WO 2011150171.

5. B.D. Plourde, J.P. Abraham, D.R. Plourde, A. Gikling, R. Pakonen, “Dual-Axis Tracking Device”, US Patent # 10,168,412.

6. B. D. Plourde, J. P. Abraham, D.R. Plourde, R. Pakonen, “Control Valve Assembly for Fluid Heating System”, US Patent # 10,495,720.

7. B. D. Plourde, J. P. Abraham, D.R. Plourde, R. Pakonen, “Dual Axis Tracking Device”, China National Intellectual Property Administration, Patent number ZL201580075224.1, 2020.

8. B.R. Plourde, J. P. Abraham, D.R. Plourde, R. Pakonen, “Dual Axis Tracking Method”, U.S. Patent 10,890,645.

9. B.D. Plourde, A. Gikling, J.P. Abraham, R. Pakonen, “Digital Fluid Heating System”, US Patent Application Number 15/818,052, filed November 20, 2017; PCT Application Number US2017/062558, filed November 20, 2017. (Patent granted, number forthcoming).

10. B.D Plourde, J.P. Abraham, D. Plourde, R. Pakonen, A. Gikling, N. Naughton, Fluid Heating system, European Patent, granted, number forthcoming, 2021.

11. B. D. Plourde, J. P. Abraham, D.R. Plourde, R. Pakonen, “Method of Calculating Pathogen Inactivation for a Fluid Heating System”, US Patent, 11,255,804.

12. B.D. Plourde, A. Gikling, J.P. Abraham, R. Pakonen, “Digital Fluid Heating System”, China National Intellectual Property Administration, Chinese Application Number 201780083752.0

13. B.D. Plourde, A. Gikling, J.P. Abraham, R. Pakonen, “Digital Fluid Heating System”, African Regional Intellectual Property Organization (ARIPO), (patent granted, number forthcoming).

14. B.D. Plourde, A. Gikling, J.P. Abraham, R. Pakonen, “Digital Fluid Heating System”, European Union number EP 4,080,134.

15. B.D. Plourde, A. Gikling, J.P. Abraham, R. Pakonen, “Digital Fluid Heating System”, European Union number EP3,542,107.

16. B.D. Plourde, A. Gikling, J.P. Abraham, R. Pakonen, “Digital Fluid Heating System”, Columbia, Application number NC 2019/00006027, (*number to be issued*).

17. B.D. Plourde, A. Gikling, J.P. Abraham, R. Pakonen, and D. Plourde, Solar Heating for Refrigeration and Fluid Heating Devices, Colombian Application No. 2019/0011368, (number to be issued).

Pending Patents

1. B.D. Plourde, J.P. Abraham, D. Plourde, R. Pakonen, A. Gikling, N. Naughton, "Fluid Heating System", US Patent Application Number 14/954,292, filed December 1, 2015.

2. B.D. Plourde, J.P. Abraham, "Solar Heating System", US Patent Application No. 62/423,814 (filed November 18, 2016).

3. B.D. Plourde, A. Gikling, J.P. Abraham, R. Pakonen, "Solar Heating for Refrigeration and Fluid Heating Devices", filed March 2018. US Application number 20180266712.

4. B.D. Plourde, A. Gikling, J.P. Abraham, R. Pakonen, "Dual-Axis Tracking Method", US Application number 2019/0107598, filed November 2018.

5. B.D. Plourde, A. Gikling, J.P. Abraham, R. Pakonen, "Digital Fluid Heating System", US Application number 2018/0142905, filed November 2017.

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.

Editorial Board Member

18. International Society of Cardiovascular Translational Research, 2020-present
19. Energies, Thermal Management, 2019-present
20. Cardiovascular Revascularization Medicine, 2018-present
21. Stem Cell Biology and Transplantation, 2015-present
22. Associate Editor, NCSE, Climate Science, 2012-present
23. International Journal of Mechanics and Energy, 2012-present
24. Open Mechanical Engineering Journal, 2007-present
25. Open Mechanical Engineering Reviews, 2007-present
26. Open Mechanical Engineering Letters, 2007-present
27. Open Medical Devices Journal, 2008-present
28. Creative Engineering Journal, 2009-present
29. ISRN Applied Mathematics, 2011-present
30. International Journal of Sustainable Energy, 2012 - present
31. International Journal of Materials, Methods, and Technologies, 2012- present

CONSULTANTSHIPS

GRANTS (funding $24.02 million)

Varian Medical Systems	**2023-present**
Flotherm	**2021-present**
LEMA, LLC, MN	**2016-present**
HRST, Inc., MN	**2021**
Biotronik	**2021**

Starky	**2020**
Marvin Windows	**2020-2022**
Cardiovascular Systems, Inc.	**2019-2021**
ALS Consulting	**2019**
Medivator, MN	**2018-2019**
Medivators, MN	**2014-2015**
EKOS, MN	**2018**
Marcor	**2018**
Marvin Windows	**2018**
Medtronic, Fridley, MN	**2017-2020**
Orbital ATK	**2017-2018**
Pride Engineering, MN	**2017-2018**
Cargill, MN	**2016-2017**
EKOS, MN	**2016-2017**
Precision Air, MN	**2016**
3M, MN	**2015-2017**
Flourescence, Inc., MN	**2015**
Smiths Medical, MN	**2014-2015**
WTS LLC, MN	**2014-2022**
Somnetics, MN	**2014**
Lake Region Medical, MN	**2013-2014**
Amphora Medical, MN	**2013-2014**
ALS Consulting, MN	**2013-2016**
Medtronic, Fridley, MN	**2013-2016**
Devicix, MN	**2012-2013**
CriticCare, MN	**2012**
HRST, Inc., MN	**2012-2015**
QIG Group, OH	**2011-2013**
Phraxis, MN	**2011-2012**
Cardiovascular Systems, Inc., Roseville, MN	**2007-2015**
Translational Biologic Infusion, AZ	**2011-2013**
Galil Medical, Roseville, MN	**2011**
Imation, Oakdale, MN	**2010**
Medtronic, Fridley, MN	**2008-2011**
R4 Engineering, India	**2008-2009**
Horizontal Winds,	**2008-2**
Lockheed Martin, Eagan, MN	**2007-2009**
St. Jude Medical, Minnetonka, MN	**2007-2009**
Arizant Medical, Eden Prairie, MN	**2006**
Johnson and Johnson, Newark, NJ	**2004-2005**
Cortron/XeteX, Fridley, MN	**2005**
MicroControl Company, MN	**circa 2001**
Donaldson Co., Bloomington, MN	**1999-2003**
Augustine Medical, Eden Prairie, MN	**2000-2003**
Midmac Systems Inc., St Paul, MN	**2002**
Remmele Engineering Inc., St Paul, MN	**2002-2005**
Urologix, Minneapolis, MN	**circa 2004**
Restore Medical, Minneapolis, MN	**circa 2002**
Jennio, Minnesota	**circa 2001**
Caterpillar, Minneapolis, MN	**circa 2000**
ADC telecom, Minneapolis, MN	**circa 2000**

Entropy Solutions **circa 2000**
XeteX, Inc., Minneapolis, MN **1996-2000**
Pneuseal, St. Paul, MN **1996-1998**
Los Alamos National Laboratory, Los Alamos, NM **1994**

GRANTS (funding $24.02 million)

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 transcutaneous recharge
$25.5k for simulation of tissue temperatures during transcutaneous recharge

Medivators **2018**

$18k to research airflow in medical sterilization equipment.

Marvin Windows **2018-2020**

$6k to research thermal processes during window ventillation
$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

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.

Floursecence, 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 transcutaneous recharge

Smiths Medical **2014**
$9.5k for design and optimization of medical warming blankets
$10k for the design and improvement of medical fans
$12kfor 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 communiation 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 palleted 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
$10k for the design of a polymeric extrusion die **2010**

Cypress Wind
$30.6k for the development of a vertical axis, small-footprint wind turbine. **2010**

Cypress Wind
$27k for the development of a vertical axis, small-foorprint wind turbine. **2009**

Cardiovascular Systems, Inc. **2009**
$80k for the study of cavitation and bolus formation during orbital atherectomy procedures.

Medtronic, Inc.
$65k for analysis of subdermal heating associated with recharge of neuromodulation systems. **2008-2011**

University of St. Thomas Faculty Development Grant **2009**
$4,200 for the purchase of a high-performance computer for numerical simulations.

CSUMS: A computational Traininig 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 **2004-2005**
Analysis of a uterine fibroid embolization device

Urologix **circa 2004**
Design of thermoelectric device for heating/cooling of urological catheter fluids

Donaldson Co. **1999-2003**
Analysis and characterization of a filter-manufacturing device

Augustine Medical **2000-2003**
Characterizsation of a forced-air patient warming device

Midmac Systems Inc. **2002**
Thermal analysiss of a polymeric sealing machine

Restore Medical **circa 2002**
Characterization of sleep apnea treatment

Remmele Engineering Inc. **2002-2005**
Thermal analysis of a polymeric sealing machine for insulin packaging
Thermal analysis of liquid-based cold plates for cooling naval radar

MicroControl Company **Circa 2001**

Analysis of burn-in board devices

Jennio **circa 2001**
Analyzed devices that handle, transport, and cool turkey carcases during processing.

Caterpillar **circa 2000**
Analysis of a screed heating machine

ADC Telecom **circa 2000**
Optimization of an AC/DC power converter

Entropy Solutions **circa 2000**
Design and Analysis of insulation and phase change thermal management for shipping containers

XeteX, Inc **1996-2000**
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

Pneuseal **1996-1998**
Operation and optimization of a polymeric sealing device for medical packageing

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