Ravi S. Prasher, Ph.D.
Lawrence Berkeley National Lab
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Summary:

- Technologist, researcher and educator with demonstrated accomplishments in industrial (Intel Corp.) technology start-up (Sheetak Inc.), academic (UCB, ASU), government sectors (ARPA-E) and national lab (LBNL)
- **Area of Expertise**: Nano to macroscale thermal energy process and systems, thermal storage, concentrated solar power, electronics cooling, waste heat harvesting, thermoelectrics
- **Research Experience:**
  - 89 archival journal publications (24 solo author) in top science and engineering journals (e.g. Nature Nanotechnology, Physical Review Letters)
  - More than 30 patents in the area of thermal energy based devices
  - **h-index**: 53 (based on Google Scholar)
  - **Citations**: more than 10,000 (based on Google Scholar)
  - Research funding received from: DOE, NSF and Office of Naval Research
  - Advised/served Ph.D. students/committees at Stanford, Berkeley and ASU
- **Teaching Experience**: Developed and taught two graduate level courses on nanoscale thermal transport and thermal properties production and taught undergraduate thermodynamics at ASU
- **Other**
  - Reviewer for multiple top science and engineering journals such as Science, Nature Materials, Nature Energy, Physical Review Letters & J. of Heat Transfer
  - Fellow of ASME (elected 2009, one of the youngest fellows at the age of 36)
  - and Sr. Member of IEEE
  - Intel Achievement Award (highest award for technical achievement in Intel) for electronics thermal management
  - Outstanding Engineer Award from IEEE Components and Packaging Society
  - Associate Editor: J. Heat Transfer, Nanoscale and Microscale thermophysical Engineering & Annual Reviews of Environment and Resources, IEEE Transactions on Components and Packaging Technology (2005-2016), ASME Journal of Thermal Science Engineering and Applications (2010 – 2013)

Employment:

University of California, Berkeley

Adjunct Professor, Department of Mechanical Engineering, July 2017- Present

- Conducting research in the areas of thermal transport in Lithium ion batteries, microelectronics thermal management using microfluidics, solar thermal energy conversion, high density thermochemical storage, thermoelectrics, phase change heat transfer, solar thermal desalination and heat and mass transfer in roll-to-roll manufacturing process.
- Teaching interest: Heat Transfer, Radiation Heat Transfer, Nanoscale Thermal Transport, Materials and Devices for Energy Applications

Lawrence Berkeley National Laboratory, Berkeley, CA

Director, Energy Storage and Distributed Resources Division, June 2015 – Present

- Responsible for providing strategic leadership and management t
- Establish and sustain partnership with the wider science and technology ecosystem
- Accountable for Division budgets, funding, workforce planning, human resources management
- Member of the laboratory senior management to ensure smooth operations and long-term prospects

- Actively shepherding three major new multidisciplinary research initiatives: 1) Cost-effective desalination 2) Science of scaling/manufacturing 3) Grid initiative
- Lab lead for science of manufacturing program for Advanced Manufacturing Office of DOE
- Established Thermal Energy Science and Technology Lab (TEST-Lab)
- Won $1.5 funding from DOE BENEFIT FOA to develop super thermal insulation for buildings using nanoparticles

Sheetak Inc., Austin, Texas
Vice President, Product Development, Nov. 2012 – May 2015

- Sheetak is a device-to-systems thermoelectrics company focused on making low cost energy harvesters and converters based on its proprietary thermoelectrics material and devices
- Sheetak has been funded by private venture and various US government agencies due to its innovative thermoelectric chip and system
- I am responsible for developing an appliance that produces electricity based on thermoelectrics in collaboration with a major appliance maker
- Started the India subsidiary of Sheetak by relocating to India for one year

Advanced Research Projects Agency-Energy, US Department of Energy
Program Director**:** March 2010- November 2012

- I was one of the first program directors at ARPA-E. I was actively involved in creating the basic DNA of the agency. Due to the operational structure of ARPA-E, I got a panoramic view of the whole energy field
- As a program director my job involved program creation to define technology whitespace and opportunities, figuring out the right cost for new technology, convincing the ARPA-E director to appropriately fund the programs, selecting teams to develop technologies, active program management and developing technology commercialization strategies.
- Created and managed two programs on cooling/heating of buildings and thermal energy storage for applications such as automobiles, concentrated solar power, and fuel production from sunlight.
- Total value of the portfolio was ~ $ 100M with more than 30 teams.
- Outreach activities for success of these programs involved significant interactions with venture capital community, other government agencies, large corporations & other entities.
- Cooling/heating program target was to develop disruptive cooling/heating technologies for buildings to increase the efficiency by > 50%
- Thermal storage program target was to deliver technologies that can increase the range of electric vehicles by ~40%, decrease cost of concentrated solar power < $1/W and make sunlight to fuel efficiency > 10x of biofuels. The synopsis of the research behind the creation of this program was published in Science (Vol. 335, 1454, 2012).
- Technical advisory board member of the SunShot (DOE program on making solar electricity cost competitive with fossil fuel-based electricity) I advised the team on project selection and changing the technical direction to be in line with the goals of the program. I also actively participated in project selection.

Arizona State University (ASU), 2004-2013
Adjunct Professor, Dept. of Mech. and Aero. Eng.

- **Courses**:
    - Co-developed two graduate courses "*Nanoscale Thermal Transport*" and "*Thermal Properties Prediction*
    - Taught undergraduate *thermodynamics* & *electronics cooling* section of the graduate course on *electronics packaging*
- **Research Funding**:

- System-level approach for multi-phase, nanotechnology-enhanced cooling of high-power microelectronic systems, $500k (ASU portion), 05/01/07 - 04/31/12, Office of naval research, MURI
- Transport in nanoscale colloidal systems, $307,218, 04/15/2004 - 03/31/07, National science foundation
- Nanoparticle-filled liquid fuels for efficient energy conversion, $110,000, 09/01/06 - 08/31/07, national science foundation,

- Thesis committee member/co-advisor of various MS and PhD students

Intel Corporation: 1999-2010

- **Technology Development Manager**, Thermal and Fluids Core-Competency : A Team of 9 Ph.D. Engineers: 2006-2010
  - Research and development of advanced cooling technologies for Intel CPU
  - Development of new metrologies and modeling techniques for electronics thermal management
  - Development of thermal technology roadmap for electronics thermal management
  - Research and development of physics-based electronic package manufacturing
  - Research and development of advanced nano-materials
- **Sr. Technologist**: **2003-2005**
  - Led various technology development projects: microchannels, thermal interface materials, Heat pipes, nanofluids, nanoscale thermoelectric
- **Sr. Thermal Engineer**: **1999-2003**
  - Led various technology development projects: microchannels, thermal interface materials, heat pipes, nanofluids

Awards and honors

- **Fellow** of American Society of Mechanical Engineers (Elected 2009)
- Senior Member of IEEE (Elected 2005)
- Outstanding Young Engineer of the Year Award, Components and Packaging Society of IEEE, 2006
- Best Paper Award for "Predicted Efficiency of Nanofluid-Based Direct Absorption Solar Receiver," Proceedings of ES 2007, Energy Sustainability 2007, Long Beach, California, June 27-30 by H. Tyagi, P. Phelan and R.S. Prasher
- **Intel Achievement Award** (highest award for technical achievement in Intel)
- IEEE society award for very significant contribution to the CPMT Phoenix Chapter

Other professional activities:

Publications:

- **More than 85 Archival Journal publications** in top science and engineering journals (Nature Nanotechnology, Science, Physical Review Letters, Journal of Heat Transfer and etc.)
- **4 book chapters** on thermal interface materials, nanofluids and electronics cooling

Patents:

More than 30 US patents on microchannels, heat pipes, thermoelectric, thermal interface materials, nanofluids, carbon nanotubes

Associate Editor:

- *IEEE Transactions on Components and Packaging Technology* (2005-present)
- *Nanoscale and Microscale Thermophysical Engineering* (2008-present)
- *ASME Journal of Thermal Science Engineering and Applications (2010 – 2013)*
- *Annual Reviews of Environment and Resources (2013-2018)*

Tutorial:

Taught a 4 hour tutorial on Micro/Nanotechnology in Electronics Thermal Management (with Prof. Ken Goodson of Stanford University) in the ASME InterPACK, and ITHERM

Dissertation Committee Member of Students at Various Universities

- **Ph.D. committee: Stanford**: Xuejiao Hu (2005), Matt Panzer (2010)**; U. of California Berkley**: Tao Tong (2007)**; ASU**: Prajesh Bhattacharya (2005), Himanshu Tyagi (2008), Lucia Lai, Sabarish Vinod and Todd Otanicar (on going)**;**
- **M.S committee: ASU**: Sridhar Nara (2005)

Panelist and Reviewer for Multiple Research Agencies:

NSF, Air Force Office of Scientific Research (AFOSR), American Chemical Society, US Department of Energy, National Research Council of Canada, World Bank

Reviewer for Various Archival Journals and Magazines:

Science, Nature Materials, Nature Energy, Scientific Reports, ACS Nano, Physical Review Letters, Physical Review B, J. Applied Physics, Physical Review E, ASME J. of Heat Transfer, Physics Letters A, ASME J. of Electronics Packaging, AIAA J. of Thermophysics and Heat Transfer, J. of Enhanced Heat Transfer, IEEE Transaction of Components and Packaging Technology, International J. of Thermal Sciences, International J. of Heat and Mass Transfer, Nano Today, Materials Today, Nano Letters

Invited Seminars and Lectures: Multiple invited seminars and lectures on Thermal Energy Transport and Conversion at places such as MIT, Ecole Centrale Paris Lawrence Berkeley National Laboratory, *Japan/U.S. Joint Seminar on Nanoscale Transport Phenomena - Science and Engineering*

Mentor for Semiconductor Research Corporation (SRC) (1999-present):

- Provide both technical and strategic guidance to universities for future research needs and current research
- Thesis committee member of Ph.D. students at Stanford University

iNEMI (International Electronics Manufacturing Initiative): **Co-Chair** of the 2009 iNEMI Thermal Roadmap Technology Working Groups (TWGs) & **Co-Chair** of 2007 Thermal Technology Integration Group

Education

01/96-05/99 **Arizona State University** Tempe, AZ

- Ph.D. in Mechanical Engineering, (Adviser: Dr. Pat Phelan)
- Minor: Electrical Engineering

07/91-05/95 **Indian Institute of Technology (IIT)** New Delhi, India

- BS in Mechanical Engineering

Ph.D. Dissertation: Size and Interfacial Effects on the Thermophysical Properties of Thin Solid Films

- Thermal analysis of solid state devices
- Proposed a universal dimensionless parameter for the prediction of size effects on the thermodynamic properties of solids
- Developed two analytical models to predict the thermal boundary resistance at the interface of thin films used in solid state devices and their substrates
- Developed an analytical model to describe the size effects on the specific heat of semiconductor thin films and microstructures due to their reduced dimension

Refereed Journal Publications:

1) Lee, S., et al., 2016, "Low-Temperature Melting of Silver Nanoparticles in Subcooled and Saturated Water," *J. of Heat Transfer*, Vol. 138, 052301
2) Vishwakarma, V., et al., 2015, "Heat transfer enhancement in a lithium-ion cell through improved material-level thermal transport," *J. of Power Sources*, Vol. 30, 123
3) Lee, S., et al., 2015, "The effective latent heat of aqueous nanofluids," *Materials Research Express*, Vol. 2, 065004
4) Shi, L., et al., 2015, "Evaluating broader impacts of nanoscale thermal transport research," *Nanoscale & Microscale Thermophysical Engineering*, Vol. 19, 127

5) Kaur, S., Rarvikar, N., Helm, B.A.Helms, **Prasher, R.S.,** and Ogletree, D.F., 2014, "Enhanced thermal transport at covalently functionalized carbon nanotube array interfaces," *Nature Communications*, Vol. 5, 3082
6) Henery, A., and **Prasher, R.S**.,2014, " The prospect of high temperature solid state energy conversion to reduce the cost of concentrated solar power," *Energy and Environmental Science*, Vol. 7, 1819
7) Yang, J. et al., 2014, "Phonon transport through point contacts between graphitic nanomaterials," *Phys. Rev. Lett*., Vol. 112, 205901
8) Lee, S. et al., 2014, "Experimental investigation of the latent heat of vaporization in aqueous nanofluids," *App. Phys. Lett*., Vol. 104, 151908
9) Gunawan, A., 2014, "The amplifying effect of natural convection on power generation thermogalvanic cells," *Int. J. of Heat and Mass Transfer*, Vol. 78, 423
10) Taylor, R. et. al., 2013, "Small particle big impacts: A review of the diverse application of nanofluids," *Journal of Applied Physics*, Vol. 113, 11301
11) Gunawan, A., 2013, " Liquid tthermolectrics: Review of recent and limited new data of thermogalvaic cell experiments," *Nanoscale and Microscale Thermophysical Engineering*, Vol. 17, 304
12) Miner, M.J. et all, 2013, "Optimized expanding microchannel geometry for flow boiling," *J. of Heat Transfer*, Vol. 135, 042901
13) Taylor, R. et al., 2012, "Socioeconomic impacts of heat transfer research," *International Communications in Heat and Mass Transfer*, 39, 1467
14) Odom, B.A., et al., 2012 "Heat Sink Effect on System Pressure and Mass Flow Rate in a Pumped Refrigerant Loop," *Journal of Thermal Science Engineering and Applications* , Vol. 4, 31009
15) Odom, B.A., et al., 2012, "Microchannel Two-Phase Flow Oscillation Control With an Adjustable Inlet Orifice," *Journal of Heat Transfer*, Vol. 134, 122901
16) Yang, J., Yang, Y., Waltermire, S.W., Wu, X., Zhang, H., Gutu,T., Jiang, Y., Chen, Y., Zinn, A.,**Prasher, R.**, Xu, T. and Li, D., 2012, "Enhanced and Switchable Nanoscale Thermal Conduction due to van der Waals Interfaces, *Nature Nanotechnology*, Vol. 7, 91
17) Gur, I., Sawyer, K., and **Prasher, R.S**., 2011, "Searching for a Better Thermal Battery," Science, 335, 1454
18) Taylor, R.E., et al., 2011, "Nanofluid Optical Property Characterization Towards Efficient Direct Absorption Solar Collectors," *Nanoscale Research Letters*, **6**, 225
19) Taylor, R.E. et al., 2011, "Applicability of Nanofluids in High Flux Solar Collectors," *J. Renewable and Sustainable Energy* , 3, 023104
20) Otanicar, T., Phelan, P.E., **Prasher, R.S**., Rosengarten, G., and Taylor, R.A, 2010**, "**Nanofluid- based direct absorption solar collector, *Journal of Renewable and Sustainable Energy*, 2, 033102
21) Otanicar, T., Chowdhury, E.T., Phelan, P.E., and **Prasher, R.S**., 2010, "Parametric analysis of a coupled photovoltaic/thermal concentrating solar collector for electricity generation," *J. Applied of Physics*, 108, 114907
22) **Prasher, R.S.,** 2010, "Graphene Spreads the Heat," *Science*, Vol. 28, 185
23) Zhang, T., Peles, Y., Went, J.T., Tong, T., Chang, J-Y, **Prasher, R.S**., and Jensen, M., 2010"Analysis and Active Control of Pressure-drop Flow Instabilities in Boiling Microchannel System." *Int. J. of Heat and Mass Transfer, 53*, 2347
24) Phelan, P.E., Gupta, Y., Tyagi, H., Prasher, R.S., Catano, J., Michna, G., Zhou, R., Wen, J., Jensen, M., and Peles, Y. 2010, "Energy Efficiency of Refrigeration Systems for High-Heat-Flux Microelectronics," J. of Thermal Science and Engineering Applications, Vol. 2, 031004
25) Lai, W.Y., Phelan, P.E., and Prasher, R.S., 2010, "Pressure-drop Viscosity Measurements for γ-Al_2O_3 in Water and PG-Water Mixtures," to appear in *J. of Nanoscience and Nanotechnology*
26) Taylor, R., Phelan, P.E., Otanicar, T., Adrian, R., **Prasher, R.S**., 2009, "Vapor Generation in a Nanoparticle Liquid suspension Using a Focused Continuous Laser," *Appl. Phys. Lett*., Vol. 95, 161907.
27) Chowdhury, I, **Prasher, R.S**., Lofgreen, K., Chrysler, G., Narasimhan, S., Mahajan, R., Koester, D.,

Alley, R., and Venkatasubramanian, R., 2009, "Site-specific and On-demand Thermoelectric Cooling of Electronic Devices," *Nature Nanotechnology*, Vol.4, 235

28) Zhang, T., Tong, T., Chang, J, Peles, Y., **Prasher, R.S**., Jensen, M., Wen, J., and Phelan, P.E., 2009, "Ledinegg instability in microchannels" *Int. J. of Heat and Mass Transfer*, 52, 5661
29) Sarangi, R.K., Bhattacharya, A., and **Prasher, R.S.** 2009, "Numerical Modelling of Boiling Heat Transfer In Microchannels, *Applied Thermal Engineering*, 29, 300
30) **Prasher, R.S.,** Hu, X.J., Chalopin, Y., Mingo, N., Lofgreen, S. Volz, Cleri, F., and Keblinski, P., 2009, " Turning Carbon Nanotubes From Exceptional Heat Conductors Into Insulators," *Phys. Rev. Lett*., Vol. 102, 105901
31) **Prasher, R.S.,** 2009, "Acoustic Mismatch Model for Thermal Contact Resistance of van der Waals Contacts," *Applied Physics Letters*, Vol.94, 041905
32) Lai, W.Y., Vinod, S., Phelan, P.E., and Prasher, R.S., 2009, "Convective Heat Transfer for Water-based Alumina Nanofluids in a Single 1.02 mm Tube," *J. Heat Transfer*, 131, 112401
33) Tyagi, H., Phelan, P.E., and **Prasher, R.S**., 2008, "Predicted Efficiency of a Low-Temperature Nanofluid- Based Direct Absorption Solar Collector, to appear in Journal of *Solar Energy Engineering*
34) Tyagi, H., Phelan, P.E., **Prasher, R.S.,** Peck, R., Lee, T., Pacheco, J.R, and Arentzen, P., 2008**,** **"**Increased Hot-Plate Ignition Probability for Nanoparticle-Laden Diesel Fuel**,"** *Nano Letters*, Vol. 8, 1410
35) **Prasher, R.S**., 2008 "Thermal Boundary Resistance and Thermal Conductivity of Multiwalled Carbon Nanotube," *Physical Review B*, 77, 75424
36) Garimella, S.V. et al., 2008, "Thermal Challenges in Next-Generation Electronic Systems," *IEEE Transactions on Components and Packaging Technology*, Vol. 31, No. 4, pp. 801-815
37) Chang, J-Y., **Prasher, R.S.,** Prstic, S., Cheng, P., and Ma, H.B, 2008, "Evaporative Thermal Performance of Vapor Chambers Under Non-uniform Heating Conditions," *J. Heat Transfer*, 130, 121501
38) Moore, A.L., Saha, S., **Prasher, R.S**., and Shi, L., 2008, "Phonon Backscattering and Thermal Conductivity Suppression in Sawtooth Nanowires," *Applied physics Letters*, 93, 083112
39) Keblinski, P., **Prasher, R.S.**, and Eapen, J., 2008, "Thermal Conductivity of Nanofluids: Is the Controversy Over?" *J. of Nano Particle Research*, In press
40) Evans, W., **Prasher, R.S.**, Fish, J., Meakin, P., Phelan, P.E., and Keblinski, P., 2008 "Effect of Aggregation and Interfacial Thermal Resistance On the Thermal Conductivity of Nanocomposites and Colloidal Nanofluids," *International Journal of Heat and Mass Transfer*, 51, 1431
41) **Prasher, R.S**., Tong, T. , Majumdar, A., 2008 "Approximate Analytical Models for Phonon Specific Heat and Ballistic Thermal Conductance of Nanowires," *Nano Letters*, 8, 99
42) **Prasher, R.S.**, 2007, "Thermal Radiation in Dense Nano and Micro Particulate Media," *J. Applied Phys*, 102, 74316
43) Hu, J.X., **Prasher, R.S.**, Lofgreen, K., 2007, "Ultra-low Thermal Conductivity of Nanoparticle Packed Bed," *Appl. Phys. Lett*., 91, 203113
44) **Prasher, R.S.**, Tong, T., and Majumdar, A., 2007 "An acoustic and Dimensional Mismatch Model for Thermal Boundary Conductance Between a Vertical Mesoscopic Nanowire/nanotube and a Bulk Substrate," *J. Appl. Phys.*, 102, 104312
45) **Prasher, R.S.**, Tong, T., and Majumdar, A., 2007, "Diffraction-limited Phonon Thermal Conductance of Nanoconstrictions," *Appl. Phys. Lett*., 91, 143119
46) **Prasher, R.S.**, 2007, "Thermal Conductance of Single-Walled Carbon Nanotube Embedded in an Elastic Half-Space," *Applied Physics Letters*, 90, 143110
47) **Prasher, R.S.**, Dirner, J., Chau, D., Chang, J-Y, Myers, A., Prstic, P., and Dongming, H., 2007 "Nusselt Number and Friction Factor of Staggered Arrays of Low Aspect Ratio Micro-Pin-Fins Under Cross Flow for Water as Fluid," *J. of Heat Transfer*, Vol. 129, pp. 141 - 153
48) **Prasher, R.S.**, 2006, "Far Field Thermal Radiation Through Nanoholes and Apertures," *Nano Letters*, Vol. 6, No. 9, 2135 - 2139

49) **Prasher, R.S.**, "Transverse Thermal Conductivity of Porous Materials Made From Aligned Nano and Micro Cylindrical Pores," *J. Applied Physics*, Vol. 100, 064302
50) **Prasher, R.S.**, 2006"Thermal Conductivity of Composites of Aligned Nanoscale and Microscale Wires and Pores," *J. Applied Physics*, Vol. 100, 034307
51) **Prasher, R.S.**, 2006, "Ultra Low Thermal Conductivity of Packed Bed of Crystalline Nanoparticles: A Theoretical Study," *Physical Review B*, 74, 165413
52) **Prasher, R.S.**, "Thermal Conductivity of Tubular and Core-Shell Nanowires," *Applied Physics Letters*, Vol. 89, 063121, 89, 063121
53) **Prasher, R.S.**, 2006, "Thermal Transport Due to Phonons in Random Nano-particulate Media in The Multiple and Dependent (Correlated) Elastic Scattering Regime, *J. of Heat Transfer*, 128, 627
54) **Prasher, R.S.**, 2006, "Thermal Interface Materials: Historical Perspective, Status and Future Directions," *Proceedings of the IEEE* (Invited), Vol. 94, No. 8, 1571-1586'
55) **Prasher, R..S.**, Bhattacharya, P., and Phelan, P.E., 2006, "Brownian-Motion-Based Convective-Conductive Model for the Effective Thermal Conductivity of Nanofluids," *Journal of Heat Transfer*, Vol. 128, pp. 588 - 595
56) Bhattacharya, P., Nara, S., Vijayan, P., Tang, T., Phelan, P.E., **Prasher, R.S.,** Song, D.W., and Wang, J., 2006 "Characterization of Temperature Oscillation Technique to Measure the Thermal Conductivity of Fluids," *International Journal of Heat and Mass Transfer*, Vol. 49, pp. 2950 – 2956
57) Krishnamurthy, S., Bhattacharya, P., Phelan, P.E., and **Prasher, R.S.**, "Enhanced Mass Diffusion in Nanofluids," *Nano Letters* , 6, 419
58) **Prasher, R.S.**, Evans, W., Meakin, P., Fish, J., Phelan, P., and Keblinski, P., 2006 "Effect of Aggregation on Thermal Conduction in Colloidal Nanofluids, *Applied Physics Letters*, 89 , 143119
59) **Prasher, R.S.**, 2005, "Modification of Planck Blackbody Emissive Power and Intensity in Particulate Media Due to Multiple and Dependent Scattering," *J. of Heat Transfer* Vol. 127, pp. 903-910
60) **Prasher, R.S.**, 2005, "Planck Blackbody Emissive Power in Particulate Media," *Applied Physics Letters*, Vol. 86, 071914
61) **Prasher, R.S.**, 2005, "Modeling of Thermal Boundary Resistance of Nanocomposites," *International J. of Heat and Mass Transfer*, 48, 4942
62) **Prasher, R.S.,** and Phelan, P.E., "Microscopic and Macroscopic Thermal Resistance of Pressed Mechanical Contacts," *J. Applied Physics*, Vol. 100, 063538
63) **Prasher, R.S.**, 2005, "Predicting the Thermal Resistance of Nano-sized Constrictions," Nano Letters , 5, 2155
64) **Prasher, R.S.**, 2005, "Thermal Transport Due to Transverse Phonons in Nano and Micro Particulate Media," *J. of Applied Physics* Vol. 97, 0643313
65) Ganpathy, D, Singh, K., Phelan, P.E., and **Prasher, R.S**, 2005 "An Effective Unit Cell Approach to Compute the Thermal Conductivity of Composites with Cylindrical Particles," *Journal of Heat Transfer*, Vol. 127, 553-559
66) **Prasher, R.S.**, 2005, "Rheology Based Modeling and Design of Particle Laden Thermal Interface Materials," *IEEE transactions on components and packaging technology* , Vol.. 28, pp. 230-237
67) **Prasher, R.S.**, Song, D., Wang, J., and Phelan, P., "Measurement of Nanofluid Viscosity and Its Implications for Thermal Applications, *Applied Physics Letters*, Vol. 89, 133108
68) **Prasher, R.S.**, Phelan, P.E., and Bhattacharya, P., 2006 "Effect of Aggregation Kinetics on Thermal Conductivity of Nanoscale Colloidal Solutions (Nanofluids)," *Nano Letters*, Vol. 6, 1529-1534
69) Torresola, J., Chiu, C-P., Chrysler G., Grannes, C., Mahajan, R., **Prasher, R.S.**, and Watwe, A., 2005 "Density Factor Approach to Representing Impact of Die Power Maps on Thermal Management," *IEEE Transactions on Advanced Packaging*, Vol. 28, pp. 659-664
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71) **Prasher, R.S.**, 2004**,** "Thermal Transport Cross Section and Phase Function of Longitudinal Phonons for Scattering by Nano and Micro Particles*," J. of Applied Physics*, Vol. 96, No. 9, pp. 5202-5211

72) **Prasher, R.S.**, 2004, "Mie Scattering Theory for Phonon Transport in Particulate Media," J. *of Heat Transfer*, Vol. 1126, No. 5, p. 793-804
73) Bhattacharya, P., Yadav, A., Saha, S., Phelan, P.E., and **Prasher, R.S.**, 2004 "Brownian Dynamics Simulation to Determine Effective Conductivity of a Nanofluid," *Journal of Applied Physics*, Vol. 95, No. 11, pp.6492-6494, also in *Virtual Journal of Nanoscience and Technology*, June 7, 2004, Vol. 9, No. 22
74) **Prasher, R.S.**, and Matayabus, J.C., 2004, "Thermal Contact Resistance of Cured Gel Polymeric Thermal Interface Materials," *IEEE transactions on components and packaging technology*, Vol. 27, No. 4, pp. 702-709
75) **Prasher R.S.**., 2003, "Phonon Transport in Anisotropic Scattering Particulate Media," *J. of Heat Transfer*, vol. 125, No. 6
76) **Prasher R.S.**, 2003, "Generalized Equation of Phonon Radiative Transport," *Applied Physics Letters*, Vol. 83, No. 1, pp. 48-51
77) **Prasher R.S.**, Koning, P., Shipley, J., Prstic, S., and Wang, J.L.,2003"Thermal Resistance of Particle Laden Polymeric Thermal Interface Materials," *J. of Heat Transfer*, Vol. 125, No. 6
78) **Prasher, R.S.**, Koning, P., Shipley, J.C., and Devpura, A, 2003, "Dependence of Thermal Conductivity and Mechanical Rigidity of Particle-Laden Polymeric Thermal Interface Material on Particle Volume Fraction," *Journal of Electronics Packaging*, vol. 125, No. 3
79) **Prasher, R.S.,** 2003, "A Simplified Conduction Based Modeling Scheme for Design Sensitivity Study of Thermal Solution Utilizing Heat Pipe and Vapor Chamber Technology," *Journal of Electronics Packaging*, Vol. 125, No. 3
80) **Prasher, R.S.**, and Phelan, P.E., 2001, "A Scattering Mediated Acoustic Mismatch Model for the Prediction of Thermal Boundary Resistance," *ASME J. of Heat Transfer*, Vol. 123, No.1
81) De Bellis, L., Phelan, P.E., **Prasher, R.S.**, 2000 " Variations of the Acoustic and Diffuse Mismatch Models in Predicting Thermal Boundary Resistance", *Journal of Thermophysics and Heat Transfer*, Vol.14, No.2, April-June2000
82) **Prasher, R.S.**, and Phelan, P.E., 1999, "Nondimensional Size Effects on the Thermodynamic Properties of Solids", *Int. J. of Heat and Mass Transfer*, Vol. 42, pp. 1991-2001
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