Ronggui Yang

Assistant Professor and Sanders Faculty Fellow in Engineering
Director, Nanoscale and Ultrafast Thermal Sciences and Applications Lab (NUTS)
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RESEARCH INTERESTS:

- Micro/Nanoscale and Ultrafast Transport Phenomena
- Micro- and Nanotechnology for Energy Conversion
- Micro/Nano-Enabled Thermal Management for Electronics and Optoelectronics
- Nanostructured Materials (Nanocomposites, Hybrid Micro/Nano-Structures, Inorganic-Organic Hybrid Materials)
- MEMS/NEMS and Micro/Nanofabrication

EDUCATION:

- **Massachusetts Institute of Technology (MIT)**, GPA:5.0/5.0, Feb. 2006
  Ph.D. in Mechanical Engineering (Heat Transfer), Minor: Solid State Electronics
  Dissertation: Nanoscale Heat Conduction with Applications in Nanoelectronics and Thermoelectrics.
  Dissertation Advisor: Professor Gang Chen
  Committee: Gang Chen, Mildred S. Dresselhaus, John H. Lienhard, Borivoje B. Mikic
- **University of California, Los Angeles (UCLA)**, GPA: 3.85/4.0, June 2001
  M.S. in Mechanical Engineering (Micro-Electro-Mechanical Systems)
- **Tsinghua University**, Beijing, China, GPA:85/100, July 1999
  M.S. in Engineering Thermophysics
- **Xi'an Jiaotong University**, Xi'an, China, GPA: 85/100, July 1996
  B.S. in Thermal Engineering

POSITIONS HELD:

2008-2011 Sanders Faculty Fellow, College of Engineering and Applied Science, CU-Boulder.
01/2006 – Assistant Professor of Mechanical Engineering, CU-Boulder.
08/2005-12/2005 Adjunct Assistant Professor of Mechanical Engineering, CU-Boulder.
09/2001-12/2005 Graduate Research Assistant, Mechanical Engineering, MIT.
09/1999-07/2001 Graduate Research Assistant, Mechanical and Aerospace Engineering, UCLA.
09/1996-07/1999 Graduate Research Assistant, Thermal Engineering Department, Tsinghua University, Beijing, China.

AWARDS AND DISTINCTIONS:

2008 Technology Review's TR35 Award (one of the 35 young scientists and technologists in world who are under the age of 35, but their work--spanning medicine, computing, communications, electronics, nanotechnology, energy, and more--is changing our world.)

2008 DARPA/MTO Young Faculty Award (one of the 39 rising stars in university Microsystems research)
2008-2011 Sanders Faculty Fellow, College of Engineering and Applied Science, CU-Boulder.
2008 Outstanding Research Award, Department of Mechanical Engineering, CU-Boulder
2008 Nominated for IEEE/ACM William J. McCalla ICCAD 2008 Best Paper Award by the conference organizers of the 2008 International Conference on Computer-Aided Design (ICCAD), San Jose, CA, November 10-13, 2008.
2005 Best Paper Award – Research, InterPACK 2005 (the ASME/Pacific Rim Technical Conference and Exhibition on Integration and Packaging of MEMS, NEMS, and Electronic Systems), 1 out of 500+ papers.
2005 Goldsmid Award for Excellence in Research in Thermoelectrics, International Thermoelectrics Society.
2004 NASA Certificate of Recognition for a Technical Innovation (Space Act Tech Brief Award), NASA Inventions and Contributions Board.
2003 Elected full member of Sigma Xi, the Scientific Research Society.
1999 Lee Wang Se Al Mei Scholarship, Fujian Province, China.
1997-1998 Takada Fellowship, Tsinghua University, China.
1993-1996 Outstanding Student Scholarship, Xi'an Jiaotong University, China.

AFFILIATIONS:

- Department of Mechanical Engineering, University of Colorado at Boulder
  Directing the research activities in the Nanoscale and Ultrafast Thermal Sciences and Applications (NUTS) Lab including: (1) developing multi-carrier and multiscale simulation tools for electron and thermal transport in nanostructures and systems with embedded nanostructures, (2) building electrical and optical measurement systems to characterize thermal and electrical transport on the micro/nano~ and ultrafast scales including building two-color femtosecond pump-probe measurement systems [NIR-Blue and Visible-EUV] for studying fundamental energy relaxation processes of electrons and phonons and for thermal imaging, (3) applications of nanotechnology and ultrafast science for energy conversion, thermal management in electronics and photonics, controllable nonmanufacturing, and bio-medical instrumentation.
- NSF Engineering Research Center for Extreme Ultraviolet Science and Technology
- DARPA Focus Center on Nanoscale Science and Technology for Integrated Micro/Nano-Electromechanical Transducers

PROFESSIONAL AND UNIVERSITY SERVICES

Proposal Review Panelist/Reviewer for Federal Funding Agencies

- Review Panelist, NSF/CBET Thermal Transport Program, Arlington, VA, December, 2006.
- Review Panelist, NSF/Sandia National Laboratories Program, Albuquerque, NM, June 29, 2006.
- Review Panelist, NSF – NIRT Proposals, Arlington, VA, March 1-2, 2006.
- Proposal Reviewer, National Science Foundation, February 2006 ~
- Proposal Reviewer, Department of Energy, March 2007 ~
- Proposal Reviewer, American Chemical Society Petroleum Research Fund, March 2006 ~

- Proposal Reviewer, Kentucky Science and Engineering Foundation, November 2006
- Proposal Reviewer, U.S. Civilian Research and Development Foundation, 2007~

Journal Editor

- Co-Guest Editor for a special issue on "Nanoscale Heat Transfer" in Journal of Computational and Theoretical Nanoscience, Published in February 2008, American Scientific Publishers.

Referee for Journal Manuscripts

Nanotechnology and Physics Journals:

Science (2006~); Nature (2007~); Physical Review Letters (2005~); Physical Review B (2005~); Nano Letters (2005~); Applied Physics Letters (2004~); Journal of Applied Physics (2005~); Physics Letters A (2005~); Journal of Physics D: Applied Physics (2006~); Nanotechnology (2006~); IEEE Transactions on Electronic Devices (2006~); Superlattices and Microstructures (2003~); Journal of Computational and Theoretical Nanoscience (2006 ~); Journal of Electronic Materials (2007~); Computational Physics Communications (2007~); Journal of Microengine and Micromechanics (2007~); Journal of Physics and Chemistry of Solids (2008~); Review of Scientific Instruments (2008~); IEEE Transactions on Very Large Scale Integration Systems (2008~), IEEE Transactions on Electronic Devices (2007-), Nano Research Letters (2008~)

Heat Transfer and Energy Journals:

ASME Journal of Heat Transfer (2002~); International Journal of Heat and Mass Transfer (2005~); Nanoscale/Microscale Thermophysical Engineering (2004~); AIAA Journal of Thermophysics and Heat Transfer (2006 ~); International Journal of Thermophysics (2006~); Energy Conversion and Management (2004~); Applied Thermal Engineering (2005~); Microfluidics and Nanofluidics (2007~); IEEE Transactions on Components and Packaging Technologies (2006~); HVAC&R Research Journal (2008~); Heat Transfer Engineering Journal (2007~)

Conference Organizer / Session Chair:

Program Committee

- Program Committee Member, the 2nd Integration & Commercialization of Micro & Nanosystems International Conference & Exhibition, June 2008, Hongkong.
- Program Committee Member, the 1st International Conference on Integration and Commercialization of Micro- and Nanosystems, Sanya, Hainan, China, January 10 - 13, 2007.

Topic/Track/Symposium Organizer

- Topic Co-Organizer, Topic #25 Thermal Properties of Nanostructured Materials, the 17th Symposium on Thermophysical Properties, Boulder, CO, June 21-26, 2009.
- Topic Organizer, Topic 9-1 Transport Phenomena in Materials Processing and Manufacturing 2008 ASME Summer Heat Transfer Conference, August 10-14, 2008, Jackonsville, Florida.

- Track Organizer, Track #5 Nano/Micro-scale Thermal Transport and Integrated System Applications**,** the 2nd Integration & Commercialization of Micro & Nanosystems International Conference & Exhibition, ASME Nano-Institute, June 2008, Hongkong.
- Track Organizer, Track #1 Design and Modeling of Nanocomposites**,** Multifunctional NANOcomposites 2006 International Conference, ASME Nano-Institute, Honolulu, Hawaii, Sept. 20-22, 2006.
- Local Organizer, 15th U.S. National Congress on Theoretical and Applied Mechanics, Boulder, CO, June 25-30, 2006.

Session Organizer

- Session Chair, Session 8 Solid-Liquid Interface, the 6th US-Japan Joint Seminar on Nanoscale Transport Phenomena - Science and Engineering, July 13-16, 2008, Radisson Hotel, Boston, MA
- Session Chair, Session 5-3 Nano/Micro-Enabled Enery Systems, the 2nd Integration & Commercialization of Micro & Nanosystems International Conference & Exhibition, ASME Nano-Institute, June 2008, Hongkong.
- Session Chair, Micro/Nanoscale Energy Transport Poster Session, International Conference on Integration and Commercialization of Micro- and Nanosystems, Sanya, Hainan, China, January 10 - 13, 2007
- Session Chair, Properties at the Nanoscale 2 – Thermal Properties of Nanoscale Materials, 16th Symposium on Thermophysical Properties, Boulder, CO, July 30-Aug. 04, 2006
- Session Chair, Nanomaterials Poster Session, Energy Nanotechnology International Conference, ASME Nano-Institute, MIT, MA, June 25-28, 2006.
- Session Chair, Session 1-1 and 1-2, Design and Modeling of Nanocomposites**,** Multifunctional NANOcomposites 2006 International Conference, ASME Nano-Institute, Honolulu, Hawaii, Sept. 20-22, 2006.

Conference Manuscript Reviewer:

ASME/JSME Joint Thermal Engineering Conference (AJTE 2003).
ASME International Mechanical Engineering Conference and Exhibitions (IMECE 2002, 2004, 2006, 2007).
ASME Summer Heat Transfer Conference (2005, 2006, 2007, 2008).
The ASME/Pacific Rim Technical Conference and Exhibition on Integration and Packaging of MEMS, NEMS, and Electronic Systems (InterPACK 2005, 2007).
ASME Multifunctional NANOcomposites International Conference (MN06, MN 07)
The 13th International Heat Transfer Conference (IHTC-13), Sydney, Australia, 2006.
The 36th SAE International Conference on Environmental Systems (ICES), 2006.
MRS Proceedings, 2003-2007
ASME Energy Nanotechnology International Conference(ENIC06), 2006, 2008
ASME International Conference on Integration and Commercialization of Micro- and Nanosystems (MicroNano 2007, 2008)
ASME Micro/Nanoscale Heat Transfer Int. Conference (MNHT08), Taiwan, January 2008.

Book Proposal Reviewer for John Wiley & Sons, UK.

University Services:

- Graduate Committee, Department of Mechanical Engineering, CU-Boulder, Fall 2007 -
- Chair of Departmental Seminars, Department of Mechanical Engineering, CU-Boulder, Fall 2007 -
- Reviewer of Undergraduate Research Opportunities Program (UROP) Proposals (Spring 2006).

Membership:

ASME, American Society of Mechanical Engineers, International
IEEE, Institute of Electrical and Electronic Engineers Inc.
MRS, Material Research Society
APS, American Physical Society
SAE, Society of Automotive Engineers
ITS, International Thermoelectrics Society
Sigma Xi, The Scientific Research Society

PUBLICATIONS

Ph.D Dissertation

Ronggui Yang, Nanoscale Heat Conduction with Applications in Nanoelectronics and Thermoelectrics, MIT, Defended on November 18, 2005.

Book Chapter

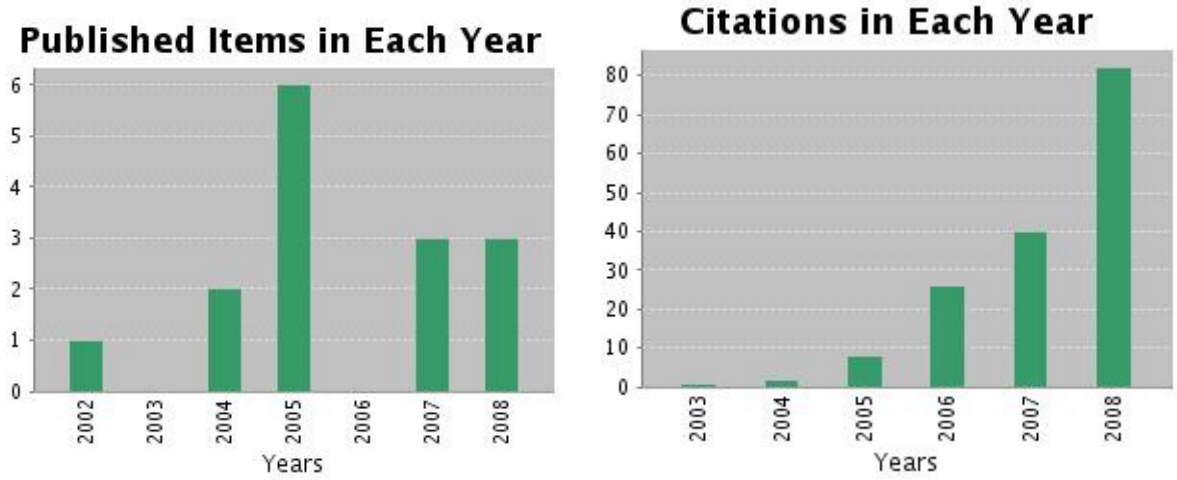
- G. Chen, D. Borca-Tascuic and **R.G. Yang**, "Nanoscale Heat Transfer," in "Encyclopedia of Nanoscience and Nanotechnology", eds. H.S. Nalwa, Vol. 7, pp. 429-459, American Scientific Publishers, 2004.
- **Ronggui Yang**, "Nanoscale Heat Transfer: Challenges and Opportunities," in "Encyclopedia of Life Support Systems (EOLSS)" (www.eolss.net) under topic "Heat and Mass Transfer" edited by Professor Wenquan Tao, UNESCO, committed to deliver the manuscript by August 2008.
- **Ronggui Yang,** "Nano-Thermoelectrics", in Annual Review for Nano Research, edited by Guozhong Cao and C. Jeffrey Brinker, committed to deliver the manuscript by October 2008

Patents (Applications and Invention Disclosures)

1. Gang Chen, **Ronggui Yang**, and Arvind Narayanaswamy, Surface-Plasmon Enabled Nonequilibrium Thermoelectric Devices, US Provisional 60/567,987, May 4, 2004, Full US Patent Application 11/007,557, December 8, 2004 . International Application submitted in May 2005.
2. Gang Chen, Xiaoyuan Chen, and **Ronggui Yang**, Multistage Thermoelectric Micro Cryogenic Coolers, Disclosed to MIT Technology License Office in March 2005 (MIT Case No. 11653), Full US and International Patent Application, January 2007.
3. **Ronggui Yang**, Weixue Tian, and Y.C. Lee, Photonic Crystal Fiber Based Capillary Pumped Loops Disclosed to University of Colorado Technology Transfer Office, March 2006, US Provisional No. 60/911,228, April 11, 2007.

4. **Ronggui Yang,** Y.C. Lee, Chen Li, Jen-Hau Cheng, G.P. "Bud" Peterson, and Victor M. Bright, Flexible Thermal Ground Plane and Manufacturing Thereof, Disclosed to University of Colorado Technology Transfer Office, July 2007.
5. Jen-Hau Cheng, and **Ronggui Yang,** A Universal Fabrication Process for Miniature Thermoelectric Devices, Disclosed to University of Colorado Technology Transfer Office, August 2007.
6. **Ronggui Yang,** Victor Bright, Zhifeng Ren, Joseph J. Brown, H. Jerry Qi, and Lucy Y. Pao, Programmable Thermal Point-Source Based Nanofabrication (PTBN), Disclosed to University of Colorado Technology Transfer Office, December 2007.
7. Y.C. Lee, Wounjhang Park, and **Ronggui Yang,** Nanowire-Enabled Artificially Structured Materials with Novel Electromagnetic Properties and Their Fabrication Methods, Disclosed to University of Colorado Technology Transfer Office, April 2008.
8. **Ronggui Yang**, Y.C. Lee, and Steven M. George, Molecular-Layer-Deposition (MLD) Enabled Nano-Thermal Interface, Disclosed to University of Colorado Technology Transfer Office, September 2008.

Journal Papers Published and In Press



(Data Report taken from ISI Web of Science as of August 31, 2008)

1. Jianping Fu, **Ronggui Yang**, Gang Chen, G. Jeffrey Snyder and Jean-Pierre Fleurial, Integrated Electroplated Heat Spreaders for High Power Quantum Well Lasers, Journal of Applied Physics, Vol. 104, Art # 064907, 2008.
2. A. Evgrafov, K. Maute, **R.G. Yang**, and M.L. Dunn, Topology Optimization for Nano-scale Heat Transfer, International Journal for Numerical Methods in Engineering, http://doi.wiley.com/10.1002/nme.2413 (Published online in July 2008).
3. Ming-Shan Jeng, **Ronggui Yang**, David W. Song, and Gang Chen, Modeling the Thermal Conductivity and Phonon Transport in Nanoparticle Composites using Monte Carlo Simulation, ASME Journal of Heat Transfer, Vol. 130, Article #042410 (1-11), April 2008.
   Top 10 most downloaded articles in the months of May 2008, June 2008
4. Weixue Tian and **Ronggui Yang**, Phonon Transport and Thermal Conductivity Percolation in Random Nanoparticle Composites (Invited Paper), Computer Modeling in Engineering and Sciences (CMES), Vol. 24, p.123-141, 2008.

5. Weixue Tian and **Ronggui Yang**, Effect of Interface Scattering on Phonon Thermal Conductivity Percolation in Random Nanowire Composites, Applied Physics Letters **90**, 263105, June 2007. It has also been selected for the July 9, 2007 issue of Virtual Journal of Nanoscale Science & Technology (Vol. 16, n2) http://www.vjnano.org.
6. M. S. Dresselhaus, G. Chen, M.Y. Tang, **R.G. Yang**, H. Lee, D.Z. Wang, Z. F. Ren, J. P. Fleurial, and P. Gogna, New Directions for Low Dimensional Thermoelectric Materials **(Invited Review)**, Advanced Materials **19**, pp.1043-1053, April 2007.
   Ranked #2 of the top 20 most accessed articles in April 2007.
7. Weixue Tian, and **Ronggui Yang**, Thermal Conductivity Modeling of Compacted Nanowire Composites, Journal of Applied Physics **101**, 054320, March 2007.

8. **Ronggui Yang**, Gang Chen, and Mildred S. Dresselhaus, Thermal Conductivity of Simple and Tubular Nanowire Composites in the Longitudinal Direction, Physical Review B **72**, 125418, 2005. It has also been selected for the Sep 26, 2005 issue of Virtual Journal of Nanoscale Science & Technology (Vol. 12, n13) http://www.vjnano.org.
9. **Ronggui Yang**, Gang Chen, and Mildred Dresselhaus, Thermal Conductivity Modeling of Core-Shell and Tubular Nanowires, Nano Letters, Vol. **5**, pp. 1111-1115, June 2005.
10. **Ronggui Yang**, Gang Chen, Marine Laroche and Yuan Taur, Multidimensional Transient Heat Conduction at Nanoscale using the Ballistic-Diffusive Equations and the Boltzmann Equation, ASME Journal of Heat Transfer, Vol. **127**, pp.298-306, 2005.
11. **Ronggui Yang**, Arvind Narayanaswamy and Gang Chen, Surface Plasmon Coupled Nonequilibrium Thermoelectric Refrigerators and Power Generators, Journal of Computational and Theoretical Nanoscience, Vol. **2**, pp. 75-87, 2005.
12. **Ronggui Yang**, Gang Chen, A. Ravi Kumar, G. Jeffrey Snyder and Jean-Pierre Fleurial, Transient Cooling of Thermoelectric Micro Coolers and its Applications, Energy Conversion and Management, Vol. **46**, pp.1407-1421, 2005 (published in Sep. 2004).
13. **Ronggui Yang** and Gang Chen, Nanostructured Thermoelectric Materials: From Superlattices to Nanocomposites (Invited Review), Materials Integration **18**; pp. 31-36**,** Feature issue on "Thermoelectric Materials R&D in the World".
14. Gang Chen, **Ronggui Yang**, and Xiaoyuan Chen, Nanoscale Heat Transfer and Thermoelectric Energy Conversion, Journal de Physique IV, Vol. **125**, pp.499-504, 2005.

15. **Ronggui Yang** and Gang Chen, Thermal Conductivity Modeling of Periodic Two-Dimensional Nanocomposites, Physical Review B, Vol. **69**, 195316 (1-10), 2004.
16. **Ronggui Yang**, Gang Chen, G. Jeffrey Snyder, and Jean-Pierre Fleurial, Multistage Thermoelectric Micro Coolers, Journal of Applied Physics, Vol. **95**, pp. 8226-8232, 2004. It has also been selected for the June 21, 2004 issue of Virtual Journal of Nanoscale Science & Technology (Vol. 9, n24) http://www.vjnano.org.

17. G. Jeffrey Snyder, Jean-Pierre Fleurial, Thierry Caillat, **Ronggui Yang** and Gang Chen, Supercooling of Peltier Cooler using a Current Pulse, Journal of Applied Physics, Vol. **92**, n3, pp.1564-1569, 2002.

18. **Ronggui Yang**, Shuye Lei and Jianhua Du, Transport Phenomena in Unsaturated Porous Media Due to Sudden Heating, Journal of Tsinghua University (in Chinese), Vol.**39** n6, p78-82, 1999

19. Shuye Lei, **Ronggui Yang** and Jianhua Du, Research on Heat and Mass Transfer in Unsaturated Porous Media, Journal of Tsinghua University (in Chinese), Vol.**39** n6, p.74-77, 1999.
20. Lihe Chai and **Ronggui Yang**, Philosophical Perspective on Modeling Methods, Exploration of Nature (Chinese), Vol. **18**, n2, pp. 87-90, 1999.
21. Shuye Lei and **Ronggui Yang**, Seepage Model on Heat and Mass Transfer in Unsaturated Porous Media, Chinese Academic Journal, Vol. **4**, n8, 1998.

Journal Papers in Review and in Preparation

22. Nicholas Allec, Zyad Hassan, Li Shang, Robert P. Dick and **Ronggui Yang**, "ThermalScope: Multi-scale Thermal Analysis for Nanometer-scale Integrated Circuits," submitted to IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, September 2008
23. Mark Siemens, Qing Li, Margaret Murnane, Henry Kapteyn, Ronggui Yang, Keith A. Nelson, "Observing quasi-ballistic heat transport with EUV light from HHG," to be submitted to Physical Review Letters, October 2008.
24. Dae Up Ahn and **Ronggui Yang**, Thermodynamic Stability of Block Copolymer Nano-Cylinders Perpendicular to Various Organic/Inorganic Surfaces, to be submitted to Small, October 2008.
25. Xiaochun Wang, **Ronggui Yang,** Yong Zhang, Jean-Pierre Fleurial, Andrew F. May, and G. Jeffrey Snyder, First Principles Study on Electronic Structures of High Efficiency Themoelectric Materials Lanthanum Chalcogenides, to be submitted to Physical Review B, October 2008.
26. Yadong Zhang, **Ronggui Yang**, Y. C. Lee, Jacob A. Bertrand and Steven M. George, Defect Visualization in Atomic Layer Deposited Thin Films, Submitted to Thin Solid Films, October 2008.
27. Yadong Zhang, Yu-Zhong Zhang, David C. Miller, Jacob A. Bertrand, **Ronggui Yang**, Martin L. Dunn, Steven M. George and Y. C. Lee, Fluorescence Tags-Based Inspection of Barrier Coatings for Organic Light Emitting Diodes and Polymer Packages, Submitted to Nano Letters, October 2008.
28. Suresh Ramanan and **Ronggui Yang**, Effect of Gas Rarefaction on the Performance of Submicron Fins, Submitted to Applied Physics Letters, October 2008.
29. Liang-Chun Liu, Mei-Jiau Huang, and **Ronggui Yang**, Curvature Effect on the Thermal Conductivity Reduction of Dielectric Nanowires, to be submitted to Journal of Applied Physics, October 2008.
30. Xiaochun Wang, Ronggui Yang, and Yong Zhang, First-Principles Study on the Stability of Self-Organized Nanostructure Patterns, to be submitted to Physical Review B, December 2008.
31. Xiaobo Li, Weixue Tian, Jen-Hau Cheng, and **Ronggui Yang**, Thermal Conductivity Reduction of Mg_2Si-Mg_2Ge Thermoelectric Nananocomposites, to be submitted to Applied Physics Letters, December 2008.

32. **Ronggui Yang,** Gang Chen, Hong Zhao, and Jonathan Freund, Size Effects of Thermal Boundary Resistances, to be submitted.
33. **Ronggui Yang**, Gang Chen, and Mildred S. Dresselhaus, Particle-Size Dependent Thermoelectric Transport in Nanocomposites, to be submitted.

34. **Ronggui Yang,** and Xiaoyuan Chen, Aaron Schmidt, and Gang Chen, Nonequilibrium Electron-Phonon Thermal Transport under Ultrafast Illumination, to be submitted.
35. **Ronggui Yang**, Xiaoyuan Chen, Aaron Schmidt, and Gang Chen, Phonon Relaxation Time Extraction Using Sub-pico Second Pump-Probe Measurement, to be submitted.

Invited and Keynote Conference Presentations (after January 1, 2006)

1. **Invited Panelist: Ronggui Yang,** Thermoelectric Nanocomposites: A Cheaper Nanotech Solution to Cleaner and Quieter Global Energy, EmTech 2008 organized by MIT Technology Review, September 23-25, MIT campus, MA.
2. **Invited: Ronggui Yang**, et al, Probing Nanoscale Thermal Transport using Extreme Ultraviolet (EUV) Light, 6th Japan- US Joint Seminar on Nanoscale Transport Phenomena - Science and Engineering," July 13-16, 2008, Radisson Hotel, Boston, MA.
3. **Invited Poster:** Xiaochun Wang, **Ronggui Yang,** Yong Zhang, Jean-Pierre Fleurial, Andrew F. May, and G. Jeffrey Snyder, First Principles Study on Thermoelectric Properties of Lanthanum Chalcogenides, 6th Japan- US Joint Seminar on Nanoscale Transport Phenomena - Science and Engineering," July 13-16, 2008, Radisson Hotel, Boston, MA.
4. **Invited: Ronggui Yang,** et al, Defect Decoration and Visualization for Atomic Layer Deposited Coatings, the 2nd Integration & Commercialization of Micro & Nanosystems International Conference & Exhibition, June 2008, Hongkong.
5. **Invited Tutorial:** Margaret M. Murnane, Jorge Rocca, John Miao, **Ronggui Yang**, Keith Nelson, Eric Anderson, Martin Aeschlimann, Carmen Menoni, Mario Marconi, and Henry C. Kapteyn, "Harnessing Attosecond Science for Visualizing the Nanoworld," OSA Conference on Lasers and Electro-optics/ Quantum Electronics and Laser Science (CLEO/QELS), San Jose, CA, May 2008, (presented by Margaret Murnane). Paper QMF1. Presented by Margaret Murnane.
6. **Invited:** Mark Siemens, Qing Li, Margaret Murnane, Henry Kapteyn, **Ronggui Yang,** Keith Nelson, Nanoscale Heat Transport Probed with Soft-X-Rays, Paper CWA6, OSA Conference on Lasers and Electro-Optics and the Quantum Electronics and Laser Science Conference (CLEO/QELS), May 2008, San Jose, CA, presented by Mark Siemens.
7. Mark Siemens, Qing Li, Ra'anan Tobey, Oren Cohen, Margaret Murnane, Henry Kapteyn, **Ronggui Yang,** and Keith Nelson, Ultrasensitive, Ultrafast Holographic Detection of Thermal Transients with Extreme Ultraviolet Radiation, The Gordon Research Conference on Photoacoustic and Photothermal Phenomena 2008, Los Angeles, Feb 8-14, 2008

8. **Invited:** Ronggui Yang, Thermoelectric Transport in Nanocomposites, Session on Thermoelectrics, 7th Pacific Rim Conference on Ceramic and Glass Technology, November 11-14, 2007, Shanghai, China
9. **Invited Workshop Talk**: Henry Kapteyn, Margaret Murnane , Keith Nelson, John Miao, Martin Aeschlimann, Ronggui Yang, "Ultrafast Probes of Materials using Table-top Coherent EUV Beams," Division of Materials Sciences and Engineering Council Workshop on Ultrafast Materials Science, Santa Fe, NM, October 2007, (Presented by Henry Kapteyn).
10. **Research Update:** Mark Siemens, Luis Avila, Xibin Zhou, Wen Li, Nick Wagner, Robynne Hooper, Qing Li, Jing Yin, Etienne Gagnon, Arvinder Sandhu, Ronggui Yang, Henry Kapteyn, Margaret Murnane, Erik Anderson, Keith Nelson, Martin Aeschlimann, "Ultrafast Probes of Molecules and Materials using Table-top Coherent EUV Beams," 2007 Retreat of

the NSF Engineering Research Center in Extreme Ultraviolet Science and Technology, Estes Park, CO, October 2007. (Presented by Henry Kapteyn).

11. **Keynote:** Ronggui Yang, Thermoelectric Transport in Nanocomposites, International Conference on Innovative Solutions for the Advancement of the Transport Industry, Oct 4-6, 2006 .
12. **Invited:** Ronggui Yang, Thermoelectric Transport in Nanocomposites, Fourth International Workshop On Polymer Routes to Multifunctional Ceramics for Advanced Energy and Propulsion Applications, July 30-August 05, 2006, Boulder, CO.
13. **Invited:** Z. F. Ren, D. Z. Wang, B. Poudel, Yi Ma, Wenzhong Wang, Xiao Yan, Lili Chen, Bo Yu, Gang Chen, M. S. Dresselhaus, H. Lee, Q. Hao, R. G. Yang, M. Y. Tang, J. P. Fleurial, and P. Gogna, "Nanocomposite approach to high figure-of-merit thermoelectric materials", ASME 1st Energy Nanotechnology International Conference (ENIC2006, Keynote), June 25 - 28, 2006, MIT.
14. **Invited:** Ronggui Yang, Gang Chen, M.S. Dresselhaus, J.P. Fleurial, and P. Gogna, Nanocomposite Engineering for High Efficiency Thermoelectric Materials, the 5th Joint Meeting of Overseas Chinese Physicists Worldwide - International Conference on Physics education and Frontier Physics (OCPA06), June 25-30, 2006, Taipei, Taiwan.
15. **Research Update,** Henry Kapteyn, Elliot Bernstein, Steve Leone, Dan Dessau, John Gland, Chris Greene, Tamar Seideman, Martin Aeschlimann, Ronggui Yang, Keith Nelson, Ivan Christov, Barry Walker, Tom Silva, and Rich Mirin, "Novel linear and nonlinear spectroscopies using small-scale EUV light sources," NSF Engineering Research Center for Extreme Ultraviolet Science and Technology Annual Site Visit, May 2006. Presented by H. Kapteyn.
16. **Invited Tutorial:** M.S. Dresselhaus, G. Chen, J. Heremans, R.G. Yang, and G. Dresselhaus, Low Dimensional Thermoelectricity, Tutorial at 2006 APS March Meeting, March 12, 2006, Baltimore, MD.

Contributed Conference Presentations and Papers (presented by Ronggui Yang)**

1. David C. Miller, Ross R. Foster, Yadong Zhang, Shih-Hui Jen, Jacob A. Bertrand, Zhixing Lu, Dragos Seghete, Jennifer L. O'Patchen, **Ronggui Yang**, Yung-Cheng Lee, Steven M. George, and Martin L. Dunn, "Mechanical Robustness of Atomic Layer Deposited and Molecular Layer Deposited Coatings for Microsystems and Flexible Electronics Applications," Symposium I: Reliability and Properties of Electronic Devices on Flexible Substrates, Material Research Society (MRS) Symposium, Fall 2008, Boston, MA
2. Nicholas Allec, Zyad Hassan, Li Shang, Robert P. Dick and **Ronggui Yang**, "ThermalScope: Multi-scale Thermal Analysis for Nanometer-scale Integrated Circuits," **(IEEE/ACM William J. McCalla ICCAD 2008 Best Paper Award Nomination),** 2008 International Conference on Computer-Aided Design (ICCAD), San Jose, November 10-13, 2008 (referred paper, presented by Zyad Hassan, ~23% acceptance rate).
3. Liang-Chun Liu, Mei-Jiau Huang, and Ronggui Yang, Curvature Effect on the Thermal Conductivity of Nanowires, 2008 Summer Heat Transfer Conference, August 10-14, 2008 Jacksonville, FL (referred paper).
4. Mark Siemens, Qing Li, Margaret Murnane, Henry Kapteyn, **Ronggui Yang**, and Keith Nelson, Nanoscale Heat Transport Probed with Soft X-Rays, XVI International Conference

on Ultrafast Phenomena, June 9-13 2008, Italy (referred paper, presented by Margaret Murnane).

5. Anton Evgrafov, Kurt Maute, **Ronggui Yang** and Martin Dunn, "Topology Optimization for Nano-Scale Heat Transfe," 8th. World Congress on Computational Mechanics (WCCM8) and the 5th. European Congress on Computational Methods in Applied Sciences and Engineering (ECCOMAS 2008), 30 June - 4 July 2008, the Lido Island, Venice, Italy.
6. Yadong Zhang, Yu-Zhong Zhang, David C. Miller, Jacob A. Bertrand, **Ronggui Yang,** Martin L. Dunn, Steven M. George and Y. C. Lee, Fluorescent Tag-Based Inspection of Barrier Coatings for OLEDs and Polymer Packages, NSTI Nanotech 2008, Boston, MA, June 1-5, 2008 (referred paper).
7. Yadong Zhang, David C. Miller, Jacob A. Bertrand, Yu-Zhong Zhang, **Ronggui Yang,** Martin L. Dunn, Steven M. George and Y. C. Lee, Fluorescent Tag-Based Inspection of Barrier Coatings for OLEDs and Polymer Packages, Society for Information Display, 2008 International Symposium, Seminar and Exhibition May 18-23, 2008, Los Angeles, CA (referred paper).
8. Kurt Maute, Anton Evgrafov, **Ronggui Yang**, Martin Dunn, Topology Optimization of Nano- and Submicro-scale Heat Transfer, Proceedings of 2008 NSF Engineering Research and Innovation Conference, January 2008, Knoxville, TN (un-referred paper).
9. **Ronggui Yang,** Jen-Hau Cheng, Weixue Tian, Ming-Shan Jeng, and Gang Chen, Thermal Conductivity of Nanocomposites, ASME Micro/Nanoscale Heat Transfer International Conference (MNHT08), January 2008, Tainan, Taiwan, (oral presentation).

10. ****Ronggui Yang,** Introduction to Nanoscale and Ultrafast Thermal Sciences and Applications Lab, DARPA Young Faculty Award Workshop, November 2007, Arlington VA, (invited poster presentation).
11. ****Ronggui Yang,** Surface-Plasmon Enabled High Efficiency Thermoelectric Devices, DARPA Young Faculty Award Workshop, November 2007, Arlington VA, (Invited Seedling Presentation).
12. Mark E. Siemens, Qing Li, Oren Cohen, Henry Kapteyn, Margaret Murnane, and **Ronggui Yang,** "Probing Quasi-ballistic heat transport using coherent EUV beams", Directed Energy Professional Society 2007, Ultrashort Pulse Laser Workshop, October 2007, (oral presentation).
13. Mark Siemens, Qing Li, Margaret Murnane, Henry Kapteyn, Ronggui Yang Keith A. Nelson, "Observing quasi-ballistic heat transport with EUV light from HHG," Directed Energy Professional Society Ultrashort Pulse Laser Materials Interaction Workshop, Boulder, CO, October 2007. Presented by Mark Siemens.
14. Qing Li, Mark E. Siemens, Oren Cohen, Henry Kapteyn, Margaret Murnane, **Ronggui Yang**, Probing Quasi-Ballistic Phonon Thermal Transport using Extreme Ultraviolet (EUV), Ultrafast Optics 2007, High Field Short Wavelength, September 2007, (oral presentation).
15. Weixue Tian and **Ronggui Yang**, Thermal Conductivity of Randomly Stacked Nanoparticle Composites, ASME-JSME Heat Transfer Conferences, Vancouver, Canada, August 2007 (referred paper).
16. ** **Ronggui Yang,** Thermal Conductivity Modeling and Characterization of Nanocomposites and Nano-ceramics, AFOSR focused workshop on Ultra-High Temperature Ceramic (UHTC) Materials Menlo Park, CA, July 23-25, 2007, (poster presentation).

17. Y. Zhang, R. Yang, S.M. George and Y.C. Lee, Atomic Layer Deposition for Hermetic Polymer Packages, (abstract #1637), NSTI Nanotechnology Conference and Trade Show, May 20-24, 2007, Santa Clara, California, (poster presentation).
18. ** **Ronggui Yang**, et al, Introduction to Nanoscale and Ultrafast Thermal Sciences and Applications Lab, the 2nd CU-NIST Symposium, Boulder, CO, March 2007, (poster presentation).
19. ** **Ronggui Yang,** G.P. "Bud" Peterson, Chen Li, Victor Bright, Y.C. Lee, Martin Dunn, Steven M. George, Kurt Maute, Margaret M. Murnane, and Henry Kapteyn, Thermal Challenges and Innovations in Emerging Micro/Nano Systems, DARPA Microsystems Technology Symposium, March 3-5, 2007, San Jose, CA, (poster presentation).
20. Weixue Tian and **Ronggui Yang**, Monte Carlo simulation of thermal conductivity in randomly distributed nanowire composites (A43.00009), American Physical Society March Meeting, Denver CO, 2007, (oral presentation).
21. Ming Tang , Hohyun Lee , Asegun Henry , **Ronggui Yang** , Dezhi Wang , Jean-Pierre Fleurial , Pawan Gogna , Gang Chen , Zhifeng Ren , Mildred Dresselhaus, Thermoelectric properties of Si-Ge nanoparticle composites (N43.00009), American Physical Society March Meeting, Denver CO, 2007, (oral presentation).

22. Ming Y. Tang, Mildred S Dresselhaus, Gang Chen, and **Ronggui Yang**, Thermoelectric Modeling of Si Nanoparticle Composites, December 1, 2006 Fall MRS Meeting at Boston, (oral presentation).
23. ** **Ronggui Yang,** "Some Ideas on Variable Thermal Resistors", DARPA Workshop on Variable Thermal Resistors, Boulder, CO, October 2006, (**invited** 45 minutes individual presentation to Program Manager Dr. Tom Kenny).
24. ** **Ronggui Yang**, Thermoelectric Transport in Nanocomposites, Multifunctional NANOcomposites 2006 International Conference, ASME Nano-Institute, Honolulu, Hawaii, Sept. 20-22, 2006, (oral presentation).
25. Gang Chen, X.Y. Chen, Z. Chen, L. Hu, A. Narayanaswamy, and **R.G. Yang**, Thermally-Excited Nonequilibrium Between Electrons and Phonons for Energy Conversion, Nanoscale Energy Conversion and Information Processing Devices, Nice, France, September 24-26, 2006, (**invited** oral presentation).
26. ** **Ronggui Yang**, Thermoelectric Transport in Nanocomposites, 16th Symposium on Thermophysical Properties, Boulder, CO, July 30-Aug. 04, 2006, (oral presentation).
27. ** **Ronggui Yang**, and Gang Chen, Thermoelectric Transport in Nanocomposites, SAE 2006 World Congress, Detroit, MI, April 3-5, 2006.
28. G. Chen, **R. Yang**, M.S. Dresselhaus, et al, The Nanocomposite Approach to Enhanced Thermoelectric Performance (B35.00003), 2006 APS March Meeting, Baltimore, MD, March 13–17, 2006, (oral presentation).

29. M.S. Dresselhaus, G. Chen, M.Y. Tang, **Ronggui Yang**, D.Z. Wang, Z.F. Ren, J.P. Fleurial, and P. Gogna, New Directions for Nanoscale Thermoelectric Materials Research (**invited**), Proc. MRS Fall Meeting, paper # F1.1, Boston, MA, 2005.
30. Ming Y. Tang, M. S. Dresselhaus, **Ronggui Yang,** and Gang Chen, Thermoelectric Modeling of Si-$Si_{1-x}Ge_x$ Ordered Nanowire Composites, Proc. MRS Fall Meeting, Boston, MA, 2005.

31. ** **Ronggui Yang**, Nanoscale and Ultrafast Thermal Transport with Applications in Nanoelectronics, Thermoelectrics, and Bio-Medical Engineering, CU-NIST Symposium, Boulder, CO, Nov. 18, 2005.
32. G. Chen, **R.G. Yang**, et al, Design, Modeling, and Synthesis of Nanocomposites for Solid-State Energy Conversion, SPIE Optic East - Nanofabrication: Technologies, Devices, and Applications, Boston, October 23-26, 2005 (**invited** oral presentation).
33. ** **Ronggui Yang**, Xiaoyuan Chen, Aaron Schmidt, and Gang Chen, Pump-Probe Experimental Study of Phonon Reflectivity at an Interface and Phonon Relaxation Time (Nano2005-87064), ASME 4th Integrated Nanosystems – Design, Synthesis, & Applications, UC-Berkeley, September 14-16, 2005, (extended abstract).
34. ** **Ronggui Yang**, and Gang Chen, Non-local Formulation of Rarefied Poiseuille Flow (Nano2005-87072), ASME 4th Integrated Nanosystems – Design, Synthesis, & Applications, UC-Berkeley, September 14-16, 2005, (extended abstract).
35. ** G. Chen, **R.G. Yang,** et al, Engineering Phonon and Electron Transport in Nanocomposites for Solid-State Energy Conversion (**invited**), Proceedings of the 5th International Workshop on Structural Health Monitoring, Ed. Fu-Kuo Chang, pp. 1443-1450, Stanford, September 12-14, 2005.
36. G. Chen, A. Narayanaswamy, Z. Chen, **R.G. Yang**, and L. Hu, Nanoscale Thermal Radiation: Fundamental Issues and New Opportunities, US-Japan Seminar on Nanoscale Heat Transfer, July 2005, (**invited** oral presentation)
37. ** **Ronggui Yang**, Gang Chen and Mildred S. Dresselhaus, Thermal Conductivity of Core-Shell Nanostructures: from Nanowires to Nanocomposites (HT 2005-72198), ASME Heat Transfer Conference, San Francisco, July 2005.
38. ** Ming-Shan Jeng, **Ronggui Yang,** and Gang Chen, Monte Carlo Simulation of Phonon Transport and Thermal Conductivity in Nanocomposites (IPACK 2005-73494), The ASME/Pacific Rim Technical Conference and Exhibition on Integration and Packaging of MEMS, NEMS, and Electronic Systems (InterPACK'05), San Francisco, July 2005.
39. ** Ming-Shan Jeng, **Ronggui Yang,** and Gang Chen, Monte Carlo Simulation of Thermoelectric Properties in Nanocomposites, the 24th International Conference on Thermoelectrics (IEEE), Clemson University, Clemson SC, June 19-23, 2005.
40. Hohyun Lee, Dezhi Wang, Wenzhong Wang, Zhifeng Ren, B. Klotz, Ming Y. Tang, **Ronggui Yang**, Pawan Gogna, Jean-Pierre Fleuiral, Mildred S. Dresselhaus, and Gang Chen, Thermoelectric Properties of Si/Ge Nano-composite, the 24th International Conference on Thermoelectrics (IEEE), Clemson University, Clemson SC, June 19-23, 2005.
41. K. Miyazaki, H. Tsukamoto, **R.G. Yang,** and G. Chen, Thermal Conductivity of Nanostructured Material, Fifth International Conference on Enhanced, Compact and Ultra-Compact Heat Exchangers: Science, Engineering and Technology, Whistler, BC, Canada, Sep 11-15, 2005.

42. Gang Chen, **Ronggui Yang**, Arvind Narayanaswamy, and Xiaoyuan Chen, Thermally-Excited Nonequilibrium States between Electrons and Phonons for Energy Conversion, the Second International Symposium on Micro/Nanoscale Energy Conversion and Transport (MECT-04), Seoul, Korea, August 8-13, 2004 (**invited** oral presentation).
43. ** **Ronggui Yang** and Gang Chen, Thermal Conductivity Prediction of Periodic Nanocomposites using Phonon Boltzman Equation (HT-FED2004-5646), Proc. 2004 ASME

Heat Transfer/Fluids Engineering Summer Conference (HTFED2004), pp. 449-456, Charlotte, North Carolina, July 11-15, 2004.

44. ** **Ronggui Yang**, Arvind Narayanaswamy and Gang Chen, Nonequilibrium Electron-Phonon Thermoelectric Devices using Surface Plasmon, Proc. the Sixth International Symposium of Heat Transfer (ISHT6), Beijing, China, June 15-19, 2004.
45. ** **Ronggui Yang** and Gang Chen, Recent Developments in Nanostructured Thermoelectric Materials and Devices, Panel on "Challenges in Chip/Processor Level Thermal Engineering" at 9th IEEE/ASME Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (ITHERM2004), pp.731-732, Las Vegas, NV, June 1-4, 2004.

46. ** **Ronggui Yang** and Gang Chen, Theoretical Thermal Conductivity of Nano-composites, in *Thermoelectric Materials 2003, Research and Applications*, vol 793, pp. 121-126, eds. G. S. Nolas and J. Yang and T. P. Hogan and D. C. Johnson. From the Materials Research Society Fall 2003 Meeting, Symposium S, Paper S5.2.
47. G. Chen, C. Dames, T. Harris, D. Borca-Tasiuc, **R.G. Yang**, B. Yang, W.L. Liu, D. Song, and M. Takashiri, Thermal Conductivity Reduction Mechanisms in Superlattices (**invited**), Proc. International Thermoelectric Conference 2003 (IEEE), La Grande Motte, France, August 2003.
48. Jianping Fu, **Ronggui Yang**, Gang Chen, G. Jeffrey Snyder, and Jean-Pierre Fleurial, Integrated Electroplated Heat Spreaders for High Power Quantum Well Lasers (TED-AJ03-332), Proc. 7th ASME/JSME Joint Thermal Engineering Conference (AJTE 2003), Hawaii, March 2003.

49. Gang Chen and **Ronggui Yang**, Nano-to-Macroscale Transport Modeling through Approximations (IMECE2002-32120, **invited**), Proc. International Mechanical Engineering Conference and Exhibition (IMECE2002), pp. 61-68, New Orleans, Nov. 2002
50. ** **Ronggui Yang**, Gang Chen, and Yuan Taur, Ballistic-Diffusive Equations for Multidimensional Nanoscale Heat Conduction, Proc. International Heat Transfer Conference (IHTC 2002), Grenoble, France, August 2002.
51. **R.G. Yang** and G. Chen, Energy Conversion and Transport Near a Solid-Solid Interface, International Thermoelectric Conference 2002 (IEEE), Long Beach, CA, August 2002, (oral presentation).
52. **Ronggui Yang**, Diana Borca-Tasuica and Gang Chen, Heat Conduction and Energy Conversion in Nanoscale, Proc. The 20th Symposium on Energy Engineering Sciences, Argonne, IL, May 20-21, 2002.
53. ** **R.G. Yang**, G. Chen, G.J. Snyder and J.-P. Fleurial, Design of two-stage Thick film Thermoelectric Micro Coolers for Mid-IR Lasers Thermal Management, Proc. 8th IEEE/ASME Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems (ITHERM 2002), pp. 323-329, San Diego, CA, May 2002.

54. ** **Ronggui Yang** and Gang Chen, Two Dimensional Nanoscale Heat Conduction Using Ballistic-Diffusive Equations, Proc. International Mechanical Engineering Conference and Exhibition, Vol. 1: pp.363-366, New York, Nov. 2001.
55. ** **R.G. Yang**, G. Chen, G.J. Snyder and J.-P. Fleurial, Geometric Effects On the Transient Cooling of Thermoelectric Coolers, Proc. Material Research Society Fall 2001 Meeting, pp. 281-286, Boston, MA, Nov. 2001.

56. A.Ravi Kumar, **R.G. Yang,** G. Chen, and J. P. Fleurial, Transient Thermoelectric Cooling for Thin Film Devices, Proc. IEEE International Symposium on Circuits and Systems, v 4, 2001, p Z1141-Z1146 (MRS Spring 2000 meeting).

57. **Ronggui Yang**, Shuye Lei and Jianhua Du, Heat and Mass transfer in Low Moisture-content Saturated Porous Media During Sudden Heating: I. Fundamentals, Proceedings of 5th ASME/JSME Joint Thermal Engineering Conference (AJTE1999), San Diego, California, March 1999.
58. **Ronggui Yang**, Jianhua Du and Shuye Lei, Heat and Mass Transfer in Low Moisture-content Saturated Porous Media during Sudden Heating: II. Numerical Simulation, Proceedings of 5th ASME/JSME Joint Thermal Engineering Conference (AJTE 1999), San Diego, California, March 1999.
59. Shuye Lei, Chunmei Xia, **Ronggui Yang** and Yong Cao, Numerical Simulation and Analysis of Process in Unsaturated Porous media for Measuring Thermal Conductivity with Transient Heat Probe, 5th Asian Thermal Property Conference, Sep. 1998, Seoul Korea.
60. **** Ronggui Yang**, Jianhua Du and Shuye Lei, Seepage Model on Simultaneous Transport of Heat-Water-Air-Solute in Porous Media, 12th Hydrodynamics Conference (in Chinese), August 1998.
61. ** Shuye Lei, **Ronggui Yang** and Jianhua Du, Transport Theory in Unsaturated Porous Media, Annual Heat and Mass Transfer Conference of Chinese Engineering Thermophysics Society (in Chinese), 1998.
62. **** Ronggui Yang**, Jianhua Du and Shuye Lei, Numerical Simulation of the Transport Phenomena in Porous Media, Annual Heat and Transfer Conference of Chinese Engineering Thermophysics Society (in Chinese), 1998.
63. **** Ronggui Yang**, Jianhua Du and Shuye Lei, Solute Effect on Heat and Moisture Transfer in Unsaturated Porous Media, Annual Heat and Transfer Conference of Chinese Engineering Thermophysics Society (in Chinese), 1998.
64. Shuye Lei, Guanyu Zheng, Buxuan Wang, **Ronggui Yang** and Chunmei Xia, Numerical Simulation of the Transport Phenomena Due to Sudden Heating in Porous Media, ASME 31st National Heat Transfer Conference (NHTC 1997), Baltimore, Maryland, August 1997.
65. Shuye Lei, Chunmei Xia, **Ronggui Yang** and Yong Cao, Analysis of Unsaturated Porous Media Thermal Conductivity Measurement, Annual Heat and Transfer Conference of Chinese Engineering Thermophysics Society (in Chinese), Oct. 1997.

INVITED SEMINARS

1. June 26, Nanoscale Heat Transfer: Challenges and Opportunities, National Renewable Energy Lab, Golden, CO [Host: Dr. Sreekant Narumanchi and Dr. Kenneth Kelly].
2. June 4, 2008, Challenges and Opportunities in Nanoscale Heat Transfer, Department of Mechanical Engineering, Hongkong University of Science and Technology [Host: Dr. Zhigang Li].
3. March 28, 2008, Challenges and Opportunities in Nanoscale Heat Transfer, Department of Mechanical Engineering, University of Toledo [Host: Dr. Calvin H. Li].
4. May 2007, Nanotechnological Innovations in Thermoelectric Energy Conversion and Thermal Management, Beijing University, Tsinghua University, Zhongshan University, sponsored by National Natural Science Foundation of China [Host: Prof. Xiaofeng Peng at Tsinghua University].

5. March 22, 2007, Nanotechnological Innovations in Thermoelectric Energy Conversion and Thermal Management, CU Building Systems Seminar Series, University of Colorado at Boulder.
6. May 17, 2006, Nanoscale and Ultrafast Thermal Sciences and Applications, National Renewable Energy Lab (Golden, CO) [Host: Dr. Mark Hanna and Dr. Chuck Kutscher]
7. April 12, 2006, Nanoscale Heat Transfer and Energy Conversion, CU Energy and Environment Seminar Series, University of Colorado at Boulder [Host: Drs. Shelly L. Miller and Mike Hannigan].
8. March 16, 2006, Nanoscale and Ultrafast Thermal Sciences and Applications, Department of Chemistry, University of Colorado at Boulder [host: Dr. Steven M. George].
9. Feb. 13, 2006, Nanoscale and Ultrafast Thermal Sciences and Applications, Materials Reliability Division, National Institute of Standards and Technology (NIST-Boulder) [Host: Dr. Wood Johnson].
10. Feb. 03, 2006, Nanoscale and Ultrafast Thermal Sciences and Applications, JILA/Physics Department, University of Colorado at Boulder [host: Drs. Margaret M. Murnane and Henry Kapteyn].
11. Dec. 02, 2005, Nanoscale Heat Transfer with Applications in Nanoelectronics, Department of Electrical and Computer Engineering, Tufts University.
12. May 13, 2005, Nanoscale Heat Transfer with Applications in Nanoelectronics and Thermoelectrics, Intel Corporation – Assembly Technology Development, Arizona
13. April 4, 2005, Nanoscale Heat Transfer with Applications in Nanoelectronics and Thermoelectrics, University of Notre Dame.
14. March 31, 2005, Nanoscale Heat Transfer with Applications in Nanoelectronics and Thermoelectrics, University of Colorado – Boulder.
15. March 22, 2005, Nanoscale Heat Transfer with Applications in Nanoelectronics and Thermoelectrics, University of Houston.
16. March 17, 2005, Nanoscale Heat Transfer with Applications in Nanoelectronics and Thermoelectrics, University of Illinois – Urbana Champaign.
17. March 01, 2005, Nanoscale Heat Transfer with Applications in Nanoelectronics and Thermoelectrics, University of Wisconsin.
18. Feb. 24, 2005, Nanoscale Heat Transfer with Applications in Nanoelectronics and Thermoelectrics, the City College of New York.
19. Feb. 17, 2005, Nanoscale Heat Transfer with Applications in Nanoelectronics and Thermoelectrics, SUNY-Stony Brook.
20. Dec. 20, 2004, Nanoscale Heat Transfer with Applications in Nanoelectronics and Thermoelectrics, Columbia University.

RESEARCH GROUP

Current Members

Dr. Dae Up Ahn (Post-Doc, Jan. 2008 - , Copolymer Templated Nanofabrication, Ph.D 12/2007, Polymer Engineering, University of Akron, MS/BS, Polymer Science and Engineering, Seoul National University)

Dr. Wei Wang (Post-Doc, August 2008 - , Research Area: Porous Anodic Alumina Templates, Heterostructured Nanowires for Energy Applications,.Ph.D 07/2008, Condensed Matter Physics, University of Science and Technology of China)

Mr. Jen-Hau Cheng (Ph.D student, co-advised with Prof. Y.C. Lee, Sep. 2006 - , Research Area: Thermal and Thermoelectric Characterization, Energy Harvesting, and Thermal Management, MS 2003, Mechanical Engineering, National Taiwan University)

Mr. Yadong Zhang (Ph.D student, co-advised with Prof. Y.C. Lee, Sep. 2006 - , Research Area: ALD Hermetic Packaging – Micro/Nanofabrication and Characterization, MS. 2004/ BS. 2001, Material Science and Engineering, Beijing University of Aeronautics and Astronautics, China)

Mr. Xiaobo Li (Ph.D student, Sep. 2007 - , Research Area: Molecular Dynamics Simulation and Nonequilibrium Green's Function Theory, MS 2007, Institute of Engineering Thermophysics, Chinese Academy of Science)

Mr. Suraj Joottu Thiagarajan (Ph.D student, June 2008 - , Research Area: Thermoelectrics, Electron Transport in Nanostructured Materials, MS. 2007, Mechanical Engineering, Ohio State University, BS 2005, PSG College of Technology, India)

Mr. Lennon Rogers (Ph.D student, co-advised with Dr. Sreekant Narumanchi at NREL, September 2008 - , Research Area: Thermal Management of High Power Electronics, MS 2006 Mechanical Engineering, MIT, BS 2003, Mechanical Engineering, UIUC)

Mr. Jun Liu (Ph.D student, September 2008 - , Research Area: Nanostructured Thermal Interface Materials, BS 2008 Thermal Engineering, Huangzhong University of Science and Technology, China)

Mr. Dave Makhija (Ph.D student, co-advised with Prof. Kurt Maute in Aerospace Engineering Sciences,September 2008 - , Research Area: Reactive Micro/Nano- Flow and Heat Transfer, BS 2008 Mechanical Engineering, BS 2008 Physics, Kettering University)

Mr. Suresh Ramanan (Master student, Sep. 2006 - , Research Area: Monte Carlo Simulation and Mesoscale Heat Exchanger, BE 2006, Mechanical Engineering, Visveswaraiah Technological University, India)

Affiliated Members (who I meet and/or supervise every week)

Dr. Chen Li (Research Assistant Professor 2007 - ? and Post-Doc 2006-2007, Research Area: Thermal Management)

Dr. Pilhwa Lee (Post-Doc, May 2008-?, advisors: Kurt Maute and Ronggui Yang, Research Area: Numerical Simulations and Optimization of Nanoscale Heat Transfer Problems)

Mr. Mark Siemens (Ph.D student in JILA/Physics at CU-Boulder, advisors: Henry Kapteyn and Margaret Murnane, Research Area: EUV probe for phonon transport and structure characterization)

Ms. Qing Li (Ph.D student in JILA/Physics at CU-Boulder, advisors: Henry Kapteyn and Margaret Murnane, Research Area: EUV probe for phonon transport and structure characterization)

Awards Received by Advisees (need complete info from students)

1. Suraj Joottu Thiagarajan, Engineering Dean's Research Assistantship (RA paid by the Dean for a semester, 1 out of 7 total in the college.), 2008
2. Dave Makhija, Engineering Dean's Research Assistantship (RA paid by the Dean for a semester, 1 out of 7 total in the college.)
3. Yadong Zhang, Travel Fellowship for attending the 2008 SID Display Seminar and Exhibition, Society for Information Display, May 2008

4. Yadong Zhang et al, DARPA/iMINT Center Best Poster Award (1 out of 3 total), March 2008
5. Bo Shi et al, DARPA/iMINT Center Best Poster Award (1 out of 3 total), March 2008
6. Weixue Tian et al, DARPA/iMINT Center Best Poster Award (1 out of 3 total), March 2007

Alumni

Dr. Xiaochun Wang (Post-Doc, Oct. 2007- , Research Area: First Principle Simulations and Electron Transport in Nanostructures, Ph.D 07/2007, Physics, Xiamen University)

Dr. Weixue Tian (Post-Doc, Jan. 2006 – Sep. 2007, Research Area: Monte Carlo Simulation of Phonon Transport, Ph.D 12/2005, Mechanical Engineering, University of Connecticut, MS. 2000 / BS. 1997, Shanghai Jiaotong University.)

Dr. Bin Li (Post-Doc, Nov 2006-Dec. 2007, Research Area: Pump and Probe Experiments, Ph.D 08/2006, Physics, University of Pittsburgh, BS. 1999 Physics, Peking University.)

Mr. Li'an Tian (Ph.D student, 08/2006-05/2007, Currently a Ph.D student in Bioengineering Program at CU-Boulder.)

Ms. Liang-Chun Liu (Visiting Ph.D student from Taiwan University, Sep. 2007-Sep. 2008, Research Area: Phonon Transport and Nanoscale Thermal Characterization)

Mr. Scott Johnson (Research Assistant & UROP 05/2006-05/2007, Research Area: Micro Heat Pipe, BS/MS. 2007 in Mechanical Engineering, CU-Boulder.).

Mr. Charles Oclassen (NSF EUV ERC REU 05/2006-05/2007, Research Area: Thermal Probes for Nanofluids, BS/MS. 2007 in Mechanical Engineering, CU-Boulder.)

Mr. Brian Rhode (Summer Research for 04/2006-08/2006, Research Area: Thermal Characterization, BS. 2006 Mechanical Engineering, CU-Boulder)

Mr. Mindong Bian (Summer Research for 05/2007-08/2007, Research Area: Programming for Automatic Instrumentation, Electrical Engineering, University of Colorado at Boulder)

Ph.D Thesis Committee Member for:

Dr. Alexandar D. Laws (2006-2007, Mechanical Engineering, advisor: Yung-Cheng Lee)
Mr. Rick Chuang (2006-2008, Mechanical Engineering, advisor: Victor M. Bright)
Mr. Mark E. Siemens (2006- , Physics, advisors: Margaret M. Murnane and Henry Kapteyn)
Ms. Qing Li (2006-, Physics, advisors: Margaret M. Murnane and Henry Kapteyn)
Mr. Chris DeLuca (2007-, Mechanical Engineering, advisor: Victor M. Bright)
Mr. Bradley Davidson (2007-, Mechanical Engineering, advisor: Victor M. Bright)
Mr. Chris Oshman (2007-, Mechanical Engineering, advisor: Victor M. Bright)
Mr. Mu-Hong Lin (2008-, Mechanical Engineering, advisor: Yung-Cheng Lee)

Current Support

1. Modeling and experiments in the nucleate boiling regime in the context of power electronics cooling, Department of Energy/National Renewable Energy Lab (DoE/NREL), PI: Ronggui Yang, $170K, 10/01/2008-09/30/2012.
2. Surface plasmon enabled high efficiency thermoelectric devices, DARPA MTO Young Faculty Award, PI: Ronggui Yang, $150K, 06/01/2008-08/31/2009.
3. A Design tool for nanostructures with tunable thermal properties, AFOSR (BAA 2007-08 Discovery Challenge Thrusters), PI: Ronggui Yang, Co-PIs: Kurt Maute and Martin Dunn, $600K, 03/01/2008-12/31/2010.

4. Flexible thermal ground plane with micro/nano wicking structures, DARPA (BAA 07-36 Thermal Ground Plane), PI: Y.C. Lee, Co-PI: Victor Bright, Ronggui Yang (Technology Leader), Chen Li, Steven M. George G.P. "Bud" Peterson, and Suraj Rawal, total: $4.0M, Yang: $0.9M ($0.6M for core tech development), 04/01/2008-12/30/2011.
5. Nanocomposite thermoelectric materials development and characterization, Lockheed Martin Corporation, PI: Ronggui Yang, $50K, 10/25/2007-11/15/2008.
6. A design-centered approach to nano-engineering, National Science Foundation, PI: Kurt Maute, Co-PIs: Martin Dunn and Ronggui Yang, $330K, 09/01/2007-08/31/2010.
7. Energy harvesting and storage systems and their integration into AF aero vehicles, Air Force Office of Scientific Research - Multidisciplinary University Research Initiative (AFOSR-MURI); PI: Minoru Taya, Co-PIs: Ronggui Yang and 8 other co-PIs, total: $6M, CU: $1.5M, 05/01/2006-04/30/2011.
8. Measurement of thermal transport in nanostructures using EUV pump-probe systems, National Science Foundation; PI: Ronggui Yang (Funded through the NSF Engineering Research Center for Extreme Ultraviolet Science and Technology - NSF EUV ERC), $50K annually, 05/01/2006-09/30/2013.
9. DARPA iMINT Center Core Research: ALD-enabled packaging for integrated MEMS/NEMS, DARPA Focus Center on Nanoscale Science and Technology for Integrated Micro/Nano-Electromechanical Transducers (iMINT), PI: Y.C. Lee, co-PI: Ronggui Yang, $100K annually, 09/01/2006-08/31/2010.
10. Nanowire-Based Metamaterial for Miniaturized Antennas, DARPA iMINT Center Seed Grant, PI: Won park, Co-PIs: Ronggui Yang, Y.C. Lee, and Pavel Kabos, T. Mitch Wallis, Jim Booth, Total: $50K, Yang: $0, 04/01/2008-03/31/2009.
11. Unrestricted gift fund, $6,000, ITRI - Industry Technology Research Institute (through National Taiwan University), 10/15/2007.
12. Unrestricted gift fund, $15,000, ITRI - Industry Technology Research Institute, 08/15/2006.
13. University of Colorado Start-up Funds, PI: Ronggui Yang, $350,000 Equipments + $60,000 Discretionary + student supports (2-year RA + 2-year TA), 01/2006 – 01/2009.

Completed Projects

14. Understand the building with your eyes: building and environment science and technology visualization Lab. CU-Engineering Excellence Fund, PI: John Zhai, Co-PI: Ronggui Yang and 3 others, $26,695, 05/01/2007-04/01/2008 [Education Grant].
15. Constructing a femtosecond nanometer resolution photo-thermal imaging system using extreme ultraviolet (EUV) to study nanoscale thermal transport, National Science Foundation; PI: Ronggui Yang, Co-PI: Margaret Murnane, $94,919, 09/01/2006-08/31/2007.
16. Photonic crystal fiber based micro capillary pumped loops, University of Colorado Technology Transfer Office; PI: Ronggui Yang, $12,500, 12/01/2006-05/31/2007.
17. Photonic crystal fiber based micro heat pipe arrays and capillary pumped loops, CU Engineering Dean's Seed Fund for Novel Ideas; PI: Ronggui Yang, Co-PIs: Y.C. Lee and Victor M. Bright, $10,000, 06/10/2006-12/31/2006.

Pending Proposals

1. 07/23/2008: CAREER: An Integrated Research and Education Program on Nanoscale Thermal Transport: Developing a High Spatiotemporal Resolution Photo-Thermal Microscope, National Science Foundation, PI: Ronggui Yang, $500,000, 02/01/2009-01/31/2014.

2. 08/07/2008: Molecular Layer Deposition-Enabled NanoThermal Interfaces, DARPA BAA08-42 (NanoThermal Interfaces), PI: Y.C. Lee, Co-PIs: Ronggui Yang, Steven M. George, Martin L. Dunn, Victor M. Bright, and Michael H. Stowell (CU) Subcontractor: Suresh Rawal (LMCO), $4.8M, January 1, 2009 to June 30, 2013

Collaborators

Gang Chen (Ph.D thesis advisor, Mechanical Engineering at MIT); Mildred S. Dresselhaus (Ph.D thesis co-advisor, Physics & Electrical Engineering at MIT); Zhifeng Ren (Physics at Boston College), G.J. Snyder & J.P. Fleurial (JPL/Caltech); Yuan Taur (Electrical and Computer Engineering at UCSD); Jonathan Freund (Mechanical Engineering at UIUC); Steven M. George (Chemistry & Chemical Engineering at CU-Boulder); Margaret Murnane and Henry Kapteyn (JILA/Physics at CU-Boulder); Minoru Taya (Mechanical Engineering, Electrical Engineering & Material Science at Univ. Washington); Samson A. Jenekhe (Chemistry & Chemical Engineering at Univ. Washington); Guozhong Cao (Material Science at Univ. Washington); Jing Li (Chemistry-Rutgers); Kurt Maute (Aerospace Engineering Sciences at CU-Boulder); Y.C. Lee, Martin L. Dunn, Victor Bright, Chen Li, Rishi Raj, & George P. Peterson (Mechanical Engineering at CU-Boulder); Li Shang, Lucy P. Pao and Won Park (Electrical Engineering at CU-Boulder); Sreekant Narumanchi, Kenneth Kelly, Andrew Norman, & Yong Zhang (DoE/National Renewable Energy Lab); Jihui Yang (Material Scientist, GM R&D Center), X. Jack Hu & Ravi Prasher (Packaging - Intel); Suraj Rawal (Lockheed Martin Space Systems Corp.), Faheem Faheem (Foster-Miller); Mai-Jiao Huang (National Taiwan University), Ming-Shan Jeng (ITRI-Taiwan), Min Gao (University of Cardiff, UK), Koji Miyazaki (Kyushu Institute of Technology, Japan).

Popular Press & Press Release

- AFOSR Press Release for MIT Technology Review's TR35 Award (September 08, 2008) **"**Engineer's energy research could cut costs, increase efficiency"
  http://www.af.mil/news/story.asp?id=123114237
  http://www.afmc.af.mil/news/story.asp?id=123114201
- CU Press Release for MIT Technology Review's TR35 Award (August 19, 2008):
  "CU-Boulder Engineering Professor Named One Of World's Top 35 Young Innovators"
  http://www.colorado.edu/news/r/9b0ff83babc043e1d1c4b6ff5fbfa353.html
  Speaker for Technology Review's EmTech 2008 Conference:
  http://www.technologyreview.com/emtech/08/speakers.aspx
  Selected Media Reports:
  http://www.dailycamera.com/news/2008/aug/19/cu-prof-named-top-young-innovator/
  http://www.greentechmedia.com/articles/mit-tech-review-names-tesla-cto-innovator-of-the-year--1291.html
  http://www.coloradodaily.com/news/2008/aug/19/cu-prof-named-top-young-innovator/?printer=1
  http://coloradohigherednews.com/Pages/Articles.php?id=424
  http://colorado.construction.com/ddj/archive/2008/080818_ddj4.asp
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  http://www.therocky.com/news/2008/aug/19/harley-recalling-08-touring-models-47579-cycles/

- Technology Review Profile for MIT Technology Review's TR35 Award (August 19, 2008): http://www.technologyreview.com/tr35/Profile.aspx?Cand=T&TRID=750
  "35 Innovators Under 35 - Technology Review presents its eighth annual list of leading young innovators." In Sep/Oct 2008 issue of Technology Review:
  http://www.technologyreview.com/article/21284/
  Selected Media Reports:
  http://www.reuters.com/article/pressRelease/idUS131664+19-Aug-2008+BW20080819
  http://www.nsti.org/press/PRshow.html?id=3626
  http://www.nanotech-now.com/news.cgi?story_id=30374
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  http://money.aol.com/news/articles/_a/bbdp/technology-review-reveals-the-2008-tr35/109707
  http://www.finanznachrichten.de/nachrichten-2008-08/artikel
  www.marketwatch.com/.../story.aspx?guid=%7B0C2E95DB-D195-44EF-8C6C-0D76001E1EE5%7D&dist=TQP_Mod_pressN
  http://digitalproducer.digitalmedianet.com/articles/viewarticle.jsp?id=489828
  http://biz.yahoo.com/bw/080819/20080819005223.html?.v=1
  http://web.mit.edu/newsoffice/2008/tr35-0819.html
- Feature Report on CU Homepage http://www.colorado.edu for July and August:
  CU Special Report: Nanotechnology Research Blossoming at CU-Boulder (July 30th, 2008):
  http://www.colorado.edu/news/reports/nanotechnology/
- Graduate student Mark Siemens' work on "Soft X-Ray Probe for Nanoscale Heat Transfer" was highlighted in the Physics Update of the monthly American Physical Society member magazine Physics Today in July 2008 issue, p.17 (July 2008)
  http://ptonline.aip.org/journals/doc/PHTOAD-ft/vol_61/iss_7/16_1.shtml
- Graduate student Mark Siemens' work was highlighted as one of the 5 CLEO Technical News Summaries (May 2008):
  http://www.cleoconference.org/media_center/technical-news-summaries.aspx
- CU Press Release for DARPA Thermal Ground Plane Project (May 7th, 2008)
  http://www.colorado.edu/news/r/48198905b2ed67272af5d67343ad3078.html
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  http://www.nanowerk.com/news/newsid=5635.php

- CU Press Release for DARPA Young Faculty Award, (April 15, 2008)
  http://www.colorado.edu/news/r/a39f3714c24d3b66a94fafd9ba05b04f.html
  Denver Post: http://www.denverpost.com/watercooler/ci_8964665
- DARPA Press Release for DARPA Young Faculty Award, (March 18, 2008)
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- CU Engineering 2008, pp.16-17 "Novel Thermal Ground Plane to Improve Cooling in Electronic Devices" featured in the annual CU Engineering publication (March 2008).
  http://engineering.colorado.edu/news/CUE/2008/features/mech.htm
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  http://web.mit.edu/newsoffice/2005/aandh-aug16.html
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