

September 2013

LOUIS C. CHOW

University Chair of Mechanical Engineering (2002-present)
Professor, Mechanical and Aerospace Engineering (2012-present)
Professor (Joint Appointment) of Optics and Photonics/CREOL
University of Central Florida

PROFESSIONAL INTERESTS

Heat Transfer in Electro-Optical, Computing and Power Systems
Miniaturization of Engineering Systems
Spray Cooling
Thermal Control in Aircraft and Spacecraft
Boiling and Thin-Film Evaporation

EDUCATION

Ph.D. - Mechanical Engineering, University of California, Berkeley, 1978.
MS - Mechanical Engineering, University of California, Berkeley, 1974.
AB - Physics (Distinction in General Scholarship), University of California, Berkeley, 1972.

EXPERIENCE

Educational

Associate Dean for Research and Administration, College of Engineering and Computer Science, September 2010-December 2012
Interim Chair, Mechanical, Materials and Aerospace Engineering, January 2010-December 2010
Interim Director, Advanced Materials Processing and Analysis Center, February 2008-August 2009
Interim Dean, College of Engineering and Computer Science, August 2003-May 2004
Professor and Chair, Mechanical, Materials and Aerospace Engineering, University of Central Florida, Orlando, Florida, December 1995- December 2000.
Professor, Mechanical Engineering, University of Kentucky, Lexington, Kentucky, July 1988 – December 1995.
Director of Graduate Studies, Mechanical Engineering, University of Kentucky, July 1988 – June 1990.
Associate Professor, Mechanical Engineering, University of Kentucky, October 1985 – June 1988.
Assistant Professor, Mechanical Engineering, Washington State University, Pullman, Washington, August 1981 - August 1985.
Invited Lecturer, Power Machinery Engineering, Shanghai Jiao Tong University, Shanghai, China, June 1983 - July 1983.
Assistant Professor, Mechanical Engineering, Texas A & M University, College Station, Texas, September 1978 - July 1981.

Governmental

Visiting Scientist, Air Force Research Laboratory, Dayton, Ohio, May 2001 – April 2002.
Visiting Scientist, Air Force Wright Laboratory, Dayton, Ohio, July 1991 - June 1992.
Visiting Scientist, Air Force Aero Propulsion Laboratory, Dayton, January 1986 – December

1987.

Summer Faculty Fellow, Air Force Aero Propulsion Laboratory, Dayton, July 1985 – September 1985.

Summer Faculty Fellow, NASA - Johnson Space Center, Houston, Texas, May 1985 - July 1985.

Summer Faculty Fellow, Air Force Aero Propulsion Laboratory, Dayton, June 1984 – August 1984.

Industrial

Senior Engineer, Bechtel Power Corporation, San Francisco, May 1980 - August 1980.

Engineer, General Electric Company, San Jose, February 1977 - August 1978.

HONORS

Allan Kraus Thermal Management Medal, ASME, 2012

Fellow, American Association for the Advancement of Science (AAAS), 2012

University Chair of Mechanical Engineering, 2002-present

Lockheed Martin Professor, 2001-2002

UCF Research Incentive Award, 2001

Fellow, American Society of Mechanical Engineers (ASME), 1992.

Associate Fellow, American Institute of Aeronautics and Astronautics (AIAA), 1992.

University of Kentucky Faculty Award, 1988-1991.

Washington State University Faculty Award, 1982.

University of California Graduate Fellowship, 1972-1974.

RESEARCH at University of Central Florida (1996-present)

GRANTS AND CONTRACTS (all internal projects, internal and cost sharing funds are excluded)

- 1 PI: Louis Chow, UCF account: 16-26-406
Sponsor; National Science Foundation
Project: Engineering Research Equipment: Classic Particle Dynamic Analyzer
Award Amount: \$49,308; Award Period: February 96- January 97

- 2 PI: Louis Chow; UCF account: 16-26-508
Sponsor: Air Force Research Laboratory
Project: Thermal Management of Solid-State Lasers
Award Amount: \$858,631; Award Period: July 97 – July 04

- 3 PI: Louis Chow; UCF account: 16-26-509
Sponsor: Army Research Office
Project: Spray Cooling in Superconducting and Hybrid Circuits
Award Amount: \$140,000; Award Period: September 96 – May 00

- 4 PI: Louis Chow; UCF account: 16-26-511
Sponsor: Air Force Office of Scientific Research
Project: Simulation of Power MOSFETs Operating at Cryogenic Temperatures

- Award Amount: \$114,031; Award Period: June 97 – December 00
- 5 PI: Louis Chow; UCF accounts: 16-26-407, 16-26-409
Sponsor: National Science Foundation
Project: Nucleation and Critical Heat Flux in Spray Cooling
Award Amount: \$65,000; Award Period: June 97 – May 99
 - 6 PI: Louis Chow; Co-PI: Ruey-Hung Chen; UCF account: 16-26-411
Sponsor: National Science Foundation
Project: Nucleation and Critical Heat Flux in Spray Cooling
Award Amount: \$139,614, Award Period: July 98 – June 01
 - 7 PI: Louis Chow; Co-PIs: K. Sundaram and Issa Batarseh; UCF account: 16-26-865
Sponsor: Lockheed Martin
Project: Miniature Heat Pump Design and Cooling Analysis
Award Amount: \$35,000; Award Period: July 98 – June 99
 - 8 PI: Louis Chow; Co-PIs: Michael Bass and Peter Delfyett; UCF account: 16-26-301
Sponsor: Office of Naval Research
Project: DURIP – Thermal Management of Laser Diode Arrays
Award Amount: \$157,835; Award Period: March 99 – December 00
 - 9 PI: Louis Chow; Co-PIs: K. Sundaram and Jay Kapat; UCF account: 68-01-806
Sponsor: Lockheed Martin
Project: Miniature Cryocooler
Award Amount: \$35,000; Award Period: July 99 – June 00
 - 10 PI: Jay Kapat; Co-PIs: Louis Chow and K. Sundaram; UCF account: 16-26-874
Sponsor: Lockheed Martin
Project: Miniature Refrigerator – Design, Fabrication and Testing
Award Amount: \$21,000; Award Period: January 00 – December 00
 - 11 PI: Louis Chow
Sponsor: Sun Microsystems
Equipment Donation: Sun Enterprise 450 Server
Award Amount: \$67,095; Award Period: January 01 – December 01
 - 12 PI: Louis Chow; Co-PIs: Ruey Chen, Kurt Lin and Jay Kapat; UCF account: 16-26-877
Sponsor: Sun Microsystems
Project: Spray Cooling for Computer Applications
Award Amount \$55,907; Award Period: January 01-December 01
 - 13 PI: Louis Chow
Sponsor: Rini Technologies, Inc
Project: Thermal Management of Diode Laser Arrays

- Award Amount: \$100,000; Award Period: May 01 – June 02
- 14 PI: Louis Chow; Co-PIs: Mike Bass, Peter Delfyett and Jay Kapat; UCF account: 16-26-513
Sponsor: Air Force Office of Scientific Research
Project: DURIP - Micro-fabrication of Spray Cooling Nozzles for High-Power Diode Laser Arrays
Award Amount: \$155,000; Award Period: May 01 – April 03
 - 15 PI: Louis Chow; UCF account: 16-26-512
Sponsor: Air Force Research Laboratory
Project: Thermal Management of Diode Laser Arrays
Award Amount: \$126,264; Award Period: May 01 – April 02
 - 16 PI: Gene Lee; Co-PIs: Louis Chow and Jay Kapat; UCF account: 16-24-708 and 16-26-783
Sponsor: University of South Florida
Project: Development of an Enhanced Biological Isolation Suit with Internal Cooling for Use in Warm Climates
Award Amount: \$233,589; Award Period: November 01 - May 03
 - 17 PI: Jay Kapat; Co-PIs: Louis Chow and K. Sundaram; UCF account: 16-26-887
Sponsor: Lockheed Martin
Project: Development of Miniature Compressor
Award Amount: \$30,000; Award Period: December 01 - December 02
 - 18 PI: Mike Bass; Co-PI: Louis Chow; UCF account: 65-04-888
Sponsor: Raytheon Company
Project: Development and Demonstration of Spray Cooling Technology
Award Amount: \$800,000; Award Period: January 02 - January 05
 - 19 PI: Louis Chow; Co-PI: Jay Kapat; UCF account: 16-26-884
Sponsor: Rini Technologies
Project: Development of Miniature Compressors and Heat Exchangers
Award Amount: \$50,000; Award Period: September 01 - February 03
 - 20 PI: Jay Kapat; Co-PI: Louis Chow; UCF account: 16-26-889
Sponsor: Rini Technologies
Project: Development and Testing of Key Components for a Reliable, Compact and Light-Weight Cryocooler
Award Amount: \$20,000; Award Period: January 02 – December 02
 - 21 PI: Michael Bass; Co-PI: Louis Chow; UCF account: 65-01-813
Sponsor: Infinite Photonics
Project: High Power GCSEL Diode Lasers

Award Amount: \$5,525; Award Period: January 02-December 02

- 22 PI: Louis Chow; Co-PI: Tom Mahefkey; UCF account: 16-26-514
Sponsor: Air Force Research Laboratory
Project: IPA Assignment for Tom Mahefkey at AFRL
Award Amount: \$268,669; Award Period: May 02 – April 04
- 23 PI: Louis Chow; Co-PI: Jay Kapat; UCF account: 16-26-894
Sponsor: Rini Technologies
Project: Spray Cooling with Ammonium Hydroxide
Award Amount: \$60,000; Award Period: May 02 – December 03
- 24 PI: Jay Kapat; Co-PI: Louis Chow; UCF account: 16-26-234
Sponsor: NASA-KSC
Project: Miniature Joule Thompson (JT) Cryocoolers for Propellant Management
Award Amount: \$110,407, Award Period: September 02-August 04
- 25 PI: Issa Batarseh; Co-PI: Louis Chow, Jay Kapat and Tom Wu; UCF account: 16-28-874
Sponsor: Emerson Electric Company
Project: Low Voltage DC-DC Converters with Improved Efficiency and Power Density
Award Amount: \$1,033,725, Award Period: January 03-December 04
- 26 PI: Louis Chow; UCF account: 16-30-801
Sponsor: Rini Technologies
Project: Thermal Energy Storage System for High-Energy Diode Lasers
Award Amount: \$80,000; Award Period: January 03 - December 03.

Research Funding from May 2003 to July 2012 (internal and matching funds are not included)
(My share of the funds is included in parentheses)

May 03

1626-6014 – Air Force Research Laboratory, \$150,114, (PI, 100%)

July 03

1626-8033 – ONR STTR (with RTI), \$21,552, (PI, 50%)

August 03

1626-6012 - Air Force Research Laboratory, \$114,981 (PI, 100%)

September 03

1626-8037 - NASA-ASRC, \$48,000 (Co-PI, 33%)

1626-7002 – USF/Army, \$20,000 (Co-PI, 50%)

January 04

1626-8040 – RTI, \$100,000 (PI, 100%)

1626-8041 – NASA STTR (with RTI), \$32,902 (Co-PI, 50%)

March 04

1626-7005 – USF/Army, \$188,928 (Co-PI, 50%)

May 04

6501-8070 – Raytheon, \$259,126 (Co-PI, 50%)

1626-6014 – Air Force Research Laboratory, \$152,414 (PI, 100%)

1626-8050 – Rini Technologies, \$45,000 (Co-PI, 50%)

June 04

1626-8033 – Rini Technologies, \$9,050 (PI, 50%)

1626-8053 – Rini Technologies, \$150,000 (PI, 50%)

December 04

1622-8071 – Emerson, \$500,000 (Co-PI, 5%)

2005

January 05

1626-8060 – UTC, \$28,114 (PI, 100%)

February 05

1626-8063 – Rini Technologies, \$30,000 (Co-PI, 50%)

June 3, 05

1626-8068 – UES, \$36,800 (PI, 100%)

June 22, 05

1626-8070 – Rini Technologies, \$180,000 (PI, 40%)

July 18, 05

1626-7005 – USF, \$100,215 (Co-PI, 50%)

August 30, 05

1626-8063 – Rini Technologies, \$15,000 (Co-PI, 50%)

November 16, 05

1626-8073 – Rini Technologies, \$50,000 (PI, 100%)

2006

January 17, 2006

1626-8080 – Universal Technology Corporation, \$60,977 (PI, 50%)

July 1, 2006

1626-8086 – Rini Technologies, \$101,100 (PI, 50%)

September 1, 2006
1626-6039 – AFRL, \$112,718 (PI, 100%)

September 8, 2006
1626-6040 – ONR, \$138,960 (PI, 100%)

March 8, 2006
1626-9013 – NASA-FSEC, \$100,000 (PI, 34%)

December 1, 2006
1626-9035 – NASA-SFTI Phase I, \$125,000 (PI, 20%)

July 1, 2006
2019-4402 – FHTC, \$67,000 (PI, 50%)

2007

February 2007
16-26-8095 – Rini Technologies, \$100,000 (PI, 50%)

July 2007
16-26-8080 – Universal Technology Corporation, \$32,696 (PI, 50%)
16-26-6042 – NASA, \$40,000 (PI, 40%)

September 2007
16-26-6039 – Air Force Research Laboratory, \$132,549 (PI, 100%)

November 2007
16-26-8111 – North Carolina A&T State University, \$102,014 (PI, 100%)

December 2007
16-26-6040 – Office of Naval Research, \$116,303 (PI, 100%)

January 2007
16-26-9046 – NASA-SFTI Phase II, \$42,000 (PI, 50%)

February 2007
20-19-0066 – FHTC, \$88,708 (PI, 50%)

August 2007
16-26-9049 – Florida Space Grant Consortium, \$25,000, (PI, 50%)

2008

May 2008
63-01-8012 – Universal Technology Corporation, \$96,233 (co-PI, 40%)

High-heat-capacity poly-alpha-olefin based nanofluid using encapsulated phase change nanoparticles

May 7, 08 – July 9, 09

June 2008

16-26-8117 – Universal Technology Corporation, \$18,740 (PI, 100%)

Thermal energy storage integrated model development

June 16, 08 – November 27, 2008

July 2008

63-01-6025 – National Science Foundation, \$300,000 (co-PI, 40%)

Encapsulated phase change nanoparticles for heat transfer

August 1, 08 – July 31, 2012

October 2008

16-26-6040 – Office of Naval Research, \$25,000 (PI, 100%)

Microchannel heat sink with micro encapsulated phase change material slurry

September 8, 2006 – May 31, 2009

16-26-8130 - University of Dayton Research Institute, \$54,400, (PI, 100%)

Investigation of Sorption Enhanced Heat Pipes

April 1, 2009 – January 31, 2010

16-26-8128 – North Carolina A&T State University,

Thermal Management of High Heat Flux Components Phase II

January 10, 2009 – February 28, 2011, \$107,273 (PI, 100%)

16-40-6094 – Air Force Research Laboratory, \$267,000 (PI, 100%)

Dynamic Heat Generation Modeling and Thermal Management of Electromechanical Actuators

January 21, 2009 – May 31, 2012

16-40-8137 - Boeing Company, \$180,000 (co-PI, 50%, PI: Thomas Wu)

16-40-8147 Dynamic Heat Generation Modeling for Boeing All Electric Aircraft

August 24, 2009 – July 23, 2012

16-22-8110 - Maglev Energy, \$50,490 (co-PI, 25%, PI: Thomas Wu)

Modeling and Optimization of Permanent Magnet Reluctance Machine for Renewable Energy Application

September 1, 2011 – April 30, 2012

Active projects during May 8, 2012 to May 7, 2013 (internal funds are not included)

16-40-7007 – State of Florida, \$1,950,000, (co-PI, 2%, PI: Issa Batarseh)

Florida Energy Systems Consortium

July 1, 2008 – June 30, 2013

- 16-26-8163 North Carolina A&T State University
Thermal Management of High Heat Flux Components, Phase III
May 1, 2011 – January 31, 2014, \$195,197 (PI, 50%)
- 16-26-8157 - Rini Technologies, Inc. \$68,750 (PI, 100%)
Carbon Foam for New Generation of Air-Cooled Compact Condenser
April 1, 2011 – May 31, 2013
- 16-26-8184 - Rini Technologies, Inc. \$49,200 (PI, 50%)
Thermal Management of Aircraft High Performance Electrical Actuation
June 6, 2012 – August 15, 2013
- 16-22-8113 - Maglev Energy, \$400,023 (co-PI, 25%, PI: Thomas Wu)
Design of Next Generation Advanced Permanent Reluctance Machine for
Renewable Energy Application
April 25, 2012 – April 31, 2014
- 16-22-8124 - ANSYS, \$40,000 (co-PI, 50%, PI: Thomas Wu)
Development of Electric Machine Design and Thermal Analysis
Software Modules
April 1, 2013 – March 31, 2014
- 16-26-8208 UES, Inc., \$44,999, (PI, 100%)
Air Cooling of Electromechanical Actuators for Aircraft Applications
May 1, 2013 – April 30, 2014

Internal Projects:

- 1 PI: Jay Kapat; Co-PI: Louis Chow; UCF account: 16-26-986
Sponsor: Florida Space Grant Consortium
Project: Development and Testing of Key Components for a Reliable, Compact and Light-Weight Cryocooler
Award Amount: \$27,448; Award Period: November 01 – September 02
- 2 PI: Louis Chow; Co-PI: 6 others
Sponsor: Florida Solar Energy Center
Project: Two-Stage Cryocooler Development for Liquid Hydrogen Systems
Award Amount: \$794,793; Award Period: July 02 - September 07
- 3 PI: Louis Chow
Sponsor; Florida Space Grant Consortium
Project: Effect of Vibration on Cryogen Boil-off During Launch, Transfer and Transport
Award Amount: \$25,000; Award Period: September 1, 2012 – August 31, 2013

PATENTS (15 issued, 2 pending)

Method and Apparatus for High Heat Flux Heat Transfer, US Patent # 6,571,569, June 3, 2003.

Method and Apparatus for Use of Beam Control Prisms with Diode Laser Arrays, US Patent # 6,975,465, December 13, 2005.

Method and Apparatus for High Heat Flux Heat Transfer, US Patent # 6,993,926, February 7, 2006.

Method and Apparatus for Highly Efficient Compact Vapor Compression Cooling, US Patent # 7,010,936, March 14, 2006.

Method and Apparatus for Absorbing Thermal Energy, US Patent # 7,316,262, January 8, 2008.

Method and Apparatus for Highly Efficient Compact Vapor Compression Cooling, US Patent # 7,318,325, January 15, 2008.

Method and Apparatus for High Heat Flux Heat Transfer, US Patent #7,654,100, February 2, 2010.

Method and Apparatus for High Heat Flux Heat Transfer, US Patent #7,921,664, April 12, 2011.

Method and Apparatus for Highly Efficient Compact Vapor Compression Cooling, US Patent #7,942,642, May 17, 2011.

Miniature High Speed Compressor having Embedded Permanent Motor, US Patent #7,942,646, May 17, 2011.

Method and Apparatus for Highly Efficient Compact Vapor Compression Cooling, US Patent #8,024,942, September 27, 2011.

Hydrophilic Particle Enhanced Phase Change-Based Heat Exchange, US Patent #8,235,096, August 7, 2012.

Thermally Conductive Porous Element-Based Recuperators, US Patent #8,322,406, December 4, 2012.

Method and Apparatus for Highly Efficient Compact Vapor Compression Cooling, US Patent #8,371,134, February 12, 2013.

Hydrophilic Particle Enhanced Heat Exchange and Method of Manufacture, US Patent #8,434,225, May 7, 2013.

Method and Apparatus for Absorbing Thermal Energy, US Patent Application #11/970,442, filed on January 7, 2008.

Dual Latent Heat Sink, Patent Application No. 12/485,518, filed on June 16, 2009.

**PUBLICATIONS (132 journal and 204 conference papers since 1974)
(1996-present)**

C.D. Sulfridge, K.A. Tagavi and L.C. Chow, "Homogeneous Nucleation of Vapor by Depressurization at Constant Volume," International Journal of Heat and Mass Transfer, 39, pp. 235-246, 1996.

J.D. Yang, L.C. Chow and M.R. Pais, "An Analytical Method to Determine the Liquid Film Thickness Produced by Gas Atomized Sprays," Journal of Heat Transfer, 118, pp. 255-258, 1996.

Y.D. Dong, K.A. Tagavi, T.W. Wu and L.C. Chow, "Numerical Modeling of Void Migration in Solids Due to Temperature Gradient Using the Boundary Element Method," Numerical Heat Transfer, 30, pp. 365-378, 1996.

L.C. Chow, J.K. Zhong and J.E. Beam, "Thermal Conductivity Enhancement for Phase-Change Storage Media," International Communications in Heat and Mass Transfer, 23, pp. 91-100, 1996.

J.D. Yang, L.C. Chow and M.R. Pais, "Nucleate Boiling Heat Transfer in Spray Cooling," Journal of Heat Transfer, 118, pp. 668-671, 1996.

L.C. Chow, M.S. Sehmbeys and M.R. Pais, "High-Heat-Flux Spray Cooling," Annual Review of Heat Transfer, 8, pp. 291-318, 1997.

J.E. Leland and L.C. Chow, "Immersion Cooling of a Simulated Electronic Chip Protruding into a Flow Channel," Journal of Thermophysics and Heat Transfer, 12, pp. 398-405, 1998.

C.D. Sulfridge, L.C. Chow and K.A. Tagavi, "Initiation and Growth of Solidification Shrinkage Voids," Annual Review of Heat Transfer, 10, pp. 221-278, 1999.

K.S. McFall and L.C. Chow, "Future Heat Transfer Concerns in Josephson Junction Computers," IEEE Transactions on Components, Packaging, and Manufacturing Technology, 22, pp. 378-383, 1999.

R.J. Mauriello, K.B. Sundaram and L.C. Chow, "Simulation of Si Power MOSFET under Cryogenic Conditions," Solid-State Electronics, 43, 771-777, 1999.

S.F. Shams, K.B. Sundaram and L.C. Chow, "Simulation of Silicon Carbide Power MOSFETs at High Temperature," Solid-State Electronics, 43, 367-374, 1999.

W.Lu, R.J. Mauriello, K.B. Sundaram and L.C. Chow, "A Study of On-Resistance and Switching Characteristics of the Power MOSFET under Cryogenic Conditions," International Journal of Electronics, 87, pp. 99-106, 2000.

D.N.T. Nguyen, R.H. Chen, L.C. Chow and C. Gu, "Effects of Heater Orientations and Confinement on Liquid Nitrogen Pool Boiling," Journal of Thermophysics and Heat Transfer, 14, pp. 109-111, 2000.

J. J. Huddle, L.C. Chow, S. Lei, D.P. Rini, A. Marcos, T. Chung, S.J. Lindauer, M. Bass and P.J. Delfyett, "Advantages of Spray Cooling for a Diode Laser Module," SAE Transactions – Journal of Aerospace, 109-1, pp. 893-897, 2000.

L. Zhou, J.S. Kapat, L.C. Chow and X. Li, "Design of a High Effectiveness Micro Heat Exchanger for Mars Application," SAE Transactions – Journal of Aerospace, 109-1, pp. 875-882, 2000.

Y.R. Lin, K.B. Sundaram and L.C. Chow, "Performance Characteristics of MOSFETs Operating at High Power," SAE Transactions – Journal of Aerospace, 109-1, pp. 888-892, 2000.

D.P. Rini, R.H. Chen and L.C. Chow, "Bubble Behavior and Heat Transfer Mechanism in FC-72 Pool Boiling," Experimental Heat Transfer, 14, pp. 27-44, 2001.

D.P. Rini, R.H. Chen and L.C. Chow, "Bubble Behavior and Nucleate Boiling Heat Transfer in Saturated FC-72 Spray Cooling," Journal of Heat Transfer, 124, pp. 63-72, 2002.

R.H. Chen, L.C. Chow and J.E. Navedo, "Effects of Spray Characteristics on Critical Heat Flux in Subcooled Water Spray Cooling," International Journal of Heat and Mass Transfer, 45, 4033-4043, 2002.

Y.R. Lin, T.Y. Chung, J.H. Du, L.C. Chow, M. Bass and D.P. Rini, "Thermal Design in Diode Array Packaging," SAE Transactions – Journal of Aerospace, 111-1, pp. 915-921, 2002.

R. Agrawal, Q. Hasan, N. Ashraf, K.B. Sundaram, L.C. Chow, J.S. Kapat and J. Vaidya, "Design and Fabrication of Meso-scale Variable Capacitance Motor for Miniature Heat Pumps," Journal of Micromechanics and Microengineering, 13, 1-7, 2003.

M. Hu, H. Du, S.F. Ling, Y. Fu, Q. Chen, L. Chow and B. Li, "A Silicon-on-Insulator Based Micro Check Valve," Journal of Micromechanics and Microengineering, 14, 382-387, 2004.

R.H. Chen, L.C. Chow and J.E. Navedo, "Optimal Spray Characteristics in Water Spray Cooling," International Journal of Heat and Mass Transfer, 47, 5095-5099, 2004.

L.An, Y. Wang, L. Bharadwaj, L. Zhang, Y. Fan, D. Jiang, Y. Sohn, V.H. Desai, J. Kapat and L.C. Chow, "Silicoaluminum Carbonitride with Anomalously High Resistance to Oxidation and Hot Corrosion," Advanced Engineering Materials, 6, No. 5, 337-340, 2004.

L. An, W. Xu, S. Rajagopalan, C. Wang, H. Wang, Y. Fan, L. Zhang, D. Jiang, J. Kapat, L. Chow, B. Guo, J. Liang and R. Vaidyanathan, "Carbon-Nanotube-Reinforced Polymer-Derived Ceramic Composites," Advanced Materials, 16, 2036-2040, 2004.

Louis C. Chow, Jayanta S. Kapat, Krishna M. Kota, "Mesoscopic Energy Systems", Annual Review of Heat Transfer, 14, 475-509, 2005.

L.P. Zheng, T.X. Wu, J. Vaidya, M.G. Sarwar, K.B. Sundaram, C.H. Ham, H. Seigneur, L.M. Zhao, N. Vanasse, A. Canale, J. Kapat and L.C. Chow, "Design of a Super-High-Speed Axial Flux Permanent Magnetic Synchronous Motor for Centrifugal Compressor," Electromotion, 12, No. 1, 9-18, 2005.

Liping Zheng, Thomas X. Wu, Dipjyoti Acharya, Kalpathy B. Sundaram, Jay Vaidya, Limei Zhao, Lei Zhou, Chan H. Ham, Nagaraj Arakere, Jay Kapat, and Louis Chow, "Design of a Super-high Speed Cryogenic Permanent Magnet Synchronous Motor," IEEE Transactions on Magnetics, 41, No. 10, 3823-3825, 2005.

Limei Zhao, C.H. Ham, Q. Han, T.X. Wu, L. Zheng, K.B. Sundaram, J. Kapat and L. Chow, "Design of Optimal Digital Controller for Stable Super-High-Speed Permanent-Magnet Synchronous Motor," IEE Proc.-Electrical Power Applications, 153, No. 2, 213-218, 2006.

Limei Zhao, Chan H. Ham, Thomas X. Wu, Liping Zheng, Hubert P. Seigneur, Kalpathy B. Sundaram, Jay Kapat, Jay Vaidya and Louis Chow, "Development of A Super High Speed Permanent Magnet Synchronous Motor (PMSM) Controller and Analysis of The Experimental Results", Journal of Systemics, Cybernetics and Informatics, 3, No.1, 2006.

N.R. Nagaiah, A. Sleiti, S. Rodriguez, J.S. Kapat, L. An and L. Chow, "A Novel Design and Analysis of a MEMS Ceramic Hot-Wire Anemometer for High Temperature Applications," J. of Physics: Conf. Series, 34, pp. 277-282, 2006.

N.R. Nagaiah, J.S. Kapat, L. An and L. Chow, "Novel Polymer Derived Ceramic High Temperature Heat Flux Sensor for Gas Turbine Environment," J. of Physics: Conf. Series, 34, pp. 458-463, 2006.

Limei Zhao, Chan Ham, Liping Zheng, Thomas Wu, Kalpathy Sundaram, Jay Kapat and Louis Chow, "A Highly Efficient 200000 RPM Permanent Magnet Motor System," IEEE Transactions on Magnetics, 43, no. 6, pp. 2528-2530, June, 2007.

R.H. Mertens, Louis Chow, Kalpathy B. Sundaram, R. Brian Cregger, Daniel P. Rini, Louis Turek and Benjamin A. Saarloos, "Spray Cooling of IGBT Devices," ASME Journal of Electronic Packaging, 129, no.3, pp. 316-323, 2007.

Ruey-Hung Chen, David S. Tan, Kuo-Chi Lin, Louis C. Chow, Alison R. Griffin and Daniel P. Rini, "Droplet and Bubble Dynamics in Saturated FC-72 Spray Cooling," ASME Journal of Heat Transfer, Vol. 130, No. 10, 2008, p. 1010011-1010016.

A.R. Griffin, A. Vijayakumar, R.H. Chen, K.B. Sundaram and L.C. Chow, "Development of a Transparent Heater to Measure Surface Temperature Fluctuations Under Spray Cooling Conditions," ASME Journal of Heat Transfer, Vol. 130, No. 11, 2008, pp. 1145011-1145014.

Krishna M. Kota, Louis C. Chow, Jianhua Du, Jayanta Kapat, Quinn Leland and Richard Harris, "Design of a Dual Latent Heat Sink for Pulsed Electronic Systems," AIAA Journal of Thermophysics and Heat Transfer, Vol. 22, No. 4, 2008, pp. 572-580.

K.M. Kota, L.C. Chow, J. Du, J.S. Kapat, Q.H. Leland, and R.J. Harris, "Numerical Analysis of Heat Storage Phenomenon in a Dual Latent Heat Sink," AIAA Journal of Thermophysics and Heat Transfer, Vol 23, No. 1, 2009, pp. 148-156.

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M. Bai, J.N. Chung, J.H. Du, W. Wu, Y.R. Lin, J.S. Kapat and L.C. Chow, “Carbon Foam Cold Head Heat Exchanger for O₂ Liquefaction,” 47th AIAA Aerospace Sciences Meeting, Orlando, FL, AIAA Paper 2009-1424, January 5-8, 2009.

Quinn Leland, Krishna Kota and Louis Chow, “Optimization of Film Condensation Driven Thermal

Energy Storage Containers,” Proceedings of the US-EU-China Thermophysics Conference – Renewable Energy, UECTC-RE’09, Beijing, China, ASME Paper UECTC2009-327, May 28-30, 2009.

Sarada Kuravi, Jianhua Du and Louis C. Chow, “Encapsulated Phase Change Material Slurry Flow in Manifold Microchannels,” 41st AIAA Thermophysics Conference, San Antonio, TX, AIAA Paper 2009-4097, June 22-25, 2009.

Yeong-Ren Lin, Krishna Kota, Louis Chow and Quinn Leland, “Design of a Thermal Management System for Directed Energy Weapons,” 41st AIAA Thermophysics Conference, San Antonio, TX, AIAA Paper 2009-4248, June 22-25, 2009.

L. Chow, “High Heat Flux Spray Cooling,” International Microelectronics and Packaging Society (IMAPS), Orlando, FL, June 17, 2009.

D. Woodburn, T.X. Wu, Q. Leland, N. Rolinski, L. Chow, and B. Jordan, “Parabolic Approximation to EMA Motion Profiles,” National Aerospace and Electronics Conference (NAECON 2009), Paper CM-03, Dayton, OH, July 21-23, 2009.

K. Zhang, T.X. Wu, N. Kutkur, J. Shen, D. Woodburn, L. Chow, W. Wu, H. Mustain, and I. Batarseh, “Modeling and Design Optimization of Planar Power Transformer for Aerospace Application,” National Aerospace and Electronics Conference (NAECON 2009), Paper CM-06, Dayton, OH, July 21-23, 2009.

L. Chow, “Spray Cooling for Thermal Management of High Heat Flux Components,” 7th International Energy Conversion Engineering Conference and Exhibit, Denver, CO, August 2-5, 2009.

H. Bostanci, D. Van Ee, B.A. Saarloos, D.R. Rini, and L.C. Chow, “Spray Cooling of Power Electronics Using High Temperature Coolant and Enhanced Surface,” 5th IEEE Vehicle Power and Propulsion Conference, (VPPC’09), Dearborn, MI, September 7-11, 2009.

D.A. Woodburn, T. Wu, L. Chow, Q. Leland, W. Brokaw, J. Bindl, N. Rolinski, R. Zhou, Y.R. Lin and B. Jordan, “Dynamic Heat Generation Modeling of High Performance Electromechanical Actuator,” 48th AIAA Aerospace Sciences Meeting, Orlando, FL, AIAA Paper 2010-0290, January 2010.

D.A. Woodburn, T. Wu, S. Lin, J. Bindl, Y. Hu, W. Brokaw, L. Chow, L. Zhou, Y.R. Lin, Q. Leland, B. Tran, B. Jordan, E. Gregory, S. Iden and N. Rolinski, “Integrated Nonlinear Dynamic Modeling and Field Oriented Control of Permanent Magnet Motor for High Performance EMA,” SAE 2010 Power Systems Conference, Ft. Worth, TX, Paper 2010-01-1742, November 2-4, 2010.

L. Zhou, Y.R. Lin, L. Chow, D.A. Woodburn, T. Wu, J. Bindl, Y. Hu, W. Brokaw, Q. Leland, B. Tran, B. Jordan, E. Gregory, S. Iden and N. Rolinski, “Lumped Node Thermal Modeling of EMA with FEA Validation,” SAE 2010 Power Systems Conference, Ft. Worth, TX, Paper 2010-01-1749,

November 2-4, 2010.

L. Chow, W. Wu, S. Ding, Y. Hong, M. Su, J. Kizito, L. Gschwender and E. Synder (invited paper), “Spray and Jet Impingement with Nano-Slurry,” 2011 Materials Research Society Spring Meeting, San Francisco, CA, April 25-29, 2011.

W. Wu, H. Bostanci, L. Chow, Y. Hong, M. Su and J. Kizito, “Jet Impingement Heat Transfer with Air-borne Nanoencapsulated Phase Change Materials,” 2011 Materials Research Society Spring Meeting, San Francisco, CA, April 25-29, 2011.

Y. Hong, W. Wu, J. Hu, A. Voevodin, L. Chow and M. Su, “Encapsulated Phase Change Nanoparticles for Heat Transfer,” 2011 Materials Research Society Spring Meeting, San Francisco, CA, April 25-29, 2011.

H. Liu, W. Brokaw, J. Harms, W. Wu, M. Epstein, T. Chalfant, A. Camarano, Y. Hu, Y. Bai, L. Chow and T. Wu, “Design and Optimization of Permanent Magnet Switch Reluctance Machine for Renewable Energy Application,” XXth International Conference on Electrical Machines (ICEM’2012), Marseille, France, September 2-5, 2012.

Y.R. Lin, Y. Hu, L. Zhou, D. Woodburn, T. Wu, L. Chow and Q. Leland, “A Reduced-Order Model for Electromechanical Actuator,” SAE 2012 Power Systems Conference, Phoenix, AZ, SAE Paper 2012-01-2230, October 30 – November 1, 2012.

Y. Hu, D. Woodburn, Y.R. Lin, T. Wu, L. Chow and Q. Leland, “Modeling and Simulation of Power Loss in Drive Unit of Electromechanical Actuator,” SAE 2012 Power Systems Conference, Phoenix, AZ, Paper 2012-01-2232, October 30 - November 1, 2012.

H. Liu, Y. Hu, M. Tulbane, W. Wu, L. Chow, Y. Bai, J. Harms, M. Epstein and T. Wu, “Design of a Permanent Magnet Motor with Wide Temperature Range,” 12th Joint MMM/Intermag Conference, Chicago, IL, January 14-18, 2013.

S. Lin, X. Hu, E. Dlala, M. Christini, S. Stanton, K. Zhang, L. Chow and T. Wu, “Temperature Effects on the Performance of Interior Permanent Magnet Electrical Machine,” 12th Joint MMM/Intermag Conference, Chicago, IL, January 14-18, 2013.

RESEARCH COLLABORATION (1996-present)

I have in-depth knowledge of mechanical engineering as well as a broad background in aerospace engineering, electrical engineering, materials science and engineering, optics and lasers, and physics. Thus, I have been able to work with many faculty members at UCF. The collaboration has been very beneficial to all involved.

Mechanical and Aerospace Engineering:
Jay Kapat, Kurt Lin, Ray Chen and Quanfang Chen

Industrial Engineering and Management Systems:
Gene Lee

Electrical Engineering:
K. Sundaram, Thomas Wu, John Shen and Issa Batarseh

Optics and Photonics:
Mike Bass and Peter Delfyett

AMPAC:
Linan An

FSEC:
Neelkanth Dhere

FSI:
Chan Ham

Nanoscience and Technology Center:
Ming Su

RESEARCH SUPERVISION (1996-present)

Former Graduate Students

W.F. Lu, Ph.D. 1997 (awarded at University of Kentucky)
J.Y. Um, Ph.D. 1997 (awarded at University of Kentucky)
Diane Nyuyen, MS 1997 (with Ruey Chen)
Dan Rini, MS 1998 (with Larry Chew)
Dan Rini, Ph.D. 2000 (with Ruey Chen)
Jose Navedo, Ph.D. 2000 (with Ruey Chen)
Jennifer Huddle, MS 2000
Alexandra Laveau, MS 2000 (with Jay Kapat)
Y.R. Lin, MS 2001
Anabel Marcos, MS 2001
David Tan, Ph.D. 2001 (with Kurt Lin and Ruey Chen)
G.W. Finger, MS 2002 (with Jay Kapat)
Alison Griffin, MS 2002 (with Ray Chen)
Bin He, MS 2002
Yan Yin, MS 2002 (with Jay Kapat)
Harold Carter, MS 2003 (with Jay Kapat)
Brian Gulliver, MS 2003 (with Jay Kapat)
Kevin Finney, MS 2003 (with Jay Kapat)
Casey Walsh, MS 2003 (with Jay Kapat)
Brad Carman, MS 2004 (with Jay Kapat)
Lei Zhou, Ph.D. Summer 2004 (with Jay Kapat)

Jose Recio, MS Summer 2004 (with Jay Kapat)
Brian Glassman, MS Spring 2005
Krishna Murty, MS Spring 2005
Zhengxiang Pu, Ph.D. Spring 2005 (with Jay Kapat)
Xiaoyi Li, Ph.D. Summer 2005 (with Jay Kapat)
Dipjyoti Acharya, MS Summer 2006 (with Jay Kapat)
Sarada Kuravi, MS Fall 2006
Alison Griffin, Ph.D. Summer 2008 (with Ruey Chen)
Krishna Kota-Murty, Ph.D. Summer 2008
Johan Westin, Ph.D. Fall 2008 (with Jay Kapat)
Sarada Kuravi, Ph.D. Fall 2009
James Hughes, MS, Fall 2009
Huseyin Bostanci, Ph.D. Summer 2010
Wesley Johnson, MS Fall 2010
Jonathan Partridge, MS Fall 2010
Brandon Smith, MS Fall 2012
Walid Aboelsoud, Ph.D. Spring 2013

Current Graduate Students

Dan Zhao, MS
Erin Schlichenmaier, MS
Shakil Ferdousi, Ph.D.

Current Research Engineers and Postdoctoral Students

Y.R. Lin, 01-present
Dr. Wei Wu, 07-present

Former Research Engineers and Postdoctoral Students

Dr. Lei Zhou, 04-10
Dr. Weixing Xu, 06-07
Louis Turek, 04-05
Dr. J. Du, (from Tsinghua University), 00-09
Dr. G. Zhao (from Tsinghua University), 02-04
Professor Shuye Lei (from Tsinghua University), 98-00
Dr. Chuanbao Gu (from Tsinghua University), 96-98
M.S. Sehbey, 96-97
Guosu Su, 96-98
Kevin McFall, 98-99

Undergraduate Students

Joseph Tapley, Honors in the Major, 1998
Louis Turek
Jose Solomon (with Jay Kapat)
Brian Gulliver (with Jay Kapat)
Brian Cregger (with Jay Kapat)

Jose Recio
Gabriella Ahlqvist
Alex Canale
Casey Walsh (with Jay Kapat)
William Funk
James Hughes
Matthew Murrian
Jon Harms