Curriculum Vitae Jim P. Zheng April 29, 2013

General Information

University address:	Department of Electrical and Computer Engineering FAMU-FSU College of Engineering 2525 Pottsdamer St Florida State University Tallahassee, Florida 32310 Phone: 850/410-6464; Fax: 850/410-6479
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Professional Preparation

1990	Ph.D. in Electrical Engineering, State University of New York at Buffalo
1986	M.S. in Electrical Engineering, State University of New York at Buffalo
1982	B.S. in Physics, Fudan University, China

Professional Experience

2013-present	Courtesy Professor, Department of Chemical and Biomedical Engineering, FAMU-FSU College of Engineering, Tallahassee, Florida
2003–present	Professor, Department of Electrical and Computer Engineering, FAMU-FSU College of Engineering, Tallahassee, Florida
1997-2003	Associate Professor, Department of Electrical and Computer Engineering, FAMU-FSU College of Engineering, Tallahassee, Florida
1996-1997	Electrical Engineer and Research Scientist, Army Research Laboratory/General Technical Services, Inc., Wall Township, New Jersey
1993-1995	National Research Council Research Fellow, Army Research Laboratory, Fort Monmouth, New Jersey
1991-1992	Research Assistant Professor, Department of Electrical and Computer

Engineering, State University of New York at Buffalo, Amherst, New York

1990-1991 Research Associate, Department of Electrical and Computer Engineering, State University of New York at Buffalo, Amherst, New York

Visiting Professorship

6/2010-7/2010	Shanghai Institute of Technical Physics of the Chinese Academy of Sciences,
	China
6/2011-7/2011	Shanghai Institute of Technical Physics of the Chinese Academy of Sciences,
	China
6/2012-7/2012	Tongji University, China

Fellowship

1/1993-12/1995 National Research Council Research Fellow

Honors, Awards, and Prizes

National Research Council Fellow (1993)
Army Research & Development Achievement Award (1997)
Faculty Research Award, NASA (1999)
Engineering Faculty Research Award, FAMU-FSU College of Engineering (2001)
Progress Energy Professional Development Award (2005)
Departmental Service Award (2006)
Engineering Research Award, FAMU-FSU College of Engineering (2007)
Engineering Invention Award, FAMU-FSU College of Engineering (2008)
Innovator Award, Florida State University (2008)
Engineering Research and Development Award, FAMU-FSU College of Engineering (2009)
Innovator Award, Florida State University (2010)
Engineering Research Award, FAMU-FSU College of Engineering (2011)
Engineering Invention Award, FAMU-FSU College of Engineering (2011)
Innovator Award, Florida State University (2012)
Sprint Eminent Scholar Chair in Electrical and Computer Engineering (2013)

Current Membership in Professional Organizations

Electrochemical Society (ECS) Institute of Electrical and Electronic Engineers (IEEE) Materials Research Society (MRS)

Teaching

Courses Taught

Introductory Circuit Analysis (EEL3111) Electronics (EEL3300) Electronics I Lab (EEL3300L) Electromagnetic Fields I (EEL3472) Electronic Circuits and System Design (EEL4301) Electronics II Lab (EEL4301L) Microelectronics Engineering (EEL4330) Solid State Materials and Devices (EEL4351) Senior Design Project I (EEL4911C) Senior Design Project II (EEL4914C/4915C) Engineering Optics (EEL4930/5930) Nanosciences and Nanotechnologies (EEL4930/5930) Introductory Energy Storage (EEL4930/5930) Solid State Sensors (grad.) (EEL5333) Semiconductor Device Theory (grad.) (EEL6353) EE Graduate Seminar (grad.) (EEL6932) Thesis (grad.) (EEL6971) Dissertation (grad.) (EEL6980) Preliminary Doctoral Exam (grad.) (EEL8964)

New Course Development

Semiconductor Device Theory (1997) Solid State Sensors (2000) Engineering Optics (2004) Nanosciences and Nanotechnologies (2010) Introductory Energy Storage (2012)

Curriculum Development

Restructure of the Department of Electrical and Computer Engineering Graduate Program, including developing new graduate curriculum and defining the new core courses (2002-2006)

Doctoral Committee Chair

1. Xu Wang, Ph.D. in Electrical Engineering, December 2004, Dissertation Title: Pulsed Laser Deposition Growth and Property Studies of Ca_{2-x}La_xRuO₄ and RuO₂ Thin Films.

- 2. Arthur Pun, Ph.D. in Electrical Engineering, May 2005, Dissertation Title: A Novel In-Situ Method for Inhibiting Surface Roughening during the Thermal Oxide Desorption Etching of Silicon and Gallium Arsenide.
- 3. Lenwood L. Fields, Ph.D. in Electrical Engineering, August 2006, Dissertation Title: The Fabrication, Characterization, and Modeling of a Single Tin Dioxide Nanobelt Chemical Sensor.
- 4. Yang Wang, Ph.D. in Electrical Engineering, December 2007, Dissertation Title: A Monolithic Hybrid Direct Methanol Fuel Cell & an Equivalent Nonlinear Electric Circuit Model for Direct Methanol Fuel Cell.
- 5. Pedro Moss, Ph.D. in Electrical Engineering, April 2008, Dissertation Title: Study of Capacity Fade Of Lithium-Ion Polymer Battery With Continuous Cycling & Power Performance Modeling Of Energy Storage Devices.
- 6. Huazhong Wang, Ph.D. in Electrical Engineering, April 2009, Dissertation Title: Study of 2-D Square Rod-in-Air Photonic Crystal Optical Switch and Design of Fast Planar Laser Shutter.
- 7. Wanjun Cao, Ph.D. in Electrical Engineering, April 2013, Dissertation Title: Novel High Energy Density Li-ion Capacitors.

Doctoral Committee Member

Mohammad I. Kilani (2002), Ph.D. in M.E. JianHua Su (2004), Ph.D. in M.E. Pa Zheng (2004), Ph.D. in M.E. Jie Tang (2006), Ph.D. in M.E. Danwei Liu (2006), Ph.D. in E.E. Xiaoyu Liu (2006), Ph.D. in E.E. Saleh Hayek (2007), Ph.D. in M.E. Cherng-Shii Yeh (2007), Ph.D. in I.E. Xiaorong Wang (2008), Ph.D. in E.E. Sardis Azongha (2008), Ph.D. in E.E. Antonio Soares (2008), Ph.D. in E.E. Liviu Oniciuc (2009), Ph.D. in E.E. Ayodeji Adedoyin (2009), Ph.D. in E.E. Lei Wang (2010), Ph.D. in E.E. Tangming Shen (2010), Ph.D. in E.E. Honghai Song (2010), Ph.D. in E.E. Haifeng Fan (2011), Ph.D. in E.E. Hang Wen (2011), Ph.D. in M.E. Jamie Gomez (2012), Ph.D. in Chem. E.

Master's Committee Chair

- 1. Peter Charbel, M.S. in Electrical Engineering, May 2000, Thesis Title: A Three-Dimensional Computer for Simulation of Light-Trapping Effects in Porous Silicon.
- 2. Tim Lynch, M.S. in Electrical Engineering, May 2000, Thesis Title: Design and Development of an Luminous Intensity versus Angle and Chromaticity Measurement Facility for Traffic Signals and Signs.
- 3. Qingli (Lily) Fang, M.S. in Electrical Engineering, August 2000, Thesis Title: Electrochemical and Physical Properties of Ruthenium Oxide Film Electrodes Prepared at Low Temperatures for High Power Delivery Applications.
- 4. Arthur Pun, M.S. in Electrical Engineering, May 2002, Thesis Title: RHEED Analysis of Epitaxial of Grown Ge/GaAs and GaAs/GaAs Thin Films Grown by Pulsed Laser Deposition.
- 5. Tzu-Yen Chang, M.S. in Electrical Engineering, May 2003, Thesis Title: Electrolytic-Electrochemical Tantalum Oxide-Ruthenium Oxide Hybrid Capacitors.
- 6. Pedro Moss, M.S. in Electrical Engineering, May 2003, Thesis Title: Study of capacity fading with cycling in Li_XV₂O₅ cathode material.
- 7. Zhaoning (Johnnie) Jiang, M.S. in Electrical Engineering, May 2004, Thesis Title: Application and Development of Luminous Intensity Measurement for LED Related Traffic Signals and Signs.
- 8. Huazhong Wang, M.S. in Electrical Engineering, July 2004, Thesis Title: Study of Polyamide Coating on Aluminum Sibstrate by Different Methods.
- 9. Vivek Tiwari, M.S. in Electrical Engineering, April 2009, Thesis Title: Formation of RuO₂.xH₂O-Supported Pt Anode Electrode for Direct Methanol Fuel Cells.
- 10. Annadanesh Shellikeri, M.S. in Electrical Engineering, April 2010, Thesis Title: Pseudocapacitance: Metal Oxide Coated on Buckypaper/CNTs as Electrodes for Asymmetrical Pseudocapacitor.
- 11. Michael Greenleaf, M.S. in Electrical Engineering, April 2010, Thesis Title: Physical Based Modeling and Simulation of LiFePO₄ Secondary Batteries.
- 12. Xujie Chen, M.S. in Electrical Engineering, August 2011, Thesis Title: Development of Electrolytes for Li-ion Capacitors.
- 13. Jermaine A. Bailey, M.S. in Electrical Engineering, August 2012, Thesis Title: Lithium/Water-Battery System for Inclusion in Submarine Applications.

- 14. Emem Akpanekong, M.S. in Electrical Engineering, August 2012, Thesis Title: Fabrication and Evaluation of Polyvinylidene Fluoride/Polyvinyl Alcohol (PVA/PVDF) Hybrid Membranes for Lithium-Air Battery Applications. (Co-advisor)
- 15. Mark Hagen, M.S. in Electrical Engineering, December 2012, Thesis Title: Optimization of Microstructure of Buckypaper-based Proton Exchange Membrane Fuel Cell by using Electrochemical Impedance Spectroscopy.
- 16. Harsha Ravindra, M.S. in Electrical Engineering, May, 2013, Thesis Title: Investigation of Dynamic Interactions of PV Inverters and Traditional Devices in Regulation of Voltage on Distribution Feeders with High Penetration Levels of Solar PV.

Master's Committee Member

Gregory Triplett (1998), M.S. in E.E. Adolfo Bello (1998), M.S. in E.E. Trevor D. Brooks (1998), M.S. in E.E. J.S. Pelt (1999), M.S. in E.E. Matthew E. Ramsey (2000), M.S. in E.E. Edward Poindexter (2000), M.S. in E.E. Steve L. Atwell (2001), M.S. in E.E. Kishma A. Meyers (2001), M.S. in E.E. Vijayanand Lakshminaryanan (2002), M.S. in E.E. Xiaoyu Liu, (2003), M.S. in E.E. Kilnam Kim (2003), M.S. in E.E. Lining Zhou (2005), M.S. in E.E. Daphne Ku (2007), M.S. in I.E. Derek Vollmer (2008), M.S. in E.E. Indranil Bhattacharya (2009), M.S. in E.E. Jesse Smithtman (2010), M.S. in I.E. Satish Vemaraju (2011), M.S. in E.E.

Present Doctoral Students Advising

Michael Greenleaf, Ph.D. in Electrical Engineering, Fall 2013

Annadanesh Shellikeri, Ph.D. in Electrical Engineering, 2014

Xujie Chen, Ph.D. in Electrical Engineering, 2015

Mark Hagon, Ph.D. in Electrical Engineering, 2016

Present Master's Students Advising

Research and Original Creative Work

Publications

Refereed Journal Articles

- 1. J. Gomez, E. Kalu, R. Nelson, C. Akpovo, M. Weatherspoon, and J.P. Zheng, "Binder-free Electrode Fabrication by Electroless-Electrolytic Method", *Electrochem. Lett.*, **1**, D25 (2012).
- 2. G.Q. Zhang, J.P. Zheng, M. Hendrickson, E.J. Plichta, and M. Au, "Preparation, Characterization and Electrochemical Catalytic Properties of Hollandite Ag₂Mn₈O₁₆ for Li-air Batteries", *J. Electrochem. Soc.* **159**, A310 (2012).
- 3. A. P. Andrei, J.P. Zheng, M. Hendrickson, and E.J. Plichta, "Modeling of Li-Air Batteries with Dual Electrolyte", *J. Electrochem. Soc.* **159**, A770 (2012).
- 4. Jesse Smithyman, Richard Liang; Andrew Moench; Jim P. Zheng; Chuck Zhang; Ben Wang, "Binder-free composite electrodes using carbon nanotube networks as a host matrix for activated carbon microparticles", *Applied Physics*, **107**, 723 (2012).
- 5. W.J. Cao and J.P. Zheng, "Li-ion Capacitors with Carbon Cathode and Hard Carbon/SLMP Anode Electrodes", *J. Power Sources*, **213**, 180 (2012).
- 6. J.P. Zheng, P. Andrei, M. Hendrickson, and E.J. Plichta, "The Theoretical Energy Densities of Dual-electrolytes Rechargeable Li-air and Li-air Flow Batteries", *J. Electrochem. Soc.* **158**, A43 (2011).
- 7. Alex Huang, Mariesa Crow, Gerald Heydt, Jim Zheng, Steiner Dale, "The Future Renewable Electric Energy Delivery and Management (FREEDM) System: The Energy Internet", *Proceedings of the IEEE*, Vol. 99, 133 (2011).
- G.Q. Zhang, J.P. Zheng, R. Liang, C. Zhang, B. Wang, M. Au, M. Hendrickson, and E.J. Plichta, "α-MnO₂/Buckypaper Composite Catalytic Air Electrodes for Rechargeable Lithium-air Batteries", *J. Electrochem. Soc.* 158 A822 (2011).
- 9. J. Gomez, R. Nelson, E.E. Kalu, M.H. Weatherspoon, J.P. Zheng, "Equivalent circuit model parameters of a high-power Li-ion battery: Thermal and state of charge effects", *J. Power Sources.* **196**, 4826 (2011).
- W. Zhu, C. Zeng, J.P. Zheng, R. Liang, C. Zhang, and B. Wang, "Preparation of Buckypaper Supported Pt Catalyst for PEMFC Using Supercritical Fluid Method", Electrochem. and *Solid-State Lett.* 14, B81 (2011).

- 11. Quyet H. Do, Changchun Zeng, Chuck Zhang, Ben Wang, and Jim Zheng, "High Capacity Supercapacitors Electrodes from Carbon nanotubes-Vanadium Oxide Hybrid Nanostructures by Supercritical Fluid Deposition", *Nanotechnology*, **22**, 365402 (2011).
- P.L. Moss, G. Au, E.J. Plichta, and J.P. Zheng "Study of Capacity Fade of Lithium-Ion Polymer Rechargeable Batteries with Continuous Cycling", *J. Electrochem. Soc.* 157, A1 (2010).
- 13. W. Zhu, D. Ku, J.P. Zheng, R. Liang, B. Wang, C. Zhang, S. Walsh, G. Au, and E. J. Plichta, "Buckypaper-Based Catalytic Electrodes for Improving Platinum Utilization and PEMFC's Performance", *Electrochimica Acta*, **55**, 2555 (2010).
- 14. J. Chatterjee, T. Liu, B. Wang, and Jim P. Zheng, "Highly conductive PVA organogel electrolytes for applications of lithium batteries and electrochemical capacitors", *Solid State Ionics*, **181**, 531 (2010).
- G.Q. Zhang, R.Y. Liang, J.P. Zheng, M. Hendrickson, and E.J. Plichta, "Lithium-air Batteries Using SWNT/CNF Buckypapers as Air Electrodes" *J. Electrochem. Soc.* 157, A953 (2010).
- 16. H.Z. Wang, W.M. Zhou, and J.P. Zheng, "A 2D rods-in-air square-rod photonic crystal optical switch", *Optik.* **121**, 1988 (2010).
- 17. P. Andrei, J.P. Zheng, M. Hendrickson, and E.J. Plichta, "Some possible approaches for improving the energy density of Li-air batteries" *J. Electrochem. Soc.* **157**, A953 (2010).
- 18. W. Zhu, J.P. Zheng, R. Liang, B. Wang, C. Zhang, G. Au, and E. J. Plichta, "Ultra-Low Platinum Loading High-Performance PEMFCs using Buckypaper Supported Electrodes", *Electrochemistry Communications*, **12**, 1654 (2010).
- 19. P.L. Moss, G. Au, E.J. Plichta, and J.P. Zheng, "Investigation of solid electrolyte interfacial layer development during continuous cycling using ac impedance spectra and micro-structural analysis", *J. Power Sources*, **189**, 66 (2009).
- 20. J.P. Zheng, "High energy density electrochemical capacitors without consumption of electrolyte", J. Electrochem. Soc. 156, A500 (2009).
- 21. W. Zhu, J.P. Zheng, R. Liang, B. Wang, C. Zhang, G. Au, and E. J. Plichta, "Durability Study of Carbon Nanotube/Nanofiber Buckypaper Catalyst Support for PEMFCs", *J. Electrochem. Soc.* **156**, B1099 (2009).
- 22. Y. Wang, G. Au, E.J. Plichta, and J.P. Zheng, "A Semi-Empirical Method for Electrically Modeling of Fuel Cell: Executed on a Direct Methanol Fuel Cell", *J. Power Sources*, **175**, 851 (2008).

- 23. J.P. Zheng, R.Y. Liang, M. Hendrickson, and E.J. Plichta, "The Theoretical Energy Density of Li-Air Batteries", *J. Electrochem. Soc.* **155**, A432 (2008).
- 24. P.L. Moss, J.P. Zheng, G. Au, and E.J. Plichta, "An Electrical Circuit Model for Dynamic Performance of Li-ion Polymer Batteries", *J. Electrochem. Soc.* **155**, A986 (2008).
- 25. Y. Cheng, P. Xiong, C,S. Yun, G.F. Strouse, J.P. Zheng, R.S. Yang, Z.L. Wang, "Mechanism and optimization of pH sensing with SnO₂ nanobelt field effect transistors", Nano Letters, **8**, 4179 (2008).
- 26. Y. Wang and J.P. Zheng, "A Monolithic Hybrid Direct Methanol Fuel Cell", *Electrochem. and Solid-State Lett.* **10**, B26 (2007).
- 27. A.F. Pun, X. Wang, S.M. Durbin, and J.P. Zheng, "Reduction of Thermal Oxide Desorption Etching on Gallium Arsenide", *Thin Solid Films*, **515**, 4419 (2007).
- 28. Y. Xin, X. Wang, Z. Zhou, and J.P. Zheng, "Epitaxial Ca₂RuO_{4+δ} Thin Films Grown on (001) LaAlO₃ by Pulsed Laser Deposition", *Thin Solid Films*, **515**, 3946 (2007).
- 29. A.F. Pun and J.P. Zheng, "Utilizing gallium arsenide sacrificial films to inhibit surface roughening during the thermal desorption of gallium arsenide", *Electrochem. and Solid-State Lett.* **10**, H189 (2007).
- P.L. Moss, J.P. Zheng, G. Au, P.J. Cygan, and E.J. Plichta, "Transmission Line Model for Describing Power Performance of Electrochemical Capacitors", J. Electrochem. Soc. 154, A1020 (2007).
- P. Andrei, L.L. Fields, J.P. Zheng, Y. Cheng, and P. Xiong, "Modeling and Simulation of Single Nanobelt SnO₂ Gas Sensors with FET Structure", *Sensors and Actuators B: Chemical*, 128, 226 (2007).
- 32. A.F. Pun, X. Wang, S.M. Durbin, and J.P. Zheng, "A Method for Reducing Surface Roughening during the Thermal Desorption of Silicon", *Thin Solid Films*, **504**, 136 (2006).
- 33. X. Wang, A.F. Pun, Y. Xin, and J.P. Zheng, "Investigation of the growth dynamics of pulsed laser deposited RuO₂ films using in situ resistance measurement and atomic force microscopy", *Thin Solid Films*, **510**, 82 (2006).
- Y. Yang and J.P. Zheng, "A Novel Supercapacitor-Fuel Cell Hybrid Cell", *Rare Metals*, Vol. 25, 12 (2006),
- 35. J.P. Zheng and Z.N. Jiang, "Resistance Distribution in Electrochemical Capacitors with Spiral-Wound Structure", *J. Power Sources*, **156**, 748 (2006).
- 36. L.L. Fields, Y. Cheng, P. Xiong, and J.P. Zheng, "Room-Temperature Low-Power Hydrogen Sensor Based on a Single Tin Dioxide Nanobelt", *Appl. Phys. Lett.* **88**, 263102 (2006).

- Y. Cheng, P. Xiong, L.L. Fields, J.P. Zheng, R. Yang, and Z.L. Wang, "Intrinsic Characteristics of Semiconducting Oxide Nanobelt Field-Effect Transistors", *Appl. Phys. Lett.* 89, 093114 (2006).
- 38. P. Zheng, Y. Haik, C.J. Chen, Z. Jiang, and J.P. Zheng, "Properties of NdFeB Film Growth on Silicon Substrate by PLD Under External Magnetic Field", *Surface & Coatings Technology*, **194**, 372 (2005).
- 39. F. Pun, X. Wang, S.M. Durbin, and J.P. Zheng, "Tri-layer Wafer Pacification Structure for (100) Oriented Silicon", *Electrochem. and Solid-State Lett.* **8**, G258 (2005).
- 40. J.P. Zheng, "Theoretical Limitation of Energy Density for Electrochemical Capacitors with Intercalation Electrodes", *J. Electrochem. Soc.* **152**, A1864 (2005).
- 41. J.P. Zheng, P.L. Moss, R. Fu, Z. Ma, Y. Xin, G. Au and E.J. Plichta, "Capacity Degradation of Lithium Rechargeable Batteries", *J. Power Sources*, **146**, 753 (2005).
- 42. A.F. Pun, J.P. Zheng, V.J. Kennedy, A. Markwitz, and S.M. Durbin, "Analysis of Heteroepitaxial Germanium on Gallium Arsenide Grown by Pulsed Laser Deposition", *Current Applied Physics*, **4**, 229 (2004).
- 43. X. Wang and J.P. Zheng, "The Optimal Energy Density of Electrochemical Capacitor Using Asymmetrical Electrodes", *J. Electrochem. Soc.* **151**, A1683 (2004).
- 44. J.P. Zheng, "Resistance Distributions in Electrochemical Capacitors with Bipolar Structure", *J. Power Sources*, **137**, 158 (2004).
- 45. X. Wang, A.F. Pun, Y. Xin, and J.P. Zheng, "Low Cost Multi-target Holder for Pulsed Laser Deposition System Fit for Vacuum Chamber Ports of All Size", *Review of Scientific Instruments*, **75**, 3365 (2004).
- 46. A.F. Pun, X. Wang, J.B. Meeks, S.M. Durbin, and J.P. Zheng, "Initial Growth Dynamics of Epitaxial GaAs (100) Deposited with Pulsed Laser Deposition", J. Appl. Phys. 96, 6357 (2004).
- 47. T.Y. Chang, X. Wang, D.A. Evans, S.L. Roberson, and J.P. Zheng, "Characterization of Tantalum Oxide-Ruthenium Oxide Hybrid Capacitors", *IEEE Transactions on Industrial Electronics*, Vol. **51**, 1313 (2004).
- 48. Z. Ma, P. Moss, R.Fu, G. Au, E.J. Plichta, and J.P. Zheng, "Investigation of Li_xV₂O₅ Cathode Electrodes from Li-Rechargeable Batteries at Different Charge States Using NMR Spectroscopy", *J. New Materials for Electrchem. Sys.* **7**, 270 (2004).

- M.S. Ding, K. Xu, J.P. Zheng, and T.R. Jow, "γ-Butyrolactone-Acetonitrile Solution of Triethylmethylammonium Tertrafluroborate as an Electrolyte for Double-Layer Capacitors", *J. Power Sources*, **138**, 340 (2004).
- 50. X. Wang, Y. Xin, P.A. Stampe, R.J. Kennedy, and J.P. Zheng, "Epitaxial Thin Film Growth of Ca₂RuO_{4+d} by Pulsed Laser Deposition", *Appl. Phys. Lett.* **85**, 6146 (2004).
- 51. J.P. Zheng, "The Limitation of Energy Density of Battery/Double-Layer Capacitor Asymmetrical Cells", J. Electrochem. Soc. 150, A484 (2003).
- 52. P.L. Moss, R. Fu, G. Au, E.J. Plichta, Y. Xin, and J.P. Zheng, "Investigation of Cycle Life of Li-Li_xV₂O₅ Rechargeable Batteries", *J. Power Sources*, **124**, 261 (2003).
- 53. R. Fu, Z. Ma, and J.P. Zheng, "High Resolution ⁷Li Solid State NMR Study of Li_xV₂O₅ Cathode Electrodes for Li-Rechargeable Battery", *J. Phys. Chem. B.* **107**, 9730 (2003).
- 54. J.P. Zheng and P.T. Charbel, "A Three-Dimensional Model for Simulation of Light-Trapping Effects in Porous Silicon" *Journal of Microelectronic Engineering*, **66**, 224 (2003).
- 55. J.P. Zheng and C.K. Huang "Electrochemical Behavior of Amorphous and Crystalline Ruthenium Oxide Electrodes", J. New Materials for Electrochem. Sys. 5, 41 (2002).
- 56. R.Q. Fu, Z. Ma, and J.P. Zheng, "Proton NMR and Dynamic Studies of Hydrous Ruthenium Oxides", J. Phys. Chem. B. 106, 3592 (2002).
- 57. J.P. Zheng and Y. Xin, "Characterization of RuO₂.xH₂O with Various Water Contents", *J. Power Sources*, **110**, 86 (2002).
- 58. T.Y. Chang, X. Wang, D.A. Evans, S.L. Roberson, and J.P. Zheng, "Tantalum Oxide-Ruthenium Oxide Hybrid Capacitors", *J. Power Sources*, **110**, 138 (2002).
- 59. J.P. Zheng, S.P. Ding, and T.R. Jow, "Hybrid Power Sources for Pulse Current Applications", *IEEE Transactions on Aerospace and Electronic Systems.* **37**, 288 (2001).
- 60. Q.L. Fang, D.A. Evans, S.L. Roberson, and J.P. Zheng, "Ruthenium Oxide Film Electrodes Prepared at Low Temperatures for Electrochemical Capacitors", *J. Electrochem. Soc.* **148**, A833 (2001).
- 61. D.A. Evans, J.P. Zheng, and S.L. Roberson, "Improved Capacitor Using Amorphous RuO₂", *Battery Man*, **32**, May 2000.
- 62. J.P. Zheng, P.T. Charbel, and H.S. Kwok, "Micro-porous Silicon as a Light –Trapping Layer for Photodiodes", *Electrochem. and Solid-State Lett.* **3**, 338 (2000).
- 63. Z.R. Ma, J.P. Zheng, and R.Q. Fu, "Solid State NMR Investigation of Hydrous Ruthenium Oxide", *Chem. Phys. Lett.* **331**, 64 (2000).

- 64. J.P. Zheng, "Ruthenium Oxide-Carbon Composite Electrodes for Electrochemical Capacitors", *IEEE/ECS Electrochem. and Solid-State Lett.* **2**, 359 (1999).
- 65. T.R. Jow and J.P. Zheng, "Electrochemical Capacitors Using Hydrous Ruthenium Oxide and Hydrogen Inserted Hydrous Ruthenium Oxide", *J. Electrochem. Soc.* **145**, 49 (1998).
- 66. J.P. Zheng, J. Huang, and T.R. Jow, "The Limitation of Energy Density for Electrochemical Capacitors", *J. Electrochem. Soc.*, **144**, 2026 (1997).
- 67. J.P. Zheng and T.R. Jow, "The Effect of Salt Concentration in Electrolytes on The Maximum Energy Storage For Double Layer Capacitors", *J. Electrochem. Soc.*, **144**, 2417 (1997).
- 68. J.P. Zheng, P.J. Cygan and T.R. Jow, "Investigation of Dielectric Properties for Polymer Laminates with Thin Layer Coatings of Polyvinylidene Fluoride", *IEEE Trans. Dielectrical and Electrical Insulation*, **3**, 144 (1996).
- 69. J.P. Zheng, T.R. Jow, Q.X. Jia, and X.D. Wu, "Proton Insertion into Ruthenium Oxide Film Prepared by Pulsed Laser Deposition", *J. Electrochem. Soc.* **143**, 1068 (1996).
- 70. J.P. Zheng and T.R. Jow, "High Energy and High Power Density Electrochemical Capacitors Using Amorphous Metal Oxide Electrodes", *J. Power Sources*, **62**, 155 (1996).
- 71. J.P. Zheng and T.R. Jow, "A New Charge Storage Mechanism for Electrochemical Capacitors", J. Electrochem. Soc. 142, L6 (1995).
- 72. Q.X. Jia, J.P. Zheng, H.S. Kwok and W.A. Anderson, "Indium Tin Oxide on InP by Pulsed Laser Deposition", *Thin Solid Films*, **258**, 260 (1995).
- 73. J.P. Zheng, P.J. Cygan and T.R. Jow, "Hydrous Ruthenium Oxide as Electrode Material for Electrochemical Capacitors", *J. Electrochem. Soc.* **142**, 2695 (1995).
- Q.X. Jia, X.D. Wu, S.R. Foltyn, A.T. Findikoglu, R. Tiwari, J.P. Zheng, and T.R. Jow, "Heteroepitaxial Growth of Highly Conductive Metal-Oxide RuO₂ Thin Films by Pulsed Laser Deposition", *Appl. Phys. Lett.* 67, 1677 (1995).
- 75. W.P. Shen, C. Lehane, J.P. Zheng and H.S. Kwok, "Interface Effects on YBa₂Cu₃O_{7-s} Ultrathin Film Growth Monitored by in situ Resistance Measurement", *Appl. Phys. Lett.* 64, 3175 (1994).
- 76. J.P. Zheng and H.S. Kwok, "Exciton and Biexciton Recombination in Semiconductor Nanocrystals", *Appl. Phys. Lett.* **65**, 1151 (1994).
- 77. J.P. Zheng and H.S. Kwok, "Low Resistivity Indium-Tin-Oxide thin Films by Pulsed Laser Deposition", *Appl. Phys. Lett.* **63**, 1 (1993).

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Invited Book Chapters

- 1. P. Andrei, L.L. Fields, A.J. Soares, R.J. Perry, Y. Cheng, P. Xiong, J.P. Zheng, "Physics-based modeling of SnO2 gas sensors with field-effect transistor structure," in *Chemical Sensors: Simulation and Modeling*, Momentum Press, New York. Editor: Ghenadii Korotcenkov, 2012.
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Refereed Proceedings

- 1. J.P. Zheng, G.Q. Zhang, M.A. Hendrickson, and E.J. Plichta, "Nano-metal oxide/Carbon Nanotube/Carbon Nanofiber Composite Catalytic Air Electrodes for Li-air Batteries", in Proceedings of the 45th Power Sources Conference, Las Vegas, NV, June 11-14, 2012.
- 2. W.J. Cao and J.P. Zheng, "High Energy Density Li-ion Capacitors using Carbon-Carbon Electrodes", in Proceedings of the 45th Power Sources Conference, Las Vegas, NV, June 11-14, 2012.
- 3. W.J. Cao and J.P. Zheng, "Development and Characterization of High Energy Density Lithium Capacitor Pouch Cells", in *Proceedings of The 22nd International Seminar on Double Layer Capacitors and Hybrid Energy Storage Devices*, Deerfield Beach, Florida, December 3-5, 2012.
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- T.R. Jow and J.P. Zheng, "Development of Amorphous Ruthenium Oxide for Electrochemical Capacitor Applications" *Proceedings of The Symposium on Electrochemical Capacitors, eds. F.M. Delnick and M. Tomkiewicz*, Vol. 95-29, 50 (1995).

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- 99. H.S. Kwok, J.P. Zheng, Z.Q. Huang, Q.Y. Ying, S. Witanachchi, and D.T. Shaw, "Plasma Assisted Laser Deposition of Superconducting Thin Films-- A Basic Study", edited by R.D. McConnell and S.A. Wolf, *Science and Technology of Superconducting Thin Films*, Plenum Press, New York, pp11-20 (1989).
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- 102. L.W. Song, Y.H. Kao, Q.Y. Ying, J.P. Zheng, H.S. Kwok, Y.Z. Zhu, and D.T. Shaw, "Critical Current Density of Narrow Superconducting Thin Films Fabricated by Laser Ablation Techniques", ed. by J. Narayan, P. Chu, L. Schneemeyor, and D. Christen, *High Temperature*

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- 103. J.P. Zheng, Q.Y. Ying, H.S. Kim, D.T. Shaw, and H.S. Kwok, "Laser Patterning and Electrical Properties of Submicrometer Lines of Y-Ba-Cu-O Films", *Mat. Res. Soc. Symp. Proc.*, Vol. 158, p485 (1989).
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- 106. H.S. Kwok and J.P. Zheng, "Ultrafast Recombination in Semiconductor-Doped Glass", *International Conference on Quantum Electronics, Technical Digest Series*, 1988.
- 107. H.S. Kwok and J.P. Zheng, "Ultrafast Recombination and Photoluminescence Spectra of Semiconductor Microcrystallites", ed. by R.R. Alfano, Ultrafast Laser Probe Phenomena in Bulk and Microstructure Semiconductors II, SPIE Proceedings, Vol. 942, pp173-179 (1988).
- 108. H.S. Kwok, P. Mattocks, D.T. Shaw, L. Shi, X.W. Wang, S. Witanachchi, Q.Y. Ying, J.P. Zheng, and P. Bush, "Laser Evaporation Deposition of Superconducting and Semiconducting Thin Films", ed. by J.A. Ionson and R. Nicols, *Sensing, Discrimination and Signal Processing and Superconducting Materials and Instrumentation, SPIE Proceedings*, Vol. 879, pp153-158 (1988).
- 109. H.S. Kwok, P. Mattocks, D.T. Shaw, L. Shi, X.W. Wang, S. Witanachchi, Q.Y. Ying, J.P. Zheng, and P. Bush, "Laser Evaporation Deposition of YBa₂Cu₃O_{7-x} Thin Films", ed. by M.B. Brodsky, R.C. Dynes, K. Kitazawa, and H.C. Tuller, *High Temperature Superconductors, MRS Proceedings*, Vol. 99, pp735-740 (1988).
- 110. H.S. Kwok, P. Mattocks, D.T. Shaw, L. Shi, X.W. Wang, S. Witanachchi, Q.Y. Ying, and J.P. Zheng, "Growth of Highly Oriented CdS_xSe_{1-x} Thin Films by UV Laser Evaporation Deposition", ed. by D.J. Ehrlich, G.S. Higashi, and M.M. Oprysko, *Laser and Particle-Beam Processing of Semiconductors, MRS Proceedings*, Vol. 101, pp337-342 (1988).
- 111. S. Witanachchi, J.P. Zheng, Q.Y. Ying, L. Shi, X. Wang, D.T. Shaw, and H.S. Kwok, "Laser Deposition of Superconducting and Semiconducting Films", edited by H.S. Kwok and D.T. Shaw, *Superconductivity and Its Applications*, Elsever, New York, pp194-200 (1988).
- 112. K.A. Menard, D.G.H. Long, H.S. Kwok, and J.P. Zheng, "Pulse Shortening in a Grazing Incidence Dye Laser", *Conference on Laser and Electro-Optics, Technical Digest Series*, Vol. 14, p298 (1987).

Presentations

Invited Keynote and Plenary Presentations at Conferences

- Jim P. Zheng, Carbon Nanotube composite electrodes for energy storage devices and fuel cells, IUPAC 8th International Conference on Novel Materials and Synthesis (NMS-VIII) & 22nd International Symposium on Fine Chemistry and Functional Polymers (FCFP-XXII), Xi'An, China, October 16, 2012, (Keynote Speaker).
- 2. Jim P. Zheng, Transformation of University Research to Commercialization, Florida Energy Summit Orlando, Florida, August 17, 2012. (Panel Speaker)

Invited Presentations at Conferences

- 3. High Energy Density Lithium Capacitors using Carbon-Carbon Electrodes, The TMS Annual Meeting & Exhibition, San Antonio, Texas, March 3-7, 2013.
- 4. A 3-D Catalytic Electrode Structure for Ultra-low Platinum Loading and High Performance PEMFCs", the 2012 Villa Conference on Energy and Environmental Research, Orlando, Florida, April 17, 2012.
- 5. A 3-D Catalytic Electrode Structure for High Performance and Low Cost PEMFCs, the 243rd American Chemical Society National Meeting, San Diego, California, March 27, 2012.
- 6. Ultra-Low Platinum Loading High-Performance PEMFCs, The 2011 Villa Conference on Energy and Environmental Research, Las Vegas, Nevada, April 21-25, 2011.
- 7. High Performance PEMFCs using Ultra-Low Platinum Loading Membrane Electrode Assembly Based on Gradient Carbon Nanotube/Nanofiber Supported Electrodes, The 8th International Symposium on New Materials and Nano-Materials for Electrochemical Systems, Shanghai, China, July 12, 2010.
- 8. Highly Efficient and Stable CNT Paper-Based Electrodes for PEMFCs, 2009 China-North America Workshop on Fuel Cell Science and Technology, Shanghai, China, August 14, 2009.
- 9. Nanocomposites for Energy Storage and Conversion, Nanocomposites 2008, San Diego, CA, September 16, 2008.
- 10. Equivalent Circuits for Double-Layer Capacitors under DC, AC, and Transient Operations, and Power Projection, 2007 International Conference on Advanced Capacitors, Kyoto, Japan, May 28, 2007.

- 11. Proton Transfer and Storage Behavior in Nanoparticles of Hydrous Ruthenium Oxide, 211th Electrochemical Society Annual Meeting, Chicago, Illinois, May 8, 2007.
- 12. Investigation of Capacity Degradation Mechanisms of Li-Polymer Batteries, Lithium Mobile Power 2006-The 2nd Conference on Advances in Lithium Battery Technologies for Mobile Applications: Lithium Ion/Lithium Polymer, Miami Beach, Florida, December 4, 2006.
- 13. High Performance Hybrid Devices and Supercapacitors Using Nanostructural Materials, Lithium Mobile Power 2004 – Advanced in Lithium Battery Technologies for Mobile Applications, Miami Beach, Florida, December 6-7, 2004.
- 14. RuO₂.xH₂O Nanoparticles and Composite Electrodes in High Energy and High Power Ultracapacitors, The 10th Annual International Conference on Composite/Nano Engineering, New Orleans, Louisiana, July 20-25, 2003.
- 15. Electrolytic and Electrochemical Hybrid Capacitors, 2003 International Conference on Advanced Capacitors, Kyoto, Japan, May 29-31, 2003.
- Nanoparticles of Hydrous Ruthenium Oxide for Ultra-Capacitor Applications, NanoEnergy 2002, The Annual Knowledge Foundation's International Conference, Miami Beach, Florida, December 11-13, 2002.
- 17. Testing Capability of LED Traffic Signals and Signs at TERL, Transportation Research Board, 2nd Workshop on LED Technology in Traffic Systems, Ft. Lauderdale, Florida, June 6, 2000.
- 18. Analysis of Electrochemical Capacitors Using AC Impedance Spectra, The Seventh International Seminar on Double Layer Capacitors and Similar Energy Storage Devices", Deerfield Beach, Florida, December 8-10, 1997.
- 19. Indium Tin Oxide and Ruthenium Oxide Films Prepared by Pulsed Laser Deposition and Their Applications, The Fourth International Symposium on Sputtering & Plasma Processes, Kanazawa, Japan, June 4-6, 1997.
- 20. High Power and High Energy Density Capacitors with Composite Hydrous Ruthenium Oxide Electrodes, The Fifth International Seminar on Double Layer Capacitors and Similar Energy Storage Devices", Boca Raton, Florida, December 4-6, 1995.
- 21. Recent Development in Electrochemical Capacitors, The 46th Annual Meeting of the International Society of Electrochemistry, Xiamen, China, August 27-September 1, 1995.

Invited Lectures/Seminars

1. Li-air batteries and Li-air flow batteries, Department of Chemical and Biomedical Engineering, FAMU-FSU College of Engineering, Tallahassee, FL, February 15, 2013.

- 2. New Structures for Energy Storage Devices and Fuel Cells, Integrative NanoScience Institute, Florida State University, Tallahassee, FL, January 28, 2013.
- 3. Introduce Some Frontier Researches in Energy Storage and Conversion, Wuhan University of Technology, Wuhan, China, July 15, 2011.
- 4. A 3-D Catalytic Electrode Structure for High Performance and Low Cost of PEMFCs, School of Automotive Studies, Tongji University, Shanghai, China, June 30, 2011.
- 5. Li-air Batteries: A Future Energy Storage Sources, The Ningbo Institute of Material Technology and Engineering, Chinese Academy of Science, Ningbo, China, July 9, 2010.
- 6. Electrochemical Capacitors and Their Applications, Shanghai Institute of Technical Physics, Chinese Academy of Sciences, Shanghai, China, August 28, 2009.
- 7. Recent Advances in Activity and Durability Enhancement using Pt-Buckypaper Catalytic Cathodes in PEMFCs, University of Science and Technology of China, Hefei, China, August 17, 2009.
- 8. Technical Forecast of Supercapacitors, Shanghai University, China, April 8, 2009.
- 9. High Performance Fuel Cells using Buckypaper, Louisiana State University, Baton Rouge, LA, February 13, 2009.
- 10. Energy storage, energy conversion, and sensor devices research at Florida State University, Shanghai Institute of Technical Physics, Chinese Academy of Sciences, Shanghai, China, July 4, 2008.
- 11. Development of Energy Storage and Sensor Devices, Department of Chemistry at Tsinghua University, Beijing, China, June 24, 2008.
- 12. Monolithic Fuel Cell-Supercapacitor Hybrid Power Sources, Department of Chemical Engineering at National Taiwan University, Taiwan, June 13, 2008.
- 13. Porous Silicon as a Light-Trapping Layer for Photodiodes and Solar Cells, Department of Physics at Tamkang University, Taiwan, June 12, 2008.
- 14. Pulsed Laser Deposition, Department of Mechanical Engineering, FAMU-FSU College of Engineering, Tallahassee, Florida, November 21, 2006.
- 15. A Novel Monolithic Hybrid Fuel Cell, Department of Chemical and Biomedical Engineering, FAMU-FSU College of Engineering, Tallahassee, Florida, November 3, 2006.
- 16. Room-Temperature Low-Power Chemical Sensor Based on a Single Semiconductor Nanobelt, Sensors and Electron Devices Directorate, Army Research Laboratory, Adelphi, MD, June 1, 2006.

- 17. Some Important Aspects on Energy and Power Densities for Supercapacitors, Corning Incorporation, Corning, NY, April 24, 2006.
- Nanoparticles of Hydrous Ruthenium Oxide for Supercapacitor Applications, Department of Ceramic and Materials Engineering, Rutgers, The State University of New Jersey, Piscataway, NJ, October 25, 2005.
- 19. A Novel In-Situ Method for Inhibiting Surface Roughening during the Thermal Oxide Desorption Etching of Silicon and Gallium Arsenide, Tamkang University, Taiwan, July 8, 2005.
- 20. Pulsed Laser Deposition, Department of Physics, Tamkang University, Taiwan, July 8, 2005.
- 21. Capacity Degradation of Lithium Rechargeable Batteries and Li-Ion and Li-Ion Polymer Batteries, Department of Ceramic and Materials Engineering, Rutgers, The State University of New Jersey, Piscataway, NJ, June 13, 2005.
- 22. Photon Sensors using Nanostructure Materials, Department of Applied Physics, Shandong University at Weihai, Weihai, China, July 7, 2004.
- 23. Ultracapacitors and Their Applications, Department of Applied Physics, Shandong University at Weihai, Weihai, China, July 7, 2004.
- 24. In-Situ Study of Pulsed Laser Deposition, Department of Physics/Center for Materials Research and Technology, Florida State University, Tallahassee, FL, January 13, 2003.
- 25. Supercapacitors, Department of Chemistry, Fudan University, Shanghai, China. June 26, 2002.
- 26. Porous Silicon Physical Mechanisms of Photoluminescence, Department of Physics, Fudan University, Shanghai, China, June 25, 2002.
- 27. Ruthenium Oxide Film Formation at Low Temperatures for Ultra-capacitor Applications, The National High Magnetic Field Laboratory, Tallahassee, FL, October 15, 2001.
- 28. Supercapacitors and Their Applications, IEEE Regional Chapter, Tallahassee, Florida, September 26, 2000.
- 29. Electrochemical Capacitor, Department of Chemical Engineering, FAMU-FSU College of Engineering, Tallahassee, Florida, September 11, 1998.
- 30. Basic Semiconductor Device Fabrication, Department of Mechanical Engineering, FAMU-FSU College of Engineering, Tallahassee, Florida, April 14, 1998.

- 31. Physical Mechanism of Laser Deposition of Thin Solid Films, Department of Physics, Fudan University, Shanghai, China, 7 January 1994.
- 32. Optical Response of High T_c Superconducting Thin Films, U.S. Army Laboratory Command (LABCOM), Electronics Technology & Devices Lab, Fort Monmouth, New Jersey, 16 July 1992.
- 33. Laser Processing and Optical Response of YBCO Thin Films, Department of Physics, University of Arkansas, Fayetteville, AR, 22 November 1991.
- 34. Microphysics of Microcrystallites, Department of Physics, State University of New York at Buffalo, Amherst, NY, 27 October 1987.

Patented Inventions

- 1. J. P. Zheng, "High Energy Density Electrochemical Capacitors", PCT patent application No. PCTIUS20111038901, filed June 2, 2011, U.S. Provisional Patent Application Serial No. 611350,776, filed June 2, 2012.
- 2. J.P. Zheng, "Alkali Metal-air Flow Batteries", PCT International Patent Publication No. WO 2012/061817 A1, filed May 10, 2012.
- 3. J.P. Zheng, Z.Y. Liang, B. Wang, C. Zhang, and W. Zhu, "Catalytic electrode with gradient porosity and catalyst density for fuel cells", US Patent Pub. No. US2011/0008705.
- 4. J.P. Zheng, Z.Y. Liang, B. Wang, C. Zhang, and W. Zhu, "Carbon nanotube and nanofiber film materials based membrane electrode assemblies for fuel cells", US Patent Pub. No. US2010/0143822.
- 5. Y. Wang and J.P. Zheng, "System and Methods for Implementing a Non-Linear Electrical Circuit Dynamic Fuel Cell Model", US Patent Number 7,844,434, November 30, 2010.
- 6. A.F. Pun and J.P. Zheng, "Thermal Desorption of Oxide from Surface", US Patent Number 20060276038, December 7, 2006.
- 7. T.R. Jow and J.P. Zheng, "Proton Insertion Ruthenium Oxide Electrode Material for Electrochemical Capacitors", US Patent Number 6,383,363 B2, May 7, 2002.
- 8. J.P. Zheng and T.R. Jow, "Electrode Materials from Hydrous Metal and/or Hydrous Mixed Metal Oxides", US Patent Number 6,097,588, August 1, 2000.
- 9. J.P. Zheng and T.R. Jow, "Composite Electrode Materials for High Energy and High Power Density Storage Devices", US Patent Number 5,961,887, October 5, 1999.

- 10. T.R. Jow and J.P. Zheng, "Proton Inserted Ruthenium Oxide Electrode Material for Electrochemical Capacitors", US Patent Number 5,875,092, February 23, 1999.
- 11. J.P. Zheng and T.R. Jow, "Electrode materials for electrochemical capacitors from hydrous metal oxides and hydrous mixed metal oxides and method of preparation of same", US Patent Number 5,851,506, December 22, 1998.
- 12. J.P. Zheng and T.R. Jow, "Method of making composite electrode material for High Energy and High Power Density Storage Devices", US Patent Number 5,797,971, August 25, 1998.
- 13. J.P. Zheng, P.J. Cygan, and T.R. Jow, "Capacitor having an enhanced dielectric breakdown strength", US Patent Number 5,636,100, June 3, 1997.
- 14. J.P. Zheng and T.R. Jow, "Composite Electrode Materials for High Energy and High Power Density Storage Devices", US Patent Number 5,621,609, April 15, 1997.
- 15. T.R. Jow and J.P. Zheng, "Amorphous Thin Film Electrode Materials from Hydrous Metal Oxides" US Patent Number 5,600,535, Feb. 4, 1997.
- J. Smithyman, Z.Y. Liang, J.P. Zheng, B. Wang, C. Zhang, "Binder-free Nanocomposite Material and Method of Manufacture", U.S. Provisional Application No. 61/259,599, filed November 9, 2009.
- 17. J.P. Zheng, W. Zhu, C. Zeng, Z.Y. Liang, B. Wang, and C. Zhang, "A Method of Making Catalytic Electrodes for Fuel Cells", U.S. Provisional Patent Application No. 61/467,264, filed March 24, 2011.
- 18. J.P. Zheng and G.Q. Zhang, "Bifunction Hollandite Ag₂Mn₈O₁₆ Catalyst for Lithium-air Batteries", U.S. Provisional Patent Application No. 61/589,524, filed January 23, 2012.

Contracts and Grants

Contracts and Grants Funded

- 1. J.P. Zheng (single PI), Project Dates: 02/06/2013-02/05/2014, Title: Development of Li-ion Conductive Flexible Membrane for Li-air Batteries, Sponsor: US Army-CERDEC, Awarded Amount: \$250,000.
- 2. J.P. Zheng (single PI), Project Dates: 01/01/2013-01/01/2014, Title: High energy density supercapacitors, Sponsor: Florida State University GAP Program, Total award: \$50,000.
- J.P. Zheng (PI), M. Weatherspoon, and E. Kalu, Project Dates: 08/01/2008-07/31/2018, Title: Development of Advanced Energy Storage Devices, Sponsor: National Science Foundation (NSF), Awarded Amount: \$2,850,000, as a subcontract to the proposal of "Future Renewable Electric Energy Delivery and Management (FREEDM) Systems", led by Alex Huang at

North Carolina State University, co-PIs by M.L. Crow, S. Dale, G.T. Heydt, and J.P. Zheng, Total Awarded Amount: \$40,000,000.

- 4. H. Li and J.P. Zheng (co-PI), Awarded Period: 7/1/10-6/30/13, Title: Improving Power Quality and Safety Operation of Multiple Grid-Connected Residential Photovoltaic (PV) Systems with Distributed Storage, Control and Power Conditioning System, Sponsor: National Science Foundation (NSF), Awarded Amount: \$349,547.
- N. Dai, F.Y. Huang, S.L. Wang, X.N. Li, J.P. Zheng (co-PI), and D. Wei, Project Dates: 04/01/2009-04/01/2014, Title: An International Collaboration Group on Solar Cell Technologies Development, Sponsor: Chinese Academy of Sciences, Awarded Amount: \$877,193.
- 6. J.P. Zheng (PI) and R. Liang, Project Dates: 5/17/2011-5/15/2012, Title: Desktop machines for battery and capacitor research and development, Sponsor: Florida State University, Awarded Amount: \$62,480.
- 7. J.P. Zheng (single PI), Award Period: 08/29/2011-8/28/2012, Title: Characterization of Catalytic Electrodes and PEMFCs, Sponsor: Bing Energy Inc. Awarded Amount: \$39,155.
- 8. J.P. Zheng (PI), W. Zhu, R. Liang, and H. Chen, Project Dates: 09/01/2010-12/31/2012, Title: Development of a Low-Cost and High-Efficiency 500 W Portable PEMFC System, Sponsor: Department of Energy/Florida Hydrogen Initiative, Awarded Amount: \$383,609.
- J.P. Zheng (single PI), Project Dates: 10/01/2010-12/31/2012, Title: 3-D Nanofilm Asymmetric Ultracapacitor, a phase II STTR Project, Sponsor: Department of Energy, Awarded Amount: \$225,000.
- 10. J.P. Zheng (PI), P. Andrei, and T. Liu, Awarded Dates: 8/15/10-12/31/12, Title: Research and Development on Some Critical Issues for High Energy and Power Densities, and Good Lifespan of Li-air Batteries, Sponsor: US Army CERDEC, Awarded Amount: \$463,750.
- 11. J.P. Zheng (single PI), Award Dates: 5/19/10-5/18/11, Title: Develop Li/Air Rechargeable Batteries, Sponsor: Savannah River National Laboratory, Awarded Amount: \$30,000.
- 12. J.P. Zheng (single PI), Award Period: 5/15/10-12/31/10, Title: Study Stability and Reliability of PEMFCs made with Buckypaper Supported Catalytic Electrodes, Sponsor: Bing Energy Inc. Awarded Amount: \$16,324.
- J.P. Zheng (single PI), Project Dates: 1/6/2010-12/31/2011, Title: In-Pile Temperature Monitor and Control for ATR, Sponsor: Idaho National Laboratory, Awarded Amount: \$50,000.
- R.Q. Fu and J.P. Zheng (co-PI), Project Dates: 1/1/2010-12/31/2011, Title: In Situ Electrochemical-NMR Spectroscopy of Lithium Rechargeable Batteries, Sponsor: The National High Magnetic Field Laboratory/National Science Foundation, Awarded Amount: \$197,755.

- J.P. Zheng (single PI), Project Dates: 08/01/09-04/15/10, Title: 3-D Nanofilm Asymmetric Ultracapacitor, a phase I STTR Project, Sponsor: Department of Energy, Awarded Amount: \$30,000.
- 16. J.P. Zheng (PI), R. Liang, C. Zheng, and B. Wang, Project Dates: 01/01/2009-01/01/2012, Title: Planning award for High Performance and Low Cost Fuel Cells for Future Vehicles, Sponsor: Institute for Energy Systems, Economics and Sustainability (IESES), Florida State University, Awarded Amount: \$15,000.
- C.S. Edrington, D. Cartes, F. Alvi, H. Li, J.P. Zheng (co-PI), Juan Ordonez, M. Steurer, Project Dates: 01/01/2009-01/01/2012, Title: Microgrids for a Sustainable Energy Future, Sponsor: Institute for Energy Systems, Economics and Sustainability (IESES), Florida State University, Awarded Amount: \$1,000,000.
- J.P. Zheng (single PI), Project Dates: 12/01/2008-12/01/2010, Title: Investigation of Fluoride Based Electrode for High Energy Density Li-Ion Rechargeable Batteries, Sponsor: US Army-CERDEC, Awarded Amount: \$200,000.
- J.P. Zheng (single PI), Project Dates: 03/01/2008-03/01/2009, Title: Development of Fuel Cell/Supercapacitor Hybrid Energy Devices, Sponsor: Florida State University GAP Program, Awarded Amount: \$47,800.
- 20. J.P. Zheng (PI), R. Liang, C. Zhang, and B. Wang, Project Dates: 10/01/2007-09/30/2010, Title: Optimization of specific capacity of Li-Air Batteries Using Carbon Nanotube Sheets as Air Electrodes, Sponsor: US Army-CERDEC, Awarded Amount: \$443,741.
- 21. J.P. Zheng (single PI), Project Dates: 10/01/2007-09/30/2008, Title: Study of high-speed photoconductive semiconductor switches and other photonic devices for military applications, Sponsor: US Army Research Laboratory, Awarded Amount: \$25,000.
- 22. J.P. Zheng (single PI), Project Dates: 10/01/2007-09/30/2008, Title: Investigation of Co-intercalation in Li-ion based cell for improvement of energy and power densities, Sponsor: US Army-CERDEC, Awarded Amount: \$50,000.
- 23. B. Wang, R.G. Alamo, J.S. Brooks, N. Dalal, A. El-Azab, H. Kroto, B.W. Kwan, R. Liang, A.G. Marshall, O.I. Okoli, Y.B. Park, J.J. Pignatiello, C. Zhang, and J.P. Zheng (Co-PI), Project Dates: 11/01/2006-11/01/2009, Title: Center for Excellence in Advanced Materials, Sponsor: Florida State University System, Awarded Amount: \$4,000,000.
- J.P. Zheng (single PI), Project Dates: 10/01/2006-09/30/2008, Title: Fuel Cell/Supercapacitor Monolithic Hybrid Devices for High Power Density and High Fuel Efficiency, Sponsor: US Army-CERDEC, Awarded Amount: \$199,332.

- 25. J.P. Zheng (single PI), Project Dates: 05/01/2006-05/01/2007, Title: Investigation of Dielectric Insulators for Cryogenic Applications, Sponsor: Center for Advanced Power Systems/Department of Energy, Awarded Amount: \$103,333.
- 26. J.P. Zheng (single PI), Project Dates: 05/01/2005 to 04/30/2007, Title: Investigation and Improvement of Low Temperature Performance of Li-Ion Batteries, Sponsor: US Army Communications-Electronics Command, Awarded Amount: \$120,573.
- 27. P. Andrei and J.P. Zheng (Co-PI), Project Dates: 01/01/2005-03/01/2007, Title: Design and Modeling of Nanoscale Semiconductor Devices, Sponsor: U. S. Army High Performance Computing Research Center, Awarded Amount: \$228,586.
- J.P. Zheng (single PI), Project Dates: 05/01//2004-05/01/2005, Title: Investigation of Capacity Degradation of Li-Polymer Batteries Using AC Impedance Spectrometer and Micro-structure Analysis, Sponsor: US Army Communications-Electronics Command, Awarded Amount: \$36,000.
- 29. L.J. Tung, J.P. Zheng (Co-PI), and J.R. Simpson, Project Dates: 12/01/2003-03/01/2006, Title: Standards Research, Testing & Training Development for the Traffic Engineering Research Lab, Sponsor: The Florida Department of Transportation, Awarded Amount: \$500,293.
- 30. Y. Xin and J.P. Zheng (Co-PI), Project Dates: 03/01/2003 to 06/01/2005, Title: Monolithic Integration of Strongly Correlated Transition Metal Oxides with Complementary Functionalities through Thin Film Nano-Engineering, Sponsor: Cornerstone Project, Florida State University, Awarded Amount: \$90,000.
- 31. J.P. Zheng (PI) and R. Fu, Project Dates: 03/01/2003-02/28/2004, Title: In-situ NMR Imaging of Lithium-Polymer Batteries During Charge and Discharge Cycle, Sponsor: US Army Communications-Electronics Command, Awarded Amount: \$30,840.
- 32. C.J. Chen, Y.S. Haik, J.P. Zheng (Co-PI), W.C. Chin, and H. Garmestani, Project Dates: 03/01/2002-12/31/2002, Title: Center for Applications of Nanotechnology in Micro Total Analysis Systems, Sponsor: Cornerstone Project, Florida State University, Awarded Amount: \$125,000.
- 33. J.P. Zheng (single PI), Project Dates: 05/01/2002-04/30/2005, Title: Integrated Catalyst and Membrane for Fuel Cell Applications, Sponsor: Cornerstone Project, Florida State University, Awarded Amount: \$98,514.
- 34. J.P. Zheng (single PI), Project Dates: 01/01/2002-05/01/2003, Title: Investigation of Dielectric Properties of Cryo-Insulations for Superconducting Power Cables, Transformers, and Machines in Electric Ships, Sponsor: Center for Advanced Power Systems, FSU/Office for Naval Research, Awarded Amount: \$44,867.

- 35. L.J. Tung, B.W. Kwan, J.P. Zheng (Co-PI), J.R. Simpson, and W.V. Ping, Project Dates: 01/01/2002-07/01/2004, Title: Advanced Traffic Engineering in Support of Florida's Initiatives, Sponsor: The Florida Department of Transportation, Awarded Amount: \$482,633.
- 36. C.J. Chen, Y.S. Haik, and J.P. Zheng (Co-PI), Project Dates: 05/01/2001-04/30/2003, Title: Magnetic Micro Mechanical Systems, Sponsor: Cornerstone Project, Florida State University, Awarded Amount: \$100,000.
- 37. J.P. Zheng (PI) and R. Fu, Project Dates: 10/01/2000 to 09/30/2001, Title: Investigation of Capacity Degradation in Lithium-ion Batteries at Low Temperatures Using NMR Spectroscopy, Sponsor: US Army Communications-Electronics Command, Awarded Amount: \$32,726.
- 38. Y.S. Haik, C.J. Chen, and J.P. Zheng (Co-PI), Project Dates: 05/01/2000-04/30/2001, Title: Development of Magnetically Driven Micro Pump, Sponsor: Sandia National Laboratories, Awarded Amount: \$25,000.
- 39. J.P. Zheng (single PI), Project Dates: 04/01/2000-03/31/2004, Title: Electrochemical Capacitors and Hybrid Power Sources for Space Applications, Sponsor: National Aeronautics and Space Administration (NASA), Awarded Amount: \$296,121.
- 40. L.J. Tung, B.W. Kwan, and J.P. Zheng (Co-PI), Project Dates: 01/01/2000-12/31/2001, Title: Advanced Traffic Engineering and Its Technologies, Sponsor: The Florida Department of Transportation, Awarded Amount: \$377,106.
- 41. J.P. Zheng (single PI), Project Dates: 10/01/1999-09/30/2001, Title: Capacitors with Improved RuO₂ Electrodes and Electrolytes, a phase II STTR Project, Sponsor: Air Force Research Laboratory, Awarded Amount: \$92,781.
- 42. R. Fu and J.P. Zheng (Co-PI), Project Dates: 08/01/1999-07/31/2001, Title: Solid State NMR Study of the Hydrous Ruthenium Oxide Electrode Materials, Sponsor: Cornerstone Project, Florida State University, Awarded Amount: \$91,290.
- C.J. Chen, Y.S. Haik, J.P. Zheng (Co-PI), and V.M. Pai, Project Dates: 06/01/1999-05/31/2001, Title: Wireless Magnetic Actuators, Sponsor: Sandia National Laboratories, Awarded Amount: \$50,000.
- 44. J.P. Zheng (PI) and S.M. Burbin, Project Dates: 07/01/1999-06/30/2004, Title: Sub-Microsecond RHEED Investigation of Pulsed Laser Deposition Film Growth Dynamics, Sponsor: National Science Foundation (NSF), Awarded Amount: \$225,212.
- 45. J.P. Zheng (single PI), Project Dates: 05/01/1999-09/30/1999, Title: Ultracapacitor Applications, Sponsor: Lockheed Martin Corp., Awarded Amount: \$3,000.

- 46. J.P. Zheng (single PI), Project Dates: 06/01/1999-01/31/2000, Title: Optical Spectra and Nonlinearity in Semiconductor Doped Glasses, Sponsor: CRC COFRS, Florida State University, Awarded Amount: \$7,688.
- 47. J.P. Zheng (single PI), Project Dates: 09/01/1998-06/30/1999, Title: Improved Capacitor Using Amorphous RuO₂, a phase I STTR Project, Sponsor: Air Force Research Laboratory, Awarded Amount: \$30,000.
- 48. J.P. Zheng (PI) and T.R. Jow, Project Dates: 10/01/1996-09/30/1998, Title: Ni-Metal Hydride Batteries---Japanese and Chinese Ni-MH Batteries, Sponsor: Army Materials Command, Awarded Amount: \$40,000.
- 49. T.R. Jow and J.P. Zheng (Co-PI), Project Dates: 10/01/1996-02/28/1997, Title: Prototype Devices of High Power Electrochemical Capacitors with RuO₂.xH₂O Electrodes, Sponsor: Kim Technologies International, Inc., Awarded Amount: \$10,000.
- 50. T.R. Jow and J.P. Zheng (Co-PI), Project Dates: 10/01/1996-07/01/1997, Title: Development of Electrolytes for Hybrid Electrochemical-Electrolytic Capacitors, Sponsor: Wilson Greatbatch, Ltd., Awarded Amount: \$22,000.
- 51. T.R. Jow and J.P. Zheng (Co-PI), Project Dates: 09/01/1996-02/28/1998, Title: Non-aqueous Electrolyte Development for High Power/High Energy Electrochemical Capacitors, Sponsor: Department of Energy, Awarded Amount: \$317,000.
- 52. J.P. Zheng (PI) and T.R. Jow, Project Dates: 09/01/1996-02/28/1998, Title: High Energy Density Electrochemical Capacitors for Electric Vehicles Part II, Sponsor: Advanced Research Projects Agency, Awarded Amount: \$380,000.
- 53. J.P. Zheng (PI) and T.R. Jow, Project Dates: 10/01/1995-09/30/1997, Title: Osaka Carbon---Carbon Materials for Superconductors and Batteries Applications, Sponsor: Army Materials Command, Awarded Amount: \$45,000.
- 54. T.R. Jow and J.P. Zheng (Co-PI), Project Dates: 10/01/1995-09/30/1996, Title: Novel Carbon Materials for Electrochemical Capacitors and Li-ion Batteries, Sponsor: Army Research Laboratory, Awarded Amount: \$100,000.
- 55. T.R. Jow and J.P. Zheng (Co-PI), Project Dates: 10/01/1994-09/30/1996, Title: Power Capacitor-Japanese Electrochemical Capacitors, Sponsor: Army Materials Command, Awarded Amount: \$45,000.
- 56. T.R. Jow, J.P. Zheng (Co-PI), and P.J. Cygan, Project Dates: 02/01/1994-11/01/1994, Title: High Energy Density Electrochemical Capacitors for Electric Vehicles, Sponsor: Advanced Research Projects Agency, Awarded Amount: \$120,000.

- 57. T.R. Jow, J.P. Zheng (Co-PI), and P.J. Cygan, Project Dates: 10/01/1993-09/30/1994, Title: New Electrode Materials for High Energy Density Electrochemical Capacitors for Electric Power Assist, Sponsor: Army Research Laboratory, Awarded Amount: \$100,000.
- J.P. Zheng (single PI), Project Dates: 08/01/1992-12/31/1992, Title: Superconducting Infrared Detectors with BSCCO Thin Films, Sponsor: Excel Technology Inc., Awarded Amount: \$20,000.
- 59. J.P. Zheng (single PI), Project Dates: 05/01/1991-04/30/1992, Title: Superconducting Infrared Detectors with Y-Ba-Cu-O Thin Films, Sponsor: Excel Technology Inc., Awarded Amount: \$70,000.

Postdoctoral Supervision

- Dr. Zhiru Ma, 1999-2001
- Dr. Wei Zhu, 2007-present
- Dr. Pedro Moss, 2008-2009
- Dr. Guoqing Zhang, 2009-2011
- Dr. Qiang Wu, 2010-present

Visiting Scholars/Professors

Dr. Hui-Yong Deng, 2010-2011, National Laboratory for Infrared Physics, Shanghai Institute of Technical Physics, China

Dr. Yujun Lu, 2011-present, Zhejiang Sci-Tech University, China

Prof. Ning Dai, 03/2010, 08/2011, 08/2012, Shanghai Institute of Technical Physics, Chinese Academy of Sciences, China.

Dr. Hong Zhang, Northeast Normal University, China, 2012-present

Dr. Lijun Wang, Shanghai Second Polytechnic University, China, 2012-present

Service

Professional Service National and International

- Organizing Committee Member for Massive Energy Storage for the Broader Use of Renewable Energy Sources, Fairmont Newport Beach, Newport Beach, California, June 23-26, 2013.
- International Advisory Board Member for 4th International Conference on Functional Materials and Devices, 2013 (ICFMD-2013), Penang, Malaysia, April 8-11, 2013,

Editorial Board of the Journal of Materials, 2012-present

Organizer, Symposium on Catalysts for Energy Storage and Conversion, 240th American Chemical Society National Meeting & Exposition, Boston, MA, August 22-26, 2010

Treasure, Energy Technology Division of the Electrochemical Society, 2009-2010

Editorial Advisory Board Member of The Open Electrochemistry Journal, 2008-present

Member of Review Panel for The National Defense Science and Engineering Graduate Fellowship Program, 1998-2008

Reviewer and Editorial Activities

Proposals

Research Proposal Reviewer, Army Research Lab., 1992-1997 Research Proposal Reviewer, DOE, 1996, 1997, 2003, 2004, 2007, 2010, 2012 Research Proposal Reviewer, NIST, 1995 Research Proposal Reviewer, U.S. Civilian Research and Development Foundation, 2007 Research Proposal Reviewer, National Science Foundation, 2009 Research Proposal Reviewer, Canada Research Council, 2011, 2012 Research Proposal Reviewer, Singapore National Science Foundation, 2013

Journals and Books

Manuscript Reviewer, Journal of Electrochemical Society, 1996-present

Manuscript Reviewer, Applied Physics Letters, 1995, 1996

Manuscript Reviewer, Thin Solid Films, 1998-2000

Manuscript Reviewer, The Journal of the International Society of Electrochemistry, 1999-2012

Manuscript Reviewer, IEEE Transactions on Aerospace and Electronic Systems, 1999-2001

Manuscript Reviewer, Journal of Applied Electrochemistry, 2002-2005

Manuscript Reviewer, Electrochemical and Solid-State Letters, 2002-present

Manuscript Reviewer, Electrochemica Acta, 2003-present

Manuscript Reviewer, IEEE Transactions on Power Electronics, 2004

Manuscript Reviewer, Journal of Physical Chemistry, 2005

Manuscript Reviewer, Sensors and Actuators, 2007

Manuscript Reviewer, Nano Letters, 2010

Manuscript Reviewer, Advanced Materials, 2010

Materials Research Letters, 2013

Book Chapter Reviewer, CRC Handbook, 1998

Florida State University

University Service

- Chair of Subcommittee of FSU Graduate Policy Committee for Reviewing Department of Industrial Engineering's Graduate Programs, 2003-2004
- Chair of Committee for Search of ECE Department Chair and Sprint Eminent Scholar (FSU), 2004-2005

FSU Senator, 2008-2010

- Member of Energy & Materials Faculty Search Committee, 2012-present
- Member of College of Engineering Dean Search Committee, 2011
- Member of FSU Tenure and Promotion Committee, 2008-2011, 2012-2013

Member of FSU Budget Crisis Committee, 2010-

Member of FSU Library Committee, 2008-2010

Member of FAMU Tenure and Promotion Committee, 2004-2005, 2006-2007Member of Faculty

College Service

Chair of ECE CAPS Faculty Search Committee, 2009-2011

- Chair of College Tenure and Promotion Committee, 2008-2009
- Chair of College Graduate Committee, 2005-2006
- Member of Tenure and Promotion Committee at Civil and Environmental Engineering Department, 2008-2009

Member of Engineering Research Strategic Plan Feedback Committee, 2008-2010

Member of Tenure and Promotion Committee at Industrial Engineering Department, 2007-2008

Member of College Graduate Committee, 2002-2006

Member of College Council of Academic Program Coordinators, 2002-2004

Department Service

- ECE Graduate Program Coordinator, 2002-2006
- Chair of ECE Tenure and Promotion Committee, 2003-2004, 2008-2009
- Chair of ECE Committee for Examining the Faculty Merit Pay Evaluation, 2004-2006
- Chair of ECE Graduate Committee, 2002-2006
- Chair of ECE Faculty Search Committee, 2001-2002
- Chair of ECE Scholarships Committee, 2000-2001
- Chair of EE Seminar Committee, 1999-2000
- Co-Chair of ECE Lab Space Committee, 2007-2008
- Coordinator of ECE Ad Hoc Committee for potential merger of ECE and CS, 2008-2009
- Member of ECE Executive Committee, 2008-2009
- Member of ECE ABET Executive Committee, 2005-2006
- Member of ECE Tenure and Promotion Committee, 2001-2002, 2004-2013
- Member of ECE Faculty Search Committee, 1999-2001, 2002-2006
- Member of ECE Research and Seminar Committee, 2001-2006
- Member of EE Research Committee, 1999-2002
- Member of EE Graduate Studies Committee, 1999-2001, 2008-2013
- Member of EE Seminar Committee, 1997-1999
- Member of EE Instructional Laboratory Committee, 1997-1999

The Community

Treasurer, Chinese Association of Tallahassee, 1999-2000

Consultation

Founder, General Capacitor LLC, Tallahassee, Florida, 2011

Co-Founder, Bing Energy Inc., Chino, California, 2010

Consultant, Chrysalix Energy Management Inc, Vancouver, BC, Canada, 2004-2006, 2008, 2010

Consultant, Maxwell Technologies, San Diego, California, 2004-2012

Technology Board Member, Advanced Portable Power (APP), Delaware, 2003

Consultant, OPG Ventures, Inc, Toronto, Canada, 2001

Consultant, Evans Capacitor Company, East Providence, Rhode Island, 1998-2001, 2004-2006, 2008, 2010, 2011

Lockheed Martin Corp., Orlando, Florida, 1999