Curriculum Vitae
M. Parans Paranthaman, Ph.D.
Oak Ridge National Laboratory/The University of Tennessee, Knoxville

Distinguished Corporate Fellow and Group Leader/UT-Battelle Distinguished Inventor
Professor, Bredesen Center Joint Faculty, The University of Tennessee, Knoxville

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Education/Training

Institution and Location	Degree	Year(s)	Field of Study
Madurai Kamaraj University, Madurai, India	B.Sc.	1980	Chemistry
Madurai Kamaraj University, Madurai, India	M.Sc.	1982	Chemistry
Indian Institute of Technology, Madras	Ph.D.	1988	Chemistry

Research and Professional Experience

2017-Present: Distinguished Corporate Fellow and Group Leader, Materials Chemistry Group, Chemical Sciences Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee

2010-Present: Professor, The University of Tennessee, Knoxville, Bredesen Center for Interdisciplinary Research and Graduate Education Faculty

2006-2016: Distinguished Research Staff and Group Leader, Materials Chemistry Group, Chemical Sciences Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee

1999-2005: Senior Research Staff, Chemical Sciences Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee

1993-1999: Research Staff, Chemistry Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee

1991-1993: Research Associate, Superconductivity Laboratories, Department of Physics, University of Colorado, Boulder (worked with **Professor Allen M. Hermann**)

1988-1991: Post-doctoral Fellow, Center for Materials Science and Engineering, The University of Texas at Austin (worked with **Professor John B. Goodenough**)

1982-1988: Research Fellow, Materials Science Research Center, Indian Institute of Technology, Madras, India (Ph.D. Thesis Advisor: **Professor G. V. Subba Rao**)

Editorial Boards – Journals

Associate Editor, Journal of the American Ceramic Society (2004-Present)
Editorial Board, Applied Sciences (2017-Present)
Editorial Board, Materials Science and Engineering (2017-Present)
Editorial Board, Materials Science and Engineering B Journal (2017-Present)
Editorial Board, MRS Advances (2016-Present)
Co-editor, MRS Advances, MRS Spring 2016 Meeting Proceedings, March 2016
Key Reader: Metallurgical and Materials Transactions E: Materials for Energy Systems (2014-Present)
International Editorial Board, European Superconductivity News Forum (2012-Present)

Editorial Board, Advances in Materials Research (2011-Present)

Editorial Board, The Open Applied Physics Journal (2008-Present)

Editorial Board, Superconductor Science and Technology (2003-2009)

Technical Editor, Materials Branch, IEEE Trans. on Applied Superconductivity, Applied Superconductivity Conference, Chicago, Illinois, August 2008

Guest Editor, Special Issue on "Superconducting Wires and Tapes," Journal of Electronic Materials, October 2007

Technical Editor, Materials Branch, IEEE Trans. on Applied Superconductivity, Applied Superconductivity Conference, Seattle, Washington, August 2006

Guest Editor, Special Issue on "High performance YBCO coated conductors," MRS Bulletin, August 2004

Technical Editor, Materials, IEEE Trans. on Applied Superconductivity, Applied Superconductivity Conference, Jacksonville, Florida, October 2004

Technical Editor, Materials Branch, IEEE Trans. on Applied Superconductivity, Applied Superconductivity Conference, Houston, Texas, August 2002

Editor – Books

Co-Editor, Book on "Sodium-ion Batteries," Springer, 2017 – in progress

Co-Editor, Book on "Semiconductor Materials for Solar Photovoltaic Cells," Springer, 2015

Co-Editor, Book on "Advances in Materials Science for Environmental and Energy Technologies II," *Ceramic Transactions*, Volume 241, John Wiley & Sons, Inc., 2013

Co-Editor, Book on "High Temperature Superconductors," Wiley-VCH, 2010

Co-Editor, Book on "Flux Pinning and AC Loss Studies on YBCO Coated Conductors," Nova Science Publishers, 2007

Co-Editor, Book on "High-Temperature Superconductor Materials, Devices, and Applications," *Ceramic Transactions*, Volume 160, The American Ceramic Society, Ohio, 2004

Co-Editor, Book on "Materials for High-Temperature Superconductor Technologies," Materials Research Society, 2002

Professional Activities

- Fellow: National Academy of Inventors (2017)
- Fellow: UT-Battelle/ORNL Corporate Fellow (2017)
- Fellow: Materials Research Society Fellow (2017)
- Fellow: American Association for the Advancement of Science(2016)
- Fellow: The American Ceramic Society (2015)
- Fellow: ASM International, The Materials Information Society (2014)
- Fellow: Institute of Physics, London, UK (2004)
- Member: TMS, 2015-present
- Member: Materials Research Society, 1993-present
- Member: American Chemical Society, 2009-present
- Member: Electrochemical Society, 2009-present
- Member: American Physical Society, 2013-present

Conferences/Workshops Organized

- Organizer, Symposium on Lithium-Ion and Sodium-Ion Batteries, 2016 MRS Spring Meeting, Phoenix, Arizona, March 28-April 1, 2016.
- Technical Chair, DOE Workshop on Materials Innovation for Next Generation R&D Grid Components,, Oak Ridge, TN, August 26-27, 2015

- Co-organized a symposium based on Energy Conversion – Photovoltaic, Concentrating Solar Power, and Thermoelectrics in the Materials Science and Technology Conference in Pittsburgh, PA, October 8-12, 2012.
- Co-organized the High Temperature Superconductivity symposium in the Materials Science and Technology Conference in Houston, Texas, October 17-21, 2010.
- Organizer, Perovskite Oxides: Films, Nanostructures, Properties, and Applications Symposium for the Material Science & Technology 2008 (MS&T'08) Conference and Exposition, October 5-9, 2008, in Pittsburgh, Pennsylvania.
- Organizer, High Temperature Superconductivity symposium for the Material Science & Technology 2007 (MS&T'07) Conference and Exposition, September 16-20, 2007 in Detroit, Michigan.
- Organizer, High Temperature Superconductor Wires & Tapes symposium for the Material Science & Technology 2006 (MS&T'06) Conference and Exposition, October 15-18, 2006 in Cincinnati, Ohio.
- Organizer, High temperature superconductor materials, devices and applications symposium in 106th Annual Meeting & Exposition of the American Ceramic Society, April 2004.
- Organizer, High temperature superconductivity symposium in 2001 Fall MRS meeting, December 2001, Boston, MA
- Co-organizer, International Workshop on Coated Conductors for Applications, Italy, September 2003
- Chair, MRS International Workshop on Superconductors and Applications in Gatlinburg, Tennessee, August 2002
- Chair, 2007 DOE Wire Development Workshop in Panama City, Florida, January 2007
- Chair, 2005 DOE Wire Development Workshop in St. Petersburg, Florida, January 2005
- Chair, 2003 DOE Wire Development Workshop in St. Petersburg, Florida, January 2003

Review Panels

- ORNL Distinguished Fellows Review Committee Member (2017-Present)
- ORNL Postdoc Group Mentor (2017)
- Reviewed several Advanced Light Source User Proposals, Lawrence Berkeley National Laboratory, CA, 2013-present
- Reviewed several DOE SBIR and BES Early Career Proposals, 2009-present
- Reviewed Hundreds of Journal Articles that were published in several international journals
- Member by invitation on the panel of judges for Department of Energy's university project, and Industry peer reviews, 1999, 2000, 2004
- Member by invitation on the panel of reviewers for various DOE SBIR-STTR, Air Force, and DARPA Programs, 1996-present

Awards and Honors

2017 UT-Battelle **Corporate Fellow**
2017 **Fellow** of Materials Research Society (MRS)
2017 Battelle Celebration of Solvers Award
2017 Seventh R&D 100 Award Finalist: Additive Manufacturing of Magnets
2016 Cited in The Economist Article – Magnetic Moments (Additive Manufacturing)
2016 UT-Battelle **Inventor of the Year**
2016 ORNL **Technology Commercialization** Award
2016 Sixth **R&D 100 Award**: Waste-tire derived carbon for lithium ion batteries
2016 Scholar of the week, The University of Tennessee, Knoxville
2015 **Fellow** of the American Association for the Advancement of Science (AAAS)
2015 Fifth **R&D100 Award:** Multifunctional Superhydrophobic Transparent Glass Coating. Finalist in two Categories (Mechanical Devices/Materials and Market Disruptor Product).
2015 **Fellow** of the American Ceramic Society

2015 ORNL **Technology Commercialization** Award
2014 **Fellow** of the ASM International
2014 ORNL **Technology Commercialization** Award
2014 The American Ceramic Society: Ceramographic Competition Award: First Place: Scanning Probe Microscopy Category
2014 Parans Paranthaman's journal article was featured on Superconductor Science and Technology journal Cover page during February 2014; Volume 27; 022002 (6pp).
2013 Parans has contributed a book chapter in InTech's book on "Applications of High-Tc Superconductivity" that has been accessed/downloaded more than 3000 times.
2012 Fourth **R&D 100** Award related GaN Based Power Electronics
2011 ORNL Partnership Award
2011 FLC National Award: Excellence in Technology Transfer
2010 FLC Southeast Regional Award: Excellence in Technology Transfer Award
2010 Third **R&D 100** Award for developing "High Performance, High-Tc Superconducting Wires enabled via Self-assembly of Non-superconducting Columnar Defects"
2010 Co-authored top cited Physica C article in the last 5 years (2005-2010)
2009 ***Ranks # 2 in worldwide citations in the HTS research during the last decade*** (1999-2009)
2008 Second National FLC Award for Excellence in Technology Transfer.
2008 Co-authored three highly cited papers in the area of superconductivity since 2003 in PRL, PRB, JAP, APL, and SuST journals
2009 Ranks # 2 in worldwide citations in the HTS research during the last decade (1999-2009)
2008 **National FLC Award** for Excellence in Technology Transfer.
2008 ORNL Key Contributor Award Recipient
2007 Second **R&D 100** Award for 2007 for Developing High-performance LMO-enabled High-Temperature Superconducting Tape
2007 FLC Southeast Regional Award; Excellence in Technology Transfer Award for developing High-performance $LaMnO_3$ Enabled, High-Temperature Superconducting Tape
2007 DOE Excellent Mentor Award
2007 DOE Superconductivity Program Annual Peer Review, "Received top ranking with unprecedented high score of 98.4 out of 100 points" – ORNL-SuperPower CRADA
2007 R&D Significant Technical Accomplishment Award, Oak Ridge National Laboratory
2007 Patent Royalty Award for patents issued and licensed
2006 **Nova 50 Award** for Technical Accomplishments
2006 Excellent Team Award for Technology Transfer to Industries, Awards Night, ORNL
2006 DOE Excellent Mentor Award
2005 Patent Royalty Award for patents issued and licensed
2005 Authored highly cited paper in Appl. Phys. Lett. Since 2000
2005 DOE Excellent Mentor Award
2004 **Fellow** of the Institute of Physics, London, UK
2004 Patent Royalty Award for patents licensed
2003 Selected as one of 11 "**Distinguished Inventors**" at Oak Ridge National Laboratory by the Battelle Memorial Institute, Columbus, Ohio
2003 DOE Superconductivity Program Annual Review, "**Exceptional Accomplishment Award**" – ORNL-AMSC CRADA: Development of 2G YBCO RABiTS Wires.
2000 Patent Royalty Awards for patents and technology transfer
2003 Authored two highly cited papers in Physica C journal since 1995
2003 Authored highly cited paper in Superconductor Science and Technology journal since

2003 Patent Royalty Awards for patents licensed
2001 Federal Laboratory Consortium (**FLC**) Award for Excellence in Technology Transfer
2001 **Energy-100** award for co-developing the RABiTS Technology 1999 **R&D 100** Award for co-developing the RABiTS Technology
1999 R&D *Sustained* Development Accomplishment Award, Oak Ridge National Laboratory
1999 American Museum of Science & Energy (AMSE)'s "Tribute to Tennessee Technology" Award
1999 World-Class Teamwork Award, Oak Ridge National Laboratory
1998 Lockheed Martin Energy Research Corp.- Tech. Transfer Award for Technical Support
1997 **Lockheed-Martin NOVA** Award for technical achievement
1997 **Lockheed Martin Scientist of the Year** Award
1997 R&D Significant Technical Accomplishment Award, Oak Ridge National Laboratory
1997 Lockheed Martin Energy Research Corp.- Tech. Transfer Award for Technical Support
1996 Lockheed Martin Energy Research Corp. - Tech. Transfer Award for Technical Support
1996 Department of Energy's (DOE), Office of Science, Materials Science Award for technical achievement In Solid State Physics
1988-1991 Robert A. Welch Fellowship for Postdoctoral Research, Univ. of Texas at Austin

Graduate and Postdoctoral Advisors

Ph.D. (1988) with Prof. G.V. Subba Rao (IIT, Madras);
Postdoc (1988-1991) with Prof. John B. Goodenough (UT, Austin);
Research Associate (1991-1993) with Prof. Allen M. Hermann (Univ. Colorado, Boulder).

Student Supervision Experience

Thesis Advisor and Postgraduate-Scholar Sponsor: I have co-advised several thesis projects of
3 Ph.D. students (through University of Tennessee, Knoxville and University of Houston)
2 M.S. students (through Tenn. Tech. Univ.)
70 Undergraduate students; 5 College teachers; 26 High school teachers, and 14 postdoctoral scholars
Present Post Docs (1):
Ling Li

Present Graduate Student (2)
Yunchao Li
Sam F. Evans

Teaching Experience
Has delivered over 100 lectures, workshop presentations, invited talks, and contributed talks.
Has taught graduate level classes at the University of Tennessee, Knoxville

Collaborators from other Institutions (past 60 months)
Yury Gogotsi, Drexel University
Stephen Harrison, Simbol Materials
Rich Lee, RJLee Group
John Ormerod, Robert Fredette, Magnet Applications Inc.
Scott McCall, Lawrence Livermore National Laboratory
Tom Lograsso, Ikenna Nlebedim, Ames Laboratory
Frank Johnson, GE
Zaffir Chaudhury, UTRC
David Mandrus, University of Tennessee
W. Wong-Ng, L. P. Cook, NIST, Gaithersburg

D. P. Norton, University of Florida
J. Z. Wu, University of Kansas
Dean Miller, V. Maroni, Argonne National Laboratory
V. Selvamanickam, University of Houston
M. W. Rupich, S. Sathyamurthy, C. Thieme, X. Li, American Superconductor Corporation
Y. Chen, SuperPower
D. Larbalestier, E. Hellstrom, Florida State University
Zhengwei Pan, University of Georgia
Q. Xia, Los Alamos National Laboratory
A. Manthiram, J.B. Goodenough, The University of Texas at Austin
A. Manivannan, National Energy Technology Laboratory
Raghu Bhattacharya, C. Teplin, H. Branz, National Renewable Energy Laboratory.
Thomas Fanning, Jon Bornstein, Steve Hane, Ampulse

Publications

I. Summary of Paranthaman's Publications

Journal Publications: **>386**
Web of Science Total Citations **10398;** h-index: **51**
Google Scholar Total Citations **14818;** h-index: **59**
Patents Issued: **36**
Patent Applications Published: **>17**
Invention Disclosures Submitted/Elected to File/Patent Applications Filed: >**15**
Books co-edited: **7**
Book Chapters/Proceedings Written: **58**

II. Selected Journal Publications

1. Y. Li, S. Wan, G.M. Veith, R.R. Unocic, M.P. Paranthaman, S. Dai, and X.G. Sun, "A Novel Electrolyte Salt Additive for Lithium-Ion Batteries with Voltages Greater than 4.7 V," *Adv. Energy Mater.* 7, 1601397 (2017). **DOI:** 10.1002/aenm.201601397

2. J.S. Zhang, J.A. Schott, Y. Li, W.C. Zhan, S.M. Mahurin, K. Nelson, X.G. Sun, M.P. Paranthaman, and S. Dai, "Membrane-Based Gas Separation Accelerated by Hollow Nanosphere Architectures," *Adv. Mater.* 29, 1603797 (2017). **DOI:** 10.1002/adma.201603797

3. I.C. Nlebedim, H. Ucar, C.B. Hatter, R.W. McCallum, S.K. McCall, M.J. Kramer, and M.P. Paranthaman, "Studies on in situ Magnetic Alignment of Bonded Anisotropic Nd-Fe-B Alloy Powders," *J. Mag. And Mag. Mater.* 422, 168 (2017). **DOI:** 10.10161/j.jmmm.2016.08.090

4. Y.F Yue, Y. Li, C.A. Bridges, G. Rother, J.S. Zhang, J.H. Chen, D.K. Hensley, M.K. Kidder, B.C. Richardson, M.P. Paranthaman, and S. Dai, "Hierarchically Superstructured Metal Sulfides: Facile Perturbation-Assisted Nanofusion Synthesis and Visible Light Photocatalytic Characterizations," *ChemNanoMat*. 2, 1104 (2016). **DOI:** 10.1002/cnma.201600292

5. L. Li, A. Tirado, I.C. Nlebedim, O.Rios, B. Post, V. Kunc, R.R. Lowden, E. Lara-Curzio, R. Fredette, J. Ormerod, T.A. Lograsso, and M.P. Paranthaman, "Big Area Additive Manufacturing of High Performance Bonded NdFeB Magnets," *Scientific Reports* 6, 36212 (2016). DOI: 10.1038/srep36212

6. G.E. Jellison, T. Ayug, A.R. Lupini, M.P. Paranthaman, and P.C. Joshi, "Optical Properties of a Nanostructured Glass-based Film using Spectroscopic Ellipsometry," *Thin Solid Films* 617, 38 (2016). **DOI:** 10.1016/j.tsf.2015.12.046

7. A. al-Wahish, U. al-Binni, C.A. Bridges, S. Tang, Z. Bi, M.P. Paranthaman, A. Huq, and D. Mandrus, "In Situ X-ray and Neutron Diffraction of the Rare-Earth Phosphate Proton Conductors Sr/Ca-Doped $LaPO_4$ at Elevated Temperatures," *Chem. Mater.* 28, 7232 (2016). **DOI:** 10.1021/acs.chemmater.6b01531

8. Y. Han, J.M.Y. Carrillo, Z. Zhang, Y. Li, K. Hong, B.G. Sumpter, M. Ohl, M.P. Paranthaman, G.S. Smith, C. Do, "Thermoreversible Morphology and Conductivity of a Conjugated Polymer Network Embedded in Block Copolymer Self-Assemblies," *Small* 12, 4857 (2016). **DOI:** 10.1002/smll.201601342

9. J.E. Mathis, M.K. Kidder, Y. Li, J. Zhang, and M.P. Paranthaman, "Controlled Synthesis of Mesoporous Codoped Titania Nanoparticles and Their Photocatalytic Activity," *Adv. in Nano Research*, 4, 157 (2016). **DOI:** 10.12989/anr.2016.4.3.157

10. Y. Li, G. Fu, M. Watson, S. Harrison, and M.P. Paranthaman, "Monodispersed Li4Ti5O12 with Controlled Morphology as High Power Lithium Ion Battery Anodes," *ChemNanoMat.* 7, 642 (2016). **DOI:** 10.1002/cnma.201600106

11. M.P. Paranthaman, C.S. Shafer, A. Elliott, D. Siddel, M.A. McGuire, R.M. Springfield, J. Martin, R. Fredette, and J. Ormerod, "Binder Jetting: A Novel NdFeB Bonded Magnet Fabrication Process," *JOM* 68, 1978 (2016). **DOI:** 10.1007/s11837-016-1883-4

12. Y. Li, M.P. Paranthaman, K. Akato, A.K. Naskar, A.M. Levine, R.J. Lee, S. Kim, J. Zhang, S. Dai, and A. Manthiram, "Tire-derived Carbon Composite Anodes for Sodium-ion Batteries," *J. Power Sources* 316, 232 (2016). **DOI:** 10.1016/j.jpowsour.2016.03.071

13. M. Naguib, T. Saito, S. Lai, M.S. Rager, T. Aytug, M.P. Paranthaman, M.Q. Zhao, and Y. Gogotsi, "Ti_3C_2Tx (MXene)-Polyacrylamide Nanocomposite Films," *RSC Adv.* 6, 72069 (2016). **DOI:** 10.1039/c6ra10384g

14. M.A. Abreu-Sepulveda, C. Dhital, A. Huq, C.A. Bridge, M.P. Paranthaman, S.R. Narayanan, D.J. Quesnel, D.A. Tryk, and A. Manivannan, "The Influence of Fe Substitution in Lanthanum Calcium Cobalt Oxide on the Oxygen Evolution Reaction in Alkaline Media," *J. Electrochem. Soc*. 163, F1124 (2016). **DOI:** 10.1149/2.1311609

15. M. Abreu-Sepulveda, M. Williams, A. Huq, C. Dhital, Y.C. Li, M.P. Paranthaman, K. Zaghib, A. Manivannan, "Synthesis and characterization of substituted garnet and perovskite-based lithium-ion conducting solid electrolytes," *Ionics* 22 (3) 317-325 (2016). **DOI**:10.1007/s11581-015-1556-2

16. X. G. Sun, Z. Bi, H. Liu, Y. Fang, C. A. Bridges, M. P. Paranthaman, S. Dai, G. M. Brown, "A high performance hybrid battery based on aluminum anode and $LiFePO_4$ cathode," *Chem. Comm*. 52(8), 1713-1716 (2016). **DOI:** 10.1039/c5cc09019a

17. Z. D. Hood, H. Wang, Y. Li, A. S. Pandian, M. P. Paranthaman, and C. Liang, "The filler effect": A study of solid oxide fillers with beta-Li_3PS_4 for lithium conducting electrolytes", *Solid State Ionics* 283, 75-80 (2015). **DOI:**10.1016/j.ssi.2015.10.014

18. Y. Li, M. P. Paranthaman, L. W. Gill, E. W. Hagaman, Y. Wang, A. P. Sokolov, S. Dai, C. Ma, M. F. Chi, G. M. Veith, A. Manthiram, J. B. Goodenough, "Conduction below 100 degrees C in nominal $Li_6ZnNb_4O_{14}$," *J. Mater. Sci.* 51 (2), 854-860 (2016). **DOI:** 10.1007/s10853-015-9408-z

19. S. M. Yang, M. P. Paranthaman, T. W. Noh, S. V. Kalinin, and E. Strelcovt, "Nanoparticle Shape Evolution and Proximity Effects During Tip-Induced Electrochemical Processes," *ACS Nano* 10 (1), 663-671 (2016). **DOI:** 10.1021/acsnano.5b05686

20. J. E. Mathis, J. J. Lieffers, C. Mitra, F. A. Reboredo, Z. Bi, C. A. Bridges, M. K. Kidder, and M. P. Paranthaman, "Increased photocatalytic activity of TiO_2 mesoporous microspheres from codoping with transition metals and nitrogen," *Ceramics International* 42 (2) 3556-3562 (2016). **DOI:** 10.1016/j.ceramint.2015.10.164

21. M. Boota, M.P. Paranthaman, A.K. Naskar, Y.C. Li, K. Akato, Y. Gogotsi, "Waste tire derived carbon-polymer composite paper as Pseudocapacitive electrode with long cycle life," *ChemSusChem* 8 (21) 3576-3581 (2015). **DOI**: 10.1002/cssc.201500866

22. Jinshui Zhang, Ying Bai, Xiao-Guang Sun, Yunchao Li, Bingkun Guo, Jihua Chen, Gabriel M. Veith, Dale K. Hensley, Mariappan Parans Paranthaman, John B. Goodenough, and Sheng Dai, "Superior Conductive Solid-like Electrolytes: Nanoconfining Liquids within the Hollow Structures," *Nano Lett*ers, 15, 1062-1069 (2015); http://dx.doi.org/10.1021/nl5040286

23. S. M. Yang, E. Strelcov, M. P. Paranthaman, A. Tselev, T. W. Noh, and S. V. Kalinin, "Humidity Effect of Nanoscale Electrochemistry in Solid Silver Ion Conductors and the Dual Nature of Its Locality." *Nano Letters* 15, 1062-1069 (2015). http://dx.doi.org/10.1021/nl5040286

24. Sang Mo Yang, M. Baris Okatan, M. Parans Paranthaman, Stephen Jesse, Tae Won Noh, and Sergei V. Kalinin, "Second harmonic detection in the electrochemical strain microscopy of Ag-ion conducting glass." *Appl. Phys. Lett.* 105, 193106 (2014). http://dx.doi.org/10.1063/1.4901736

25. T. Aytug, A.R. Lupini, G.E. Jellison, J.C. Pooran, I.N. Ivanov, L. Tao, P. Weng, R. Menon, R.M. Trejo, E. Lara-Curzio, S.R. Hunter, J.T. Simpson, M. P. Paranthaman, and D.K. Christen, 'Monolithic graded-refractive-index glass-based antireflective coatings: broadband/omnidirectional light harvesting and self-cleaning characteristics,' *J. Mater. Chem. C* 3, 5440 (2015)

26. J. E. Mitchell, D. A. Hillesheim, C. A. Bridges, M. P. Paranthaman, K. Gofryk, M. Rindfleisch, M. Tomsic, and A. S. Sefat, "Optimization of a non-arsenic iron-based superconductor for wire fabrication," *Superconductor Science & Technol.* 28 (4) 045018 (2015) DOI: 10.1088/0953-2048/28/4/045018.

27. Huseyin Ucar, Ikenna C. Nlebedim, M. Parans Paranthaman, and R. William McCallum "Improving the energy product of amorphous Pr-Co-B powders by mechanical milling and nanocrystallization," *Journal of Applied Physics*, 116, 233901 (2014).

28. Loraine Torres-Castro, Jifi Shojan, Christian M. Julien, Ashfia Huq, Chetan Dhital, M. P. Paranthaman, Ram S. Katiyar, and A. Manivannan, "Synthesis, characterization and electrochemical performance of Al-substituted Li_2MnO_3," *Materials Science and Engg. B* 201, 13-22 (2015).

29. Yunchao Li, Mariappan Parans Paranthaman, Lance W. Gill, Edward W. Hagaman, Yangyang Wang, Alexi P. Sokolov, Sheng Dai, Cheng Ma, Miaofang Chi, Gabriel M. Veith, Arumugam Manthiram, and John B. Goodenough, "Conduction Below 100 °C in Nominal $Li_6ZnNb_4O_{14}$," *J. Mater. Sci.* 51 (2), 854-860 (2016). DOE: 10.1007/s10853-015-9408-z

30. Yanfeng Yue, Yunchao Li, Zhonghe Bi, Gabriel M. Veith, Craig A. Bridges, Bingkun Guo, Jihua Chen, David R. Mullins, Sumedh P. Surwade, Shannon M. Mahurin, Hongjun Liu, M. Parans

Paranthaman, and Sheng Dai, "A POM-Organic Framework Anode for Li-ion Battery," *J. Mater. Chem. A 3, 22989* (2015). DOE: 10.1039/c5ta06785e

31. Ucar, H.; Nlebedim, I.C.; Paranthaman, M.P.; McCallum, R.W. Evolution of Structural and Magnetic Properties due to Nanocrystallization of Mechanically Milled Amorphous Pr-Co-B Powders. *J. Appl. Phys.* **2014**, *116*(23), 233901. **DOI:** 10.1063/1.4904359

32. Harrison, K. L.; Bridges, C. A.; Segre, C. U.; Varnado, C. D.; Applestone, D.; Bielawski, C. W.; Paranthaman, M. P.; Manthiram, A., 'Chemical and Electrochemical Lithiation of LiVOPO4 Cathodes for Lithium-Ion Batteries.' *Chem. Mat.* **2014**, *26*, (12), 3849-3861.

33. Bi, Z. H.; Paranthaman, M. P.; Guo, B. K.; Unocic, R. R.; Meyer, H. M.; Bridges, C. A.; Sun, X. G.; Dai, S., 'High performance Cr, N-codoped mesoporous TiO_2 microspheres for lithium-ion batteries. *J. Mater. Chem. A* **2014**, *2*, (6), 1818-1824.

34. Cheng, Y. Q.; Bi, Z. H.; Huq, A.; Feygenson, M.; Bridges, C. A.; Paranthaman, M. P.; Sumpter, B. G., An integrated approach for structural characterization of complex solid state electrolytes: the case of lithium lanthanum titanate.' *J. Mater. Chem. A* **2014**, *2*, (7), 2418-2426.

35. Beck, F. R.; Cheng, Y. Q.; Bi, Z. H.; Feygenson, M.; Bridges, C. A.; Moorhead-Rosenberg, Z.; Manthiram, A.; Goodenough, J. B.; Paranthaman, M. P.; Manivannan, A., 'Neutron Diffraction and Electrochemical Studies of $Na_{0.79}CoO_2$ and $Na_{0.79}Co_{0.7}Mn_{0.3}O_2$ Cathodes for Sodium-Ion Batteries. *J. Electrochem. Soc.* **2014**, *161*, (6), A961-A967.

36. Liao, C.; Han, K. S.; Baggetto, L.; Hillesheim, D. A.; Custelcean, R.; Lee, E. S.; Guo, B. K.; Bi, Z. H.; Jiang, D. E.; Veith, G. M.; Hagaman, E. W.; Brown, G. M.; Bridges, C.; Paranthaman, M. P.; Manthiram, A.; Dai, S.; Sun, X. G., 'Synthesis and Characterization of Lithium Bis (fluoromalonato) borate for Lithium-Ion Battery Applications.' *Adv. Energy Mater.* **2014**, *4*, (6) 1301368.

37. Al-Wahish, A.; Jalarvo, N.; Bi, Z.; Herwig, K. W.; Craig Bridges, C. A.; Paranthaman, M. P.; Mandrus, D. 'Quasi-Elastic Neutron Scattering Reveals Fast Proton Diffusion in Ca-Doped $LaPO_4$.' *J. Phys. Chem. C* **2014**, *118*, 20112#20121

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III. US Patents Issued (36) and Published US Patent Applications (>17)

List of Issued US Patents (36)

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52. **M. Paranthaman**, A. Manthiram and J. B. Goodenough, Chemical Characterization of Thallium-Cuprate Superconductors. *In Thallium-Based High Temperature Superconductors*, A.M. Hermann and J.V. Yakhmi eds., 147-175 (Marcel Dekker, Inc., New York, **1993**).

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54. **M. Paranthaman**, W. Kiehl and A. M. Hermann, Synthesis and Characterization of $Tl_2Ba_2CuO_6$ Systems - A Review. In *Studies of High Temperature Superconductors*, A. V. Narlikar ed., Vol. 11, 353-381 (Nova Science Publishers, Inc., New York, **1993**).

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56. Manoharan, R.; **Paranthaman, M.P**.; Goodenough, J.B. Electrocatalysis on Sr1-xNbO3-d (0.05≤ x ≤ 0.3). Proc. of the 176th Electrochemical Society Meeting, Hollywood, Florida (1989).

57. Rao, G.V.S.; Varadaraju, U.V.; **Paranthaman, M.P**.; Sankaranarayanan, V.; Ravindran, R.; Srinivasan, R. Superconductivity Studies on Tl-Ba-Ca-Cu-O System. Proc. of the 1st Asia-Pacific Conference on Condensed Matter Physics (World Scientific, Singapore) p.305 (1989).

58. Rao, G.V.S.; Aruchamy, A.; Aravamudan, G.; **Paranthaman, M.P**. Studies on Photoelectrochemical Behavior of Certain Oxide Materials for Photoassisted Electrolysis of Water. Adv. Hyd. Energy, 4 (Hydrogen Energy Progress V, Vol. 3), T.N. Veziroglu and J.B. Taylor eds., pp. 1075-1083 (Pergamon Press, New York, 1984).

Selected Invited Presentations Given by Paranthaman (57; Since 2010)

1. Invited Speaker, Title: Tire derived carbon for Sodium Ion Batteries, Chairing Session: Battery and Energy Technology; New Orleans, Louisiana, May 28 – June 1, 2017; http://www.electrochem.org/231

2. Invited Speaker, Title: Additive Manufacturing of NdFeB Magnets, INTERMAG 2017, Dublin, Ireland, April 24-28, 2017; http://intermag2017.com/

3. Invited Speaker, Title: Additive Manufacturing of NdFeB Magnets, Army Research Lab Director Visit to ORNL, April 10, 2017

4. Invited Speaker, Title: 3D Printing of Bonded Magnets, Tengam, Magnet company, Grand Rapids, Michigan, March 23, 2017; http://www.tengam.com/

5. Invited Speaker, Title: Recovery of Carbon from Recycled Tires for Energy Storage Applications, ORNL SULI/CCI Interns, Oak Ridge, Tennessee, March 15, 2017

6. Invited Speaker, Title: Novel Tire Derived Carbon for Energy Storage Applications College of Engineering, Florida State University, February 1-2, 2017; Presented two department seminars

7. Invited Speaker, Title: Big Area Additive Manufacturing of NdFeB Bonded Magnets, at the Magnetics 2017 conference and CMI Industry Meet, Orlando, Florida, January 18-20, 2017

8. Invited Speaker, Additive Manufacturing of Bonded Magnets, Arnold Magnetics Technologies, Rochester, New York, December 12, 2016; http://www.arnoldmagnetics.com/en-us/

9. Invited Speaker, Title: Safe and Fast Charging Structural Lithium-Ion Batteries, Global Security Directorate – SAG Meeting, ORNL, Oak Ridge, Tennessee, December 6, 2016

10. Speaker, Two oral presentations, Title: High Performance Tire-Derived Carbon Anodes for Sodium-Ion Batteries, and Additive Manufacturing of Permanent Magnets, MRS Fall Meeting, Boston, Massachusetts, November 27- December 2, 2016; http://www.mrs.org/fall2016

11. Invited Speaker, Title: Current Status of Bonded Magnets Research, US – Japan 4th Bilateral Workshop, Ames Laboratory, Ames, Iowa, November 7-8, 2016

12. Invited Speaker, Title: Novel Carbon Materials for Energy Storage Applications, ORNL SULI/CCI Interns, Oak Ridge, Tennessee, October 12, 2016

13. Webinar Presentation, Additive Manufacturing of NdFeB Permanent Magnets, CMI Website Published, September 21, 2016 – Record number of listeners signed up for this CMI popular webinar presentation

14. Invited Speaker, Title: Additive Manufacturing of Permanent Magnets, CMI Annual Meeting, Oak Ridge, Tennessee, August 16-18, 2016

15. Invited Speaker, Title: Recovery of Lithium from Geothermal Brines and Current Status of Lithium-ion Batteries, Hazen Research, Denver, Colorado, August 12, 2016

16. Invited Speaker, Aluminum Lithium Hybrid Battery, Alcoa Technology Center, Pittsburgh, PA, May 18-19, 2016

17. Invited Speaker, Department Seminar, Title: Novel Carbon from Recycled Tires for Batteries and Supercapacitors, Wake Forest University, Winston-Salem, North Carolina, April 27-28, 2016

18. Invited Speaker, Title: Low-cost tire-derived carbon composite electrodes for energy storage applications; Co-organized a symposium title: Electrode Materials and Electrolytes for Lithium and Sodium-Ion Batteries, Session Chair, MRS Spring Meeting 2016, Phoenix, Arizona, March 27 – April 1, 2016

19. Invited Speaker, Title: 3D Printing of NdFeB Bonded Magnets, TMS 2016 145th Annual Meeting, Nashville, Tennessee, February 17-18, 2016

20. Invited Speaker, Title: Low-cost, high performance anodes for lithium-ion batteries, ORNL SULI Interns, Oak Ridge, Tennessee, February 10, 2016

21. Invited Speaker, Title: Current Status of NdFeB Magnet Printing Research, CMI Magnet Thrust Meeting, San Diego, California, January 11-12, 2016

22. Invited Speaker, Title: Additive Manufacturing of Permanent Magnets, 1st TMS Summit on Integrated Manufacturing and Materials Innovations, Pittsburgh, Pennsylvania, November 17-18, 2015

23. Invited Speaker, Title: Bonded Magnet Research, US – Japan Bilateral Workshop; US – Japan – Europe Trilateral Workshop; Tokyo, Japan, October 26-28, 2015

24. Invited Speaker, Title: Lithium-Ion Batteries, ORNL SULI Interns, Oak Ridge, Tennessee, October 7, 2015

25. Invited Speaker, CMI Annual Meeting, Idaho National Laboratory, Idaho Falls, Idaho, August 4-6, 2015

26. Invited Speaker, Magnet Applications Inc., DuBois, Pennsylvania, July 8, 2015

27. Invited Speaker, RJLee Group Inc., Monroeville, Pennsylvania, June 11-12, 2015

28. Invited Speaker, United Technologies Research Center, Hartford, Connecticut, May 4-5, 2015

29. Invited Speaker, Brown University, CMI Magnet Thrust Meeting, Providence, Rhode Island, May 6-7, 2015

30. Invited Speaker, ACS Spring 2015 Meeting, Denver, Colorado, March 23-25, 2015

31. Invited Keynote Speaker, Rethink Disruption – Emerging Technologies Transforming Business & Society Meeting, San Francisco, California, November 5-6, 2014

32. Invited Speaker, CMI Annual Meeting, Ames, Iowa, September 8-10, 2014

33. Webinar Presentation, Tile: Pyrolytic Carbon Black Composites, YouTube Uploaded, August 7, 2014

34. Invited Speaker, Title: 3D Printing of NdFeB Magnets, GE Global Corporation, CMI Magnet Thrust Meeting, Albany, New York, August 4-6, 2014

35. Invited Speaker, Title: Advancements in Additive Manufacturing, Lawrence Livermore National Laboratory, CMI Magnet Thrust Meeting, Livermore, California, April 7-8, 2014

36. Invited Speaker, Title: Lithium-ion Batteries, SULI Interns, ORNL, Oak Ridge, Tennessee, January 15, 2014

37. Speaker, Title: Investigation of Li-rich High Energy Density Cathodes for Li-ion Batteries, MRS Fall 2013 meeting, Boston, Massachusetts, December 2-5, 2013

38. Invited Speaker, Title: Recovery of Lithium from Geothermal Brine, Simbol Materials Inc., Pleasanton, California, November 21-22, 2013

39. Invited Speaker, Title: Mesoporous TiO_2 Anodes for Lithium-Ion Batteries, SPARK meeting, ORNL, Oak Ridge, Tennessee, November 18, 2013

40. Invited Speaker, Title: TiO_2 Based Safe Lithium-Ion Batteries, Cristal USA, Baltimore, Maryland, October 10-11, 2013

41. Invited Speaker, Title: Additive Manufacturing of Magnets, Ames Laboratory, CMI Kickoff Meeting, Ames, Iowa, September 10-12, 2013

42. Invited Speaker, Title: Novel Solid Electrolytes for Lithium-ion Batteries, The University of Texas at Austin, BES Meeting, Austin, Texas, August 26-27, 2013

43. Invited Speaker, Title: Lithium Extraction Methods, Simbol Materials Inc., Pleasanton, California, July 25-26, 2013

44. Invited Speaker, Title: Investigation of Li-rich High-Energy Density Cathodes, Chaired Sessions, 223rd Electrochemical Society Meeting, Toronto, Canada, May 13-16, 2013

45. Invited Speaker, Title; High Performance Cathode Materials for Lithium-ion Batteries, Lawrence Berkeley National Laboratory, Battery Workshop, Berkeley, California, October 10-11, 2012

46. Invited Speaker, Title: Lithium-ion Batteries, Technical Society of Knoxville, Knoxville, Tennessee, September 18, 2012

47. Invited Speaker, Title: Titanium Oxides Based Safe Batteries, Bren-Tronics Energy Systems, Gainesville, Florida, August 29-30, 2012

48. Invited Speaker, Title: Lithium-ion Batteries, Vellore Institute of Technology, Vellore, India, August 14, 2012

49. Invited Speaker, Title: Fast-charging and Safe Lithium-Ion Batteries, Sandia National Laboratory, Albuquerque, New Mexico, July 9-10, 2012

50. Invited Speaker, Title: TiO_2 Based Lithium-Ion Batteries, LBNL Advanced Light Source, Berkeley, California, May 1-2, 2012

51. Invited Speaker, Title: Advanced Anode Materials for Lithium-ion Batteries, Bren-Tronics Energy System, Alachua, Florida, December 8-9, 2011

52. Speaker, Two Oral Presentations, Title: Controlled surface modification of $LiMn_{1.5}Ni_{0.5}O_4$ spinel cathode materials for Lithium-ion batteries; Mesoporous TiO_2 sphere with nitrogen adsorption for lithium-ion batteries, 220th ECS Fall Meeting, Boston, Massachusetts, October 12-13, 2011

53. Invited Speaker, Title: Flexible Silicon Solar Photovoltaics, Ferro Corporation, Cleveland, Ohio, February 23-24, 2011

54. Speaker, Title: Single Crystalline Si Photovoltaics on Flexible Copper Substrates, MRS Fall Meeting 2010, Boston, Massachusetts, November 28 – December 1, 2010

55. Speaker, Co-organizing a Symposium, Title: High Temperature Superconductor Wires and Tapes, MS&T 2010, Houston, Texas, October 18-20, 2010

56. Invited Speaker, Title: Flexible Si Thin Films, Ascent Solar, Denver, Colorado, April 20-21, 2010

57. Invited Speaker, Title: Growth of textured Si thin films on RABiTS, National Renewable Energy Laboratory, Ampulse Meeting, Denver, Colorado, April 21-22, 2010