Dr. Prabeer Barpanda

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Indian Institute of Science (IISc),
Bangalore – 560 012, India.

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Indian Institute of Science Campus,
Bangalore – 560 012, India.

Date of Birth: 24th June 1981

Citizenship: Indian

Education:

2005~2009	Ph. D., Materials Science and Engineering, Full fellowship, (Jan 2009), **Rutgers, The State University of New Jersey, NJ, USA.** (Thesis: Physical & electrochemical study of halide-modified activated carbons)
	M. S., Materials Science and Engineering, Full fellowship, (May 2006), **Rutgers, The State University of New Jersey, NJ, USA.**
	Certificate in Management, CME fellowship, (Nov 2007), **Rohrer Centre for Management & Entrepreneurship, Rutgers Univ, NJ.**
2003~2004	M. Phil., Materials Modeling, Shell-Chevening Fellowship, (Dec 2004), **The University of Cambridge (Wolfson College), UK.**
1998~2002	B. Engg. (Hons.), Ceramic Engineering, NALCO Fellowship, (Jun 2002), **National Institute of Technology, Rourkela (NITR), INDIA.**

Visiting Appointments:

07/2017~08/2017	Visiting Faculty Program Fellow, Department of Materials and Interfaces, Weizmann Institute of Science, Rehovot, **Israel**. (Host: Prof. Michal Leskes)
06/2016~07/2016	Visiting Researcher, Department of Applied Chemistry, Faculty of Science, Tokyo University of Science, Tokyo, **Japan**. (Host: Prof. Shinichi Komaba)
06/2015~07/2015	Visiting Researcher, Institute for Materials Chemistry and Engineering, Kyushu University, Fukuoka, **Japan**. (Host: Prof. Shigeto Okada)
07/2014~08/2014	Visiting Researcher, Institute for Materials Chemistry and Engineering, Kyushu University, Fukuoka, **Japan**. (Host: Prof. Shigeto Okada)

Academic Appointments:

11/2013~present	Assistant Professor, Faraday Materials Lab., Materials Research Center, Indian Institute of Science Bangalore (IISc), **India**.
09/2013~10/2013	Assistant Professor, Metallurgical Engineering and Materials Science, Indian Institute of Technology Bombay (IITB), Powai, **India**.

12/2012~07/2013	Senior Researcher, Yamada Laboratories and Unit of ESICB, Department of Chemical System Engineering, University of Tokyo, **Japan**. Joint Affiliation with Unit of ESICB, Kyoto University, Kyoto, **Japan**.
11/2010~11/2012	J.S.P.S. Postdoctoral Fellow, Yamada Lab, (Host: Prof. Atsuo Yamada) Department of Chemical System Engineering, University of Tokyo, **Japan**.
01/2009~11/2010	C.N.R.S. Postdoctoral Fellow, Laboratoire de Réactivité et Chimie des Solides, Université de Picardie Jules Verne, UMR CNRS, Amiens, **France**. (Advisors: Prof. Jean-Marie Tarascon and Prof. Michel Armand)
11/2008~12/2008	NSF Visiting Student, Andreas Laboratory, Department of Chemistry, Dalhousie University, Halifax, NS, **Canada**. (Host: Prof. Heather A. Andreas)
01/2005~12/2008	Graduate Research Assistant, Energy Storage Research Group (ESRG), Department of Materials Science and Engineering, Rutgers University, Piscataway, NJ, **USA**. (Advisor: Prof. Glenn G. Amatucci)
10/2003~12/2004	Graduate Assistant, Department of Materials Science and Metallurgy, The University of Cambridge, **UK**. (Advisor: Prof. Rafal E. Dunin-Borkowski)

Research Focus:

* Sustainable synthesis of Li- and Na-based cathode materials for rechargeable batteries.
* Structure and electrochemical characterization and optimization of cathode materials.
* Fabrication and development of carbon-based materials for electrochemical supercapacitors.
* Micromagnetic simulation of magnetic nanostructures.

Awards and Honors:

- 'Visiting Faculty Program Fellowship- 2017', by Weizmann Institute of Science, Rehovot, Israel.
- 'Ross Coffin Purdy Award- 2016', by The American Ceramic Society (ACerS), USA.
- 'Energy Technology Division Supramaniam Srinivasan Young Investigator Award- 2016', by The Electrochemical Society (ECS), USA.
- 'ISE Prize for Applied Electrochemistry- 2015', by International Society of Electrochemistry (ISE), HQ: Switzerland.
- 'ACS Excellence in Review Award - 2015', by The American Chemical Society (ACS), USA.
- 'ISE Travel Award for Young Electrochemists', by International Society of Electrochemistry, 2012.
- 'J.S.P.S. Postdoctoral Fellowship-2010' by Japan Society for the Promotion of Science, Japan.
- 'Marquis *Who's Who* in World', Listed by Marquis 2010 – 2012 (27^{th} - 29^{th}), 2013 – 2014 (30-31^{st}).
- 'Marquis *Who's Who* in America', Listed by Marquis 2008– 2010 (63-65^{th}), 2012 (66^{th}), 2014(68^{th}).
- 'Fellow of Cambridge Commonwealth Society', Cambridge, UK inducted in Dec 2004.
- 'H.H. Dow memorial student achievement award-2008', awarded by Electrochemical Society, US.
- 'Colin Garfield Fink Summer Fellowship-2007' awarded by the Electrochemical Society, USA.
- 'Battery Division Student Travel Award' to attend ECS-Prime meeting, Oct 12-17, 2008, Hawaii.
- 'NSF-ICMR International Research Fellowship', for visit to Dalhousie University, Canada.
- 'Ceradyne International Award for Professional Development' at ICC-2006, Toronto, Canada.
- 'Shell Centenary Chevening Scholarship –2003' for M. Phil. study at Univ. of Cambridge, UK.

Book(s)/ Book Chapter(s):

1. P. Barpanda, "Carbon-Halide Nanocomposites: Structure, Morphology & Electrochemistry", VDM-Verlag Publication, Germany (2009), ISBN 978-3-639-12061-5.
2. P. Barpanda, J-M. Tarascon, "Fluorine-based polyanionic compounds for high-voltage electrode materials", Ch-7 in "*Lithium Batteries: Advanced Technologies and Applications*" (Wiley Pub.), *Editors*: B. Scrosati, K.M. Abraham, W. van Schalkwijk, J. Hassoun, 2013.

Technical Patents:

1. J.-M. Tarascon, P. Barpanda (30%), M. Ati, J.N. Chotard, M. Armand, "Material, useful in electrode for a lithium or lithium ion, comprises fluorosulfate particles comprising triplite structure phase and optionally tavorite structure phase", **FR2972441-A1, FR2972441-B1, WO2012146842-A1, EP2683478-A1, US20140306149-A1, US-9444102, JP2014511002-W, KR2014 027143-A, CN103619474-A**.
2. A. Yamada, P. Barpanda (50%), "Manufacture of carbon-coated lithium or sodium-containing oxoate compound used for positive electrode active material, involves heating intermediate complex obtained using sodium-containing oxoate compound precursor solution and fuel", **JP2014221690-A**, **WO2013035572-A1**.
3. A. Yamada, P. Barpanda (30%), G. Oyama, S. Nishimura, "Positive electrode active material used in sodium ion secondary battery for electronic devices, comprises sulfate", **JP2013-187914, WO2015037489-A1, TW201519495-A**.
4. P. Barpanda, D. Dwibedi, N. Dimov, A. Kitajou, Y. Kee, S. Okada, "Solution assisted spray drying synthesis of high-voltage sulfate based insertion compounds for secondary Li-ion and Na-ion batteries", Japanese Patent in preparation.

Journal Publications: (* means corresponding author) (*h*-index = 28, *citations* > 2820, Google scholar)

1. R. Gond, S. Krishnakanth, B. Senthilkumar, P. Barpanda*, "Bifunctional electrolytic behaviour of sodium cobalt phosphates in alkaline solution", *ChemElectroChem*, In Press, 2017.
2. D. Dwibedi, M. Chinnasamy, M. Leskes, P. Barpanda*, "Influence of synthesis temperature on cation ordering in hydrothermally prepared zinc aluminate ($ZnAl_2O_4$) spinel", *Mater. Res. Bull.*, In Press, 2017.
3. L. Sharma, P. Nayak, E. de la Llave, H. Chen, S. Adams, D. Aurbach, P. Barpanda*, "Electrochemical and diffusional investigation of $Na_2Fe^{II}PO_4F$ fluorophosphates sodium insertion material obtained from Fe^{III} precursor", *ACS Appl. Mater. Interfaces*, In Press, 2017.
4. T. Watcharatharapong, J. T-Thienprasert, P. Barpanda, R. Ahuja, S. Chakraborty, "Sodium-ion diffusion and small hole polaron formation in Kröhnkite $Na_2Fe(SO_4)_2.2H_2O$ cathode material for battery applications", *J. Mater. Chem. A*, In Press, 2017.
5. S. Krishnakanth, B. Senthilkumar, P. Barpanda*, "Electrochemical potassium-ion intercalation in Na_xCoO_2: A novel cathode material for potassium-ion batteries", *Chem. Commun.*, **53**(61), 8588-8591, 2017.
6. S. Ghosh, A. Dayamani, B. Kishore, N. Munichandraiah, R. Prasada Rao, L.L. Wong, S. Adams, P. Barpanda*, "Autocombustion synthesis of nanostructured $Na_2Ti_6O_{13}$ negative insertion material for Na-ion batteries: Electrochemical and diffusion mechanism", *J. Electrochem. Soc.*, **164**(9), A1881-A1886, 2017.

7. R. Gond, S.S. Meena, S.M. Yusuf, V. Shukla, N.K. Jena, R. Ahuja, S. Okada, P. Barpanda*, "Enabling the electrochemical activity in sodium iron metaphosphate [$NaFe(PO_3)_3$] sodium battery insertion material: Structural and electrochemical insights", *Inorg. Chem.*, **56**(10), 5918-5929, 2017.
8. M. Sale, M. Avdeev, Z. Mohamed, C.D. Ling, P. Barpanda, "Magnetic structure and properties of centrosymmetric twisted melilite $K_2CoP_2O_7$", *Dalton Trans.*, **46**, 6409-6416, 2017.
9. D. Dwibedi, R. Gond, A. Dayamani, R. B. Araujo, S. Chakraborty, R. Ahuja, P. Barpanda*, "$Na_{2.32}Co_{1.84}(SO_4)_3$ as a new member of *alluaudite* family of high-voltage sodium battery cathode", *Dalton Trans.*, **46**, 55-63, 2017. (Highlighted as Inside Cover Image).
10. S. Duraisamy, T. Penki Rao, B. Kishore, P. Barpanda, P. K. Nayak, D. Aurbach, N. Munichandraiah, "Porous, hollow $Li_{1.2}Mn_{0.53}Ni_{0.13}Co_{0.13}O_2$ microspheres as a positive electrode material for Li-ion batteries", *J. Solid State Electrochem.*, **21**, 437-445, 2017.
11. S. Ghosh, S. Mitra, P. Barpanda*, "Sonochemical synthesis of nanostructured $Li_4Ti_5O_{12}$ negative insertion material for Li-ion and Na-ion batteries", *Electrochim. Acta*, **222**, 898-903, 2016. (Special issue related to the 19th Topical Meeting of ISE, Auckland, New Zealand).
12. R.B. Araujo, S. Chakraborty, P. Barpanda, R. Ahuja, "$Na_2M_2(SO_4)_3$ (M= Fe, Mn, Co and Ni): Towards high voltage sodium battery applications", *Phys. Chem. Chem. Phys.*, **18**, 9658-9665, 2016.
13. D. Dwibedi, C.D. Ling, R.B. Araujo, S. Chakraborty, S. Duraisamy, N. Munichandraiah, R. Ahuja, P. Barpanda*, "Low temperature ionothermal synthesis of high-voltage alluaudite $Na_{2+2x}Fe_{2-x}(SO_4)_3$ sodium insertion compound: Structural, electronic and magnetic insights", *ACS Appl. Mater. Interfaces*, **8**(11), 6982-6991, 2016.
14. P. Barpanda*, "Pursuit of sustainable iron-based positive insertion materials for sodium-ion batteries: Two case studies", *Chem. Mater.*, **28**(4), 1006-1011, 2016. (*Invited Perspective Article*) (*ToC image highlighted*).
15. D. Dwibedi, R.B. Araujo, S. Chakraborty, P. Shanbogh, N. Sundaram, R. Ahuja, P. Barpanda*, "$Na_{2.44}Mn_{1.79}(SO_4)_3$: A new member of *alluaudite* family of insertion compound for sodium ion batteries", *J. Mater. Chem. A*, **3**, 18564-18571, 2015.
16. Y. Kee, N. Dimov, A. Staikov, P. Barpanda, Y.C. Lu, K. Minami, S. Okada, "Insight into the limited electrochemical activity of $NaVP_2O_7$", *RSC Adv.*, **5**, 64991-64996, 2015.
17. S. Ghosh, Y. Kee, S. Okada, P. Barpanda*, "Energy-savvy solid-state and sonochemical synthesis of lithium sodium titanate as an anode active material for Li-ion batteries", *J. Power Sources*, **296**, 276-281, 2015.
18. D. Dwibedi, M. Avdeev, P. Barpanda*, "Role of fuel on cation disorder in magnesium aluminate ($MgAl_2O_4$) spinel prepared by combustion synthesis", *J. Am. Ceram. Soc.*, **98**(9), 2908-2913, 2015.
19. P. Barpanda*, D. Dwibedi, S. Ghosh, Y. Kee, S. Okada, "Lithium metal borate ($LiMBO_3$) family of insertion materials for Li-ion batteries: A sneak peak", *Ionics*, **21**(7), 1801-1812, 2015. (*Invited Review*)
20. P. Barpanda*, "Sulphate chemistry for high-voltage insertion materials: Synthetic, structural and electrochemical insights", *Isr. J. Chem.*, **55**(5), 537-557, 2015. (*Invited Review*) (Special issue on "Next Generation Batteries: Materials & Electrochemical Systems").
21. J. Ming, P. Barpanda, S. Nishimura, M. Okubo, A. Yamada, "An alluaudite $Na_{2+2x}Fe_{2-x}(SO_4)_3$ (x = 0.2) derivative phase as an insertion host for lithium battery", *Electrochem. Commun.*, **51**, 19-22, 2015.

22. P. Barpanda*, G. Liu, M. Avdeev, A. Yamada, "*t*-$Na_2VOP_2O_7$: A 3.8 V pyrophosphate insertion material for sodium-ion batteries", *ChemElectroChem*, **1**(9), 1488-1491, 2014. (*Inside Cover Page Image*).
23. P. Barpanda, G. Oyama, S. Nishimura, S.C. Chung, A. Yamada, "A 3.8 V earth-abundant sodium battery electrode", *Nature Communications*, **5**, 4358: 1-8, 2014. [Winner of the 2016 Ross Coffin Purdy Award for Best Paper, The American Ceramic Society, USA].
24. J.M. Clark, P. Barpanda, A. Yamada, M.S. Islam, "Sodium-ion battery cathodes $Na_2FeP_2O_7$ and $Na_2MnP_2O_7$: Diffusion behavior for high rate performance", *J. Mater. Chem. A*, **2**(30), 11807-11812, 2014.
25. P. Barpanda*, G. Liu, Z. Mohamed, C.D. Ling, A. Yamada, "Structural, magnetic and electrochemical investigation of novel binary $Na_{2-x}(Fe_{1-y}Mn_y)P_2O_7$ ($0 \leq y \leq 1$) pyrophosphate compounds for rechargeable sodium-ion batteries", *Solid State Ionics*, **268**, 305-311, 2014. (*ICMAT-2013* Special Issue)
26. P. Barpanda*, G. Oyama, C.D. Ling, A. Yamada, "*Kröhnkite*-type $Na_2Fe(SO_4)_2.2H_2O$ as a novel 3.25 V insertion compound for Na-ion batteries", *Chem. Mater.*, **26**(3), 1297-1299, 2014.
27. M. Avdeev, C.D. Ling, T.T. Tan, S. Li, G. Oyama, A. Yamada, P. Barpanda, "Magnetic structure and properties of the rechargeable battery insertion compound Na_2FePO_4F", *Inorg. Chem.*, **53**(2), 682-684, 2014.
28. P. Barpanda*, C.D. Ling, G. Oyama, A. Yamada, "Sodium manganese fluorosulphate with a triplite structure", *Acta Cryst.* **B69**(6), 584-588, 2013.
29. T. Ye, P. Barpanda, S. Nishimura, N. Furuta, S.C. Chung, A. Yamada, "General observation of Fe^{3+}/Fe^{2+} redox couple close to 4 V in partially substituted $Li_2FeP_2O_7$ pyrophosphate solid-solution cathodes", *Chem. Mater.*, **25**(18), 3623-3629, 2013.
30. P. Barpanda*, G. Liu, C.D. Ling, M. Tamaru, M. Avdeev, S.C. Chung, Y. Yamada, A. Yamada, "$Na_2FeP_2O_7$: A safe cathode for rechargeable sodium-ion batteries", *Chem. Mater.*, **25**(17), 3480-3487, 2013.
31. M. Avdeev, Z. Mohamed, C.D. Ling, J. Lu, M. Tamaru, A. Yamada, P. Barpanda*, "Magnetic structures of $NaFePO_4$ maricite and triphylite polymorphs for sodium-ion batteries", *Inorg. Chem.*, **52**(15), 8685-8693, 2013.
32. Y. Yamashita, P. Barpanda, Y. Yamada, A. Yamada, "Demonstration of Co^{3+}/Co^{2+} electrochemical activity in $LiCoBO_3$ cathode at 4.0 V", *ECS Electrochem. Lett.*, **2**(8), A75-A77, 2013.
33. P. Barpanda*, G. Rousse, T. Ye, C.D. Ling, Z. Mohamed, Y. Klein, A. Yamada, "Neutron diffraction study of the Li-ion battery cathode $Li_2FeP_2O_7$", *Inorg. Chem.*, **52**(6), 3334-3341, 2013.
34. P. Barpanda*, Y. Yamashita, Y. Yamada, A. Yamada, "High-throughput solution combustion synthesis of high-capacity $LiFeBO_3$ cathode", *J. Electrochem. Soc.*, **160**(5), A3095-A3099, 2013. (Focus Issue on 'Intercalation Compounds for Rechargeable Batteries").
35. P. Barpanda*, T. Ye, M. Avdeev, S.C. Chung, A. Yamada, "A new polymorph of $Na_2MnP_2O_7$ as a 3.6 V cathode material for sodium-ion batteries", *J. Mater. Chem. A*, **1**(13), 4194-4197, 2013.
36. P. Barpanda*, J. Lu, T. Ye, M. Kajiyama, S.C. Chung, N. Yabuuchi, S. Komaba, A. Yamada, "A layer-structured $Na_2CoP_2O_7$ pyrophosphate cathode for sodium-ion batteries", *RSC Adv.*, **3**(12), 3857-3860, 2013.
37. P. Barpanda*, M. Avdeev, C.D. Ling, J. Lu, A. Yamada, "Magnetic structure and properties of the $Na_2CoP_2O_7$ pyrophosphate cathode for sodium-ion batteries: A super-superexchange driven non-collinear antiferromagnet", *Inorg. Chem.*, **52**(1), 395-401, 2013.

38. P. Barpanda*, T. Ye, S. Nishimura, S.C. Chung, Y. Yamada, M. Okubo, H. Zhou, A. Yamada, "Sodium iron pyrophosphate: A novel 3.0 V iron-based cathode for sodium-ion batteries", *Electrochem. Commun.*, **24**, 116-119, 2012.
39. M. Tamaru, P. Barpanda, Y. Yamada, S. Nishimura, A. Yamada, "Observation of the highest $Mn^{3+/}Mn^{2+}$ redox potential at 4.45 V in a $Li_2MnP_2O_7$ pyrophosphate cathode", *J. Mater. Chem.*, **22**(47), 24526-24529, 2012.
40. P. Barpanda*, S. Nishimura, A. Yamada, "High-voltage pyrophosphate cathodes", *Adv. Energy Mater.*, **2**(7), 841-859, 2012. ("Special Issue on Next Generation Batteries") (*Invited Review*).
41. D. Shimizu, S. Nishimura, P. Barpanda, A. Yamada, "Electrochemical redox mechanism in 3.5 V $Li_{2-x}FeP_2O_7$ ($0 \leq x \leq 1$) pyrophosphate cathode", *Chem. Mater.*, **24**(13), 2598-2603, 2012.
42. P. Barpanda*, T. Ye, S.C. Chung, Y. Yamada, S. Nishimura, A. Yamada, "Eco-efficient splash combustion synthesis of nanoscale pyrophosphate ($Li_2FeP_2O_7$) positive-electrode using Fe(III) precursors", *J. Mater. Chem.*, **22**(27), 13455-13459, 2012.
43. S.C. Chung, P. Barpanda, S. Nishimura, Y. Yamada, A. Yamada, "Polymorphs of $LiFeSO_4F$ as cathode materials for lithium ion battery- A first principle computational study", *Phys. Chem. Chem. Phys.*, **14**(24), 8678-8682, 2012.
44. N. Furuta, S. Nishimura, P. Barpanda, A. Yamada, "Fe^{3+}/Fe^{2+} redox couple approaching 4 V in $Li_{2-x}(Fe_{1-y}Mn_y)P_2O_7$ pyrophosphate cathodes", *Chem. Mater.*, **24**(6), 1055-1061, 2012.
45. P. Barpanda*, R. Dedryvere, M. Deschamps, C. Delacourt, M. Reynaud, A. Yamada, J.M. Tarascon, "Enabling the Li-ion conductivity of Li-metal fluorosulphates by ionic liquid grafting", *J. Solid State Electrochem.*, **16**(5), 1743-1751, 2012. (*ICMAT-2011* Special Issue).
46. M. Reynaud, P. Barpanda, G. Rousse, J-N. Chotard, B. Melot, N. Recham, J-M. Tarascon, "Synthesis and crystal chemistry of the $NaMSO_4F$ family (M = Mg, Fe, Co, Cu, Zn)", *Solid State Sci.*, **14**(1), 15-20, 2012.
47. P. Barpanda, M. Ati, B.C. Melot, G. Rousse, J-N. Chotard, M-L. Doublet, M-T. Sougrati, S.A. Corr, J.C. Jumas, J-M. Tarascon, "A 3.90 V iron-based fluorosulphate material for lithium-ion batteries crystallizing in the triplite structure", *Nature Materials*, **10**(10), 772-779, 2011.
48. M. Ati, B.C. Melot, G. Rousse, J.N. Chotard, P. Barpanda, J.M. Tarascon, "Structural and electrochemical diversity in the $LiFe_{1-\delta}Zn_\delta SO_4F$ solid solution: a Fe-based positive-electrode material", *Angew. Chem. Int. Ed.*, **50**, 10574-10577, Aug 2011 (Highlighted as 'Hot Paper').
49. P. Barpanda*, G. Fanchini, G.G. Amatucci, "Structure, surface morphology and electrochemical properties of brominated activated carbons", *Carbon*, **49**(7), 2538-2548, 2011.
50. P. Barpanda, K. Djellab, N. Recham, M. Armand, J-M. Tarascon, "Direct and modified ionothermal synthesis of $LiMnPO_4$ with tunable morphology for rechargeable Li-ion batteries", *J. Mater. Chem.*, **21**(27), 10143-10152, 2011. (Themed Issue on 'Advanced Materials for Lithium Batteries') (Highlighted as 'Hot Paper') (*Inside Cover Page Image*).
51. P. Barpanda, J-N. Chotard, C. Delacourt, M. Reynaud, Y. Filinchuk, M. Armand, M. Deschamps, J-M. Tarascon, "$LiZnSO_4F$ made in an ionic liquid: a ceramic electrolyte composite for solid-state lithium batteries", *Angew. Chem. Int. Ed.*, **50**(11), 2526-2531, 2011 (Highlighted as 'Hot Paper').
52. P. Barpanda*, "Magnetisation reversal in cylindrical nickel nanobars involving magnetic vortex structure: A micromagnetic study", *Physica B*, **406**(6-7), 1336-1340, 2011.
53. P. Barpanda*, K. Djellab, R.K. Sadangi, A. Sahu, D. Roy, K. Sun, "Structural and electrochemical modification of graphitic carbons by vapor-phase iodine-incorporation", *Carbon*, **48**(14), 4178-4189, 2010.

54. P. Barpanda, J-N. Chotard, N. Recham, C. Delacourt, M. Ati, L. Dupont, M. Armand, J-M. Tarascon, "Structural, transport, and electrochemical investigation of novel $AMSO_4F$ (A = Na, Li; M = Fe, Co, Ni, Mn) metal fluorosulphates prepared using low temperature synthesis routes", *Inorg. Chem.*, **49**(16), 7401-7413, 2010.
55. M. Ati, M-T. Sougraty, N. Recham, P. Barpanda, J.B. Leriche, M. Courty, M. Armand, J.C. Jumas, J-M. Tarascon, "Fluorosulphate positive electrodes for Li-ion batteries made via a solid-state dry process", *J. Electrochem. Soc.*, **157**(9), A1007-1015, 2010.
56. M. Ati, L. Dupont, N. Recham, J-N. Chotard, W.T. Walker, C. Davoisne, P. Barpanda, V. Sarou-Kanian, M. Armand, J-M. Tarascon, "Synthesis, structural, and transport properties of novel bihydrated fluorosulphates $NaMSO_4F.2H_2O$ (M = Fe, Co and Ni)", *Chem. Mater.*, **22**(13), 4062-4068, 2010.
57. P. Barpanda, N. Recham, J-N. Chotard, K. Djellab, W. Walker, M. Armand, J-M. Tarascon, "Structure and electrochemical properties of novel mixed $Li(Fe_{1-x}M_x)SO_4F$ (M = Co, Ni, Mn) phases fabricated by low temperature ionothermal synthesis", *J. Mater. Chem.*, **20**(9), 1659-1668, 2010 (*Cover Page Image*).
58. J-M. Tarascon, N. Recham, M. Armand, J-N. Chotard, P. Barpanda, W. Walker, L. Dupont, "Hunting for better Li-based electrode materials via low temperature inorganic synthesis", *Chem. Mater.*, **22**(3), 724-739, 2010. ("Materials Chemistry of Energy Conversion Special Issue") (*Cover Page Image*).
59. P. Barpanda*, Y. Li, F. Cosandey, S. Rangan, R.A. Bartynski, G.G. Amatucci, "Fabrication, physical and electrochemical investigation of microporous carbon polyiodide nanocomposites", *J. Electrochem. Soc.*, **156**(11), A873-885, 2009. (Highlighted in *Virtual Journal of Nanoscale Science and Technology*, **20**(13), 28 Sep 2009 Issue).
60. P. Barpanda*, "Fabrication, structure and electrochemistry of iodated microporous carbons of low mesoporosity", *Electrochemical Society Interface*, **16**(4), 57-58, 2007. (Final report of C.G. Fink Fellowship-2007 of the Electrochemical Society).
61. P. Barpanda*, G.Fanchini, G.G. Amatucci, "The physical and electrochemical characterization of vapor phase iodated activated carbons", *Electrochim. Acta*, **52**(24), 7136-7147, 2007.
62. P. Barpanda*, G. Fanchini, G.G. Amatucci "Physical and electrochemical properties of iodine-modified activated carbons", *J. Electrochem. Soc.*, **154**(5), A467-476, 2007.
63. P. Barpanda*, M.R. Scheinfein, T. Kasama, R.E. Dunin-Borkowski, "The role of magnetic vortex formation in chains of spherical FeNi nanoparticles: A micromagnetic study", *Jpn. J. Appl. Phys.*, **48**(10), 103002(1-6), 2009.
64. P. Barpanda*, "Micromagnetics of magnetization reversal mechanism in Permalloy chain-of-sphere structure with magnetic vortices", *Comp. Mater. Sci.*, **45**(2), 240-246, 2009.
65. P. Barpanda*, T. Kasama, M.R. Scheinfein, R.E. Dunin-Borkowski, A.S. Arrott, "Evolution and propagation of magnetic vortices in chains of Permalloy nanospheres", *J. Appl. Phys.*, **99**(8), 08G103, 1-3, 2006.
66. T. Kasama, P. Barpanda, R.E. Dunin-Borkowski, S. Newcomb, F. Castano, C.A. Ross, "Off-axis electron holography of pseudo-spin-valve thin-film magnetic elements", *J. Appl. Phys.*, **98**(1), 013903, 1-7, 2005.
67. P. Barpanda*, S.M. Kulkarni, Kishore, "Sliding wear behaviour of an epoxy reinforced with particulate fly ash filler," *Adv. Compos. Lett.*, **18**(6), 211-217, 2009.
68. P. Barpanda, S.K. Behera, P.K. Gupta, S.K. Pratihar, S. Bhattacharyya "Chemically induced order disorder transition in magnesium aluminium spinel," *J. Eur. Ceram. Soc.*, **26**(13), 2603-2609, 2006.

69. Kishore, P. Barpanda, S.M. Kulkarni, "Compression strength of saline water-exposed epoxy system containing fly ash particles," *J. Reinf. Plast. Compos.*, **24**(15), 1567-1576, 2005.
70. S.K. Behera, P. Barpanda, S.K. Pratihar, S. Bhattacharya "Synthesis of magnesium-aluminium spinel from autoignition of citrate-nitrate gel," *Mater. Lett.*, **58**(9), 1451-1455, 2004.

Conference Proceedings: (* means corresponding author)

1. B. Senthilkumar, K. Sada, P. Barpanda*, "Carbon coated $Na_4Co_3(PO_4)_2P_2O_7$: A multifunctional cathode material for hybrid sodium-air battery", *Procedia Engg.*, In Press, 2017.
2. D. Dwibedi, P. Barpanda*, "Solution-assisted energy-savvy synthesis of high-voltage $Na_2M_2(SO_4)_3$ (M = 3d metals) alluaudite family of sodium insertion materials", *Mater. Today Proc.*, In Press, 2017.
3. D. Dwibedi, P. Barpanda, "Alluaudite class of high voltage sodium insertion materials: An interplay of polymorphism and magnetism", *AIP Conf. Proc.*, **1832**, 130041, 2017.
4. A. Rambabu, B. Kishore, N. Munichandraiah, S. B. Krupanidhi, P. Barpanda, "$Na_2Ti_6O_{13}$ thin films as anode for thin film sodium ion batteries", *AIP Conf. Proc.*, **1832**, 080059, 2017.
5. D. Dwibedi, P. Barpanda*, "Designing novel sulphate-based ceramic materials as insertion host compounds for secondary batteries", *Trans. Ind. Ceram. Soc.*, **74**(4), 191-194, 2015.
6. P. Barpanda*, Y. Yamashita, A. Yamada, "Enabling lithium metal borate cathodes: Synthetic and electrochemical insights", *Proceeding of the 14th ACSSI*, 1-10, 2014.
7. P. Barpanda*, T. Ye, J. Lu, Y. Yamada, S.C. Chung, S. Nishimura, M. Okubo, H. Zhou, A. Yamada, "Splash combustion synthesis and exploration of alkali metal pyrophosphate ($A_2MP_2O_7$; A = Li, Na) cathodes", *ECS Trans.*, **50**(24), 71-77, 2013.
8. P. Barpanda*, Y. Yamashita, S.C. Chung, Y. Yamada, S. Nishimura, A. Yamada, "Revisiting the lithium iron borate ($LiFeBO_3$) cathode system: Synthetic and electrochemical findings", *ECS Trans.*, **50**(24), 21-26, 2013.
9. P. Barpanda*, M. Ati, B.C. Melot, J.N. Chotard, G. Rousse, J-M. Tarascon, "Effect of both Mn and Zn partial substitution on the electrochemical performance of $LiFeSO_4F$", *ECS Trans.*, **45**(29), 227-233, 2013.
10. M. Ati, M-T. Sougrati, N. Recham, P. Barpanda*, M. Reynaud, C. Delacourt, J-C. Jumas, M. Armand, J-M. Tarascon, "Synthesis of new fluorosulphate materials using different approaches", *ECS Trans.*, **35**(32), 57-63, 2011.
11. P. Barpanda*, M. Ati, N. Recham, J-N. Chotard, W. Walker, M. Armand, J-M. Tarascon, "Crystal structure and electrochemical study of $A(Fe_{1-x}M_x)SO_4F$ (A =Li/ Na; M = Co/Ni/Mn) fluorosulfates prepared by low temperature ionothermal synthesis", *ECS Trans.*, **28**(31), 1-9, 2010.
12. P. Barpanda*, N. Recham, K. Djellab, A. Boulineau, M. Armand, J-M. Tarascon, "Ionothermal synthesis and electrochemical characterization of nanostructured lithium manganese phosphates", *ECS Trans.*, **25**(14), 1-7, 2010.
13. P. Barpanda*, G.G. Amatucci, "Structure and electrochemistry of carbon-bromine nanocomposites electrodes for electrochemical energy storage", *Mater. Res. Soc. Symp. Proc.*, **1127**, T01-11, 2008.
14. P. Barpanda*, G. Fanchini, G.G. Amatucci, "Faradaic and non-faradaic reaction mechanisms in carbon-iodine nanocomposites electrodes for asymmetric hybrid supercapacitors", *ECS Trans.*, **13**(17), 13-18, 2008.

15. P. Barpanda*, G. Fanchini, G.G. Amatucci, "Microporous carbon-halide nanocomposites electrodes for symmetric & asymmetric capacitor", *Mater. Res. Soc. Symp. Proc.*, **1100**, JJ06-04, 2008.
16. P. Barpanda*, "Stability of larger ferromagnetic chain-of-sphere nanostructure comprising magnetic vortices", *Mater. Res. Soc. Symp. Proc.*, **1071**, F03-14, 2008.
17. P. Barpanda*, G. Fanchini, G.G. Amatucci, "Study of underlying electrochemical mechanisms in nanoscale amorphous carbon-iodine electrodes", *ECS Trans.*, **11**(31), 113-118, 2008.
18. P. Barpanda*, G. Fanchini, G.G. Amatucci, "Nanostructured Halide Modified Carbon Electrodes for Symmetric and Asymmetric Electrochemical Supercapacitors", *ECS Trans.*, **6**(25), 177-182, 2008.
19. P. Barpanda*, G.G. Amatucci, "Carbon-halide nanocomposites for asymmetric hybrid supercapacitors", *Mater. Res. Soc. Symp. Proc.*, **1056**, HH03-51, 2007.
20. I. Plitz, M. Kunduraci, A. DuPasquier, P. Barpanda, M. Cervenak, P. Smith, G.G. Amatucci, High power non-aqueous chemistries based on nanostructured lithium titanate, *Proceedings of the Power Sources Conference*, **42**, 575-578, 2006.
21. K.K.K. Koziol, T. Kasama, R. Dunin-Borkowski, P. Barpanda, A.Windle, "Electron holography of ferromagnetic nanoparticles encapsulated in three-dimensional arrays of aligned nanotubes", *Mater. Res. Soc. Symp. Proc.*, **962E**, P13-03, 2006.
22. P. Barpanda*, G.G. Amatucci, "Activated carbons for high power storage: below the surface of non-Faradaic reactions", *Mater. Res. Soc. Symp. Proc.*, **973E**, BB07-02, 2006.
23. P. Barpanda*, "A novel combustion synthesis technique to produce high-quality olivine based $LiFePO_4$: a next generation cathode materials for rechargeable battery", *ICC Proceedings: Frontier of Ceramic Research*, 1-5, 2006. (**Best Student Paper Award by NSF-USA**).
24. P. Barpanda*, S. Pratihar & S. Bhattacharya, "Does the chemically induced disorderness in spinel structure affect its sintering kinetics?," *TMS Proceedings: Science and technology of powder materials: synthesis, consolidation and properties*, 87-95, 2005.
25. P. Barpanda*, "Recent advances in solid oxide fuel cells (SOFC)", *Proceedings of Indian Ceramic Society*, 1-6, 2002. (Best Undergraduate Student Paper by InCerS, India).

Selected Research Workshops: (in Nine countries)

1. '17th School on neutrons as probes of condensed matter (NPCM)', Bhabha Atomic Research Centre (BARC), Mumbai, MH, India, January 27-31, 2015. (with Financial Support)
2. 'ECS-India School on advances in batteries and supercapacitors', conducted by Prof. D. Aurbach, Kodaikanal, TN, India, May 13-15, 2014.
3. 'ICMS-Cambridge University winter school on frontiers in materials science', Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore, India, December 3-8, 2012. (with Financial Support).
4. 'Carbon materials for energy storage and generation' (*Elsevier*), Shanghai, China, 24 Jul 2011.
5. 'The 2010 CAMD summer school on electronic structure theory and materials design', Technical University of Denmark, Lyngby, Denmark, Aug 14-20, 2010 (Full Financial Support from DTU, Denmark).
6. Workshop on 'Fluorinated materials and energy conversion (FMEC-2010)', ICMCB, Bordeaux, France, April 12-13, 2010 (presented an Invited Talk).
7. 'Pan-American Advanced Studies Institute (PASI) workshop on Microscopy techniques for nanomaterials', Cancun, Mexico, Aug 21-29, 2008. (Full Financial Support from NSF-USA)

8. 'Grand challenges of electron chemistry & catalysis at interfaces', University of California, Santa Barbara (UCSB), CA, USA, Aug 10-15, 2008. (with Full Scholarship).
9. 'Solid state chemistry', Gordon research conference GRC-2008, New London, NH, USA, Jul 27-31, 2008. (Director's funding).
10. '20th annual workshop on recent developments in electronic structure methods', University of Illinois at Urbana-Champaign (UIUC), IL, USA, Jun 18-20, 2008 (with Full Scholarship).
11. '1st USINSEI-Indo-US advanced studies institute on nanoscale science and engineering', Chennai, India, Jan 09-18, 2008 (Full Financial Support from NSF-USA).
12. 'X-ray Physics', Gordon research conference 2007, New London, NH, USA, Aug 05-10, 2007. (Director's funding).
13. '1st International Ceramic Congress- Global roadmap for ceramic research', Toronto, Canada, Jun 25-29, 2006 (Full Financial Support from NSF-USA).
14. 'Solid-state studies in ceramics: Optimization of performance through microstructural design', Gordon research conference 2006, Andover, NH, USA, Aug 13-18, 2006. (Director's funding).
15. 'Stereochemical aspects of novel materials', University of California, Santa Barbara (UCSB), CA, USA, August 14-27, 2005. (with Full Scholarship).
16. 'Summer school on computational materials science', University of Illinois at Urbana-Champaign (UIUC), IL, USA, June 13-27, 2005 (with Full Scholarship).
17. 'Summer school and workshop on targets and ion sources', Oak Ridge National Lab (ORNL), TN, USA, May 23-27, 2005 (with Full Scholarship).
18. 'Workshop on strongly correlated electronic materials', Princeton Centre for Complex Materials (PCCM), Princeton University, NJ, USA, Jan 27-28, 2005.
19. '5th Swiss Light Source users meeting', Paul Scherer Institute (PSI), Zurich, Switzerland, October 4-5, 2004.
20. 'Workshop on Nanomaterials–Part II', International Max Planck Research School on Advanced Materials (IMPRS-AM), Stuttgart, Germany, Sept 27-29, 2004.

Research Seminars: (in Thirteen countries)

1. "Exploring high energy density cathode materials for sodium ion batteries", Shell Technology Centre Bangalore (STCB), Bangalore, India, 6 Sep 2017.
2. "Polyanionic battery insertion materials: Some case studies", Indian Institute of Technology Hyderabad (IITH), Hyderabad, India, 24 Aug 2017.
3. "High rate positive insertion materials for Na-ion batteries: Two case studies", Tel Aviv University, Tel Aviv, Israel, 2nd Aug 2017.
4. "Polyanionic cathode materials for Li-ion batteries with high energy density", Weizmann Institute of Science, Rehovot, Israel, 19 Jul 2017.
5. "Developing Fe-based battery electrode materials: Few case studies", Indian Institute of Science Education and Research Mohali (IISER), Mohali, India, 31st March 2017.
6. "Structure and electrochemical properties of some 3d framework electrode materials", Indian Institute of Technology Bhubaneswar (IITBBS), Bhubaneswar, India, November 2016.
7. "Solution assisted synthesis of nanostructured electrode materials for rechargeable batteries", Uppsala University, Uppsala, Sweden, August 2016.
8. "Four case studies on iron-based polyanionic insertion compounds for secondary batteries", Tokyo Denki University, Tokyo, Japan, July 2016.
9. "Polyanionic battery cathode materials $A_xM_y[(SO_m)_n]$: Few case studies with X = S", Tokyo University of Science, Tokyo, Japan, July 2016.

10. "Materials chemistry as a tool to design high energy density batteries", Tokyo University of Science, Tokyo, Japan, June 2016.
11. "Thermal methods for materials evaluation", Central Power Research Institute (CPRI), Bangalore, India, Feb 2016.
12. "Economic pyrophosphate insertion materials for high-voltage lithium-ion batteries", Technion- Israel Institute of Technology, Haifa, Israel, Nov 2015.
13. "Fe-based polyanionic insertion compounds for secondary batteries", Bar-Ilan University, Ramat-Gan, Israel, Nov 2015.
14. "Development of chemically stable iron-based chemistry for secondary battery materials", Osaka University, Osaka, Japan, July 2015.
15. "High-voltage polyanionic positive insertion materials for Li-ion and Na-ion batteries", Kyushu University, Fukuoka, Japan, July 2015.
16. "High-voltage polyanionic cathode materials for sodium-ion batteries", Saga University, Saga, Japan, June 2015.
17. "Polyanionic chemistry as an alternative of oxides for Li-battery cathode materials", St. Joseph College, Bangalore, India, 13th Feb 2015.
18. "Materials and ionics aspect of some new cathodes for secondary batteries", National Institute of Fundamental Studies (NIFS), Kandy, Sri Lanka, 02nd Jan 2015.
19. "Oxyanionic ceramic materials for low-cost and sustainable rechargeable batteries", Thailand Institute of Scientific & Technological Research (TISTR), Bangkok, Thailand, 21st Nov 2014.
20. "Discovery and design of high-voltage polyanionic cathodes for next-generation Li-ion and Na-ion batteries", King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia, 10th Sep 2013.
21. "Rich world of pyrophosphate polyanionic compounds for Li- and Na-ion batteries", Seoul National University (SNU), Seoul, Korea, 28th Aug 2013.
22. "Crystal/ magnetic structures and electrochemical performances of pyrophosphate family of cathode materials", Ulsan National Institute of Science and Technology (UNIST), Ulsan, Korea, 26th Aug 2013.
23. "Recent advances in sulphate-based cathode materials for secondary alkali-ion batteries", Pohang University of Science and Technology (POSTECH), Pohang, Korea, 23rd Aug 2013.
24. "Overview of sulphate-based polyanionic insertion compounds for rechargeable batteries", Daegu Gyeongbuk Institute of Science and Technology (DGIST), Daegu, Korea, 22nd Aug 2013.
25. "New classes of polyanionic compounds for Li-ion and Na-ion batteries", SungKyunKwan University (SKKU), Suwon, Korea, 21th Aug 2013.
26. "Innovation of alkali metal fluorosulphate and pyrophosphate polyanionic insertion materials for secondary batteries", IMRAM, Tohoku University, Sendai, Japan, 17th May 2013.
27. "Economic synthesis and materials for rechargeable Li-ion and Na-ion batteries", RIKEN Advanced Science Institute, Saitama, Japan, 12th Mar 2013.
28. "Developing novel cathodes for rechargeable Li-ion and Na-ion batteries with earth-abundant elements", Indian Institute of Science, Bangalore, India, 6th Dec 2012.
29. "Novel economic iron-based sulphate and diphosphate containing polyanionic cathodes for rechargeable batteries: $AFeSO_4F$ and $A_2FeP_2O_7$ (A = Li/ Na)", Kyushu University, Kasuga, Japan, 12th November 2012.
30. "Designing novel low-cost iron-based polyanionic cathode materials for secondary batteries: Energy-savvy syntheses, structural and electrochemical insights", Japan Fine Ceramic Center (JFCC), Nagoya, Japan, 26th October 2012.

31. "Green synthesis, crystal/ magnetic structure and electrochemical insights on novel metal fluorosulphate ($AMSO_4F$) cathode materials for next-generation batteries", National Taiwan University of Science and Technology, Taipei, Taiwan, 9th Oct 2012.
32. "Gen-next Li-ion batteries: Developing new cathode materials", Indian Institute of Science, Bangalore, India, 4th Jul 2012.
33. "Synthesis of fluorosulphate and pyrophosphate polyanionic cathode systems for rechargeable Li-ion batteries", Indian Institute of Technology, Bombay, India, 13th Jan 2012.
34. "Novel fluorosulphate and pyrophosphate based polyanionic cathode materials for Li-ion batteries", Indian Institute of Technology, Bombay, India, 11th Jan 2012.
35. "Alkali metal fluorosulphates ($AMSO_4F$): Eco-friendly synthesis and electrochemical usages", Fudan University, Shanghai, P.R. China, 25th Jul 2011.
36. "Low-temperature synthesis of olivines and metal fluorosulphates: Aspects of synthesis, structure and electrochemical properties", University of Tokyo, Tokyo, Japan, 27th Jan 2011.
37. "Metal fluorosulfate chemistry for Li- and Na-ion batteries: Fundamental perspectives on synthesis, structure and electrochemical properties", Lomonosov Moscow State University, Moscow, Russia, 5th October 2010.
38. "Physical and electrochemical study of halide-modified activated carbons", Department of chemistry, Dalhousie University, Halifax, Nova Scotia, Canada, 21st Nov 2008.
39. "Structure and electrochemistry of novel carbon-iodine nanocomposites", General Electric Inc., Niskayuna, NY, USA, 25th Oct 2008.
40. "Structure, morphology and electrochemistry of carbon-halide nanocomposites", Brookhaven National Laboratory, Upton, NY, USA, 12th Sept 2008.

Selected Conference Presentations: (* means presenting author)

1. D. Dwibedi, P. Barpanda*, "Recent advances in alluaudite class of sodium battery materials" (ORAL), to be presented at 21st International Symposium on Batteries, Fuel Cells & Capacitors (ISBFCC-19), November 2017, Fukuoka, Japan. (**Invited Talk**)
2. G.S. Shinde, B. Senthilkumar, P.D. Nayak, P. Barpanda*, "$Na_{0.7}MnO_{2.05}$ as cathode materials for Na-ion batteries and Na-ion capacitors" (ORAL), 1st World Conference on Solid Electrolytes for Advanced Applications: Garnets and Competitors (GARNET-2017), September 2017, Pondicherry, India. (**Invited Talk**)
3. D. Dwibedi, P. Barpanda, "Stoichiometrically driven electrochemistry in alluaudite class of sodium insertion host" (POSTER), 1st World Conference on Solid Electrolytes for Advanced Applications: Garnets and Competitors (GARNET-2017), September 2017, Pondicherry, India. (***Best Poster Award***)
4. B. Senthilkumar, K. Sada, P. Barpanda, "Sodium metal phosphates as an efficient electrocatalysts for rechargeable non-aqueous and aqueous sodium-air batteries" (POSTER), 1st World Conference on Solid Electrolytes for Advanced Applications: Garnets and Competitors (GARNET-2017), September 2017, Pondicherry, India. (***Best Poster Award***)
5. P. Barpanda*, "Enhanced energy density in oxides and alluaudites battery materials" (ORAL), 24th Congress of International Union of Crystallography (IUCr-2017), August 2017, Hyderabad, India. (**Invited Talk**)
6. A. Chaupatnaik, A. Dayamani, P. Barpanda, "First demonstration of $P2_1/m$ framework lead tri-titanate as low voltage anode for rechargeable Na-ion batteries" (ORAL), 2nd International Conference on Electrochemical Science and Technology (ICONEST), Aug 2017, Bangalore,

India. (***Best Oral Paper Award***)

7. K. Sada, B. Senthilkumar, P. Barpanda, "Electrochemical potassium-ion intercalation properties of layered P2-type Na_xCoO_2" (POSTER), 2nd International Conference on Electrochemical Science and Technology (ICONEST), Aug 2017, Bangalore, India. (***Best Poster Award***)
8. D. Dwibedi, P. Barpanda, "Aqueous sustainable synthesis of alluaudite family of high-voltage sodium battery materials" (ORAL), 9th International Conference on Materials for Advanced Technologies (ICMAT), June 2017, Singapore. ***(Winner: MRS-Singapore Graduate Student Award***)
9. P. Barpanda*, "Synthetic, electrochemical and diffusional insights of some Ti-based anodes" (ORAL), 9th International Conference on Materials for Advanced Technologies (ICMAT), June 2017, Singapore. (**Invited Talk**)
10. R. Gond, L. Sharma, G.S. Shinde, P. Barpanda, "Phosphate-based polyanionic insertion materials for Na-ion and K-ion batteries: Four case studies" (POSTER), 9th International Conference on Materials for Advanced Technologies (ICMAT), June 2017, Singapore. (***Best Poster Award***)
11. L. Sharma, S. Franger, P. Barpanda, "Synthesis and electrochemistry of nanoscale sodium iron fluorophosphate synthesized by a combustion method for rechargeable sodium batteries" (ORAL), European Materials Research Society (E-MRS) Spring Meeting, May 2017, Strasbourg, France. ***(Winner: EMRS Young Scientist Award for outstanding paper)***
12. P. Barpanda, "Transition metal borates as lithium insertion materials" (ORAL), 3rd International Conference of Young Researchers on Advanced Materials (IUMRS-ICYRAM 2016), Dec 2016, Bangalore, India. (**Invited Talk**)
13. S. Ghosh, A. Dayamani, P. Barpanda*, "Energy-miser synthesis of Ti-based anodes for secondary batteries: Electrochemical and diffusional insights" (ORAL), 11th International Symposium on Advances in Electrochemical Science and Technology (ISAEST-2016), Dec 2016, Chennai, India. (***Best Paper Award***)
14. L. Sharma, P. Barpanda, "Solution combustion synthesis of sodium iron fluorophosphate cathode material" (POSTER), 15th Asian Conference on Solid State Ionics ACSSI 2016, Nov 2016, Patna, India. (***Best Poster Award***)
15. R. Gond, G. Shinde, P. Barpanda*, "Insights on new phosphate compounds for Na-ion batteries" (ORAL), 67th Annual ISE Meeting, Aug 2016, The Hague, The Netherlands. (**Invited Talk**) (**ISE Prize for Applied Electrochemistry Lecture**)
16. S. Okada, D. Tsunoe, A. Kitajou, H. Hori, N. Dimov, P. Barpanda, "Possibility of composite cathodes with sacrificial salts" (ORAL), 18th International Meeting on Lithium Batteries (IMLB-18), Jun 2016, Chicago, IL, USA. (**Invited Talk**)
17. D. Dwibedi, P. Barpanda*, "Na-M-S-O quaternary cathode materials for high voltage sodium batteries" (ORAL), 229th ECS Meeting, May 2016, San Diego, CA, USA. (**Invited Talk**) (**ECS ETD Supramanian Srinivasan Young Investigator Award Lecture**)
18. D. Dwibedi, G.S. Shinde, P. Barpanda*, "New sodium iron sulfate chemistry for grid-scale power storage: materials perspective" (ORAL), Materials Research Society (MRS) Spring Meeting, March 2016, Phoenix, AZ, USA. (**Invited Talk**)
19. D. Dwibedi, G. Shinde, P. Barpanda*, "Alluaudite frameworks for sodium batteries" (ORAL), International Battery Association Meeting (IBA-2016), March 2016, Nantes, France. (**Invited Talk**)
20. S. Okada, A. Kitajou, H. Hori, N. Dimov, T. Yamashita, D. Tsunoe, P. Barpanda, "Composite cathodes with LiF/NaF for Li/Na-ion batteries" (ORAL), 40th International Conference and

Exposition on Advanced Ceramics and Composites (ICACC-40), Jan 2016, Daytona Beach, FL, USA. (**Invited Talk**)

21. P. Barpanda*, "High-voltage iron based battery electrodes" (ORAL), Joint Indo-French workshop on advanced materials, January 2016, Bangalore, KA, India. (**Invited Talk**)
22. P. Barpanda*, "High-capacity borate based functional ceramics for Li-ion batteries" (ORAL), Ceramic and Advanced Materials for Energy and Environment (CAMEE-2015), December 2015, Bangalore, KA, India. (**Invited Talk**)
23. P. Barpanda*, "SO_4-based polyanionic cathodes for Li-ion batteries: Reality check for EV applications" (ORAL), 7th Indo-Korea Joint Workshop on Green Mobility and Energy Materials, November 2015, Hyderabad, India. (**Invited Talk**)
24. A. Yamada, M. Okubo, P. Barpanda, S. Nishimura, S.C. Chung, G. Oyama, Y. Suzuki, "Alluaudite $Na_{2+2x}Fe_{2-x}(SO_4)_3$ as 3.8 V sodium battery cathode", The 66th Annual ISE Meeting, Oct 2015, Taipei, Taiwan. (**Keynote Talk**)
25. D. Dwibedi, P. Barpanda*, "Ionothermal synthesis and electrochemical study of novel alluaudite $Na_2Fe_2(SO_4)_3$ sodium-ion cathode" (ORAL), European Materials Research Society (E-MRS) Fall Meeting, September 2015, Warsaw, Poland. (***Invited Talk***)
26. P. Barpanda*, R. Gond, D. Dwibedi, "Green synthesis of phosphate polyanionic cathode materials: Polymorphism and electrochemistry" (ORAL), The 11th Pacific Rim Conference of Ceramic Societies (PACRIM-11), August 2015, Jeju Island, Korea. (***Invited Talk***)
27. D. Dwibedi, G.S. Shinde, P. Barpanda*, "Aqueous sustainable synthesis of high-voltage sulphate-based polyanionic cathodes for secondary batteries" (ORAL), The 8th Asian Conference on Electrochemical Power Sources (ACEPS-8), August 2015, Kunming, China. (***Invited Talk***)
28. D. Dwibedi, P. Barpanda, "The *alluaudite* family of sodium insertion materials: Synthesis, structure and magnetic properties" (POSTER), ICMAT-2015 & IUMRS-ICA-2015, June 2015, Suntec, Singapore. (***Best Poster Award***)
29. P. Barpanda*, D. Dwibedi, "Alternate sustainable synthesis methods to develop Na-Fe-S-O quaternary cathodes: Structural and electrochemical aspects" (ORAL), ICMAT-2015 & IUMRS-ICA-2015, June 2015, Suntec, Singapore.
30. S. Ghosh, Y. Kee, S. Okada, P. Barpanda, "Energy-savvy synthesis of Ti-based anodes for Li-ion batteries" (POSTER), The 26th Annual General Meeting of Materials Research Society of India (MRSI 26th AGM), February 2015, Jaipur, RJ, India. (***Best Poster Award***)
31. P. Barpanda*, "Designing novel chalcogenide ceramics as efficient energy storage materials for sodium-ion batteries" (ORAL), 78th Annual Session of the Indian Ceramic Society (CeraViz-2015), February 2015, Jamshedpur, JH, India. (**R.L. Thakur Award Lecture**)
32. P. Barpanda*, "Sulphate-based nanostructured polyanionic cathodes: Realization of the highest Fe^{3+}/Fe^{2+} redox voltage for advanced batteries" (ORAL), Second International Workshop on Nano Materials for Energy Conversion (NMEC-2), November 2014, Ho Chi Minh City, Vietnam.
33. P. Barpanda*, A. Yamada, "Fresnoite and alluaudite framework 3.8 V insertion materials for sodium-ion batteries" (ORAL), 65th Annual ISE Meeting, Sep 2014, Lausanne, Switzerland.
34. P. Barpanda*, "Novel sulphate compounds as high-voltage Fe-based cathodes" (ORAL), The 1st Cooperative Forum on Energy Conversion and Storage, Aug 2014, Kyushu University, Aug 2014, Fukuoka, Japan. (***Invited Talk***)
35. P. Barpanda*, Y. Yamashita, A. Yamada, "Enabling lithium metal borate cathodes: Synthetic and electrochemical insights" (ORAL), 14th Asian Conference on Solid State Ionics ACSSI 2014, Jun 2014, Singapore. (***Invited Talk***)

36. A. Yamada, J. Lu, S.C. Chung, G. Oyama, S. Nishimura, P. Barpanda, "Comparative studies of Li vs. Na systems: Phase diagram and new polyanionic cathodes" (ORAL), MRS Spring Meeting, April 2014, San Francisco, CA, USA. (**Invited Talk**)
37. P. Barpanda*, G. Liu, M. Avdeev, C.D. Ling, S.C. Chung, Y. Yamada, A. Yamada, "Alkali metal pyrophosphate polyanionic cathodes for rechargeable batteries" (ORAL), The 14th IUMRS-ICA 2013, Dec 2013, Bangalore, India.
38. P. Barpanda*, M. Avdeev, G. Rousse, C.D. Ling, T. Ye, J. Lu, A. Yamada, "Illustration of the magnetic structure and physical properties of some oxyanionic cathode materials" (POSTER), ICMAT-2013, June 2013, Suntec, Singapore. (***Best Poster Award***).
39. P. Barpanda*, J. Lu, T. Ye, S. Nishimura, M. Okubo, Y. Yamada, S.C. Chung, H. Zhou, A. Yamada, "$Na_2FeP_2O_7$: a 3 V high-rate cathode for sodium-ion batteries" (ORAL), The 19th International Conference on Solid State Ionics (SSI-19), June 2013, Kyoto, Japan.
40. P. Barpanda*, T. Ye, N. Furuta, S.C. Chung, S. Nishimura, Y. Yamada, A. Yamada, "Observation of the highest $Fe^{2+/3+}$ redox potential approaching 4.0 V in fluorosulphates and pyrophosphates polyanionic cathodes" (ORAL), 63rd Annual ISE Meeting, Aug 2012, Prague, Czech Republic. (***ISE Travel Award***)
41. P. Barpanda*, "High voltage polyanionic cathode materials for lithium ion batteries" (ORAL), 1st ICYRAM-2012, Jul 2012, Singapore. (***Invited Talk***)
42. P. Barpanda*, M. Ati, G. Rousse, J-N. Chotard, B.C. Melot, J-M. Tarascon, "Realizing the highest $Fe^{II/III}$ redox potential at 3.9 V in a triplite-structured metal fluorosulphate cathode for Li-ion batteries" (ORAL), 10th Spring ISE Meeting, Apr 2012, Perth, Australia. ***(ISE support of Registration Fee Waiver)***
43. P. Barpanda*, A. Yamada, "Fluorosulphate cathodes" (ORAL), SNU-UT Workshop on Defect Chemical Nature of Advanced Materials: JSPS Asian Core Pragram, Mar 2012, Tokyo, Japan. (***Invited Talk***)
44. P. Barpanda*, "Insights into the development of faradaic activity in halidated carbons $C:H_n$ (H = Br, I)" (ORAL), 6th ACEPS Meeting, Jan 2012, Chennai, India. (***Best Paper Award*** given by Energy & Environmental Sciences, Royal Society of Chemistry).
45. P. Barpanda*, T. Ye, N. Furuta, D. Shimizu, S.C. Chung, S. Nishimura, A. Yamada, "Structural and electrochemical insights on novel $Li_2(Fe_{1-x}M_x)P_2O_7$ (M = Mn/ Co) pyrophosphate cathodes for Li-ion batteries" (ORAL), AEES-2011, Dec 2011, Hong Kong.
46. J-M. Tarascon, P. Barpanda, M. Ati, G. Rousse, J.N. Chotard, B.C. Melot, N. Recham, M. Armand, M. Reynaud, "F-based polyanionic structural frameworks and their use in Li-ion batteries", (ORAL), 62nd Annual ISE Meeting, Sep 2011, Niigata, Japan. (***Plenary***)
47. P. Barpanda*, J-N. Chotard, C. Delacourt, M. Reynaud, M. Armand, J-M. Tarascon, "Ionic liquid grafting as a novel route to develop ceramic electrolytes for solid-state Li-batteries" (ORAL), ICMAT-2011, June 2011, Suntec, Singapore. (***Travel Support***) (***Session Chair***)
48. P. Barpanda*, N. Recham, M. Armand, J-N. Chotard, M. Ati, W. Walker, L. Dupont, J-M. Tarascon, "Search for better Li-based materials via low temperature inorganic synthesis", (ORAL), 15th International Meeting on Lithium Batteries (IMLB), 2010, Montréal, Canada. (***Invited Talk***)
49. P. Barpanda*, N. Recham, J-N. Chotard, C. Delacourt, M. Ati, M. Armand, J-M. Tarascon, "Fluorine-based electrodes for Li-ion batteries" (ORAL), FMEC-2010, 2010, ICMCB, Bordeaux, France. (***Plenary Talk***)
50. P. Barpanda*, N. Recham, M. Armand, J-M. Tarascon, "Ionothermal synthesis and electrochemical characterization of nanostructured lithium manganese phosphates" (ORAL), 216th ECS meeting, 2009, Vienna, Austria.

Professional Membership:

* Member, The International Society of Electrochemistry (ISE).
* Member, The Electrochemical Society (ECS).
* Member, The American Ceramic Society (ACerS) (000450036).
* Elected Member, The International Centre for Diffraction Data (ICDD).

Teaching:

MR 304:	Characterization Techniques in Materials Science (Co-instructor)
IP 323:	Topics in Basic and Applied Electrochemistry (Co-instructor)
CD 222:	Material Chemistry (Co-instructor)

Awards Won by Students:

* Ms. Debasmita Dwibedi,	MRS-S Graduate Student Award - 2017 Materials Research Society (MRS-S), Singapore.
* Ms. Debasmita Dwibedi,	Robert L. Snyder Student Travel Award - 2017 International Centre for Diffraction Data (ICDD), USA.
* Mr. Lalit Sharma,	EMRS Young Scientist Award for outstanding paper 2017 European Materials Research Society (EMRS), France.
* Ms. Debasmita Dwibedi,	ECS H. H. Uhlig Summer Fellowship-2017 The Electrochemical Society (ECS), USA.
* Ms. Debasmita Dwibedi,	Ludo Frevel Crystallography Scholarship Award-2017 International Centre for Diffraction Data (ICDD), USA.

Expertise:

Materials science:

- Inorganic electrode materials synthesis by solid-state and solution-assisted synthesis routes (Mechanochemistry, Hydrothermal/ Ionothermal/ Polyol-assisted synthesis, Spray drying).
- Powder X-ray diffraction and X-ray fluorescence.
- Scanning electron microscopy (SEM) coupled with energy dispersive elemental analysis.
- Surface area analyzer and porosity distribution using BET method.
- FT-Infrared and Raman spectroscopy, Mössbauer spectroscopy.
- Thermal analysis (TG-DSC), Zeta-potential study, Mechanical milling, Glove box operation.

Electrochemistry:

- Electrochemistry of electrode materials (cycling, GITT, PITT, impedance spectroscopy).
- Electrical conductivity study (AC and DC methods), Electrochemical measurements.
- LLG micromagnetic simulation of nanomagnetic structures.

Editorial Service for ISI-cited journals:

1. *Materials for Renewable and Sustainable Energy (Springer Pub.)* [Since Oct 2016].

Review Service for ISI-cited journals:

Electrochimica Acta, Journal of European Ceramic Society, Materials Science & Engineering B, Journal of the Electrochemical Society, Journal of Electroceramics, IEEE Transaction of Magnetism, Journal of Electromagnetic Waves Application, Tribology International, Carbon, Journal of Molecular Structure, Journal of Physical Chemistry, Chemistry Letters, Journal of Materials Chemistry, Microporous Mesoporous Materials, RSC Advances, New Journal of Chemistry, Journal of Solid State Electrochemistry, Physical Chemistry Chemical Physics, Electrochemistry Communications, Dalton Transactions, Energy and Environmental Science, Nanoscale, Sensors, ECS Electrochemistry Letters, Chemical Science, Journal of Power Sources, Chemistry of Materials, Solid State Ionics, Materials for Renewable Sustainable Energy, CrystEngComm, Inorganic Chemistry, ACS Applied Materials & Interfaces, Journal of Alloys and Compounds, Inorganics, Angewandte Chemie International Edition, Journal of Visualized Experiments, ChemSusChem, Current Science, Journal of Materials Chemistry A, Nano Energy, Journal of the American Chemical Society, Particle & Particle Systems Charac, Applied Materials Today, Journal of Materials Science, Advanced Energy Materials, Ionics, Journal of American Ceramic Society, ACS Energy Letters, Journal of Electroanalytical Chemistry, ACS Nano, Energy Technology, Journal of Asian Ceramic Societies, Materials Research Bulletin.

Review Service for Funding Agency Proposal:

1. *Ministry of Power, Govt. of India.*
2. *Research Foundation Flanders (FWO), Belgium.*
3. *Science and Engineering Research Board (SERB), India.*
4. *Board of Research in Nuclear Sciences (BRNS), Department of Atomic Energy (DAE), India.*

References: (Available upon request)

1. Prof. Atsuo YAMADA,
   Department of Chemical System Engineering,
   The University of Tokyo,

2. Prof. Jean-Marie TARASCON,
   Collège de France,
   Paris Cedex 05, 75231, France.

3. Prof. Glenn G. AMATUCCI,
   Department of Materials Science and Engineering,
   Rutgers University, North Brunswick, NJ, 08702, USA.

4. Prof. Rafal E. DUNIN-BORKOWSKI,
   Research Centre Julich,
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