Dr. K. BALAMURUGAN
INSPIRE Faculty
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Career Objective

- To join any leading institution as a professor (with any suitable grade) and execute the duties of teaching and carry out academic / industrial collaborative research activities.
- To teach and demonstrate science and yet following the social ethics.

Present Work Status

- At present, I am working as an *INSPIRE Faculty** in Department of Physics, National Institute of Technology (NIT) Tiruchirappalli, Trichy – 620015, Tamil Nadu, INDIA.
- I run an academic research project funded by Department of Science and Technology (DST), Government of India and teach academic courses for Under Graduate (UG), Post Graduate (PG) and Graduate students.

Academic Degrees

B.Sc. Physics Nehru Memorial College, Puthanampatti, ||Apr. 2002
Affiliated to *Bharathidhasan University*,
Tiruchirappalli, Tamil Nadu (India).
Marks: 83.68 % ***University Rank No.:*** 11

M.Sc. Physics The American College, Madurai ||Jun. 2004
Affiliated to *Madurai Kamaraj University*,
Madurai, Tamil Nadu (India).
Marks: 69.00 %

Ph.D. Physics *Indian Institute of Technology (IIT) Madras* ||Jul. 2010
Chennai, Tamil Nadu (India).
Thesis title*: Structural, magnetic and electrical properties of some perovskite oxide based multifunctional materials*

**INSPIRE Faculty* is an award given by Department of Science and Technology (DST), Ministry of Science and Technology, Government of India. The award includes *research grant* and a consolidated salary that is e*quivalent to an Assistant Professor of an IIT" as per the definition found in the "undertaking form (July 2014)".*

****For more details:*** *http://www.inspire-dst.gov.in/faculty_scheme.html*

Research and Teaching Experiences

M.Sc. research project theses: (*The American College*)

1. *Synthesis of Zinc Oxide Nanoparticles and its Characteristic Studies* ||Oct. 2003
2. *Theoretical Studies on Quantum Corral and Preparation and Characterization of Metal-Oxide Nanocrystal Thin Films* ||Apr. 2004

Lecturer: Department of Physics, Nehru Memorial College[‡] || Jul. 2004 – Aug. 2004||

Courses taught:

1. Thermodynamics for B.Sc. Physics
2. Quantum Mechanics for M.Sc. Physics

Ph.D. Research Scholar: Department of Physics, IIT Madras. ||10-09-2004 –30-04-2010||

Guides: Prof. Dr. P. N. Santhosh[£] & Prof. Dr. N. Harish Kumar[¥]

Research specializations:

1. Diluted magnetic semiconductors (DMS) based on $BaSnO_3$
2. Multiferroics materials based on Sr-substituted $BiFeO_3$

Thesis title: Structural, magnetic and electrical properties of some perovskite oxide based multifunctional materials

Assisted in guiding M.Sc. research project: 1

Half Time Research / Teaching Assistant:

1. Instrument operator for Powder X-ray Diffractometer (PANalytical)
2. Teaching laboratory practical for B.Tech., M.Sc. (Physics) and M.Tech. (Solid State Technology) students

Postdoctoral Associate: Duquesne University, Pittsburgh (USA). ||10-05-2010 – 08-05-2012||

Supervisor: Prof. Dr. Jennifer Aitken[$]

Research specializations:

1. Diamond-like semiconductors (DLS)
2. Density functional theory (DFT) calculations using WIEN2k

Notable contribution: First to start DFT calculations in the group.

Postdoctoral Researcher: Seoul National University, Seoul REPUBLIC OF KOREA. ||15-11-2012 – 15-10-2014||

Supervisor: Prof. Dr. Je-Geun Park[#], IBS-CCES.

Research specialization:

1. Honeycomb lattice (HCL) magnetic materials
2. 2D van der Waals materials of the class $TMPX_3$ and $CrPS_4$

Notable contribution: Developed a new research laboratory for growing single crystals of 2D materials using Chemical Vapour Transport (CVT) reaction and trained a Ph.D. student to work in the laboratory.

[‡] http://www.nmc.ac.in [£] https://physics.iitm.ac.in/santhosh [¥] https://physics.iitm.ac.in/nhk
[$] http://www.scienceresearch.duq.edu/chem/chemdept/aitken.html [#] http://magnetism.snu.ac.kr

INSPIRE Faculty: Department of Physics, NIT Tiruchirappalli[§] ||29-10-2014 – Present||

Research laboratory: 2D Materials Laboratory (Independent)

Equipment and research facilities:

1. Two-zone tubular furnace
2. Glove box
3. Digital micro balance
4. Ultrasonic bath
5. Platinum crucible
6. Desktop computers (3) for office and lab.
7. Wien2k software for DFT calculations
8. LaserJet printers (2) for office and lab.
9. Air coolers (2) for office and lab.
10. Furniture sets for office and lab.

Ongoing funded research projects: 'Single crystal growth and study of electrical, optical, dielectric, and magnetic properties of graphene-like 2D materials and $Bi_{1-x}Sr_xFeO_3$ for next generation device applications' (Fund amount: ₹35,00,000/- for 5 years)

Ph.D. guideship: Co-guide for one Ph.D. student

M.Sc. research projects (co-)guided: 4 (+1)

1. Growth and characterization of $Bi_{0.5}Ca_{0.5}FeO_3$ single crystals ||June 2016
2. Growth and characterization of $Bi_{0.5}Sr_{0.5}FeO_3$ single crystals and $Bi_{0.5}Ba_{0.5}FeO_3$ polycrystals ||June 2017
3. Growth and characterization of multiferroic barium titanate and muscovite novel composite system ||June 2018
4. Density functional studies on 50% Sr-substituted $BiFeO_3$ ||June 2018
5. Investigation on magnetic vortex states using micro-magnetic simulations ||*Ongoing*

Handled courses:

1. PHIR11 Physics I (& Laboratory Practical)
2. PHIR12 Physics II (& Laboratory Practical)
3. PHIR13 Physics II (& Laboratory Practical)
4. PH653 Classical Mechanics (3 batches)
5. PH660 Electronics Laboratory (1 batch)
6. PH657 Quantum Mechanics (Unit IV: *Angular momentum*)
7. PH614 Fracture Mechanics and Failures of Materials (4 batches)
8. PH801 Frontier Areas of Research in Physics (Unit V: *Quantum Computation*)
9. PH603 Ultrasonic Testing (1 batch)

Invited Talks:

1. **Title:** *Opportunities at Lower Dimensions* ||21-09-2015
   Place: Department of Physics, Sacred Heart College, Tiruppattur, Vellore District, Tamil Nadu, INDIA.
2. **Title:** *Multiferroic properties of Sr-substituted $BiFeO_3$* ||08-01-2016
   Place: National Conference on the *Advances in Materials Science and Nonlinear Systems* (AMSNS – 2016), Department of Physics, K.S.R. College of Engineering, Tiruchengode, Tamil Nadu, INDIA.

[§] *https://www.nitt.edu/home/academics/departments/physics/Faculty/*

3. **Title:** *Valleytronics* ||15-04-2016
   Place: Physics Department Colloquium, National Institute of Technology Tiruchirappalli, INDIA.
4. **Title:** *Multiferroics and Magneto-electrics* ||23-08-2016
   Place: *Workshop on Functional Materials and Spectroscopy*, Sacred Heart College, Tiruppattur, Vellore District, INDIA.
5. **Title 1:** *Multiferroics and Magneto-electrics* ||29-09-2016
   Title 2: *Opportunities at Lower Dimensions* ||30-09-2016
   Place: Department of Physics, Mother Teresa Women's University, Kodaikanal, INDIA.
6. **Title:** *An introduction to graphene-like 2D materials and recent trends in Multiferroics* ||04-02-2017
   Place: *Two Day Workshop on Advanced Functional Materials*, SSN College of Engineering, Chennai, INDIA.

Experiences in Materials Synthesis / Preparation

- Single crystal growth by slow evaporation, chemical vapor transport (CVT), vapor sublimation and molten-flux methods.
- Polycrystalline materials by high temperature solid state reaction.
- Nanocrystalline materials by sol-gel, solvothermal and precipitation methods.
- Thin films by pulsed laser deposition (PLD), physical vapor deposition (PVD), dip-coating techniques.

Experiences in Sample Characterization

- X-ray, electron and neutron diffraction methods and Rietveld analyses.
- Thermal analysis: thermo-gravimetric analysis (TGA), differential thermal analysis (DTA) and differential scanning calorimetry (DSC).
- Element analysis using energy dispersive x-ray (EDX) spectroscopy and inductively coupled plasma – atomic emission spectroscopy (ICP-AES).
- Scanning electron microscopy (SEM) and transmission electron microscopy (TEM).
- Optical absorption, diffuse reflectance, Raman, X-ray photoelectron and Mössbauer spectroscopy techniques.
- Atomic force microscopy (AFM) and magnetic force microscopy (MFM).
- Magnetic measurements using vibrating sample magnetometer (Lakeshore and Quantum Design), specific heat measurements using physical property measurement system (PPMS).
- Dielectric spectroscopy, ferroelectric hysteresis, electrical resistivity, Hall effect and magneto-resistance.

Experiences in Operating / Handling Scientific Equipment / Instruments

1. Glove box (NanoTec, India, Motek, South Korea and MBraun LabMaster 130, USA.)
2. Quartz tube sealing station under high vacuum condition (home-made setup)
3. High temperature box, two-zone tubular, and vertical tubular furnaces.
4. Fume hoods
5. Powder X-ray diffractometer (Rigaku MiniFlex II and PANalytical X'Pert Pro)
6. Scanning Electron Microscope (COX I EM-30 and Hitachi S-3400) with Bruker EDX attachments.
7. High Resolution Raman Microscope (HORIBA JOBIN YVON LabRAM HR)
8. Vibrating Sample Magnetometer (Lake Shore VSM-300, EG & G PARC VSM 155)
9. Electron Spin Resonance Spectrometer (Varian E112)
10. UV-Visible-NIR Spectrophotometer (Cary5000, Varian and JASCO)
11. Spectrofluorometer (JASCO FP-6300)
12. Impedance Analyzer (Agilent 4294A)
13. Closed Cycle Refrigerator (APD Cryogenics Inc.)
14. Physical Property Measurement System (PPMS-9ECII), Quantum Design, USA.
15. Magnetic Property Measurement System (MPMS-XL5), Quantum Design, USA.
16. Low temperature and high temperature electrical transport measurements.
17. Hall effect measurement setup (Home-made setup)
18. Dielectric polarization loop tracer (Home-made setup)
19. Digital storage oscilloscope (Agilent 54621A)
20. Pulsed Laser Deposition (HINDHIVAC)
21. Thermal evaporation system (HINDHIVAC)
22. Machine-shop tools

Experiences in Using Scientific / Technical Software Programs

1. *X'pert HighScore* Plus and ICDD data base for X-ray diffraction data analysis.
2. *General Structure Analysis System (GSAS), CMPR & LOGIC* for solving crystal, nuclear and magnetic structures using X-ray and neutron powder diffraction data.
3. *DRAWxtl 5.3* for magnetic structure plotting and lone-pair electron modelling.
4. *CrystalMaker* and *VESTA* for drawing/visualizing crystal structure.
5. *CrystalDiffract* for analysing of X-ray and neutron diffraction patterns.
6. *SingleCrystal* for analyzing electron diffraction patterns.

7. *Bilbao crystallographic server:* http://www.cryst.ehu.es
8. cctbx - Explore symmetry: https://cci.lbl.gov/cctbx/explore_symmetry.html
9. *Fit;O)* for fitting experimental Mössbauer spectrum.
10. *Scanning Probe Image Processor* (*SPIP*) for processing Atomic Force Microscope (*AFM*) and Scanning Electron Microscope (*SEM*) images.
11. *WIEN2k*_18.2 and XCrysDen for electronic band structure, density of states and charge/spin density calculations.
12. *OriginPro* and *KaleidaGraph* for plotting graphs and curve fitting.
13. *Microsoft office* and *Adobe acrobat* for documentation and presentations.
14. Cloud storage using Microsoft OneDrive, Dropbox and NAS.

Experiences in Computer Literacy

Operating system: Microsoft Windows and Linux (*openSUSE*)

Qualified competitive examination

Graduate Aptitude Test in Engineering (GATE) 2004 conducted jointly by the seven Indian Institutes of Technology and Indian Institute of Science, Bangalore, India.

Score: 90.26 percentile **All-in-India Rank:** 267

Received Awards and Fellowships

- *INSPIRE Faculty* Award (2014 - Session I) given by Department of Science and Technology (DST), Ministry of Science and Technology, Government of India.
- Incentive payment (200,000 KRW) by IBS-CCES, Department of Physics & Astronomy, Seoul National University, South Korea.
- 2nd place (75 USD) in the SEM micrograph contest (2011) conducted at Duquesne University, Pittsburgh, PA (USA).
- Travel grants: (i) *Institute Financial Sanction* from IIT Madras and (ii) *Foreign Travel Grant for Young Research Scholars* from *CSIR*, Govt. of India, for participating and presenting research papers in the *53rd Annual Conference, MMM 2008*, Austin, Texas (USA).
- Senior research fellowship (SRF) by Indian Institute of Technology Madras, Chennai (India): from Sep. 2006 – Sep. 2009.
- Junior research fellowship (JRF) by Indian Institute of Technology Madras, Chennai (India): from Sep. 2004 – Sep. 2006.

Participations in International / National School / Workshop and Seminars

1. *International Winter School-2018* on "*Frontiers in Materials Science*" conducted at Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore, India. – 3-7th Dec., 2018.
2. *WIEN2011: Hands on Workshop on the WIEN2k Package*, conducted at The Pennsylvania State University, University Park, Pennsylvania (USA) – June 2011.
3. *Scanning Electron Microscope (SEM) Workshop*, conducted at Duquesne University, Pittsburgh, PA (USA) – Sep. 2010.
4. *ICMS – ICMR Winter School on Chemistry and Physics of Materials*, conducted at Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore (India) – 6-13th Dec. 2007.
5. *"SERC School on Condensed Matter Physics", conducted at Saha Institute of Nuclear Physics, Kolkata (India) – Jan. 2006.*
6. One day seminar on *"Concepts of Theoretical Physics"*, conducted at Pondicherry University, Pondicherry, India. – 23rd Sep., 2005.
7. Two days seminar on *"Opportunities and National Facilities in Condensed Matter Physics"*, conducted at Madurai Kamaraj University, Madurai, India. – 17-18 Jan. 2003.
8. One day seminar on *"Recent Trends in Thin Film technology"*, conducted at the Department of Physics, St. Joseph's College, Trichy, India. – 14th Feb., 2003.
9. Five days workshop on *"Introductory School on Astronomy and Astrophysics"*, conducted at The American College, Madurai, sponsored by Inter-University Centre for Astronomy and Astrophysics, Pune, India. – 22-26, Feb., 2003.

Φ Publications with Impact Factors (IF)† & Number of Citations (NC)‡

S.No.	Publication details	IF	NC
1.	M. Kirubanithy, N. Gopalakrishnan*, **K. Balamurugan***, Effect of heat treatment on optical properties of layered muscovite single crystal sheets. ***(To be submitted soon)***		
2.	M. Kirubanithy, N. Gopalakrishnan*, **K. Balamurugan***, Magnetic vortex state in a layered muscovite sheet silicate single crystal, ***Mater. Res. Exp.*** 5 (2018) 096103-10pp.	1.151	_
3.	Mi Jung Lee, Sangik Lee, Sungmin Lee, **K. Balamurugan**, Chansoo Yoon, Jun Tae Jang, Sung-Hoon Kim, Jae-Pyoung Ahn, Dae Hwan Kim, Je-Geun Park, and Bae Ho Park*, Synaptic devices implemented with two-dimensional layered single crystal chromium thiophosphate ($CrPS_4$), ***NPG Asia Mater.*** 10 (2018) 23–30.	9.157	2
4.	Cheng-Tai Kuo*, Michael Neumann*, **Karuppannan Balamurugan**, Hyun Ju Park, Soonmin Kang, Hung Wei Shiu, Jin Hyoun Kang, Byung Hee Hong, Moonsup Han, Tae Won Noh, and Je-Geun Park*, Exfoliation and Raman	4.259	45

	Spectroscopic Fingerprint of Few-Layer $NiPS_3$ Van der Waals Crystals, ***Sci. Rep.*** 6 (2016) 20904-10pp.		
5.	Cheng-Tai Kuo, **Karuppannan Balamurugan**, Hung Wei Shiu, Hyun Ju Park, Soobin Sinn, Michael Neumann, Moonsup Han, Young Jun Chang, Chia-Hao Chen, Hyeong-Do Kim, Je-Geun Park, and Tae Won Noh*, The energy band alignment at the interface between mechanically exfoliated few-layer $NiPS_3$ nanosheets and ZnO, ***Curr. Appl. Phys.*** 16 (2016) 404-408.	1.971	5
6.	**K. Balamurugan**, Sang-Hyun Lee, Jun-Sung Kim, Jong-Mok Ok, Youn-Jung Jo, Young-Mi Song, Shin-Ae Kim, E. S. Choi, Manh Duc Le, and Je-Geun Park*, Successive spin-flop transitions of a Néel-type antiferromagnet Li_2MnO_3 single crystal with a honeycomb-lattice, ***Phys. Rev. B.*** 90 (2014) 104412-7pp.	3.836	10
7.	**K. Balamurugan***, B. Ramachandran, M. Krishna Surendra, N. Harish Kumar, M.S. Ramachandra Rao and P.N. Santhosh*, Electrical surface-resistivity, dielectric resonance, polarization and magnetic properties of $Bi_{0.5}Sr_{0.5}FeO_{3-\delta}$ thin films grown by pulsed laser deposition, ***J. Phys. D: Appl. Phys.*** 47 (2014) 355304-12pp.	2.588	_
8.	Kimberly A. Rosmus, Carl D. Brunetta, Matthew N. Srnec, **Balamurugan Karuppannan**, and Jennifer A. Aitken*, Synchrotron X-ray Powder Diffraction and Electronic Band Structure of α- and β-Cu_2ZnSiS_4, ***Z. Anorg. Allg. Chem.*** 638 (15) (2012) 2578–2584.	1.251	18
9.	**K. Balamurugan***, N. Harish Kumar, J. Arout Chelvane, and P. N. Santhosh*, Effect of W co-doping on the optical, magnetic and electrical properties of Fe-doped $BaSnO_3$, ***Physica B*** 407 (2012) 2519-2523.	1.386	15
10.	**K. Balamurugan**, E. Senthil Kumar, B. Ramachandran, S. Venkatesh, N. Harish Kumar, M. S. Ramachandra Rao, and P. N. Santhosh*, Dielectric resonance and magnetic properties of Fe-3% doped $BaSnO_3$ thin films grown by pulsed laser deposition, ***J. Appl. Phys.*** 111 (2012) 074107-5pp.	2.068	5
11.	Carl D. Brunetta, **Balamurugan Karuppannan**, Kimberly A. Rosmus and Jennifer A. Aitken*, The crystal and electronic band structure of the diamond-like semiconductor Ag_2ZnSiS_4, ***J. Alloys Compd.*** 516 (2012) 65-72.	3.133	34
12.	R. L. Withers*, L. Bourgeois, **K. Balamurugan**, N. Harish Kumar, P. N. Santhosh, P. M. Woodward, and G. King, A TEM investigation of the $(Bi_{1-x}Sr_x)Fe^{3+}O_{3-x/2}$, $0.2 \leq x \leq 0.67$, solid solution and a suggested superspace structural description thereof, ***J. Solid State Chem.*** 182 (2009) 2176-2184.	2.299	13
13.	**K. Balamurugan**, N. Harish Kumar, B. Ramachandran, M. S. Ramachandra Rao, J. Arout Chelvane, and P. N. Santhosh*, Magnetic and optical properties of Mn-doped $BaSnO_3$, ***Solid-State Commun.*** 149 (2009) 884-887.	1.554	44

14.	**K. Balamurugan**, N. Harish Kumar, J. Arout Chelvane, and P. N. Santhosh*, Room temperature ferromagnetism in Fe-doped $BaSnO_3$, ***J. Alloys Compd.*** 472 (2009) 9-12.	3.133	33
15.	D. Samal, **K. Balamurugan**, C. Shivakumara, and P. S. Anil Kumar*, Phase separation versus spin glass behavior in $La_{0.85}Sr_{0.15}CoO_3$, ***J. Appl. Phys.*** 105 (2009) 07E320-3pp.	2.068	9
16.	**K. Balamurugan**, N. Harish Kumar, and P. N. Santhosh*, Multiferroic properties of $Bi_{1/2}Sr_{1/2}FeO_3$, ***J. Appl. Phys.*** 105 (2009) 07D909-3pp.	2.068	35
17.	K. Kamala Bharathi, **K. Balamurugan**, P. N. Santhosh, M. Pattabiraman, and G. Markandeyulu*, Magneto-capacitance in Dy-doped Ni ferrite, ***Phys. Rev. B*** 77 (2008) 172401-4pp.	3.836	66
18.	**K. Balamurugan**, Saumyadip Mandal, N. Harish Kumar, and P. N. Santhosh, Magnetic and Optical Properties of Cr_2O_3 Nanoparticles, ***Proc. DAE Solid State Phys. Symp.*** 52 (2007) 365-366.	N.A.	N.A.

[Φ] *Some other findings (such as muscovite changing its optical transparency) of the research work carried out as an INSPIRE Faculty are written as research paper for publications in international journals.*

[†] *Accumulated total number of impact factor:* **38.821** [‡] *Accumulated total number of citations:* **334**

Presentations in International / National Conferences or Symposiums

S.No.	Presentation details	Mode
1.	M. Kirubanithy, N. Gopalakrishnan, and **K. Balamurugan**, *Effect of heat treatment on optical properties of layered muscovite sheet silicate single crystal*, International Conference on Advances in Materials Research (ICMAR-2019), Sacred Heart College (Autonomous), Tirupattur, Vellore District, Tamil Nadu (India). – Feb. 2019.	Oral
2.	Kirubanithy Murugan, Gopalakrishnan Nammalvar, and **Balamurugan Karuppannan**, *Investigation on magnetic configurations in bulk layered muscovite sheet silicate single crystals*, 5th International Conference on Nanoscience and Nanotech-nology (ICONN 2019), SRM University, Chennai, Tamilnadu, India. – Jan. 2019.	Poster
3.	**K. Balamurugan**, M. Kirubanithy, N. Gopalakrishnan, *Magnetic Vortex State in Muscovite Natural Single Crystals*, International Winter School on "Frontiers in Materials Science", conducted at Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore (India) – Dec. 2018.	Poster
4.	**K. Balamurugan**, Progress Report on *Single crystal growth and study of electrical, optical, dielectric, and magnetic properties of graphene-like 2D materials and $Bi_{1-x}Sr_xFeO_3$ for next generation device applications*, INSPIRE Faculty	Poster

	Monitoring-cum-Interaction Meet, Chandigarh University, Mohali (India) – Feb. 2017.	
5.	**K. Balamurugan**, Sang-Hyun Lee, Jun-Sung Kim, Jong-Mok Ok, Youn-Jung Jo, Young-Mi Song, Shin-Ae Kim, E. S. Choi, Manh Duc Le, and Je-Geun Park, *Effect of Ti substitution on the spin-flop transition of Li_2MnO_3 single crystal with honeycomb lattice*, Korean Physical Society (KPS) Spring Meeting, Daejeon, (South Korea) – Apr. 2014.	Oral
6.	**K. Balamurugan**, Sang-Hyun Lee, Jun-Sung Kim, Jong-Mok Ok, Youn-Jung Jo, Young-Mi Song, Shin-Ae Kim, E. S. Choi, Manh Duc Le, and Je-Geun Park, *Spin-flop transitions of Neel-type antiferromagnet Li_2MnO_3 and $Li_2Mn_{1-x}Ti_xO_3$ single crystals with honeycomb-lattice*, Quantum Materials Symposium, Muju Deogyusan Resort (South Korea) – Feb. 2014.	Poster
7.	**K. Balamurugan**, Jacqueline L. Sturgeon, Johanna D. Burnett, Kristin L. Bunker, Karen E. Harris and Jennifer A. Aitken, Simple methods for synthesizing micro- and nano-structures of I-III-VI_2 materials, 4th International Conference on Advanced Nano Materials (ANM 2012), Indian Institute of Technology Madras (India) – Oct. 2012.	Oral
8.	Kimberly R Daley, Carl D Brunetta, Matthew Srnec, **Balamurugan Karuppannan**, Jeffry D Madura, Jennifer A Aitken, Electronic structure calculations for quaternary diamond-like semiconductors using density functional theory, 243rd ACS National Meeting & Exposition, San Diego, California (USA) – Mar. 2012.	Oral
9.	Johanna Burnett, **Balamurugan Karuppannan**, Jacilynn Brant, Jacqueline Sturgeon, Kristin Bunker, Karen Harris and Jennifer Aitken, Structure, Morphology and Oxidation State Determination of Iron-Substituted $CuInS_2$ Materials Prepared by High-Temperature Solid-State Synthesis, *Materials Science & Technology 2011 Conference & Exhibition* (MS&T'11), Columbus, Ohio (USA) – Oct. 2011.	Oral
10.	**Balamurugan Karuppannan**, Jacqueline Sturgeon, Johanna Burnett, Kristin Bunker, Karen Harris, and Jennifer Aitken, Micro- and Nano-Structures of I-III-VI_2-Based Materials Prepared via Solvothermal Processes, *Materials Science & Technology 2011 Conference & Exhibition* (MS&T'11), Columbus, Ohio (USA) – Oct. 2011.	Oral
11.	**Balamurugan Karuppannan** and Jennifer A. Aitken, Morphology and Microstructure of Chalcopyrites Prepared by High Temperature Solid State Synthesis, *Celebration of Scanning Electron Microscopy* – 2011, Duquesne University, Pittsburgh, Pennsylvania (USA) – Sep. 2011.	Oral
12.	Josh Lucas, **Balamurugan Karuppannan**, Jin Lei Yao, Jennifer A. Aitken, Phase purity and solid solubility limit of manganese in $AgInSe_2$ chalcopyrites, *Fall 2011 National Meeting & Exposition*, conducted by *American Chemical Society*, Boston, Massachusetts (USA) – Aug. 2011.	Oral

13.	**K. Balamurugan**, N. Harish Kumar, P. M. Woodward, Maxim Avdeev, P. N. Santhosh, Crystal Structure and Multiferroic Properties of $Bi_{0.5}Sr_{0.5}FeO_{3-\delta}$, 2011 MRS Spring Meeting and Exhibit, San Francisco, California (USA) – Apr. 2011.	Poster
14.	Joshua D. Lucas, **Balamurugan Karuppannan**, Jin-Lei Yao, and Jennifer A. Aitken, Solid solubility limit of manganese in $AgInSe_2$ chalcopyrites, *Fall 2010 National Meeting & Exposition*, conducted by *American Chemical Society*, Boston, Massachusetts (USA) – Aug. 2010.	Poster
15.	**K. Balamurugan**, B. Ramachandran, M. Krishna Surendra, N. Harish Kumar, M.S. Ramachandra Rao, P.N. Santhosh, Magnetic and ferroelectric properties of $Bi_{0.5}Sr_{0.5}FeO_3$ thin films grown by pulsed laser deposition, *The 5th DAE-BRNS National Symposium on Pulsed Laser Deposition of Thin Films and Nanostructured Materials* (PLD-2009), conducted at Indian Institute of Technology Madras, Chennai (India) – Dec. 2009.	Oral
16.	**K. Balamurugan**, E. Senthil Kumar, B. Ramachandran, S. Venkatesh, N. Harish Kumar, M.S. Ramachandra Rao and P.N. Santhosh, Growth and characterization of Fe-3% doped $BaSnO_3$ thin films, *The 5th DAE-BRNS National Symposium on Pulsed Laser Deposition of Thin Films and Nanostructured Materials* (PLD-2009), conducted at Indian Institute of Technology Madras, Chennai (India) – Dec. 2009.	Poster
17.	**K. Balamurugan,** Magnetic and optical properties of Co and Mn co-doped SnO_2, *International Symposium for Research Scholars on Metallurgy, Materials Science and Engineering* (ISRS 2008), conducted at Indian Institute of Technology Madras, Chennai (India) – Dec. 2008.	Oral
18.	**K. Balamurugan**, N. Harish Kumar, and P. N. Santhosh, $Bi_{1/2}Sr_{1/2}FeO_3$ - a novel room-temperature multiferroic material, *53rd Annual Conference on Magnetism and Magnetic Materials* (MMM 2008), conducted at Austin, Texas (USA) – Nov. 2008.	Poster
19.	**K. Balamurugan**, N. Harish Kumar, B. Ramachandran, M. S. Ramachandra Rao, J. Arout Chelvane, and P. N. Santhosh, Evolution of ferromagnetism in Mn-doped $BaSnO_3$ with increasing Mn-content, *53rd Annual Conference on Magnetism and Magnetic Materials* (MMM 2008), conducted at Austin, Texas (USA) – Nov. 2008.	Poster
20.	D. Samal, **K. Balamurugan**, C. Shivakumara, and P. S. Anil Kumar, Phase separation versus spin glass behavior in $La_{0.85}Sr_{0.15}CoO_3$, *53rd Annual Conference on Magnetism and Magnetic Materials* (MMM 2008), conducted at Austin (USA) – Nov. 2008	Oral
21.	**K. Balamurugan**, N. Harish Kumar, J. Arout Chelvane and P. N. Santhosh, Weak ferromagnetism in Fe- and W-codoped $BaSnO_3$ at room temperature, ***International Conference** on **Magnetic Materials & their Applications for 21st Century [MMA21],*** conducted at New Delhi (India) – Oct. 2008.	Poster

22.	**K. Balamurugan**, Saumyadip Mandal, N. Harish Kumar and P. N. Santhosh, Nanocrystalline Cr_2O_3 – a multifunctional magnetic material for magneto-electronics, *India-Singapore symposium on "Current Trends in Physics"* conducted at Indian Institute of Technology Madras, Chennai (India) – Feb. 2008.	Poster
23.	**K. Balamurugan**, Saumyadip Mandal, N. Harish Kumar, and P. N. Santhosh, Magnetic and Optical Properties of Cr_2O_3 Nanoparticles, *DAE Solid State Physics Symposium*, conducted at University of Mysore, Mysore (India) – Dec. 2007.	Poster
24.	**K. Balamurugan**, Saumyadip Mandal, N. Harish Kumar and P. N. Santhosh, Multifunctional magnetic materials for magneto-electric and spintronic applications, *ICMS – ICMR Winter School on Chemistry and Physics of Materials*, conducted at Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bangalore (India) – Dec. 2007.	Poster
25.	**K. Balamurugan**, Multiferroics: Recent developments, "*SERC School on Condensed Matter Physics*" conducted at Saha Institute of Nuclear Physics, Kolkata (India) – Jan. 2006.	Oral
26.	**K. Balamurugan**, X-ray lasers - a seminar presented in the *National Science Day celebrations 2003* at the Department of Physics, The American College, Madurai, Tamil Nadu, India. – Feb. 28, 2003.	Seminar

Reviewer Experiences

- Reviewer for the following international journals:
  1. Journal of Magnetism and Magnetic Materials
  2. Physical Chemistry Chemical Physics

Volunteered Works

- For conducting group meeting, seminars, symposiums and conferences
- Demonstrating simple and research level physics experiments for school students and public audience in the technical festival called *Shastra 2008* and *Institute Open House*, IIT Madras.
- Guiding students of various schools and colleges in visiting our labs.
- Coordinator for *National Science Day Celebrations* (2003) in the Department of Physics (P.G.), The American College, Madurai India. The programme included an invited seminar talk by Prof. Dr. K. Navaneethakrishnan, Department of Theoretical Physics, Madurai Kamaraj University, Madurai and my seminar talk on *X-ray Lasers*.