

## Dr. K. EPHRAIM BABU PROFILE



Dr. Karumanchi Ephraim Babu  
Assistant Professor in Physics (Ad-hoc)  
Department of Physics  
Adikavi Nannaya University Campus,  
Tadepalligudem,  
West Godavari Dist – 534 101,  
Andhra Pradesh,

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### **Achievements:**

- Organized a two week “Faculty Development Program (FDP) cum workshop on New Frontiers in Multiscale Modelling of Advanced Materials” from 10<sup>th</sup> to 25<sup>th</sup> November 2017 with a funding of Rs.5,99,700/- from AICTE vide its sanction Letter F.No.6-158/RIFD/FDP/Policy-1/2016-17, dated. 6.6.2017.
- Text Book Author: “Applied Physics” published by Spectrum Publication.
- Title of Patent: “LONG-LASTING SOLID-STATE BATTERIES FOR FUTURE ELECTRIC VEHICLE SYSTEM”, Application Number- 202111032644, Published Date-20/08/2021
- Title of Paten: “Dual Functional Superwetable Nano-Structured Membrane method and thereof ”, Application Number- 202241031000, Published Date-10/06/2022
- Number of Publications: **25**, Total Citations: **220**, h-index: **10**, i-10 index: **10**
- Number of Presentations (Oral/ Invited/ Poster) in National/ International Conferences: **50**
- Total Teaching Experience: **16** years.  
(Ratified as Associate Professor in Physics from JNTU-Kakinada).
- Qualified GATE & APSET

**Ph.D Thesis Title:** DENSITY FUNCTIONAL THEORETICAL STUDY OF SOME CUBIC PEROVSKITE MATERIALS & EXPERIMENTAL INVESTIGATIONS OF LITHIUM MANGANESE BASED CATHODE MATERIALS.

### **Personal Details:**

Name	: <b>KARUMANCHI EPHRAIM BABU</b>
Fathers Name	: <b>KARUMANCHI PUNNAIAH</b>
Date of Birth	: <b>29-08-1976</b>
Sex	: <b>Male</b>
Marital Status	: <b>Married</b>

## Educational Qualifications

- **B. Sc.** (Mathematics-Physics-Chemistry)- Acharya Nagarjuna University, Guntur
- **M. Sc.** (Physics)- Andhra University, Visakhapatnam
- **M.Tech.** (Computational Techniques)-University of Hyderabad, Hyderabad
- **Ph.D (Physics)** - Andhra University, Visakhapatnam, AP, (**Awarded on 24-08-2015**)

## Computing Skills

- **Languages and Packages:** MatLab C, FORTRAN.
- **Platforms** : Linux, Windows 9x, 2000, XP.

## Academic Experience:

- **Teaching 3 years “Solid State Physics” to the M.Sc. (Physics) course, Andhra University, Visakhapatnam**
- **5 years of experience** (2001 to 2006) as a Lecturer in Dept. of Physics, Avanthi Institute of Engineering and Technology, Narsipatnam, Visakhapatnam from 2001 to 2006, Teaching paper “Engineering Physics”.
- **One year** (2009-2010) worked as an Asst. Professor in Department of Physics, DVR Engineering College, Hyderabad, teaching paper “Solid State Physics”.
- **One year** (2015-2016) worked as an Associate Professor in Department of Physics, BITS Visakhapatnam.
- **Five years** (2016 to 2021) worked as an Associate Professor in Physics in Narasaraopeta Engineering College (Autonomous), Narasaraopeta Guntur Dist.
- From 15<sup>th</sup> December 2021 to till date, working as Assistant Professor(Ad-hoc) in Physics, Adikavi Nannaya University, Tadepalligudem-534101

## Research Interest:

- Computational Materials Science, Li-ion Battery Materials, Density Functional Theory (DFT), First-principles Study.
- Training on Bruker NMR Instrument for eight days in the month of May 2013 in NMR Research Centre, **Indian Institute of Sciences, Bangalore (IISc)**.

## Academic Achievements:

- ✓ UGC (BSR-SAP) (meritorious) Senior Research Fellow (SRF)
- ✓ Won various awards in Singing and Debating at College/University level.

## LIST OF PUBLICATIONS/PRESENTATIONS

1. **K. Ephraim Babu**, A.Veeraiah, D. TirupathiSwamy, V. Veeraiah "*First-principles study of electronic and optical properties of cubic perovskite CsSrF<sub>3</sub>*", **Materials Science- Poland**, **30** (2012) 359-367.
2. **K. Ephraim Babu**, A. Veeraiah, D. Tirupathi Swamy, V. Veeraiah, "*First-principles study of electronic structure and optical properties of cubic perovskite CsCaF<sub>3</sub>*", **Chinese Physics Letters**, **29** (2012) 117102.
3. D. Tirupathi Swamy, **K. Ephraim Babu**, V. Veeraiah, "Evidence for high ionic conductivity in lithium–lanthanum titanate, Li<sub>0.29</sub>La<sub>0.57</sub>TiO<sub>3</sub>" **Bulletin of Materials Science**, **36** (2013) 1115-1119.
4. **K. Ephraim Babu**, A. Veeraiah, N. Murali, D. Tirupathi Swamy, V. Veeraiah "*Investigation of electronic structure and optical properties of cubic perovskite RbCdF<sub>3</sub>*", **Defence Science Journal**, Accepted on 2-3-2013 (**Defence Science Journal**)
5. **K. Ephraim Babu**, A. Veeraiah, N. Murali, D. Tirupathi Swamy, V. Veeraiah, "*Structural and optoelectronic properties of cubic perovskite RbPbF<sub>3</sub>*", **Bulletin of Materials Science**, **37** (2014) 287-293
6. **K. Ephraim Babu**, N. Murali, K.Vijaya Babu, V. Veeraiah "*First-principles study of structural, elastic and optical properties of cubic perovskite CsCaCl<sub>3</sub> compound*" **ACTA PHYSICA POLONICA A**, **125** (2014) 1179-1185.
7. **K. Ephraim Babu**, N. Murali, K. Vijaya Babu, Paulos Taddesse Shibeshi, and V. Veeraiah, "*Investigation of optoelectronic properties of cubic perovskite LaGaO<sub>3</sub>*", **AIP conference proceedings 1620** (2014) 173.
8. N. Murali, K. Vijaya Babu, **K. Ephraim Babu**, V. Veeraiah "*Structural characterization of LiNiO<sub>2</sub> and LiNi<sub>0.96</sub>Mg<sub>0.04</sub>O<sub>2</sub> cathode materials*", **Journal of Applicable Chemistry**, Volume 3, Pages 1202-1207, 2014.
9. N. Murali, K. Vijaya Babu, **K. Ephraim Babu**, V. Veeraiah "*Synthesis and Structural characterization of LiNi<sub>0.92</sub>Mg<sub>0.08</sub>O<sub>2</sub> and LiNi<sub>0.92</sub>Co<sub>0.06</sub> Mg<sub>0.02</sub>O<sub>2</sub> cathode materials*", AIP Conference Proceedings, 1665,140057 (2005)
10. **K. Ephraim Babu**, N. Murali, D. Tirupathi Swamy, V. Veeraiah, "*Density functional study of structural, electronic and optical properties of cubic perovskite KCdF<sub>3</sub>*", **Chinese Physics Letters**, **32** (2015) 016201
11. N. Murali, K. Vijaya Babu, **K. Ephraim Babu**, V. Veeraiah "*Preparation and structural stability of LiNiO<sub>2</sub> in separate synthesis methods at different temperatures*", **Chemical Science Transactions**, **3**(4), pages 1317-1325, 2014.

12. **K. Ephraim Babu**, N. Murali, K. Vijaya Babu, V. Veeraiah, "*Structural, Electronic and Elastic properties of  $KCaF_3$  and  $RbCaF_3$  for vacuum-ultraviolet-transparent lens materials*" **AIP Conference Proceedings-ICCMP-2014**, **1661**, 100002 (2015); <https://doi.org/10.1063/1.4915437>.
13. N. Murali, K. Vijaya Babu, K. Ephraim Babu, V. Veeraiah "*Structural and morphological characterization of Mg doped  $LiNiO_2$  cathode materials for Lithium-ion batteries*", Chemical Science Transactions, *Chem Sci Trans.*, 2015, 4(4), pp 1031-1036
14. **K. Ephraim Babu**, N. Murali, K. Vijaya Babu, V. Veeraiah, "*Electronic structure and magnetic properties of cubic perovskites  $PrFeO_3$  and  $NdFeO_3$ : A first-principles study*", **AIP Conference Proceedings**, **1992**, 040036 (2018).
15. **K EPHRAIM BABU**, G Tewodros Aregai, K Vijaya Babu, B Vikram Babu, N Murali, , Psv Subba Rao, V Veeraiah, "*Structural, Morphological, Magnetic and Impedance Studies of Layered  $LiNi_{1/3}Co_{1/3}Mn_{1/3}O_2$  Cathode Material for Lithium Ion Batteries*"", Chemical Science Transactions, *Chem Sci Trans.*, 2017, 6(1).
16. **K EPHRAIM BABU**, N. Murali, S. J. Margarete, P. Himakar and V. Veeraiah, "*Synthesis and Structural Studies of  $LiMn_{2-x}Zn_xMg_yO_4$  ( $x = y = 0.0, 0.02, 0.04$ ) Spinel As Cathode Materials For Lithium-Ion Batteries*" International Journal of Hybrid Information Technology Vol. 10, No.1 (2017), pp. 425-432 <http://dx.doi.org/10.14257/ijhit.2017.10.1.34>
17. **K Ephraim Babu**, K Neeraja, D Deenabandhu, A Mary Vijaya Ratna, V Venkata Kumar, K Bueala Kumari, Paulos Taddesse, G Tewodros Aregai, MVK Mehar, B Vikram Babu, K Samatha, V Veeraiah, "First-principles study of structural, elastic, electronic and optical properties of cubic perovskite  $LiMgF_3$  for novel applications", Journal of Physics: Conference Series, Volume 1495, International Conference on Multifunctional Materials (ICMM-2019) 19-21 December 2019, Hyderabad, India, *J. Phys.: Conf. Ser.* 1495, 012010. doi:10.1088/1742-6596/1495/1/012010.
18. D Deenabandhu, K Neeraja, **K Ephraim Babu**, V Venkata Kumar, K Bueala Kumari, K Samatha, V Veeraiah, "Laser applications for the optical exploration of the  $Dy^{3+}$  doped  $Li_2O-CaF_2-Al_2O_3-B_2O_3-SiO_2$  glasses" AIP Conference Proceedings 2269, 030096 (2020); <https://doi.org/10.1063/5.0019923>
19. **K. Ephraim Babu**, N. Murali, K. Vijaya Babu, V. Veeraiah, "*Structural Electronic, Elastic and optical properties of  $BaCeO_3$  by using mBJ method*", (under review).
20. **K. Ephraim Babu**, N. Murali, K. Vijaya Babu, V. Veeraiah, "Synthesis, Structural and Impedance Characterization of Cu and Ce substituted  $LiMn_2O_4$ " (under review).
21. **K. Ephraim Babu**, N. Murali, K. Vijaya Babu, V. Veeraiah, "Synthesis and Characterization of  $LiMn_{1.85}Fe_{0.1}M_{0.05}O_4$  (M=Ni,Co,Zn and Nd) for battery Applications" (under review).
22. N. Murali, K. Vijaya Babu, **K. Ephraim Babu**, V. Veeraiah "*Synthesis, Micro-structural and Impedance study of  $LiNiO_2$ ,  $LiNi_{0.92}Co_{0.06}Mg_{0.02}O_2$  and*

*LiNi<sub>0.92</sub>Zn<sub>0.06</sub>Mg<sub>0.02</sub>O<sub>2</sub> Cathode Materials*", **Materials Chemistry and Physics**,  
(under review)

23. N. Murali, K. Vijaya Babu, **K. Ephraim Babu**, V. Veeraiah " *Effect of magnesium doping on the structural stability of layered LiNiO<sub>2</sub> based cathode materials*", **Andhra University**, (under review)

**ORAL PRESENTATIONS (INTERNATIONAL / NATIONAL)**

1. **K. Ephraim Babu**, N. Murali, A. Veeraiah, D. Tirupathi Swamy, V. Veeraiah, 1<sup>st</sup> International Conference on Functional Materials for Defence, May 18-20, 2012- Pune, "*Investigation of electronic structure and optical properties of cubic perovskite RbCdF<sub>3</sub>*".
2. **K. Ephraim Babu**, N. Murali, K. Vijaya Babu, A. Venkateswarao, K. Ramarao, V. Veeraiah, "Computational Study of Structural, Electronic and Optical Properties of Cubic BiInO<sub>3</sub>", 2nd National Seminar on Computational Techniques for Engineering Applications (NSCTEA-12) (8th-10th November 2012), Corporate group of Institutions, Hataikheda, Near Patel Nagar, Raisen Road, Bhopal-462 022 (M.P.).
3. **K. Ephraim Babu**, N. Murali, K. Vijaya Babu, K. Ramarao, N. Gnana Praveena and V. Veeraiah, "First-Principles Study on the Structural, Electronic and Optical Properties of Cubic Perovskite RbHgF<sub>3</sub>", AP Science Congress, (14th-16th November, 2012), Acharya Nagarjuna University, Guntur, Andhra Pradesh.
4. **K. Ephraim Babu**, N. Murali, K. Ramarao, N. Gnana Praveena and V. Veeraiah, "*Theoretical prediction of the structural, electronic and optical properties of CsHgF<sub>3</sub>*", National Conference on Advances in materials Science and Technologies, (19th-21th November 2012), Department of Physics, Kakatiya University, Warangal, Andhra Pradesh.
5. **K. Ephraim Babu**, N. Murali, K. Ramarao, V. Veeraiah 100<sup>th</sup> Indian Science Congress, held during 3-7 January 2013, at University of Kolkata, Kolkata "Structural and Optoelectronic Properties of cubic perovskite CsCaCl<sub>3</sub> for novel applications".
6. **K. Ephraim Babu**, N. Murali, K. Ramarao, N. Gnana Praveena, V. Veeraiah, National Conference on Advanced Functional Materials (NCAFM-2013), held during 21-23 January 2013, at Dept. of Chemistry, Visvesvaraya National Institute of Technology, Nagpur, Maharashtra, "Density Functional Theoretical Study of Structural, electronic and optical properties of cubic perovskite BaPrO<sub>3</sub>".

7. **K. Ephraim Babu**, N. Murali, Paulos Teddesse Shibeshi, P.Himakar, V. Veeraiah, "*DFT study of structural, electronic, elastic and optical properties of cubic perovskite BiInO<sub>3</sub> by using mBJ method*" First annual International conference and Industry-CCRS Congress (ICC) -2013, July 13<sup>th</sup> -14<sup>th</sup>, 2013.
8. **K. Ephraim Babu**, K. Vijaya Babu, Paulos Taddesse, K. Ramarao, N. Gnana Praveena, N. Murali, Y. B. Shankar Rao, V. Veeraiah "Theoretical studies of structural and magnetic properties of cubic perovskite NdAlO<sub>3</sub>", accepted for presentation at International conference on Multifunctional Materials, Energy and Environment to be held at Sharda University, Greater Noida, India from 21-23 August 2013.
9. **K. Ephraim Babu**, K. Vijaya Babu, Paulos Taddesse, , N. Gnana Praveena, N. Murali, V. Veeraiah " Electronic structure and magnetic properties of cubic perovskites PrFeO<sub>3</sub> and NdFeO<sub>3</sub>: A first-principles study", accepted for presentation at International conference on Magnetic Materials and Applications (MagMA-2013), to be held at Indian Institute of Technology - Guwahati, India from 5-7 December 2013.
10. **K. Ephraim Babu**, N. Murali, K. Vijaya Babu and V. Veeraiah, International Conference "Nano, Bio& Materials Science" (ICONBMS-2014) 8<sup>th</sup>-10<sup>th</sup> January 2014, Osmania University, Hyderabad.
11. **K. Ephraim Babu**, "Training programme on Nuclear Magnetic Resonance (NMR) Spectroscopy" 6<sup>th</sup> – 8<sup>th</sup> March 2014, Department of Physics, Andhra University, Visakhapatnam.
12. **K. Ephraim Babu**, N. Murali, K. Vijaya Babu, V. Veeraiah, "Investigation of optoelectronic properties of cubic perovskite LaGaO<sub>3</sub>" accepted for oral presentation at International conference on Light (Optics 14), at National Institute of Technology - Calicut, India from 19-21 March 2014.
13. **K. Ephraim Babu et al**, "Advances in Materials Processing" 28-29<sup>th</sup> March 2014, Department of Nanotechnology, Acharya Nagarjuna University, Guntur, A.P.
14. **K. Ephraim Babu**, Participated Lecture workshop on "Functional Materials and their Applications in Devices" 3<sup>rd</sup> -4<sup>th</sup> April 2014, Department of Physics, Andhra University, Visakhapatnam. (Conducted by A.U and IASc).
15. **K. Ephraim Babu**, N. Murali, K. Vijaya Babu, V. Veeraiah, "International Conference on Condensed Matter Physics (ICCMP-2014)" November 4-6<sup>th</sup> 2014, Himachal Pradesh University, Himachal Pradesh, India.
16. **K. Ephraim Babu**, N. Murali, K. Vijaya Babu, Tewodros Aregai G, V. Veeraiah, "Experimental and Density Functional Theoretical (DFT) study of LiMn<sub>2</sub>O<sub>4</sub> cathode material for Lithium ion battery" International Seminar on Glasses and other Functional

- Materials (ISGFM), 11<sup>th</sup> -13<sup>th</sup> December 2014, Acharya Nagarjuna University, Guntur.
17. **K. Ephraim Babu**, N. Murali, K. Vijaya Babu, P Himakar, “A cluster of topical meetings on Current Trends in Condensed Matter Physics” 19<sup>th</sup> - 22<sup>nd</sup> February, 2015 National Institute of Science Education and Research (NISER), Bhubaneswar.
  18. **K. Ephraim Babu et. al**, “National Conference on Emerging Trends of Advanced Functional Materials-NCAFM-2015”, 3<sup>rd</sup> and 4<sup>th</sup> September, 2015, Department of Physics, KL University, Guntur, Andhra Pradesh.
  19. **K. Ephraim Babu et. al**, “Two day National Seminar on Energy and Ecology”. 4<sup>th</sup> &5<sup>th</sup> October 2016, Department of Physics, CR Reddy College, Autonomous, Eluru, A.P.
  20. **K. Ephraim Babu et. al**, “2<sup>nd</sup> Andhra Pradesh Science Congress”, Andhra Pradesh Academi of Sciences, Amaravathi, 7-9<sup>th</sup> November 2016, held at P.B. Siddhartha College of Arts & Sciences, Vijayawada.
  21. **K. Ephraim Babu et. al**, “National Seminar on Characterization Techniques of Materials” NSCTM-2016, 28-29<sup>th</sup> March 2016, Department of Nanotechnology, Acharya Nagarjuna University, Guntur, A.P.
  22. **K. Ephraim Babu et. al**, “The Indian Science Congress Association(104<sup>th</sup> Indian Science Congress)” held at S.V. University, Tirupati, 3-7<sup>th</sup> January 2017.
  23. **K. Ephraim Babu et. al**, “National workshop on Electron Spin Resonance Spectrometer”, DST-PURSE Programme, 7<sup>th</sup> April, 2017, Advanced Analytical Laboratory, DST-PURSE Programme, Andhra University, Visakhapatnam.
  24. **K. Ephraim Babu et. al**, “Two-Day National Seminar on Recent Advances in Materials Sciences”, 30 & 31<sup>th</sup> May, 2017, Department of Physics, Andhra University, Visakhapatnam, A.P.
  25. **K. Ephraim Babu et. al**, “Andhra Pradesh Science Congress”, Andhra Pradesh Academi of Sciences, Amaravathi, 7-9<sup>th</sup> November 2017, held at Andhra University, Visakhapatnam.A.P.
  26. **K. Ephraim Babu** participated in AICTE recognized Short Term Course on “Curriculum Development through ICT” conducted by Curriculum Development Centre from 4-12-2017 to 8-12-2017 (One week) at Narasaraopeta Engineering College, Guntur dist, A.P
  27. **K. Ephraim Babu**, “International Conference on Renewable Energy Research & Education (RERE-2018)” from 8-10<sup>th</sup> February 2018, Govt. College, Rajahmundry, A.P.
  28. **K. Ephraim Babu**, “International Conference on Materials for Energy and Environmental Protection” 12-13<sup>th</sup> February 2018, Sir CR Reddy College (Autonomous), Eluru, A.P. (Delivered Invited Talk)

29. **K. Ephraim Babu** participated in AICTE recognized Short Term Course on “Environment Pollution through ICT” conducted by Civil Engineering Department from 19-03-2018 to 23-03-2018 (One week) at Narasaraopeta Engineering College, Guntur dist, A.P
30. **K. Ephraim Babu** participated in AICTE recognized Short Term Course on “Linux Administration using CentOS through ICT” conducted by Computer Science & Engineering Department from 30-04-2018 to 04-05-2018 (One week) at Narasaraopeta Engineering College, Guntur dist, A.P
31. **K. Ephraim Babu** participated in AICTE recognized Short Term Course on “Outcome Based Curriculum through through ICT” conducted by Curriculum Development Centre from 25-06-2018 to 29-06-2018 (One week) at Narasaraopeta Engineering College, Guntur dist, A.P
32. **K. Ephraim Babu** participated (Phase-1 completed) in “IUCEE International Engineering Educator Workshop”, July 12-14, 2018, VIT-AP University, Amaravati. A.P. conducted by Andhra Pradesh State Skill Development Corporation (APSSDC). Department of Skill Development, Entrepreneurship & Innovation, Govt. of A.P.
33. **K. Ephraim Babu** participated in AICTE recognized Short Term Course on “Optimization using MATLAB through through ICT” conducted by National Institute of Technical Teachers Training and Research, Chandigarh from 27-08-2018 to 31-08-2018 (One week) at Mechanical Engineering Department, Narasaraopeta Engineering College, Guntur dist, A.P
34. **K. Ephraim Babu**, participated in UGC sponsored, A state level seminar on “Recent Advances in Clean Energies (RACE-2018)” on 27<sup>th</sup> December 2018, Govt. College, Rajahmundry, A.P.
35. **K. Ephraim Babu**, attended the Two-Day Science Academie’s Lecture Workshop on “Applications of Quantum Mechanics to Optics” organized by the Dept. of Physics& Electronics, KBN College (Autonomous), Vijayawada during 1<sup>st</sup> -2<sup>nd</sup> February 2019 (Sponsored by Indian Academy of Sciences/Indian National Science Academy/The National Academy of Science)

**DECLARATION:**

I hereby declare that the information furnished above is true to the best of my knowledge.

Place: Visakhapatnam  
Date:15-12-2021



(K. Ephraim Babu)