

PUBLICATIONS / PATENTS/ PRESENTATIONS:

Journal articles published as a **Principal Investigator (PI) or co-PI** (April 2012-present)

1. Bhusankar Talluri, E. Prasad, **Tiju Thomas**, "*Ultra-small ($r < 2$ nm), stable (> 1 year), mixed valence copper oxide quantum dots with anomalous band gap*", (just accepted in Superlattices and Microstructures)
2. Bandi Pallavi, Sneha Sathyan, Takuya Yoshimura, Praveen Balakrishnan, Kousika Anbalagan, Bhusankar Talluri, Sarathi Ramanujam, Prem Ranjan, and **Tiju Thomas**, "*Suppression of red luminescence in wire explosion derived Eu:ZnO*", Journal of Electronic Materials (2017, just accepted)
3. Rasaki Sefiu Abolaji, Zhang Bingxue, Kousika Anbalgam, **Tiju Thomas*** and Yang Minghui*, "*Synthesis and application of nanostructured metal nitrides and carbides: a review*", Progress in Solid State Chemistry (2017, just accepted)
4. Manjunatha S., Harikrishna R., **Tiju Thomas***, Bhabani Shankar Panigrahi, and Dharmaprasanth M. S., "*Moss-Burstein effect in stable, cubic $ZrO_2:Eu^{+3}$ nanophosphors prepared by rapid microwave-assisted solution-combustion technique*" , Materials Research Bulletin 98, 139-147 (2018) .
<https://doi.org/10.1016/j.materresbull.2017.10.006>
5. Sathishkumar Kannaiyan, Chitra Boobalan, Avinash Umasankaran, Abhaiguru Ravirajan, Sneha Sathyan, TijuThomas, "*Comparison of experimental and calculated thermophysical properties of alumina/cupric oxide hybrid nanofluids*", Journal of Molecular Liquids 244, 469-477 (2017). <https://doi.org/10.1016/j.molliq.2017.09.035>

6. Abhishek Sarkar, Christoph Loho, Leonardo Velasco, **Tiju Thomas**, Subramshu S. Bhattacharya, Horst Hahn, and Ruzica Djenadic, “*Multicomponent equiatomic rare earth oxides with narrow band gap and associated praseodymium multivalency*”, RSC Dalton Transactions 46, 12167-12176 (2017). doi: [10.1039/C7DT02077E](https://doi.org/10.1039/C7DT02077E)
7. Mingming Zou, Erum Pervaiz, Lu Feng, **Tiju Thomas**, and Minghui Yang, “*Amine coupled Ordered Mesoporous (Co-N) co-doped TiO₂: Green Photocatalyst for Selective Aerobic Oxidation of Thioether*” RSC Catal. Sci. Technol. (2017). Doi: [10.1039/C7CY00946A](https://doi.org/10.1039/C7CY00946A)
8. Bhusankar Talluri and Tiju Thomas, "Indications of hard-soft-acid-base interactions governing formation of ultra-small ($r < 3$ nm) digestively ripened copper oxide quantum-dot", Chemical Physics Letters [685](https://doi.org/10.1016/j.cplett.2017.07.041), 84-88 (2017). doi: [10.1016/j.cplett.2017.07.041](https://doi.org/10.1016/j.cplett.2017.07.041)
9. Argha Sarkar Santanu Maity Aneesh M. Joseph S Chakraborty and **Tiju Thomas**, "Methane-Sensing Performance Enhancement in Graphene Oxide/Mg:ZnO Heterostructure Devices", Journal of Electronic Materials: 1-7. DOI: [10.1007/s11664-017-5619-1](https://doi.org/10.1007/s11664-017-5619-1) (2017)
10. Abdul Malek, Edamana Prasad, and **Tiju Thomas**, "Chimie douce hydrogen production from Hg contaminated water, with desirable throughput, and simultaneous Hg-removal", International Journal of Hydrogen Energy, [42 \(24\)](https://doi.org/10.1016/j.ijhydene.2017.04.035), 5724-15730 (2017).
11. Mingming Zou, Fengqiang Xiong, Ayyakannu Sundaram Ganeshraja, Xiaohua.Feng, Chuanxi.Wang, **Tiju Thomas*** and Minghui Yang, *Visible light photocatalysts (Fe, N):TiO₂ from ammonothermally processed, solvothermal self-assembly derived Fe-TiO₂ mesoporous microspheres*", Materials Chemistry and Physics 195, 259-267 (2017). DOI: [10.1016/j.matchemphys.2017.04.035](https://doi.org/10.1016/j.matchemphys.2017.04.035)

12. Xiong, Feng-Qiang, Lipeng Wan, Yue Li, **Tiju Thomas**, Francis Joseph DiSalvo, and Minghui Yang, "*Crucial role of donor density in the performance of oxynitride perovskite LaTiO₂N for photocatalytic water oxidation reaction*", ChemSusChem 10 (5), 930-937 (2017).
13. Zou, Mingming, Honghong Liu, Lu Feng, **Tiju Thomas**, and Minghui Yang, "*Enhanced visible light photocatalytic activity in N-doped edge-and corner-truncated octahedral Cu₂O*", Solid State Sciences 65, 22-28 (2017).
14. [Bhusankar Talluri](#), [Edamana Prasad](#), and **Tiju Thomas**, "*Ultra-small ($r < 2$ nm), stable (> 1 year), mixed valence copper oxide quantum dots with anomalous band gap*", [arXiv:1706.01261](#) (2017)
15. Zou, Mingming, Honghong Liu, Lu Feng, Fengqiang Xiong, Tiju Thomas, and Minghui Yang. "Effect of nitridation on visible light photocatalytic behavior of microporous (Ag, Ag₂O) co-loaded TiO₂", Microporous and Mesoporous Materials 240 (2017): 137-144.
16. Wan, Lipeng, Feng-Qiang Xiong, Yue Li, **Tiju Thomas**, Ruxin Che, and Minghui Yang. "*Low Defect Density, High Surface Area LaNbON₂ Prepared via Nitridation of La₃NbO₇*" Materials Letters 188, 212–214 (2017). <http://dx.doi.org/10.1016/j.matlet.2016.11.012>
17. [Xin Liu](#), [Nan Yin](#), **Tiju Thomas**, [Minghui Yang](#), [Junhu Wang](#) and [Quan Shi](#), "*Effect of nitrogen substitution on the structural and magnetic ordering transitions of NiCr₂O₄*", RSC Advances 6, 112140-112147 (2016); DOI: 10.1039/C6RA22773B
18. Prakashbabu, D., H. B. Ramalingam, R. Hari Krishna, B. M. Nagabhushana, R. Chandramohan, C. Shivakumara, J. Thirumalai, and **Tiju Thomas**, "*Charge compensation assisted enhancement of photoluminescence in combustion derived Li⁺ co-doped cubic ZrO₂: Eu³⁺ nanophosphors*", Physical Chemistry Chemical Physics 18, no. 42 (2016): 29447-29457. DOI: 10.1039/c6cp04633a.

19. Malek, Abdul, **Tiju Thomas**, and Edamana Prasad, "Visual and Optical Sensing of Hg^{2+} , Cd^{2+} , Cu^{2+} , and Pb^{2+} in Water and Its Beneficiation via Gettering in Nanoamalgam Form," ACS Sustainable Chemistry & Engineering 4(6) : 3497-3503 (2016).
20. Jian Zheng, Feng-Qiang Xiong, Mingming Zou, **Tiju Thomas**, Heng Jiang, Ying Tian, Minghui Yang, "Enhanced photocatalytic degradation of rhodamine B under visible light irradiation on mesoporous anatase TiO_2 microspheres by codoping with W and N", Solid State Sciences 54, 49-53 (2016)
21. Abhijit Kalaskar, **Tiju Thomas**, Rajeev Ranjan, "Electric field induced short range to long range structural ordering and its influence on the Eu^{+3} photoluminescence in the lead-free ferroelectric $\text{Na}_{1/2}\text{Bi}_{1/2}\text{TiO}_3$ ", Journal of Applied Physics 117 (24) , 244106 (2015).
22. R. Hari Krishna, B. M. Nagabhushana, H. Nagabhushana, N. Suriya Murthy, C. Shivakumara, Babu Rao, **TijuThomas**, "Luminescence enhancement in monoclinic $\text{CaAl}_2\text{O}_4:\text{Eu}^{2+}$, Cr^{3+} nanophosphor by fuel-blend combustion synthesis", Chemical Engineering Journal 267, 317-323 (2015).
23. Niya Mary and **Tiju Thomas**, "Nanorod to quantum dot conversion in ZnO dispersions with co-surfactants", RSC Advances 5 (20), 15154-15158 (2015).
24. Aakanksha Chaudhary, Poshit Nag, **Tiju Thomas**, N. Ravishankar, Manish Jain, SrinivasanRaghavan, "Synergistic effect of Mo+Cu co-doping on the photocatalytic behavior of metastable TiO_2 solid solutions", ACS Journal of Physical Chemistry C 118 (51), 29788-29795 (2014).
25. Arun D Rao, Suresh Karalatti, Praveen C Ramamurthy, **Tiju Thomas**, "Self-assembled, aligned ZnO nanorod buffer layers for high current density, inverted organic photovoltaics", ACS Applied Materials and Interfaces 6(19), 6792-16799 (2014)

26. D. L. Monika, H. Nagabhushana, R. Hari Krishna, B. M. Nagabhushana, S. C. Sharma, Tiju Thomas, "Synthesis and photoluminescence investigations on Li^+ co-activator based $\text{Sr}_2\text{CeO}_4:\text{Dy}^{3+}$ nanophosphor – a viable potential white light phosphor", RSC Advances 4(73), 38655-38662 (2014)
27. Jacob, Niya Mary, and Tiju Thomas. "Digestive ripening and green synthesis of ultra-small ($r < 2\text{nm}$) stable ZnO quantum dots." *Ceramics International* 40.9 (2014): 13945-13952.
- a. <http://dx.doi.org/10.1016/j.ceramint.2014.05.116>
28. R. Hari Krishna, B. M. Nagabhushana, H. Nagabhushana, D. L. Monika, R. Sivaramakrishna, C. Shivakumara, R. P. S. Chakradhar, **Tiju Thomas**, "Photoluminescence, thermoluminescence and EPR studies of solvothermally derived Ni^{2+} doped $\text{Y}(\text{OH})_3$ and Y_2O_3 multi-particle-chain microrods", *Journal of Luminescence* 155,125-134 (2014).
29. Niya Mary, Giridhar Madras, Nagaraju Kottam and **Tiju Thomas**, "Multivalent Cu doped ZnO nanoparticles with full solar spectrum absorbance and enhanced photoactivity" *ACS Industrial and Engineering Chemistry Research* 53 (14): 5895–5904 (2014).
30. R. Hari Krishna, B. M. Nagabhushana, H. Nagabhushana, N. Suriya Murthy, R. Sivaramakrishna, C. Shivakumara, R. P. S. Chakradhar, **Tiju Thomas**, "Combustion synthesis approach for spectral tuning of Eu doped CaAl_2O_4 phosphors", *Journal of Alloys and Compounds* 589 : 596-603 (2014)
31. R. Hari Krishna, B. M. Nagabhushana, H. Nagabhushana, R. Sivaramakrishna, C. Shivakumara, R. P. S. Chakradhar, **Tiju Thomas**, "Auto-ignition based synthesis of Y_2O_3 for photo- and thermo-luminescent applications", *Journal of Alloys and Compounds* 585: 129-137 (2014) . (<http://dx.doi.org/10.1016/j.jallcom.2013.09.037>)

32. Niya Mary Jacob, Praveena Kuruva, Giridhar Madras and **Tiju Thomas**, “Room temperature synthesized ZnO, (Zn,Cu)O and cobalt ferrite based versatile adsorbents”, ACS Industrial and Engineering Chemistry 52 (46), 16384–16395 (2013) (<http://dx.doi.org/10.1021/ie402727z>)
33. Rajesh Kumar Prusty, Praveena Kuruva, U. Ramamurty, **Tiju Thomas**, “Correlations between photoluminescence and mechanical modulus trends in Eu doped sodium bismuth titanate”, Solid State Communications **173**, 38-41 (2013).
a. (<http://dx.doi.org/10.1016/j.ssc.2013.09.002>)
34. Praveena Kuruva, S. Srinath, B. Radhika and **Tiju Thomas**, “Magnetic property optimization in size-controlled cobalt ferrite nanoparticles prepared using an aqueous chemical route”, IEEE Transactions on Magnetics (2013) (<http://dx.doi.org/10.1109/TMAG.2013.2283467>)
35. **Tiju Thomas** and Nagaraju Kottam, “Combining “chimiedouce” and green principles for the developing world: improving industrial viability of photocatalytic water remediation”, Chemical Engineering Science (letter to the editor) (2013) **102**, 283-288 (<http://dx.doi.org/10.1016/j.ces.2013.08.004>).
a. Research publications **prior to becoming a faculty member** (Aug 2007-Mar 2012)
36. **Tiju Thomas**, Shawn Chatman, Jake Wells, Lisa Emberley, Muhammad Asim Rasheed and Kristin M. Poduska, “Lateral heterogeneities in ZnO Electrodeposits and Their Impact on Electrical and Optical Properties”, ECS Solid State Letters 1 (2), P35-P37 (2012).
37. **Tiju Thomas**, Xiaomei Guo, Junxia Shi, Lori Lepak, MVS Chandrashekhar, Kewen Li, Francis DiSalvo and Michael G Spencer, “Gallium nitride powders: mechanism of ammonothermal synthesis, ball-mill assisted rare earth doping and uniform

electrophoretic deposition”, Journal of Crystal Growth, 316, 90-96 (2011).

38. W. M. Jadwisieczak, K. Wisniewski, M. Spencer, **Tiju Thomas** and D. Ingram, “Optical properties, luminescence quenching mechanism and radiation hardness of Eu doped GaN powder”, Radiation Measurements, 45, 500-502 (2010).
39. **Tiju Thomas**, XiaomeiGuo, MVS Chandrashekhar, Carl B. Poitras, William Shaff, Mark Dreibelbis, Jesse Reiherzer, Kewen Li, Francis J. DiSalvo, Michal Lipson and M.G. Spencer,”Purification and mechanical nanosizing of Eu-doped GaN”, Journal of Crystal Growth, 311, 4402-4407 (2009).
40. K. Wisniewski, W. Jadwisieczak, **Tiju Thomas** and M. Spencer, “ *High pressure luminescence studies of europium doped GaN*”, Journal of Rare Earths **27**, 667 (2009).
41. Wojciech M. Jadwisieczak, Saleem Ramadan, **Tiju Thomas**, Michael G. Spencer, Nelson Y. Garces, Evan R. Glaser and Krzysztof Wisniewski, “*Luminescence and Excitation Mechanisms of Eu-doped GaN Phosphors*”, MRS Proceedings, **1111**, 1111-D02-07 (2009).
42. **Tiju Thomas**, Dhananjai Pandey and Umesh V. Waghmare, “*Soft modes at the stacking faults in SiC crystals: First principles calculations*”, Physical Review B, **77**, 121203 (Rapid Communication) (2008).
43. Assa Aravindh, Shobhana Narasimhan, **Tiju Thomas** et al. “*Si_xC_{1-x}O₂ alloys: A possible route to stabilize carbon-based silica like solids?*”, Solid State Communications **144**, 273-276 (2007).

a. Manuscripts currently under review with IITM affiliation

44. Sai Srikanth Arvapalli, Bhushankar Talluri, Kousika Anbalagan, and **Tiju Thomas**, “*Role of pinning mechanism in co-precipitation derived cobalt rich, cobalt ferrite nanoparticles*”, (under review in Solid State Sciences)
45. Prasanna Kumar, Nagaraju Kottam, Preetham R, R. Harikrishna, **Tiju Thomas**, “*Understanding the photoluminescence behaviour in nano CaZrO₃:Eu³⁺ pigments by Judd-Ofelt intensity parameters*”, Dyes and Pigments (under review)
46. Sritama Mukherjee, Tanvi Gupte, S. Jenifer, **Tiju Thomas*** and Thalappil Pradeep, “*Arsenic in Environment: Sources, Contamination and Removal*”, Wiley Encyclopaedia (just submitted)
47. Sritama Mukherjee, Tanvi Gupte, S. Jenifer, **Tiju Thomas*** and Thalappil Pradeep, “*Arsenic in Environment: Sensing and Remediation*”, Wiley Encyclopaedia (just submitted)
48. Abdul Malek, **Tiju Thomas**, Edamana Prasad, “*Evidence of Nano-galvanic Couple Formation on in-situ Formed Nanoaluminum-amalgam Surfaces for Passivation-bypassed Water Splitting*”, Journal of Materials Chemistry A (under review)
49. Bingxue Zhang, Xinxin Zhou, Shendan Zhang, Fengdong Qu, **Tiju Thomas** and Minghui Yang, “*Porous coral-like NiCo₂O₄ nanospheres with promising xylene gas sensing properties*”, Sensors and Actuators B (under review)
50. Bhusankar Talluri, Edamana Prasad, **Tiju Thomas**, “*Impact of solvent in ceramic digestive ripening: a case of CuO*” (soon to be submitted)
51. Bhusankar Talluri, Edamana Prasad, **Tiju Thomas**, “*Impact of surfactant in ceramic digestive ripening: a case of CuO*” (soon to be submitted)

52. Nanocluster team @ NIT-Trichy, Bhusankar and **Tiju Thomas**, “*Implication of a unified Lee-Clark mechanistic model for DR in ceramic nanoparticles*”(to be submitted to Chemical Engineering Journal)

Manuscripts under preparation (with IITM affiliation)

"*Nanocrystalline multicomponent equiatomic rare earth oxides as new hydrogen storage systems*", Abhishek Sarkar, Christoph Loho, **Tiju Thomas**, Subramshu S. Bhattacharya, Horst Hahn, and Ruzica Djenadic (under preparation)

"*Phase behavior of ultra-small, stable, digestively ripened, ZnO QDs ($r < 2$ nm) in discotics*", Bhusankar Talluri, Niya Mary, Sandeep Kumar, and **Tiju Thomas**, (under preparation)

"*Barium tantalum oxides: phase stability and optical band gap studies on solution-combustion derived systems, and band structure evaluations*", Kousika A, R Harikrishna, and **Tiju Thomas**

"*Nitridation kinetics in solution-derived barium tantalum oxides and systematic study of band structure modification through high pressure nitridation*", Kousika A, R Harikrishna, and **Tiju Thomas**

"*Barium tantalum oxynitride: thermophysical computations and empirical dielectric dispersion studies*", Kousika A, R Harikrishna, and **Tiju Thomas**

"*Electronic structure modification of BiVO_4 through high pressure, ammonothermal processing, for photoanode applications*", A Malek, A Kousika, Bhusankar T, **Tiju Thomas**

"*Gadolinium doped sodium bismuth titanate – optical and spectrochemical investigation* ", Santosh Behera Kumar, Lalitha G, et al

"*Systematic optical property investigation in $\text{Na}_{0.5}\text{Bi}_{0.5-x}\text{Eu}_x\text{TiO}_3$* ", Wojciech Jadwicienczak, Praveena Kuruva, and **Tiju Thomas**, (under preparation)

"*Ab-initio studies on thermoelectric properties of Eu doped sodium bismuth titanate*", Mousumi U. Kahaly, and **Tiju Thomas** (under preparation)

"*Photocatalytic disinfection of water from Nairobi using Cu doped ZnO*", Vincent O. Madadi, **Tiju Thomas**, and Shem O Wandiga, (under preparation)

"*Atmospheric pressure dielectric breakdown as a means of recycling water remediation materials*", Yoon Kee Kim, and **Tiju Thomas**, (under preparation)

“Photoluminescence studies on calcium tungstates”, R Harikrishna, BM Nagabhushana and **Tiju Thomas**

"Nano Si and Si:CNT in-situ, arc-discharge synthesis and electrochemical characterization", Sneha S, Madhubala, Raja A, Bhusankar T, Kousika A, **Tiju Thomas**

Papers on (i) replacement of sodium borohydride in amalgam based hydrolytic processes, (ii) QD seeded monodisperse nanoparticles, (iii) QD-polymer **electrospun composites** for **electrochemical liquid phase sensing**, (iv) unified **mechanistic modeling** of DR in ceramic nanoparticles (Lee-Clark hybrid model; anisotropy; enthalpic and electrostatic corrections; defect chemistry; predictive modeling), (v) Bond Valence method for **sintering dynamic simulations** in complex ceramic, (vi) As sensor using rGO/MnOx system, (vii) band gap engineering in Bismuth oxide derivatives and photoactive aluminates – **electronic structure/ ab initio studies** and engineering simulations, (viii) As detection and remediation technologies – materials and **nano-biotechnology** approaches

A review articles on (i) “Synthesis of pnictide and chalcogenide superconductors” and “Oxynitride and multiphase materials for supercapacitor applications” is underway.

(more Malek, Kousika, Bhusankar, Santosh, Tanvi, Dr. Sudhapriyanka collaborations planned)

Conference publications

1. Jingzhou Wang, Praveena Kuruva, **Tiju Thomas**, Wojciech M. Jadwisieniczak, “Optical Studies of $Na_{0.5}Bi_{0.5-x}Eu_xTiO_3$ Perovskite Red Phosphor with High Europium Content”, International Workshop on Advanced Spectroscopy and Optical Materials, Gdańsk, Poland (July 2013) (peer reviewed paper).

2. Arun D Rao, Suresh Karalatti, Arul Varman K, **Tiju Thomas** and Praveen C Ramamurthy, “Organic solar cell using vertically aligned nanostructured ZnO nanorods”, IEEE Conference, Boston, US.A (July 2013). (**Invited Contribution**) (peer reviewed paper)

3. Jingzhou Wang, PraveenaKuruva, **Tiju Thomas**, Adam Brant, Wojciech M. Jadwisieniczak, “Optical Characterization of Eu Doped Mixed A-site Perovskite $Na_{0.5}Bi_{0.5}TiO_3$ Red Phosphor”, International Conference on Rare Earths, Ganzhou City, Jiang Xi Province, China (August 2013). (peer reviewed paper)

4. XiaomeiGuo,**Tiju Thomas**, Kewen K. Li, Jifa Qi, Yanyun Wang, Xuesheng Chen, Michael G. Spencer, Hua Zhao, Kevin Y. Zou, Hua Jiang and Baldassare D. Bartolo, “Size reduction and rare earth doping of GaN powders through ball milling”, MRS Proceeding,**1202**, 1202-I09-12 (2009).

5. Wojciech M. Jadwisieniczak, Saleem Ramadan, **Tiju Thomas**, Michael G. Spencer,

Nelson Y. Garces, Evan R. Glaser and Krzysztof Wisniewski, "Luminescence and Excitation Mechanisms of Eu-doped GaN Phosphors", MRS Proceedings, **1111**, 1111-D02-07 (2009).

6. **Tiju Thomas**, MVS Chandrashekhar, Carl B. Poitras, Junxia Shi, Jesse C. Reiherzer, Francis J. DiSalvo, Michal Lipson and M. G. Spencer, "Photoluminescence enhancement in Eu doped GaN powder by oxidative passivation of the surface", MRS Proceedings, **1111**, 1111-D04-01 (2008).

7. 2 papers by Bhusankar and Kousika in IIT Roorkee Materials conference (to appear soon)

Journals I have refereed/am refereeing for: RSC Physical Chemistry Chemical Physics, RSC Crystal Engineering Communication, Materials Chemistry and Physics, Plasmonics, Journal of Electrochemical Society, Journal of Hazardous Materials, Inorganics, IEEE Magnetics, Materials Research Symposium Proceedings, Research on Chemical Intermediates, Korean Journal of Chemical Engineering, Solar Energy, Transactions of Indian Institute of Metals, Scientific Reports (a journal from the *Nature* Publishing Group), Journal of Industrial and Engineering Chemistry, Materials Physics and Chemistry.

PROFESSIONAL AFFILIATIONS: Materials Research Society, IEEE, American Chemical Society, Electron Microscopy Society of India (Life member), Rare Earth Society of India (Life member).

Patents

1. "A perovskite $Na_{0.5}A_{0.5-x}RE_xZO_3$ and a process thereof", Indian Patent (application no. 2211/CHE/2013)
2. "Soft, self-assembly process of low dimensional Au nanostructures using slanted-substrate method" (2016,) Indian Patent (application no. 201641033963); filing date: 04/10/2016.
3. "Hydrogen generation from waste water via galvanic corrosion of in-situ formed aluminum amalgam" (2016) (Indian Patent application no. 201641027502; International application no: PCT/ IN2017/ 050334

4. *“Digestively-ripened seed/nucleus-driven rapid and high yield synthesis of monodispersed ceramic/compound semiconductor nanoparticles”* (2017) (IIT Madras IDF- 1567 – Indian Patent filed)