

Dr. M. Baby Mariyatra, MSc, PhD

Assistant Professor
 Department of Chemistry
 St. Xavier's College (Autonomous)
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EDUCATION

Ph.D. Chemistry

School of chemistry, Bharathidasan University, Tiruchirappalli, India

CSIR-UGC joint National Eligibility Test for Lecturership in Chemistry

M.Sc. Chemistry, School of chemistry, Bharathidasan University, Tiruchirappalli, India

B.Sc. Chemistry, Holy Cross College, Tiruchirappalli, India.

WORK EXPERIENCE

Since 2013	Assistant Professor , St. Xavier's College, Palayamkottai,
2010-2012	Postdoctoral Fellow , The University of Dublin, Trinity College, Ireland
2008-2009	Postdoctoral Fellow , Indian Institute of Technology-Bombay, India
2001-2006	Research Scholar , School of Chemistry, Bharathidasan University, Tiruchirappalli, India

RECOGNITIONS

- Science Academies Teacher Fellow 2017, Indian Academy of Sciences, India
- Associate member of Royal Society of Chemistry, UK
- Postdoctoral fellowship, University of Dublin, Trinity College, Ireland

RESEARCH AREA

Functional inorganic materials for energy, gas storage, catalysis and drug delivery

Crystal Engineering and Supramolecular chemistry

TEACHING SKILLS

ICT enabled teaching and blended learning

Developing e-content

Differentiated instruction

Facilitating peer group learning

Practicing inverted class room

Executing problem based learning

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RESEARCH COLLABORATIONS

1. Prof. Helen Stoeckli-Evans, Universite de Neuchatel, Switzerland

2. Prof. Antonia Neels, Empa-Swiss Federal Laboratories for Materials Science and Technology, Switzerland

TRAINING ACQUIRED THROUGH ORIENTATION PROGRAMMES

1. Orientation programme for college teachers (UGC sponsored), St. Xavier's College, Palayamkottai, 21 January 2014.

2. Orientation programme for college teachers on "innovative teaching strategies for student-centered education, St. Xavier's College, Palayamkottai, 5th July 2014.

3. Orientation programme for colleges teachers on "Classroom management and teaching skills", St. Xavier's College, Palayamkottai, 21st August 2014.

4. Workshop on Smart Classroom Management (UGC sponsored), St. Xavier's College, Palayamkottai August 17 – 18, 2015.

5. International training programme on leadership and career development for women scientists/technologists (Sponsored by DST, IUSSTF and COACH international), August 28 – September 1, 2015.

6. Workshop on e-content development (UGC sponsored), St. Xavier's College, Palayamkottai November 12 – 15, 2015.

7. Seminar on Millenium Psychology of students, IQAC, St. Xavier's College, Palayamkottai, 14-15 June 2016

8. Workshop on Life Skills and Soft Skills for our students, IQAC, St. Xavier's College, Palayamkottai, 22-23 November 2016.

9. Orientation programme for teachers on 'Counselling and mentoring', IQAC, St. Xavier's college, Palayamkottai 19-20, 2017.

10. Workshop on human values development , conducted by ALL INDIA ASSOCIATION FOR CHRISTIAN HIGHER EDUCATION,, St. Xavier's College, Palayamkottai 13-14 February 2017.

INVITED/GUEST LECTURES DELIVERED:

1. "Nano: Small wonders", Physics department association meeting, St. Xavier's College, Palayamkottai, 22 February 2018.

2. Served as Judge for poster presentation held during national conference on Recent developments in effective materials, Department of Physics, Sarah Tucker College, Tirunelveli, 19 February 2018.

3. "Nano- A world of opportunities", State level seminar on Nano- Small wonders Endless Frontiers, PG and Research Department of Physics, Holy Cross College, Tiruchirappalli, 24 January 2018.

4. "Hybrid organic and Inorganic Porous Framework materials for advanced applications, UGC sponsored state level seminar on Expanding Frontiers in Chemistry, Arul Anandar College, Madurai, 23September 2016.

5. "Designing Organic Synthesis-Retrosynthetic Approach", Department of Chemistry, Mother Theresa Women's University, Kodaikonal, 2 April, 2016.

6. "Asymmetric Synthesis", Department of Chemistry, Mother Theresa Women's University, Kodaikonal, 2 April, 2016.

7. "Infrared spectroscopy" in Second Hands-on Experimental Workshop on Characterization Techniques, PSN College of Engineering and Technology, Tirunelveli, 8 October 2015.

8. "Chemistry for the Community" in "Young Student Scientist Programme for School children (IX-X std)" St. Xavier's College, April-May, 2014.

9. "Change or Be Changed" III Year UG and I & II PG students, St.Xavier's College, Palayamkottai.

ORAL PRESENTATIONS:

1. "Student Training and Action for Neighbourhood Development project in St.Xavier's College" in Two day seminar on Extension Activities: Challenges and Opportunities in Tamil Nadu Jesuit Colleges, St.Joseph's College, Tiruchirappalli, 12, 13 Feb 2016.

2. Mapping conceptual understanding: A useful tool for curriculum design and evaluation, National seminar on “innovations in studentcentered Teaching-learning process in 21st century” (NAAC sponsored), St. Xavier’s College, Palayamkottai, 29-30 January, 2015.

OUTREACH PROGRAMME

1. Planned and conducted an awareness campaign with II BSc Chemistry Students, on **World Ozone day**, September 16, 2014, St. Xavier’s College, Palayamkottai.
2. Invited speaker in “Young Student Scientist Programme for School children (IX-X std)” April-May, 2014. Also, Project advisor for three teams of students. Two teams won prizes in the final day competition.
3. Staff coordinator for Chemistry Department involving in STAND (Student Training and Action for Neighbourhood Development) project for the year 2015-2016.

WORKSHOPS/SYMPOSIUM/SEMINARS/ ORGANIZED

- (1) **Convener** for “RSC symposium on Recent trends in Chemical Sciences” sponsored by Royal Society of Chemistry, UK (South India Section), December 12, 2014, St. Xavier’s College Palayamkottai.
- (2) **Coordinator** for National Science academies sponsored Three day Lecture workshop on “Emerging trends in Chemistry”, January 9-11, 2015, St. Xavier’s College, Palayamkottai.

SHORT-TERM COURSES/WORKSHOPS/SEMINARS ATTENDED

1. Course on “Chemistry of nanoscience and nanotechnology” August-October, 2005, conducted by Bharathidasan University, Tiruchirappalli.
2. Ninth BCA/CCG intensive course on “**X-ray structure analysis**”, 7th-15th April, 2003, **Durham University, UK.**
3. One month internship on gold nanoparticle chemistry, Prof. Thomas Buerger, **Universite de Neuchatel, Switzerland**, May 2006.
4. A to Z of single crystal X-ray crystallography – A practical training course conducted by **Prof. Ray Butcher** (Howard University, USA) at IIT-Bombay, 10th September to 16th October 2009.
5. Training workshop on Radiological Protection, The University of Dublin, Trinity College, Ireland, 12-13th January 2012.
6. Regional Seminar on Environmental management (UGC sponsored), St. Xavier’s College, Palayamkottai, 7th March 2014.
7. Lecture workshop on Emerging trends in Chemistry, July 18-20, 2014, Devanga Arts College, Aruppukottai.

8. Academia-Industry Interaction Meet, August 26, 2014, Lady Doak College, Madurai.
9. The Second International Conference on emerging technologies for clean water, Indian Institute of Technology-Madras, Chennai, October 23- 24, 2014.
10. Workshop on Computing with R, St. Xavier's College (DBT Sponsored), Palayamkottai.
11. International Conference on Recent Advances in materials research and its applications, St. Xavier's College, Palayamkottai, December 16, 2015
12. International Conference on new dimensions in Mathematical Biology. (Sponsored by DBT), St. Xavier's College, Palayamkottai, December 18, 2015.
13. State level seminar on Equity and Access: Women empowerment in higher education institutions in India, sponsored by Tamil Nadu state council for higher education, St. Xavier's College, Palayamkottai, March 11, 2016.
14. Workshop on e-content development (UGC sponsored), St. Xavier's College, Palayamkottai November 12 – 15, 2015.
15. International workshop on electronic structure of coordination complexes (Sponsored by DST, DBT, INSA, BRNS), Department of Chemistry, Indian Institute of Technology-Bombay, Mumbai, May 16-18, 2016.
16. International conference on Modern Trends in Molecular Magnets (Sponsored by DST, DBT, INSA, BRNS), Department of Chemistry, Indian Institute of Technology-Bombay, Mumbai, May 19-21, 2016.
17. Eighty third annual meeting of Indian Academy of Sciences, North eastern Hill University, Shillong, Meghalaya, 02-05 November 2017.
18. National Seminar on Recent Advances in Material Science, Department of Chemistry, St. Xavier's College, Palayamkottai, March 05, 2018.

PUBLICATIONS

1. Polymorphism and benzene solvent controlled stimuli responsive reversible fluorescence switching in triphenylphosphoniumfluorenylide crystals, P. S. Hariharan, **M. B. Mariyatra**, Antonia Neels, Georgina Rosair, E.M. Mothi, and S.P. Anthony, *New J. Chem.* 2017, **41**, 4592-4598.
2. Crystal structure of *N*-(2,2,2-trichloro-1-hydroxyethyl)formamide **M. Baby Mariyatra**, H. Stoeckli-Evans, *Acta Cryst.* 2015, E71, 1501-1504.

3. Homologous size-extension of hybrid vanadate capsules – solid state structures, solution stability and surface deposition, **M. B. Mariyatra**, S. Krasnikov, L. Reck, C.I. Onet, J. M. Breen, N. Zhu, B. Marzec, I. V. Shvets, W. Schmitt, *Chem Commun.* 2014, **50**, 2265.
4. {4,6-Bis[(*E*)-1-methyl-2-(pyridin-2-ylmethylidene- *N*)hydrazinyl-*N*2]pyrimidine-*N*1}dichloridocopper(II) methanol disolvate monohydrate, B. Marzec, **M. B. Mariyatra**, T. McCabe and W. Schmitt, *Acta Cryst.* 2011, E67, m1073-m1074.
5. {4,6-Bis[(*E*)-1-methyl-2-(pyridin-2-ylmethylidene)hydrazinyl]pyrimidine-3*N,N,N'*}dichloridomanganese(II), B. Marzec, **M. B. Mariyatra**, L.Zhang, T. McCabe and W. Schmitt, *Acta Cryst.* 2011, E67, m1676.
6. Bidentate coordination of a diketo phosphorus ylide: Synthesis and structure of [(C₆H₅)₃PC(COCH₃)(COC₆H₅)- κ -*O,O'*]UO₂(NO₃)₂, B.Kalyanasundari, **M. Baby Mariyatra** and K. Panchanatheswaran, *J.Coord. Chem.* 2007, 61, 270 – 276.
7. The synthesis and structural characterization of the Mercury(II) halide complexes of the phosphorus ylide, Carbethoxymethylenetriphenylphosphorane, Elinor C. Spencer, **M.Baby Mariyatra**, Judith A. K. Howard and K. Panchanatheswaran, *J.Organomet. Chem.*, 2007, 692, 1081-1086.
8. The preparation and structural elucidation of U(VI) complexes and salts of phosphorus ylides, Ph₃PCHCOPh, Ph₃PC(COCH₃)(COPh) and Ph₃PCHCOOCH₂CH₃, Elinor C. Spencer, B. Kalyanasundari, **M. Baby Mariyatra**, Judith A. K. Howard and K. Panchanatheswaran, *Inorg. Chim. Acta* 2006, 359, 35-43.
9. Di(μ 2-halogeno)-bis[halogeno(triphenylphosphine)mercury(II)], [Ph₃PHgX(μ 2-)₂XHgPPh₃] re-investigated at 120 K for X=Cl and Br, and a second polymorph for X=I, **M. Baby Mariyatra**, K. Panchanatheswaran, J. N. Low and C. Glidewell, *Acta Crystallogr.* 2005, C61, m211-m214.
10. The 2:1 adducts of (benzoylmethylene)triphenylphosphorane with fumaric and terephthalic acid, Elinor C. Spencer, **M. Baby Mariyatra**, Judith A. K. Howard and K. Panchanatheswaran, *Acta Crystallogr.* 2004, C60, o839-o842.
11. Orthorhombic and monoclinic polymorphs of 1,3,5-triphenyl-1,3,5-perhydro-2,4,6-trione at 120 K; chains and sheets formed by C-H... π (arene) hydrogen bonds, **M. Baby Mariyatra**, K. Panchanatheswaran, J. N. Low and C. Glidewell, *Acta Crystallogr.* 2004, C60, o682 –o685.
12. Intra and interionic C-H...O interactions in benzoylmethyl triphenylphosphonium picrate, **M. Baby Mariyatra**, Elinor C. Spencer, K. Panchanatheswaran and Judith A. K. Howard, *Acta Crystallogr.* 2004, E60, o123 –o125.
13. Benzoylmethyltriphenylphosphonium hydrogen maleate: Supramolecular layer formation due to C-H...O interactions, **M. Baby Mariyatra**, Elinor C. Spencer, K. Panchanatheswaran and Judith A. K. Howard, *Acta Crystallogr.* 2004, E60, o162–o164.

14. Triphenyl(benzoylmethyl)Phosphonium iodide: Supramolecular zigzag chains via C-H...O hydrogen bonding stabilized by C-H...I interactions, **M. Baby Mariyatra**, B. Kalyanasundari, K. Panchanatheswaran and A. E. Goeta, *Acta Crystallogr.* 2003, E59, o255 –o257.

15. Triphenyl(benzoylmethyl)Phosphonium nitrate: A three dimensional hydrogen bonded network, **M. Baby Mariyatra**, K.Panchanatheswaran and A. E. Goeta, *Acta Crystallogr.* 2002, E58,o807-o809.

16. Triphenyl(benzoylmethyl)phosphonium hexabromocadm(II): Supromolecular aggregation through extensive C-H...Br and C-H...O interactions, **M. Baby Mariyatra**, K.Panchanatheswaran and A. E. Goeta, *Acta Crystallogr.* 2002, E58, m694-m696.

CONFERENCE PRESENTATIONS

1. *Supramolecuar aggregation through C-H...Br and C-H... O interactions:Crystal structure of Bis(benzomethyltriphenylphosphonium)hexabromocadm(II)*, **M. Baby Mariyatra**, K. Panchanatheswaran and A.E. Goeta, , 32nd National Seminar on Crystallography, Post-Graduate Department of Physics, University of Jammu, Jammu Tawi,INDIA, October 24-26, 2002.

2. *Phosphonium ylides as proton sponges*, M. Kalyanasundari, K. Panchanatheswaran and **M. Baby Mariyatra**, 32nd National Seminar on Crystallography, Post-Graduate Department of Physics, University of Jammu, Jammu Tawi, INDIA, October 24-26, 2002.

3. *Small molecule activation using ylide complexes: Reactions of phenylisothiocyanate with trans-bis(benzoylmethylenetriphenylphosphorane-κ-O)dinitratodioxouranium(VI)*, B. Kalyanasundari, **M. Baby Mariyatra**, R. Amsarani, K. Panchanatheswaran and A. G. Samuelson, Fifth National Symposium in Chemistry, CLRI, Chennai, INDIA, February 7-9, 2003.

4. *Synthesis of mercury(II) organometallics using phosphoylides: Their reactivity towards aldehydes*, **M. Baby Mariyatra** and K.Panchanatheswaran, INDO-US conference on Recent Advances in organometallic catalysis and Olefin polymerisation, Indian Institute of Technology-Madras, Chennai, INDIA, December, 10-12, 2003.

5. *Molecular structure of resonance stabilized phosphorus ylides-II:Crystallographic Investigations*, K. Panchanatheswaran, **M. Baby Mariyatra** and S. Jose kavitha, 33rd National Seminar on Crystallography, NCL, Pune, INDIA, Jan 8- 10, 2004.

6. *Molecular and Supramolecular structure of Chloral Formamide*, R. Divya Reshmini, S. Jenifer, M. Marimuthu & **M. Baby Mariyatra**,One day National seminar on Current trends in Chemistry, A P C Mahalaxmi College for women, Thoothukudi August 27, 2014.

7. *Formation, Crystal Structures and supramolecular organization of metalates derived from triphenylphosphoniumflurenylide*, **M. Baby Mariyatra** & Georgina Rosair, International conference on functional materials, PSN centre for scientific and applied research, Tirunelveli, september 7-10, 2016.

8. *Hydrogen bonding analysis of hydrazine derivatives*, C. Selvakumari, S. Muthuselvi & M. Baby Mariyatra, National Seminar on Advances in material science, Department of Chemistry, St. Xavier's College, Palayamkottai, March 5, 2018.

9. Phosponium Metalates: Synthesis, structures and supramolecular organization, M. Baby Mariyatra, S. Jose Kavitha, K.Panchanatheswaran, International conference on 'Recent advances in chemistry-2018', January 9, Mother Theresa Women's University, Kodaikanal.