Faculty Profile - Department of Applied Physics

Name : **M. SENTHILKUMAR**

Designation : Assistant Professor

Office Address : Department of Applied Physics, Karunya Institute of Technology and Sciences, Coimbatore

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Area of Specialization: Crystal Growth of NLO Materials, Nano-Bio Materials

Professional Experience: (Total Year of Experience)

Title of the Profession	Employer	Duration
Assistant Professor	Karunya Institute of Technology and Sciences, Coimbatore	28 March to Till Date

Academic Qualification (List from highest to lowest degree)

Degree	Board/University	Year of passing	Class/Grade	Subjects
Ph.D	Anna University Chennai	2011	Highly Commended	Crystal Growth of NLO Materials
MSc	Bharathiar University	2004	First Class with Distinction	Physics
BSc	Bharathiar University	2002	First Class with Distinction	Physics

Subject Taught

Undergraduate	Postgraduate
Applied Physics	Solid State Physics
Engineering Physics	Nuclear Physics
Materials Science	Electromagnetic Theory
Astronomy and Astrophysics	Properties of Matter
Thin Film Technology	Condensed Matter Physics
Medical Physics	Semiconductor Physics I
Nutrition	Semiconductor Physics II
Visual Optics I	Materials Characterisation

Projects Guided

Ph.D			
Name of the Scholar/Student	**Title of the Project**	**Status (Completed/ Pursuing)**	**Year of Ph.D Award**
Mrs Suja Jose RP13PH002	Preparation And Characterization of Metal/Rare Earth Elements Doped Nano Hydroxyapatite For Bio Medical Applications	Pursuing	
Mr Niranjan Prakash RP17PH001	Preparation And Characterization of Phosphate based Nanomaterials for Super-capacitor Applications	Pursuing	
Anjumol Joy RRK18PH002	Prepration and characterization of pure and metal doped graphene oxide/polymer nano-biomaterials for medical applications.	Pursuing	
Gayathri Unnikrishnan	Pure and functionalized Graphene oxide and their applications in drug deliveryand wound healing	Pursuing	
Manoj Jeyan RRK19PH004	preparation and characterisation of Gelatin methacryloyl (gelma)hydrogel composite for bone tissue engineering application	Pursuing	
Megha M RRK19PH007	Preparation and characterization of pure and metal doped hydroxyapatite /polymer Nanocomposite for Bone tissue engineering Applications	Pursuing	
M.Phil			
G. Stefy Janet RR13PH2001	Preparation And Characterization of Pure And Iron Doped Nano Hydroxyapatite For Biomedical Applications	Completed	2014
M.Sc			
Angel S L PRK19PH1003	Analysis of Carbonaceous aerosol using OCEC analyser	Completed	2021
Bijusha T J PRK19PH1020	MoS_2 -Cu Doped CoO Hybrid Nanomaterial For Photocatalytic Application Under UV–Visible Light	Completed	2021

Jeny Jose PRK18PH1005	Synthesis and Preparation of Zirconium and Cissus quadrangularis doped Hydroxyapatite and its Characterization	Completed	2020
Divya PRK17PH1010	Preparation And Charaterisation of Pure And Doped(Sr & Mg) Hydroxyappitate Nano Particle For Drug Delivery Application	Completed	2019
Jeevitha PR12PH1007	Preparation And Characterization of Pure And Silver Doped Nano Hydroxyapatite For Biomedical Applications	Completed	2014
Ponnamma PR11PH1006	Green Synthesis And Characterization of Silver Nanoparticles From Herb Extracts	Completed	2013

Details of the Publications

1. Suja Jose, M Senthilkumar, K Elayaraja, M Haris, Amal George, A Dhayal Raj, S John Sundaram, AKH Bashir, M Maaza, K Kaviyarasu, "Preparation and characterization of Fe doped n-hydroxyapatite for biomedical application" Surfaces and Interfaces.Vol.25 (2021) 101185

2. E Bruno, M Haris, A. Mohan, M Senthilkumar "Formation of self-assembled hierarchical structure on Zn doped in CuO nano particle using a microwave-assisted chemical precipitation approach" Journal of Materials Science: Materials in Electronics. Vol. 32, (2021) 19339–19351

3. Amal George, D. Magimai Antoni Raj, A. Dhayal Raj, A. Albert Irudayaraj, J. Arumugam, M. Senthilkumar, H. Joy Prabu, S. John Sundaram, Naif Abdullah Al-Dhabi, Mariadhas Valan Arasu, M. Maaza, K. Kaviyarasu, "Temperature effect on CuO nanoparticles: Antimicrobial activity towards bacterial strains" Surfaces and Interfaces 21 (2020) 100761

4. C Saravanan, M Haris, M Senthilkumar, V Mathivanan, "Gamma ray irradiation and characterization on urea and thiourea doped potassium hydrogen phthalate (KHP) crystals" Optik-International journal for light and electron optics. Vol.28 (2020) 165259

5. C Saravanan, M Haris, M Senthilkumar, V Mathivanan, "Structural, optical, and mechanical properties of gamma beam-irradiated pure and CeCl3-doped potassium hydrogen phthalate (KHP) crystals for scintillating applications" Journal of Materials Science: Materials in Electronics. Vol.31 (2020) 21368–21378

6. Amal George, A. Dhayal Raj, A. Albert Irudayaraj, D. Magimai Antoni Raj, X. Venci G. Jayakumar, J. Arumugama, M. SenthilKumar, S. John Sundaram, K. Kaviyarasu " Two step synthesis of vanadium pentoxide thin films for optoelectronic applications" https://doi.org/10.1016/j.matpr.2020.05.104

7. M. Senthilkumar, Pramod K. Singh, Vijay Singh, R. Sathyalakshmi, K.Pandiyan & R. K. Karn "Unidirectional seeded growth of l-Glutamicacid hydrobromide single crystal and itscharacterization" Phase Transitions 2019, DOI: 10.1080/01411594.2019.1670831

8. Narayanan Balaji, Toijam Sunder Meetei, Meerasha Mubarak Ali, Shanmugam Boomadevi, Muthuswamy Senthilkumar, and Krishnamoorthy Pandiyan "Generation of Nearly Flattop Ultrabroadband Response in a QPM Device Using Phase Shifter", Journal of Lightwave Technology, Institute of Electrical and Electronics Engineers (IEEE), 37, 845-851, Nov 2018

9. D. Magimai Antoni Raj, A. Dhayal Raj, A. Albert Irudayaraj, R. L. Josephine, M. Senthil Kumar, M. Thambidurai "One step synthesis, optimization and growth mechanism carambola fruit shaped CuO nanostructures: electrochromic performance", J Mater Sci: Mater Electron, 26(2):659-665. DOI: 10.1007/s10854-014-2446-5 (Impact Factor: 1.57)

10. T. Prasanyaa, M. Harisa, V. Mathivanan, M. Senthilkumar, T. Mahalingam, V. Jayaramakrishnan "Synthesis and characterization of pure, urea and thiourea doped organic NLO l-arginine trifluoroacetate single crystals" Materials Chemistry and Physics, Volume 147, Issue 3, 15 October 2014, Pages 433–438 (Impact Factor: 2.259)

11. V.Mathivanan, M.Haris, T. Prasanyaa, M.Amgalan, M. Senthilkumar "Structural, magnetic, dielectric and thermal analysis of gel grown pure and doped cadmium tartrate crystals" Optik - International Journal for Light and Electron Optics 125 (2014), pp. 5153-5159 (Impact Factor: 0.677)

12. M. Senthilkumar, M. Kalidasan, S. Sugan, R. Dhanasekaran "Growth of neodymium lanthanum calcium borate (NdLCB) single crystals by the Czochralski method and its characterization" Journal of Crystal Growth, Volume 362, 1 January 2013, Pages 189–192 (Impact Factor: 1.698)

13. M. Senthilkumar, M. Kalidasan, S. Sugan, R. Dhanasekaran, "Crystal growth of lanthanum calcium borate (LCB) single crystals from melt and its characterization" Journal of Crystal Growth, Volume 362, 1 January 2013, Pages 202–206 (Impact Factor: 1.698)

14. R. Arun Kumar, Senthilkumar M., and R. Dhanasekaran, "Growth of YCOB single crystals by flux technique and their characterization" Cryst. Res. Technol. DOI: 10.1002/crat.200711096 (2007). (Impact Factor: 1.164)

15. R Arun Kumar, Senthilkumar M., and R. Dhanasekaran "Growth and Characterization of yttrium calcium oxy borate (YCOB) single crystals for Nonlinear Optical applications" Synthesis and Reactivity in Inorganic, Metal-Organic, and Nano-Metal Chemistry, 38 (2008)132-135. (Impact Factor: 0.518)

Details of the funded projects

Title of the Project	Funding Agency	Duration	Status
Preparation and Characterisation of Semiconductor Nano-materials by Electrospun Technique	Karunya Institute of Technology and Sciences, Coimbatore	1 Year	Completed
Preparation Of Pure and Metal Doped Nano- Hydroxyappitate for Medical Applications	Karunya Institute of Technology and Sciences, Coimbatore	1 Year	Completed
Luminescent Emission and Enhancement properties of Fluorescent Nano-Hydroxyapatite for Bio-Imaging Applications	Karunya Institute of Technology and Sciences, Coimbatore	6 Months	Completed

Awards and Fellowships received

- Senior Research Fellowship - Direct award by Council of Scientific and Industrial Research (CSIR) New Delhi, Government of India (Nov 2008 to Dec 2010)
- Senior Research Fellowship - Department of Science and Technology, Government of India Funded Major Research Project (Sep 2007 to Oct 2008)
- Junior Research Fellow – Department of Science and Technology, Government of India Funded Major Research Project (Oct 2005 to Sep 2007)
- Best research paper award – Oral in the National Conference On Materials For Future Technology NCMFT-2012 held at Sacred Heart College Tirupathur on 28th September 2012
- Best research paper award – Poster in the DST, DRDO, UGC, CSIR India and The Research Council of Norway sponsored International Conference on Advanced Materials (ICAM 2011)held at PSG College of Technology, Coimbatore during December 2012
- Best research paper presentation award at the University Grants Commission (UGC) sponsored National Seminar on “Crystal Growth of Laser and Non-Linear Optical Materials (NSCGOM - 2008) held at National College, Trichirappalli during 25 – 25 September 2008

Academic and Administrative responsibilities

1. Internal Quality Assurance Cell (IQAC) - Coordinator
2. National Board of Accreditation (NBA) - Coordinator
3. National Assessment and Accreditation Council (NAAC) – Coordinator
4. University Grants Commission (UGC) – Coordinator
5. All India Council for Technical Education (AICTE) – Coordinator
6. National Institutional Ranking Framework (NIRF) – Coordinator
7. Curriculum Development Cell (CDC) - Member
8. Board of Studies - Member
9. Astronomy Club – Coordinator and Nature Club – Co-Coordinator
10. QS Stars, Annual, Monthly and Statutory Reports and Alumni Cell – Coordinator

Member of organizing committee

1. National conference on Nanomaterials (NCN 2012) National level workshop on "Thin Film Coating and Characterization Techniques" held at Karunya Institute of Technology and Sciences.

2. External Expert Member for the Board of Studies of Coimbatore Institute of Technology and Sciences, Coimbatore, India

Invited Talk Delivered

1. M. Senthilkumar "Growth and Characterisation of Borate based Single Crystals for frequency conversion and Laser Applications" International Conference on Smart materials held at PG and Research Department of Physics, Sacred Hearts College, Tirupattur11-12, February 2015

2. M. Senthilkumar, "Growth of Lanthanum Calcium Borate (LCB) Single Crystals and its Characterization for Laser Applications" One day state level seminar on "advances in materials science Theivanaiammal, College for Women, Villupuram, 23, January 2015

Papers Presented in International Conferences

1. **M. Senthilkumar** and Steffy Janet "Preparation of Pure And Iron Doped Nano Hydroxyapatite crystals and its Characterization**"** Paper presentation in an *International conference on Smart Materials (ICSM 2015)* held at Sacred Heart College, Tirupatur, Tamilnadu on 12th and 13th Feb 2015.

2. T. U. Jeevitha, R. Sathyalakshmi and **M. Senthilkumar** "Synthesis, Preparation and Characterisation of Pure and Silver doped nano Hydroxyapatite (nHAp) powder for Biomedical Applications" ***paper presentation in International Conference on Nanomaterials for Frontier Applications (ICNFA 2015)*** 2 – 4, December 2015, Coimbatore Institute of Technology ,Coimbatore

3. **M. Senthilkumar** "Melt Growth of Neodymium Lanthanum Calcium Borate (NdxLa2-xCaB10O19 - NdLCB) Single Crystals for NLO Applications" in the International Conference on Advanced Materials (ICAM 2011) PSG College of Technology, Coimbatore during December 12 – 16, 2012

4. **M. Senthilkumar**, M. Kalidasan., S. Sugan and R. Dhanasekaran "Crystal Growth of Lanthanum Calcium Borate ($La_2CaB_{10}O_{19}$ - LCB) Single Crystals from melt and its Characterisation" The 5th Asian Conference on Crystal Growth and Crystal Technology June 20-July 1 to be held at Singapore jointly with International Conference on Materials for Advanced Technologies (ICMAT-2011)

5. **M. Senthilkumar**, M. Kalidasan., S. Sugan and R. Dhanasekaran "Growth of Neodymium Lanthanum Calcium Borate ($Nd_xLa_{2-x}CaB_{10}O_{19}$ - NdLCB) Single Crystals by Czochralski method and its Characterisation" The 5th Asian Conference on Crystal Growth and Crystal Technology June 20 to July 1 to be held at Singapore jointly with International Conference on Materials for Advanced Technologies (ICMAT 2011)

6. **M. Senthilkumar**, R. Arun Kumar, and R. Dhanasekaran "Growth of Lanthanum Calcium Borate (LCB) Single Crystals and its Characterisation for Laser Applications" at 5th International Conference on Materials for Advanced Technologies (ICMAT 2007), during 28 June to 3rd July 2009, held at Suntec Singapore International Convention and Exhibition Centre, Singapore.

7. Arun Kumar R., **Senthilkumar M**. and Dhanasekaran R. 'Growth and characterization of yttrium calcium oxy borate (YCOB) single crystals for Nonlinear Optical applications', 4th International Conference on Materials for Advanced Technologies (ICMAT 2007), Singapore, June 30-July 06 2007.

Papers Presented in National Seminar/ Conferences

1. **M. Senthilkumar** "Neodymium Lanthanum Calcium Borate (NdLCB) Single Crystals for Frequency Conversion and Laser Applications " National Conference On Materials For Future Technology Ncmft-2012. held at Sacred Heart College Tirupathur on 28th September 2012

2. **M. Senthilkumar** and R. Dhanasekaran "Melt Growth of Lanthanum Calcium Borate (LCB) Single Crystals and its Characterization" organized by School of advanced sciences , VIT University and Indian association for Crystal Growth held at VIT University, Vellore 14 during 10 – 12, March 2010

3. **M. Senthilkumar**, R. Arun Kumar and R. Dhanasekaran "Growth of Lanthanum Calcium Borate - $La_2CaB_{10}O_{19}$ (LCB) Single Crystals and its Characterisations" conducted by PG & Research department of Physics, National College**,** Tiruchirappalli – 01 during 25-25 September 2008

4. Arun Kumar R., **Senthilkumar M**. and Dhanasekaran R. (2007), 'Single crystal growth of Yttrium Calcium Oxy Borate (YCOB) crystals by flux technique and their characterizations', 7th National Laser Symposium (NLS-7) University of Baroda, Vadodara, 17 - 20, December 2007.

5. Arun Kumar R., **Senthilkumar M**. and Dhanasekaran R., 'Growth of Yttrium Calcium Oxy Borate (YCOB) single crystals – a novel NLO and a laser host material', Regional Level Seminar on Crystal growth and Nanoscience, Adithanar College of Arts and Science, Tiruchendur, 30 August – 1 September, 2007.

6. Arun Kumar R., **Senthilkumar M**. and Dhanasekaran R. (2006), 'Growth of Yttrium Calcium Oxy Borate (YCOB) single crystals for Nonlinear optics', National Laser Symposium, Raja Ramanna Centre for Advanced Technology, Indore, 5-8, December 2006.

7. Arun Kumar R. , **Senthilkumar M**. and Dhanasekaran R. (2006), 'Growth and Characterisation of RECOB crystals for Nonlinear Optical applications', National Conference on Advances in Technologically Important Crystals conducted by the Dept. of Physics and Astrophysics, University of Delhi, Delhi, October 12-14, 2006.

8. **M. Senthilkumar**, R. Arun Kumar and R.Dhanasekaran "Synthesis and Growth of Potassium Aluminium Borate Single crystals for Nonlinear Optical applications" National Conference on "Advances in Technologically Important Crystals" conducted by Dept. of Physics and Astrophysics, University of Delhi, Delhi, during 12-14 October, 2006.