

**Dr. N.Meenakshisundaram**  
Assistant Professor of Physics,  
Vivekananda College (Residential & Autonomous), College with Potential for Excellence,  
Tiruvedakam West, Madurai – 625234, India



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[nrmsundar@gmail.com](mailto:nrmsundar@gmail.com)

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### Education

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| ✦ <b>Ph.D.</b> in Physics, IIT Madras, Chennai (India)   | <b>2010</b> |
| ✦ <b>Thesis title:</b> Studies in Quantum Chaos: From an almost exactly solvable model to Hypersensitive operators |             |
| ✦ <b>M.Sc.</b> in <b>Physics</b> , The American College, Madurai, Tamilnadu (First class, 73 %)                    | <b>2002</b> |
| ✦ <b>B.Sc.</b> in <b>Physics</b> , Vivekananda College, Madurai, Tamilnadu (First class with Distinction, 89.8 %)  | <b>2000</b> |
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### Research Experience

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| ✦ Assistant Professor of Physics, Vivekananda College (Residential & Autonomous), College with Potential for Excellence, Tiruvedakam West, Madurai – 625234 | (Since Aug. 2016)       |
| ✦ Assistant Professor (Research), School of Electrical and Electronics Engineering, SASTRA University, Thanjavur-613401, Tamilnadu                          | (Dec. 2012 - June 2016) |
| ✦ Post Doctoral Fellow, Computational Neuroscience Lab, IIT Madras, Chennai, Tamilnadu  | (Oct. 2009 - June 2010) |
| ✦ CSIR- JRF   | (Sep. 2003 – Aug. 2005) |
| ✦ CSIR-SRF  | (Sep. 2005 – Aug. 2009) |
| ✦ System Administrator: Department Computing Facility, IIT Madras   | Even 2005 & Odd 2006    |
| ✦ Junior Research Fellow, Physical Research Laboratory, Ahmedabad, Gujarat  | (Aug. 2002 - July 2003) |
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### Teaching Experience

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|---|---|
| ✦ Assistant Professor of Physics, Vivekananda College (Residential & Autonomous), College with Potential for Excellence, Tiruvedakam West, Madurai – 625234                           | (Since Aug. 2016)                         |
| ✦ Additional Responsibility - Postgraduate and Research Coordinator<br>NPTEL SPOC – Local Chapter, Vivekananda College (Initiated in January 2019)                                    |   |
| ✦ Assistant Professor (Research), School of Electrical and Electronics Engineering, SASTRA University, Thanjavur-613401, Tamilnadu  | (Dec. 2012 - June 2016)                   |
| ✦ Assistant Professor (ad hoc), Physics Section, Department of Education in Science and Mathematics, Regional Institute of Education (NCERT), Mysore (RIE Mysore) - 570006, Karnataka | (July 2010 – Nov. 2012)                   |
| ✦ Teaching Assistant: Physics I and II (B.Tech.) IIT Madras   | Even 2006, Odd 2006, Even 2007 & Odd 2007 |
| ✦ Instructor: B.Tech. General Physics Laboratory, IIT Madras  | Even 2005 & Odd 2005                      |
| ✦ Instructor: M.Sc. Electronics Laboratory, IIT Madras  | Odd 2003, Even 2004 & Odd 2004            |
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### Research Specialization and Interests

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- ✦ Nonlinear Dynamics and Quantum Chaos, Theoretical and Computational Physics, Photonics, Biophysics, Material Discovery and Science/Technology Education
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### Grants

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- ✦ Project Name: DST SERB Young Scientist  
✦ Project Title: Studies on the interplay between Multifractal Eigenstates of Quantum Chaos and Entanglement Spectrum  
✦ Amount: 17.75 Lakhs Rupees  
✦ Status: Ongoing (Nov. 2016-Till date)
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### Awards

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| ✦ Qualified in Joint CSIR-UGC Test for Junior Research Fellowship (JRF) and Eligibility for Lectureship (NET) | 2002 |
| ✦ Qualified in GATE (Physics) with a percentile of 90.50  | 2002 |
| ✦ Qualified in All-India JEST for PhD with a percentile of 92.20  | 2002 |
| ✦ Qualified in IISc Entrance Exam for PhD   | 2002 |
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### Computer Proficiency

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Programming	Fortran 77/90, C/C++, Anaconda, Enthought Canopy (Python module), R and Verilog
Operating Systems	Linux, Macintosh and Windows
	Virtual Learning Environment : Moodle
Simulation Packages	COMSOL, ANSYS Fluent and CoventorWare

DFT Codes/Packages	ATK-Quantumwise, MedeA, FHI-aims, Quantum ESPRESSO, ABINIT, VASP, WIEN2K, GAMESS-US and MOPAC
MD Codes	AMBER, GROMACS, NAMD, LAMMPS and DL-POLY
Plotting Softwares	Gnuplot, Xmgrace, Xfig and Origin
Others	MATLAB, MATHEMATICA, Machine Learning, MEEP, LaTeX, Tecplot360, VMD and Bioinformatics

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### Career Advancement Courses (MOOC) Audited/Credited/ Pilot Projects conducted

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- 127<sup>th</sup> Orientation Course, HRDC- Pondicherry University, Pondicherry. - Feb. 1 to Feb.28, 2019
- Canopy – Advanced Python training courses (6 Self Paced Courses) – Jan. 2015 – Dec. 2017
- Computational Materials Physics (Self Paced Course), Ghent University, Belgium - Sep. 2016 to Dec. 2016 & Sep. 2017 to Dec. 2017  
Project: Discovery of new stable Quaternary Crystals
- NME-ICT- **Introduction to Research Methodology** – IITB (Subscribed it as Research Methodology Course for Research Scholars/Part-time Ph.D./M.Sc./M.Tech.12 students as contact course – **Pilot project**) – Jan. 2014 to May 2016
- Educational Technology for Engineering Teachers (IITBX-ET601X) – Jan. 2016 to May 2016
- Signals and Systems (IITBX- ES210X) – Jan. 2016 to Apr. 2016
- Technical Communication for Science and Engineering** (IITBX-HS791X) – (**Graded 6 students**) - Jan. 2016 to May. 2016
- Statistics and R for Life Sciences- Self Paced Courses (HarvardX- PH525.1X, PH525.2X and PH525.3X) – Jan. 2015 to Sep. 2015
- Solar Energy-Fundamentals, Technology and Systems (TU-Delft, Netherlands, ET.3034TU) – Sep. 2014 to Dec. 2014
- Introduction to Computer Science and Programming in Python (MITX-6.001X) - Feb. 2014 to Apr. 2014 & Jan. 2016 to May. 2016
- Classical Mechanics (MITX-8.001X) – Sep. 2013 to Nov. 2013
- 2-Day ISTE Workshop on Research Methods in Educational Technology (Using **Virtual Learning Environment – Moodle**) – 02 Feb. 2013 and 09 Feb. 2013
- Quantum Mechanics and Quantum Computation (BerklyX-CS191X) - Feb. 2013 to Apr. 2013

**MOOC Course Offered: GATE-Physics – 4 Video lectures on Mathematical Physics (SASTRA University, May 2016)**

My Youtube Channel: Physics for KIDS : <https://youtu.be/3OY8MoXfdBk>

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### Curriculum Development

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- Revision of M.Sc. Ed., (Physics) Syllabus, RIE Mysore
- Development of General Physics and Advanced Physics Labs and Electronics Lab for M.Sc. Ed (Physics), RIE Mysore
- Introduced 10 experiments based on Experimental Physics Kit developed by Prof. R. Srinivasan for the M.Sc. Ed (Physics), RIE Mysore
- Curriculum development for core courses of M.Sc. Physics following choice based credit system with Outcome based Education, SASTRA University and revising it subsequently.
- Introduced 5 experiments based on Experimental Physics Kit developed by Prof. R. Srinivasan for M.Sc. Physics, SASTRA University
- Question paper Setter for Ph.D. and M.Sc. Physics entrance exams, SASTRA University for 3 years
- Training UG students for JAM/University entrance exams for pursuing M.Sc. and PG students for GATE/NET/University entrance exams for pursuing Ph.D. and training them for facing Ph.D. interviews at IITs/NITs/Universities etc., since June 2002.
- Syllabus framing for M.Sc. Physics course as Postgraduate and Research Coordinator of Physics, Vivekananda College, Madurai.

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### Innovative teaching Practices

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| ✓ Paragogy along with Pedagogy      | ✓ Outcome based Education              |
| ✓ Constructivism and their variants | ✓ Connectivism                         |
| ✓ Active learning                   | ✓ Activity based learning              |
| ✓ Reinforcement learning            | ✓ Cooperative learning                 |
| ✓ Reward based learning             | ✓ Peer learning                        |
| ✓ Flipped learning                  | ✓ Problem solving                      |
| ✓ Mini projects                     | ✓ Moodle -Virtual Learning Environment |
| ✓ Concept Centered Experiments      |  |

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## Publications

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S.No.	Publication details	Year
1.	K. Roja, Priya Mehta, M. Premalatha, K. Jeyadheepan, C. Gopalakrishnan, N.Meenakshisundaram, Kamatchi Sankaranarayanan, Biosynthesized silver nanoparticles as antimicrobial agents and photocatalytic degradation of methylene blue, <i>Desalination and Water Treatment</i> (2019).(doi: 10.5004/dwt.2019.23605)	2019
2.	Santhia Carmel, Adhithan Pon, N Meenakshisundaram, R. Ramesh and Arkaprava Bhattacharyya, Bandgap Scaling and Negative Differential Resistance behavior of Zigzag Phosphorene Antidot Nanoribbons (ZPANRs), <i>Phys. Chem. Chem. Phys.</i> 20, 14855.	2018
3.	S M Ramachandran, K V P Latha and N Meenakshisundaram, Calculation of the atomic electric dipole moment of Pb <sup>2+</sup> induced by nuclear Schiff moment, <i>J. Phys. B: At. Mol. Opt. Phys.</i> , 50, 145003.	2017
4.	M.S.Sameeha, Soumya Joy, N. Meenakshisundaram, R.K. Karn, C. Gopalakrishnan, P. Karthick, K. Jeyadheepan, K. Sankaranarayanan, Phase Tuned Synthesis of Titanium Di-Oxide Nanoparticles for Room Temperature Enhanced Ammonia Detection. <i>RSC Advances</i> Vol.7,37720.	2017
5.	K. Sankaranarayanan, N.Meenakshisundaram, Micro-viscosity induced conformational transitions in Poly-L-Lysine. <i>RSC Advances</i> , Vol.6, 74009.	2016
6.	N. Meenakshisundaram, K. Sankaranarayanan, Role of Interfacial viscosity and pH in L-Phe, L-Trp molecular rotors. <i>Spectroscopy &amp; Spectral Analysis</i> Vol. 5, 35.	2016
7.	Kamatchi Sankaranarayanan, N. Meenakshisundaram, Influence of Ficoll on urea induced denaturation of Fibrinogen. <i>AIP Advances</i> Vol. 6, 035150.	2016
8.	N. Meenakshisundaram, Design and Analysis of Dual Periodic Optical Superlattices using Walsh-Hadamard Transform Matrix, <i>Optics and Quantum Electronics</i> , 48, 176.	2016
9.	N. Meenakshisundaram, The Analysis of Eigenstates of a Few Generalized Quantum Baker's Maps Using Hadamard and Related Transforms, <i>International Journal of Bifurcation and Chaos</i> , 26, 1650057.	2016
10.	Gargi Rastogi, N. Meenakshisundaram and Kamatchi Sankaranarayanan, Propensities to ATP binding sites in Myosin II domains, <i>Research Journal of Biotechnology</i> , 10, 78.	2015
11.	N. Meenakshisundaram, Hypersensitivity to perturbation of some crucial operators relevant to quantum computation, <i>Physica Scripta</i> , 90, 035102.	2015
12.	N. Meenakshisundaram, L. Vignesh and P. Sabareesan, Tailoring of Bandgaps in Magnonic Antidot Waveguides by Varying Bias Field, <i>Asian Journal of Applied Sciences</i> , 7 (8): 814.	2014
13.	N. Meenakshisundaram, Krishnamoorthy Pandiyan and Raman Kashyap, A Systematic Approach for Designing Quasi-Periodic Optical Superlattice using Hadamard Matrix, <i>Journal of Optics (IOP)</i> , 16,015204.	2014
14.	K.N. Magdoom, D. Subramanian, V.S. Chakravarthy, B. Ravindran, Shun-ichi Amari and N. Meenakshisundaram, Modeling Basal Ganglia for understanding Parkinsonian Reaching Movements, <i>Neural computation</i> , 23, 477.	2011
15.	Arul Lakshminarayan and N. Meenakshisundaram, Using the Hadamard and related transforms for simplifying the spectrum of the quantum baker's map, <i>J. Phys. A</i> , 39, 11205.	2006
16.	N. Meenakshisundaram and Arul Lakshminarayan, The Fourier transform of the Hadamard transform: Multifractals, Sequences and Quantum Chaos, Allied Publishers, Ed. M. Lakshmanan and Rajasekar, pp-69, Chennai, India, February.	2006
17.	N. Meenakshisundaram and Arul Lakshminarayan, Multifractal eigenstates of quantum chaos and the Thue-Morse sequence, <i>Phys. Rev. E</i> 71, 065303(R).	2005

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## Courses Taught

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### Undergraduate Level

#### RIE Mysore

Quantum Mechanics and Statistical Mechanics  
 Quantum Mechanics and Relativity  
 Electricity and Magnetism

#### Vivekananda College, Madurai

Classical Mechanics, Quantum Mechanics and Relativity  
 Physics for Competitive Examinations  
 Solar Energy  
 Allied Physics I & II  
 Mechanics  
 Electricity and Magnetism  
 Thermodynamics and Statistical Mechanics  
 Solid State Physics  
 Nuclear Physics  
 Space Science  
 Numerical Methods  
 Modern Physics & Astrophysics

### Postgraduate Level

#### RIE Mysore

Science of Renewable Energy Sources  
 Liquid Crystals  
 Mathematical Physics – I  
 Optics

#### SASTRA University, Thanjavur

Thermodynamics and Statistical Physics  
 Solid State Physics

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## Ph.D./Project Guidance

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Ph.D. -1 (Ongoing)	Design and Development of Metal oxide Nanoparticles Decorated Carbon Nanomaterials for Boosting the Photocatalytic Activity (M. Aravindh, Since May. 2019)
M.Tech.-1	Tailoring of Bandgaps in Magnonic Antidot Waveguides by Varying Bias Field (L.Vignesh (114051023), SASTRA University - 2014)
M.Sc. - 1	Design and analysis on Aperiodic Optical Superlattice using Walsh-Hadamard matrix (G. Saravanapriya (115124006), SASTRA University - 2015)

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## Conferences /Schools /Refresher Courses/Workshops Participated

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- ✚ Workshop and Symposium on Advanced Simulation Methods: DFT, MD and Beyond Basic Principles and Modern Insights” (ASM2019), IIT Delhi, Mar. 6 to Mar.10, 2019
  - ✚ Science Acadmies’ Lecture Workshop on Emerging trends in Material Science, Jan. 03 and Jan. 04, 2017, P.G. and Research Department of Physics, Raja Doraisingam Govt. Arts College, Sivagangai, India.
  - ✚ National Level Workshop on Genomic Analysis and Protein Designing using Internet Tools, Oct. 6, 2016, Post Graduate and Research Department of Zoology, Vivekananda College, Madurai, India.
  - ✚ One day Workshop on Verilog Programming, Dec. 15, 2015, SASTRA Univeristy, Thanjavur, India.
  - ✚ Science Acadmies’ Lecture Workshop on Nonlinear Physics, Jan. 23-35, 2014, Post Graduate and Research Department of Physics, Bishop Heber College, Trichy, India.
  - ✚ International Conference on Multidisciplinary Frontiers of Medicinal Chemistry: Synthesis, Molecular Biology & Technology, Jan. 18 and Jan. 19, 2013, Department of Chemistry, SASTRA University, Thanjavur, India.
  - ✚ 7<sup>th</sup> National Conference on Nonlinear Systems and Dynamics (NCNSD-2012), July 12 - 15, 2012, IISER PUNE, India.
  - ✚ 30<sup>th</sup> Refresher Course in Experimental Physics, Sponsored by various Academy of Sciences, July 11 – July 27, 2011, Department of Physics, IIT Madras, Chennai, India.
  - ✚ Special course on Analytical Methods, July. 7 – July 19, 2010, National Centre for Catalysis Research, IIT Madras, Chennai, India.
  - ✚ 3<sup>rd</sup> National Conference on Nonlinear Systems and Dynamics (NCNSD-2006), Feb. 6-8, 2006, Ramanujan Institute for Advanced study in Mathematics, University of Madras, Chennai, India.
  - ✚ SERC School on Nonlinear Dynamics, Nov. 28 – Dec. 18, 2004, Physical Research Laboratory, Ahmedabad, India.
  - ✚ National School on Nonlinear Dynamics, Dec. 21-27, 2003, Indian Statistical Institute, Kolkatta, India.
  - ✚ National Conference on Nonlinear Systems and Dynamics (NCNSD-2003), Dec. 28-30, 2003, IIT Kharagpur, India
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## Conferences/ Workshops Organized/Served as Resource Person for Refresher Courses

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- ✚ Coordinator, Science Academies’ Lecture Workshop on Recent Trends in Applied Physics for Technology, Dec. 29 and Dec. 30, 2017, Vivekananda College, Madurai, India.
  - ✚ Coordinator, One day Hands on Workshop on LaTeX for Faculties, Research Scholars and M.Tech. (2014 & 2015), SASTRA University, Thanjavur, India.
  - ✚ Organizing Committee Member, 1<sup>st</sup> International Conference on Opto-Electronics and Photonic Materials (ICOPMA 2015), SASTRA University, Thanjavur, India.
  - ✚ Organizing Committee Member, International Conference on Thin Films & Applications (ICTFA 2013), SASTRA University, Thanjavur, India.
  - ✚ Resource Person, 46<sup>th</sup> Refresher Course in Experimental Physics, Sponsored by various Academy of Sciences, Mar. 5 - 20 Mar. 2013, Indian Academy of Sciences, Jalahalli, Bangalore, India.
  - ✚ Resource Person, 38<sup>th</sup> Refresher Course in Experimental Physics, Sponsored by various Academy of Sciences, June 5 –June 20, 2012, Department of Physics, B.S. Abdur Rehman University, Vandalur, Chennai, India.
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## Academic Research Collaboration

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IIT Madras	BARC, Mumbai
IIT Delhi	NIT Trichy
Pondicherry University	SASTRA University
PRL, Ahmedabad	JNCASR, Bangalore
RIE Mysore	IASST Guwahati

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## Academic Research Visits

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IIT Madras – May 2014, November 2016, June 2018, January 2019, February 2020  
Pondicherry University – May 2017 to June 2017, November 2017, April 2019, February 2020  
IIT Delhi – July 2018, March 2019, May 2019  
Physical Research Laboratory, Ahmedabad – May 2018  
JNCASR – June 2019  
IASST Guwahati – November 2019 and December 2019  
NIT Trichy – January 2019  
SASTRA University – February 2017, February 2018

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## Invited Talks and Academic Outreach Activities

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- 16.05.14 - The Walsh-Hadamard transform : From Sequences to phase reversal quasi-phase matched grating structures, Department of Physics, IIT Madras
- 16.01.19 - 2D materials for nanoscale applications, Department of Physics, IIT Madras
- 10.03.19 - Investigation on the electrical and transport properties of phosphorene antidot nanoribbons for nanoscale applications, ASM 2019, IIT Delhi
- 07.01.19 - Invited Lecture titled “What, Who, When, Where, How, Why of a Career and You” – Lakshmi College of Education, Gandhigram.
- 11.01.19 - One day workshop on “Physics for Competitive Exams (GATE/NET/SET/JEST etc.)” – Department of Physics The American College, Madurai.
- 20.03.19 - Valedictory Address – UG and PG Association of Physics titled “So you want to be a Physicist?” – Fatima College, Madurai.
- 06.06.19 - Novel 2D materials for nanoscale applications, JNCASR, Bangalore
- 15.11.19 - Phosphorene antidot nanoribbons - a novel 2D material for nanoscale applications, IASST, Guwahati
- 27.01.20 - CSIR-NET Coaching – Physical Sciences – Cluster of Colleges Program, Department of Physics, SFR College for Women Sivakasi
- 22.02.20 & 23.02.20 - CSIR-NET – Physical Sciences – Special Lecture Program – Department of Physics, Alagappa University, Karaikudi
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## Membership in bodies

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Life Member, Indian Association of Physics Teachers (10392, L6627)

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## Other Information

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- References available upon request
- Known Languages: English, Tamil and Hindi

I, hereby declare that all the information found in my resume is true to the best of my knowledge and belief.

**Place:** Madurai  
**Date:** March 8, 2020

*Sincerely,*  
*N. Meenakshisundaram*