

## Dr.T.KANNA

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Bishop Heber College,  
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M.Sc.	Physics	Bharathidasan University	1996
B.Sc.	Physics	Madurai Kamaraj University	1991

### Ph.D. Details

Title of Thesis		Area of Specialization
Novel Shape Changing Collisions of Optical Solitons in Nonlinear Media and their Applications		Nonlinear Dynamics
Research Supervisor	Research Centre	Year of Award
Prof. M. Lakshmanan	Center for Nonlinear Dynamics, Bharathidasan University	2004

<b>Obtained Post Doctoral Fellowship :</b>	Yes	<b>Agency</b>
<b>Host Institution :</b>	Universite de Bourgogne	

<b>Cleared NET / SET :</b>	<b>Details</b>	<b>Year of Passing</b>
SET		1998

### Additional Qualification

<b>Name of Course</b>	<b>Place of Study</b>	<b>Date</b>	<b>Duration</b>
Orientation Course	Bharathidasan University		01.11.2008-28.11.2008
Refresher Course in Physics	Bharathiar University		09.06.2011-29.06.2011
Refresher Course	Bharathidasan Univ.		01.02.2014 - 21.02.2014

### Work Experience

<b>Name of Institution</b>	<b>Address of Institution</b>	<b>Designation</b>	<b>From</b>	<b>To</b>
Gandhigram Rural University	Gandhigram, Dindigul	Lecturer	1996	1997
PSNA College of Engineering	Dindigul	Assistant Professor	29/3/2006	2/9/2006
University of Bourgogne France		Post-Doctorant	Dec.2004	Dec.2005
Optical Sciences Group		Post Doctorate	1/2/2004	1/5/2004
Australian National University				

### Teaching / Research Experience

<b>U.G. :</b> 10 years	<b>P.G. :</b> 10 years	<b>M.Phil.</b> 4 years	<b>Ph.D.</b> 10 years
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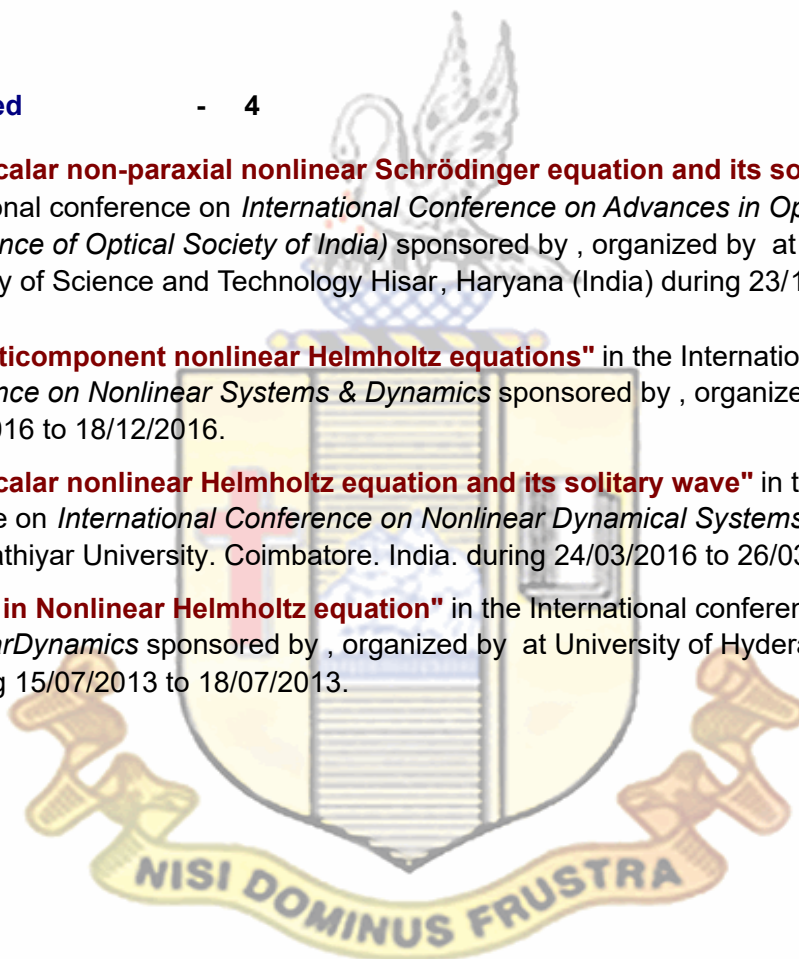
1.	Conferences / workshops / Seminars Attended	3
2.	Research Papers Presented	4
3.	Publication in Journals	47
4.	Publication in Books	0
5.	Books Published / Edited	4
6.	Conferences / Workshops / Seminars Organised	2
7.	Research Projects	4
8.	Resource Person	0
9.	Consultancy	0
10.	Awards Recieved	9
11.	Patent	0
12.	Extension Activities Undertaken	0
13.	Professional Membership	0
14.	M.Phil. / Ph.D. Produced	0 / 3

1. State level Workshop on **"Attended"** sponsored by Bishop Heber College organized by Bishop Heber College at Tiruchirappalli during 25/02/2012 to 01/01/1900.
2. State level Workshop on **"Attended"** sponsored by Bishop Heber College organized by Bishop Heber College at Tiruchirappalli during 25/02/2012 to 01/01/1900.
3. National level Conference on **"Presented"** sponsored by Bishop Heber College organized by Bishop Heber College at Tiruchirappalli during 26/03/2009 to 26/03/2009.

Research Papers Presented

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1. **"Non-integrability of scalar non-paraxial nonlinear Schrödinger equation and its solitary waves"** in the International conference on *International Conference on Advances in Optics and Photonics (XLI Conference of Optical Society of India)* sponsored by , organized by at Guru Jambheshwar University of Science and Technology Hisar , Haryana (India) during 23/11/2017 to 26/11/2017.
2. **"Solitary waves in multicomponent nonlinear Helmholtz equations"** in the International conference on *Conference on Nonlinear Systems & Dynamics* sponsored by , organized by at IISER Kolkata during 16/12/2016 to 18/12/2016.
3. **"Non-integrability of scalar nonlinear Helmholtz equation and its solitary wave"** in the International conference on *International Conference on Nonlinear Dynamical Systems* sponsored by , organized by at Bharathiyar University. Coimbatore. India. during 24/03/2016 to 26/03/2016.
4. **"Soliton Compression in Nonlinear Helmholtz equation"** in the International conference on *Perspective in NonlinearDynamics* sponsored by , organized by at University of Hyderabad, Telangana, India. during 15/07/2013 to 18/07/2013.



1. **"Bright matter-wave bound soliton molecules in spin-1 Bose–Einstein condensates with non-autonomous nonlinearities"** published in Physica D (PEER REVIEW) Vol. 448, Issue No. , March 2023 ISSN : ---.
2. **"Resonant collision of lumps with homoclinic orbits in the two-dimensional multi-component long-wave–short-wave resonance interaction systems"** published in Physica D (PEER REVIEW) Vol. 439, Issue No. , January 2022 ISSN : ---.
3. **"Higher-order optical rogue waves in spatially inhomogeneous multimode fiber"** published in Physica D (PEER REVIEW) Vol. 435, Issue No. , January 2022 ISSN : ---.
4. **"Reviving modulational instability with third-order dispersion"** published in Physics Letters A (PEER REVIEW) Vol. 422, Issue No. , November 2021 ISSN : ---.
5. **"Multiple double-pole bright-bright and bright-dark solitons and energy-exchanging collision in the M-component nonlinear Schrödinger equations"** published in Physical Review E (PEER REVIEW) Vol. 103, Issue No. , June 2021 ISSN : ---.
6. **"Nonlocal M-component nonlinear Schrödinger equations: Bright solitons, energy-sharing collisions, and positons"** published in Physical Review E (PEER REVIEW) Vol. 102, Issue No. , September 2020 ISSN : ---.
7. **"On the integrability aspects of nonparaxial nonlinear Schrödinger equation and the dynamics of solitary waves"** published in Physics Letters A (PEER REVIEW) Vol. 384, Issue No. , July 2020 ISSN : ---.
8. **"Engineering optical rogue waves and breathers in a coupled nonlinear Schrödinger system with four-wave mixing effect"** published in Physica Scripta (PEER REVIEW) Vol. 95, Issue No. , July 2020 ISSN : ---.
9. **"Numerical study of bright-bright-dark soliton dynamics in the mixed coupled nonlinear Schrödinger system"** published in OPTIK (PEER REVIEW) Vol. 224, Issue No. , January 2020 ISSN : ---.
10. **"Manipulation of vector solitons in a system of inhomogeneous coherently coupled nonlinear Schrödinger models with variable nonlinearities"** published in , Journal of Physics A: Mathematical and Theoretical (PEER REVIEW) Vol. 53, Issue No. , January 2020 ISSN : ---.
11. **"Spatially modulated two- and three-component Rabi-coupled Gross–Pitaevskii systems"** published in Journal of Physics A: Mathematical and Theoretical (PEER REVIEW) Vol. 52, Issue No. , August 2019 ISSN : ---.

12. **"Cubic-quintic nonlinear Helmholtz equation: Modulational instability, chirped elliptic and solitary waves"** published in Chaos (PEER REVIEW) Vol. 29, Issue No. , June 2019 ISSN : ---.
13. **"Vector rogue waves in integrable M-coupled nonlinear Schrödinger equations"** published in Physica Scripta (PEER REVIEW) Vol. 94, Issue No. , April 2019 ISSN : ---.
14. **"Harnessing energy-sharing collisions of Manakov solitons to implement universal NOR and OR logic gates"** published in Physical Review E (Rapid communications) (PEER REVIEW) Vol. 97, Issue No. , June 2018 ISSN : ---.
15. **"Dynamics of lumps and dark-dark solitons in the multi-component long-wave-short-wave resonance interaction system"** published in Proceedings of the Royal Society of London A: Mathematical Physical and Engineering Sciences (PEER REVIEW) Vol. 474, Issue No. 2209, January 2018 ISSN : ---.
16. **"Lie symmetry analysis and group invariant solutions of the nonlinear Helmholtz equation"** published in Applied Mathematics and Computation (PEER REVIEW) Vol. 331, Issue No. , January 2018 ISSN : ---.
17. **"Bright-dark and dark-dark solitons in coupled nonlinear Schrödinger equation with PT-symmetric potentials"** published in Chaos: An Interdisciplinary Journal of Nonlinear Science (PEER REVIEW) Vol. 27, Issue No. 12, December 2017 ISSN : ---.
18. **"Non-autonomous bright solitons and their stability in Rabi coupled binary Bose-Einstein condensates"** published in Journal of Physics Communications (PEER REVIEW) Vol. 1, Issue No. 4, November 2017 ISSN : ---.
19. **"A systematic construction of parity-time ( $\mathcal{PT}$ )-symmetric and non- $\mathcal{PT}$ -symmetric complex potentials from the solutions of various real nonlinear evolution equations"** published in Journal of Physics A: Mathematical and Theoretical (PEER REVIEW) Vol. 50, Issue No. 41, September 2017 ISSN : ---.
20. **"Nonparaxial elliptic waves and solitary waves in coupled nonlinear Helmholtz equations"** published in Commun Nonlinear Sci Numer Simulat (PEER REVIEW) Vol. 39, Issue No. , January 2016 ISSN : ---.
21. **"Superposed nonlinear waves in coherently coupled Bose-Einstein condensates"** published in Physics Letters A (SELECT) Vol. 380, Issue No. , January 2016 ISSN : ---.
22. **"Explicit construction of single input-single output logic gates from three soliton solution of Manakov system"** published in Commun Nonlinear Sci Numer Simulat (PEER REVIEW) Vol. 36, Issue No. , January 2016 ISSN : ---.
23. **"Nonparaxial elliptic waves and solitary waves in coupled nonlinear Helmholtz equations"** published in Commun Nonlinear Sci Numer Simulat (PEER REVIEW) Vol. 39, Issue No. , January 2016 ISSN : ---.



24. **"Multicomponent long wave-short wave resonance interaction system: Bright solitons, Energy sharing collisions and resonant solitons"** published in Physical Review E (PEER REVIEW) Vol. 90, Issue No. , January 2014 ISSN : ---.
25. **"Non-autonomous bright matter wave solitons in spinor Bose-Einstein condensates"** published in Physics Letters A (PEER REVIEW) Vol. 378, Issue No. , January 2014 ISSN : ---.
26. **"Mixed (2+1) dimensional solitons in multicomponent long wave short wave system"** published in Physical Review E (PEER REVIEW) Vol. 90, Issue No. , January 2014 ISSN : ---.
27. **"Vector rogue waves and dark-bright boomeronic solitons in autonomous and non-autonomous settings"** published in Physical Review E (SELECT) Vol. 90, Issue No. , January 2014 ISSN : ---.
28. **"Elliptic waves in twocomponent long-wave– short-wave resonance interaction system in one and two dimensions"** published in Physics Letters A (PEER REVIEW) Vol. 378, Issue No. , January 2014 ISSN : ---.
29. **"Dynamics of bright soliton bound states in the multicomponent long wave-short wave resonance interaction system"** published in European Physical Journal Special topics (PEER REVIEW) Vol. 222, Issue No. , January 2013 ISSN : ---.
30. **"Bright solitons coherently coupled nonlinear Schrödinger equations with alternate signs of nonlinearities"** published in Journal of Mathematical Physics (PEER REVIEW) Vol. 54, Issue No. , January 2013 ISSN : ---.
31. **"Non-autonomous darkbright solitons and Rabi oscillations in multicomponent Bose-Einstein Condensates"** published in Journal of Physics A: Math. Theor. (PEER REVIEW) Vol. 46, Issue No. , January 2013 ISSN : ---.
32. **"General Multicomponent Yajima-Oikawa System: Painlevé Analysis, Soliton Solutions and Energy Sharing Collisions"** published in Physical Review E (PEER REVIEW) Vol. 89, Issue No. , January 2013 ISSN : ---.
33. **"Multicomponent coherently coupled and incoherently coupled solitons and their collisions"** published in Journal of Physics A: Math. Theor. (PEER REVIEW) Vol. 44, Issue No. , January 2011 ISSN : ---.
34. **"Coherently coupled bright optical solitons and their collisions"** published in Journal of Physics A: Math. Theor. (PEER REVIEW) Vol. 43, Issue No. , January 2010 ISSN : ---.
35. **"Higher dimensional bright solitons and their collisions in multicomponent long waveshort wave system"** published in Journal of Physics A: Math. Theor. (PEER REVIEW) Vol. 42, Issue No. , January 2009 ISSN : ---.

36. **"Multisoliton solutions and energy sharing collisions in coupled nonlinear Schrödinger equations with focusing defocusing and mixed type nonlinearities"** published in European Physical Journal Special topics (PEER REVIEW) Vol. 173, Issue No. , January 2009 ISSN : ---.
37. **"Painlevé singularity structure analysis of threcomponent Gross- Pitaevskii type equations"** published in Journal of Mathematical Physics (PEER REVIEW) Vol. 50, Issue No. , January 2009 ISSN : ---.
38. **"Bright-dark solitons and their collisions in mixed coupled nonlinear Schrödinger equations"** published in Physical Review A (PEER REVIEW) Vol. 77, Issue No. , January 2008 ISSN : ---.
39. **"Energy-exchange collision of the Manakov vector solitons under strong environmental perturbations"** published in J.Opt.Soc.Am.B (PEER REVIEW) Vol. 24, Issue No. , January 2007 ISSN : ---.
40. **"Periodic energy switching of bright solitons in mixed coupled nonlinear Schrödinger equations with linear self-coupling and cross-coupling terms"** published in Physical Review A (PEER REVIEW) Vol. 76, Issue No. , January 2007 ISSN : ---.
41. **"Soliton collisions with shape change by intensity redistribution in mixed coupled nonlinear Schrödinger equations"** published in Physical Review E (PEER REVIEW) Vol. 73, Issue No. , January 2006 ISSN : ---.
42. **"On the solutions of multicomponent nonlinear Schrödinger equations"** published in Physics Letters A (PEER REVIEW) Vol. 330, Issue No. , January 2004 ISSN : ---.
43. **"Exact soliton solutions of coupled nonlinear Schrödinger equations: Shape changing collisions, logic gates and partially coherent solitons"** published in Physical Review E (PEER REVIEW) Vol. 67, Issue No. , January 2003 ISSN : ---.
44. **"Effect of phase shift in shape changing collision of solitons in coupled nonlinear Schrödinger equations"** published in Eur. Phys. J. B (PEER REVIEW) Vol. 29, Issue No. , January 2002 ISSN : ---.
45. **"Shape changing collisions of optical solitons, universal logic gates and partially coherent solitons in coupled nonlinear Schrödinger equations"** published in Pramana J. Phys. (PEER REVIEW) Vol. 57, Issue No. , January 2001 ISSN : ---.
46. **"Exact soliton solutions, shape changing collisions and partially coherent solitons in coupled nonlinear Schrödinger equations"** published in Physical Review Letters (PEER REVIEW) Vol. 86, Issue No. , January 2001 ISSN : ---.
47. **"Shape changing collisions of coupled bright solitons in birefringent optical fibers"** published in Reports on Mathematical Physics (PEER REVIEW) Vol. , Issue No. , January 1900 ISSN : ---.

## Books Published / Edited

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- \* K.Sakkaravarthi . **Soliton Collision Dynamics in the General Coupled Nonlinear Schrödinger System, Proceedings of HICAMS 2012, Ed. P. Mariappan.** : Excel India Publications , January 2012.
- \* M.Vijayajayanthi . **Mixed type soliton solutions of multicomponent coupled nonlinear Schrödinger equations with defocusing nonlinearity, Nonlinear Dynamics, Eds.: M. Daniel and S. Rajasekar.** : Narosa Publishing House , January 2009.
- \* M. Lakshmanan . **Multicomponent higher order bright soliton solutions and shape changing collisions in couple nonlinear Schrödinger equations, Optical Solitons-Theoretical and experimental challenges, Eds.: K. Porsezian and V.C.Kuriakose.** : Springer Verlag, Berlin , January 2003.
- \* M. Lakshmanan . **Nonlinear dynamics: From theory to technology, Nonlinear Systems, Eds. R. Sahadevan and M. Lakshmanan.** : Narosa Publishing House , January 2002.

## Conferences / Workshops / Seminars Organised

- 2

1. National level Workshop Entitled **"Nonlinear Physics"** at Bishop Heber College, sponsored by Indian Academy of Sciences, during 23/01/2014 to 25/01/2014.
2. National level Workshop Entitled **"Frontier Topics in Physics"** at Bishop Heber College, sponsored by Indian Academy of Sciences, during 04/02/2008 to 05/02/2008.

## Awards Recieved

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Award Name	Presented by	Year	Level	Instituted by / Place	amount
Best Researcher award		01/01/2015	NATIONAL	Bishop Heber college	
Postdoctoral Research Fellowship		02/01/2004	INTERNATIONAL	Australian National University Australia	
CSIR Research Associate		01/01/2004	NATIONAL	Council of Scientific and Industrial Research	
Scientist		01/01/2004	NATIONAL	Department of Science and Technology project	
Theoretical Physics Seminar Circuit Speaker		01/01/2003	NATIONAL	Department of Science & Technology	
CSIR Senior Research Fellow		01/01/2002	NATIONAL	Council of Scientific and Industrial Research	
Junior Research Fellow		01/01/1998	NATIONAL	Department of Science and Technology project	
Qualified SLET exam		01/01/1998	NATIONAL	State Govt	
Qualified GATE exam		01/01/1997	NATIONAL	Bharathidasan Univ	



1. Major project entitled **"Soliton dynamics in homogeneous and inhomogeneous nonlinear optical systems: Soliton synchronization and birth of rogue waves with application to optical computing"** (*SELECT*), Sponsored by , during 03/04/2022 to Till Date [Ongoing].
2. Major project entitled **"Nonlinear matter waves in multicomponent Bose-Einstein condensates"** (*PRINCIPAL INVESTIGATOR*), Sponsored by DST-SERB, during 26/06/2016 to Till Date [Ongoing].
3. Major project entitled **"Multicomponent solitons in nonlinear optics"** (*PRINCIPAL INVESTIGATOR*), Sponsored by DST-SERC, during 01/01/2010 to 12/31/2013 [Completed].
4. Major project entitled **"Shape Changing Collision of Optical Solitons and its Application in Optical Computing and Quantum Computing"** (*PRINCIPAL INVESTIGATOR*), Sponsored by DST Fasttrack programme for young scientistis, during 01/12/2006 to 12/30/2009 [Completed].



**Signature of Staff**  
**(T.KANNA)**