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Personal Details

Date of Birth	: 15^{th} May, 1957
Marital Status	: Married
Children	: Two daughters

Education

1. B.Sc., Govt. College Kasaragod, Kerala (1978) [First Class, College Topper]
2. M.Sc., University of Calicut, Thenhippalam, Kerala (1980) [First Class, First Rank]
3. Ph.D., Department of Mathematics, Indian Institute of Technology Bombay (1986)
   Title of thesis: Approximation and Localization of Eigenelements
   Supervisor: Prof. B.V. Limaye

Areas of Research

1. Spectral Approximation of Linear Operators
2. Approximation Methods for Solving Operator/Integral Equations
3. Regularization and Approximation of Inverse and Ill–Posed Problems

Research Experience before Ph.D.

1. ***Research Scholar*** at Tata Institute of Fundamental Research, Bombay (August 1980 – July 1981).
2. ***Junior / Senior Research Fellow*** at Indian Institute of Technology Bombay, (July 1981 – September 1984) sponsored by BRNS, DAE, Govt. of India.

Research and Teaching Experience after Ph.D.

1. ***Post Doctoral Fellow*** at Institute IMAG, Université de Grenoble, FRANCE, under **French Government Scholarship**; December 1984 – November 1985.
2. ***Research Scientist*** at Indian Institute of Technology Bombay, under the project *Operator Theoretic Techniques for Qualitative Analysis and Analytical Design of Systems* sponsored by DST, Govt. of India; February 3, 1986 – February 2, 1987.
3. ***Lecturer in Mathematics*** at Goa University; February 3, 1987 – November 30, 1989.
4. ***Reader in Mathematics*** at Goa University; December 1, 1989 – December 10, 1995.
5. ***Assistant Professor*** at Department of Mathematics, Indian Institute of Technology Madras: December 11, 1995 – December 17, 1996.
6. ***Associate Professor*** at Department of Mathematics, Indian Institute of Technology Madras; December 18, 1996 – January 11, 2004
7. ***Professor*** at Department of Mathematics, Indian Institute of Technology Madras; January 12, 2004 onwards.
   (***Professor - HAG*** from July 1, 2013 onwards.)

Awards

1. French Government Scholarship for Post Doctoral Research in France, December 1984 – November 1985.
2. C.L.Chandna Award for Distinguished and Outstanding Contributions to Mathematics Research and Teaching in India for the year 2003.
3. Visiting Guest Professor by DAAD (Gaest Dozenten) at Universität Kaiserslautern, GERMANY, April – July, 2002.
4. 12th Ganesh Prasad Memorial Award Lecture (29th December 2015) at the 81st Annual Conference of Indian Mathematical Society, held at VNIT Nagpur.
5. B K Master Memorial National Excellence Award 2016 for contributions in the filed of higher education, instituted by Udma Educational Trust at a well attended public function on October 24, 2016 at Green Woods Public School auditorium, Palakkunnu, Udma, Kerala

Membership in Professional Societies

1. Life Member, Indian Mathematical Society.
2. Life Member, Ramanujan Mathematical Society.
3. Annual Member, American Mathematical Society.

Member Editorial Board of Journals

1. Inverse Problems in Science and Engineering, Associate Editor 2012-2015.
2. Journal of Mathematical Analysis, Member 2013-2015.
3. Journal of Analysis and Number Theory (An International Journal), Member 2014 onwards.

Foreign Assignments

1. ***Post Doctoral Fellow*** at Institut IMAG,
   Université de Grenoble, FRANCE (December 1984 – November 1985).
2. ***Visiting Fellow*** at Centre for Mathematical Analysis,
   Australian National University, AUSTRALIA (March – June, 1989).
3. ***Visiting Professor*** at Fachbereich Mathematik,
   Universität Kaiserslautern, GERMANY (October – November, 1992).
4. ***Visiting Fellow*** at Centre for Mathematics and its Applications,
   Australian National University, AUSTRALIA (June–December, 1993).
5. ***Visiting Professor*** at Fachbereich Mathematik,
   Universität Kaiserslautern, GERMANY (May – June, 1996).
6. ***Visiting Professor*** at Fachbereich Mathematik,
   Universität Kaiserslautern, GERMANY (June – July, 1999).
7. ***Visiting Guest Professor (Gaest Dozenten, DAAD*** at Fachbereich Mathematik,
   Universität Kaiserslautern, GERMANY (April – July, 2002).
8. ***Visiting Mathematician*** at School of Mathematics and Computational Sciences,
   Sun Yat-sen University, Guangzhou, China (May 20 – June 17, 2011).
9. ***Visiting Professor*** at Institut Camille Jordan,
   University of St-Etienne, France (June 5 - June 30, 2016).

Other Foreign Institutions Visited

1. *University of New South Wales*, Sydney, Australia, June 14, 1989.
   Purpose: To give a talk.
2. *Technischen Universität Berlin*, Germany, July 6, 1999.
   Purpose: To give a colloquium talk.
3. *Universität Karlsruhe* Germany, June 13, 2002.
   Purpose: To give a colloquium talk.
4. *Johannes Gutenberg Universität Mainz*, Germany, June 19, 2002.
   Purpose: To give a colloquium talk.
5. *Sun Yat-sen University*, Guangzhou, China, Dec. 17-21, 2009.
   Purpose: To give an Invited Talk at the *International Conference/workshop* on *Computational methods for ill-posed problems*.
6. *RICAM*, Linz, Austria, June 29-July 2, 2010
   Purpose: To give an Invited Talk at the *International Conference/workshop* on *Impact of Smoothness on Regularization*
7. *Institute of Geology and Geophysics, The Chinese Academy of Sciences*, Beijing, China, July 12 - July 15, 2010.
   Purpose: To give an Invited Talk at the *The Second International Workshop* on *Computational Inverse Problems and Applications*
8. *Institute of Geology and Geophysics, The Chinese Academy of Sciences*, Beijing, China, June 2-5, 2011.
   Purpose: To give a colloquium talk.
9. *People's Friendship University*, Moscow, Russia, August 21-August 28, 2011
   Purpose: To give an Invited Talk at the 8^{th} *International Conference of ISAAC (International Society for Analysis, its Application and Computation)*.
10. *Ecole des Mines, Albi*, France, 26–28 June 2013. Purpose: To give an Invited Talk at the 4^{th} *International Symposium on Inverse Problems, Design and Optimization*.
11. *Weierstrass Institute for Applied Analysis and Stochastics*, Berlin, Germany, September 17 18, 2015.
    Purpose: To give an Invited Talk at the *Workshop on Recent Developments in Inverse Problems*.

Project Involvements

1. ***Junior and Senior Research Fellow*** in a BRNS (DAE) sponsored project during June 1981–June 1984, Principal Investigator: Prof. B.V. Limaye, IIT Bombay.
2. ***Junior Research Fellow*** in a BRNS (DAE) sponsored project during September 1984–December 1984, Principal Investigator: Prof. D.V. Pai, IIT Bombay.
3. ***Research Scientist*** in a DST sponsored project during February 1986–February 1987, Principal Investigator: Prof. M.C. Joshi, IIT Bombay.
4. ***Principal Investigator*** of an NBHM (DAE) sponsored project. Duration: Three years (June 1997 – July 2000)
5. ***Principal Investigator*** of a DST sponsored project. Duration: Three years **(July 2014 – July 2017)**

Supervision of PhD, MPhil, MSc

1. ***Ph.D. Thesis:***
   (i) Santhosh George, *Approximation Methods for Ill–Posed Operator Equations* (1995).
   (ii) Rajan, M.P., *On Regularization and Approximation of Linear Ill–Posed Problems* (2001).
   (iii) Shine Lal, *Mollifier Method for Ill–Posed Problems* (2005).
   (iv) Pallavi Mahale, *Regularization of Nonlinear Ill–Posed Problems under General Source Conditions* (2009).
   (v) Ravi Shankar, P., *Regularized Continuous Newton Type Methods for Solving Nonlinear Ill–Posed Operator Equations* (2010).
   (vi) Deepesh, K.P., *A Study on Approximation Numbers of Operators* (2011)[With S.H. Kulkarni].
2. ***Ph.D. Ongoing:***
   (i) Ajoy Jana (Topic: Semigroup approach to inverse parabolic problems), January 2014 -
   (ii) Samprita Das Roy (Topic: Parameter identification problems), July 2014 -
   (iii) Subhankar Biswas (Topic: Operator Equations), January 2016 -
3. ***M.Phil. Thesis***:
   Lucas Miranda, *Projection Methods for Operator Equations of the Second Kind* (1991).
4. ***M.Sc. Dissertations***:
   (i) L. Bharath, *On perturbation Results for Eigenelements* (1997).
   (ii) K. Arthi, *An Introduction to Orthonormal Wavelets* (1998).
   (iii) R. Sudharsana*On Discrete Ill–Posed Problems* (1998).
   (iv) R. Tara, *On Functions of Several Complex Variables* (1999).
   (v) R. Prabha, *Interpolation and Numerical Integration* (1999).
   (vi) Swaminathan, *Perturbation of Singular Subspaces* (2000).
   (vii) Nirmala, N. V., *Generalized Riemann Integral* (2001)
   (viii) Varadharaj, *Perturbation of Eigenvalues and Invariant Subspaces* (2002).
   (ix) Aneesa Zeenath, *Differentiability Theorems: A Simplified Approach Based on Caratheodary's Definition of Differentiability* (2003).
   (x) Sreevidya, R., *On Linear Preserver Problems* (2004).
   (xi) Anoop, T. V., *Stability of Invariant Subspaces* (2005).
   (xii) Kelkar Harsha Narasimha, *On Fundamental Theorems of Calculus and Algebra* (2008).
   (xiii) Maulik Shah, *A Study of Approximately Invariant subspaces* (2008).
   (xiv) Banhita Maitra, *On geometric approach to saddle points of surfaces* (2010).
   (xv) Arghya Partha Chattopadhyay, *A study on several complex variables* (2011).
   (xv) Samprita Das Roy, *Weak solutions of elliptic equations* (2014).

Publication Details

Number of papers in refereed journals: 73
(14 Indian + 59 Foreign)

Number of papers in Mathematics Newsletter of Ramanujan Mathematical Society: 5

Number of papers in proceedings of conferences (including chapters in books) : 15

Total number: 72+5+15 = 92

Number of single authored papers in journals: 26

Number of single authored papers in proceedings of conferences: 9
(In mathematics, having single authored papers are considered to be important).

Books Published

1. ***Functional Analysis: A First Course***,
   Prentice-Hall of India, New Delhi, 2002 (Reprinted: 2008, 2010).
2. ***Linear Operator Equations: Approximation and Regularization***,
   World Scientific, Singapore, May 2009.
3. ***Functional Analysis***,
   NPTEL - IIT Madras, August 2012.
4. ***Calculus of One Variable: For Science and Engineering Students***,
   Ane Books Pvt. Ltd., July 2014.

Remarks:

- The book *Functional Analysis: A First Course* is a prescribed text or reference book for many of the universities in India, and some universities in abroad.
- The book *Linear Operator Equations: Approximation and Regularization* is a standard reference text in many of the publications in the area of "operator equations and mathematical theory of inverse problems". This book was finalized using the Golden Jubilee grant from IIT Madras, including a book-writing-sabbatical for six months.
- The book *Calculus of One Variable: For Science and Engineering Students* is based on my notes for B.Tech courses, which had already become a standard reference text for IIT Madras students. The writing of this book was support by *Centre for Continuing Education*, IIT Madras.

Mathematical Reviews (American Mathematical Society) of the papers/books etc.
http://www.ams.org/mathscinet/search/publications.html?pg1=IID&s1=129155

Books in preparation

1. ***Linear Algebra*** (with A. Singh),
   Springer (Submitted Proposal – Acceptance awaited)
2. ***Measure and Integration: A First Course***,
   Springer (Submitted Proposal – Acceptance awaited)

Lecture Notes of many courses are available in the homepage:
https://mat.iitm.ac.in/home/mtnair/public_html/
E.g.: ((i) Real Analysis, (ii) Linear Algebra, (iii) Elements of Matrix Theory, (iv) Measure and Integration, Fourier Analysis)

List of Publications in Refereed National & International Journals

1. M.T. Nair, A modified projection method for equations of the second kind, *Bull. Austral. Math. Soc.,* **36** (1987) 485–492.
2. B.V. Limaye and M.T. Nair, Localization of a simple eigenvalue and a corresponding eigenvector, *Houston J. Math.*, **14** (1988) 129–141.
3. B.V. Limaye and M.T. Nair, On the accuracy of Rayleigh–Schrödinger approximations, *J. Math. Anal. and Appl.*, **139** (1989) 413–431.
4. M.T. Nair, A modified projection method for equations of the second kind – Corrigendum and Addendum, *Bull. Austral. Math. Soc.,* **40** (1989) 487–487.
5. M.T. Nair, On iterative refinements for spectral sets and spectral subspaces, *Numer. Funct. Anal. and Optim.*, **9&10** (1989) 1019–1037.
6. M.T. Nair, Approximation of spectral sets and spectral subspaces in Banach spaces, *J. Indian Math. Soc.*, **54** (1989) 187–200.
7. M.T. Nair, A note on Rayleigh–Schrödinger series, *J. Math. and Phys. Sci.*, **23** (1989) 185–193.
8. B.V. Limaye and M.T. Nair, Eigenelements of perturbed operators, *J. Austral. Math. Soc.,* Series A, **49** (1990) 138–148.
9. M.T. Nair, Computable error estimates for Newton's iterations for refining invariant subspaces, *Indian J. Pure and Appl. Math.*, **21** (1990) 1049–1054.
10. M.T. Nair and R.S.Anderssen, Superconvergence of modified projection method for integral equations of the second kind, *J. Integral Equations and Applications*, **3** (1991) 255–269,
11. M.T. Nair, On strongly stable approximations, *J. Austral. Math. Soc.,* Series A, **52** (1992) 251–260.
12. M.T. Nair, On uniform convergence of approximation methods for operator equations of the second kind, *Numer. Funct. Anal. and Optim.*, **13 (1&2** (1992) 69–73.
13. M.T. Nair, A generalization of Arcangel's method for ill–posed problems leading to optimal rates, *Integral Equations and Operator Theory*, **15** (1992) 1042–1046.
14. S.George and M.T. Nair, An a posteriori parameter choice for simplified regularization of ill–posed problems, *Integral Equations and Operator Theory*, **16** (1993) 392–399.
15. M.T. Nair, On accelerated refinement methods for operator equations of the second kind, *J. Indian Math. Soc.*, **59** (1993) 135–140.
16. M.T. Nair, A unified approach for regularized approximation methods for Fredholm integral equations of the first kind, *Numer. Funct. Anal. and Optim.*, **15(3&4** (1994) 381–389.
17. S.George and M.T. Nair, A class of discrepancy principles for simplified regularization of ill–posed problems, *J. Austral. Math. Soc.*, Series B, **36** (1994) 242–248.
18. S.George and M.T. Nair, Parameter choice by discrepancy principles for ill–posed problems leading to optimal convergence rates, *J. Optim. Th. and Appl.*, **83** (1994) 217–222.
19. B.V. Limaye and M.T. Nair, On multiplicities and ascent of an eigenvalue of a linear operator, *Mathematics Student*, **64** (1995) 162–166.
20. M.T. Nair, On spectral properties of perturbed operators, *Proc. Amer. Math. Soc.*, **123** (1995) 1845–1850.
21. M.T. Nair, M.Hegland and R.S.Anderssen, The trade–off between regularity and stability in Tikhonov regularization, *Mathematics of Computation*, **66** (1997) 193–206.
22. S.George and M.T. Nair, Error bounds and parameter choice strategies for simplified regularization in Hilbert scales, *Integral Equations and Operator Theory*, **29** (1997) 231–242.
23. S.George and M.T. Nair, On a generalized Arcangeli's method for Tikhonov regularization With inexact data, *Numer. Funct. Anal. and Optim.*, **19(7&8** (1998) 773–787.

24. M.T. Nair, An iterated regularized approximation procedure for ill-posed operator equations, *Progress of Mathematics*, **32** (2)(1998) 51–61.

25. M.T. Nair and E. Schock, A discrepancy principle for Tikhonov regularization with approximately specified data, *Annales Polonici Mathmatici*, **LXIX.3** (1998) 197–205

26. M.T. Nair, On Morozov's method for Tikhonov regularization as an optimal order yielding algorithm, *Zeitschrift für Analysis und ihre Anwendungen*, **18** (1) (1999) 37–46.

27. M.T. Nair, An iterated version of Lavrentiev's method for ill-posed equations with approximately specified data, *J. Inverse and Ill–Posed Problems*, **8**(2) (2000) 193–204.

28. S.H.Kulkarni and M.T. Nair, A characterization of closed range operators, *Indian J. Pure and Appl. Math.*, **31**(4) (2000) 353–361.

29. M.T. Nair and M.P. Rajan, On improving accuracy for Arcangeli's method for solving ill–posed equations, *Integral Equations and Operator Theory*, **39**(2001) 496–501.

30. M.T. Nair and M.P. Rajan, Arcangeli's discrepancy principle for a modified projection scheme for ill–posed problems, *Numer. Funct. Anal. and Optim.*, **22**(1&2) (2001) 773–787.

31. M.T. Nair, An iterative procedure for solving Riccati equation $A_2R - RA_1 = A_3 + RA_4R$, *Studia Mathematica Studia Mathematica* **147**(1) (2001) 15–26.

32. M.T. Nair and M.P. Rajan, Arcangeli's type discrepancy principles for a class of regularization methods using a modified projection scheme, *Abstract and Applied Analysis*, **6**(6) (2001) 339–356.

33. M.T. Nair, Multiplicities of an eigenvalue: Some observations, *Resonance*, **7**, no.12, (2002) 31–41.

34. M.T. Nair, Optimal order results for a class of regularization methods using unbounded operators, *Integral Equations and Operator Theory*, **44**(1) (2002) 79-92.

35. M.T. Nair and M.P. Rajan, Generalized Arcangeli's discrepancy principles for a class of regularization methods for solving ill–posed problems, *J. Inverse and Ill–Posed Problems*, **10** (2002) 281-294.

36. M.T. Nair, E.Schock, and U.Tautenhahn, Morozov's discrepancy principle under general source conditions, *Zeitschrift für Analysis und ihre Anwendungen*, **22** (1) (2003) 199–214.

37. M.T. Nair and E.Schock, On the Ritz method and its generalization for ill-posed equations with non-self adjoint operators (With E. Schock), *International J. Pure and Applied Mathematics*, Vol.5 no. 2 (2003) 119–134.

38. S.George and M.T. Nair, An optimal order-yielding discrepancy principle for simplified regularization of ill-posed problems in Hilbert scales, *International J. Mathematics and Mathematical Sciences*, Vol.39 (2003) 2487–2499.

39. M.T. Nair and U. Tautenhahn, Lavrentiev's regularization under general source conditions, *Zeitschrift für Analysis und ihre Anwendungen*, **23** (2004)1, 167 - 185.

40. S.George and M.T. Nair, Optimal order-yielding discrepancy principle for simplified regularization Hilbert scales: Finite dimensional realizations, *International J. Mathematics and Mathematical Sciences*, **37** (2004) 1973-1996.

41. M.T. Nair and Shinelal, Finite dimensional realization of mollifier method: A new stable approach, *J. Inverse and Ill–Posed Problems*, **12** No.6 (2004) 637-655.

42. M.T. Nair, Eigenpairs of perturbed matrices, *Journal of Analysis*, Vol. 12 (2004) 171-181.

43. M.T. Nair and Shinelal, Finite dimensional realization of mollifier method for compact operator equations, *Mathematics of Computation*, **74** (2005) 1281-1290.

44. M.T. Nair, S. Pereverziev, and U. Tautenhahn, Regularization in Hilbert scales for under general smoothing conditions, *Inverse Problems*, **12** (2005) 1851–1869.

45. S.H.Kulkarni, M.T.Nair and M.N.N.Namboodiri, An elementary proof for a characterization of *-isomorphisms, *Proc. Amer. Math. Soc.*, Vol. 134, No. 1, January 2006.

46. M.T. Nair, On improving error estimates for Tikhonov regularization using an unbounded operator, *Journal of Analysis*, Vol. 14, (2006) 143–157.

47. P. Mahale and M.T. Nair, General Source Conditions for Non-Linear Ill-Posed Equations, *Numer. Funct. Anal. and Optim.*, Vol. 28, Issue 1 & 2 (2007) 111 - 126.
48. M.T. Nair and S. Pereverzev, Regularized collocation method for Fredholm integral equations of the first kind, *Journal of Complexity*, Vol. 23, Issue 4-6 (2007) 454-467.
49. P. Mahale and M.T. Nair, Tikhonov regularization of nonlinear ill-posed equations under general source conditions, *J. Inverse and Ill-Posed Problems*, Vol. 15, no. 8 (2007) 813-830.
50. S.George and M.T. Nair, A modified Newton-Lavrentiev regularization for nonlinear ill-posed Hammerstein-type operator equations, *Journal of Complexity*, Vol. 24, Issue 2 (2008) 228–240.
51. M.T. Nair and P. Ravishankar, Regularized versions of continuous Newton's method and continuous modified Newton's method for under general source conditions, *Numer. Funct. Anal. Optim.* Vol. 29, Nos: 9-10 (2008) 1140-1165.
52. M.T. Nair and U. Tautenhahn, Convergence rates for Lavrentiev-type regularization in Hilbert scales, *Computational Methods in Applied Mathematics* Vol. 8 (2008) No. 3, Pages 279-293.
53. S.H. Kulkarni, M.T. Nair, and G. Ramesh Some properties of unbounded operators with closed range, *Proceedings of Indian Academy of Sciences*, Vol. 118 No. 4 (2008) Pages: 613-625.
54. M.T. Nair, On regularization of compact operator equations, *Journal of Analysis*, Vol. 16 (2008) Pages: 67–80.
55. M.T. Nair, On Morozov's discrepancy principle for nonlinear ill-posed equations, *Bulletin of Australian Mathematical Society*, Vol. 79 (2009) Pages: 337-342.
56. P. Mahale and M.T. Nair, Simplified generalized Gauss Newton method for nonlinear ill-posed problems, *Mathematics of Computation*, Vol. 78 (2009) Pages: 171-184.
57. K.P. Deepesh, S.H. Kulkarni, and M.T. Nair, Approximation numbers of operators on normed linear spaces, *Integral Equations and Operator Theory*, Vol. 65(2009) Pages 529–542.
58. P. Mahale and M.T. Nair, Iterated Lavrentive regularization for nonlinear ill-posed problems, *ANZIAM*, Vol. 51(2009) Pages 191–217.
59. M.T. Nair and P. Ravishankar, A generalization of continuous regularized Gauss-Newton method for ill-posed problems, *J. Inverse and Ill-Posed Problems*, Vol. 19 (2011), 473–510.
60. M.T. Nair, Quadrature based collocation methods for integral equations of the first kind, *Advances in Computational Mathematics*, Vol. 36 (2012) 315-329.
61. Hui Cao and M.T. Nair, A fast algorithm for parameter identification problems based on multilevel augmentation method, *Computational Methods in Applied Mathematics*, 13 (2013) 349-362.
62. K.P. Deepesh, S.H. Kulkarni, and M.T. Nair, Approximation numbers for relatively bounded operators, *Functional Analysis, Approximation and Computation* 5:2 (2013), 3542
63. P. Mahale and M.T. Nair, Lavrentiev regularization of nonlinear ill-posed equations under general source condition, *J. Nonlinear Analysis and Optim.: Theory & Applications*, Vol 4, No 2 (2013) 193–204.
64. M.T. Nair, A Unified Treatment for Tikhonov Regularization Using a General Stabilizing Operator, *Analysis and Applications*, Vol. 13, (2015) 201-215.
65. M.T. Nair, Morozov-type discrepancy principle for nonlinear ill-posed problems under η-condition, *Proc. Indian Acad. Sci. (Math. Sci)* Vol. 125, N0. 2 (2015) 227-238.
66. A. Jana and M.T. Nair, Truncated Spectral Regularization for an Ill-Posed Nonhomogeneous Parabolic Problem *J. Math. Anal. Appl.* Vol. 438, Issue 1, 1 June 2016, Pages 351-372.
67. M.T. Nair, Compact operators and Hilbert scales in ill-posed problems, *Mathematics Student*, **85**, January – June 2016, Pages 45-61.
68. A. Jana and M.T. Nair, Quasi-reversibility method for an ill-posed nonhomogeneous parabolic problem *Numer. Funct. Anal. Optim.* Vol. 37, No. 12 (2016) 1529–1550
(21 Pages. http://dx.doi.org/10.1080/01630563.2016.1216448).

69. M.T. Nair and S.D. Roy, A linear regularization method for a nonlinear parameter identification problem, *J. Inverse and Ill-Posed Problems*, 26(6)(2017), 687-701. (doi:10.1515/JIIP-2015-0091)

70. S. George and M.T. Nair, A Derivativefree iterative method for nonlinear ill-posed equations with monotone operators, *J. Inverse and Ill-Posed Problems*, Vol. 25(5) (2017), Pages 543-551. DOI:10.1515/JIIP-2014-0049

71. M.T. Nair, A discrete regularization method for Ill-posed operator equations, *The Journal of Analysis*, Vol. 25, Issue 2 (2017) 253 - 266. DOI 10.1007/s41478-017-0047-4

72. M. Thamban Nair, N. Sukavanam and Ravinder Katta, Computation of control for linear approximately controllable system using Tikhonov regularization, *Numer. Funct. Anal. Optim.*, Vol. 39, No. 3, (2018) 308-321. (doi.org/10.1080/01630563.2017.1361440)

73. Ajoy Jana and M.Thamban Nair, A truncated spectral regularization method for a source identification problem, *The Journal of Analysis*, (Published online: 3 May 2018) (15 Pages. http://doi.org/10.1007/s41478-018-0080-y).

Publications in *Mathematics Newsletter* of the Ramanujan Mathematical Society

1. M.T. Nair, Importance of some important theorems in Functional Analysis, *Mathematics Newsletter*, Vol. 16, No. 2 (2006) 29–32.
2. M.T. Nair, Least-square solution and regularization of matrix equations, *Mathematics Newsletter*, Vol. 19, September 2009, Pages 37-44.
3. M.T. Nair, Backward heat conduction problem, *Mathematics Newsletter*, Vol. 22, December 2012, Pages 231– 239.
4. M.T. Nair, A note on compactness of unit ball in a normed linear space, *Mathematics Newsletter*, Vol. 27, September 2016, Pages 168–170.
5. S. Kesavan and M.T. Nair, A note on some approximation theorems in measure theory , *Mathematics Newsletter*, Vol. 27, September 2016, Pages 170–174.

Publications In Proceedings of Conferences

1. B.V. Limaye and M.T. Nair, *Localization results for enfeeblements*, In: Modern Analysis and Applications, Ed., H.L.Manoch, Prentice Hall of India, 1983, Pages 169–178.
2. B.V. Limaye and M.T. Nair, *Rayleigh–Schrödinger approach to iterative refinements of computed enfeeblements under strong approximation*, In: Methods of Functional Analysis in Approximation Theory, Eds., C.A.Micchelli, D.V.Pai and B.V.Limaye, Birkhauser Verlag, ISNM, **76**, 1986, Pages 371–388.
3. M.T. Nair, *On spectral variation under relatively bounded perturbation*, In: Methods of Functional Analysis in Approximation Theory, Eds., C.A.Micchelli, D.V.Pai and B.V.Limaye, Birkhauser Verlag, ISNM, **76**, 1986, Pages 389–400.
4. M.T. Nair, *On some variants of projection methods for operator equations of the second kind*, In: Proc. Centre for Math. Sci.,Trivandrum, 1989, Pages 21–40.
5. M.T. Nair, *On a globally convergent method for integral equations of the second kind*, In: Theory of Differential Equations and Applications to Oceanography, Eds., S.G.Deo and Y.S.Prahlad, Affiliated East–West Press Pvt. Ltd., 1992, Pages 143–153.
6. M.T. Nair, *Regularization and approximation of ill-posed problems*, In: Proceedings of the International Conference on Recent Trends in Mathematical Analysis, Eds.: J.K. John, T. Thrivikraman, and N.R. Mangalambal, Allied Publishers, Pvt. Ltd., 2003, Pages: 33–57.
7. M.T. Nair and M.P. Rajan, *On improving accuracy for Arcangeli's method for solving ill-posed problems with modeling error*, In: Proceedings of the International Conference on Recent Trends in Mathematical Analysis, Eds.: J.K. John, T. Thrivikraman, and N.R. Mangalambal, Allied Publishers, Pvt. Ltd., 2003, Pages: 190–198.
8. M.T. Nair, *On Order optimality of regularization methods for ill-posed problems*, In: Proceedings of the National Conference on Recent Trends in Applied Mathematics, Coimbatore, 2003, Pages: 21–35.
9. M.T. Nair, *On Tikhonov regularization using Hilbert scales*, In: Proceedings of the XII Ramanujan Symposium on *Recent Trends in Analysis*, Editor: G. Balasubramanian, University of Madras Publ. 2006, Pages: 18–25. 2003, Pages: 21–35.
10. M.T. Nair, *Approximation of spectral sets and spectral subspaces*, In: Proceedings of the International Workshop on Linear Algebra, Numerical Functional Analysis, and Wavelet Analysis, Eds.: S.H. Kulkarni and M.N.N. Namboodiri, Allied Publishers Pvt, Ltd., 2003, Pages: 116–125.
11. M.T. Nair, *An Interplay Between Numerical and Functional Analysis* , In: Proceedings of the National Seminar on *Foundations of Mathematical Analysis* Editors: T. Thrivikraman and M. Haroon, 2011, Pages: 23– 29.
12. M.T. Nair, *Regularization of Fedholm integral equations of the first kind using Nystro"o"m approximation* (Book Chapter 3), In: Computational Methods for Applied Inverse Problems, Eds.: Y. Wang, A.G. Yagola, and C. Yang, De Gruyter, 2012, Pages: 65–82.

13. K.P. Deepesh, S.H. Kulkarni and M.T. Nair, *Generalized inverses and approximation numbers* (Book Chapter), In: Combinatorial Matrix Theory and Generalized Inverses of Matrices, Editors: R.B. Bapat, S.J. Kirkland, M.M. Prasad and S. Putenen, Springer, 2013, Pages 143-158.
14. Hui Cao and M.T. Nair, *Multilevel augmentation method for parameter identification problems in PDE*. In: Advances in PDE Modeling and Computation, Editor: S. Sundar, Anne Books, Pvt. Ltd., 2013, Pages 52-68.
15. M.T. Nair, *Role of Hilbert scales in regularization*, In: Semigroups, Algebra and Operator Theory, Springer India, 2015; Editor: P.G. Romeo

Papers Appeared as Research Reports

(*Australian National University, University of Kaserslautern & RICAM University of Linz*)

1. B.V. Limaye and M.T. Nair, *Rayleigh–Schrödinger approach to iterative refinements of computed enfeeblements under strong approximation*, **Res. Rep., CMA–R20–86**, Australian National University,1989.
2. M.T. Nair, *Computable error estimates for Newton's iterates for refining invariant subspaces*, **Res. Rep., CMA–R16–89**, Australian National University,1989. [Revised/modified paper appeared in a Journal.]
3. M.T. Nair, *On iterative refinements for spectral sets and spectral subspaces*, **Res. Rep., CMA–R11–89**, Australian National University,1989. [Revised/modified paper appeared in a Journal.]
4. M.T. Nair and R.S. Anderssen, *Superconvergence of modified projection method for integral equations of the second kind*, **Res. Rep., CMA–R57–89**, Australian National University,1989. [Revised/modified paper appeared in a Journal.]
5. M.T. Nair and E. Schock, *Regularized approximation methods with perturbation for ill–posed operator equations*, **Res. Rep., Nr. 231**, Universität Kaiserslautern, 1992. [Revised/modified paper appeared in a Journal.]
6. M.T. Nair, *Tikhonov regularization and approximation for ill–posed operator equations*, **Res. Rep., Nr. 237**, Universität Kaiserslautern, 1993.
7. M.T. Nair, *On spectral properties of perturbed operators*, **Res. Rep., CMA–MR31–93**, Australian National University,1993. [Revised/modified paper appeared in a Journal.]
8. S. George and M.T. Nair, *On a generalization of Arcangel's method for Tikhonov regularization with inexact data*, **Res. Rep., CMA–MR43–93, SMS–88–93**, Australian National University,1993. [Revised/modified paper appeared in a Journal.]
9. M.T. Nair, M.Hegland, and R.S.Anderssen, *The trade–off between regularity and stabilization in Tikhonov regularization*, **Res. Rep., M8–94**, Australian National University,1994. [Revised paper appeared in a Journal.]
10. M.T. Nair, *Error estimates for Tikhonov regularization with unbounded regularizing operators*, **Res. Rep., Nr.279, ISSN 0943–8874**, Universität Kaiserslautern, 1996.
11. M.T. Nair, *Optimal order results for a class of regularization methods using unbounded operators*, **Res. Rep., Nr.313, ISSN 0943–8874**, Universität Kaiserslautern, 1999. [Revised/modified paper appeared in a Journal.]
12. M.T. Nair, E. Schock, and U. Tautenhahn, *Morozov's discrepancy principle under general source conditions*, **Res. Rep., Nr.330, ISSN 0943–8874**, Universität Kaiserslautern, July 2002. [Revised/modified paper appeared in a Journal.]
13. M.T. Nair, S.V. Pereverzev, and U. Tautenhahn, *Regularization in Hilbert scales under general smoothing conditions*, **RICAM-Report No. 2005-09**, Johann Radon Institute for Computational and Applied Mathematics, Linz, Austria, June 2005 2002. [Revised/modified paper appeared in a Journal.]

Expository Articles in the Souvenir of *Forays*, IIT Madras

1. INFINITY – The Miraculous Object of Mathematics, 1997
2. On Caratheodary's Characterization of Differentiability, 1998
3. Multiplicities of an Eigenvalue: Some Observations, 2000

4. Completeness sans Cauchy, 2005
5. Least-Square Solution of Matrix Equations, 2010.
6. An Interplay Between Numerical and Functional Analysis, 2013
7. Is there a focus for a concave spherical mirror? 2014
8. Invertibility of linear equations, 2015.
9. On equivalence of CGT, BIT and UBP, 2017.

Paper Presentations and Invited Talks at Symposia/Conferences/Workshops

1. *Approximation of enfeeblements under strong convergence*,
Symposium on *Recent Advances on Mechanics, Optimization and Approximation Theory* at IIT Bombay (India), in December 1982.
2. *Localization results for enfeeblements*,
International Symposium on *Modern Analysis and Its Applications* at IIT Delhi (India), in December 1983. (With B.V.Limaye)
3. *On spectral variation under relatively bounded perturbation*,
International Conference on *Methods of Functional Analysis in Approximation Theory* at IIT Bombay (India) in December 1985.
4. *Mathematics in computer graphics*,
Symposium on *Mathematics in the Contemporary World* at Goa University, Goa (India), in March 1987.
5. *On some variants of projection methods for operator equations of the second kind*,
National Symposium on *Operator Theory and Functional Analysis* at Cochin University of Science and Technology, **Cochin** (India), July 28-30, 1989.
6. *On a globally convergent method for the integral equations of the second kind*,
International Conference on *Theory of Differential Equations and Applications to Oceanography* at Goa University, Goa (India) in December 1990.
7. *On regularization of ill-posed operator equations*,
79^{th} Session of **Indian Science Congress** at M.S.University, **Baroda** (India), January 1992.
8. *Tikhonov regularization with unbounded regularizing operators*,
International Conference on *Vistas in Modern Applied Mathematics* at Goa university (Goa), December 1993.
9. *Parameter choice strategies for Tikhonov regularization*,
Conference on *Computational Techniques and Applications - CTAC93* at the Australian National University, **Canberra**, July 5-7, 1993.
10. *An optimal order yielding algorithm for ill–posed operator equations*,
60^{th} **Annual Conference of the Indian Mathematical Society** at University of Poona (Pune), December 27-30, 1994.
11. *Regularization of ill–posed operator equations*,
Symposium on *Analysis* at University of Poona (Pune), March 13-15, 1995.
12. *Spectral Approximation and Operator Equations*,
One Day **Symposium** at Goa University (Goa), December 16, 1995.
13. *On approximately solving ill–posed operator equations*,
12^{th} **Annual Conference of the Ramanujan Mathematical Society** at JNN Engineering College (Shimoga), May 21-24, 1997.
14. *An iterated regularized approximation procedure for ill–posed operator equations*,
International Conference on *Recent Advances in Mathematical Analysis with Applications to Industrial Problems* at Banaras Hindu University, Varanasi (India) in during December 2–5, 1998.

15. *On Tikhonov regularization using unbounded operators*,
International Conference on *Recent Advances in Mathematical Analysis with Applications to Industrial Problems* at Banaras Hindu University (Varanasi), December 2–5, 1998.

16. *Simplified regularization in Hilbert scales using finite rank approximations*,
One Day Symposium on *Mathematical Methods and Applications* at Department of Mathematics, IIT Madras (India) on December 22, 1998. (With Santhosh George)

17. *Regularization of ill–posed problems*,
15^{th} **Annual Conference of the Ramanujan Mathematical Society** at Ramanujan Institute of Advanced Study in Mathematics, University of Madras (Chennai), June 5–7, 2000.

18. *Regularization and approximation of ill–posed problems*,
International Conference on *Recent Trends in Mathematical Analysis* at St. Joseph College Irinjalakuda, (Kerala), December 16–18, 2000.

19. *Approximation of spectral sets and spectral subspaces*,
International Workshop on *Linear Algebra, Numerical Functional Analysis, and Wavelet Analysis* at Cochin University of Science and Technology, Kochi (Kerala), August 6–15, 2001.

20. *Optimal order yielding algorithms for ill-posed operator equations* **International Cyber Workshop**, *A Joint Meeting on Applied Mathematics* organized by IISc Bangalore and Tulouse University, France, at IISc Bangalore, February 3-6, 2003.

21. *Ill-posedness of operator equations*,
Workshop on *Computational Mathematics* at Anna University (Chennai), March 8, 2003.

22. *On order optimality of regularization methods for ill-posed problems*,
National Conference on *Recent Trends in Applied Mathematics* at Kumaraguru College of Technology, Coimbatore (India), April 25-26, 2003.

23. *Operator Theory*,
UGC sponsored Workshop on Operator Theory at Sharada (P.G) College (Nagarjuna University)(India) at Vijayavada, December 4-5, 2003.

24. *On optimality of regularization methods for inverse problems*,
AMS-India Conference at I.I.Sc.Bangalore (India), December 18, 2003.

25. *Eigen-pairs of perturbed matrices*,
11-th Ramanujan Symposium on Operator Theory and Banach Algebras at Ramanujan Institute, University of Madras, Chennai (India), March 4, 2004.

26. *Truncations of Fourier series as best approximants*,
QIP-Short term course on Fourier Series at Department of Mathematics, IIT Madras, Chennai (India), July 7, 2004.

27. *Ill-posedness of backward heat conduction problem*,
One-Day National level Seminar on Mathematical Modeling PSGR Krishnammal College for Women at Coimbatore (India), August 6, 2004.

28. *Least-square solutions of matrix equations*,
National Seminar on Recent Trends in Mathematics, NSS Hindu College, Changanacherry, Kerala (India), August 20, 2004.

29. *A spectral characterization of closed range operators*,
National Seminar on Analysis, Topology and Applications, Chittoor Government College, Palakkad, Kerala (India), January 8-9, 2005.

30. *General source conditions for inverse heat conduction problems*,
International Indo-French Workshop on PDE and Applications, IMI-TIFR, at IISc Bangalore (India), February 7-8, 2005.

31. *On Tikhonov regularization in Hilbert scales*,
Annual Ramanujan Conference on Analysis and Applications, Ramanujan Institute, University of Madras (India), March 2-4, 2005.

32. *On improving error estimates for Tikhonov regularization using unbounded operators*,
International Conference on "Functional and Numerical Analysis" at IIT Bombay, 7-9 December 2005.

33. *On regularization of non-linear ill-posed equations*,
Golden Jubilee Conference on Analysis and Applications at IISc Bangalore, 20-23 March 2006.

34. *On solving matrix equations*,
National Seminar on *Innovations in Mathematics* at Kongunadu College of Arts and Science, Coimbatore, August 5, 2006.

35. *on stability estimates for backward for backward heat conduction problems*,
International Winter School at IIT Madras, December 11-January 12, 2007.

36. *On regularization of nonlinear ill-posed equations under Morozov's discrepancy principle*,
International Conference on *Computational, Mathematical and Statistical Methods* at IIT Madras and Stella Maris College, Chennai, January 6-8, 2007.

37. Three talks: *On stability estimates for backward heat conduction problem*,
International Winter School on *Modeling, computing and Simulation in engineering* at IIT Madras, Chennai, (India) December 11, 2006 to January 12, 2007.

38. *On a regularized approximation method for ill-posed operator equations*,
International Conference on *Operator Theory and related Topics* at Delhi University (India), on January 12, 2008.

39. Two talks: *Regularization of ill-posed equations*,
International Workshop on *Approximate Solution of Operator Equations and Eigenvalue Problems* at IIT Bombay, Mumbai, (India) on February 25 & 26, 2008.

40. Two talks: *Regularization of ill-posed operator equations*,
National Seminar on *Analysis and Differential Equations* at University of Calicut, Kerala, (India) on June 26 & 26, 2008.

41. *Use of Functional Analysis in solving equations*,
Two-days workshop on *Mathematics and its Applications* at Sri Sathya Sai University, Puttaparthi, September 22-23, 2008.

42. *Ill-posedness of compact operator equations*,
National Seminar on *Functional Analysis* at DB Pamba College, Parumala, Mannar, Kerala (India) on September 27, 2008.

43. Two talks: *Ill-posedness and regularization of inverse problems*,
Indo-German Workshop-cum lecture Series on *Computational Models and Methods Driven by Industrial Problems* at IIT Madras (India) on February 26, 2009.

44. Two talks: *Regularized approximations for integral equations of the first kind*, **Indo-German Workshop-cum lecture Series** on *Computational Models and Methods Driven by Industrial Problems* at IIT Madras (India) on February 27, 2009.

45. *On solving matrix equations* ,
AICTE Sponsored Workshop on *Mathematical Applications in Engineering* at Gayathri Vidya Parishad College of Engineering at Vishakhapatanam, June 25-26, 2009.

46. *Ill-posedness of compact operator equations* ,
National Conference on *Advances in Mathematics - Focus on Women Mathematicians* at JNU, New Delhi, October 5, 2009.

47. *A quadrature based collocation method for integral equations of the first kind*,
International Conference/workshop on *Computational methods for ill-posed problems* at Sun Yat-sen University, **Guangzhou, China**, from December 17 – 21, 2009.

48. *Role of regularization in ill-posed problems* ,
Annual Conference of Ramanujan Mathematical Society in the Syposium on *Applicable Functional Analysis* at NIT Jalandhar, May 3-5, 2010.

49. *Error estimates for Tikhonov regularization using a general stabilizing operator*,
International Conference on *Impact of Smoothness on Regularization* at RICAAM, Linz, Austria, June 29-July 2, 2010.

50. *On quadrature based regularization method for ill-posed integral equations* ,
ICM-Satellite Conference on *Numerical Functional Analysis and Operator Theory* at ISI Bangalore, July 8-11, 2010.

51. *Nyström method as regularization for integral equations of the first kind*
International Conference on *Computational Inverse Problems and Applications* at Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing, China, July 12-15, 2010.

52. *On stability estimates for backward heat conduction problems*,
ICM-Satellite Conference on *PDE and Related Topics* at TIFR Bangalore, August 13-17, 2010.

53. *Nyström Method as Regularization for Integral Equations of the First Kind*,
The Second International Workshop on *Computational Inverse Problems and Applications*" Institute of Geology and Geophysics, The Chinese Academy of Sciences, **Beijing, China**, July 12 - July 15, 2010.

54. *Ill-Posedness of Inverse Problems*,
Workshop on *Variational Analysis and Optimizatiion with Applications to PDEs* at IIT Gandhi Nagar, May 1-3, 2011

55. *A Quadrature Based Collocation Method for Integral Equations of the First Kind*,
Workshop on *Variational Analysis and Optimizatiion with Applications to PDEs* at IIT Gandhi Nagar, May 1-3, 2011

56. *Error Estimates for Tikhonov Regularization Using a New Hilbert Scale-Type Condition*,
8th International Congress of the ISAAC at Friendship University of Russia, **Moscow** August 22-27, 2011.

57. *An interplay between numerical and functional analysis*,
National Symposium on *Foundations of Analysis* at PSMO College, Thiroorangadi, Kerala, November 23-24, 2011.

58. *Use of Functional Analysis in solving equations*,
National Symposium on *Modern Analysis and Applications* at NSS Hindu College, Changanassery, Kerala, March 26, 2011.

59. *Ill-Posedness and Regularization of Inverse Problems*,
Indo-UK Symposium *on Recent Advances in Industrial & Applied Mathematics*, at IIT Bombay, November 5-6, 2011.

60. *Backward heat conduction problem* ,
Ramanujan Symposium on *mathematical Analysis and Applications* at Ramanujan Institute, Madras University, October 30, 2012.

61. *A fast algorithm for parameter identification problems based on multilevel augmentation method*,
International Conference on *Inverse Problems, Design and Optimization* at Ecole des Mines, Albi, France June 26–28, 2013.

62. *Effect of decay of singular values while solving linear equations*
National Conference on *Recent Advances in Mathematical Analysis and Applications* at KSR College of Arts and Science (Autonomous), Kuchipalayam, Tiruchengode, Salem, 6-7 September, 2013.

63. *Multi-augmentation method for parameter identification problems in PDE*
International Workshop on *Advances in PDE Modeling and Computation* at IIT Madras, October 21-25, 2013.

64. *A compact operator theoretic approach for solving parameter identification problems in PDE*
National Conference on *PDE and Applications* at Bharathiar University, Coimbatore, January 31, 2014.

65. *Regularization of nonlinear ill-posed equations: An introduction*
National Seminar on *Nonlinear Analysis and Optimization* at Pandit Ravishankar Shukla University, Raipur, February 15-17, 2014.

66. *Role of Hilbert scales in regularization theory*,
International Conference on *Semigroups, Algebras and Operator Theory* at CUSAT, February 26-28, 2014.

67. *Spaces and operators* (Three talks),
Workshop on Functional Analysis at Central University of Kerala, Kasaragod, March 20–22, 2014.

68. *Basics of Hilbert space theory*,
National Workshop on *Functional Analysis & Operator Theory* at NIT-Karnataka, Surathkal, June 2-4, 2014.

69. *Compact operators in applicable analysis*,
National Workshop on *Operator Theory* at ISI Bangalore, June 19-21, 2014.

70. *On solving ill-posed integral equations*,
UGC sponsored **National Seminar** on *New Trends in Analysis* at Nehru Arts and Science College, Padnakkad, Kanhangad (Kerala), September 25, 2014.

71. *A linear regularization method for a nonlinear parameter identification problem*,
International Workshop on *Recent Developments in Inverse Problem*, at Weierstarass Institute for Analysis and Stochastics (WIAS), Berlin, September 17-18, 2015

72. *On equivalence of CGT, BIT and UBP*,
National Symposium on *Mathematical Analysis* at Victoria College, Palakkad, October 20, 2015.

73. *Compact operators and Hilbert scales in ill-posed problems*,
12th Ganesh Prasad Memorial Award Lecture at the at the **81st Annual Conference of Indian Mathematical Society**, held at VNIT Nagpur, 29th December 2015.

74. *Regularization method for an inverse problem in PDE*,
National Conference on *Control & Inverse problems* at Central University of Tamil Nadu, February 26-27, 2016.

75. *A nonlinear dynamical system method for ill-posed problems*,
bf International Conference on *Nonlinear Dynamical Systems* at Bharathiar University, March 24-26, 2016.

76. *On Approximation and stability of operator equations*,
National Seminar on *Operator Theory and Applications* at PTM College, Perintalmanna, November 27-28, 2017.

77. *A discrete regularization method for Fredholm integral equations of the first kind*,
International Conference on *Recent Advances in Mathematical Sciences and its Applications* at Jaypee Institute of Information Technology, Noida, New delhi, December 12, 2017.

Lectures at Refresher Courses, Training Program, INSPIRE etc.

1. Three lectures on *Analysis of numerical integration*
Refresher Course for College Teachers at **Goa University**, Goa in June 1991.
2. Six lectures on *Spectrum of bounded operators and compact operators*,
Refresher Course for College Teachers at **University of Calicut**, Kerala, in July 1994.

3. *Ill–posed problems and their regularization*,
   Invited talk at Institute of Mathematical Science, Taramani, Chennai, on November 11, 1998, **UNESCO Programme for College and University Teachers of ASEAN Countries**.
4. Six lectures on *Operator Equations*, **Refresher Course** for College Teachers at **Government College Kasaragod**, Kerala, during 11-13 March 1999.
5. Fifteen lectures on *Foundations of Mathematics, Analysis*,
   Mathematics Training and Talent Search Programme (MTTS) at **Indian Institute of Technology Madras**, Chennai, during May 15–July 10, 2000
6. Six lectures on *Compact Operator Equations*,
   Refresher Course for College Teachers at **Bharathiar University**, Coimbatore, during 27-28 September, 2002.
7. Six lectures on *Spectral Theory*,
   Refresher Course for College Teachers at **University of Kerala**, Thiruvananthapuram, during October 4-5, 2002.
8. Six lectures *Spectral Theory – An Introduction*.
   Refresher Course for College Teachers at **Holy Cross College**, Nagarcoil, during November 8-9, 2002.
9. Six lectures on *Spectral Theory – An Introduction*,
   Refresher Course for College Teachers at **Pondicherry University**, Pondicherry, during November 15-16, 2002.
10. *On Optimal Recovery for Ill-Posed Equations*,
    Refresher Course for College Teachers at **I.I.T.Madras**, Chennai, on December 13, 2002.
11. *Truncations of Fourier series as best approximants*,
    QIP-Short Term Training Program on "Fourier Analysis" at Department of Mathematics, **IIT Madras**, July 7, 2004.
12. Two lectures on *Least-square solutions of matrix equations*,
    ISTE-Short Term Training Programme on "Numerical Linear Algebra" at Department of Mathematics, IIT Madras, December 6, 7 - 2004.
13. *Wavelet-Galerkin method*,
    QIP-Short Term Training Programme on "Fourier transform, Wavelet Transform and Applications" at Department of Mathematics, **IIT Madras**, December 16, 2004.
14. Three lecture on *Linear Algebra*,
    Mathematics Talent Search & Nurture Programme at **University of Calicut** during May 23–24, 2006.
15. Three lectures on *Sobolev imbedding theorems*,
    QIP-Short Term Training Program on *Harmonic Analysis and partial Differential Equations* at **IIT Madras** in January 2007.
16. Six lectures on *Some important theorems of Functional Analysis*,
    Refresher Course for College Teachers at **Ramanujan Institute, University of Madras**, Chennai on November 24 & 26, 2007.
17. Three lectures on *On solving matrix equations*,
    AICTE sponsored workshop on *Mathematical Applications in Engineering* for college lecturers at **Gayathri Vidya Parishad College of Engineering for Women** at Vishakhapatnam during 25-26 June 2009.
18. Two lectures on *Least-square solution and regularization of matrix equations*,
    Short Term Course for college teachers, VNIT Nagapur, 21-22 July 2009.
19. *How Many?*,
    DST sponsored INSPIRE programm at **MG University**, Kottayam, on April 8, 2010.

20. Three lectures on *Lebesgue Integration*,
Short Term Course for college teachers and students, at **Ramanujan Institute** for Advanced study in Mathematics, University of Madras, June 14-15, 2010.

21. *How Many? How Large? - Understanding Infinity*,
DST sponsored INSPIRE programm at **SSN College of Engineering**, Chennai, January 24, 2012.

22. Five lectures on *Measure, Integration & L^2-Theory*,
PG-Training Program of the DST sponsored *National Program on Differential Equations – Theory, Computation and Application*, IIT Delhi, May 17–19, 2012.

23. Five lectures on *Advanced Topics in Functional Analysis*,
Advanced Training Program of the DST sponsored *National Program on Differential Equations – Theory, Computation and Application*, IIT Bombay, June 18–19, 2012.

24. Six lectures on *Baire's theorem and Arzela–Ascoli's theorem* ,
Refresher Course for College Teachers, Ramanujan Institute for Advanced study in Mathematics, University of Madras, October 9–10, 2012.

25. *Understanding Infinity*, **DST sponsored INSPIRE programm** at **SV University** at Thirupathi, October 16, 2012.

26. *Understanding Infinity*,
Talk-cum-discussion at **All India Mathematics Teacher's Association Hall, Trplicane,** for for the AMTI Program for School students of class XI & X on October 26, 2012.

27. Tree lectures on *Operator Theoretic Approach to Control Systems*,
Advanced Training Program of the DST sponsored *National Program on Differential Equations – Theory, Computation and Application*, IIST Thiruvananthapuram, November 28–29, 2012.

28. Eight lectures on *Linear algebra*,
Summer internship program, ISI Chennai, May 17, 18, 19, 2013.

29. Six lectures on *Measure, Integration & L^2-Theory*,
Advanced Training Program of the DST sponsored *National Program on Differential Equations – Theory, Computation and Application*, IIT Madras, May 23-25, 2013.

30. Six lectures on *Continuity and invertibility of operators*,
Refresher Course for College Teachers, Bharathidasan University, July 22–23, 2013.

31. *Convergence*,
DST sponsored **INSPIRE programm** at **SSN College of Engineering**, Chennai, August 9, 2013.

32. *Understanding infinity*,
DST sponsored **INSPIRE programm** at **SN College, Kannur**, December 24, 2013.

33. *Some interesting consequences of elementary geometry*,
DST sponsored **INSPIRE programm** at **SSN College of Engineering**, Chennai, July 25, 2014.

34. *Some interesting consequences of elementary geometry*,
DST sponsored **INSPIRE programm** at **Velammal Institute of Technology**, Chennai, April 8, 2015.

35. Two talks on *Some elementary geometry and basic set theory*,
at **Azim Premji University (APU) - Ramanujan Mathematical Society (RMS) Workshop** Program at AMTI-Institute, Alappakkam, May 1,2 2015.

36. *Hilbert space theory*,
Advanced Level Training Program under the DST-sponsored National Program on Differential Equations: Theory, Computation & Applications (NPDE-TCA) at BITS Goa, June 29-30, 2015.

37. *Some Questions in Mathematics* ,
DST sponsored **INSPIRE programm** at **SSN College of Engineering**, Chennai, August 10, 2016.

38. *Functional Analysis - some important theorem* (Gave 4 lectures),
ATS on Functional Analysis at **IIT Thirupati**, 14-15 December 2017

39. *Concept of limit through some examples from physics and geometry*,
DST sponsored **INSPIRE programm** at **SRM University**, Katankulathur, TN, January 9, 2018.

40. *Elementary concepts in calculus through some examples from physics and geometry*,
DST sponsored **INSPIRE programm** at **SSN College of Engineering**, Chennai, January 27, 2018.

Invited/Colloquium/Seminar Talks and Lectures delivered at Various Places

In Abroad

1. Gave a **seminar talk** at Centre for Mathematical Analysis, **Australian National University**, Canberra (Australia) on June 5, 1989.
Topic: *A posteriori error estimates for refining invariant subspaces.*

2. **Invited talk** at Department of Applied Mathematics, **University of New South Wales**, Sydney (Australia) on June 14, 1989.
Topic: *On some variants of projection methods for integral equations of the second kind.*

3. Gave a **seminar talk** at Fachbereich Mathematik, **Universität Kaiserslautern**, Kaiserslautern (Germany) on November 3, 1992.
Topic: *Discrepancy principle for Tikhonov regularization.*

4. Gave a **seminar talk** at Fachbereich Mathematik, **Universität Kaiserslautern**, Kaiserslautern (Germany) on May 23, 1996.
Topic: *Regularization with unbounded operators.*

5. Gave a **seminar talk** at Fachbereich Mathematik, **Universität Kaiserslautern**, Kaiserslautern (Germany) on June 18, 1999.
Topic: *Approximate solution of ill–posed problems: Parameter choice by discrepancy methods-I.*

6. Gave a **seminar talk** at Fachbereich Mathematik, **Universität Kaiserslautern**, Kaiserslautern (Germany) on June 23, 1999.
Topic: *Approximate solution of ill–posed problems: Parameter choice by discrepancy methods – II.*

7. Gave a **seminar talk** at Fachbereich Mathematik, **Universität Kaiserslautern**, Kaiserslautern (Germany) on July 2, 1999.
Topic: *Generalized Arcangeli's method for solving ill–posed problems.*

8. **Invited talk** at Fachbereich Mathematik, **Technischen Universität Berlin**, (Germany) on July 6, 1999.
Topic: *On Morozov's method for Tikhonov regularization using unbounded regularizing operators.*

9. **A one semester course** on *Inverse Problems* at Fachbereich Mathematik, **Universität Kaiserslautern**, Kaiserslautern (Germany) during April - July, 2002.

10. **Colloquium talk** at Fakultät für Mathematik, **Universität Karlsruhe** (Germany) on June 13, 2002.
Topic: *A class of optimal order yielding regularization methods.*

11. **Seminar talk** at Fachbereich Mathematik, **Johannes Gutenberg Universität Mainz** (Germany) on June 19, 2002.
Topic: *On optimal order yielding regularization methods for ill-posed operator equations.*

12. **Seminar talk** at Fachbereich Mathematik, **Universität Kaiserslautern**, Kaiserslautern (Germany) on July 4, 2002.
    Topic: *On optimal order yielding regularization methods for ill-posed operator equations.*
13. **Colloquium talk** at Institute of Geology and Geophysics, **Chinese Academy of Sciences**, Beijing, (China) on June 3, 2011.
    Topic: *A quadrature based collocation method for ill-posed integral equations.*
14. **Colloquium talk** at Department of Mathematics, **Sun Yat-sen University**, Guangzhou, (China) on June 9, 2011.
    Topic: *Regularization of ill-posed integral equations using Nyström approximation.*
15. **Colloquium talk** at Department of Mathematics, **Sun Yat-sen University**, Guangzhou, (China) on June 13, 2011.
    Topic: *On Morozov's discrepancy principle for nonlinear ill-posed equations.*
16. **Colloquium talk** at Department of Mathematics, Institut Camille Jordan, **University of Sait Etienn**, Sait Etienne, (France) on June 13, 2016.
    Topic: *Ill-posedness of compact operator equations.*
17. **Colloquium talk** at Department of Mathematics, Institut Camille Jordan, **University of Sait Etienn**, Sait Etienne, (France) on June 20, 2016.
    Topic: *A discretization method for integral equations of the first kind.*

In India

1. Gave a **seminar talk** at **I.S.I., Delhi** in July 1984.
   Topic: *Spectral approximation.*
2. Delivered a **series of lectures** at **I.I.T. Bombay** (India) during July - December 1986. Topic: *Linear System Theory.*
3. Gave two **seminar talks** at Department of Mathematics, **University of Calicut**, Kerala, on May 14 and 15, 1987.
   Topic: *Spectral variation and numerical approximation.*
4. **Invited talk** at Department of Mathematics, **University of Calicut**, Kerala, on May 7, 1990.
   Topic: *Projection methods for equations of the second kind.*
5. Gave a **seminar talk** at Department of Mathematics, **I.I.T. Bombay** in May 1988.
   Topic: *A modified projection method for equations of the second kind.*
6. **Colloquium talk** at the **T.I.F.R., Bangalore** on 24.5.1991.
   Topic: *Projection methods for integral equations of the second kind*
   (During the visit April-May, 1991).
7. Participated in a *Discussion Meeting on Harmonic Analysis* at **I.I.Sc., Bangalore** for three days in March 1992.
8. Participated in the 80^{th} *Session of Indian Science Congress* at **Goa University**, Goa in January 1993.
   Chaired paper reading sessions and was in the panel of experts for paper presentation for Young Scientists' Award.
9. Gave a **seminar talk** at **I.I.T. Madras**, Chennai, on 6.7.1995.
   Topic: *Regularization of ill–posed operator equations.*
10. Gave a **seminar talk** at **I.I.T. Madras**, Chennai, on 8.2.1996.
    Topic: *Convergence of approximation methods for compact operator equations.*
11. **Invited talk** at Department of Mathematics, **Cochin University of Science and Technology**, Kochi, on June 4, 1997.
    Topic: *Operator equations and ill–posed problems.*
12. Gave a **seminar talk** at Department of Mathematics, **I.I.T.Madras**, Chennai, on October 16, 1997.
    Topic: *On spectral variation under perturbation.*

13. **Invited talk** at Department of Mathematics, **Indian Institute of Science**, Bangalore, on August 18, 2000.
    Topic: *Regularization and approximation of ill–posed problems*
14. Gave a **seminar talk** at School of Mathematics, **Anna University**, Chennai, on March 6, 2002.
    Topic: *What makes a matrix non-diagonalizable?.*
15. Gave a **seminar talk** at Department of Mathematics, **I.I.T.Madras**, Chennai, on January 23, 2003.
    Topic: *Optimality of regularization methods.*
16. Gave a **seminar talk** at Department of Mathematics, **I.I.T.Bombay**, Mumbai, on May 8, 2003.
    Topic: *Ill-posedness of certain inverse problems.*
17. Gave a **seminar talk** at Department of Mathematics, **I.I.T.Madras**, under AGS (Analysis Group Seminar), on February 15, 2005.
    Topic: *Inverse heat conduction problems.*
18. Gave a **seminar talk** at Department of Mathematics, **I.I.T.Madras**, Chennai, on March 24, 2006.
    Topic: *Regularized collocation method for Fredholm integral equations of the first kind.*
19. Gave an **Endowment lecture** at **Vivekananda College**, Mylapor on April 12, 2007.
    Topic: *On solving linear equations.*
20. Gave a **seminar talk** at Department of Mathematics, **I.I.T. Delhi** on January 11, 2008.
    Topic: *On convergence of regularized solutions of ill-posed operator equations.*
21. Gave **two talks** at **Mangalore University** on September 23-24, 2011.
    Topic: *On Solving Matrix Equations*
22. Gave **two lectures** at **CLRI, Chennai** for PG teachers of Kendriya Vidyalaya, May 24, 2012.
    Topic: *Linear Equations, matrices and Determinants*
23. Gave **Professor Abraham Endowment Lecture** at **SB College, Changanassery**, April 5, 2013.
    Topic: *Use of functional analysis in numerical integration*
24. Gave a **public talk** at the FORAYS-2014 at **IIT Madras**, March 16, 2014.
    Topic: *Understanding infinity*
25. **One day colloquium** at Ramanujan Institute for Advanced studies in Mathematics at **University of Madras**, March 28, 2014.
    Topic: *Understanding infinity*
26. Gave an **invited talk** at the Mathematics Department of **Kannur University**, June 5, 2014.
    Topic: *Ill-posed integral equations*
27. **Pre-departure session** for students before they leave for France for higher studies at **Alliance Francaise**, July 9, 2014.
    Topic: *My experience as Post Doctoral Fellow in France.*
28. An interaction with B.Tech students of **IIT Palakkad** December 15, 2015
    Topic: *Convergence and iteration*
29. Gave **Vaidyanathaswamy Trust endowment Lecture** at **Ramanuna Institute for Advanced Study in Mathematics**, University of Madras, March 21, 2018.
    Topic: *Least-square solution and closed range theorem*

Major Contributions to Teaching/Pedagogy

1. Took special effort to introduce a new course on *Measure and Integration* in 2nd semester MSc.
2. Took concerted effort to shift the *Topology* course from 4th semester MSc to 2nd Semester MSc.
3. Played active role in introducing new M.Sc curriculum with scope for specializations from 3rd semester onwards.
4. Coordinator for B.Tech Mathematics curriculum revision along with Prof. A. Singh.
5. A National Mentor of INSPIRE Programme of DST. Gave many lectures at INSPIRE camps in Tamil Nadu, Andhra pradesh and Kerala.
6. As head of the department, initiated and implemented restructured curriculum for M.Tech (IMSC).
7. As head of the department, formalized comprehensive test and viva with separate weightage 40 % each and over all weightage 50%.
8. Initiated discussion on BS-MS program in Mathematics.
9. Instrumental in increasing the MTech(IMSC) strength from 15 to 25, and bringing down the MSc strength from 54 to 40.

As committee convenor

1. Convenor of BAR-subcommittee for adopting common "PhD-thesis format".
2. Convenor of Senate-Subcommittee for "grade-percentage interchange" and formulating guidelines for cut-offs for grades for large, medium and small classes.

Major Administrative responsibilities at IIT Madras

1. Warden, Sarayu, 2002-2005
2. Vice-Chairman, JAM, 2004 (Before part of GATE Team)
3. Vice-Chairman, GATE, JAM 2006-2007
4. Chairman, GATE, JAM, 2008
5. Head, Department of Mathematics, IIT Madras, December 2014 - December 2017.

Involvement in Other Academic and Administrative Activities

1. Member, Editorial Board, Journal of Mathematical Analysis
2. Member, Editorial Board, Journal of Analysis and Number Theory
3. Involved in the organization of a *One Day Symposium* at Goa University in December 1989.
4. Involved in the organization of an *International Conference* at Goa University in December 1990.
5. Involved in the organization of the annual *One Day/ National Symposiums* at Department of Mathematics, IIT Madras, in December, 1996 onwards.
6. Member, Organizing Committee, International Conference on *Recent Advances in Mathematical Analysis with Applications to Industrial Problems* at Banaras Hindu University, Varanasi (India) in during December 2–5, 1998.
7. Member, Organizing Committee, *International Workshop on Linear Algebra, Numerical Functional Analysis and Wavelet Analysis* Cochin university of Science and Technology, August 6-15, 2001.
8. Involved in the organization of an *International Conference on Industrial Mathematics* at I.I.T.Madras, August 12-14, 2001.
9. Organized a Syposium on *Applicable Functional Analysis* at NIT Jalandhar, under the auspices of the Annual Conference of Ramanujan Mathematical Society, May 3-5, 2010.
10. Reviewer for American Mathematical Society and Zentralblatt.
11. Reviewer/Referee for many International & National Journals

12. *Coordinator* of the mathematics meet *Forays 1997* and *Forays 2000* at IIT Madras.
13. *Faculty Adviser* for the M.Sc students, Batches 1997–1999 and 2003–2005.
14. *Faculty Counselor* for first year B.Tech Students, 1998 and 1999 Batches.
15. *Coordinator* and *Teacher* for *Mathematics Training and Talent Search Programme* (MTTS)-2000 during May 15–June 10, 2000.
16. Member, many committees of the Institute, such as Grievance Committee, BAC, BAR, etc.
17. Member, Selection Committee for faculty members at various Institutes and Universities.
18. Involved in the conduct of JEE, GATE and JAM.
19. Member, MTech/MSc Admission Committee.
20. Member, Board of Studies of
    (a) Women Christian College (Nominee of Univ. Madras) (Past),
    (b) University of Calicut (Past),
    (c) Bharathiar University (Past),
    (d) University of Pondicherry (Past),
    (e) Cochin University of Science and Technology (Present).
    (f) Amrita Vishwa Vidyapeetham, Coimbatore (present)
21. A National Mentor of INSPIRE Programme of DST.
22. Guided INSPIRE/KVPY Fellows from NIESER Bhubaneshwar, IISER Mohali, IISER Pune, Indian Academy Summer term Fellowship.
23. Warden, Sarayu, 2002-2005
24. Vice-Chairman, JAM, 2004 (Before part of GATE Team)
25. Vice-Chairman, GATE, JAM 2006
26. Vice-Chairman, GATE, JAM 2007
27. Chairman, GATE, JAM, 2008
28. Head, Department of Mathematics, IIT Madras, December 2014 to December 2017.