

## CURRICULUM VITÆ

### 1. PERSONAL

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Nationality: Indian  
Date of Birth: 17 January 1952  
Languages Known: (Reading, writing and speaking)  
Indian:Tamil  
Foreign:English and French.  
Present Position: Professor,  
The Institute of Mathematical Sciences,Chennai.  
and  
Deputy Director, Chennai Mathematical Institute.

### 2. ACADEMIC QUALIFICATIONS

1. B.Sc.(Mathematics), University of Madras, I Class, 1971.
2. M.Sc.(Mathematics), Indian Institute of Technology, Madras, I Class, I Rank, 1973
3. Docteur-es-Sciences Mathématiques, Université Pierre et Marie Curie (Paris VI), awarded for the thesis entitled *Sur l'approximation de problèmes linéaires et nonlinéaires de valeurs propres*, supervised by Professors J.L.Lions and P.G.Ciarlet,1979.

### 3. DISTINCTIONS

- Elected **Fellow** of the **National Academy of Sciences**, Allahabad, India, in 1997.
- Won the **Tamil Nadu Scientist Award (TANSA)**, given by the Tamil Nadu State Council for Science and Technology, in Mathematical Sciences for 1998.
- Won the **C. L. Chandna Award for Outstanding Contributions to Mathematics Research and Teaching**, 1999.
- Member, National Board for Higher Mathematics.
- Elected **Fellow** of the **Indian Academy of Sciences**, Bangalore, in 2008.

### 4. PUBLICATIONS

#### a. Books

1. **Topics in Functional Analysis and Applications**, Wiley-Eastern Ltd., 1989, ISBN 81-224-0062-0 (John Wiley and Sons Inc., 1989, ISBN 0-470-21050-8).
2. **Nonlinear Functional Analysis - A First Course**, Texts and Readings in Mathematics (TRIM), **28**, Hindustan Book Agency, 2004, ISBN 81-85931-46-1.
3. **Symmetrization and Applications**, Series in Analysis, Volume 3, World Scientific, 2006, ISBN 981-256-733-X.
4. **Functional Analysis**, TRIM Series, Hindustan Book Agency, to appear.

#### b. Research Papers

1. An interesting property of square matrices, *Math. Magazine*, Vol.44, 2, pp. 99-101, 1971.
2. A lower bound for the number of topologies on a finite set, *Proc. Ind. Nat. Sc. Acad.*, Vol. 41, Part A, 3, pp. 207-212, 1975.
3. Homogénéisation et valeurs propres, *Comptes Rend. Acad. Sc.*, Paris, t. 285, Série A, pp. 229 -232, 1977.
4. (With M.Vanninathan) L'homogénéisation d'un problème de contrôle optimal, *Comptes Rend. Acad. Sc.*, Paris, t. 285, Série A, pp. 441-444, 1977.

5. (With M.Vanninathan) Sur une méthode d'éléments finis mixte pour l'équation biharmonique, *RAIRO, Anal. Num.*, Vol. 11, 3, pp. 255-270, 1977.
6. Homogenization of elliptic eigenvalue problems, Part I, *Appl. Math. Optim*, Vol. 5, pp. 153-167, 1979.
7. Homogenization of elliptic eigenvalue problems, Part II, *Appl. Math. Optim*, Vol. 5, pp. 197-216, 1979.
8. La méthode de Kikuchi appliquée aux équations de von Karman, *Numer. Math.*, Vol. 32, pp. 209-232, 1979.
9. (With P.G.Ciarlet) Approximation bi-dimensionnelle d'un problème de valeurs propres, *Comptes Rend. Acad. Sc.*, Paris, t. 289, Série A, pp. 579-582, 1979.
10. Une méthode d'éléments finis mixte pour les équations de von Karman, *RAIRO, Anal. Num.*, Vol. 14, 2, pp. 149-173, 1980.
11. Application of Newton's method to a homogenization problem, *Proc. Ind. Acad. Sc., Math. Sc.*, Vol. 90, pp. 229-238, 1981.
12. (With P.G.Ciarlet) Two dimensional approximations of three dimensional eigenvalue problems in plate theory, *Comp. Meth. Appl. Mech. Engg.*, Vol. 26, pp. 145-172, 1982.
13. (With P.N.Srikanth) On the Dirichlet problem for the Marguerre equations, *J. Nonlin. Anal. TMA*, Vol.7, 2, pp. 209-216, 1983.
14. Existence of solutions by the Galerkin method for a class of nonlinear problems, *Applicable Anal.*, Vol.16, 4, pp. 279-290, 1983.
15. A potential method for the biharmonic equation, *Numer. Math.*, Vol. 43, pp. 105-119, 1984.
16. (With A.S.Vasudevamurthy) On some boundary element methods for the heat equation, *Numer. Math.*, Vol. 46, pp. 101-120, 1985.
17. Some remarks on a result of Talenti, *Ann. Scuola Norm. Sup. Pisa*, Serie IV, Vol. XV, 3, pp. 453-465, 1988.
18. On a comparison theorem via symmetrization, *Proc. Roy. Soc. Edin.*, 119 A, pp. 159-167, 1991.
19. (With Adimurthi and S.L.Yadava) On the best constant in an inequality by J.Moser, *Theory of Differential Equations and Applications to Oceanography*, eds. S.G.Deo and Y.S.Prahlad, Affiliated East-West Press Pvt. Ltd., pp.66-71, 1992.
20. (With F.Pacella) Symmetry of positive solutions of a quasilinear elliptic equation via isoperimetric inequalities, *Applicable Anal.*, Vol.54, pp. 27-37, 1994.

21. Comparison theorems via symmetrization:revisited, *Boll. Unione Mat. Ital*, Vol. 7, 11-A, pp. 163-172, 1997.
22. (With J.Saint Jean Paulin) Homogenization of an optimal control problem, *SIAM J. of Control and Optim.*, Vol. 35, No. 5, pp. 1557 - 1573, 1997.
23. (With M.Grossi, F.Pacella and M.Ramaswamy) Symmetry of positive solutions of some nonlinear equations, *Topological Methods in Nonlinear Analysis*, Vol. 12, pp. 47 - 59,1998.
24. (With F.Pacella) Symmetry of solutions of a system of semilinear elliptic equations, *Advances in Mathematical Sciences and Applications*, Vol. 9, No. 1, pp. 361 - 369, 1999.
25. (With J. Saint Jean Paulin) Optimal control on perforated domains, *J. Math. Anal. Appl.*, Vol. 229, pp. 563 - 586, 1999.
26. (With N. Sabu) Two dimensional approximation of eigenvalue Problems in shallow shell theory, *Mathematics and Mechanics of Solids*, Vol. 4, pp. 441 - 460, 1999.
27. (With N. Sabu) One- dimensional approximation of eigenvalue problems in thin rods, in *Function Spaces and Applications*, D. E. Edmunds *et al* (eds.), Narosa, pp. 131 - 142, 1999.
28. (With M. Rajesh) Homogenization of periodic optimal control problems via multi-scale convergence, *Proceedings of the Indian Academy of Sciences, Mathematical Sciences*, Vol. 108, No. 2, pp. 189 - 207, 1998.
29. (With N. Sabu) Two - dimensional approximation of eigenvalue problems in shell theory: flexural shells, *Chinese Annals of Mathematics*, Vol. 21B, No. 1, pp. 1 - 16, 2000.
30. Isoperimetric inequalities in partial differential equations, *Proc. Nat. Acad. Sc.*, India, Vol. LXIX, Section A, Part IV, pp. 393 - 418, 1999.
31. (With J. Saint Jean Paulin) Low cost control problems, *Trends in Industrial and Applied Mathematics*, A. H. Siddiqi and M. Kočvara (eds.), pp. 251 - 274, 2002.
32. (With J. Saint Jean Paulin) Quelques problèmes de contrôle bon marché, *Comptes Rend. Acad. Sc., Paris*, t. **332**, Série 1, pp. 67 - 72, 2001.
33. (with M. Rajesh) On the limit matrix obtained in the homogenization of an optimal control problem, *Proc. Indian Acad. Sci. (Math. Sci.)*, **112**, No. 2, pp. 337 - 346, 2002.
34. (with R. Bunoiu) Fluide de Bingham dans une couche mince, *Annales de l'Université de Craiova*, Série Mathématique-Informatique, Actes du 6ème Colloque Franco-Roumain de Mathématiques Appliquées, **30**, pp. 1 - 7, 2003.
35. (with R. Bunoiu) Asymptotic behaviour of a Bingham fluid in thin lay-

- ers, *J. Math. Analysis. Appl.*, **293**, 2004, pp. 405 - 418.
36. On two functionals connected to the Laplacian in a class of doubly connected domains, *Proc. Royal Soc. Edin.*, **133**, No. 3, pp. 617 - 624, 2003.
37. (with T. Muthukumar) Homogenization of an optimal control problem with state-constraints, *Differential Equations and Dynamical Systems*, to appear.
38. On Poncaré and J. L. Lions' lemmas, *Comptes. Rend. Acad. Sc., Paris*, Ser. I, **340**, pp.27 - 30, 2005.
39. (with P. G. Ciarlet and L. Gratie) Numerical Analysis of the generalized von Kármán equations, *Comptes Rend. Acad. Sc., Paris*, Ser. I, **341**, pp. 695 - 699, 2005.
40. (with P. G. Ciarlet and L. Gratie) On the generalized von Kármán equations and their approximation, *Math. Models and Meth. in Applied Sciences*, **17**, No. 4, pp.617 - 633, 2007.
41. (with C. Amrouche, P. G. Ciarlet and L. Gratie) New formulations of linearized elasticity problems, based on extensions of Donati's theorem, *Comptes Rend. Acad. Sc., Paris*, Sé. I, **342**, pp. 785 - 789, 2006.
42. (with C. Amrouche, P. G. Ciarlet and L. Gratie) On Saint Venant's compatibility conditions and Poincaré's lemma, *Comptes Rend. Acad. Sc., Paris*, Sér. I, **342**, pp. 887 - 891, 2006.
43. (with C. Amrouche, P. G. Ciarlet and L. Gratie) On the characterization of matrix fields as linearized strain tensor fields, *J. Math. Pures et Appliquées*, **86**, pp. 116 - 132, 2006.
44. (with T. Muthukumar) Low cost control problems on perforated and non-perforated domains, *Proc. Indian Acad. Sci., (Math. Sci.)*, **118**, No. 1, pp. 133 - 157, 2008.

#### c.Conference Proceedings

1. Homogenization of elliptic eigenvalue problems, Invited Address, *Numerical Analysis of Singular Perturbation Problems*, eds. P.W.Hemker and J.J.H.Miller, pp. 275-294, Academic Press, 1979.
2. Finite element methods for the von Karman equations, *Nonlinear Problems of Analysis, Geometry and Mechanics*, eds. Atteia *et al*, pp. 137-142, Pitman Research Notes in Mathematics, No. 46, 1981.
3. Symmetrization and isoperimetric inequalities, *Proceedings of the Symposium on Operator Theory and Functional Analysis*, Publication No.18, Centre for Mathematical Sciences, Trivandrum, India, 1991.

4. Comparison theorems via Schwarz symmetrization-A survey, *Proceedings of the International Conference on Partial Differential Equations of Elliptic Type*, Cortona, Italy, 1992, Symposia Mathematica, Vol.XXXV, Cambridge University Press, 1994.
5. Symmetry of solutions of an elliptic system via isoperimetric inequalities, to appear in the Proceedings of the International Conference on Nonlinear Differential Equations and Applications, A TIFR Golden Jubilee Event, 1996.
6. Homogenization and Optimal Control, *Functional Analysis with Current Applications in Science, Technology and Industry*, eds. M. Brokate and A. H. Siddiqi, Pitman Research Notes in Mathematics Series, No. 377, pp.103 - 117, Longman,1998.
7. (With J. Saint Jean Paulin) Optimal Control Problems in Homogenization, in *Equations aux Dérivées Partielles et Applications, Articles dédiés à Jacques-Louis Lions* , pp. 597 - 609, Elsevier - Gauthier Villars, Paris, 1998.
8. Symmetry of Solutions of Differential Equations, *Proceedings of the National Seminar on Applications of Mathematics*, St. Joseph's College, Tiruchirappalli, India, February, 2000, pp. 29 - 35.
9. Homogenization of some Low Cost Control Problems, *Proceedings of the Conference on Analysis, Wavelets and Applications*, February, 2000, in *Analysis and Applications*, H. P. Dikshit and P. K. Jain (eds.), Narosa, 2002, pp. 121 - 130.
10. On the asymptotic behaviour of a Bingham fluid in thin layers, *Proceedings of the International Conference on Analysis and Applications*, December, 2003, in *Analysis and Applications*, R. S. Pathak and Nandlal (eds.), Allied Publishers Private Limited, 2004, pp. 57 - 70.
11. Introduction to measure and integration, *Proceedings of the Regional Workshop on Analysis, RWA - 2004*, Villupuram, Tamil Nadu, to appear.

#### d. Popular Articles

1. Listening to the Shape of a Drum, I. The Mathematics of Vibrating Drums, *Resonance*, September,1998.
2. Listening to the Shape of a Drum: II. You Cannot Hear the Shape of a Drum, *Resonance*, October, 1998.
3. The isoperimetric inequality, *Resonance*, September 2002.

## 5. MEMBERSHIP IN SOCIETIES

1. Life Member, Indian Mathematical Society.
2. International Society for the Interaction of Mechanics and Mathematics (ISIMM).
3. Indian Society of Industrial and Applicable Mathematics (ISIAM).
4. American Mathematical Society.
5. Life Member, Ramanujan Mathematical Society.
6. Elected Fellow, Forum d'Analystes, Chennai.