CURRICULUM VITAE

—— Patrick Ciarlet ——

July 2025

PERSONAL

- **Address:**
  Laboratoire POEMS, ENSTA, Institut Polytechnique de Paris,
  828, boulevard des Maréchaux, 91762 Palaiseau Cedex, France
- **Email:** patrick.ciarlet@ensta.fr ; **Phone:** (33) 1 81 87 20 92 ; **Fax:** (33) 1 81 87 21 30

- **Born:** Apr. 1965, Cleveland, USA.

EDUCATION

- **Ecole Polytechnique:** 1985–1988
- **ENSTA Paris:** 1988–1990
- **Ph. D in Applied Mathematics:** 1992, Paris 6 University
- **Habilitation à Diriger les Recherches in Mathematics:** 1998, Paris 6 University

WORKING EXPERIENCE

- **Professor:** 2011–present, Dept of Applied Mathematics, ENSTA
- **Director at IPP of the Mathematics and Applications Master's Program:** 2018–2024, Institut Polytechnique de Paris
- **Deputy Head of the Master's Degree Analysis, Modelling and Simulation:** 2014–2019, Paris Saclay Univ.
- **Teacher-Researcher:** 1997–2011, Dept of Applied Mathematics, ENSTA
- **Visiting Professor:** Jan.-Jun./2010, Dept of Mathematics, Chinese Univ. of Hong Kong, China
- **Researcher:** 1994–1997, Dept CSA at the Commissariat à l'Energie Atomique

- **Post Doctoral Research Fellow:** 1993–1994, Dept of Math., Univ. of California at Los Angeles, USA
- **Junior Researcher:** 1990–1993, Parallel Computing Project at the Commissariat à l'Energie Atomique

MAIN RESEARCH INTERESTS/FIELDS OF SPECIALIZATION

Mathematical study of metamaterials

Maxwell system of equations and related models in electromagnetism

Neutron diffusion and Stokes equations

Numerical solution of low-regularity PDE problems

Numerical analysis, Domain Decomposition Methods

FELLOWSHIPS/AWARDS/HONORS

- **Guest Professor:** 2011, Graduate Studies at Univ. Santiago de Compostela, Spain
- **Associate Professor:** 2005–2007, Ecole Polytechnique
- **Guest Professor:** 2002, Graduate Studies at Strasbourg Univ.
- **Guest Professor:** 2002, Graduate Studies at Univ. of Houston, USA
- **Associate Professor:** 1999–2000, Ecole Polytechnique
- **Guest Professor:** 1998, Ecole des Ondes, INRIA
- **Member of the Ordre National du Mérite (Chevalier), France**
- **Member of the Ordre des Palmes Académiques (Chevalier), France**

EDITORIAL BOARD MEMBER OF MATHEMATICAL JOURNALS

Jan. 2013 – present: Mathematical Modelling and Numerical Analysis. ESAIM

Jan. 2012 – Dec. 2017: Computers & Mathematics with Applications. Elsevier

Jul. 2008 – Jun. 2015: Differential Equations and Applications. Element d.o.o., Croatia

REFEREES FOR SCIENTIFIC JOURNALS AND BOOKS

Journals: Abstract and Applied Analysis (1); Advances in Computational Mathematics (2); Applied Mathematics and Computation (4); Applied Numerical Mathematics (2); Archive for Rational Mechanics and Analysis (1); Calcolo (1); Communications in Mathematical Sciences (1); C. R. Acad. Sci. Paris, Ser. I (4); Comput. Methods Appl. Mech. Engrg. (4); Computers Math. Applic. (8); Discrete and Continuous Dynamical Systems, Series B (1); Forum Math. (1); Found. Comput. Math. (1); IMA J. Numer. Anal. (1); Int. J. Supercomputer Applications (1); Inverse Problems (1); J. Math. Pures Appl. (1); J. Applied Numerical Analysis (1); J. Comput. Appl. Math. (4); J. Computational Mathematics (1); J. Comput. Phys. (6); J. Differential Equations (1); J. Funct. Anal. (1); J. Math. Anal. Appl. (1); J. Sci. Comput. (2); Math. Meth. Appl. Sci. (4); Math. Models Meth. App. Sci. (4); Math. Comp. (6); Math. Mod. Num. Anal. (8); Numer. Methods Partial Differ. Equations (2); Numer. Math. (9); Physics of the Earth and Planetary Interiors (1); PIER & JEMWA (3); SIAM J. Math. Anal. (6); SIAM J. Numer. Anal. (12); SIAM J. Sci. Comput. (6); SMAI Journal of Computational Mathematics (1)

Books: Computational Mathematics – Springer Series (1); Lecture Notes in Mathematics – Springer Series (1)

SERVICE AT PROFESSIONAL COMMITTEES

- **Coordinator of the Mathematics in Computational Science and Engineering Program at the Labex Mathématique Hadamard (LMH):** 2018–2023
- **Member of the Mathematics, Applied Mathematics and Computer Science Experts Committee, EDX (Ecole Polytechnique-ENSTA):** 2010–2015
- **Rapporteur of Ph. D:** 2003–present
- **Rapporteur of Habilitation à Diriger les Recherches:** 2008–present
- **Grant evaluation:**
  - 2006, Délégation Générale pour l'Armement
  - 2006, Swiss National Science Foundation (Switzerland)
  - 2009, Région Rhône-Alpes
  - 2010, Air Force Office of Scientific Research (USA)
  - 2018-2023, Labex Mathématique Hadamard
  - 2020, Dutch Research Council (Netherlands)
  - 2021, National Research and Development Agency (Chile)
  - 2024, German Research Foundation (Germany)

PROFESSIONAL MEMBERSHIP

Société de Mathématiques Appliquées et Industrielles (SMAI)

European Mathematical Society (EMS)

Society for Industrial and Applied Mathematics (SIAM)

CO-ORGANIZER OF CONFERENCES/WORKSHOPS

TIPE Earth and Space Conference, Paris, 1998

Motion of Charged Particles Conference, Strasbourg, 2001

Vector Finite Elements Day, Paris, 2004

RESEARCH GRANTS/CONTRACTS

Délégation Générale pour l'Armement postdoctoral fellowship, Oct. 1993 – Oct. 1994

France/Hong Kong PROCORE Joint Research Scheme grant Oct. 2000 – Sep. 2001

France/Hong Kong PROCORE Joint Research Scheme grant Oct. 2001 – Sep. 2002

DGA/ENSTA contract 'Computation of intense electromagnetic fields', Sep. 2003 – Aug. 2006

France-AmSud grant 'Nonlocal and local coupled equations' Jan. 2022 – Jun. 2023

CIEDS/ENSTA contract 'ElectroMath', Sep. 2022 – Aug. 2026

CIEDS/ENSTA contract 'Nolonde', Sep. 2024 – Aug. 2028

TEACHING EXPERIENCE

Variational methods for solving indefinite problems (ENSTA, Paris-Saclay Univ., Institut Polytechnique de Paris)

Parallel Computing: From Practice To Theory (ENSTA, Versailles-St-Quentin Univ., Paris-Saclay Univ.)

Practical Tools for Solving Indefinite Problems (Univ. Santiago de Compostela, ENSTA)

Maxwell's Equations (ENSTA, Versailles-St-Quentin Univ., Strasbourg Univ., Univ. of Houston, Chinese Univ. of Hong Kong, Paris-Saclay Univ., Institut Polytechnique de Paris)

Electromagnetic Waves (ENSTA, Versailles-St-Quentin Univ., INRIA)

Finite Element Methods (ENSTA)

Numerical Solution of PDEs (ENSTA, Ecole Polytechnique)

Introduction to Scientific Computing (ENSTA, Chinese Univ. of Hong Kong)

Quadratic Optimization & Linear Algebra (ENSTA)

PUBLICATIONS IN REFEREED JOURNALS

1. P. Ciarlet, Jr. **(1993)**. A decomposition of $L^2(\Omega)^3$ and an application to magnetostatic equations. *Math. Models Meth. App. Sci.*, **3**, 289-301.

2. P. Ciarlet, Jr. **(1994)**. Implementation of a domain decomposition method well-suited for parallel architectures. *High Speed Comp.*, **6**, 157-182.

3. P. Ciarlet, Jr. **(1994)**. Repeated Red-Black ordering: a new approach. *Numerical Algorithms*, **7**, 295-324.

4. P. Ciarlet, Jr., F. Lamour **(1996)**. On the validity of a front-oriented approach to partitioning large sparse graphs with a connectivity constraint. *Numerical Algorithms*, **12**, 193-214.

5. F. Assous, P. Ciarlet, Jr., E. Sonnendrücker **(1996)**. Résolution des équations de Maxwell dans un domaine avec un coin rentrant. *C. R. Acad. Sci. Paris, Ser. I*, **323**, 203-208.

6. P. Ciarlet, Jr., F. Lamour **(1996)**. Does contraction preserve triangular meshes? *Numerical Algorithms*, **13**, 201-223.

7. P. Ciarlet, Jr., J. Zou **(1997)**. Finite element convergence for the Darwin model to Maxwell's equations. *Math. Mod. Num. Anal.*, **31**, 213-250.

8. T. F. Chan, P. Ciarlet, Jr., W. K. Szeto **(1997)**. On the optimality of the median cut spectral bisection graph partitioning method. *SIAM J. Sci. Comput.*, **18**, 943-948.

9. P. Ciarlet, Jr., E. Sonnendrücker **(1997)**. A decomposition of the electric field. Application to the Darwin model. *Math. Models Meth. App. Sci.*, **7**, 1085-1120.

10. F. Assous, P. Ciarlet, Jr. **(1997)**. Une caractérisation de l'orthogonal de $\Delta(H^2(\Omega) \cap H_0^1(\Omega))$ dans $L^2(\Omega)$. *C. R. Acad. Sci. Paris, Ser. I*, **325**, 605-610.

11. F. Assous, P. Ciarlet, Jr., E. Sonnendrücker **(1998)**. Resolution of the Maxwell equations in a domain with reentrant corners. *Math. Mod. Num. Anal.*, **32**, 359-389.

12. P. Ciarlet, Jr., C. Hazard, S. Lohrengel **(1998)**. Les équations de Maxwell dans un polyèdre : un résultat de densité. *C. R. Acad. Sci. Paris, Ser. I*, **326**, 1305-1310.

13. F. Assous, P. Ciarlet, Jr. **(1998)**. Quelques résultats sur la régularité en temps des équations de Maxwell instationnaires. *C. R. Acad. Sci. Paris, Ser. I*, **327**, 719-724.

14. F. Assous, P. Ciarlet, Jr., P.-A. Raviart, E. Sonnendrücker **(1999)**. A characterization of the singular part of the solution to Maxwell's equations in a polyhedral domain. *Math. Meth. Appl. Sci.*, **22**, 485-499.

15. P. Ciarlet, Jr., J. Zou **(1999)**. Fully discrete finite element approaches for time-dependent Maxwell's equations. *Numer. Math.*, **82**, 193-219.

16. F. Assous, P. Ciarlet, Jr., S. Labrunie **(1999)**. Caractérisation de la partie singulière et résolution des équations de Maxwell en géométrie singulière axisymétrique. *C. R. Acad. Sci. Paris, Ser. I*, **328**, 767-772.

17. F. Assous, P. Ciarlet, Jr., E. Garcia **(2000)**. Résolution des équations de Maxwell instationnaires avec charges dans un domaine singulier bidimensionnel. *C. R. Acad. Sci. Paris, Ser. I*, **330**, 391-396.

18. F. Assous, P. Ciarlet, Jr., J. Segré **(2000)**. Numerical solution to the time-dependent Maxwell equations in two-dimensional singular domains: the Singular Complement Method. *J. Comput. Phys.*, **161**, 218-249.

19. P. Ciarlet, Jr., N. Filonov, S. Labrunie **(2000)**. Un résultat de fermeture pour les équations de Maxwell en géométrie axisymétrique. *C. R. Acad. Sci. Paris, Ser. I*, **331**, 293-298.

20. A. Buffa, P. Ciarlet, Jr. **(2001)**. On traces for functional spaces related to Maxwell's equations. Part I: an integration by parts formula in Lipschitz polyhedra. *Math. Meth. Appl. Sci.*, **24**, 9-30.

21. A. Buffa, P. Ciarlet, Jr. **(2001)**. On traces for functional spaces related to Maxwell's equations. Part II: Hodge decompositions on the boundary of Lipschitz polyhedra and applications. *Math. Meth. Appl. Sci.*, **24**, 31-48.

22. F. Assous, P. Ciarlet, Jr., S. Labrunie **(2002)**. Theoretical tools to solve the axisymmetric Maxwell equations. *Math. Meth. Appl. Sci.*, **25**, 49-78.

23. P. Ciarlet, Jr., V. Girault **(2002)**. Condition inf-sup pour l'élément fini de Taylor-Hood P_2-iso-P_1, 3D; application aux équations de Maxwell. *C. R. Acad. Sci. Paris, Ser. I*, **335**, 827-832.

24. P. Ciarlet, Jr., J. He **(2003)**. The Singular Complement Method for 2d problems. *C. R. Acad. Sci. Paris, Ser. I*, **336**, 353-358.

25. F. Assous, P. Ciarlet, Jr., S. Labrunie **(2003)**. Solution of axisymmetric Maxwell equations. *Math. Meth. Appl. Sci.*, **26**, 861-896.

26. P. Ciarlet, Jr., J. Huang, J. Zou **(2003)**. Some observations on generalized saddle-point problems. *SIAM J. Matrix Anal. Appl.*, **25**, 224-236.

27. P. Ciarlet, Jr. **(2003)**. Système de Stokes avec flux de vitesse et pression imposés. *C. R. Acad. Sci. Paris, Ser. I*, **337**, 119-124.

28. F. Assous, P. Ciarlet, Jr., S. Labrunie, J. Segré **(2003)**. Numerical solution to the time-dependent Maxwell equations in axisymmetric singular domains: the Singular Complement Method. *J. Comput. Phys.*, **191**, 147-176.

29. Philippe Ciarlet, P. Ciarlet, Jr. **(2004)**. Another approach to linearized elasticity and Korn's inequality. *C. R. Acad. Sci. Paris, Ser. I*, **339**, 307-312.

30. P. Ciarlet, Jr., E. Garcia, J. Zou **(2004)**. Solving Maxwell equations in 3D prismatic domains. *C. R. Acad. Sci. Paris, Ser. I*, **339**, 721-726.

31. P. Ciarlet, Jr. **(2005)**. Augmented formulations for solving Maxwell equations. *Comput. Methods Appl. Mech. Engrg.*, **194**, 559-586.

32. Philippe Ciarlet, P. Ciarlet, Jr. **(2005)**. Another approach to linearized elasticity and a new proof of Korn's inequality. *Math. Models Meth. App. Sci.*, **15**, 259-271.

33. F. Assous, P. Ciarlet, Jr., E. Garcia **(2005)**. Singular electromagnetic fields: inductive approach. *C. R. Acad. Sci. Paris, Ser. I*, **341**, 605-610.

34. P. Ciarlet, Jr., B. Jung, S. Kaddouri, S. Labrunie, J. Zou **(2005)**. The Fourier Singular Complement Method for the Poisson problem. Part I: prismatic domains. *Numer. Math.*, **101**, 423-450.

35. P. Ciarlet, Jr., B. Jung, S. Kaddouri, S. Labrunie, J. Zou **(2006)**. The Fourier Singular Complement Method for the Poisson problem. Part II: axisymmetric domains. *Numer. Math.*, **102**, 583-610.

36. F. Assous, P. Ciarlet, Jr., E. Garcia, J. Segré **(2006)**. Time-dependent Maxwell's equations with charges in singular geometries. *Comput. Methods Appl. Mech. Engrg.*, **196**, 665-681.

37. P. Ciarlet, Jr., S. Kaddouri **(2006)**. Justification de la loi de Peek en électrostatique. *C. R. Acad. Sci. Paris, Ser. I*, **343**, 671-674. (Corrigendum *C. R. Acad. Sci. Paris, Ser. I*, **344**, 657 (2007).)

38. A.-S. Bonnet-Ben Dhia, P. Ciarlet, Jr., C. M. Zwölf **(2007)**. Two- and three-field formulations for wave transmission between media with opposite sign dielectric constants. *J. Comput. Appl. Math.*, **204**, 408-417.

39. P. Ciarlet, Jr., G. Legendre **(2007)**. Well-posedness of the Drude-Born-Fedorov model for chiral media. *Math. Models Meth. App. Sci.*, **17**, 461-484.

40. R. Barthelmé, P. Ciarlet, Jr., E. Sonnendrücker **(2007)**. Generalized formulations of Maxwell's equations for numerical Vlasov-Maxwell simulations. *Math. Models Meth. App. Sci.*, **17**, 657-680.

41. P. Ciarlet, Jr., S. Kaddouri **(2007)**. Multiscaled asymptotic expansions for the electric potential: surface charge densities and electric fields at rounded corners. *Math. Models Meth. App. Sci.*, **17**, 845-876.

42. Philippe Ciarlet, P. Ciarlet, Jr., G. Geymonat, F. Krasucki **(2007)**. Characterization of the kernel of the operator CURL CURL. *C. R. Acad. Sci. Paris, Ser. I*, **344**, 305-308.

43. P. Ciarlet, Jr., E. Jamelot **(2007)**. Continuous Galerkin methods for solving the time-dependent Maxwell equations in 3D geometries. *J. Comput. Phys.*, **226**, 1122-1135.

44. C. Amrouche, Philippe Ciarlet, P. Ciarlet, Jr. **(2007)**. Vector and scalar potentials, Poincaré's theorem and Korn's inequality. *C. R. Acad. Sci. Paris, Ser. I*, **345**, 603-608.

45. Philippe Ciarlet, P. Ciarlet, Jr. **(2008)**. A new approach for approximating linear elasticity problems. *C. R. Acad. Sci. Paris, Ser. I*, **346**, 351-356.

46. F. Assous, P. Ciarlet, Jr., E. Garcia **(2008)**. A characterization of singular electromagnetic fields by an inductive approach. *Numerical Analysis and Modeling*, **5**, 491-515.

47. A.-S. Bonnet-Ben Dhia, P. Ciarlet, Jr., C. M. Zwölf **(2008)**. A new compactness result for electromagnetic waves. Application to the transmission problem between dielectrics and metamaterials. *Math. Models Meth. App. Sci.*, **18**, 1605-1631.

48. P. Ciarlet, Jr., G. Hechme **(2008)**. Computing electromagnetic eigenmodes with continuous Galerkin approximations. *Comput. Methods Appl. Mech. Engrg.*, **198**, 358-365.

49. Philippe Ciarlet, P. Ciarlet, Jr. **(2009)**. Direct computation of stresses in planar linearized elasticity. *Math. Models Meth. App. Sci.*, **19**, 1043-1064.

50. A. Buffa, P. Ciarlet, Jr., E. Jamelot **(2009)**. Solving electromagnetic eigenvalue problems in polyhedral domains with nodal finite elements. *Numer. Math.*, **113**, 497-518.

51. P. Ciarlet, Jr., S. Labrunie **(2009)**. Numerical analysis of the generalized Maxwell equations (with an elliptic correction) for charged particle simulations. *Math. Models Meth. App. Sci.*, **19**, 1959-1994.

52. P. Ciarlet, Jr., F. Lefèvre, S. Lohrengel, S. Nicaise **(2010)**. Weighted regularization for composite materials in electromagnetism. *Math. Mod. Num. Anal.*, **44**, 75-108.

53. A.-S. Bonnet-Ben Dhia, P. Ciarlet, Jr., C. M. Zwölf **(2010)**. Time harmonic wave diffraction problems in materials with sign-shifting coefficients. *J. Comput. Appl. Math.*, **234**, 1912-1919 (Corrigendum *J. Comput. Appl. Math.*, **234**, 2616).

54. C. Amrouche, Philippe Ciarlet, P. Ciarlet, Jr. **(2010)**. Weak vector and scalar potentials. Applications to Poincaré's theorem and Korn's inequality in Sobolev spaces with negative exponents. *Analysis and Applications*, **8**, 1-17.

55. P. Ciarlet, Jr., C. Scheid **(2010)**. Electrowetting of a 3D drop: numerical modelling with electrostatic vector fields. *Math. Mod. Num. Anal.*, **44**, 647-670.

56. Philippe Ciarlet, P. Ciarlet, Jr., O. Iosifescu, S. Sauter, J. Zou **(2010)**. A Lagrangian approach to intrinsic linearized elasticity. *C. R. Acad. Sci. Paris, Ser. I*, **348**, 587-592.

57. P. Ciarlet, Jr., S. Labrunie **(2011)**. Numerical solution of Maxwell's equations in axisymmetric domains with the Fourier Singular Complement Method. *Differential Equations and Applications*, **3**, 113-155.

58. Philippe Ciarlet, P. Ciarlet, Jr., O. Iosifescu, S. Sauter, J. Zou **(2011)**. Lagrange multipliers in intrinsic elasticity. *Math. Models Meth. App. Sci.*, **21**, 651-666.

59. L. Chesnel, P. Ciarlet, Jr. **(2011)**. Compact imbeddings in electromagnetism with interfaces between classical materials and meta-materials. *SIAM J. Math. Anal.*, **43**, 2150-2169.

60. A.-S. Bonnet-Ben Dhia, L. Chesnel, P. Ciarlet, Jr. **(2012)**. T-coercivity for scalar interface problems between dielectrics and metamaterials. *Math. Mod. Num. Anal.*, **46**, 1363-1387.

61. P. Ciarlet, Jr. **(2012)**. T-coercivity: application to the discretization of Helmholtz-like problems. *Computers Math. Applic.*, **64**, 22-34.

62. E. T. Chung, P. Ciarlet, Jr. **(2013)**. A staggered discontinuous Galerkin method for wave propagation in media with dielectrics and meta-materials. *J. Comput. Appl. Math.*, **239**, 189-207.

63. E. T. Chung, P. Ciarlet, T. F. Yu **(2013)**. Convergence and superconvergence of staggered discontinuous Galerkin methods for the three-dimensional Maxwell's equations on Cartesian grids. *J. Comput. Phys.*, **235**, 14-31.

64. L. Chesnel, P. Ciarlet, Jr. **(2013)**. T-coercivity and continuous Galerkin methods: application to transmission problems with sign changing coefficients. *Numer. Math.*, **124**, 1-29.

65. E. Jamelot, P. Ciarlet, Jr. **(2013)**. Fast non-overlapping Schwarz domain decomposition methods for solving the neutron diffusion equation. *J. Comput. Phys.* , **241**, 445-463.

66. P. Ciarlet, Jr. **(2013)**. Analysis of the Scott-Zhang interpolation in the fractional order Sobolev spaces. *J. Numer. Math.*, **21**, 173-180.

67. A.-S. Bonnet-Ben Dhia, L. Chesnel, P. Ciarlet, Jr. **(2014)**. Two-dimensional Maxwell's equations with sign-changing coefficients. *Applied Numerical Mathematics*, **79**, 29-41.

68. P. Ciarlet, Jr., H. Wu, J. Zou **(2014)**. Edge element methods for Maxwell's equations with strong convergence for Gauss' laws. *SIAM J. Numer. Anal.*, **52**, 779-807.

69. A.-S. Bonnet-Ben Dhia, L. Chesnel, P. Ciarlet, Jr. **(2014)**. T-coercivity for the Maxwell problem with sign-changing coefficients. *Communications in Partial Differential Equations*, **79**, 29-41.

70. P. Ciarlet, Jr., C. Stohrer **(2014)**. Finite element heterogeneous multiscale method for the Helmholtz equation. *C. R. Acad. Sci. Paris, Ser. I*, **352**, 755-760.

71. Philippe Ciarlet, P. Ciarlet, Jr., S. Sauter, C. Simian **(2016)**. Intrinsic finite element methods for the computation of fluxes for Poisson's equation. *Numer. Math.*, **132**, 433-462.

72. P. Ciarlet, Jr. **(2016)**. On the approximation of electromagnetic fields by edge finite elements. Part 1: sharp interpolation results for low-regularity fields. *Computers Math. Applic.*, **71**, 85-104.

73. A.-S. Bonnet-Ben Dhia, C. Carvalho, L. Chesnel, P. Ciarlet, Jr. **(2016)**. On the use of Perfectly Matched Layers at corners for scattering problems with sign-changing coefficients. *J. Comput. Phys.*, **322**, 224-247.

74. C. Carvalho, L. Chesnel, P. Ciarlet, Jr. **(2017)**. Eigenvalue problems with sign-changing coefficients. *C. R. Acad. Sci. Paris, Ser. I*, **355**, 671-675.

75. P. Ciarlet, Jr., S. Fliss, C. Stohrer **(2017)**. On the approximation of electromagnetic fields by edge finite elements. Part 2: A Heterogeneous Multiscale Method for Maxwell's equations. *Computers Math. Applic.*, **73**, 1900-1919.

76. P. Ciarlet, Jr., E. Jamelot, F. D. Kpadonou **(2017)**. Domain Decomposition Methods for the diffusion equation with low-regularity solution. *Computers Math. Applic.*, **74**, 2369-2384.

77. S. Chaillat, P. Ciarlet, Jr., L. Desiderio **(2017)**. Theory and implementation of $\mathcal{H}$-matrix based iterative and direct solvers for Helmholtz and elastodynamic oscillatory kernels. *J. Comput. Phys.*, **351**, 165-186.

78. A.-S. Bonnet-Ben Dhia, C. Carvalho, P. Ciarlet, Jr. **(2018)**. Mesh requirements for the finite element approximation of problems with sign-changing coefficients. *Numer. Math.*, **138**, 801-838.

79. P. Ciarlet, Jr., C. Dunkl, S. Sauter **(2018)**. A family of Crouzeix-Raviart Finite Elements in 3D. *Analysis and Applications*, **16**, 649-691.

80. P. Ciarlet, Jr., L. Giret, E. Jamelot, F. D. Kpadonou **(2018)**. Numerical analysis of the mixed finite element method for the neutron diffusion eigenproblem with heterogeneous coefficients. *Math. Mod. Num. Anal.*, **52**, 2003-2035.

81. P. Ciarlet, Jr., M. Vohralik **(2018)**. Localization of global norms and robust a posteriori error control for transmission problems with sign-changing coefficients. *Math. Mod. Num. Anal.*, **52**, p. 2037-2064.

82. J. P. Borthagaray, P. Ciarlet, Jr. **(2019)**. On the convergence in H^1-norm for the fractional Laplacian. *SIAM J. Numer. Anal.*, **57**, p. 1723-1743.

83. M. Campos Pinto, P. Ciarlet Jr., B. Després, A. Nicolopoulos **(2020)**. Degenerate elliptic equations for resonant wave problems. *IMA J. Applied Math.*, **85**, p. 132-159.

84. S. Chaillat, P. Ciarlet, Jr., F. D. Kpadonou **(2020)**. On the efficiency of nested GMRES preconditioners for 3D acoustic and elastodynamic $\mathcal{H}$-matrix accelerated Boundary Element Methods. *Computers Math. Applic.*, **80**, p. 471-489.

85. P. Ciarlet, Jr. **(2020)**. On the approximation of electromagnetic fields by edge finite elements. Part 3: sensitivity to coefficients. *SIAM J. Math. Anal.*, **52**, p. 3004-3038.

86. D. Chicaud, P. Ciarlet, Jr., A. Modave **(2021)**. Analysis of variational formulations and low-regularity solutions for time-harmonic electromagnetic problems in complex anisotropic media. *SIAM J. Math. Anal.*, **53**, p. 2691-2717.

87. C. Carvalho, P. Ciarlet, Jr., C. Scheid **(2022)**. Limiting amplitude principle and resonances in plasmonic structures with corners: numerical investigation. *Comput. Methods Appl. Mech. Engrg.*, **388**, 114207.

88. S. Chaillat, P. Ciarlet, Jr., L. Bagur **(2022)**. Improvement of hierarchical matrices for 3D elastodynamic problems with a complex wavenumber. *Adv. Comput. Math.*, **48**, article number 9.

89. P. Ciarlet, Jr., M. Kachanovska **(2022)**. A mathematical study of a hyperbolic metamaterial in free space. *SIAM J. Math. Anal.*, **54**, p. 2216-2250.

90. P. Ciarlet, Jr. **(2022)**. On the approximation of electromagnetic fields by edge finite elements. Part 4 : analysis of the model with one sign-changing coefficient. *Numer. Math.*, **152**, p. 223-257.

91. P. Ciarlet, Jr., M.-H. Do, F. Madiot **(2023)**. A posteriori error estimates for mixed finite element discretizations of the Neutron Diffusion equations. *Math. Mod. Num. Anal.*, **57**, p. 1-27.

92. P. Ciarlet, Jr., D. Lassounon, M. Rihani **(2023)**. An optimal control-based numerical method for scalar transmission problems with sign-changing coefficients. *SIAM J. Numer. Anal.*, **61**, p. 1316-1339.

93. D. Chicaud, P. Ciarlet, Jr. **(2023)**. Analysis of time-harmonic Maxwell impedance problems in anisotropic media. *SIAM J. Math. Anal.*, **55**, p. 1969-2000.

94. P. Ciarlet, Jr., E. Jamelot **(2024)**. Variational methods for solving numerically magnetostatic systems. *Adv. Comput. Math.*, **50(5)**.

95. M. Barré, P. Ciarlet, Jr. **(2024)**. The T-coercivity approach for mixed problems. *C. R. Acad. Sci. Paris, Ser. I*, **362**, p. 1051-1088.

96. P. Ciarlet, Jr., M. Kachanovska, E. Peillon **(2024)**. Study of a degenerate non-elliptic equation to model plasma heating. *Math. Mod. Num. Anal.*, **58**, p. 1785-1821.

97. P. Ciarlet, Jr., E. Jamelot **(2025)**. Explicit T-coercivity for the Stokes problem: a coercive finite element discretization. *Computers Math. Applic.*, **188**, p. 137-159.

98. P. Ciarlet, Jr., M.-H. Do, M. Gervais, F. Madiot **(to appear)**. A posteriori error estimates for the DD+L^2 jumps method on the Neutron Diffusion equations. *Computers Math. Applic.*.

PUBLICATIONS IN REFEREED PROCEEDINGS

1. P. Ciarlet, Jr. **(1993)**. *A comparison of three iterative algorithms based on domain decomposition methods.* In 7th Conf. on Domain Decomposition Methods, 1993, D. E. Keyes and J. Xu, Eds, Contemporary Mathematics, **180**, p. 387-393.

2. P. Ciarlet, Jr., F. Lamour, B. F. Smith **(1995)**. *On the influence of the partitioning schemes on the efficiency of overlapping domain decomposition methods.* In FRONTIERS'95: 5th Symp. on the frontiers of massively parallel computation, IEEE, p. 375-384.

3. F. Assous, P. Ciarlet, Jr., S. Labrunie, S. Lohrengel **(2002)**. *The singular complement method.* In 13th Conf. on Domain Decomposition Methods, 2000, N. Debit et al, Eds, CIMNE, Barcelona, Spain, p. 161-189.

4. P. Ciarlet, Jr., E. Jamelot **(2006)**. *Continuous Galerkin methods for solving Maxwell equations in 3D geometries.* In ENUMATH 2005, Santiago de Compostela, Spain, Springer, p. 547-554.

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10. J. P. Borthagaray, P. Ciarlet, Jr. **(2017)**. *Nonlocal models for interface problems between dielectrics and metamaterials.* In Metamaterials, Marseille, France, 11th International Congress on Engineered Materials Platforms for Novel Wave Phenomena, IEEE, p. 61-63.

11. S. Chaillat, P. Ciarlet, Jr., F. D. Kpadonou **(2019)**. *An efficient preconditioner for $\mathcal{H}$-matrix accelerated Boundary Element Methods for 3D wave propagation problems.* In CSMA 2019.

12. M.-H. Do, P. Ciarlet, Jr., F. Madiot **(2020)**. *Adaptive solution of the neutron diffusion equation with heterogeneous coefficients using the mixed finite element method on structured meshes.* In PHYSOR 2020.

13. P. Ciarlet, Jr., M.-H. Do, M. Gervais, F. Madiot **(2024)**. *Adaptive solution of the domain decomposition+L^2-jumps method applied to the neutron diffusion equation on structured meshes.* In SNA + MC 2024, Paris, France, EPJ Web of Conferences **302**, 02011.

14. P. Ciarlet, Jr., E. Jamelot, S. Sauter **(2025)**. *Stability of the $\mathbf{P}^1_{nc} - (P^0 + P^1)$ element.* In ENUMATH 2023, Lisbon, Portugal, Numerical Mathematics and Advanced Applications ENUMATH 2023, Vol. 1, p. 494-503.

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F. Assous, P. Ciarlet, Jr., S. Labrunie **(2018)**. *Mathematical Foundations of Computational Electromagnetism.* Applied Mathematical Sciences Series, **Vol. 198**, Springer, ISBN 978-3-319-70841-6.

CHAPTER IN BOOK

P. Ciarlet, Jr., M.-H. Do, F. Madiot **(2025)**. *Adaptive mesh refinement on Cartesian meshes applied to the mixed finite element discretization of the multigroup neutron diffusion equations.* In Error Control, Adaptive Discretizations, and Applications, Part 3, Eds. F. Chouly, S.P.A. Bordas, R. Becker, P. Omnes, Advances in Applied Mechanics Series, **60**, Elsevier, pp. 201-234.

TEXTBOOKS

P. Ciarlet, Jr., E. Lunéville **(2009)**. *La méthode des éléments finis : de la théorie à la pratique. I. Concepts généraux.* Coll. Les Cours, Les Presses de l'ENSTA, 188 pages.

E. Bécache, P. Ciarlet, Jr., C. Hazard, E. Lunéville **(2010)**. *La méthode des éléments finis : de la théorie à la pratique. II. Compléments.* Coll. Les Cours, Les Presses de l'ENSTA, 288 pages.

P. Ciarlet, Jr., E. Lunéville **(2022)**. *La méthode des éléments finis, de la théorie à la pratique.* Coll. Méthodes Numériques, Editions ISTE, 382 pages.

P. Ciarlet, Jr., E. Lunéville **(2023)**. *The Finite Element Method. From Theory to Practice.* Numerical Methods in Engineering Series, WILEY, 384 pages.

INVITED TALKS TO CONFERENCES

1st Singular Days, Lyon (Nov. 1996)

5èmes JEDP, Valenciennes (Sep. 2003)

4th Singular Days, Pont-à-Mousson (Jun. 2004)

17th Chemnitz FEM Symposium, Chemnitz, Germany (Sep. 2004)

5th Singular Days, Luminy (Apr. 2007)

Journées Singulières Augmentées, Rennes (Aug. 2013)

Numerical PDEs and their applications, Wuhan, China (May 2015)

Analysis and numerics of acoustic and electromagnetic problems, Linz, Austria (Oct. 2016)

Optimization in Scientific Computing, Hong Kong, China (Jun. 2017)

Recent Advances in Computational and Applied Mathematics, Wuhan, China (Dec. 2017)

12th Workshop on Analysis and Advanced Numerical Methods for PDEs, Strobl, Austria (Jul. 2019)

9th Singular Days, Kassel, Germany (Sep. 2019)

Numerical Waves, Nice (Oct. 2021)

PDEs, Analysis and Applications, Valenciennes (Nov. 2021)

ACOMEN, Liège, Belgium (Aug.-Sep. 2022)

Worshop HIPOTHEC (Mar. 2024)

Analyse Appliquée Hauts-de-France, Valenciennes (Oct. 2024)

3rd HK SIAM, Hong Kong (Jul. 2025)

INVITED COLLOQIUMS AND SEMINAR TALKS

- **France:** Evry Univ. (06/1995), Ecole Polytechnique (12/1996), CRESPO Seminar at INRIA (11/1997), Ecole Centrale de Lyon (06/2003), Paris 11 Univ. (04/2004), Paris 6 Univ. (02/2005), Rennes Univ. (03/2008), Nancy Univ. (06/2008), Grenoble Univ. (11/2008), Nice Univ. (04/2011), Paris 6 Univ. (06/2011), Nancy Univ. (04/2012), INRIA Sophia-Antipolis (04/2013), ENS Rennes (11/2014), INRIA Paris (05/2017), GdR MaNu (11/2017), Lorraine Univ. (01/2018), GdR Ondes (03/2018), Pau Univ. (05/2018), Versailles-St-Quentin-en-Yvelines Univ. (02/2019), Sorbonne Univ. (02/2019), Laboratoire de Mécanique et d'Acoustique, Marseille (10/2019), Séminaire INRIA (12/2021), Lorraine Univ. (11/2023).
- **Europe:** Univ. of Pavia, Italy (10/1998), Univ. of Chemnitz, Germany (11/2001), Univ. of Zürich, Switzerland (01/2006), Univ. of Zürich, Switzerland (04/2008), Univ. of Zürich, Switzerland (03/2012), Univ. of Padova, Italy (Online - 03/2021), Univ. of Bäsel, Switzerland (12/2022), Univ. of Zürich, Switzerland (05/2023).
- **Other Locations:** Univ. of Southern California, USA (03/1994), Chinese Univ. of Hong Kong, China (05/1996), Univ. of Houston, USA (09/2001), Univ. of Houston, USA (03/2002), Chinese Univ. of Hong Kong, China (04/2007).