

Monique Dauge

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Education

- Born 6 October 1956 in Nantes, France
- 1973–1978 Master and *Agrégation* at university of Nantes
- 1978–1980 **Thesis**, *University of Nantes*.
“*Etude de l’opérateur de Stokes dans un polygone : régularité, singularités et théorème d’indice*”
- 1980–1986 **Habilitation**, *University of Nantes*.
“*Régularités et singularités des solutions de problèmes aux limites elliptiques sur des domaines singuliers de type à coins*”

Employment

- 1978–1980 **Doctoral grant**, *University of Nantes*.
- 1980–1984 **Junior researcher at CNRS**, “*Attaché de Recherches*”, *University of Nantes*.
- 1984–1996 **Researcher at CNRS**, “*Chargé de Recherches*”, *University of Nantes*.
- 1996– **Senior researcher at CNRS**, “*Directeur de Recherches*”, *University of Rennes*.

Research interests

- Subjects** Partial differential equations, Spectral theory, Numerical analysis, Scientific computation
- Applications** Acoustics, Electromagnetism, Elasticity, Quantum mechanics
- Topics** Research topics include
- Elliptic boundary value problems in domains with corners;
 - Singular perturbations (thin domains, small holes, high contrast in coefficients);
 - Semi-classical analysis of ground state energy (Laplace equation in guides and layers, magnetic Laplacian);
 - Finite element methods with high degree polynomials, spectral methods and h - p version;
 - Numerical methods and computation of various spectra (Maxwell, Cosserat, Schrödinger, curl, . . .)

Scientific activities

- Authorship** Author or co-author of more than 130 documents (books, articles in peer-reviewed journals or collections). Below, one finds in a first list the references to the books [1] and [2], the book chapter [3], the chapter in the Encyclopedia of Computational Mechanics [4] and the monography [5]. A second list “*Articles in journals or proceedings*” provides full references to the other 125 publications.
- Bibliometry** MathSciNet: 119 publications, 2591 citations. Scopus h-index 24
- PhD supervision** Advisor or co-advisor of 10 PhD students (between 1997 and present). 9 of them have defended their dissertation with success after 3 years (Georgiana Andreoïou 1999, Andreas Rössle 1999, Erwan Faou 2000, Grégory Vial 2003, Victor Péron 2009, Marie Beaudouin-Chaussade 2010, Nicolas Popoff 2012, Thomas Ourmières-Bonafos 2014, Jean-Philippe Miqueu 2016). The last one (Zoïs Moitier) ends his second year and will defend next year (2019).
- Meeting organization** Contribution to the organization of many events (workshops or mini-symposia in conferences). Main achievements: the international conference in 2013 “*Journées Singulières Augmentées 2013*” in Rennes and the spring school “*Fundamentals and practice of finite elements*” in 2018 in Roscoff.
- International contacts** Collaborations abroad, including sometimes research invitations, e.g., during the last 10 years: Amsterdam (Netherlands), Pavia (Italy), Zürich (Schweizerland), Austin (Texas), Bath (Wales), Otago (New Zealand), Munich (Germany), Padova (Italy). Co-organization of workshops or mini-symposia with foreign partners, for example in Oberwolfach (Germany).

Edition Member of the editorial board of 3 peer-reviewed journals: M2AN (Mathematical Modelling and Numerical Analysis), M2AS (Mathematical Methods in the Applied Sciences), NWEJM (North-Western European Journal of Mathematics).

Invitations Numerous invitations to give plenary talks in international conferences or workshops (since 2013: Cardiff 2013, Berlin 2013, Luminy 2013, Glasgow 2013, Liverpool 2013, Tunis 2015, Bilbao 2016, Padova 2016, Bedlewo 2017) or minicourses in international summer schools (Linz 2016, Padova 2018)

Books and book chapters

- [B1] M. Dauge, *Elliptic boundary value problems on corner domains*, vol. 1341 of *Lecture Notes in Mathematics*. Berlin: Springer-Verlag, 1988. Smoothness and asymptotics of solutions.
- [B2] C. Bernardi, M. Dauge, and Y. Maday, *Spectral methods for axisymmetric domains*, vol. 3 of *Series in Applied Mathematics (Paris)*. Éditions Scientifiques et Médicales Elsevier, Paris: Gauthier-Villars, 1999. Numerical algorithms and tests due to Mejdî Azaïez.
- [B3] M. Costabel and M. Dauge, "Computation of resonance frequencies for Maxwell equations in non-smooth domains," in *Topics in computational wave propagation*, vol. 31 of *Lect. Notes Comput. Sci. Eng.*, pp. 125–161, Berlin: Springer, 2003.
- [B4] M. Dauge, E. Faou, and Z. Yosibash, "Plates and shells: Asymptotic expansions and hierarchical models," in *Encyclopedia of Computational Mechanics. Vol I* (E. Stein, R. de Borst, and T. J. Hughes, eds.), pp. 199–236 (Chapter 8), Wiley, 2004.
- [B5] V. Bonnaillie-Noël, M. Dauge, and N. Popoff, "Ground state energy of the magnetic Laplacian on corner domains," *Mém. Soc. Math. Fr. (N.S.)*, no. 145, pp. vii+138, 2016.

Articles in journals or proceedings

- [A1] M. Dauge, Y. Lafranche, and T. Ourmières-Bonafos, "Dirichlet spectrum of the fichera layer," *Integral Equations Operator Theory*, To appear, 2018.
- [A2] M. Costabel, M. Dalla Riva, M. Dauge, and P. Musolino, "Converging expansions for Lipschitz self-similar perforations of a plane sector," *Integral Equations Operator Theory*, vol. 88, no. 3, pp. 401–449, 2017.
- [A3] M. Chaussade-Beaudouin, M. Dauge, E. Faou, and Z. Yosibash, "Free vibrations of axisymmetric shells: parabolic and elliptic cases," *Asymptot. Anal.*, vol. 104, no. 1-2, pp. 1–47, 2017.
- [A4] M. Chaussade-Beaudouin, M. Dauge, E. Faou, and Z. Yosibash, "High frequency oscillations of first eigenmodes in axisymmetric shells as the thickness tends to zero," in *Recent trends in operator theory and partial differential equations - The Roland Duduchava Anniversary Volume*, vol. 258 of *Oper. Theory Adv. Appl.*, pp. 89–110, Birkhäuser/Springer, Cham, 2017.
- [A5] C. Bernardi, M. Costabel, M. Dauge, and V. Girault, "Continuity properties of the inf-sup constant for the divergence," *SIAM J. Math. Anal.*, vol. 48, no. 2, pp. 1250–1271, 2016.
- [A6] V. Bonnaillie-Noël, M. Dauge, N. Popoff, and N. Raymond, "Magnetic Laplacian in sharp three-dimensional cones," in *Spectral theory and mathematical physics*, vol. 254 of *Oper. Theory Adv. Appl.*, pp. 37–56, Birkhäuser/Springer, [Cham], 2016.
- [A7] M. Dauge, T. Ourmières-Bonafos, and N. Raymond, "Spectral asymptotics of the Dirichlet Laplacian in a conical layer," *Commun. Pure Appl. Anal.*, vol. 14, no. 3, pp. 1239–1258, 2015.
- [A8] M. Dauge, A. Düster, and E. Rank, "Theoretical and numerical investigation of the finite cell method," *J. Sci. Comput.*, vol. 65, no. 3, pp. 1039–1064, 2015.
- [A9] M. Costabel and M. Dauge, "On the inequalities of Babuška-Aziz, Friedrichs and Horgan-Payne," *Arch. Ration. Mech. Anal.*, vol. 217, no. 3, pp. 873–898, 2015.
- [A10] M. Costabel, M. Crouzeix, and M. a. Dauge, "The inf-sup constant for the divergence on corner domains," *Numer. Methods Partial Differential Equations*, vol. 31, no. 2, pp. 439–458, 2015.
- [A11] M. Dauge, R. A. Norton, and R. Scheichl, "Regularity for Maxwell eigenproblems in photonic crystal fibre modelling," *BIT*, vol. 55, no. 1, pp. 59–80, 2015.

- [A12] M. Dauge, P. Dular, L. Krähenbühl, V. Péron, R. Perrussel, and C. Poignard, "Corner asymptotics of the magnetic potential in the eddy-current model," *Math. Methods Appl. Sci.*, vol. 37, no. 13, pp. 1924–1955, 2014.
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- [A14] M. Costabel, M. Dauge, and S. Nicaise, "Weighted analytic regularity in polyhedra," *Comput. Math. Appl.*, vol. 67, no. 4, pp. 807–817, 2014.
- [A15] S. Shannon, Z. Yosibash, M. Dauge, and M. Costabel, "Extracting generalized edge flux intensity functions with the quasidual function method along circular 3-D edges," *International Journal of Fracture*, vol. 181, no. 1, pp. 25–50, 2013.
- [A16] M. Dauge and N. Raymond, "Plane waveguides with corners in the small angle limit," *J. Math. Phys.*, vol. 53, no. 12, pp. 123529, 34, 2012.
- [A17] M. Dauge, Y. Lafranche, and N. Raymond, "Quantum waveguides with corners," in *Congrès National de Mathématiques Appliquées et Industrielles*, vol. 35 of *ESAIM Proc.*, pp. 14–45, EDP Sci., Les Ulis, 2011.
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- [A19] V. Bonnaillie-Noël, M. Dauge, N. Popoff, and N. Raymond, "Discrete spectrum of a model Schrödinger operator on the half-plane with Neumann conditions," *Z. Angew. Math. Phys.*, vol. 63, no. 2, pp. 203–231, 2012.
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- [A25] G. Caloz, M. Dauge, and V. Péron, "Uniform estimates for transmission problems with high contrast in heat conduction and electromagnetism," *J. Math. Anal. Appl.*, vol. 370, no. 2, pp. 555–572, 2010.
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