

LIST OF PUBLICATIONS by PETER LAURENCE

• Quantitative Finance

– Book

Co-authored with Marco Avellaneda: *Quantitative Modeling of Derivative Securities: from theory to practice*, Chapman Hall-CRC Press, 1999, first printing, second printing 2000.

– Articles in Mathematical Finance

– *with* E. STREDULINSKY, A comparison principle for an American option on several assets: index and spread options, *Electronic Journal of Differential Equations*, Vol 74, 2003.

– *with* T-H WANG, What's a basket worth?, *Risk Magazine*, Vol. 17, no 2, February 2004.

- *ibid.*, Translated into Italian and appeared in special collections, as follows: *Risk, Italia, summer 2004*, Quanto Vale il Paniere? and reprinted in special collection of selected articles in *Risk Books, Derivatives Trading and Option Pricing*, edited by Nicholas Dunbar, 2005; Selection of "Ground breaking articles": *Structured Products*, Risk books, 2008, edited by Dilip Madan.

– *with* T-H WANG, Sharp upper and lower bounds for basket options, *Applied Mathematical Finance*, Volume 12, No. 3, p. 253-282, 2005.

– *with* D. HOBSON AND T-H WANG, Static arbitrage upper bounds for Basket Options, *Quantitative Finance*, Vol 5, no. 4, pg. 329-342, Aug. 2005.

– *with* D. HOBSON AND T-H WANG, Static arbitrage optimal subreplicating strategies for basket options. *Insurance Mathematics and Economics*, 37, pg. 553-572 (2005).

– *with* T-H WANG, Closed form solutions for quadratic and inverse quadratic models of the term structure. February 2005, *International Journal of theoretical and applied finance*, Vol. 8., no. 8, pg 1059-1083, 2005.

– *with* P. CARR AND T-H WANG, Generating Integrable one dimensional Diffusions, *Comptes Rendus de l' Académie des Sciences*, Volume 343, Issue 6, 15, Pages 393-398, September 2006.

– *with* P. CARR, Multi-asset stochastic local variance, *Mathematical Finance*, Vol. 21, Issue 1, pp. 21-52, 2010 (preprint version 2007).

- *with* L. BARONE AND T-H WANG, Geometric properties of multivariate correlation in De Finetti’s approach to insurance theory, *Journal Electronique d’Histoire de la Probabilité et de la Statistique*, December 2008. (this is a commentary on a historical article of de Finetti below).
- *with* WITH L. BARONE, About Correlations, translation of the article by de Finetti “A proposito di correlazione” into English, *Journal Electronique d’Histoire de la Probabilité et de la Statistique*, December 2008..
- *with* T-H WANG AND S-L WANG, Generalized Sabr Models with a high degree of symmetry, *Quantitative Finance*, February, 2010.
- *with* T-H WANG, Distribution free upper bounds for spread options and the market implied antimonotonicity gap, *European Journal of Finance*, Vol. 14, nb 8, pg 717-734, 2008.
- *with* T-H WANG, Sharp Distribution free lower bounds for spread options and the corresponding optimal subreplicating portfolios, *Insurance: Mathematics and Economics*, Vol. 44, Issue 1, pg 35-47, 2009.
- *with* S. SALSA, Regularity of the free boundary for an american option on several assets, *Communications on Pure and Applied Mathematics*, 62 (2009), no. 7, pg. 969–994.
- *with* J. GATHERAL, E. HSU, C. OUYANG, T-H WANG, *Asymptotics of implied volatility in local volatility models*, published online in *Mathematical Finance*, September 2010.

• **Work in Progress**

- **Book**
with ALEXANDER EYDELAND, VLADIMIR LUCIC, AKIHIKO TAKAHASHI, *Basket options in equity and energy markets*. In preparation for *Wiley Finance* (contract signed, tentatively due December 2011).
- *with* GÉRARD BEN AROUS, *Second Order Expansion for implied volatility in two factor local-stochastic volatility models and applications to the λ -Sabr model.*, submitted to *Siam Journal on Financial Mathematics*, July 2010.
- P.L. *An efficient method for calculating implied volatility in stochastic volatility models.*
- *with* GÉRARD BEN AROUS, ELTON HSU, CHENG OUYANG AND T-H WANG, *Approximations to the implied volatility in a family of stochastic volatility models*, working paper.
- *with* ELISA ALOS AND ALEXANDER EYDELAND, *New approximations for three asset spread options*, in preparation.

- *with* ARCHIL GULISASHVILI *New formulas for the distance function in the Heston model and its relation to the Grushin operator*, in preparation.
- *with* R. BAVIERA *Asymptotics for basket options*, in preparation.
- *with* ROBERTO PIGNOL AND ESTEBAN TABAK *Density estimation with constraints through flows in feature space*

1 Publications on Spectral Theory and stability in magnetohydrodynamics

- (with *M.C. Shen*) Justification of the MHD energy principle for the stability of a confined toroidal plasma, *Communications on Pure and Applied Mathematics*, Vol. 36, 2: 223-258, 1983.
- (with *E. Hameiri*) Ballooning modes in rotating plasmas, *Journal of Mathematical Physics* 25, 369-405, 1984.
- Some rigorous results concerning spectral theory in ideal MHD, *Journal of Mathematical Physics* 27, p. 1, 1916-1926, 1986.
- (with *E. Hameiri and M. Mond*) The ballooning instability in space plasmas, *J. of Geophysical Research*, Vol. 96, No. A2, 1513-1520, 1991.

2 Qualitative Properties of solutions of partial differential equations

- On the convexity of geometric functionals of level for solutions of certain elliptic differential equations, *ZAMP (Journal de Mathématiques et Physique Appliqués)*, Vol. 40, p. 258-284, 1989.
- Une nouvelle formule pour dériver par rapport aux lignes de niveau et applications, *Comptes Rendus d l'Académie des Sciences*, Série I, t. 306, p. 455-460, 1988.
- (with *E. Stredulinsky*) Sur la convexité des lignes de niveau de certaines solutions d'une classe d'Équations semilinéaires non monotones, *Comptes Rendus de l'Académie des Sciences*, Série I, t. 473, 1989.
- (with *E. Stredulinsky*) On the existence of regular solutions with convex level lines of a class of semilinear elliptic equations with non monotone nonlinearities, Part II, *Indiana University Math. Journal*, Vol. 39, 2, p. 485, 1990.
- (with *E. Stredulinsky*) *idem*, Part I, *Indiana University Math. Journal*, Existence of regular solutions with convex levels for semilinear elliptic equations with nonmonotone L^1 nonlinearities. I. An approximating free boundary problem, no. 4, 1081-1114, 1990
- (with *E. Stredulinsky*) Convex equimeasurable rearrangement: A counterexample and an example, *Comptes Rendus de l'Académie des Sciences*, Série I, p. 923, 1991.

- (with E. Stredulinsky) Quasi convex equimeasurable symmetrization: A counterexample and an example, *Z. fuer die Reine und Angewandte Mathematik (Crelle Journal)*, 30, 1993.
- (with D. Lortz, F. Soria, G. Spies) Some monotonicity and convexity results for integral means, *Z. Naturforschung* 48a, pg 841, 1993.
- (with E. Stredulinsky) Topological Rearrangement of functions, *Comptes Rendus de l'Academie des Sciences*, t. 324, série 1, p.403-408, 1997.
- (with E. Stredulinsky) Topological Rearrangement of functions, *Comptes Rendus de l'Académie des Sciences*, 328, no.8, p.653-658, 1999.

3 Partial Differential Equations and free boundary problems arising in Magnetohydrodynamics and nuclear fusion research

- (with E. Stredulinsky) A new approach to queer differential equations, *Communications on Pure and Applied Mathematics*, Vol. 38, pgs 335-355, 1985.
- (with E. Stredulinsky) A survey of regularity results for second order queer differential equations. Proceedings of the Conference in honor of Hans Lewy, Italy, *Springer Lecture Notes* 1340, June 1986.
- (with E. Stredulinsky) Un résultat de régularité supérieure pour les équations différentielles généralisées de Grad, *Comptes Rendus de l'Academie des Sciences*, Serie I, t. 305, pp. 473-475, 1987.
- (with E. Stredulinsky) A bootstrap argument for Grad generalized differential equations, *Indiana University Mathematics Journal*, Vol. 38, 2, p. 378, 1989
- (with E. Stredulinsky) Sur la convergence de n problèmes à la frontière libre a problème variationnel de Grad, *Comptes Rendus de l'Académie des Sciences*, Série I, 1990.
- (with E. Stredulinsky) On the convergence of a sequence of n free boundary problems associated to the Grad variational problem in plasma physics, *Communications in Pure and Applied Mathematics*, Vol. XLIII, 1990.
- (with E. Stredulinsky) Axisymmetric MHD equilibria, from Kruskal to Grad, Refereed Proceedings of Conference on Variational Problems, Minneapolis, Minn., April 1991, *IMA Vol. Math and its applications*, 53, 111-134, 1993

- (with M. Avellaneda) A Moffatt-Arnold formula for the mutual helicity of linked flux tubes, *Geophys. Astrophys. Fluid Dynamics*, Vol. 69, p. 243, 1993
- (with O. Bruno) On the existence of three dimensional Sharp boundary solutions of the 3-D MHD equations in a torus, *Comptes Rendus Académie des Sciences*, t. 312, v.3, 1993.
- (with E. Stredulinsky) A Gradient Bound for the Grad-Kruskal-Kulsrud Functional, *Mathematics Research Letters* 1, no.3, pgs 337-387,1994
- (with E. Stredulinsky) A Gradient Bound for the Grad Kruskal-Kulsrud variational problem, *Communications on Pure and Applied Math*, vol.49, n3, 237-286, 1996.
- (with O. Bruno) Existence of 3D toroidal MHD equilibria with nonconstant pressure, *Communications in Pure and Applied Math*, vol. 49, pp 717-764, 1996.

4 Variational Problems and topological invariants arising in the study of the solar corona and the current sheet problem

- (with M. Avellaneda) On Woltjer's variational principle for force free fields, *Journal of Mathematical Physics*, 32, May, 1991.
- (with M. Avellaneda) Woltjer's variational principle, II: The case of unbounded domains, *Geophys. Astrophys. Fluid Dynamics*, Vol. 69, p. 201, 1993.
- (with E. Stredulinsky) A Topological Decomposition of Sobolev Functions and on the localization of energy in ideal plasmas, *Comptes Rendus del'Académie des Sciences, Série 1* 324 , no. 4, pgs 403-408, 1997, .
- (with E. Stredulinsky) Topological Rearrangement of a function, *Comptes Rendus del'Académie des Sciences, Série 1*, no8,pgs 403-408, 1999.
- (with E. Stredulinsky) Variational Problems with topological constraints, *Calculus of Variations and Partial Differential Equations* 10, p.197-212, 2000.
- (with E. Stredulinsky) Two dimensional Magnetohydrodynamic Equilibria with prescribed topology, *Communications on Pure and Applied Mathematics*, Vol. 53, Issue 9, p.1177-1200, September 2000.

- (with *E. Stredulinsky*) Asymptotic Massey Products, Induced Currents and Boreman links of tori, *Journal of Mathematical Physics*, volume 41, number 5, pgs 3170-3191, 2000.
- (with *E. Stredulinsky*) A lower bound for the energy of magnetic fields supported in linked tori, *Comptes Rendus de l' Académie des Sciences*, t. 331, Série I, p. 201-206, 2000.
- (with *J.R.Clegg, B.J.I. Bromage, P. Browning and E. Stredulinsky*) On the representation of inhomogeneous linear force free fields, *Journal of Mathematical Physics*, Volume 41, nb. 19, pgs 6783-6807, 2000.
- (with *J.R.Clegg, B.J.I. Bromage, P. Browning and E. Stredulinsky*) The linear force-free field in a spherical shell using a new method to determine the coefficients of the eigenfunctions, *Astronomy and Astrophysics* 361: 2, p.753-758, 2000.
- (with *E. Stredulinsky*) Optimal regularity in a variational problem for current sheets in ideal magnetohydrodynamics, *J. Math. Phys.* 43, no. 11, 5707–5719, 2002.