Curriculum Vitae

Mark Asch [1]
Professor of Mathematics
Université de Picardie Jules Verne, 80039 Amiens, FRANCE

Academic and Professional Career Path

- 1982 : B.Sc. Agronomy, Hebrew University, Rehovot, Israel.
- 1984 : M.Sc. Applied Mathematics, Hebrew University of Jerusalem, Israel.
- 1984–1986 : Consulting Engineer in CAD and finite elements.
- 1990 : Ph.D. Mathematics, Courant Institute of Mathematical Sciences, New York University, USA.
- 1991 : Post doctoral research, INRIA, France and Institute for Advanced Studies, Princeton, USA.
- 1991–2001 : Maître de conférences, University of Paris XI, France.
- 1998 : Habilitation à diriger des recherches, University of Paris VII.
- 2001– : Professor, University of Toulon and University of Amiens since 2003.
- 2009-2010 : Visiting Researcher, INRIA Rocquencourt, France.

Research Activities

Research. My *current* research deals with two applied themes in the field of *inverse problems* :

(1) Detection of small imperfections by coupled approaches (opto-acoustic, magneto-acoustic).

(2) Multiscale marine habitat monitoring.

Earlier research dealt with numerical and geometrical controllability of the wave equation, anti-noise barriers and the interactions between fractal geometries and the acoustical qualities of porous materials.

Supervision.
- Six doctoral theses (in applied mathematics and acoustics) defended.
- Three post-doctoral students.

Contracts.
- Laboratoire de Physique de la Matière Condensée (LPMC École Polytechnique) and FX Conseil (15k EUR) : 2002-2006 for numerical and theoretical studies of acoustic damping.
- Centre Militaire d'Océanographie, Brest (20k EUR) : contract from 2001-2003 for wideband inversion in shallow water acoustics.
- EPSHOM, Brest (CMO) : 650k EUR, 2004-2007, for the development of a rapid underwater environmental assessment system – collaboration with Laboratoire d'Océanographie Dynamique (LODYC, U. Paris VI) and the Université Libre de Bruxelles.
- Thales SAFARE : industrial contract, 52 k EUR for development of real-time inversion software package based on linear optimization methods (downhill simplex, simulated annealing).
- EPSHOM, Brest (CMO) : 498k EUR, Coupled acoustic and oceanographic inversion system (2009-2010).

Administrative Activities

- Director of the Mathematical Engineering Department, Engineering School of Toulon University, 2001–2003.
- Directeur of a research team MNC (Modélisation Numérique et Couplages), Toulon University, 2001–2003.
- Member of the governing board of the SMAI (Société de Mathématiques Appliquées et Industrielles), 2003–2007.
- Vice-chancellor of the University of Amiens, 2005–2008 (research portfolio).

Currently-held Positions and Responsibilities

- Professor (1st class) of Applied Mathematics at the University of Picardy Jules Verne, Amiens, France. Research unit : LAMFA-CNRS UMR6140
- Associate Researcher at the Free University of Brussels (ULB). Research group : OPERA-EHL
- Director of the High Performance Computing platform MeCS
- Activity leader of the research group GDR Ondes - thematic group #1
- Member of the French national steering committe for HPC mesocentres
- Member of the scientific commission "Data Assimilation" of the INSU-CNRS.
- Part-time scientific secretary of the French Academy Of Engineering (2008–2010)

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– Official reviewer for Mathematical Reviews of MathSciNet
– Responsible for Scientific Computing and Interdisciplinarity, CNRS-INSMI, 2010–

SIGNIFICANT PUBLICATIONS (2003-2009)

(1) *Risk* (in French). M. Asch, A. Le Ninèze. EDP Sciences. 2003.

(2) The spectrum of the damped wave operator for geometrically complex domains in R^2 ; M. Asch, G. Lebeau ; *Experimental Mathematics* **12** , 2 ; (2003).

(3) Geoacoustic inversion of broadband acoustic data in shallow water by a single hydrophone ; M. Asch, J.-C. Le Gac, Y. Stephan, X. Démoulin ; *IEEE Journal of Oceanic Engineering* **28**, 3 (2003).

(4) Boundary voltage perturbations caused by small conductivity inhomogeneities nearly touching the boundary ; H. Ammari, M. Asch, H. Kang ; *Advances in Applied Mathematics ,* **35**, 4 (2005).

(5) An iterative multiple frequency adjoint-based inversion algorithm for parabolic-type approximations in ocean acoustics ; M. Asch, J.-P. Hermand, J.-C. Le Gac, M. Meyer, *Inverse Problems in Engineering* **13**, 3 (2006).

(6) Adjoint PE inversion method for the physical characterization of a shallow water environment ; M. Asch, J.-P. Hermand, M. Berrada, M. Meyer ; *Journal of the Acoustical Society of America*, **119**, 6 (2006).

(7) Localization and increased damping in irregular acoustical cavities ; M. Asch, S. Félix, B. Sapoval. *Journal of Sound and Vibration,* **299**, 4-5, pp. 965–976 (2007).

(8) Numerical localizations of 3D imperfections from an asymptotic formula for perturbations in the electric fields. M. Asch, S.M. Mefire. *Journal of Computational Mathematics* **26**, 2, pp. 149–195 (2008).

(9) Using reduced meshes for simulation of the localization of small electromagnetic inhomogeneities in a 3D bounded domain. M. Asch, S.M. Mefire, *International Journal of Numerical Analysis and Modeling,* **6**, 1, pp. 50–88 (2009).

(10) Enhanced wave absorption by irregular interfaces. S. Felix, B. Sapoval, M. Filoche and M. Asch. *EPL - EuroPhysics Letters*, **85** (2009).

(11) Numerical solution of an inverse boundary value problem for the wave equation in the presence of conductivity imperfections of small volume. M. Asch, M. Darbas, J.-B. Duval. *ESAIM-COCV*, **17**, 4 (2011).

(12) H. Ammari, M. Asch, V. Jugnon, L. Bustos, H. Kang. Transient wave imaging with limited-view data. *SIAM J. on Imaging Sciences,* **4**, 4 (2011).

(13) (A large number of communications and conference proceedings...)