

# ACADEMIC CURRICULUM

Fabio Rosso

July 25, 2010

**Birthday** – 24 september, 1949

**Place of birth** – Sondrio, Italia

**Nationality** – Italian

**Degree** – Graduated summa cum laude Mathematics at the University of Naples January 30, 1975

**Academic career** – Fellow of the National Research Council 1975-1976, Fellow of the Ministry of Education from 1976 to 1978, professor in charge of the University of Calabria from 1978 to 1980, researcher from 1980 to 1983, associate professor from 1983 to 1986 for the first time at the University of Naples Federico II and then 1987-2003, University Florence, extraordinary professor from 2004-2007

**Actual position** – Full professor of Mathematical Physics at the University of Florence, Italy.

**Actual research directions** – Dynamic and static dispersions, emulsions of two or more immiscible liquid components, mathematical problems in earth sciences, dynamics of non Newtonian fluids, dynamical models for the evolution of multiphase and multicomponent fluids in porous or fractured media .

**Teaching activity in Italy** – Advanced Mathematics, Classical Mechanics of solids and continuous media, Fluid Mechanics, Calculus I and II for Biologists, Geologists and similar applied sciences.

**Teaching activity abroad** Mathematics and Fluid Mechanics at the University of Minnesota (U.S.A.), PhD courses in Tucumán, San Luis, Buenos Aires (Argentina)

**Publications** – author of more than fifty papers in international journals and some didactical books

**Recent invited conferences** – ITLA 6 (Quito, settembre 2009) *The geothermal project in Italy: problems and perspectives*, SIMAI-SIMA 2010 (Cagliari, junio 2010) *Energy, water and environment*

### **Recent financially supported research projects (last ten years)**

- a) C.N.R. project: *Filtration in porous media with nonlinear fluid - solid interactions related to free boundary problems*
- b) University of Florence and Snamprogetti Inc.: *dynamic stability of concentrated suspensions of coal in water to optimize the process of pipelining*
- c) University of Florence: *Studies of the structures of mathematics and its methods with the help of computational tools*
- d) C.N.R. project: *Sedimentation of solid particles in non-Newtonian Newtonian fluids*
- e) C.N.R. project: *Modeling and simulation of continuous multicomponent systems*
- f) C.N.R. project (Florence - Turin - Trieste): *Mathematical models for multiphase flows in industrial and biomedical applications*
- g) TRASLA project supported by Tuscany Region: *Landslides in the marble quarries*
- h) MACGEO project supported by Tuscany Region: *Monitoring and forecasting the evolution of the Monte Amiata and Larderello geothermal reservoirs*

### **Some recent publications and ongoing work**

- [1] I. Borsi, L. Fusi, F. Rosso, and A. Speranza, *Isothermal two-phase flow of a vapor-liquid system with non-negligible inertial effects*, submitted for publication, 2010.
- [2] \_\_\_\_\_, *Weak solution for a two-phase nonlinear flow of a compressible fluid in an undeformable porous medium*, in preparation, 2010.
- [3] \_\_\_\_\_, *A well deliverability model for multi-phase non-darcian flow in geothermal reservoirs*, submitted for publication, 2010.

- [4] S. Corraera, A. Fasano, L. Fusi, M. Primicerio, and F. Rosso, *Wax diffusivity under given thermal gradient: a mathematical model*, ZAMM **87** (2007), no. 1, 24–36, DOI 10.1002/zamm.200510293.
- [5] A. Fasano, R. Gianni, and F. Rosso, *Creaming liquid emulsions from the mathematical point of view: a free boundary problem*, in preparation, 2010.
- [6] A. Fasano, A. Mancini, and F. Rosso, *A “close-up” view of breakage and scattering kernels of the integral–differential equation for the dynamics of liquid dispersions: theory and numerical simulations*, Applied And Industrial Mathematics In Italy Proceedings of the 7th Conference Venice, Italy 20 - 24 September 2004 (Vanda Valente Mario Primicerio, Renato Spigler, ed.), Series on Advances in Mathematics for Applied Sciences, vol. 69, World Scientific, 2005, pp. 324–335.
- [7] ———, *Implementation of fragmentation-coagulation-scattering model for the dynamics of stirred liquid-liquid dispersions*, Physica D: Nonlinear Phenomena **222** (2006), 141–158, DOI:10.1016/j.physd.2006.07.028.
- [8] A. Fasano and F. Rosso, *Multiple fragmentation of liquid droplets in agitated dispersions*, Far East J. Appl. Math. **15** (2004), no. 3, 333–352.
- [9] ———, *Dynamics of droplets in an agitated dispersion with multiple breakage. Part I: formulation of the model and physical consistency*, Math. Meth. Appl. Sc. **28** (2005), no. 6, 631–659.
- [10] ———, *Dynamics of droplets in an agitated dispersion with multiple breakage. Part II: uniqueness and global existence*, Math. Meth. Appl. Sc. **28** (2005), no. 9, 1061–1088.
- [11] ———, *Modelling breakup process of a liquid drop in shear flow*, Applied Mathematical Modelling **33** (2009), no. 1, 315 – 328.