

Proposal Submission Form



EUROPEAN COMMISSION
6th Framework Programme on
Research, Technological
Development and Demonstration

Marie Curie Mobility Actions

**Marie Curie Host Fellowships
for the Transfer of Knowledge
(ToK)**

A1

Proposal Number

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Proposal Acronym

SPADE2

General Information on the Proposal

Proposal Title

DETERMINISTIC AND STOCHASTIC DYNAMICS, FRACTALS, TURBULENCE

Action Code

TOK

Scientific Panel

MAT

Total duration in months

48

Call identifier

FP6-2002-Mobility-3

Keyword 1

Differential equations

Keyword 2

Functional analysis

Keyword 3

Probability theory

Free Keywords

Hydrodynamics, dynamical systems, stochastic processes,, function spaces, wavelet analysis, turbulence, attractors, fractals, multifractal spectra, scaling limits

Abstract (up to 2000 characters)

The subject of SPADE2 is interdisciplinary: methods of dynamical systems, 1,2, finite and infinite dimensional and study of long time behaviour for some PDE's, as Navier-Stokes Eq., and fractal nature of arising attractors. Applications include fractals (data compression, signal transmission), flows in blood vessels, population dynamics. More specifically, areas and methods include:

- 1D-dynamics, real and complex, Iterated Function systems (IFS) as a kernel of higher dimension phenomena (hyperbolic, non-uniformly hyperbolic, dominated splitting), dimensions and measures on metric attractors and basins, Multifractal Spectra of Lyapunov exponents, entropy, dimensions.
- Infinite-dimensional systems. 2D (Navier-Stokes Eq.), 3D thin domains attractors
- Scaling limits in physical processes. Dimensions and scaling exponents for the 2D models like percolation, Ising model, self avoiding random walk, etc. We expect advances in the models like diffusion limited aggregation (a generic model of fractal growth) or random matrices (of major importance in studying disordered media).
- Evolution Stochastic Processes . Evolution Stochastic ODE's and PDE's.
- Methods of Function Spaces: Sobolev Spaces, functions of bounded variation, analysis of singularities of measures, singular integrals and harmonic analysis. Wavelet methods.

The priorities in the project are the visits of top specialists from abroad giving series of lectures, seminars and schools with the participation of researchers and PhD students from IM PAN and other institutions.

The partners of IM PAN for outgoing visits are the universities: Warwick, Paris 6, SNS Pisa, Kiel, and INRIA Institute at Rocquencourt ("Projet Fractale").

The activities of ToK will be widely advertised through Web pages with abstracts of lectures and seminars, bulletins e-mailed to registered participants and PhD students.. Some ToK survey lectures and courses will be published in Banach Center Publications.