

Olivier Faugeras, wins the ERC Advanced Grant  
in the field of physical sciences and engineering sciences.



In the Nervi project (From single neurons to visual perception), we propose to develop a formal model of information representation and processing in the part of the neocortex that is mostly concerned with visual information. This model will open new horizons in a well-principled way in the fields of artificial and biological vision as well as in computational neuroscience. Specifically the goal is to develop a universally accepted formal framework for describing complex, distributed and hierarchical processes capable of processing seamlessly a continuous flow of images. This framework features notably computational units operating at several spatiotemporal scales on stochastic data arising from natural images. Meanfield theory and stochastic calculus are used to harness the fundamental stochastic nature of the data, functional analysis and bifurcation theory to map the complexity of the behaviours of these assemblies of units. In the absence of such foundations the development of an understanding of visual information processing in man and machines could be greatly hindered. Although the project addresses fundamental problems its goal is to serve as the basis for ground-breaking future computational development for managing visual data and as a theoretical framework for a scientific understanding of biological vision.

The ERC grant for such a project is a clear sign of the importance of the research addressed by this research group [ODYSSEE](#) from *INRIA Sophia Antipolis – Méditerranée*.

### *Biography*

Olivier FAUGERAS is a graduate from the Ecole Polytechnique (1971). He holds a PhD in Computer Science and Electrical Engineering from the University of Utah (1976) and a Doctorate of Science from Paris VI University (1981). He is currently Research Director at INRIA (National Research Institute in Computer Science and Control Theory), where he leads the Odysée laboratory located in Sophia-Antipolis and Ecole Normale Supérieure, Paris. His research interests include the application of mathematics to computer and biological vision, shape representation and recognition, the use of functional imaging (MR, MEG, EEG) for understanding brain activity and in particular visual perception. He has published extensively in archival Journals, International Conferences, has contributed chapters to many books and is the author of “Artificial 3-D Vision” published in 1993 by MIT Press and, with Quang-Tuan Luong and Theo Papadopoulos, of “The Geometry of Multiple Images” which appeared in March 2001, also at MIT Press.

He was an adjunct Professor from 1996 to 2001 in the Electrical Engineering and Computer Science Department of the Massachusetts Institute of Technology and a member of the AI Lab. He is an Associate Editor of several international scientific Journals including Machine Vision and Applications, Videre, Image and Vision Computing. He has served as Associate Editor for IEEE PAMI from 1987 to 1990 and as co-Editor in-Chief of the International Journal of Computer Vision from 1991 to 2004.

In April 1989 he received the “Institut de France - Fondation Fiat” award from the french Academy of Sciences for his work in Vision and Robotics. In July 1998 he received the “France Telecom” award from the French Academy of Sciences for his work on Computer Vision and Geometry.

In November 1998 he was elected a member of the French Academy of Sciences.