

Preface

It is with great pleasure that we have gathered the chapters of this book on Nonlinearity and Complex Dynamics to honor our colleague and friend Prof. Manuel G(arcía) Velarde, offered to him as a token of friendship, on the occasion of his seventieth anniversary. The contents are a follow-up of a Week of Science celebrated in September 2011 at Instituto Pluridisciplinar (IP), Universidad Complutense of Madrid (UCM), Spain. With four other UCM professors he was co-founder and there he had been for the past 20 years of his scientific career as (PROPIO) professor of physics [www.ucm.es/info/fluidos]. The IP-UCM was possible, thanks to an adventurous action of the then UCM Rector Gustavo Villapalos, a professor of law.

The Week of Science was also dedicated to honor several of his fellow colleagues at Prof. Velarde's request, as they were celebrating birthdays about the same week. They are Prof. Werner Ebeling (Berlin), Prof. Ivan B. Ivanov (Sofia), Prof. Grégoire Nicolis (Brussels), Prof. John J. Kozak (Chicago), Dr. Benoit Scheid (Brussels), Music composer Maestro Tomás Marco, and Dr. Rafael García Serrano, Museum Curator of "Museo del traje" (Madrid), formerly Curator of "Museum of Santa Cruz," Toledo. All of them have been frequent visitors of IP-UCM.

The Week of Science was an opportunity to appreciate the broad spectrum of interests of Prof. Velarde, both in science and culture. Surfer and architect Pablo Díaz offered a fascinating talk on surf waves all around the world. It was also the opportunity to learn about his love of Music, not just J. S. Bach (Cello suite #1, BWV 1007 in G major, was played by Maestro Angel Ga. Jermann, Professor at Real Conservatorio Superior de Música, Madrid). Here it follows a song much loved by Manuel:

Folks call me a maverick.
Guess I ain't too diplomatic...
Well, I have been accused
Of makin' my own rules.
There must be rebel blood
Just a runnin' through my veins.

But I ain't no hypocrite
 What you see is what you get.
 And that's the only way I know
 To play the game.
 Old Noah took much ridicule
 For building his great ark.
 But after forty days and forty nights
 He was lookin' pretty smart.
 Sometimes it's best to brave the wind and rain
 By havin' strength to go against the grain.

("Against the grain", lyrics by Bruce Bouton, Larry Cordle, and Carl Jackson; sung by Garth Brooks.)

It was then naturally fitting well with his approach to life that in September 2007 Manuel organized a conference in Toledo for the **Academia Europaea** [www.acadeuro.org] with the theme of "The Dialogue of Three Cultures and our European heritage. Toledo crucible of the Cultures at the dawn of the Renaissance" [www.ucm.es/info/fluidos, see Int. Conf. Toledo 2007]. The conference covered topics from geography, history, poetry, linguistics, art, medicine, pharmacology, geometry, mathematics, astronomy, and hydraulics. The conference started at the Cathedral of Toledo in a large room (the Sacristy) covered with more than a dozen paintings by *El Greco* and a cieling decorated by *L. Jordaens*. The inaugural speeches were delivered in Latin. As he has said, one thing he wanted to understand was what brought Toledo then (1200) for quite some time at the cultural and scientific zenith in Europe, to almost vanishing in a rather short time interval.

In 2002, a special issue of the *International Journal of Bifurcation and Chaos* (vol. 12, n. 11, 348 pp.) was edited by Prof. G. Nicolis to celebrate Manuel's sixtieth birthday. Under the topic title *Spatio-Temporal Complexity*, it included 28 original research papers contributed by 67 scientists from Europe, the Americas, Asia, Africa, and the Middle East. This book follows the same path celebrating his seventieth birthday.

Finally, we have received with joy the news of his appointment as director of a newly created "Research Chair" at Universidad Alfonso X el Sabio [www.uax.es] where Prof. Velarde is starting yet another period of his life. This has been made possible, thanks to Rector Jose Domínguez de Posada, a professor of civil engineering, Dr. Juan José Montoya, MD, Director of the UAX Foundation, and UAX President Don Jesús Núñez Velázquez.

The editors wish to express their appreciation to Manuel's secretary Mrs María J. Martín for her kindness and her endless patience in the preparation of this book with a dedication well beyond the call of duty.

The Editors

INSTITUTO PLURIDISCIPLINAR-UCM, MADRID (SPAIN)

SEPTEMBER 12-16, 2011

A WEEK OF SCIENCE

TO CELEBRATE THE
70th BIRTHDAY (SEPT. 7th, real; 14th, legal; 2011) OF
Prof. MANUEL G. VELARDE

(<http://www.ucm.es/info/fluidos>)

AND AT HIS REQUEST TO ALSO CELEBRATE THE BIRTHDAY OF HIS COLLEAGUES AND
FRIENDS

Prof. IVAN B. IVANOV (SEPT. 6th), Prof. GREGOIRE NICOLIS (SEPT. 11th),
Maestro TOMAS MARCO (SEPT. 12th), Prof. JOHN J. KOZAK (SEPT. 14th),
Prof. WERNER EBELING (SEPT. 15th), Dr. BENOIT SCHEID (SEPT. 15th), and
Museum Curator DR. RAFAEL GARCIA SERRANO (SEPT. 16th)

SCIENTIFIC COMMITTEE:

M. ADLER (MARNE-LA-VALLEE), P. ARENA (CATANIA), J. BRAGARD (PAMPLONA), A. CASTELLANOS (SEVILLA), A. P. CHETVERIKOV (SARATOV), P. COLINET (BRUSSELS), J. S. DEHESA (GRANADA), E. DEL RIO (UPM, MADRID), V. FAIREN (UNED, MADRID), G.-X. HUANG (SHANGHAI), R. G. RUBIO (UCM, MADRID) (Chair), S. KALLIADASIS (IMPERIAL COLLEGE, LONDON), A. A. NEPOMNYASHCHY (HAIFA), J. M. REDONDO (BARCELONA), Yu. S. RYAZANTSEV (MADRID) (co-Chair), V. M. STAROV (LOUGHBOROUGH), U. THIELE (LOUGHBOROUGH), A. WIERSCHEM (ERLANGEN)

OUTLINE

MONDAY SEPTEMBER 12

MULTIFLOW TRAINING DAY-

SYMPOSIUM ON FLUID PHYSICS AND RELATED NONLINEAR PHENOMENA AT INTERFACES AND IN OTHER GEOMETRIES

TUESDAY SEPTEMBER 13

MULTIFLOW TRAINING DAY-SYMPOSIUM ON WETTING AND SPREADING DYNAMICS

SPONSORED BY RAMON ARECES FOUNDATION AND SPRINGER-VERLAG IN COLLABORATION WITH MULTIFLOW CONSORTIUM (EU) AND (FASES) ESA

Presentation of special issue of EUROPEAN PHYSICAL JOURNAL-SPECIAL TOPICS- DISCUSSION AND DEBATE on

WETTING AND SPREADING PHENOMENA AND PROBLEMS,

Coordinated by Prof. Manuel G. VELARDE.

WEDNESDAY SEPTEMBER 14 (morning)

(Continued) MULTIFLOW TRAINING DAY-

SYMPOSIUM ON FLUID PHYSICS AND RELATED NONLINEAR PHENOMENA AT INTERFACES AND IN OTHER GEOMETRIES

WEDNESDAY SEPTEMBER 14 (afternoon)

SYMPOSIUM (AND ROUND TABLE) ON SOLITONS, SOLECTRONS AND SOME NOVEL ASPECTS OF ELECTRIC TRANSPORT

WEDNESDAY SEPTEMBER 14 (evening)

SCIENCE AS PART OF CULTURE

L. Pismen: Swings of science: from complexity to simplicity and back

Cello Recital: Angel Ga. Jerman: J. S. Bach: Cello suite #1, BWV 1007 in G major

AGAPE/BANQUET- 9 pm

THURSDAY SEPTEMBER 15 (morning)

SPARK SYMPOSIUM (AND ROUND TABLE) ON BIOPHYSICS, NEURODYNAMICS AND ROBOTS

THURSDAY SEPTEMBER 15 (afternoon)

SYMPOSIUM (AND ROUND TABLE) ON COMPLEX SYSTEMS

FRIDAY SEPTEMBER 16 (morning and afternoon)

MULTIFLOW TRAINING DAY ON FLOWS AND COMPUTATIONAL METHODOLOGIES-

ERCOFTAC SYMPOSIUM ON GEOPHYSICAL AND ASTROPHYSICAL FLOWS AND RELATED PROBLEMS

Without Bounds: A Scientific Canvas of Nonlinearity and
Complex Dynamics

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