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Preface

Special issue: Cellina and Yorke

Two distinguished mathematicians, Arrigo Cellina and James Yorke, were born on the same day: August 3, 1941. Both received the PhD from the University of Maryland and had plenty of good times together during those years, such as fishing for crabs in the Chesapeake Bay. In 2006, their 65th birthdays were celebrated by two conferences: one in Aveiro, organized by V. Staicu, titled "Views on ODE's," and a second one in Venice, titled "Variational and Differential Problems with Constraints," organized by P. Celada, G. Colombo, C. Mariconda, G. Pianigiani, F. Rampazzo, C. Sartori, and G. Treu.

The current issue of JDE collects a series of original papers, dedicated to Cellina and Yorke, on topics related to their work.

Arrigo Cellina received the "Laurea" degree in physics from the University of Milan in 1965, and received the PhD in mathematics from the University of Maryland in 1968. He has taught at the Universities of Perugia, Florence and Padua, then at the International School for Advanced Studies (SISSA) in Trieste. Currently he is a professor at the University of Milano Bicocca.

He has authored more than 80 papers in the areas of set-valued analysis, ordinary differential equations, differential inclusions, and the calculus of variations. He is most widely known for the book *Differential Inclusions*, written with J.P. Aubin. Since its publication by Springer-Verlag in 1984, the monograph has become the classic reference on the subject.

Cellina's research has always been highly original, introducing entirely new techniques for the analysis of nonlinear problems. Notable examples are:

(i) The method of m-approximate selections from the graph of upper semi-continuous multifunctions, establishing a basic connection between ordinary differential equations and differential inclusions. This eventually led to the notion of "Cellina-selectionable" maps, now standard in the literature.
(ii) The method of continuous selections for maps with decomposable values in $\mathbf{L}^1$, to study differential inclusions with non-convex right-hand side.
(iii) The method of Baire category, for the analysis of differential inclusions without convexity or compactness assumptions. This technique has now found applications also to problems in the calculus of variations in one or more space variables, without the standard convexity or quasi-convexity assumptions.

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Cellina has mentored several PhD students, especially during the years spent at SISSA in Trieste. Far larger is the number of collaborators and friends, whose research continues to be inspired by his seminal ideas.

Jim Yorke received his AB degree from Columbia College (Columbia University) with a major in mathematics in 1963. He came to the University of Maryland as a math graduate student in 1963 and has remained there since then. Currently he is a Distinguished University Professor of Mathematics and Physics, and chair of the Mathematics Department. In 2003, Jim was awarded the Japan Prize Laureate 2003 (shared with Benoit Mandelbrot). The Japan Prize for Science and Technology is a Japanese version of the Nobel Prize. The emperor of Japan presides over the awards ceremony. According to Jim's web page, "A PhD in mathematics is a license to investigate the universe." He says his achievements are virtually all collaborations and asks that we summarize his career by recognizing some of those co-investigators, listing those with whom he has collaborated on more than ten papers each, and so we do: James Alexander, Kathleen Alligood, Celso Grebogi, Brian Hunt, James Kaplan, Judy Kennedy, Eric Kostelich, Tien-Yien Li, John Mallet-Paret, Helena Nusse, Edward Ott, and Tim Sauer. He also said, "You (Shui-Nee Chow) and I only have 5 joint papers, though some are quite influential."

Jim Yorke has authored four books and more than 300 papers in the areas of ordinary differential equations, dynamical systems, delay differential equations, and applied and random dynamical systems. He is best known to the general public for coining the mathematical term "chaos" with T.Y. Li of Michigan State University, in a 1975 landmark paper entitled "Period Three Implies Chaos."

Jim's research has been highly influential, with some of his papers receiving hundreds of citations. Notable examples are: "Controlling Chaos," with E. Ott and C. Grebogi (1990), "On the Existence of Invariant Measures for Piecewise Monotonic Transformations," with A. Lasota (1973), "Dynamics and Control of the Transmission of Gonorrhea, Sexually Transmitted Diseases," with H.W. Hethcote and A. Nold (1978), and "Finding Zeroes of Maps: Homotopy Methods That Are Constructive with Probability One," with S.N. Chow and J. Mallet-Paret (1978). In addition, Jim has supervised over 40 PhD dissertations in the Departments of Mathematics, Physics, and Computer Science at the University of Maryland.

Alberto Bressan
Department of Mathematics,
The Pennsylvania State University,
USA

Shui-Nee Chow
School of Mathematics,
Georgia Institute of Technology,
USA

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