

Dedication

This volume is dedicated to **Djairo G. de Figueiredo** on the occasion of his 70th birthday.

In January 2003 David Costa, Orlando Lopes and Carlos Tomei, colleagues and friends of Djairo, invited us to join the organizing committee for a *Workshop on Nonlinear Differential Equations*, sending us the following message:

Djairo's career is a remarkable example for the Brazilian community. We are proud of his mathematical achievements and his ability to develop so many successors, through systematic dedication to research, advising activities and academic orchestration. Djairo is always organizing seminars and conferences and is constantly willing to help individuals and the community. It is about time that he should enjoy a meeting without having to work for it.

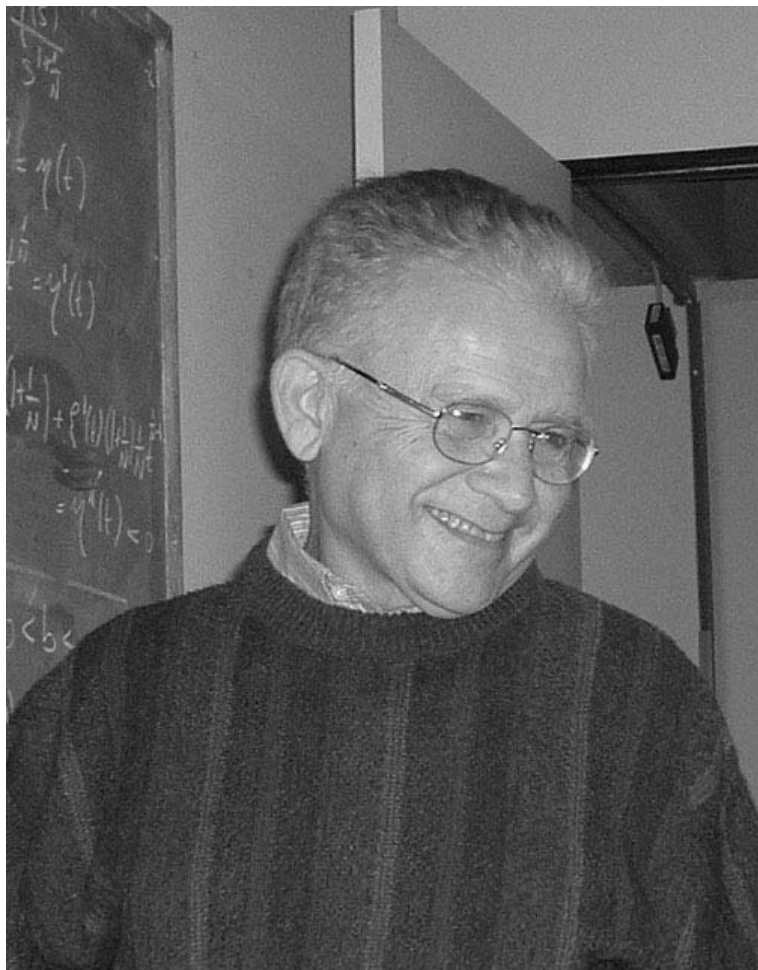
How true! Of course we all accepted with great enthusiasm. The workshop took place in Campinas, June 7–11, 2004. It was a wonderful conference, with the participation of over 100 mathematicians from all over the world.

The wide range of research interests of Djairo is reflected by the articles in this volume. Through their contributions, the authors express their appreciation, gratitude and friendship to Djairo.

We are happy that another eminent Brazilian mathematician, Jacob Palis from IMPA, has accepted our invitation to give an appreciation of Djairo's warm personality and his excelling work.

The editors:

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Djairo de Figueiredo

On Djairo de Figueiredo. A Mathematician

J. Palis

Djairo is one of the most prominent Brazilian mathematicians.

From the beginning he was a very bright student at the engineering school of the University of Brazil, later renamed Federal University of Rio de Janeiro. He turned out to be a natural choice to be awarded one of the not so many fellowships, then offered by our National Research Council - CNPq, for Brazilians to obtain a doctoral degree abroad. While advancing in his university courses, he participated at this very engineering school in a parallel mathematical seminar, conducted by Mauricio Peixoto. Mauricio, who was the *catedrático* of Rational Mechanics and about to become a world figure, suggested to Djairo to get a PhD in probability and statistics.

Actually, Elon Lima, also one of our world figures, tells me that he had the occasion to detect Djairo's talent some years before at a boarding house in Fortaleza, where they met by pure chance. Djairo was 15 years old and Elon, then a high school teacher and an university freshman, just a few years older. Full of enthusiasm for mathematics, one day Elon initiated a private course to explain the construction of the real numbers to the young fellow and one of his colleagues. That Djairo was able to fully understand such subtle abstract piece of mathematics, tells us of both his talent as well as that of Elon for learning and teaching. They both went to Rio, one to initiate and the other to complete their university degrees. Amazingly, for a while again they lived under the same roof, in *Casa do Estudante do Brasil* (curiously, two of my brothers were also staying there at the time), and continued to talk about mathematics. First, Elon departed to the University of Chicago and Djairo, a couple of years later, to the Courant Institute at the University of New York, where they obtained their PhDs.

At Courant, it happened that Djairo did not get a degree neither in probability nor in statistics, as it's so common among us not to strictly follow a well meant advice, in this case by Peixoto to him. Djairo was instead enchanted by the charm of partial differential equations, under the guidance of Louis Nirenberg. Louis and him became friends forever. He was to become an authority on elliptic partial differential equations, linear and nonlinear, individual ones or systems of them. His thesis appeared in Communications on Pure and Applied Mathematics, a very distinguished journal.

He then returned briefly to Rio de Janeiro staying at the Instituto de Matemática Pura e Aplicada – IMPA. Soon, he went to Brasília to start a “dream” University, together with his colleague Geraldo Ávila, as advised by Elon Lima to the founder of it, Darcy Ribeiro. In 1965 he returned to the United States. This time, he went to the University of Wisconsin and right after to the University of Illinois for perhaps a longer stay than he might have thought at first: unfortunately, undue external and undemocratic pressure led to a serious crisis at his home institution. In this period he developed collaborations with Felix Browder on the theory of monotone operators and with L.A. Karlovitz on the geometry of Banach spaces and applications, a bit different from his main topic of research as mentioned above.

After spending another year at IMPA, Djairo went back to the University of Brasília in the early 70’s, having as a main goal to rebuilt as possible the initial exceptionally good scientific atmosphere. He did so together with Geraldo Ávila and, subsequently, other capable colleagues. Their efforts bore good fruits. He retired from Brasília in the late 80’s and faced a new challenge: to upgrade mathematics in the University of Campinas by his constant and stimulating activity, high scientific competence and dedicated work. He has been, again from the beginning, a major figure at this new environment. And he continues to be so today, when we are celebrating his 70’s Anniversary.

To commemorate this especial occasion for Brazilian mathematics, a high level Conference was programmed. More than one hundred of his friend mathematicians took part on it, including forty-three foreigners from thirteen countries. Also, a number of his former PhD students and several grand-students.

In his career, Djairo produced about eighty research articles published in very good journals. His range of co-authors is rather broad, among them Gossez, Gupta, Pierre-Louis Lions, Nussbaum, Mitidieri, Ruf, Jianfu, Costa, Felmer, Miyagaki, and, as mentioned above, Felix Browder. He is a wonderful, very inspiring lecturer at all levels, from introductory to frontier mathematics. Such a remarkable feature spreads over the several books he has written. Among them are to be mentioned *Análise de Fourier e EDP – Projeto Euclides*, much appreciated by a wide range of students, including engineering ones, and *Teoria do Potencial – Notas de Matemática*, both from IMPA.

On the way to all such achievements, he was elected Member of the Brazilian Academy of Sciences and The Academy of Sciences for the Developing World - TWAS. He is a Doctor Honoris Causa of the Federal University of Paraíba and Professor Emeritus of the University of Campinas. He has also been distinguished with the Brazilian Government Commend of Scientific Merit – Grand Croix.

Above all, Djairo is a sweet and very gregarious person. We tend to remember him always smiling

Rio de Janeiro, 3 de Agosto de 2005.

Contributions to Nonlinear Analysis

A Tribute to D.G. de Figueiredo on the Occasion of his
70th Birthday

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