

# Some remembrances of Jacob Palis

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This year Jacob Palis turns 80 and it is my honor and privilege to share some personal memories about him, in particular during my stay at IMPA and at ICTP in Trieste. I remember vividly when I saw Jacob Palis for the first time at Brown University in the winter of 1967. He was there to visit my advisor Mauricio Peixoto and gave a beautiful conference about his thesis at Berkeley under Steven Smale. I was immediately impressed by his mathematics but also by his kindness and generosity in sharing ideas. The year 1968 was special for IMPA in Brasil: IMPA moved to the beautiful building in Rua Luiz de Camões 68 in the center of Rio de Janeiro and professor Lindolpho de Carvalho Dias was its director; in addition, the same year Jacob Palis and Mauricio Peixoto joined IMPA. I arrived in Rio de Janeiro at the end of 1968 to continue with my Ph. D. thesis there. The ambient at IMPA was extraordinary, very stimulating and with one of the best libraries in the world. Also, IMPA had (and still has) some of the best professors any institute could have, like Manfredo do Carmo, Elon Lages Lima, Leopoldo Nachbin, Jacob Palis and Mauricio Peixoto among others.

In 1970 Jacob started his Dynamical Systems seminar which for many mathematicians was essential. Participating graduate students included, among others, Pedro Mendes, Genesio Lima dos Reis, Gilda de la Rocque, Geovan Tavares dos Santos, Welington de Melo and myself. All of us obtained our Ph. D.'s on topics related to this seminar. Among the professors and young mathematicians who participated were Sheldon Newhouse, Clark Robinson, Jorge Sotomayor and of course Jacob. We all wrote our lectures and they appeared in the series *Monografias de Matemática 4. Sistemas Dinâmicos*. For me, and I am sure for the others, this seminar and our time at IMPA was a decisive time in our careers as mathematicians. At that time IMPA was already a *carrefour* visited by the very best mathematicians. I stayed at IMPA for two years, 1969-1970, and there I had the opportunity of meeting Shiing-Shen Chern, Paul Halmos, Wolfgang Krull, Blaine Lawson, Sheldon Newhouse, Clark Robinson, Stephen Smale, Rene Thom and many others. It was there that I choose my thesis topic on Anosov flows from a suggestion by Jacob. In that sense I consider him also as my advisor.

In 1971 Jacob, together with Mauricio Peixoto and Elon Lages Lima, organized a conference in Salvador, Bahia with the participation of the best mathematicians working on the field of Dynamical Systems. The influence of this conference was enormous since many of the problems and ideas suggested by the very influential paper of 1967 *Differentiable dynamical systems* in the Bulletin of the AMS by Stephen Smale had been solved or were elucidated, in fact some by Jacob Palis himself and with Smale. For me and many others that were just starting their lives as mathematicians (like Ricardo Mañé who I first met at that conference) it

was a very important event.

After my two year visit to IMPA I returned to Mexico and one day in the spring of 1983 I received a letter from the International Center for Theoretical Physics (ICTP) in Trieste, Italy, inviting me, with all expenses covered, to participate in a Workshop on dynamical systems organized by Jacob and Christopher Zeeman from Warwick University. A second conference was organized in 1984. After that, the events in dynamical systems such as conferences, schools and workshops became a triannual event that continues today. The directors have been Christopher Zeeman, Yakov Sinai, Jean-Cristophe Yoccoz, Marcelo Viana, amongst others, and recently Stefano Luzzatto (who is a scientific staff member at the Mathematics Section of ICTP). These conferences were a turning point not only for me but for many mathematicians from all over the world. There were a large number of participants from Latin America and Asia (in particular from China and India) and to a lesser extent Africa and many other countries from the developing world. In fact, in my country Mexico, a group in dynamical systems was created because of these conferences. Something similar happened in Chile and Uruguay. From 1986 to 1993 I became Coordinator of the Mathematics Section of ICTP and because of Jacob's longtime association with ICTP I was in constant contact with him as I was, together with Jim Eells, the local organizer, of many of the events directed by Jacob. All of the lectures and conferences were delivered by the very best people in dynamical systems, including some Fields Medallists like Rene Thom, John Milnor, Jean-Cristophe Yoccoz, Artur Avila and Abel Prize recipient Yacov Sinai. It is not an exaggeration to say that there have been thousands of people that benefitted from the activities at ICTP, much due to the work of Jacob. Without doubt the influence of Jacob Palis in the development of mathematics in the world is enormous. It has truly been my honour and pleasure to work with Jacob over these many years and I wish him a very happy 80th birthday.



Figure 1: Workshop on Dynamical Systems at ICTP in Trieste 1984



Figure 2: Workshop on Dynamical Systems at ICTP in Trieste 1986

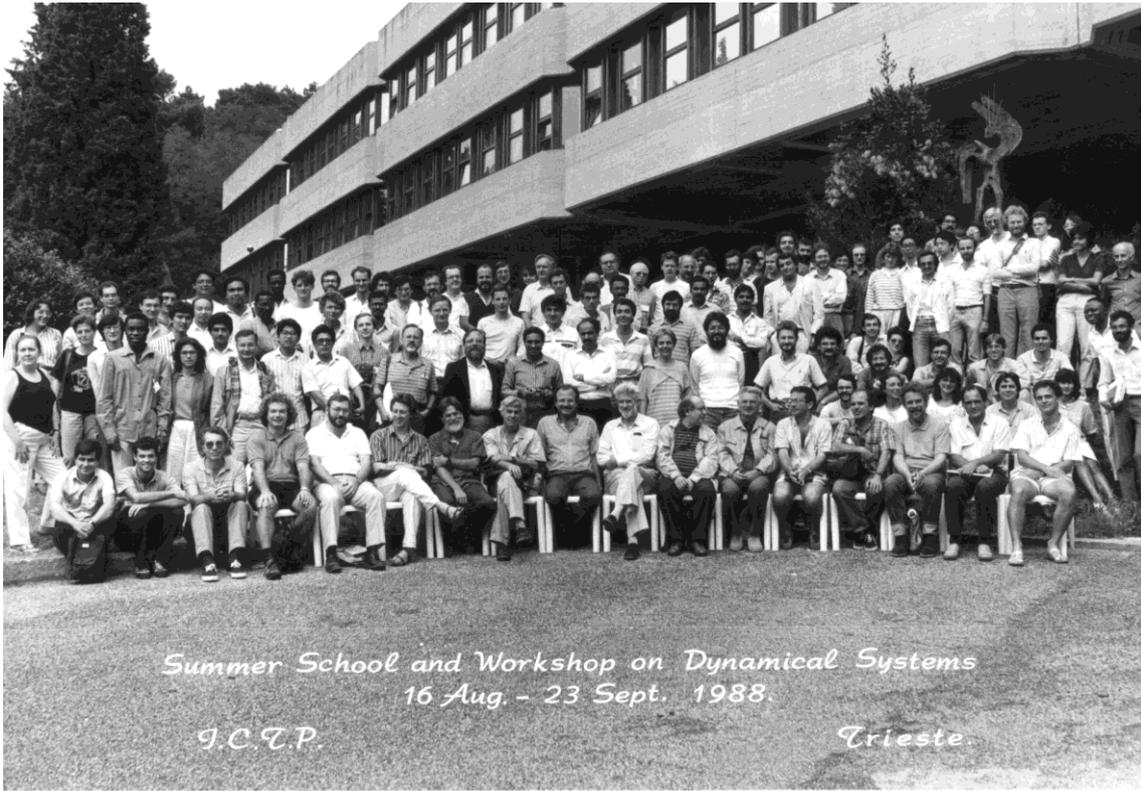


Figure 3: Workshop on Dynamical Systems at ICTP in Trieste 1988



Figure 4: Workshop on Dynamical Systems at ICTP in Trieste 1990



Figure 5: Workshop on Dynamical Systems at ICTP in Trieste 1991

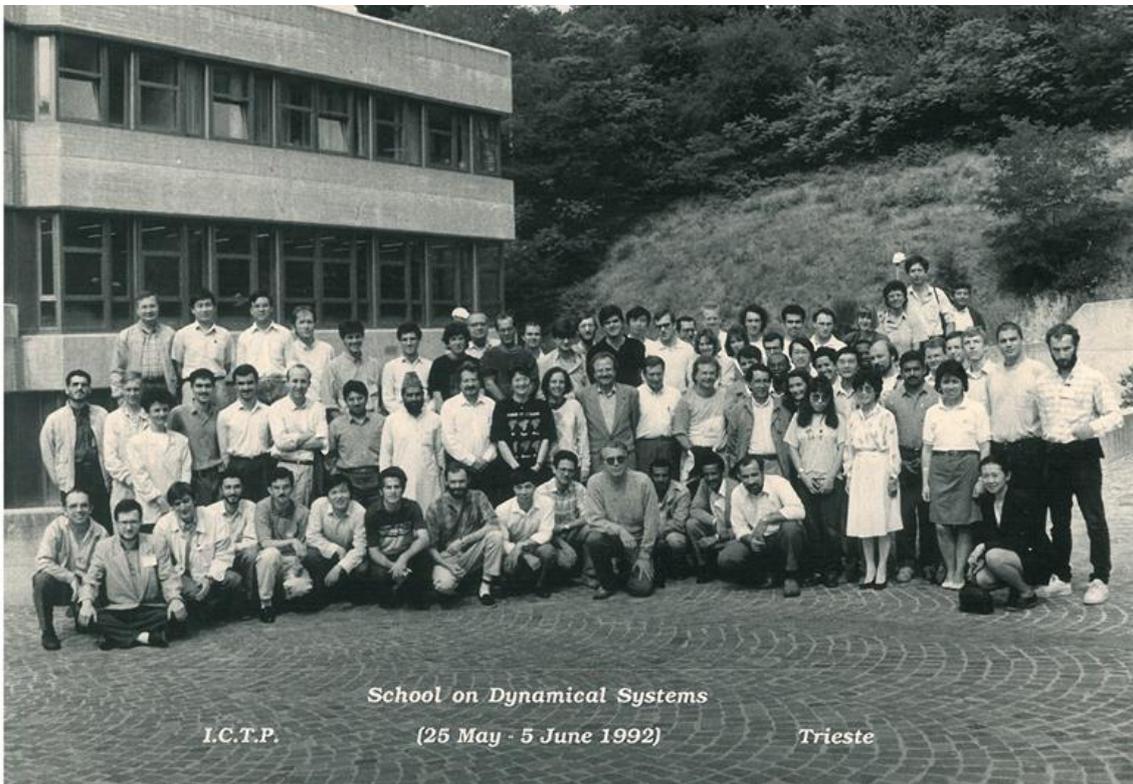


Figure 6: School on Dynamical Systems at ICTP in Trieste 1992



Figure 7: Rene Thom, Jacob Palis, Ricardo Mané, Alberto Verjovsky and 1/2 of Christian Bonatti at ICTP (courtesy of Elaine Shields)



Figure 8: With John Milnor and Christian Bonatti



Figure 9: With Alfred van der Poorten and a young Iranian mathematician in Razi University, Iran