

# MY INDO-FRENCH MATHEMATICAL EXPERIENCE

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## 1. INTRODUCTION

The delights of differential equations became a reality for me only after I joined as a participant in the IISc-TIFR Mathematics Program for Applications of Mathematics in 1976 between Indian Institute of Science (IISc), Bangalore and Tata Institute of Fundamental Research (TIFR), Mumbai. This program had started thanks to the efforts of Professor K.G. Ramanathan, then Dean, School of Maths, TIFR and Professor Satish Dhawan, Director, IISc. Some of the motivations for this program were to bring in a synergy between mathematics and other applied sciences including engineering and also to complement the classical approach to differential equations which was prevalent in India then, with the modern approach.

Applications of partial differential equations (PDE) and analysis had already taken a strong root in France and had led to significant interactions with industry. The same is true of a few other countries including USA. Thus, it is no surprise that leading institutes like Courant Institute and IRIA-Laboria (now renamed as INRIA) played an active role in setting up this program. Some of my fond memories as a student of this program are of Professor J-L Lions, with his infectious enthusiasm, telling us about PDE and their applications. He was a frequent visitor to our center and a very strong mentor for most of us. It was thanks to him that the students of this joint program could get the fellowship of IRIA-Laboria and visit France to do their doctoral program. It was also thanks to him that we had a steady stream of visitors from France who gave us mini courses on various current topics in PDE and numerical analysis. Some of these came out as lecture notes of TIFR, like that of P. Lascaux, J. Cea, R. Glowinski, Ciarlet, B. Mercier, to name a few. The first few students to join IRIA were S. Kesavan, M. Vanninathan and Vijayasundaram. With all these exposures to French mathematics, when my turn came next, I was overjoyed

## 2. MATHEMATICAL EXPERIENCE IN PARIS VI

Coming to Paris to learn mathematics was a dream coming true for me, almost a mathematical pilgrimage. Learning from the great teachers, attending the Friday morning seminar at Paris VI and then the seminar at Collège de France were important aspects of my education. Within a few months, my spoken French had improved quite a bit and it was easy to follow the mathematical talks in French and even discuss with my colleagues.

Living in Cité Universitaire, where most international students stayed, was also an interesting experience, mingling with students from all over the world. Foreign students like me, benefitted from CIES, a French service for foreign students. It used to organize monthly trips to important places around France, arrange our tickets to cultural events like opera or a concert or run French language classes. This immensely helped us to understand the French culture and appreciate it. Some of the friendships that were born during that period have persisted even now. Two and half years passed away quite fast and soon it was time for me to return to Bangalore after defending my thesis.

### 3. CONTINUATION OF MATHEMATICAL COLLABORATION

After my return to Bangalore, the thought of pursuing research in this field in complete isolation was really daunting. Then again, it was exciting to find out that CEFIPRA (Centre Franco-Indien pour le Promotion de la Recherche Avancée) was accepting joint collaborative projects. My colleague Vanninathan obtained one such joint project and I too joined in that as an investigator. Later on, I ventured on my own joint projects through CEFIPRA. Each project was for 3 years and the bilateral visits were fully funded. This was a great encouragement to my mathematical growth.

Another Indo-French effort which was quite beneficial to both sides was FICUS, another joint program. A group of researchers from both sides joined together to teach a few courses students from either side. This helped me to come into contact with the group in Toulouse University and start collaborations with them. A little later, IFCAM (Indo-French Center for Applied Mathematics) came into existence and joint projects were accepted under IFCAM. This was more geared towards students' training. All my 4 students benefitted very much from their 3 months stay in France and their theses had all the joint works with their French mentors. It also paved the way for their postdoctoral fundings.

Now I look back with such gratitude for all these Indo-French experiences that shaped my mathematical career. It is also very satisfying to me that the younger generation has moved in to fill the void as we seniors are moving out. It is heartening to see that PDE analysis is slowly spreading over India as the students are taking up faculty positions in premier institutes. It is my fond hope that these collaborations continue to grow further.