

# Playing with Symmetry and Other Memories

Maria Isabel Alonso

One of my earliest memories of Manuel is not related to science. I don't remember all the details but I have a vivid image in my mind of a Saturday afternoon that was very surprising for me by that time. I'm certain it was in early 1985 although I don't remember the date. It must have been almost spring time, when it was still rather cold but most of the snow of that icy winter was gone. Manuel invited the three Catalan students in the group: Narcís Mestres, Miquel Garriga (my husband) and me, to join him and meet some people at "Casa Nostra" (which means "Our Home" in Catalan). This place in Böblingen still exists and is a cultural meeting point especially for young people. Nowadays they are very organized and, as a non-profit-organization, they offer on their webpage many activities, like fitness, dancing, concerts, meetings, parties, courses, etc. Probably the building is not the same as back then, and I am not sure whether some link to Catalonia remains, but they still keep the name "Casa Nostra—Unser Haus". This association actually started in Switzerland when a group of Catalan emigrants founded "Casa Nostra" in Zürich in 1963 and held meetings with other emigrants in south Germany. Soon afterwards the delegation in Stuttgart was created and remained linked to the Swiss one until it became an independent association in 1970.

When we went there in 1985 the common language was German, although a few people were Catalan-speaking. Manuel had contact to this group of people and from time to time he met them. On that occasion, he was going to give a talk about Japan, where he had been on a work trip. He brought many slides with pictures of all the places he had visited together with Inge. He was talking nearly 1 hour about Japanese culture and he spent a substantial amount of time explaining details of the tea ceremony, which he dissected with precision. I could not follow some the explanations because then my German was not very good. What I recall is that the gathered audience, about 20 people, were very interested in everything: they commented and asked a lot of questions about geishas. It was amazing to see how the audience esteemed Manuel, as much as we all valued him in a scientific seminar. It was a most surprising experience to see a Max-Planck-Institute Director in this context. This and other similar memories make me remember Manuel not only as an extraordinary scientist. He was a friendly and cordial person with an overwhelming humanistic culture and exceptional communication skills. He enjoyed teaching any subject.

Needless to say, he had the same exceptional ability for science. He was a leader with a privileged intelligence and the predisposition to share his knowledge and motivate others. As a Ph.D. student at the MPI in Stuttgart, I started to work at the Epitaxy Group led by Dr. Elizabeth Bauser and my subject was Silicon-Germanium (Si-Ge) alloys. Manuel was my thesis adviser and therefore I reported my results regularly to him. I had relative freedom to do research and when some result or subject were interesting for him he guided me to pursue that line of work. He was always very positive and allowed the people to develop their best qualities and potentials. When he was involved in a subject he could become very impatient and demanded a lot of effort to get results as fast as possible. One example was the study of the Raman spectra of Si/Ge superlattices grown on Si (001). As we were discussing the results, he realized that for some combinations of layers the symmetry of the superlattice was orthorhombic, actually whenever the number of atomic layers of both Si and Ge was even. On his table there was always a zincblende model made of wooden black and yellow balls (atoms) joined by metallic dowels (bonds). He took the model and started to name the atoms for the case  $n = 2$ , and enumerating the symmetry operations that were preserved and those that were not. He was so fast that I could not follow instantly. He knew by heart all symmetry operations of the diamond structure and could visualize them effortlessly. I went out of the office with the task of classifying those superlattices in their different space groups and relating the symmetries to our lattice dynamics calculations. Concerning the symmetries, I needed to think and understand the space group tables. I had just started to figure out something when after a while he came to my office with the ball-dowel model and asked whether I had finished. Well, not yet, I'm working on it. "Look: silicon-silicon-germanium-germanium, see?" For some time I became able also to imagine all those structures and their symmetries. For me it was quite difficult. For him, a kid's game.

Long time after that, during a sabbatical stay that Fernando Cerdeira spent at the Institute for Material Science in Barcelona, we worked together on Raman scattering from organic crystals. Manuel visited us in the frame of a collaboration sponsored by ICREA (Catalan Institution for Research and Advanced Studies) and he aided us (Fernando, Miquel and myself) in the interpretation of the data. We could enjoy again with symmetry analysis, this time in molecules with many atoms and their crystals. During this stay, like always, I remember the pleasure from the contact with Inge, a wonderful and extraordinary woman.

Manuel had a deep insight and knowledge for a large variety of problems in solid state physics, which was truly unique. His mind was never at rest, if he was not doing science, he would be reading, thinking or speaking about history, cultures, traditions, art, politics, economy ... he could make any subject fascinating. He had not only the knowledge and information about them but he also had the rare ability to assimilate those to his own vital experience, enrich them, and share them with others. Like on so many other people, he had a very positive influence on me and I will never forget him.

Manuel Cardona

Memories and Reminiscences

Ensslin, K.; Viña, L. (Eds.)

2016, XV, 174 p., Hardcover

ISBN: 978-3-319-20342-3