Q&A: RODRIGO MARTINS

Europe welcomes Brazilian spirit

Rodrigo Martins, 2013 president of the European MRS, says that strong links between Brazil and Europe will yield better materials for a better life

As a Portuguese scientist at the New University of Lisbon, what connections do you have with the materials research community in Brazil?

In 1981 I went to the University of São Paulo (USP) in São Carlos to start some research activities in amorphous silicon, and I also started a course on disordered semiconductors. During that time I was proud to build the first facility in USP for processing amorphous silicon, and I saw then how Brazilians react to a new idea. They had so much enthusiasm that within six months we were able to design, build and test the complete system – and it is still working 30 years later.

From then until 1993, I typically spent between three and six months in Brazil, so I have a good idea of how the Brazilian community has built up its knowledge and capabilities within my field of electronic materials. What has been achieved in São Carlos is particularly impressive, since they started with open fields and now have one of the best research institutes in Brazil.

How have your collaborations developed in more recent years?

Over time we have developed many joint research programmes in areas such as photovoltaics and electronic materials, some of which have been supported by European projects as well as Brazilian funding agencies. One major success has been a partnership with Roberto Faria's group in São Carlos to develop a "sandwich" PhD programme, where students from Brazil and Portugal share the research infrastructure and receive a degree from both USP and the New University of Lisbon.

It's a fantastic approach because the students can learn about inorganic electronics in my lab, and then acquire skills and knowledge in organic semiconductors in São Carlos. Students who have finished this programme are now working for Cambridge Display Technology, a UK company developing organic devices for consumer applications.

How is the E-MRS developing links with the Brazilian MRS?

We are keen to establish joint development activities in three main areas where Brazil has particular strengths: materials for energy, materials for health, and multiscale modelling. At this year's meeting of the E-MRS, representatives from the Brazilian MRS met with European stakeholders from ERAnet – the organization that co-ordinates research activities across Europe – to discuss how we can build up joint research programmes in these areas.

"The Brazilian scientific community is making great strides towards integrating research and market needs"

The energy sector offers a clear opportunity for collaboration, since we know that Brazil is a pioneer in biodiesel production and also has the potential to become a world leader in the development of materials for energy. We have already worked with the Brazilian MRS to present some of the latest scientific knowledge at the Rio+20 conference on sustainable development, organized by the United Nations in 2012, and we now have the support of both ERAnet and the European Commission to develop bilateral projects in this critical area.

What can Europe learn from the materials research community in Brazil?

One key strength, and one that I think we should copy in Europe, is the focus in Brazil on understanding the entire value chain, all the way from the initial idea to building a practical system. Brazilian scientists develop expertise not just in the synthesis and characterization of materials, but also in fabrication processes and product manufacture. From this point of view the Brazilian scientific community is making great strides towards integrating research and market needs.

In terms of technology, I believe that Brazil has all the tools and resources that it needs to lead global efforts to develop materials for the energy sector. Materials for health is another key focus that will become more strategic in the coming years, while Brazil has a very good theoretical community that provides the modelling skills needed to support key developments in materials science. This is what you need: people who think, people who make things, and people who find new ways to use technology.

What role can the B-MRS play in helping the development of materials science in Brazil?
Materials science is a key enabling technology that drives development in many different areas. The B-MRS is working hard to bring together people from these different fields but who have a common interest – which is developing or exploiting novel materials. And they are succeeding: when I first went to the B-MRS meeting around a decade ago there were about 200 delegates, but when I was last there in 2012 more than 1000 people attended.

One issue that societies like the E-MRS and B-MRS must deal with is that materials on their own have little perceived value; their real power comes when they are integrated into systems. While it's important to investigate and understand the basic properties of materials, our societies also need to transmit the message that materials must be used and applied to practical applications. That should be our motto: materials for a better life.

As the president of the E-MRS Senate you said that innovation in materials is crucial for future economic development. How strong is the innovation process in Brazil?
True innovation requires creativity. It's not just about implementing a new technology, or making an incremental cost reduction, but instead developing a completely new idea that could be disruptive in the marketplace. In Brazil I have seen researchers transfer their initial creativity to the commercial sector, and that is very positive – particularly if the government also supports these activities.

"One key strength in Brazil is the focus on understanding the entire value chain"

From my own experience, I know that there are several Brazilian start-ups in organic electronics that are prepared to take risks to take their product to market. They have the right spirit and they have everything they need for success: they have the market, they have the people, they have the ideas.

How important are student exchange programmes for the development of materials science in Brazil?
Students who are involved in international exchange programmes can provide a very strong link between the Brazilian scientific community and institutions in Europe and the US. Both sides can benefit, since the students facilitate better communications between their home university and the host institution, and can often help to initiate long-term research collaborations. The students who return to Brazil also take back important know-how that will help to develop new research opportunities within Brazilian institutions.