



# PROVENCE PROMOTION

## Interview with Ahmed Charai

### Communication Pioneer 2 Marseille!

Apart from being a very senior university professor, Dean of the faculty of Science (Université Paul Cézanne Aix Marseille III) and a CNRS Research Director, Ahmed Charai, is also a pioneer endowed in communication energy! He founded the CP2M (Multidisciplinary Electron Microscopy & Microanalysis Center) joint multi-disciplinary service in 1992; it was a genuine innovation since at the time, he brought together the public and private sectors to get the best of each and the .... (infinitely) small! He has been assisted by institutional partners in the region including Provence Promotion, and clearly heralds his pleasure 15 years later. Yes!, services like the CP2M now put Marseille at the state of the art!



Ahmed Charai

#### > How did the CP2M project start ?

Ahmed Charai : Its history is fairly original .... I was originally a microscope physicist and I joined a CNRS metallurgy laboratory at the Saint Jérôme Faculty of Science in 1986, and left shortly afterwards to go to the United States as a scientific visitor at IBM for two years. This gave me an opportunity to work with extraordinary technological means. Then when I returned to St Jérôme, I had to work with a fifteen year old microscope without any fast financial means for replacing it!

Therefore, I got involved in the search for financing, which convinced me that such a purchase would be absurd if it were only used by four persons. Based on my experience, I immediately thought of a mutual form and I proposed a multidisciplinary research center open to the outside.

There were difficulties, but I nevertheless managed to build up the CP2M with a first ultra high performance microscope that satisfied many regional needs for institutions and for regional industries. At the time, this joint private/public principle in research was absolutely innovative in France, and it upset a lot of people!

#### > What sort of reception did you get and how were the regional institutions involved ?

Ahmed Charai : The Region and the university immediately helped a great deal and at several levels. The first microscope was purchased because we joined the State/Region plan. It then facilitated contacts with regional industrialists and provided unflinching financial and "political" support in the development of our equipment.

We will be able to purchase our fifth microscope, the most powerful available at the moment, within the framework of the CIMPACA (integrated PACA micro-electronic center) initiated both by the Region and the Department.

The General Council was equally efficient, without forgetting Provence Promotion, which even in the beginning helped to bring public and private players together, eliminating many barriers. Since then, it has been carrying out ongoing actions to highlight local assets in terms of research and state-of-the-art industries. This high performance agency has also attracted high tech companies into the department with which we have been cooperating with ever since.

#### > How does the CP2M work at the beginning of 2005 ?

Ahmed Charai : This service does not have any research subjects of its own, but cooperates with institutional research organizations such as the universities, the CNRS (National Scientific Research Center), INSERM (National Health & Medical Research Institute), ORSTOM (French Institute of Scientific Research for Cooperative Development), IFREMER (French Research Institute for Exploitation of the Sea), ENSAM (Arts & Métiers Engineering University), CEA (Atomic Energy Commission), Scientific Police, Assistance Publique (Healthcare Service), with industries such as Sollac, Gemplus, Atmel, St Micro-electronics and many small and medium-sized companies.

CP2M now has four very high performance electron microscopes (shortly five) associated with sample preparation equipment and image simulation and processing equipment. Its performances are continuously being updated and its ranges of skills extend from characterization of industrial materials to the demonstration of fine and hyper fine structures of living and inert materials.

The team is composed of a management council representing the main disciplines and a scientific, technical and administrative staff.

#### > And how are your relations with companies organized ?

Ahmed Charai : All our equipment is at the disposal of a large national and international scientific and industrial community. The Center also performs a further training mission.

The principle is simple: the user reserves time slots with three options:

- Time slot with no technical support for a user capable of using his own microscopes,
- Time slot with the assistance of a technician
- Study entirely done by the CP2M.



## Interview with Ahmed Charaï

### > What are the CP2M's lines of research ?

Ahmed Charaï : We are working on improving the performances of increasingly miniaturized microelectronic components, which requires knowledge of their structure and their chemistry on the atomic scale. Our Center is capable of locally and unambiguously determining not only atomic positions, but also determining their chemical nature so that observed structures can be modeled.

In metallurgy, we are working with Sollac on Analytic Electronic Microscopy, to check the quality and complexity of the most sophisticated steels. In the dental field, we are working on new cements; in biology, we are carrying out research on professional diseases with the Assistance Publique; in geology, we are working on the interaction between materials and plasma within the framework of the Cadarache ITER project, etc.

### > How do you see the CP2M developing ?

Ahmed Charaï : After the success of CP2M, I suggested an inter-university technological platform in Marseille North to the CNRS, and CP2M was integrated into this platform later. Later on, I was involved in the CIMPACA academic project that enables fifty percent financing of equipment by institutions and fifty percent by manufacturers. It resulted in the existing competitive Secured Communicating Solutions cluster project. Just a simple change of scale!

This progress from CP2M is quite logical, since it satisfies a (technological) need and a (financial) necessity. In my opinion, mutualization at all levels is essential for the future of research, since research costs are now very high.

### > In what way is it a service of the future ?

Ahmed Charaï : This type of service is essential in current scientific development. It enables better interaction between manufacturers and research workers who do not always understand each other very easily.

Thus, our PhD students can work on projects jointly with regional companies. We train their engineers and we find financial partnerships so that we can continuously have state-of-the-art research tools.

Finally, multidisciplinary exchanges are another continuous source of enrichment, since we have queries from all over France and internationally.