

of the "Mepsicron" serves to prove them wrong.

The "Mepsicron" project got underway in the late 70s to meet a specific need in the field of astronomy. Scientists wanted to observe external galaxies, quasars and faint objects in the sky through a medium sized telescope with sophisticated light analyzers. Presently, in-depth astronomical observations are carried out with large telescopes through high collection of light and the use of highly sensitive detectors. While large telescopes are extremely expensive and are thus found only in the wealthiest countries, this is not the case with the detectors. High technology research offers the opportunity of developing relatively inexpensive detectors.

In the late 70s the Institute of Astronomy of the National Autonomous University of Mexico, UNAM, had a 2.1 meter diameter telescope at the Astronomical Observatory in Baja California. Its additional equipment consisted of one Echelle spectrograph, which permits very accurate light color analysis. In order to use these instruments for extra-galactic research, a high sensitivity, low internal noise, good resolution and extended dynamic range detector was necessary but none of the most recent television cameras fulfilled these requirements.

The project to actually build the new detector took off in 1981, and was named shortly afterwards "Mepsicron." The name is an acronym for Microchannel Electron Position Sensor (and) CRON (time). The success was partially related to previous experiences in television technology which at the time was one of the most advanced techniques for astronomical observations. A series of key experiments were carried out with the cooperation of the Space Science Laboratory at the University of California Berkeley in order to demonstrate that a very high quality detector was possible. Later, the emphasis was on improving and optimizing the design. An electronic system able to process the enormous amount of information provided by the "Mepsicron" was also designed and built.

While still on an experimental basis, the "Mepsicron" became operational in 1983 in the Baja California Observatory. A group of technicians tried to guarantee optimum performance of the equipment and to observe its reactions through time and under special operating conditions.

A great amount of information has been gathered in the last three years, some of which will serve to correct critical design and technical aspects of the equipment. Thanks to the scientific results obtained, those difficult conditions of the first years will change for the better with a special laboratory currently under way. This will allow for new technological solutions and further advances.

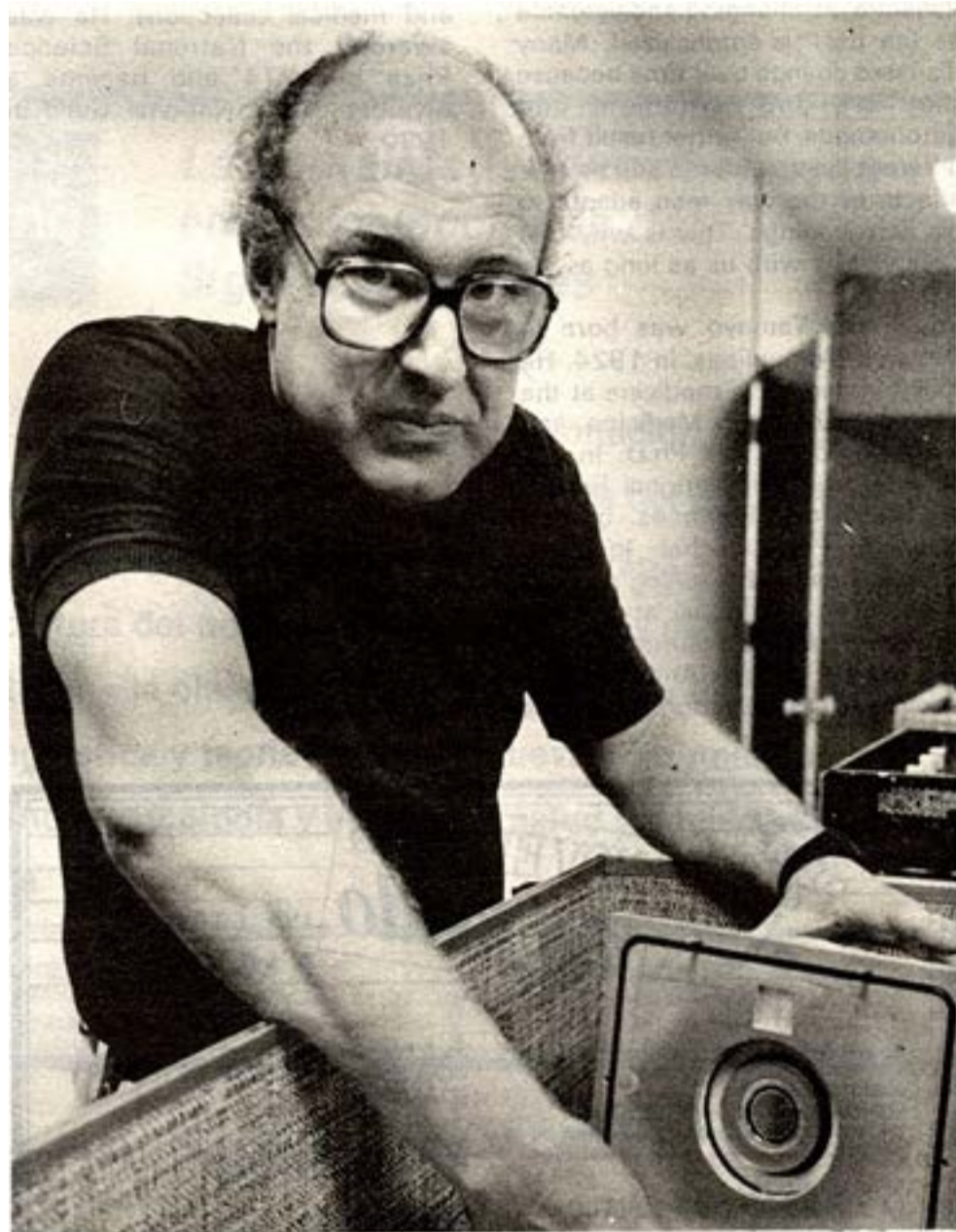
While the first detector had one of the highest resolutions ever achieved with electronic sensors,

today a new design is ready that is compatible with a resolution two times higher, and research is underway to achieve a resolution four times higher than the original device.

One of the problems that appeared during the experimental phase was the insufficient stability of the special light sensitive film; the photocathode experiments are still underway in order to guarantee a more stable regime.

An additional pleasant surprise is that "Mepsicron" turns out to have applications in scientific and technological fields besides

astronomy. Because of its flexibility, it can easily be applied to an electronic microscope in order to supply high quality images of the micro-world. Experiments carried out in UNAM's Institute of Physics showed that Mepsicron is able to provide information that is beyond the scope of more conventional technologies. This is basically related to its wide dynamical range, i.e. the capacity to simultaneously detect faint and bright details of an image. Interesting experiments in biology and medicine are also ready to be carried out.



Dr. Ferman in his lab. Photo by Nadia Blundella

Science and Nature

THE MEPSICRON. A MEXICAN BREAKTHROUGH IN ASTRONOMY AND TECHNOLOGY

The dividing line between basic science and technology is gradually blurred. Just as science can't do without the new tools provided by advanced technology, many modern technological developments would be unthinkable without the inspiring role of the basic sciences.

Nevertheless, there are people in the developed countries who maintain that basic science is not a profitable means of generating technological advances. The story

Last September the "Mepsicron" project was awarded first prize by UNAM in the field of technological research. This was a high point in the special attention the University has given this project.

Just as the project has been instrumental in overcoming the false conflict between basic science and technology and the benefits in both directions are obvious now UNAM is seeking to find applications for this technology in production. The uses of "scientific prototypes" will always be limited. In comparison with a manufactured model, yet the resources put into designing and building an industrial prototype are justifiable on the basis of great production volumes and marketing possibilities. On the other hand, the potential demand from fields in which "Mepsicron" technology may be applied can only be met with industrial production. The process and responsibility of carrying out this project is an important and illuminating experience it began five years ago as a technological development in astronomy. Then it became a source of inspiration for other fields of science. And now it is possible the "Mepsicron" will even be industrially manufactured, a process from which surely new ideas and impetus will come ★

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