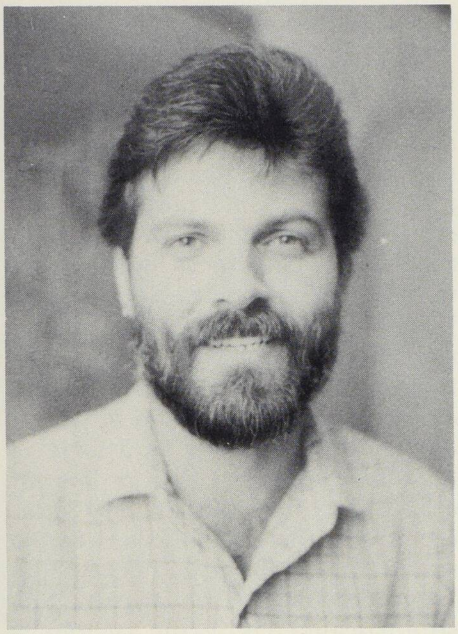


Louise Pelland

Professor Mario Poirier:

"Ultrasound allows investigators to see below the surface of materials."

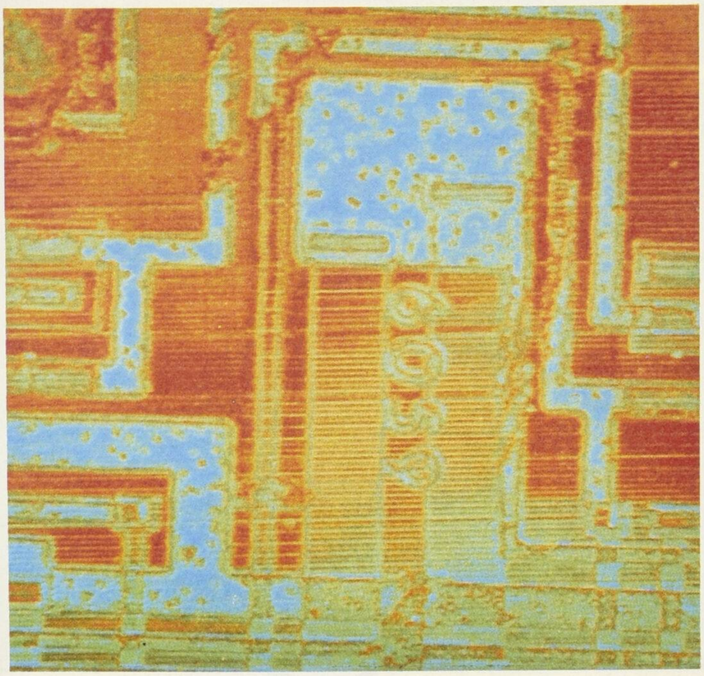
experimental acoustic microscope that will use liquid helium like the American device.

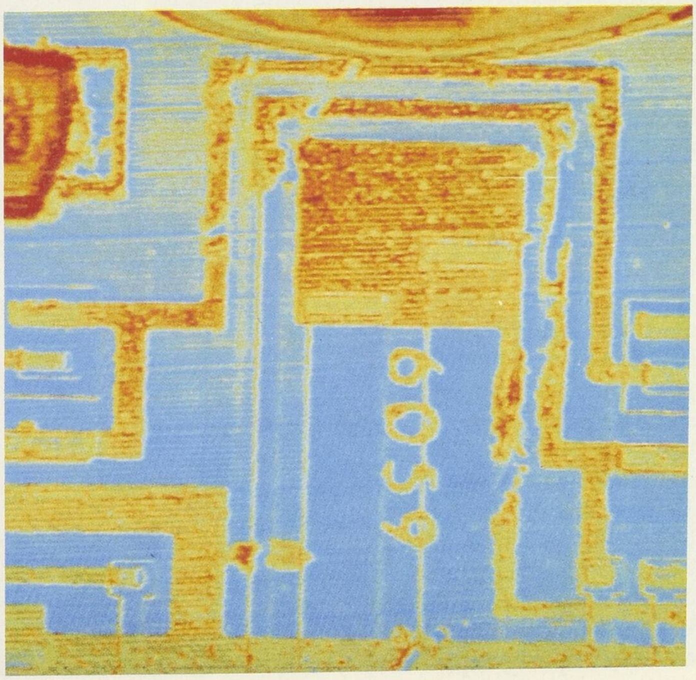
Mario Poirier feels that acoustic microscopes capable of the same resolving power as optical microscopes still have an edge in terms of biological and medical applications. Indeed, Stanford scientists studying biological samples have been able to produce high-contrast images without the use of dyes. The team leader, Calvin F. Quate, hopes to gain new information about cells, and in particular about the contractile processes involved in cell movement and growth. In fact, such acoustic images depend on so many properties of the object under study (e.g. density, viscosity, and elasticity) that it would be astonishing if they did not contain more rather than less information about living tissues than do optical images, which depend only on the sample's refractive index.

There are no doubt limits to the applications of acoustic microscopes, but judged by the optimism of researchers there is still a lot of room for development. Will this new tool for the examination of the microscopic world find its way into laboratories and industrial plants? Will it serve to complement optical, electronic, and X-ray microscopes? G.W. Farnell smiles as he acknowledges that the answer is not yet clear, although many indicators point to a bright future. "Acoustic microscopes are somewhat in the same position today as lasers were in the sixties: they were marvelous devices but had no obvious applications outside the physics laboratory . . ."

Claude de Launière is a freelance writer working in Montreal and the winner of the 1982 Canadian Science Writers' Association award for the best article written in the Technology category.

Monitoring quality in the electronics industry is expected to be a major application of the acoustic microscope, as it can detect faults other instruments fail to find. These false-colour images portray (left) part of the maze of circuitry at the surface of an electronic microchip and (right) its silicon substrate. The blue tone indicates the focus level in each image. Comparison of the images enables the inspector to pinpoint faults in the chip. (× 170)





University of Sherbrooke