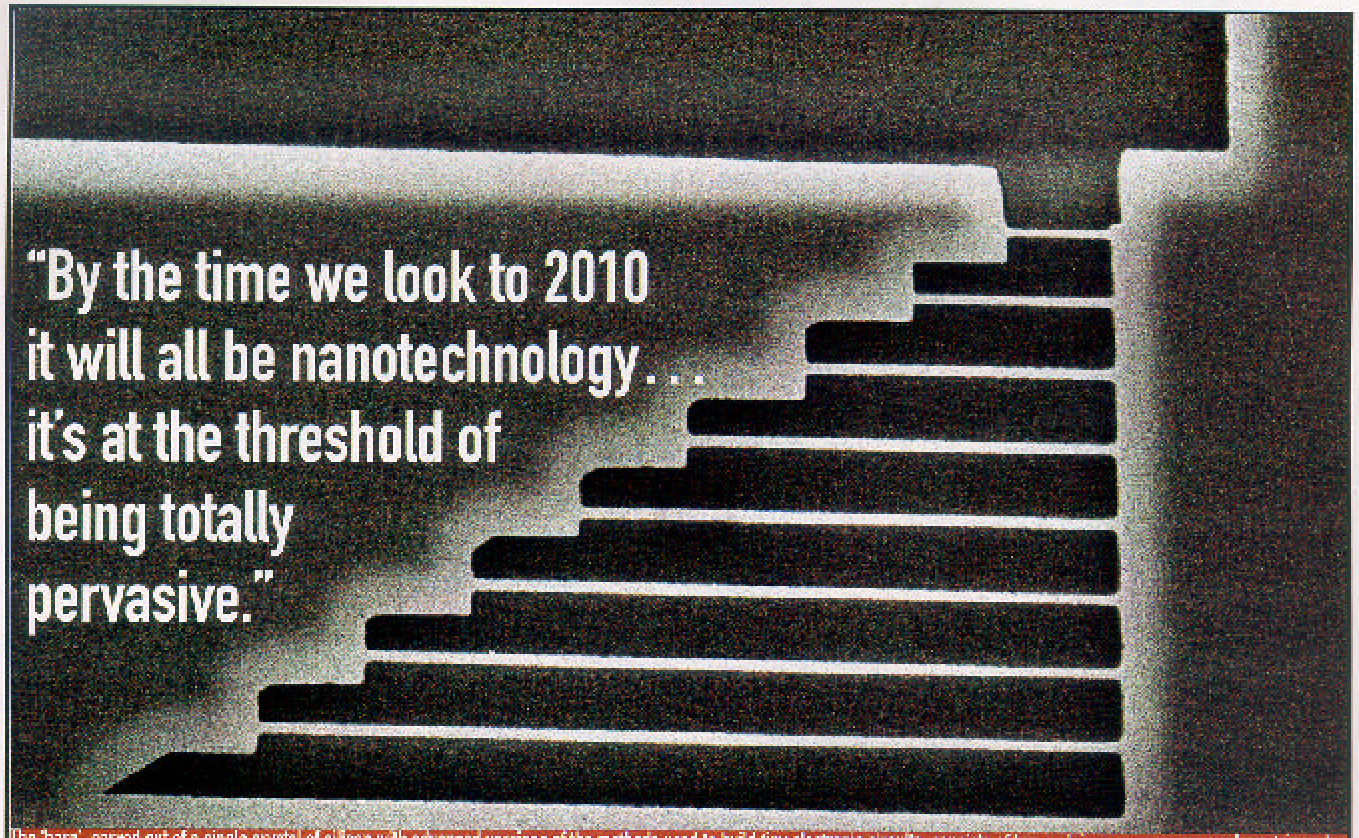

The 'harp', carved out of a single crystal of silicon with advanced versions of the methods used to build tiny electronic circuits, consists of two endpieces, one square and one triangular, with several "strings" of varying lengths stretching between them. The entire device is about the size of a red blood cell. – Photo courtesy of Dustin Carr, Cornell Nanofabrication Facility

the future and will become an intricate part of our everyday lives. "I think nanotechnology will be the technology," says Ruda. "By the time we look to 2010 it will all be nanotechnology... it's at the threshold of being totally pervasive." Dealing with the phenomena of nanotechnology is becoming inevitable in some fields. In particular, the computer industry is currently pushing the physical limits of how much information we move around and how fast we can do it using traditional methods.

"With the Internet, everyone wants real-time video, multiple computers at home and different video and audio channels at the same time," said Jeff Young, Assistant Professor in the Physics Department at UBC. "So the more things people want like that, the more technology we have to build into the system." Young has been studying properties of light, semiconductors and electronics since his days as a graduate student. While at UBC he saw an opportunity to complement the existing research and started his work on nanostructures. "Nano can mean all kinds of different things," says Young. In his lab, it refers to the size of the patterns Mandeville, Kaiser, and the other students use to harness and control light. By splitting light into thousands of colours, coding a different stream of data in each one, and sending it all down the same cable over long distances at the speed of light, researchers of "photonic" nanotechnology hope to dramatically raise the number of lanes – and the speed limit – on the information highway. But it's not good enough to move huge amounts of information quickly if your computer can't handle it. Making things smaller also happens to be the most logical route to greater computing power and speed for two reasons, explains Ruda, "If the distance between A and B are shorter, information will pass faster which makes the circuit work quicker." "The other reason," states Ruda, "is that when you have things closer together, then you can pack more devices on the same area of chip." And if computer chips shrink down to a size where quantum effects can be harnessed, computing as we know it may suddenly evolve into something quite different.

Still, no technology comes easily. Mandeville explains that the work can be deeply frustrating, but both he and Kaiser feel that when things work out, it's all worthwhile. "I get a huge sense of satisfaction looking at the finished product," ...through an electron microscope, of course. F