

**"ULTRAMACHINING"<sup>TM</sup>  
SILICON SUBSTRATES**

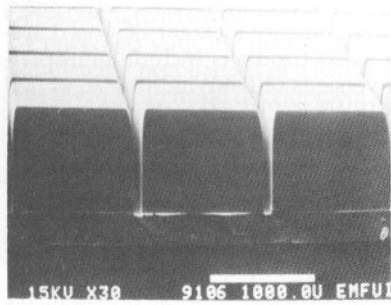


Photo Courtesy of Microfabrication Lab.; EECS Dept. University of Illinois, Chicago; & Argonne National Labs. Advanced Photo Source Lab.

Flat!

Planar!

Double side Polished!

1" thru 4" diameters!

<110> & <100> orientations!

Visit MRS Exhibit  
Booth No. 608

With flatness  $\leq 3 \mu$ , these substrates are engineered for deep groove anisotropic micro-machining. Ultramachining<sup>TM</sup> substrates are free of surface and structural defects.

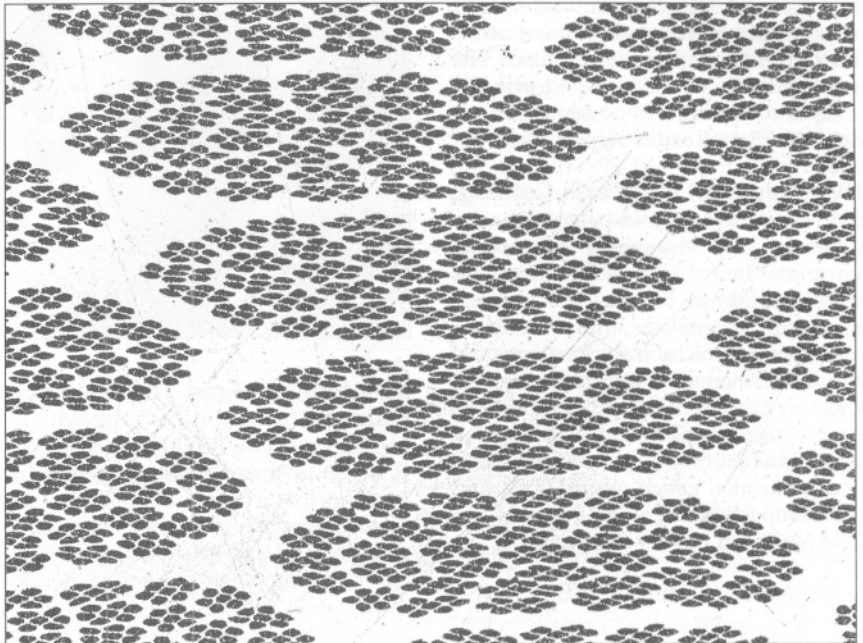
Applications include sensors, detectors, photonics and small precision parts.

When it comes to precision in silicon substrates.....**"if we can't make it, you don't need it!"**



**VIRGINIA SEMICONDUCTOR, INC.**  
1501 Powhatan Street  
Fredericksburg, VA 22401  
Phone (703) 373-2900  
Telex 9102506565  
Fax (703) 371-0371

Figures appearing in the EDITOR'S CHOICE are those arising from materials research which strike the editor's fancy as being aesthetically appealing and eye-catching. No further criteria are applied and none should be assumed. When taken out of context, such figures often evoke images beyond and unrelated to the original meaning. Submissions of candidate figures are welcome and should include a complete source citation, a photocopy of the report in which it appears (or will appear), and a reproduction-quality original drawing or photograph of the figure in question.



It may vaguely resemble the honeycomb handiwork of a colony of bees who have discovered the efficiencies derived from replication of small manufacturing islands as opposed to the massive-hive algorithm. Or, we could posit that a breakthrough in biomimesis has synthetically emulated the honeybees' architecture at the microscopic level. The arrays of pores are indeed filled with what for low-temperature physicists is darn close to honey, i.e., a modern elixir of the field. On the other hand, this repetitive pattern may be the quilt-bound product of a textile mill whose sales force has determined that graphics are back. Yes and no—for this is a cross section from a long multifilamentary "twine," but woven by no conventional loom. In fact not woven at all, but repeatedly extruded from bundles of hexagonal silver annuli filled with the metallic precursors of the high-temperature superconducting compound known as Bi-2223. Of course, all the interesting processing steps, such as mechanical mixing, oxidation, deformation texturing, sintering, and so forth are documented in the report from which this month's EDITOR'S CHOICE was lifted. Naturally, superconducting electrical properties are also presented. The authors, A. Otto, C. Craven, D. Daly, E.R. Podtburg, J. Schreiber, and L.J. Masur (*JOM*, September 1993, p. 48ff.), however, chose not to subject their beautiful finite-extent (only 9,583 filaments in three sequential bundles of 7, 37 and 37), artificially constructed, self-similar pattern to fractal geometry analysis. Although we missed that nuance, the fortunes of their company's offering on the NASDAQ exchange did not seem to react to the oversight.

**1994 MRS Spring Meeting  
April 4-8  
San Francisco, California**