



# LASONIX

## A New Method to Fabricate Three-Dimensional Microelectronics

### Features

Lasonix is a new approach for fabricating insulators, semiconductors, and metallic conductors to form standard semiconductor microcircuits, metallic connections and pathways, and vertically integrated circuits. The fabrication method grows electronics in three dimensions, rather than on a particular substrate, allowing for vertical interconnection and integration of planar substrates into electronic "blocks" or micromodules. In addition, microscale vacuum electronics, high-frequency electromagnetic devices, optoelectronics, and power-switching electronics can all be created with Lasonix, thus enabling hybrid systems to be fabricated. Vast improvements in device and system performance can be achieved through vertical integration of complex micromodules and devices. Lasonix combines all the advantages of a rapid prototyping technology with advanced microelectronics fabrication.

### Applications:

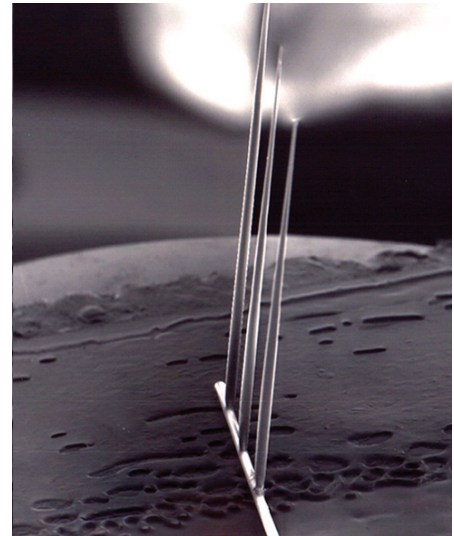
- 3-D semiconductor devices for high-speed systems
- Power electronic switching systems
- Specialized power relays
- Hybrid optical, semiconductor, and terahertz systems

### Benefits:

- Enables rapid, one-step, cost-effective production
- Vertically interconnects integrated circuits and components
- Allows hybrid architectures
- Improves heat management
- Improves power capacity and speed in microelectronics

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*A new method for fabricating microelectronics, Lasonix can be used to form standard semiconductor microcircuits in vertical arrays, conductive interconnects, and hybrid integrated circuits in three dimensions. Shown are potential electric field emitters for microvacuum electronic devices.*

### Los Alamos 2009 Winners

Artificial Retina Project

LASONIX

MAGVIZ

SIMTECHE CO<sub>2</sub> Capture Process

TeraOps Software Radio

<http://www.lanl.gov/rd100>