



## Corporate Overview

### **The Company**

NanoOpto Corporation applies proprietary nano-optical and nano-manufacturing technologies to design and fabricate novel components for optical systems and networks. The company's core capabilities enable it to deliver orders-of-magnitude advances in prototyping speed, component performance, and reduced system costs.

Backed by leading venture capitalists, the company has established headquarters and a high volume nano-pattern transfer manufacturing facility in Somerset, New Jersey. Here, working both independently and with corporate partners, NanoOpto is creating new classes of densely integrated, modular nano-optic components.

Compared to the conventional, bulk optical components, NanoOpto's optical components offer such superior cost/performance that they expand the range of commercially practical applications for optics across multiple industries.

### **The Market:**

The market size for optical components is expected to nearly double from 2002 to 2005 based on ever-increasing needs for bandwidth, connectivity, and efficiency. However, two major barriers impede conventional bulk optical components from satisfying this demand.

First, to make sound business sense, extending the optical network into access and access aggregation applications – still largely the province of electronics – will require dramatic reductions in the cost of optical components, systems, and network architectures. Second, optical systems and their constituent components must be manufactured in the high volumes that network edge deployments will require – volumes that significantly exceed current industry capabilities.

At the component level, this will require devices of significantly greater density and integration, manufactured by high-volume, high-yield, highly scaleable processes. NanoOpto is successfully introducing these advances.

### **Customer Profile:**

NanoOpto's target customer base includes companies who will purchase NanoOpto products for use in subsystems; companies who will hire NanoOpto to design components according to customized specifications; and companies who determine that nano-based solutions offer the cost/performance they require and then consequently elect to partner with a leading provider of such solutions.



**Our Technology:**

Our nano-optic design vocabulary – a growing array of nano-scale patterns that we fabricate on optical wafers – lets us control light in new and useful ways. While conventional bulk optical components interact with light at a macro level, our nano-optic devices interact with light “locally”, on a nano-scale, by way of structures many times smaller than the wavelengths of the subject light. By varying the size, shape, period, and combinations of our optical nano-structures, we create optical system building blocks that match the functionality of existing bulk optics and deliver new functions and combinations of functions, while affording much greater ease of design, manufacturing, and assembly.

Our nano-pattern transfer technology, a NanoOpto proprietary production methodology, adapts and extends semiconductor manufacturing processes and equipment to bring semiconductor-like manufacturing efficiencies to the optical domain: high volumes, high yields, high scalability, and low costs. Four key steps are involved: making a mold “negative” of the desired nano-structures; impressing this mold into a resist-coated wafer; separating the mold and selectively removing the resist to transfer the nano-pattern to the target material; and post-imprint processing.

Because our process uses wafer substrates similar to those used in chip manufacturing and adapts many of the same tools and procedures, nano-pattern transfer technology leverages decades of progress in semiconductor manufacturing and demonstrates comparable efficiencies. Nano-pattern transfer molds can be replicated and reused, facilitating complex multi-step and multi-process methods. Since initial tooling steps do not need to be repeated for each production wafer, they are amortized over the full production run of a particular modular nano-optic. Using different molds with different patterns allows the same manufacturing processes and facilities to create a full range of optical components.

**Our Products:**

NanoOpto offers a growing, coherent family of optical systems building blocks -- modular nano-optics. These consist of optical nano-patterns fabricated on optical wafer substrates and then diced to create compact, high-performance optical chips.

Compared with conventional bulk optical components, our modular nano-optics deliver:

- Ease of integration
- Ease of assembly
- High power handling and environmental tolerance
- Dramatically smaller form factors
- Reduced time to volume
- A platform for customization

**The Team:**

NanoOpto’s leadership team brings together a broad base of experience in research and business leadership spanning optics, semiconductors, systems, and networking.

**The Investors:**

The Company has received financial backing from leading venture capitalists: Bessemer Venture Partners, Morgenthaler Ventures, New Enterprise Associates (NEA), U.S. Trust, Draper Fisher Jurvetson, and Harris & Harris Group.

**Headquarter and Manufacturing Location:**

Somerset, New Jersey

**Manufacturing Facility:**

A high volume nano-pattern transfer manufacturing facility with a production capacity of millions of devices per year

**Contact Information:**

For more information, contact [sales@NanoOpto.com](mailto:sales@NanoOpto.com) or visit [www.NanoOpto.com](http://www.NanoOpto.com)