

## Webinar | Silicon Optics with Large Sag for Anamorphic Beam-Shaping

March 30, 2023

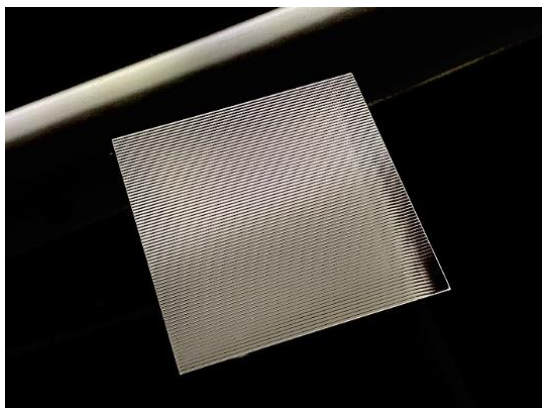
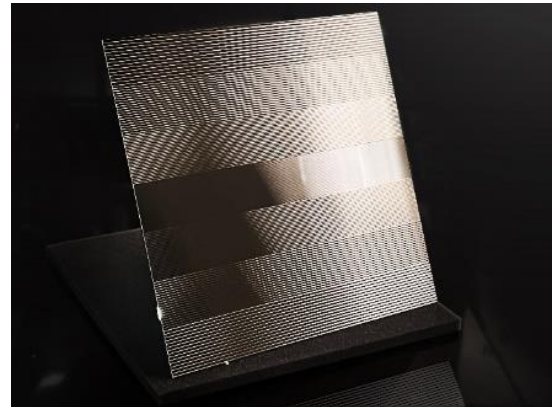
Tuesday, 4 April 14:00 BST (9 pm China time), Dr. Daniel Braam from Focuslight will be presenting at Electro Optics to talk about **Silicon Optics with Large Sag for Anamorphic Beam-Shaping**.



Video Link: [Webinar | Silicon Optics with Large Sag for Anamorphic Beam-Shaping \(focuslight.com\)](https://www.focuslight.com/webinar-silicon-optics-with-large-sag-for-anamorphic-beam-shaping)

### Abstract

The typical processing technologies of silicon optics are etching or CNC machining, resulting in the typical lens sag value of  $< 60 \mu\text{m}$  and not suitable for massive production. Focuslight now expanded its unique structuring capabilities to the mm-scale in silicon, enabling record-breaking silicon lenses. Free-form acylindrical lenses or arrays act on each optical axis separately, creating anamorphic beam-shaping solutions.



With this processing technology, **the lens sag can achieve as large as 4 mm (4000  $\mu\text{m}$ ) at an exit angle of  $0^\circ \sim 80^\circ$  on silicon optics**, which maximizes the numerical aperture (NA) that silicon optics could achieve and exceeds the limit of the silicon optics processed with conventional technologies. This enables products that have been hard or impossible to be produced by classical etching technologies, such as deep-sag decentered lenses, blazed gratings, chirped arrays or integrated prisms, **enabling innovative, highly cost-effective, and scalable core component solutions for next-generation silicon photonics, enabling biosensing, PICs, and much more.**

## Key features:

- Silicon: High IR transmission
- High refractive index ( $n=3.4$ )
- Free-form shape in one direction: asymmetric, decentered lenses, arrays & prisms
- Large sag, wide exit angles
- Polished surfaces
- In-house coating with  $R < 0.2\%$

## Applications:

- Detection and beam-shaping of IR light/energy
- High transmission efficiency for compact sensor applications
- Telecom & direct photonic integration

## Speaker



**Dr. Daniel Braam**

He has been Head of Product Line Management for micro-optics at Focuslight Laser Optics Business Unit since 2018. He studied physics and received his PhD at the University of Duisburg-Essen in the field of optics and nano-structures. He has contributed to over a dozen publications for high-impact journals.

## About Focuslight's Wafer-level Simultaneous Structuring Technology

At Focuslight, optical components are manufactured on a wafer base with Focuslight's own wafer-level simultaneous structuring technology, which is applicable to any kind of inorganic optical material. **From  $\text{CaF}_2$  and  $\text{MgF}_2$  crystals, to high-grade fused silica or high-index glasses, to semiconductor-industry quality Si and Ge material**, the wafer-based products cover a wide range of wavelengths from DUV to FIR, structuring optics with nearly unlimited complexity of 1D acylindrical and prismatic surface geometries. Especially (but not exclusively) for silicon, this includes optical and mechanical features for alignment and assembly, opening up the opportunity to implement the products for optomechanical and optoelectronic functionalities.

Video Link: [Webinar I Silicon Optics with Large Sag for Anamorphic Beam-Shaping \(focuslight.com\)](https://www.focuslight.com/webinar-1-silicon-optics-with-large-sag-for-anamorphic-beam-shaping)

## About Focuslight

Focuslight is a fast-growing company that develops and manufactures **high-power diode laser components and materials** (photon generation) and **laser optics** (photon control) used in various industries and applications. Business scope is being extended by developing and manufacturing **photonic application modules, assemblies, and sub-systems** (photonics application solutions) with a focus on automotive, pan-semiconductor, and medical & health application solutions.