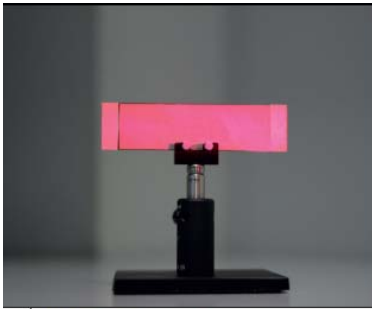
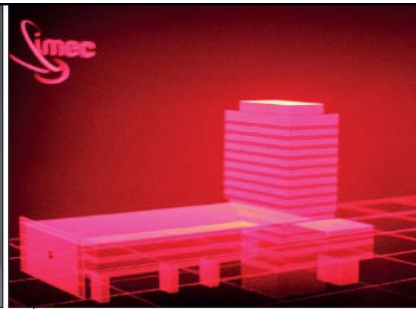


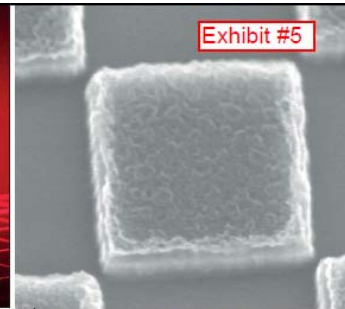
Holographic Displays



Set-up for holographic display technology.



Holographic image demonstrator.



SEM-image of sub-wavelength binary holographic pixel.

DIGITAL DIFFRACTIVE OPTICS PATH TO HIGH-QUALITY HOLOGRAPHIC DISPLAYS

Vision

Imagine having a meeting. You and your guests sit around the table arguing, discussing or presenting data. Just like any meeting you have today, only for one detail: some of the people around the table are 3D images – dynamic holograms – of people sitting in an office thousands of miles away. You will look them in the eye, feel their hesitations, and see their body language. Unlike with today's displays, you won't miss a cue.

Holographic visualization promises to offer a natural 3D experience for multiple viewers, without the undesirable side-effects of current 3D stereoscopic visualization (uncomfortable glasses, strained eyes, fatiguing experience). Imec's vision is to design the ultimate 3D display: a holographic display with wide viewing angle and a high-definition visual experience.

Challenges

Building a high-quality, real-time holographic display requires several breakthroughs from today's holographic prototypes. The challenges are threefold:

- To achieve high image quality, millions of light-diffracting elements are needed. These must all be individually controlled.
- To achieve a wide viewing angle, the light-diffracting elements should be sized close to or below the wavelength of the visible light, i.e. as small as a few hundred nanometers.
- To achieve real-time imaging, massive computing power is needed.

Technology

Imec is scaling its MEMS technology to meet these challenging demands. Our prototypes show promising results, setting the path to high-quality displays.

Imec aims for system-level solutions utilizing a unique combination of its multi-disciplinary teams with strong competences in:

- Advanced lithography
- Silicon processing
- SiGe MEMS processing platform
- MEMS design & prototyping
- Computational holography
- Holographic (lens-less) imaging
- Sub-wavelength diffractive optics
- Embedded system design
- Parallel computing platforms

Our longer-term goal is to create a display system for computer-generated holography with billions of sub-wavelength diffractive elements, delivering high-definition 3D visual experience.

