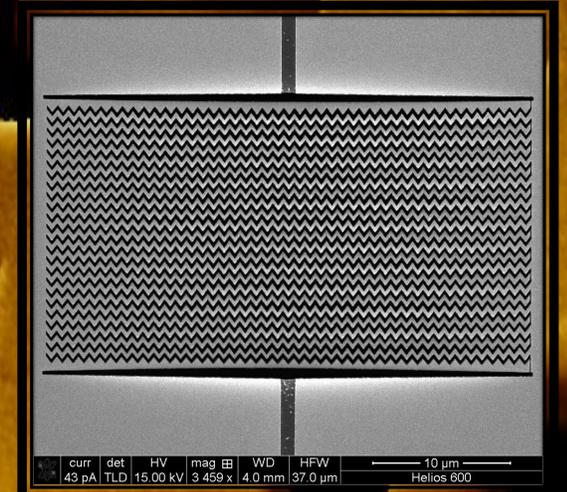


# Metamaterial

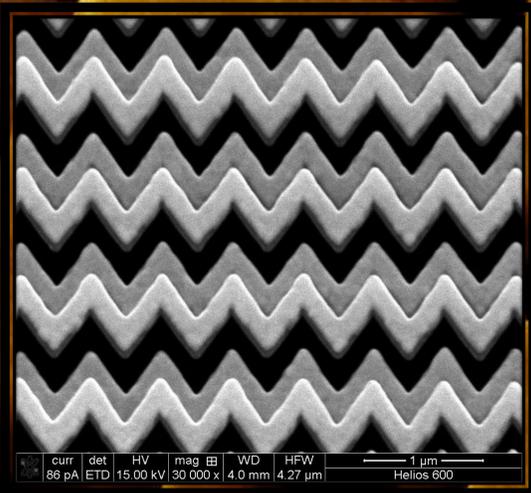
We look with our mechanical eyes  
Set in faceless machines.  
Instead of seeing, they sense  
Our strange synthesis of  
Nature's gifts and man's imagination.

Poem "written" on gold  
thin film (50nm) by  
Focused Ion Beam. Each  
letter area is roughly  
 $0.25\mu\text{m}^2$ .

At a cross-roads, light and electricity  
Meet, as they pass through  
An array of golden bridges;  
Elemental structures so small  
They could nestle in a pore of skin.



Smaller than a wave of light,  
Than our comprehension can envision;  
On a screen they bend unexpectedly.  
Man-made laws superimposed and snapped  
In this new world we cannot see.



## Inside the Scientific Project

Metamaterial functionalities are typically narrow-band and fixed by design at the point of fabrication.

A practical solution for dynamic control over metamaterial optical properties would provide a whole new level of functionality for optical communications, camouflage, optical data processing, tunable spectral filters, modulators etc. Reconfigurable Photonic Metamaterials allows us to dynamically control mechanical arrangement and optical properties of metamaterials by electrical currents and magnetic fields.

Every electron in every charge  
And every photon in every wave  
Encodes a thought, a process, a meaning.  
Unlocked by our golden bridges;  
Our incomprehensible metamaterial.

We look with our mechanical eyes  
And we understand its potential.

Scientist: João Valente

Poet: James Ashworth