



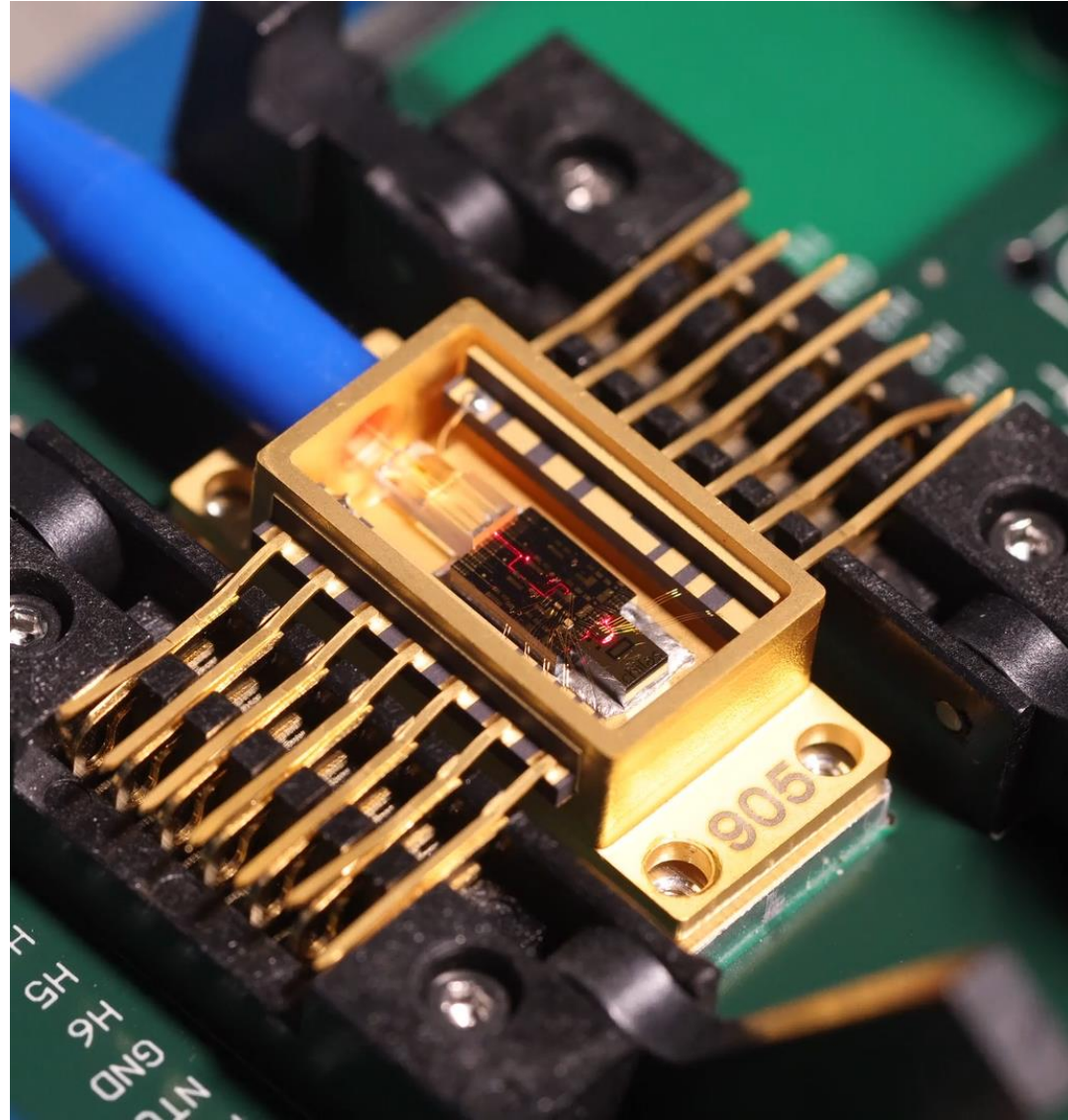
Hybrid III-V / silicon nitride external cavity lasers

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About Chilas

- **Chilas** is a growing company founded in the Netherlands in December 2018.
- **Chilas** develops and commercializes ultra-narrow linewidth external cavity tunable semiconductor lasers.
- **Chilas** is on solid growth on optics sensors market, and strategically expanding on LiDAR and Coherent communications.

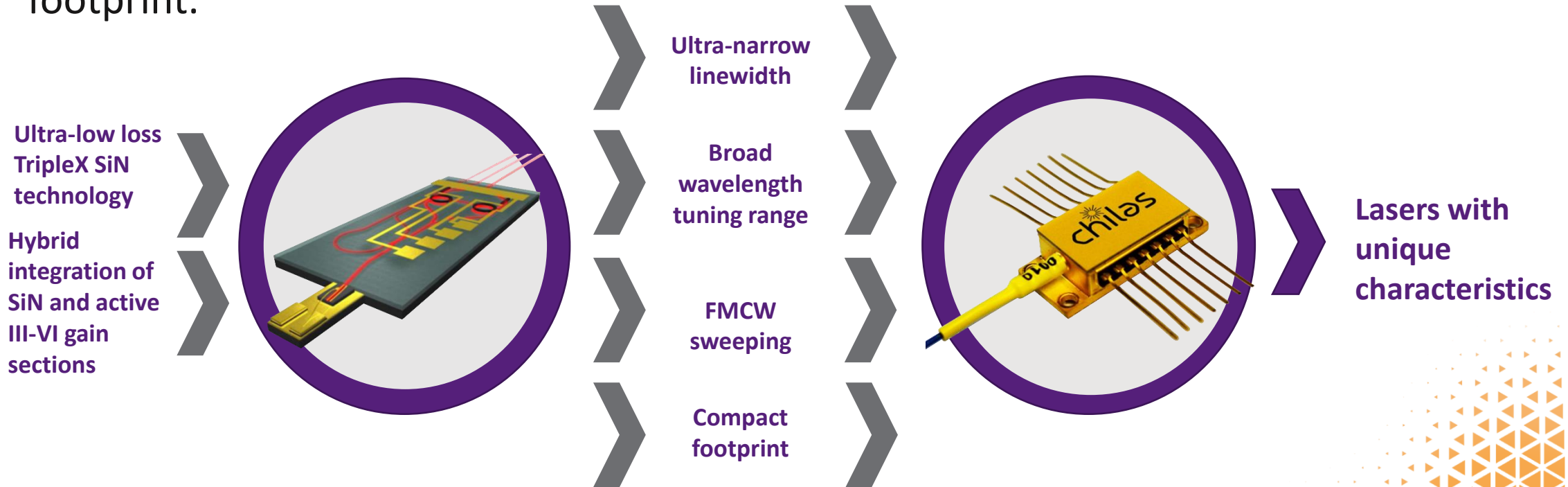


Summary



Products & Technology

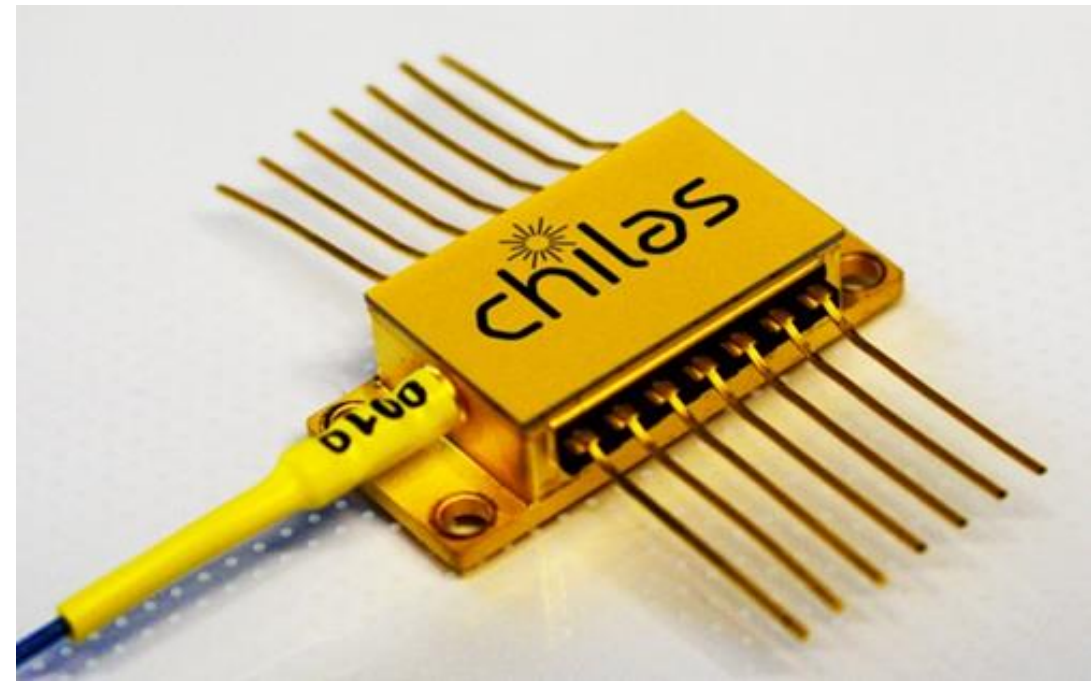
- **Chilas** uses its hybrid integration technology to integrate ultra-low loss SiN external cavities with gain sections to produce unique lasers ultra-narrow linewidth, broad wavelength tuning range, and compact footprint.



Chilas laser applications

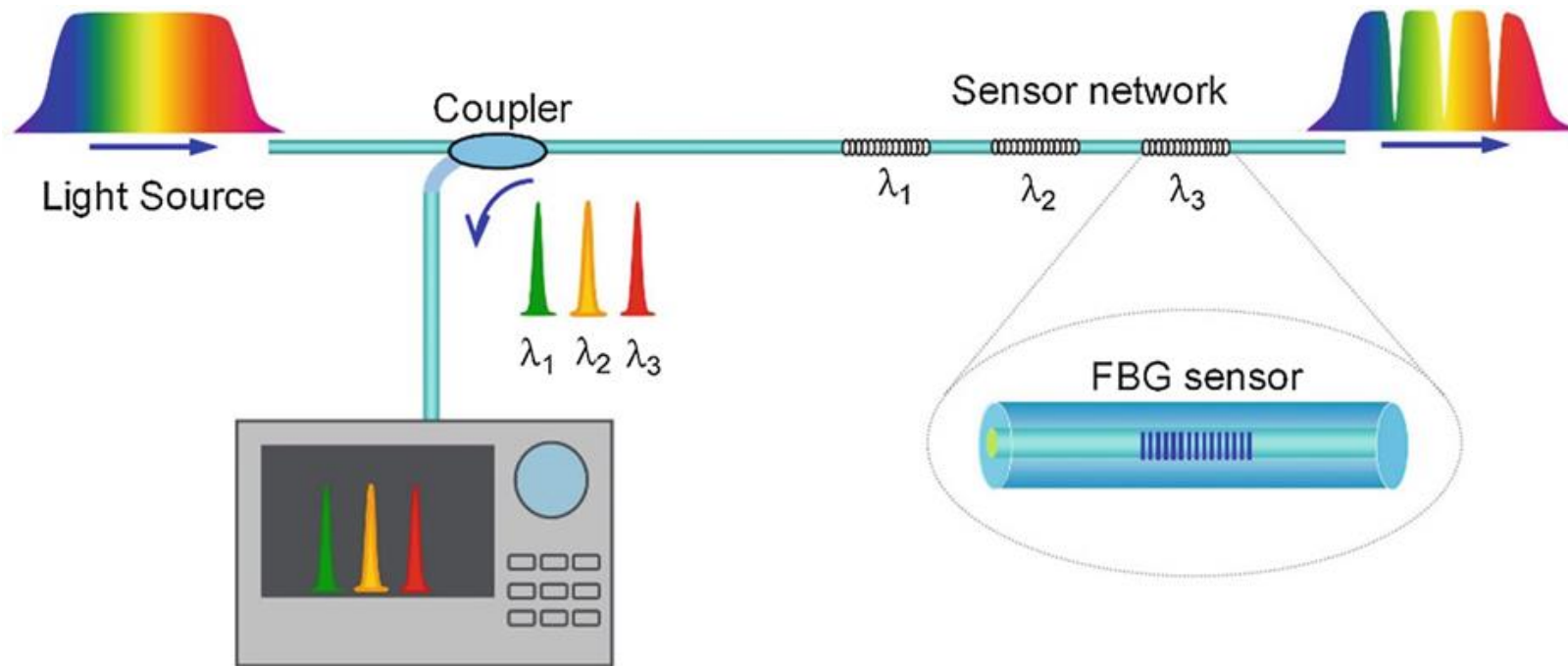
Chilas ultra-narrow linewidth, large tuning range, low noise and high-power lasers can be used in a wide range of applications

- ✦ Fiber optic sensors
- ✦ Coherent communications, ITLA
- ✦ Biomedical, OCT
- ✦ Quantum communications, QKD
- ✦ LiDAR
- ✦ Microwave photonics
- ✦ Spectroscopy
- ✦ Telecom instrumentation
- ✦ Atom cooling
- ✦ High resolution imaging
- ✦ Quantum sensing



Optic fiber sensor

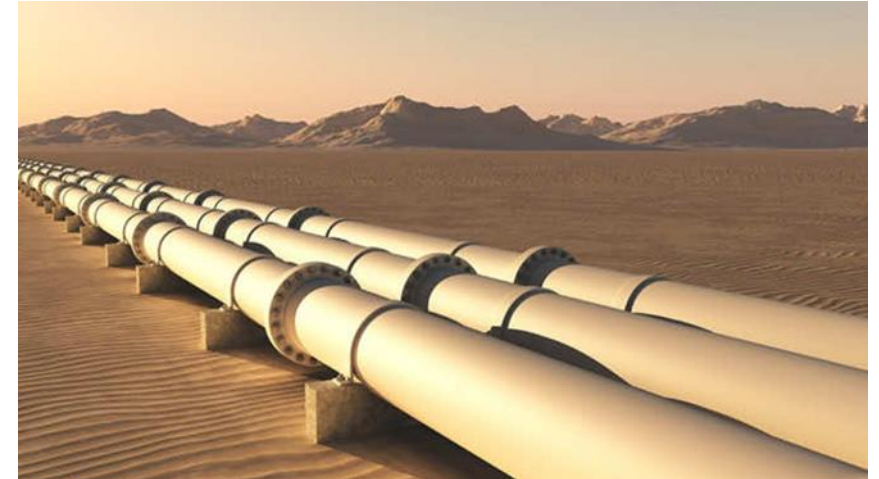
Light from a tunable laser is sent through a fiber on which grating are inscribed. The grating acts as color selective reflectors. When the light frequency matches the grating wavelength it will be reflected back. When the fiber is under external influence the reflection frequency of the grating will change.



Optic fiber sensor

Fiber optic sensors cover a very broad range of applications

- ✧ Structural health monitoring: Bridges, dams, railways, airplanes, and other so-called smart structures
- ✧ Borehole and pipeline monitoring
- ✧ Seismic exploration
- ✧ Deep sea well structures
- ✧ High-voltage power line monitoring
- ✧ Security systems for monitoring a perimeter, including Homeland Security
- ✧ Biomedical sensing



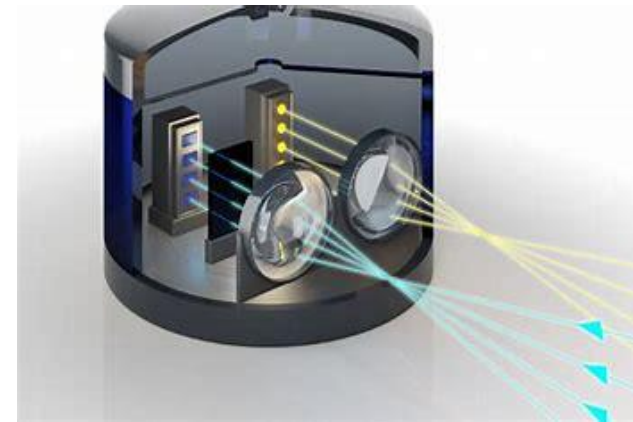
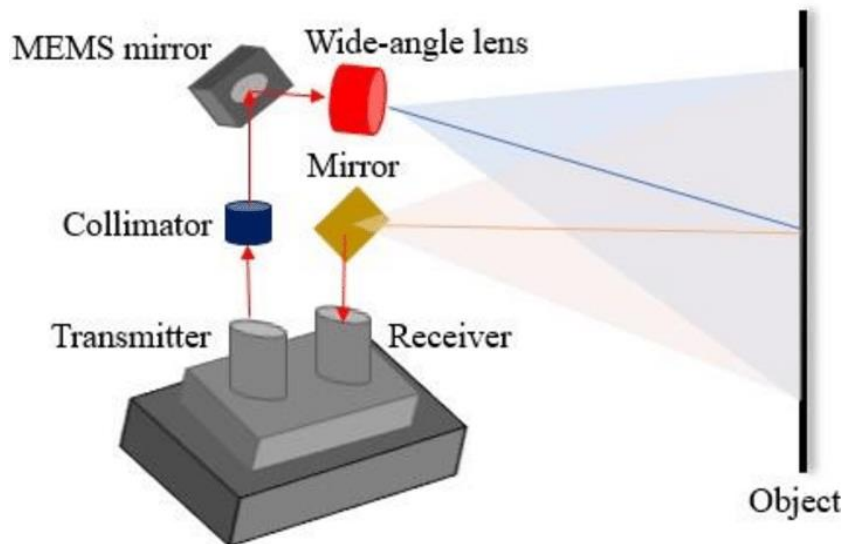
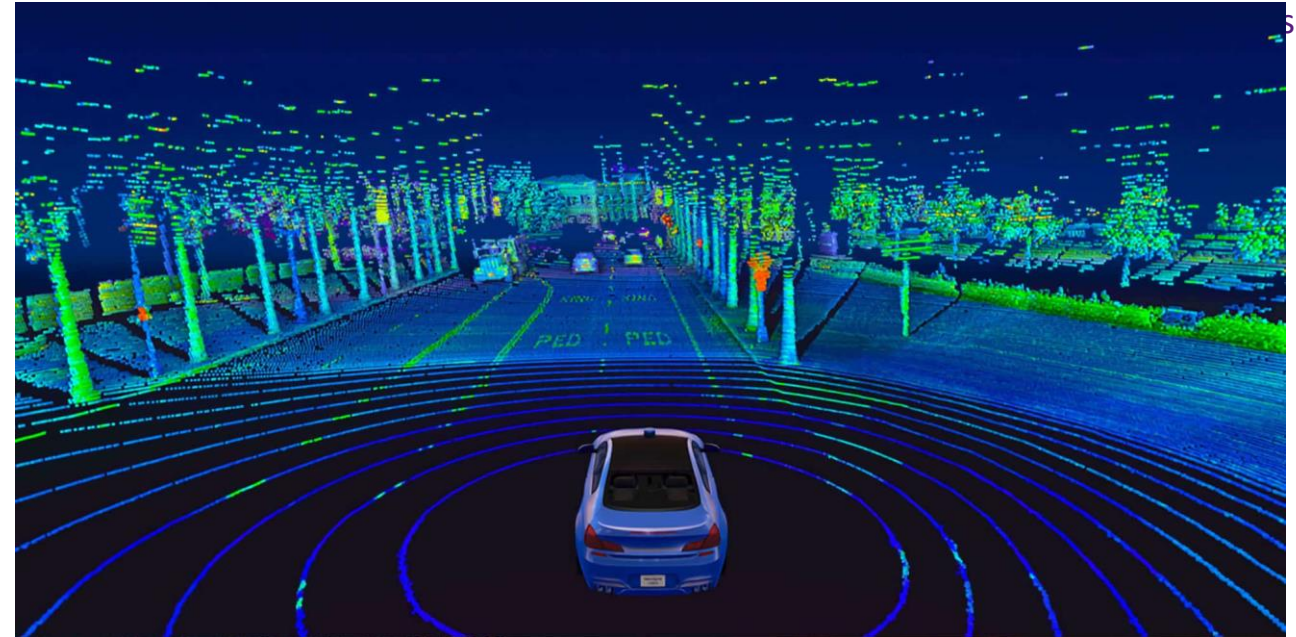
Fiber optic applications



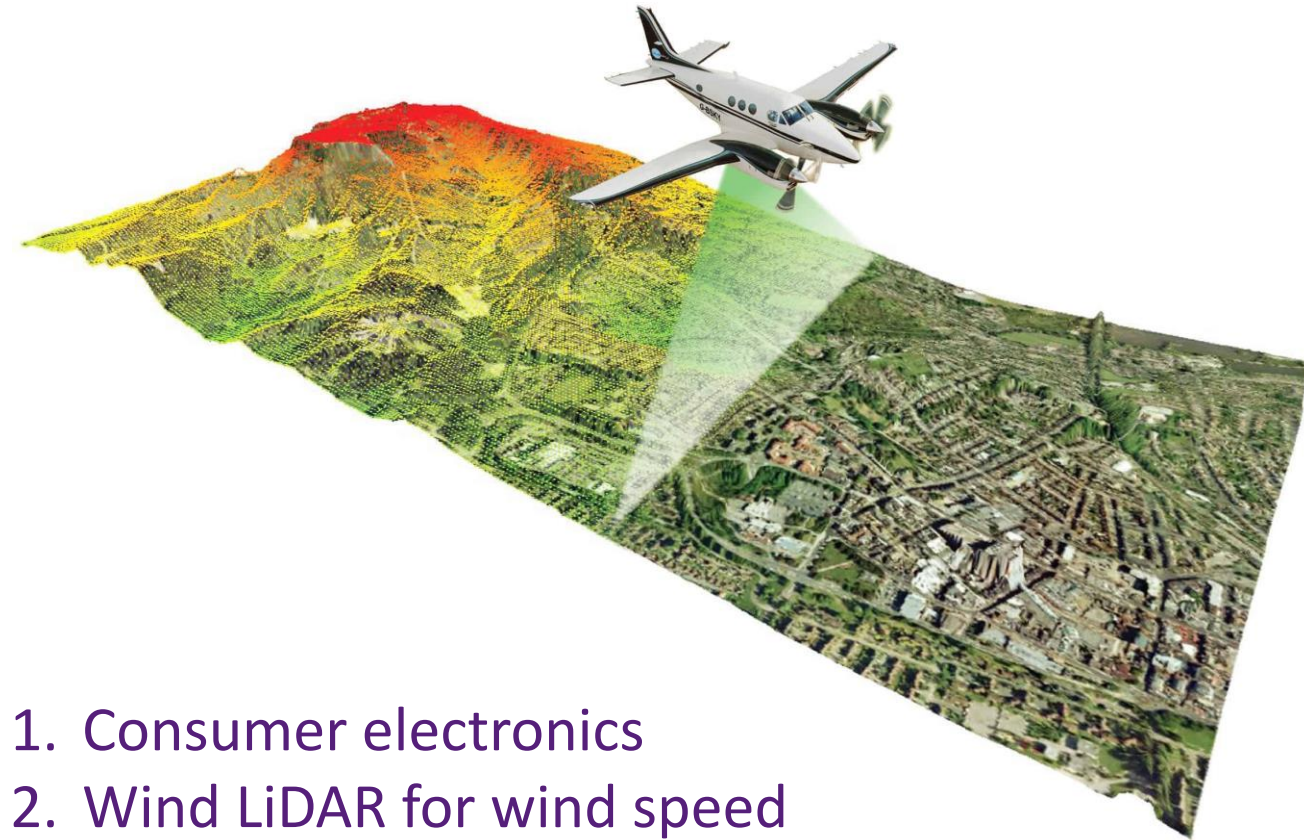
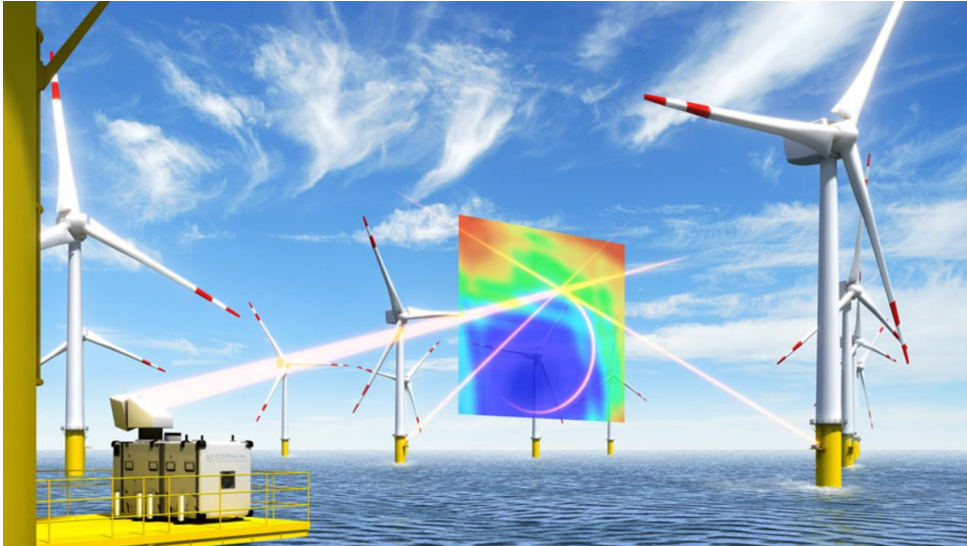
Light Detection and Ranging LiDAR

Chilas tunable laser is used in high-end LiDAR, which is used in many applications:

1. ADAS in automotive
2. Wind LiDAR for wind speed monitoring for wind turbine.
3. Aerial survey



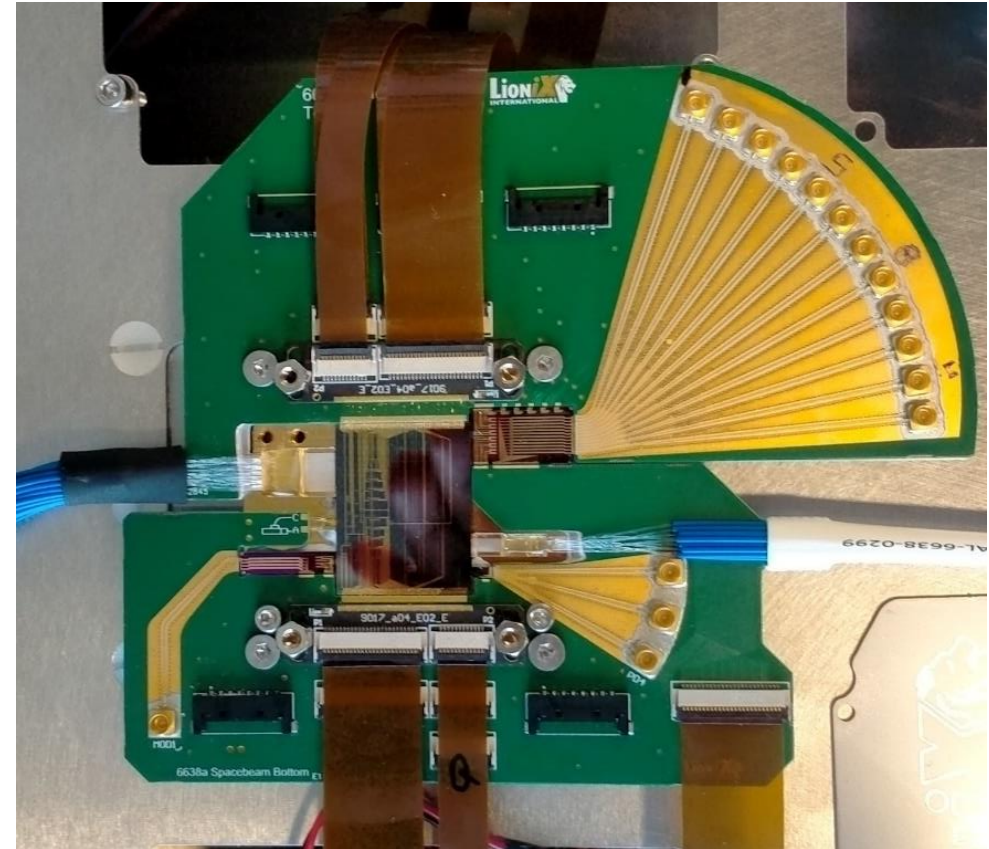
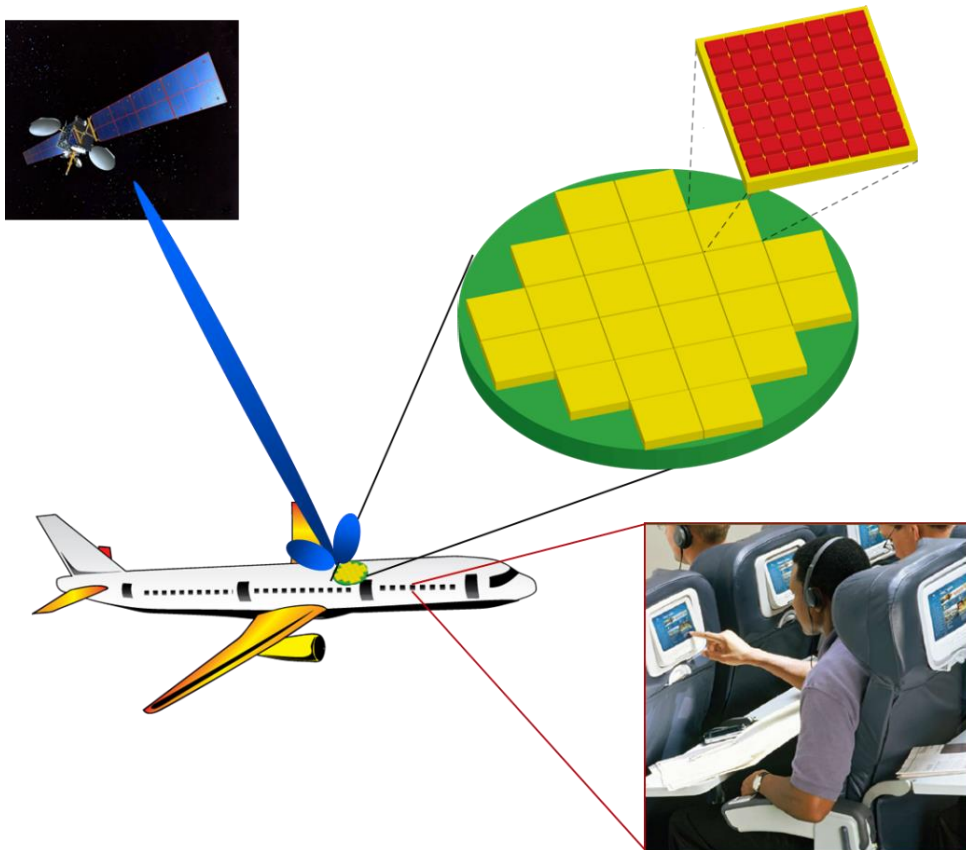
Light Detection and Ranging LiDAR



1. Consumer electronics
2. Wind LiDAR for wind speed monitoring for wind turbine.
3. Aerial survey

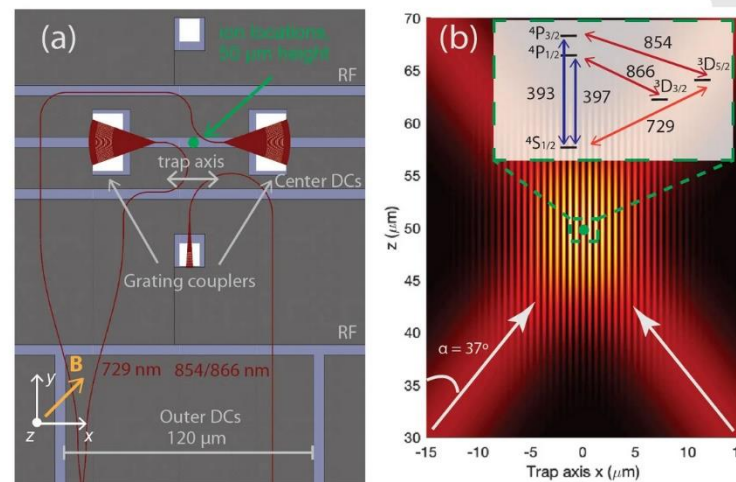
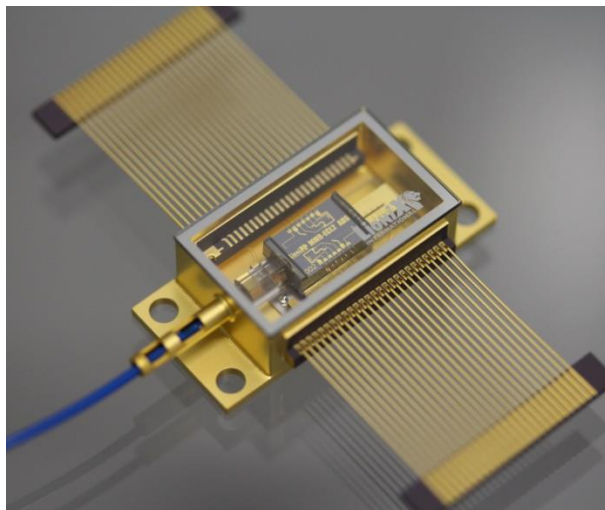
Microwave photonics

Ultra-narrow tunable laser are used in optical beam Forming Network for satellite communication.

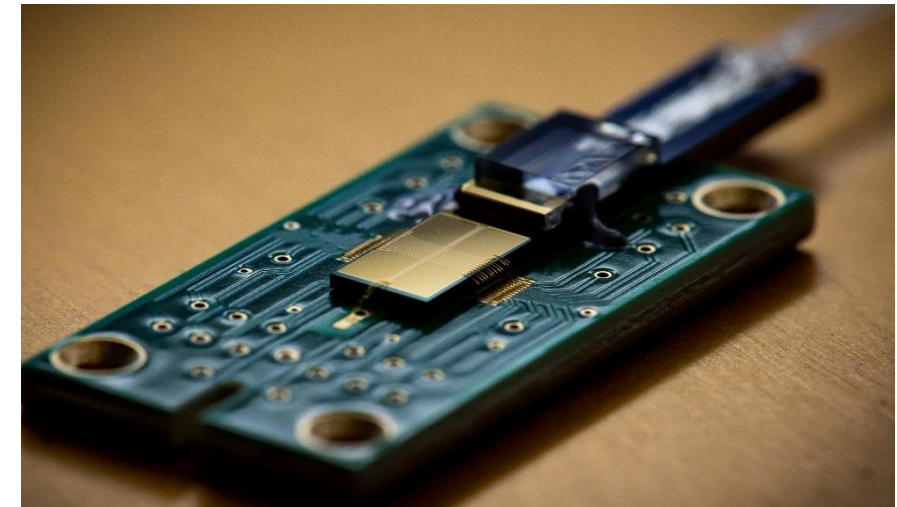


Atoms cooling

Ultra-narrow linewidth laser is used to trap and cool atoms for quantum clock, quantum sensing



Illustrations of the structured light ion trap [3]. (a) Layout of the device, including the trap electrodes and the photonic structures. The grating couplers emit 729 nm light out-of-plane to control the ion 50 μm above the chip, represented by the green dot. (b) Schematic of the light field intensity, with an inset for the electronic structure and transition wavelengths (in nm) of the calcium-40 ion.



**Thank you for your
attention**

