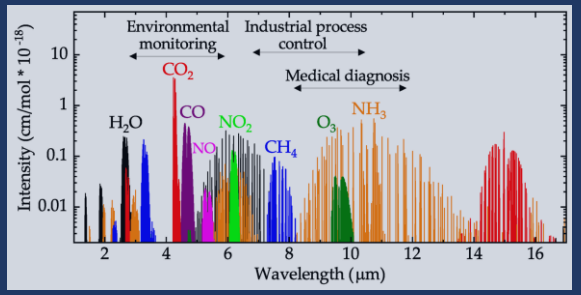
Lasers for R&D

Intraband's patented high-power QCL technology can be adapted to your specific application. Contact us to explore how our custom QCLs can meet your needs.

Industrial Lasers

Efficiency, power, and beam quality are critical in applications requiring precise energy deposition for marking or cutting. QCLs can be used with materials that absorb strongly in the 4 to 10 μm wavelength region.

Sensors and Medical Applications



QCL wavelengths match up well with the "fingerprint" regions of the infrared where most molecules have unique, fundamental absorption features [1]. High power QCLs enable detection from a distance.

Intraband

Intraband, LLC was founded to develop QCL products exploiting the bandgap engineering capability and product reliability provided by MOCVD growth. Working together with the University of Wisconsin-Madison, the company has developed new QCL technologies that enable high-power, high-efficiency, reliable operation with excellent beam quality.

The founding team includes Professor Dan Botez, Professor Luke Mawst, Tom Earles, who heads product development, and Rob Marsland who serves as President.

Key Intraband technologies, exclusively licensed from the Wisconsin Alumni Research Foundation (WARF), include QCL design approaches the team has used to achieve state-of-the-art, multi-Watt CW and peak-pulsed powers from MOCVD-grown QCL single edge emitters. The company also has technologies for surface emitting and coherent arrayed QCLs.

Intraband is based at the University Research Park in Madison, WI, with research operations carried out at the Reed Center for Photonics at UW-Madison. These facilities include the Metal-Organic Chemical-Vapor Deposition (MOCVD) equipment and processing labs critical to QCL fabrication as well as equipment for mid-infrared (4-12 μm) laser characterization.

Intraband is looking to expand its network of manufacturing partners and grow its engineering team. Contact us for further information:

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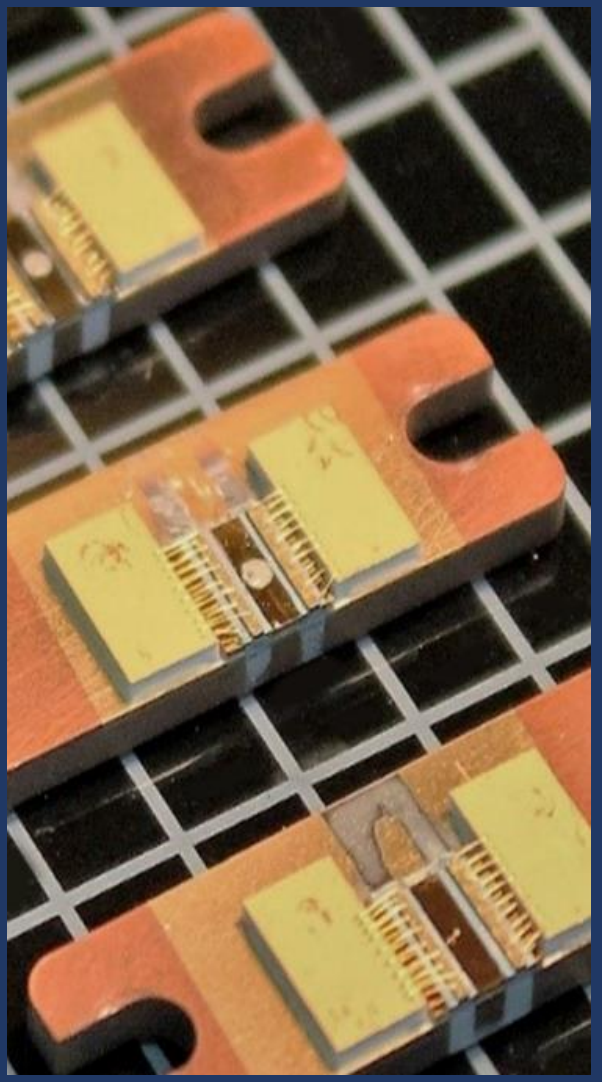
505 S. Rosa Road, Suite 34
Madison, WI 53719
www.intraband.net

Intraband



Developing QCL technologies that enable high-power, high-efficiency, reliable QCL operation with excellent beam quality

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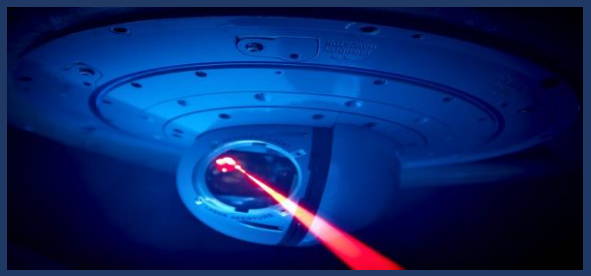

QCL Technologies

Intraband has developed new Quantum Cascade Laser (QCL) designs that enable high-power, high-efficiency, reliable QCL operation with excellent beam quality.

These technologies include QCL-design approaches we have used to achieve state-of-the-art, multi-Watt CW and peak-pulsed powers from MOCVD-grown QCL single edge emitters. The company also has technologies for surface emitting and coherent arrayed QCLs.

Technology Applications

Defense Systems

High-power midwave-infrared (MWIR) lasers are used by defense systems employing directed IR countermeasures as well as other applications such as target designation.

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Intraband

Intraband develops Quantum Cascade Lasers (QCLs) for applications requiring high power and high efficiency in the mid-wave infrared (MWIR)

Technical accomplishments

- Six patents relating to high-performance, reliable QCLs
- Highest QCL internal efficiency
- 2.6 W MWIR QCL continuous-wave (CW) operation
- Highest power surface-emitting QCL
- Highest power phase-locked QCL array with single-lobe beam

Transitioning Technology through an Intraband/WARF Strategic Partnership - Leveraging the Navy and Army's SBIR/STTR Program

- High-Speed Resonant-Cavity Infrared Detector Arrays and Narrow-Linewidth Quantum Cascade Lasers for Free Space Communication Links (A19B-T005)
- Brightness Scaling of Quantum Cascade Lasers (N191-014)
- Super-Efficient Mid-Infrared Quantum Cascade Lasers with Continuous-Wave Wall-Plug Efficiencies in Excess of 40% (N17A-006)
- Surface-Emitting, Monolithic Beam-Combined Mid-Wave IR Quantum Cascade Lasers (N13A-T006)
- Monolithic Scalable Mid-Infrared Phase-Locked Laser Array (N11A-T011)
- High-Power, Monolithic THz Sources via Difference Frequency Generation in Phase-Locked Arrays of Quantum Cascade Lasers (A15A-T003)
- On-Chip Passive Phase-Locking for High Coherent Power, Mid-IR Quantum Cascade Lasers (A10A-T007)

[1] D. Popa and F. Udrea, Sensors 2019, 19(9), 2076. The image is reprinted under the Creative Commons License Attribution 4.0 International license.