



Expression of Interest:

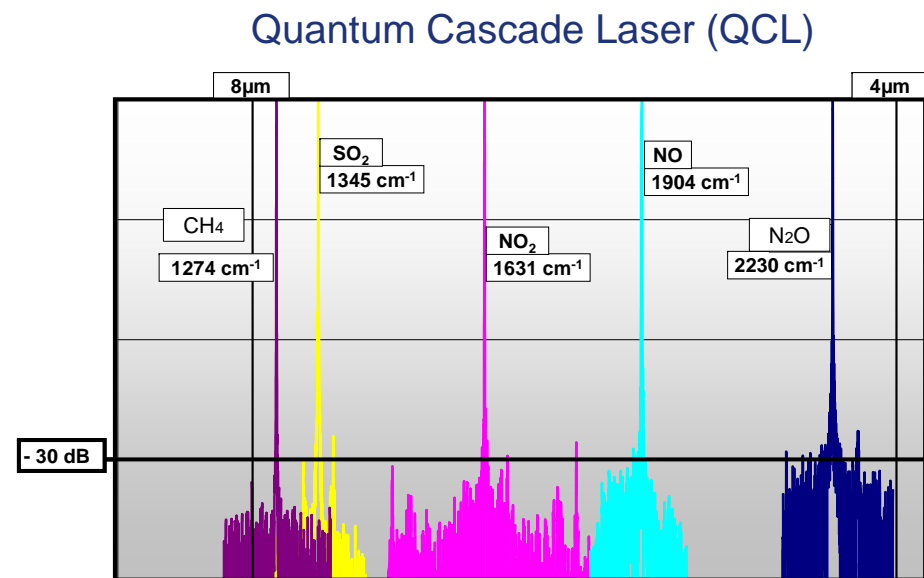
Pollutant sensor based on Quantum Cascade Laser

**Berlin, EURIPIDES Forum,
10 October 2008**

OVERALL OBJECTIVE: POLLUTANT DETECTION

- ▶ Mid infra-red spectroscopy is an extremely powerful method to detect most of the pollutant gases
- ▶ Quantum Cascade Laser technology, offer ideal sources to perform gas sensing, and offer a strong potential to develop compact low cost sensors

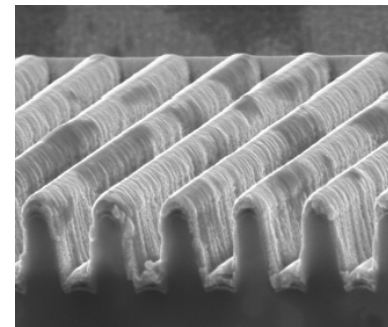
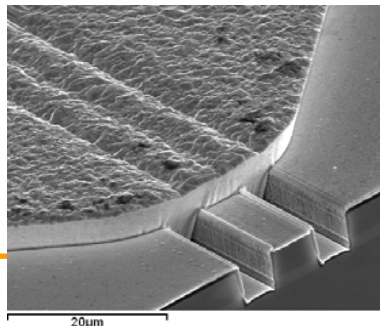
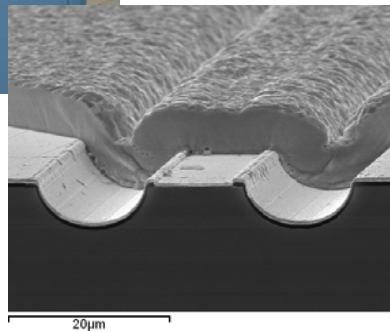
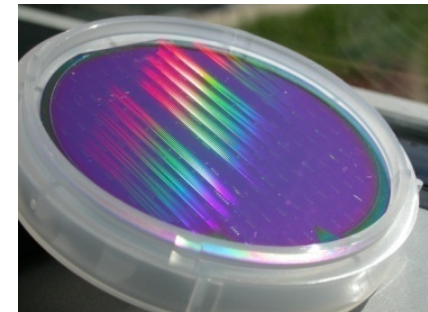
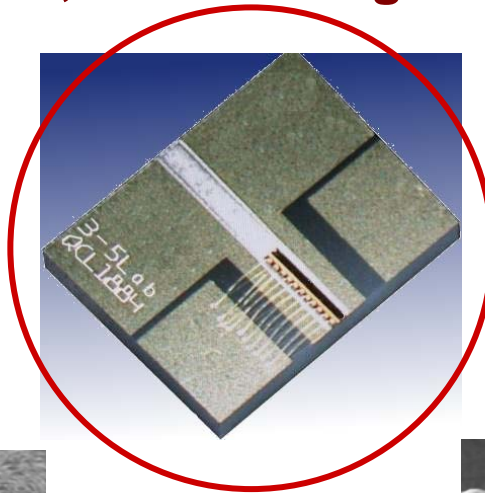
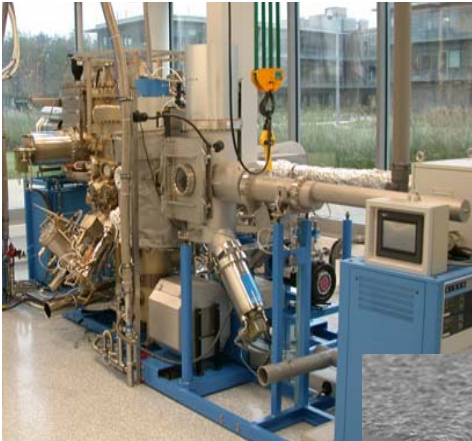
Wavelength (μm)	Wave number (cm^{-1})	Gaz
1,37	7 310	H2O
1,65	6 061	CH4
1,74	5 741	HCl
2,00	4 990	CO2
2,33	4 292	CO
2,74	3 650	CO2
3,45	2 899	NO2
3,55	2 817	HCl
4,00	2 500	S02
4,48	2 230	N2O
5,25	1 904	NO
6,13	1 631	NO2
7,43	1 345	SO2
7,85	1 274	CH4



- ▶ **PROJECT OBJECTIVE:**
 - Demonstrate the feasibility of a compact affordable high sensitivity pollutant sensor

MAIN ISSUES

- ▶ **Packaging of QCL source : mounting and packaging directly influences the performance of the laser, especially its reliability.**
- ▶ **Sensor architecture, overall integration**



PROPOSED APPROACH

- ▶ **Proposed approach (under discussion)**
 - Quasi CW mode QCLs in external cavity
 - Integrated photo-acoustic cell.

 - ▶ **Consortium (under construction)**
 - Alcatel Thales III-V Lab (French industrial lab): QCL technology, packaging design
 - Gasera (Finnish SME): Sensor design and integration
 - ...
 - *Company / SME: Packaging design and development*
 - *University / research centre: spectroscopy models / measurement*
 - ...

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