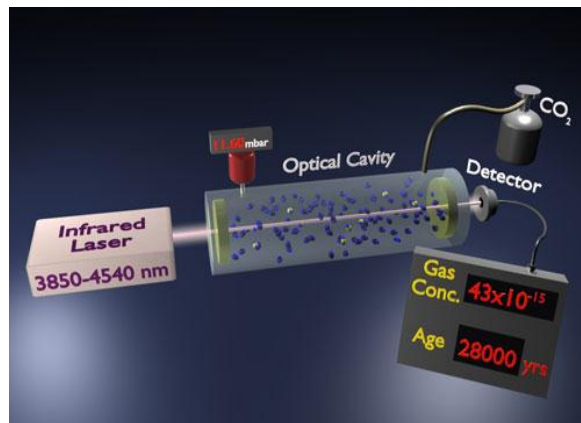


### RESEARCH ACTIVITY

High-sensitivity/precision molecular spectroscopy with mid-IR frontier coherent sources (difference-frequency generators and quantum cascade lasers).

New spectroscopic technique for record sensitivity trace gas detection: saturated-absorption cavity ring-down (SCAR).

### First optical 14C measurement



### RESULTS/PRODUCTS

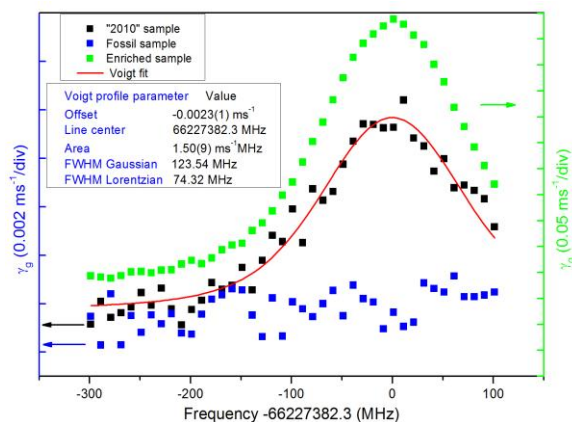
First demonstration of optical radiocarbon detection in natural and sub-natural abundance, down to 43 parts per quadrillion.

Intercalibration of the SCAR measured concentrations with an accelerated mass spectrometry (AMS) facility.

### RESEARCH TEAM

#### Istituto Nazionale di Ottica - CNR

Saverio Bartalini  
Pablo Cancio  
Paolo De Natale  
Iacopo Galli  
Giovanni Giusfredi  
Davide Mazzotti



SPECTROSCOPIC SETUP FOR THE MEASUREMENT OF RADIOCARBON DIOXIDE CONCENTRATION IN A CO<sub>2</sub> GAS SAMPLE. MEASURED SPECTRA FOR NATURAL, FOSSIL AND ENRICHED ABUNDANCE.

### FUTURE APPLICATIONS

Radiocarbon dating with a low-cost, transportable, all-optical setup.