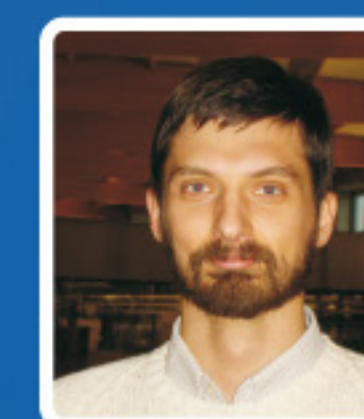


Valérie Briois  
Scientist in charge



Emiliano Fonda  
Scientist



Stéphanie Balin  
Scientist

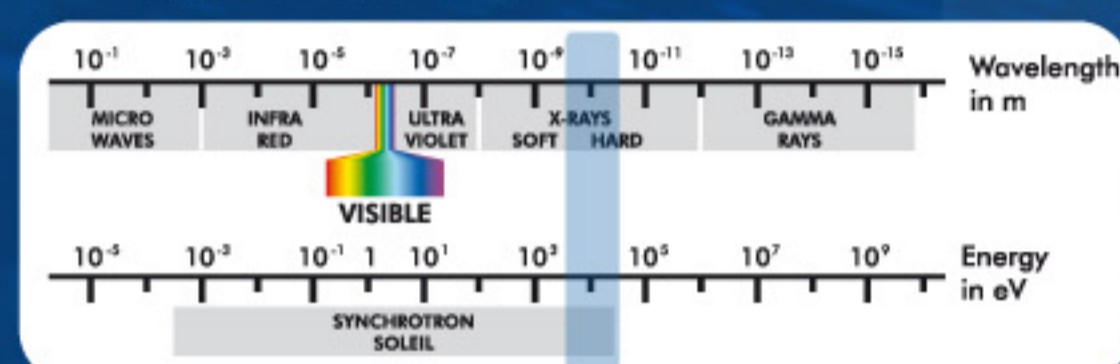


Françoise Villain  
Associated scientist



Laurent Barthe  
Assistant engineer

Energy range of SAMBA: 4000-43000eV



Light source: bending magnet  
Experimental techniques:

- X-ray absorption spectroscopy, EXAFS, XANES, surface EXAFS (SEXAFS)
- Coupling with other techniques: UV-visible spectroscopy, Raman spectroscopy, Differential Scanning Calorimetry
- X-ray diffraction

SAMBA is a multi-purpose beamline owing to its large number and variety of available sample environments (10K cryostat, 600°C furnace, liquid cells, sealed chamber for atmosphere sensitive samples, ...) and detectors (transmission, fluorescence, electron detection).

# Spectroscopies Applied to Materials Based on Absorption

## SAMBA

General purpose beamline for hard X-ray absorption spectroscopy for static and dynamic experiments

### Topics and applications

#### Material science

- Structure and electronic properties of nanosystems
- Dynamic (Operando) or static studies of electrode materials (batteries)
- In situ monitoring of phase transitions (fusion, crystallisation, damages...) resulting from temperature, pressure, light
- Characterisation of glasses, sol-gel...



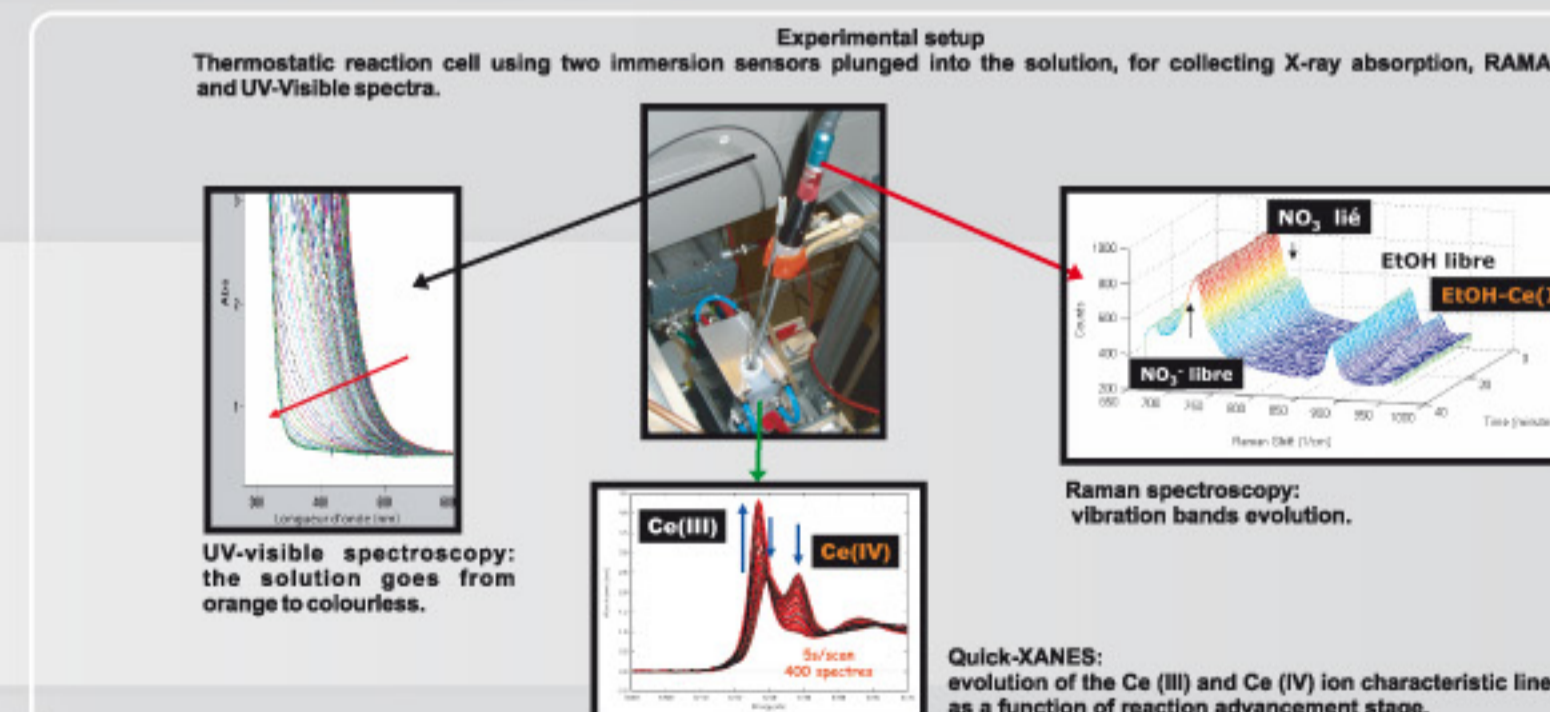
80K (-193°C) setup for light induced electron transfer measurements (XAFS beamline, Elettra synchrotron Italy).

#### Earth and environment science

- Studies of trace elements in natural environments (soils, sediments, plants, micro-organisms...)

#### Ex situ and/or in situ catalysis (Operando)

- Structural and electronic characterisation of catalysers to understand and optimise their catalytic activity and selectivity



#### Biology

- Biomimetic compounds (metalloenzymes) reactivity study
- Study of metal ions in metalloproteins and bioinorganic complexes

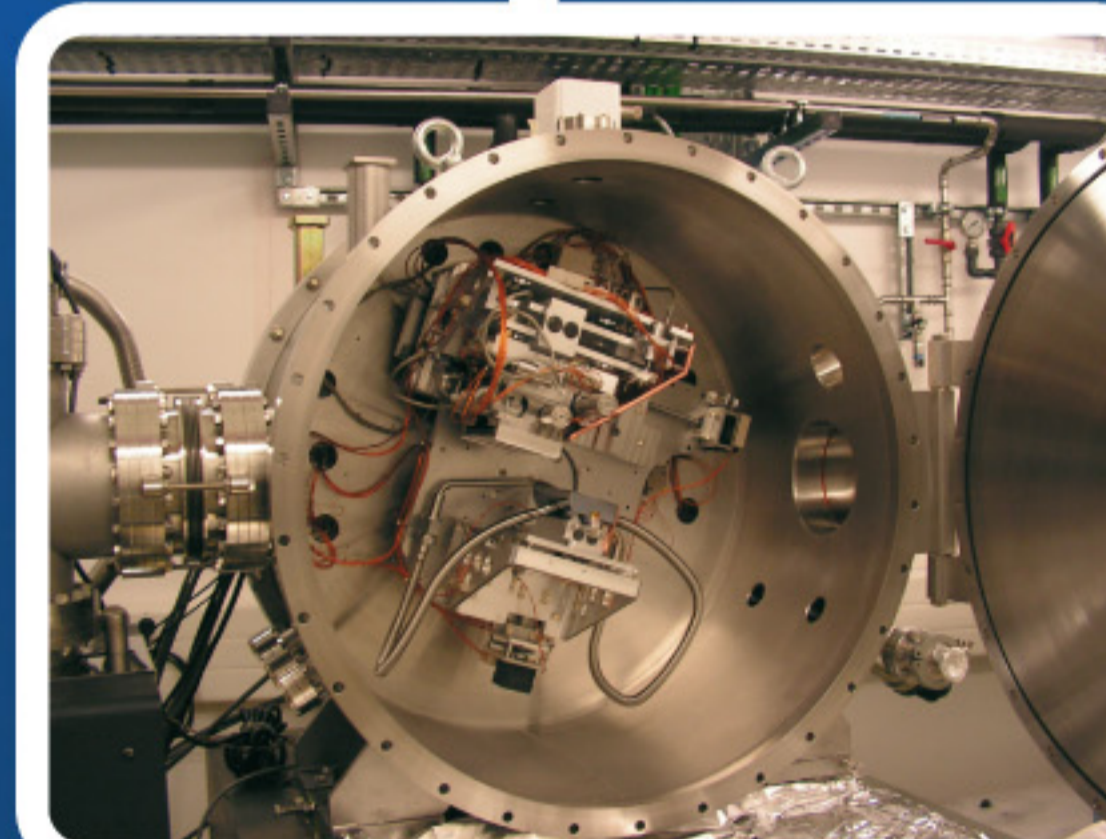
#### Surface science

- Characterisation of thin films local structure
- Study of metal/metal, metal/semiconductor and oxyde/metal interfaces



Preparation chamber and surface EXAFS analysis.

### Zoom: the various measurement modes



Horizontal plane focus monochromator for « high flux » measurements

- Experiments in "high flux" mode:  
X-ray spot size on the sample: 200x200 μm<sup>2</sup>  
Spectrum acquisition time: 15 minutes
- Experiments in dynamic mode  
X-ray spot size on the sample: a few mm<sup>2</sup>  
Spectrum acquisition time: from a few tens of milliseconds to a few hundred milliseconds
- Surface EXAFS measurements:  
*in situ* preparation and measurements of monolayers on clean surfaces