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## The Atmospheric Reactivity studies Plateform of Orléans -France

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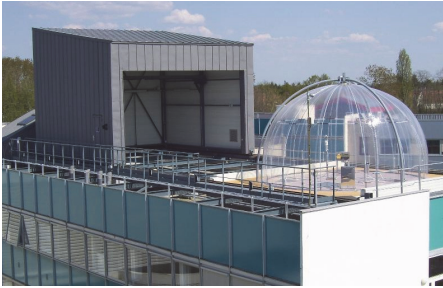
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## The Atmospheric Reactivity studies Platform of Orléans (PRAT) is composed of:

### HELIOS: Atmospheric simulation chamber with natural irradiation of Orléans



#### Objectives

- Characterization and monitoring of the evolution of pollutants under the influence of sunlight or in the dark
- Kinetics measurements and mechanisms development

#### Description

- Hemisphere of 6 m diameter (90 m<sup>3</sup>) made of FEP film
- Ultrapure air (atmospheric P° & T°)
- Used under sunlight, artificial lights or in the dark
- Mobile protective structure
- Laboratory of 110 m<sup>2</sup> (under the chamber) equipped with advanced analytical instruments (in situ FTIR, PTR-TOF-MS, API-TOF-CIMS ; Gas (NO, NO<sub>2</sub>, NO<sub>3</sub>, O<sub>3</sub>, HONO, HCHO, CO, SO<sub>2</sub>) and particles analyzers ; Chromatographs, Spectrometers ...)

### Super-site VOLTAIRE HELIOS



#### Objectives

- Air quality monitoring and research
- Regular pollutants measurements (gases and particles)
- Education and Training

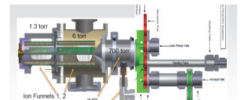
#### Description

- Located on the CNRS campus of Orléans
- Permanently measured: O<sub>3</sub> and NO<sub>x</sub> monitors, PM10 (law-regulated pollutants); meteo station

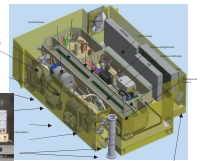


### Instrumental development

- SPECIES : in situ spectrometer with four infrared lasers  
Compounds which can be simultaneously measured with sub-ppb detection limits, among others:  
CO, CH<sub>4</sub>, NO, N<sub>2</sub>O, HNO<sub>3</sub>, H<sub>2</sub>O<sub>2</sub>, HCl, HOCl, COF<sub>2</sub>, HCHO, HCOOH, O<sub>3</sub>, NH<sub>3</sub>, NO<sub>2</sub>, H<sub>2</sub>O, OCS



- Atmospheric Mass Spectrometry (AMS) with ORBITRAP  
Dedicated to the detailed study of the chemical composition of organic aerosols



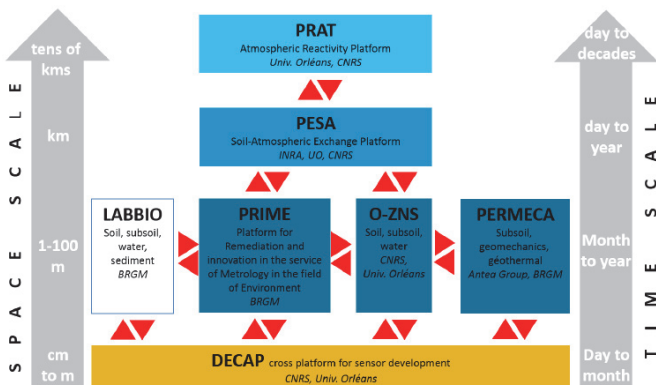
- SAMU: chemical ionization mass spectrometer: CIMS for HO<sub>2</sub>, OH, RO<sub>2</sub>, H<sub>2</sub>SO<sub>4</sub> detection



- CRDS: Cavity Ring Down Spectroscopy to measure NO<sub>3</sub> radicals and particles

### PRAT is part of large regional project (PIVOTS):

- Coordinated set of experimental and analytical platforms for environmental metrology and remediation.
- Designed for various scales (space and time), matrices e.g. soils, water, air) and contaminants, *in vitro* and *in situ*.
- Federating public bodies and private players
- Open to both academics and industry



### Specific themes of PRAT:

#### Air quality and impacts

#### From local to global pollution

- Indoor air quality
- Atmospheric aerosol formation
- Pollutants deposition
- Climate effect of the degradation products of VOC (including fluorinated)