The ALBA Synchrotron Light Source

ALBA

Overview ALBA Phase I Beamlines

Beamline	Beamline use	Field of activity	Light source
MSPD	**Material Science and Powder Diffraction**	**Materials science**	**Superconducting wiggler**
MISTRAL	**Soft X-Ray Microscopy beamline**	**Life sciences, Materials Science**	**Bending magnet**
NCD	**Non-Crystalline Diffraction**	**Life sciences, Materials science**	**In-vacuum undulator**
XALOC	**Macromolecular Crystallography**	**Life sciences**	**In-vacuum undulator**
CLÆSS	**X-Ray Absorption Spectroscopy**	**Materials science**	**Wiggler**
CIRCE	**Photoemission spectroscopy and microscopy**	**Electronic structure of surfaces**	**Helical undulator (Apple II type)**
BOREAS	**Soft X-Ray Magnetic Circular Dichroism**	**Electronic and magnetic properties of materials**	**Helical undulator (Apple II type)**

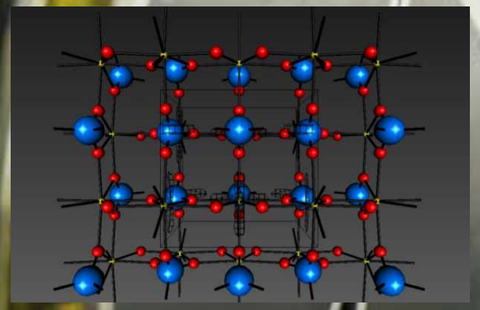
Energy	3 GeV
Current	100-250 mA
Emittance	4.4 nm·rad
Energy spread ΔE/E	$1.00 \cdot 10^{-3}$
Coupling	0.5%
Lifetime @ 100 mA	20h
Ah accumulated	>200

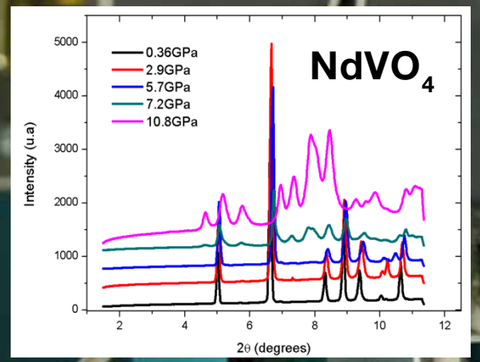
	Time Structure	
	Bunch length	Bunch separation
Multibunch mode	$\sigma = 15$ ps	2 ns
Single bunch mode	$\sigma \geq 15$ ps	896 ns

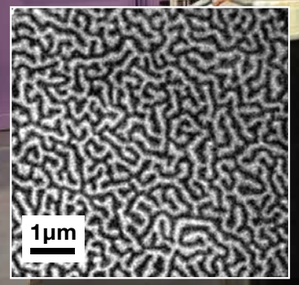
Storage Ring Status

Insertion device ports	
Long straight sections (8 m length)	3 available
Medium straight sections (4 m length)	6 available
Bending magnet ports	15 available

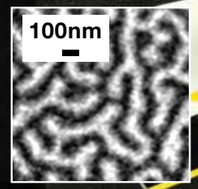
Free ports for Beamlines

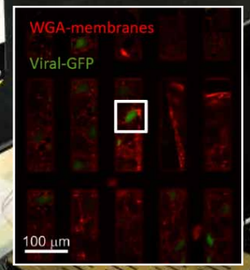




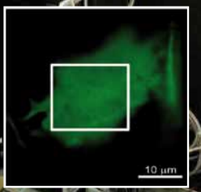


Ferromagnetic domains in Co/Pt multilayer at 778 eV





Virus-infected cells



BL04 MSPD

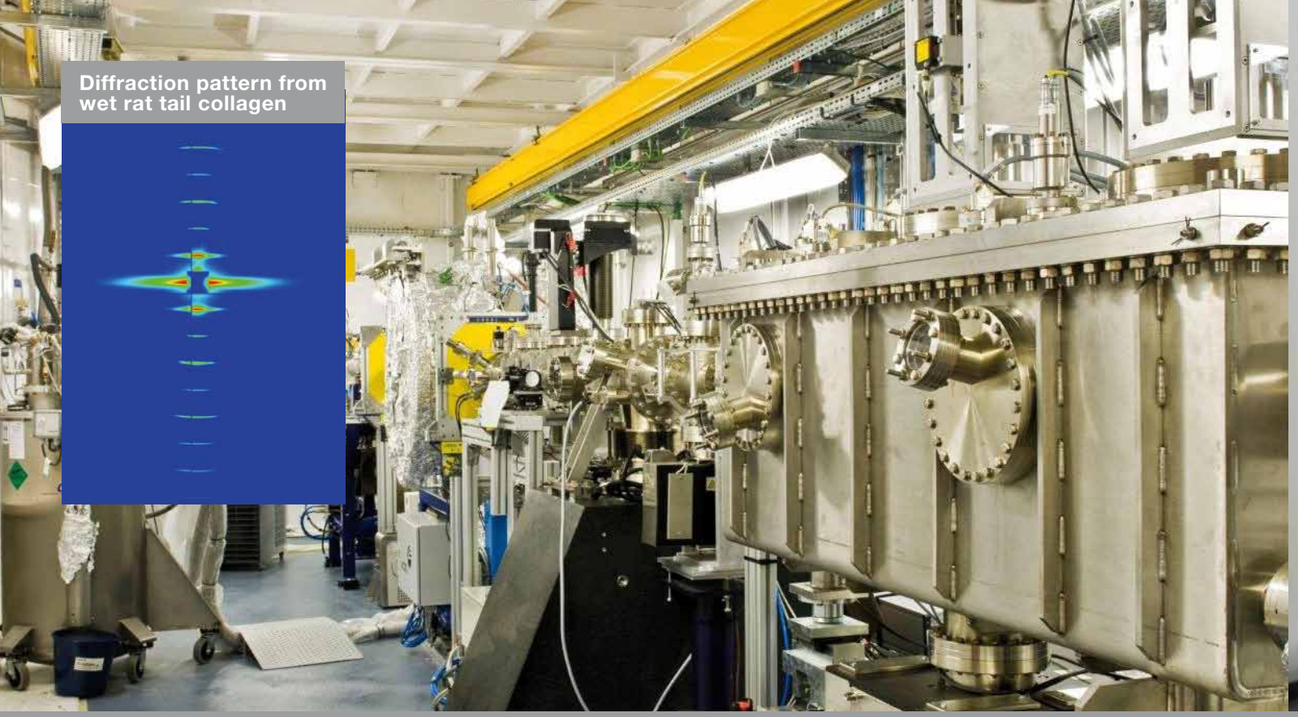
Materials Science & Powder Diffraction

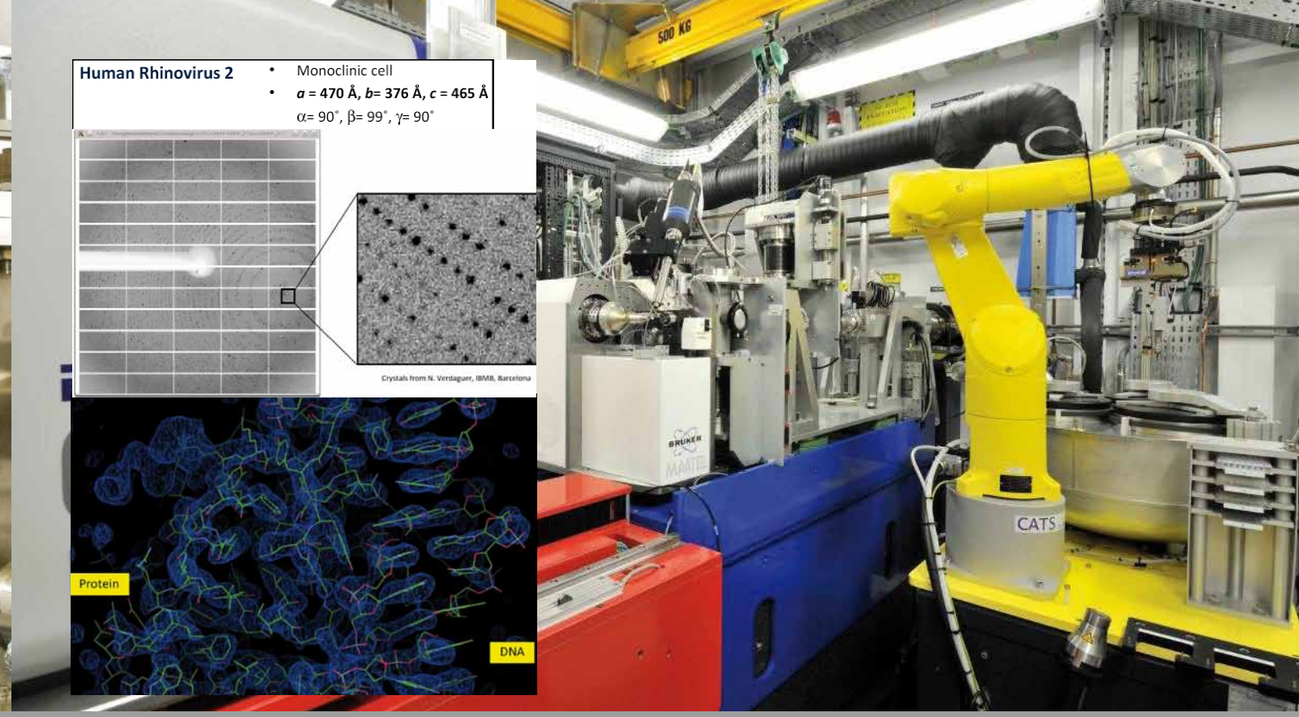
- *Two state-of-the-art end stations:*
  - *High resolution powder diffraction.*
  - *High pressure powder diffraction using diamond anvil cells.*
- *Photon energy range: 8 - 50 keV.*

BL09 Mistral

Transmission Soft X-Ray Microscopy

- *Cryo nano-tomography in water window for biological applications.*
- *Spectroscopic imaging of thin films.*
- *Photon energy range: 0.27 - 1.2 keV.*



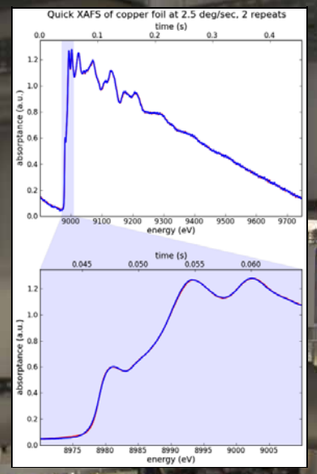


BL11 NCD
Non-Crystalline Diffraction

- *Simultaneous recordings of SAXS and WAXS for structural and functional insight at the molecular level.*
- *Study of long- and short-range structures in soft condensed matter.*
- *Time resolution of milliseconds.*
- *Photon energy range: 6.5 - 13 keV.*

BL13 XALOC
Macromolecular Crystallography

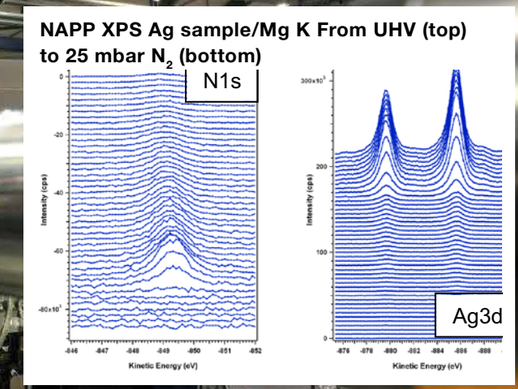
- *Flexible and reliable for solving structures of macromolecules and complexes.*
- *Copes with a broad variety of crystal sizes and unit cell parameters.*
- *Allows both wavelength dependent and independent experiments.*
- *Photon energy range: 5 - 22 keV.*

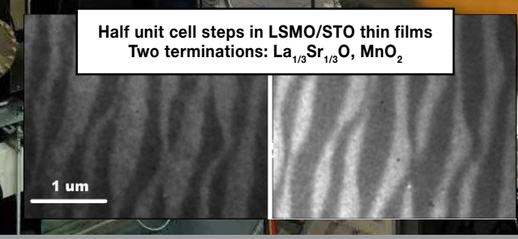


BL22 CLÆSS

Absorption & Emission Spectroscopies

- *Simultaneous & unified access to complementary techniques: Absorption and emission spectroscopies.*
- *Quick EXAFS.*
- *Photon energy range 2.4 – 65 keV.*

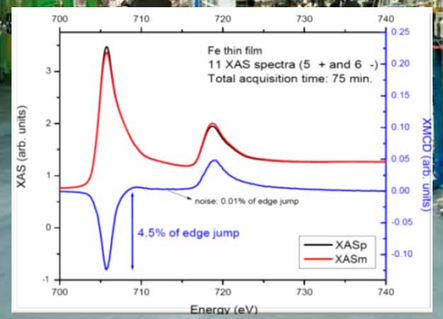




BL24 CIRCE

Photoemission Microscopy & Spectroscopy

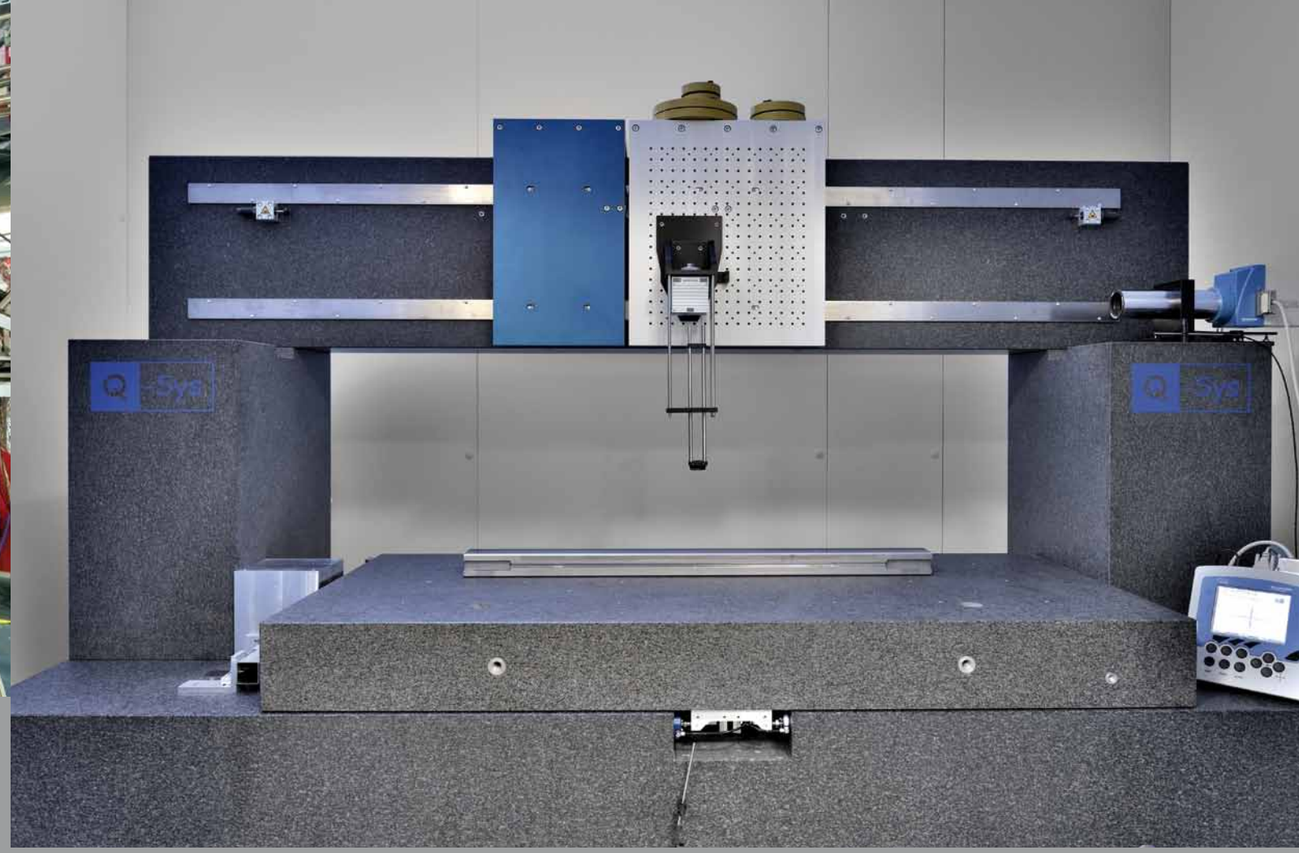
- *Variable polarization BL dedicated to advanced photoemission microscopy and spectroscopy.*
- *Two state-of-the-art end stations:*
  - *PEEM (photoemission electron microscopy).*
  - *NAPP (near ambient pressure photoemission).*
- *Photon energy range: 0.1 - 2.0 keV.*



BL29 BOREAS

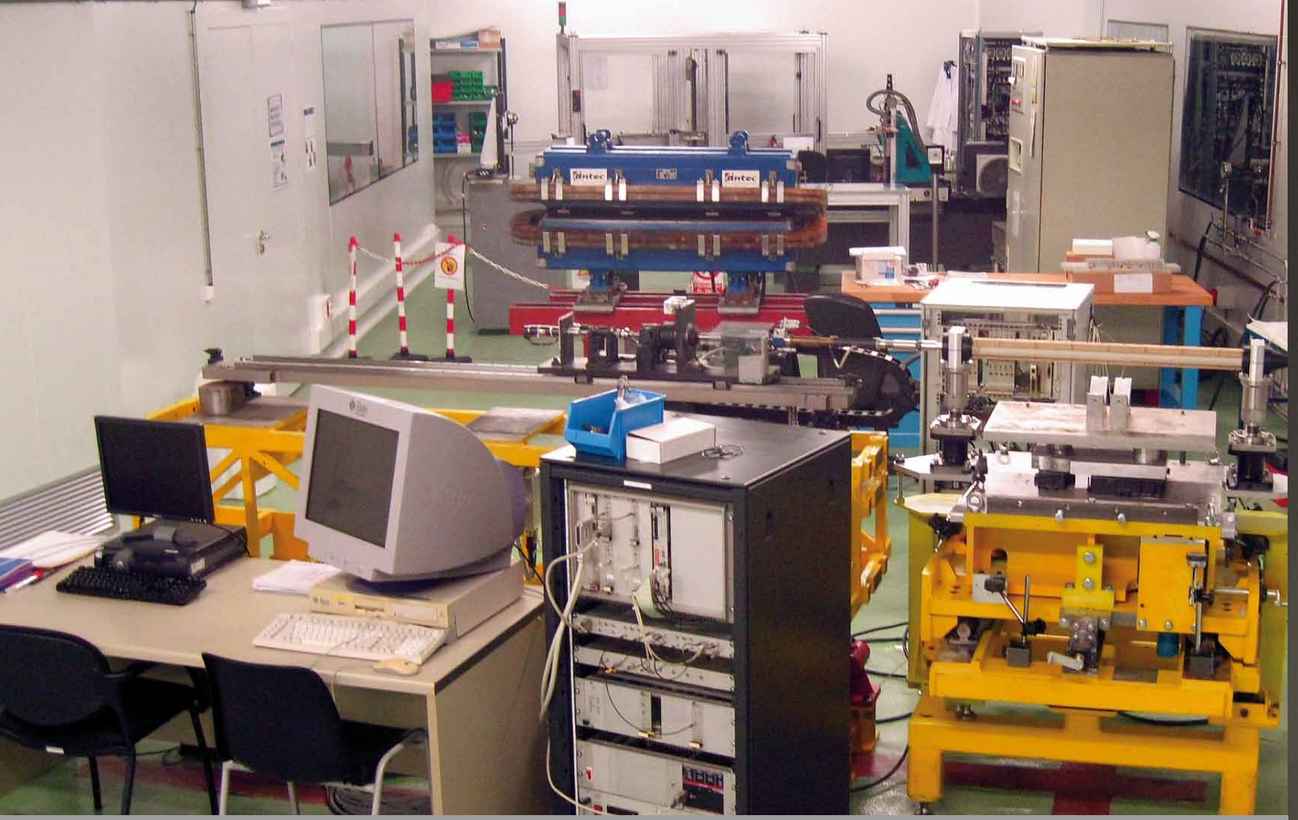
Resonant Absorption & Scattering

- *Dedicated to polarization-dependent spectroscopies of advanced materials.*
- *Two cutting-edge end stations:*
  - *HECTOR vector magnet (up to 2 / 6 Tesla) for absorption methods.*
  - *MARES UHV reflectometer for scattering and reflection measurements.*
- *Photon energy range: 0.08 - 4.0 keV.*



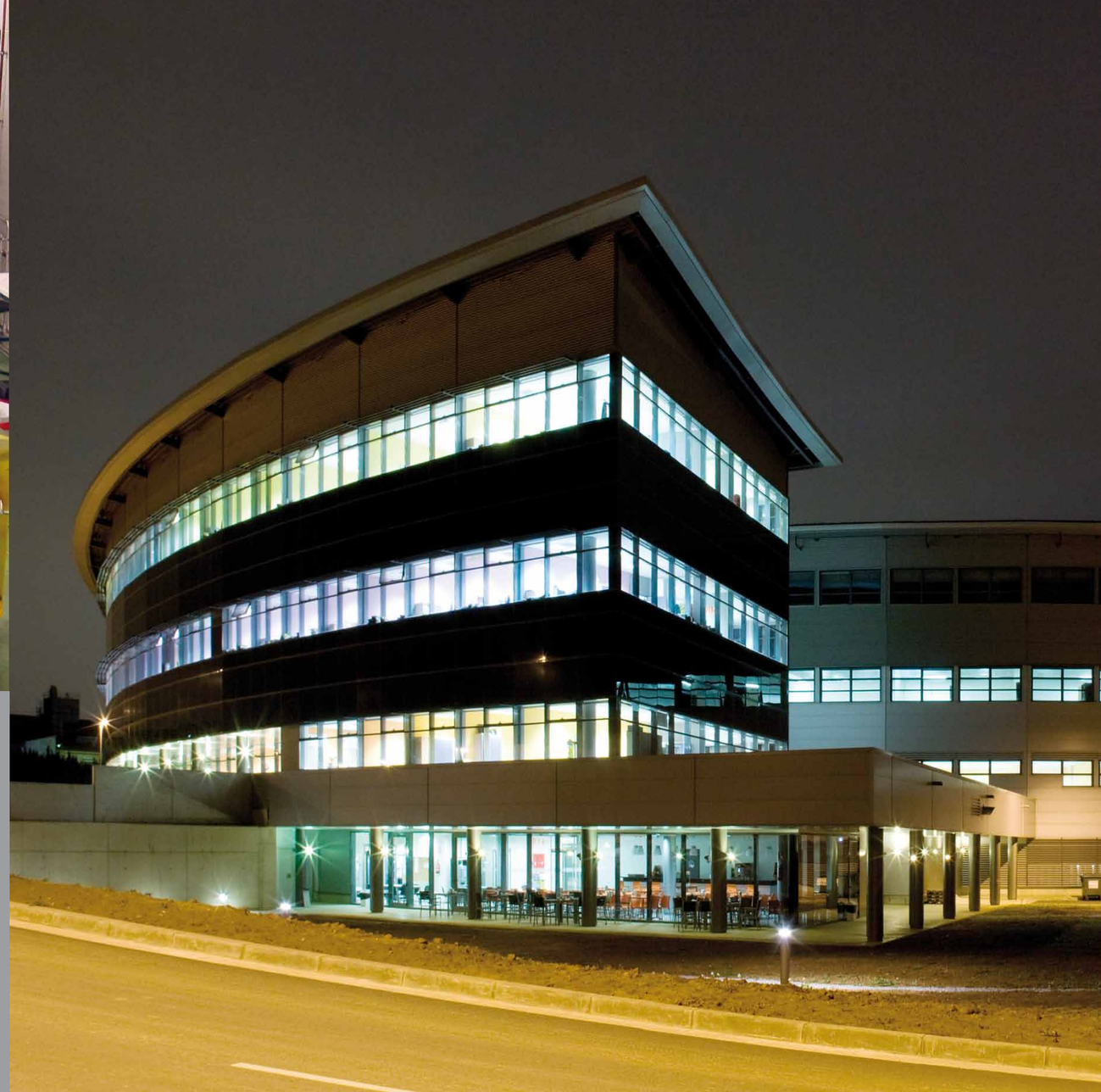
LABORATORY OF OPTICS AND METROLOGY

- *Metrology of large optical surfaces (1.5 m long), with arbitrary figure with sub-nanometer accuracy (λ/1000)*
- *Metrology of positioning systems, mechanical performances and vibrations.*



LABORATORY OF MAGNETIC MEASUREMENTS AND INSERTION DEVICES

- *Characterization of permanent magnets and electromagnets.*
- *Accurate 3D fieldmaps measurement of big magnetic structures.*
- *3D modelling of magnetic structures and measured data analysis.*



GOBIERNO DE ESPAÑA
MINISTERIO DE ECONOMÍA Y COMPETITIVIDAD

Generalitat de Catalunya

The ALBA Synchrotron Radiation Facility is the most important scientific infrastructure ever built in Spain. It is a member of the ICTS net.

It allows visualization of the atomic structure of matter as well as the study of its properties.

It will significantly enhance the scientific and industrial competitiveness in the South-West of Europe.

ALBA

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