

The background of the slide features a large, faint watermark of the University of Toronto crest. The crest is circular, with the words "UNIVERSITAS" at the top and "TORONTO" at the bottom. In the center is a shield with a checkered pattern and a sunburst emblem. Above the shield is a crown and a banner with the motto "LIBERTAS PERFUNDET OMNIA LVCE".

## **RESEARCH SUPPORT CENTRES**

## WHO WE ARE

The Madrid Complutense University Research Support Centres have the facilities required to enable the work and research of our professors. We provide equipment and facilities essential for the development of studies in a wide range of fields, continuously updating our equipment and investing in the ongoing improvement of our installations.

RSCs play an essential role in the research structure of the University, improving the performance and return on investment of large scientific equipment, in addition to facilitating the work of both our professors and other public and private institutions, thanks to support from our teams consisting of highly qualified professionals.



### MISSION

To provide research assistance by combining the extensive experience of a team of 130 highly qualified technicians and first-class facilities.



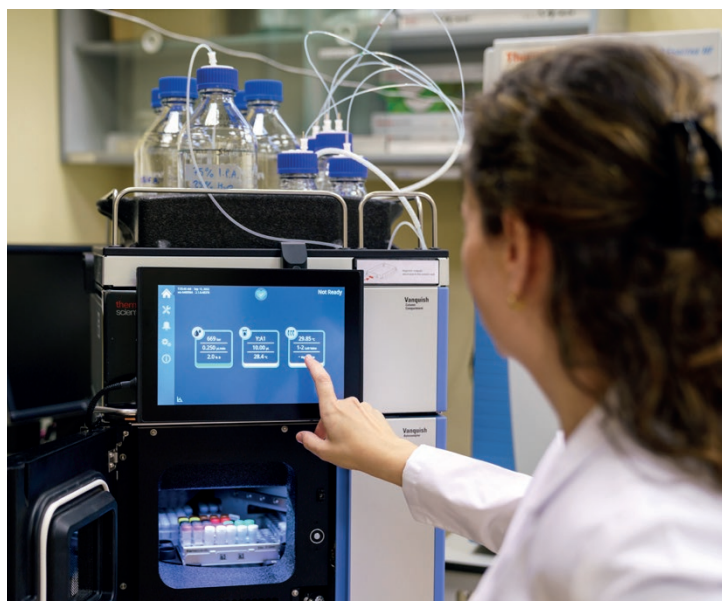
### VISIÓN

To promote research, technological development and innovation at UCM.



### VALORES

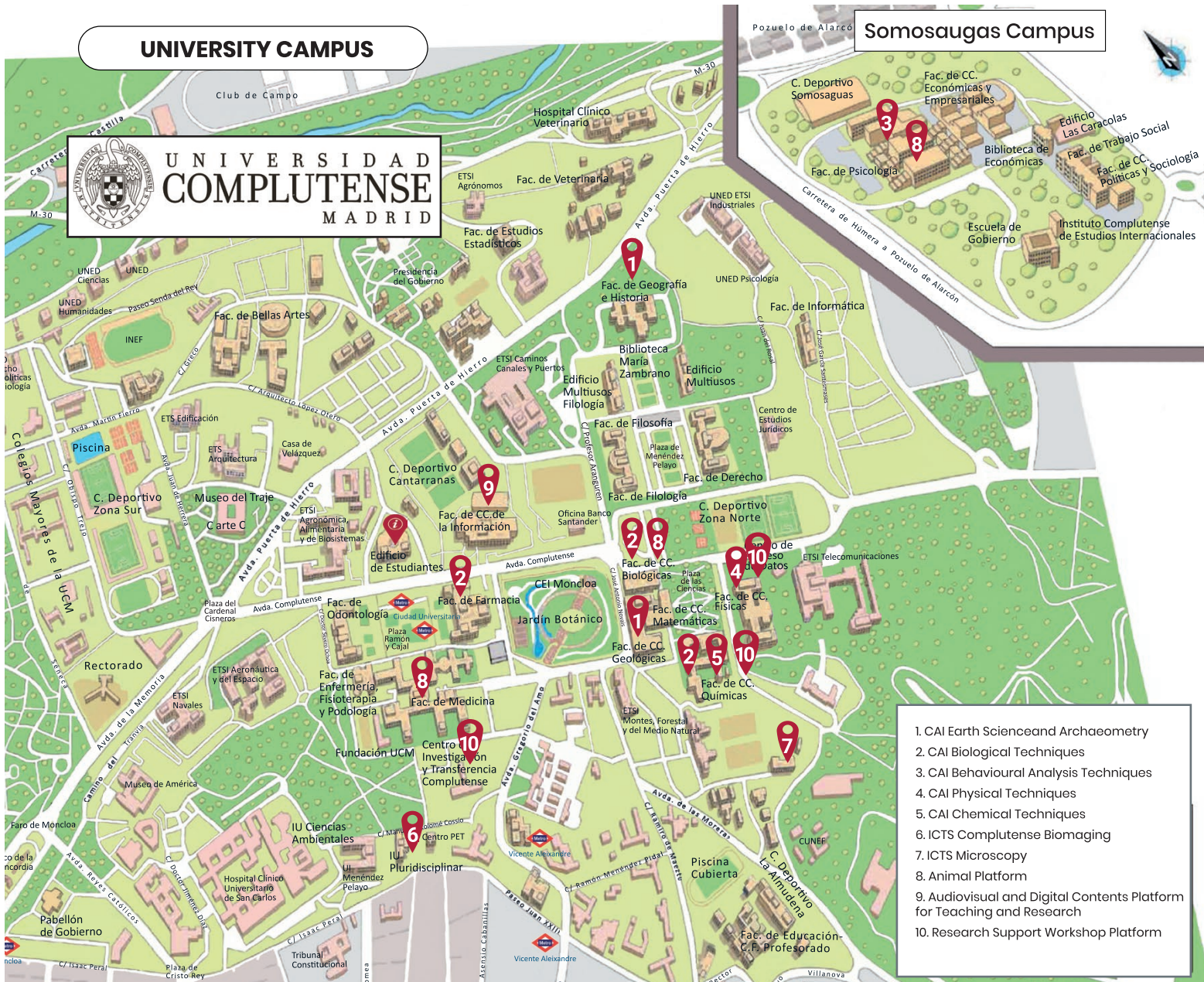
- › Avant-garde
- › Excellence
- › Teamwork
- › Collaboration
- › International leadership





## OUR FACILITIES

The UCM Research Support Centres (RSC) consist of two Unique Science and Technology Infrastructures (ICTS), five Research Support Centres with their corresponding Units and three Platforms.





## ICTS COMPLUTENSE BIOIMAGING

The ICTS Complutense Bioimaging, BiolmaC, is a unique Science and Technology Infrastructure that offers advanced biological imaging services (anatomical, functional and molecular) in the fields of Nuclear Magnetic Resonance (NMR) and Positron Emission Tomography (PET), together with Computerised Axial Tomography (CT).

### SERVICES:

High resolution electroencephalography  
Spectroscopy of semi-solid samples (tissues, foodstuffs, etc.)  
Pre-clinical magnetic resonance imaging  
Pre-clinical molecular imaging  
Veterinary imaging  
Radiotracers

### FACILITIES:

Bruker BIOSPEC 47/40  
Bruker ICON-IT  
Bruker AVIII 500MHz  
PET/CT Equipment  
Veterinary imaging equipment  
Electroencephalography equipment





## ICTS MICROSCOPY

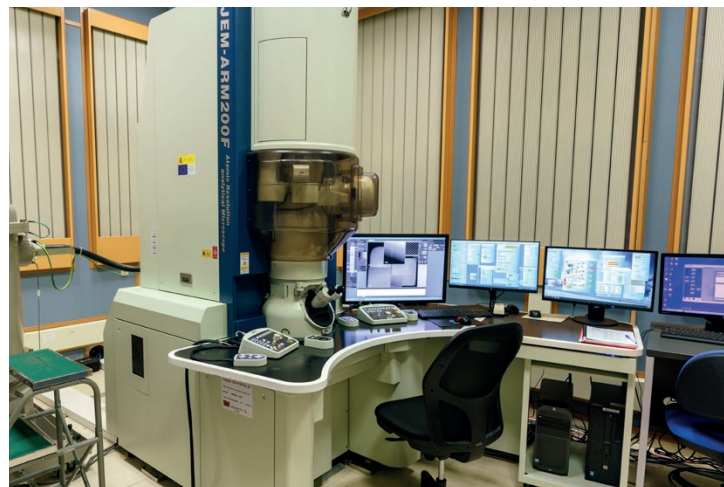
The National Centre for Electron Microscopy, NCEM, the main multidisciplinary action of the Moncloa Campus of International Excellence, is designed to develop, implement and offer the national and international scientific community the most advanced methods and techniques in transmission and scanning electron microscopy for the structural analysis of materials. .

### SERVICES:

AFM Atomic force microscope  
ARM200 cF with aberration corrected condenser lens  
GRANDARM300 with aberration corrected objective lens  
JSM6335 scanning electron microscope  
JSM6400 scanning electron microscope  
JSM7600 scanning electron microscope  
CM200FEG transmission microscope  
JEM1010 transmission microscope  
JEM1400 plus transmission microscope  
JEM2100HT transmission microscope  
JEM3000 transmission microscope  
WDS JXA 8900 microprobe

### FACILITIES:

AFM Multimode Nanoscope III A (Bruker)  
JEM 1010  
JEM 2000FX  
JEM 2100HT  
JEM ARM200CF: with aberration corrected condenser lens  
JEM ARM300CFEG: with aberration corrected objective lens  
JEM-1400  
JEM-3000F  
JSM 6400  
JSM 7600F  
JSM6335F  
PHILIPS CM200FEG  
SUPERPROBE JXA-8900 M



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# CAI EARTH SCIENCES AND ARCHAEOMETRY

## ARCHAEOMETRY AND ARCHAEOLOGICAL ANALYSIS UNIT

### SERVICES:

3D scanning of small and medium sized archaeological pieces  
Orthophotos. DRONE flights. Digital Surface Models. Photo Interpretation.  
Remote sensing. Aerial Imaging. Aerial Videos  
Geophysical Prospecting with 3D georadar  
topography with GPS TOPCON GR5



## GEOCHRONOLOGY UNIT

### SERVICES:

Analysis of the isotopic composition of Nd  
Analysis of the isotopic composition of Pb in sulphides  
Analysis of the isotopic composition of Sr in waters  
Analysis of the isotopic composition of Sr in Rb-poor samples  
Analysis of the isotopic composition of Sr in total rock (silicates)  
Analysis of the isotopic composition of Sr y Nd  
Analysis of Sr and Nd ambos by Isotopic Dilution  
Analysis Rb-Sr by Isotopic Dilution  
Sm-Nd analysis by Isotopic Dilution





## GEOLOGICAL TECHNIQUES UNIT

### SERVICES:

Total Organic Carbon -TOC Analysis

Mercury Analysis by Atomic Fluorescence Spectrometry (CV-AFS) Granulometric Analysis

Granulometric Analysis

Gas Chromatography-Mass Analysis (GC-MS)

Analysis by Ion Chromatography (IC)

X-Ray Diffraction Analysis (XRD)

Analysis by UV-Visible Spectrophotometry

Analysis by Spectrometry (GF-AAS)

Analysis by X-Ray Fluorescence Spectrometry (XRF)

Analysis by ICP Spectrometry (ICP-OES, ICP-MS)

FT-IR Spectroscopy Analysis

Scanning Electron Microscopy (SEM) Analysis

Optical Microscopy Analysis

Elemental Chemical Analysis

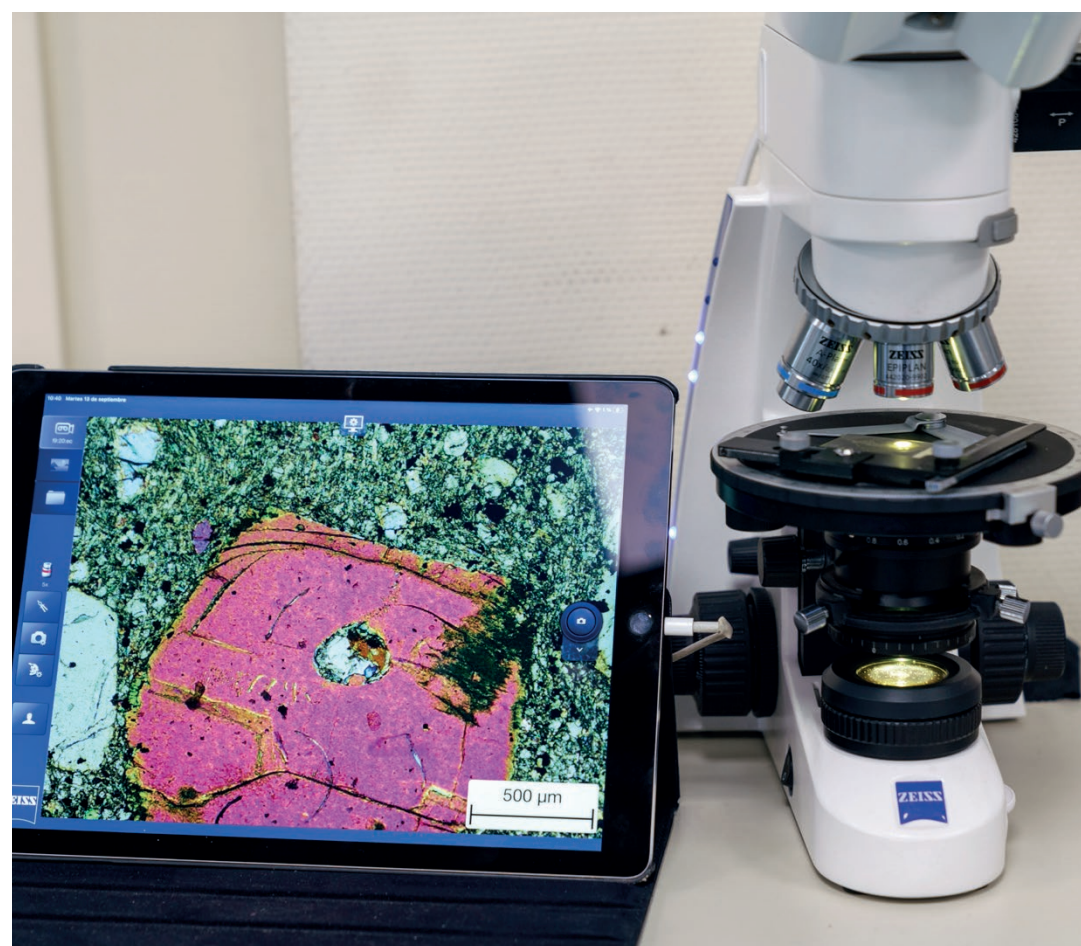
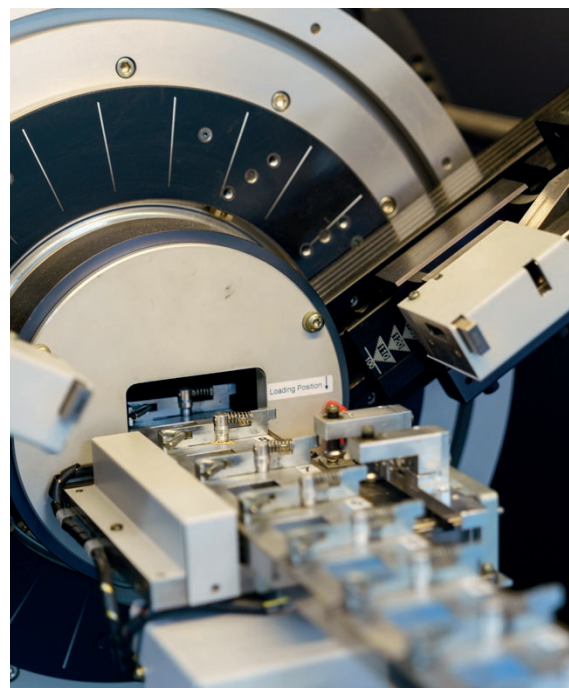
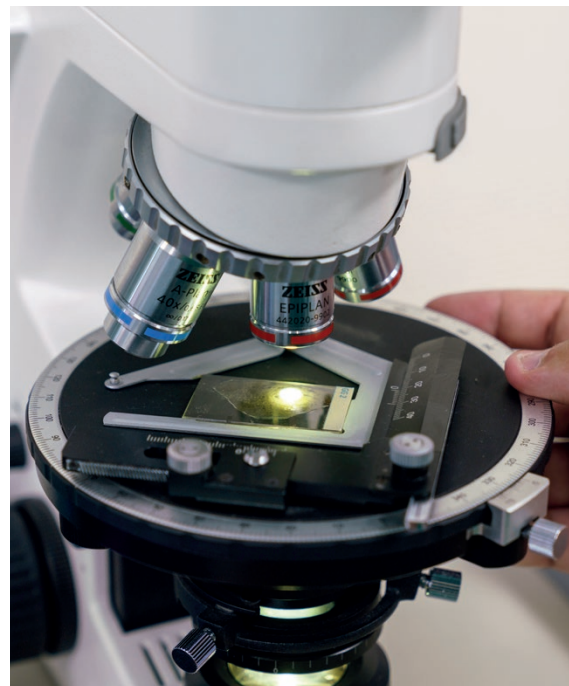
Thermal Analysis (TG, ATD, DSC)

Determination of Cation Exchange Capacity (CEC)

Determination of Nitrates by UV-Vis

Geotechnical tests: Atterberg limits, humidity, density...

Preparation of thin films





## CAI BIOLOGICAL TECHNIQUES

### FLOW CYTOMETRY AND FLUORESCENCE MICROSCOPY UNIT

#### SERVICES:

##### Flow cytometry

Flow cytometry, acquisition (1 or 2 lasers)

Flow cytometry, acquisition (3 lasers)

Flow cytometry, data analysis

Flow cytometry, separation

##### Microscopy

Fluorescence Correlation Spectroscopy (FCS)

Bright-field microscopy

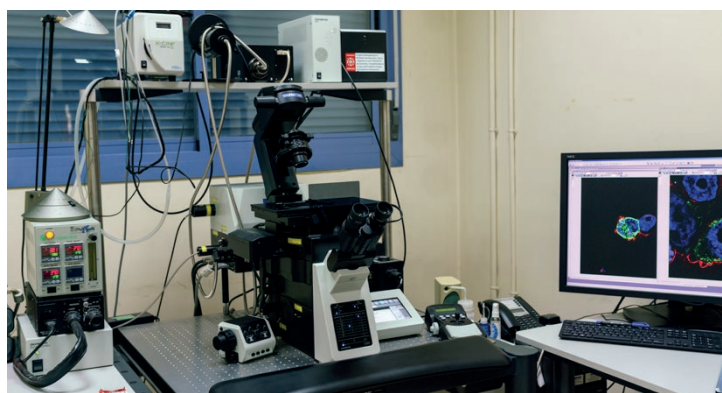
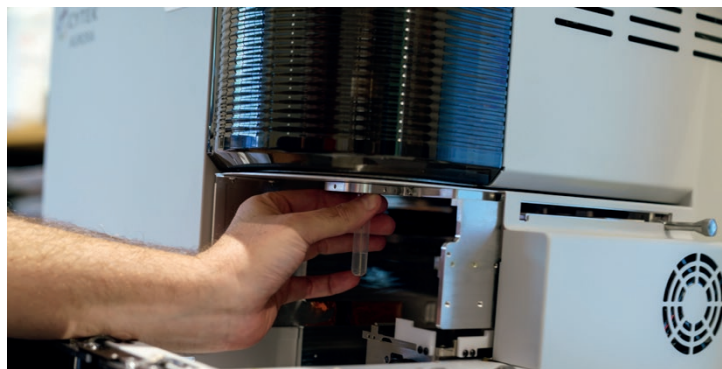
Confocal laser scanning microscopy

Multiphoton Microscopy

Fluorescence Microscopy

##### Sample Preparation

Cryotomy of frozen samples



### PROTEOMICS UNIT

#### SERVICES:

##### Mass Spectrometry

Protein Mass Determination

Identification by Peptide Fingerprinting and  
Fragmentation (MALDI-TOF/TOF)

Peptide Sequencing

##### Mass Spectrometry coupled to liquid chromatography

LC-MS/MS

Differential expression study or quantitative proteomics  
(labelled or unlabelled)

Post-translational modification study

Targeted proteomics studies

Protein separation

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## GENOMICS UNIT

### SERVICES:

DNA fragment analysis

Microarrays

Real-time quantitative PCR

PCR-Q plate

PCR-Q Taqman Low Density Array

Taqman probes

NGS - massive sequencing

16S metagenome libraries

MiSeq sequencing

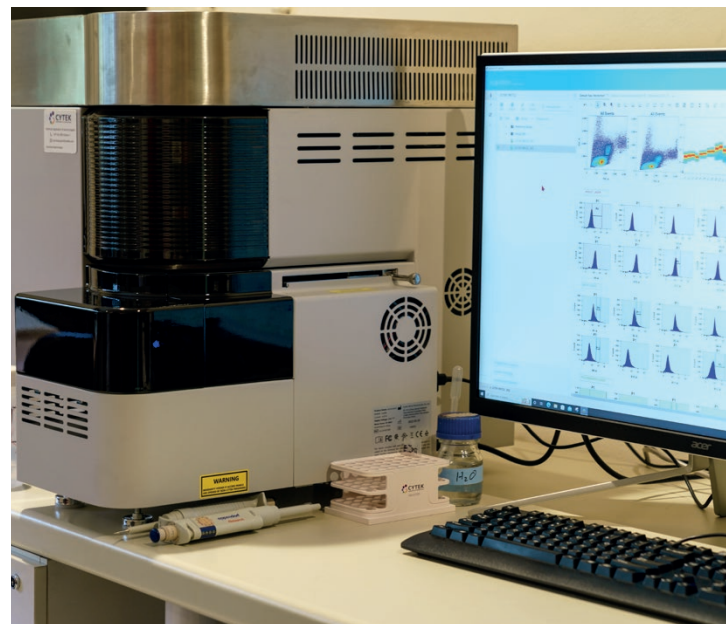
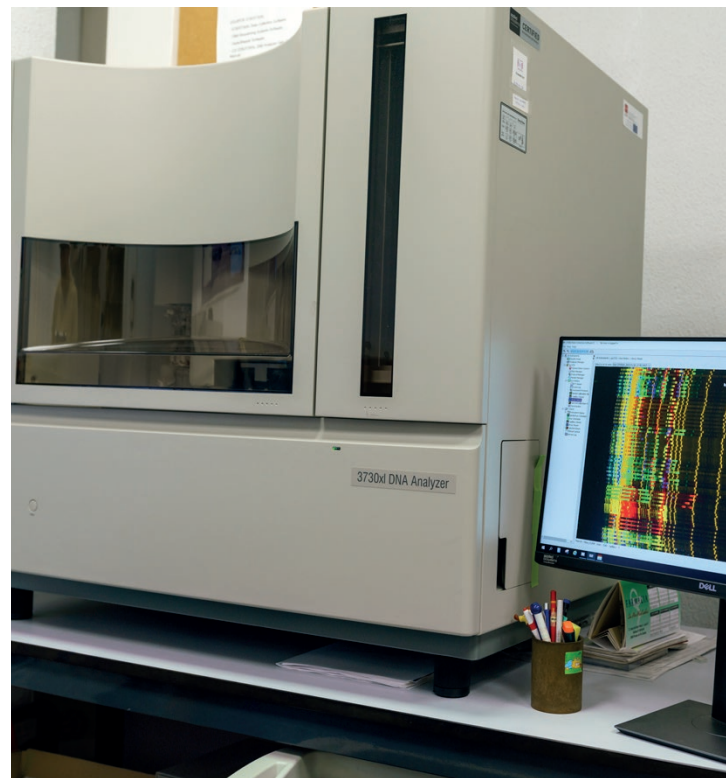
Sanger DNA Sequencing

Additional services

Experimental design and analysis

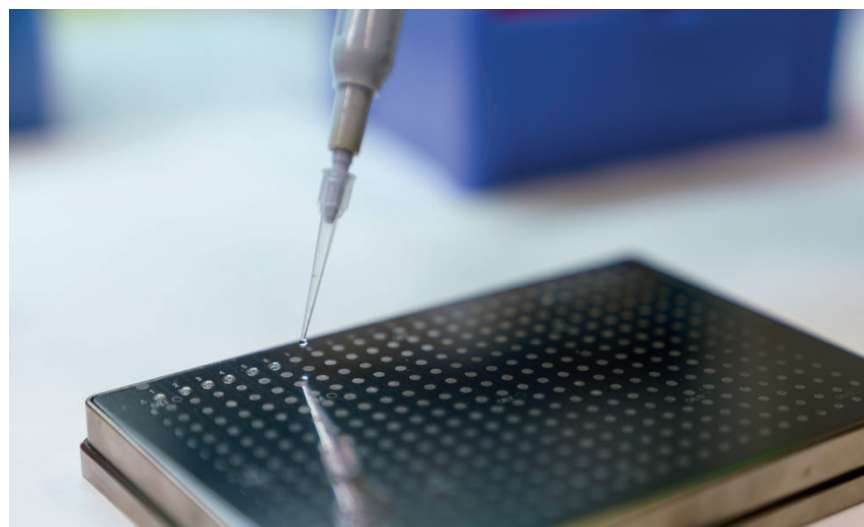
Nucleic acid extraction

Molecular identification of microorganisms



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los materiales a nivel molecular**

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# CAI CHEMICAL TECHNOLOGIES

## X-RAY DIFFRACTION UNIT

### SERVICES:

#### Single crystal diffraction

UDRX single crystal X-ray diffraction at low temperature

UDRX single crystal X-ray diffraction at room temperature

#### Polycrystal diffraction

UDRX Entry into UDRX analysis computer

UDRX Conventional diffraction, grazing incidence, reflectometry, rocking curve, 2 $\theta$ -w on thin film and parts

UDRX UDRX Powder diffraction by conventional measured reflection

UDRX X-ray powder diffraction by reflection in high temperature chamber / low temperature chamber

UDRX X-ray powder diffraction by transmission in capillary with Cu K $\alpha$ 1+2 radiation / with monochromatic Cu K $\alpha$ 1 radiation

UDRX X-ray powder diffraction by transmission in capillary with Cu K $\alpha$ 1+2 radiation

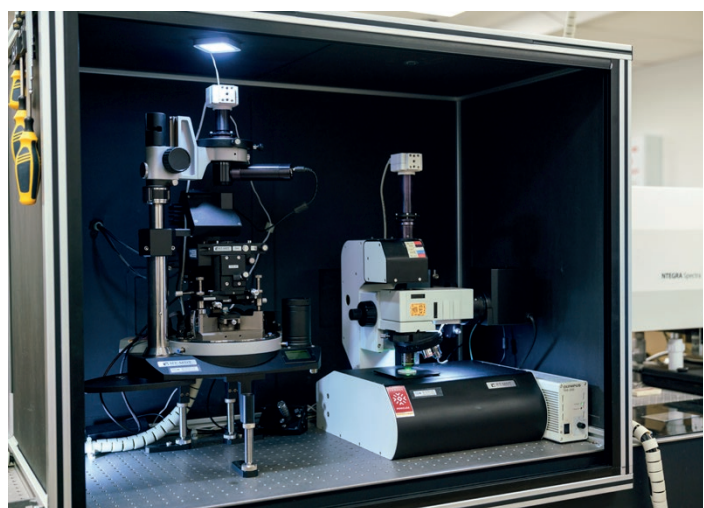
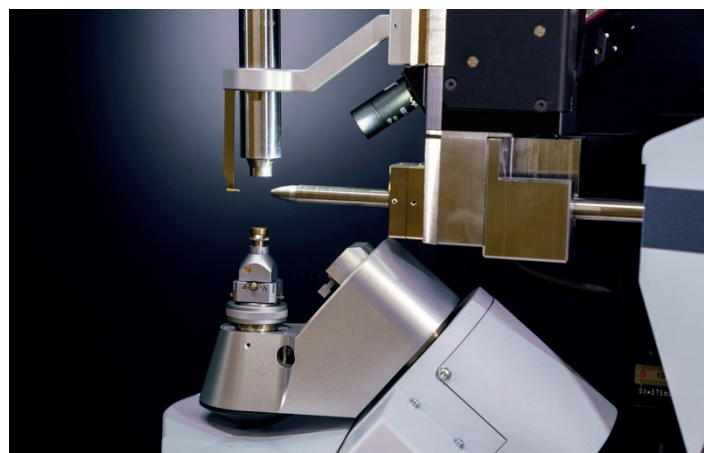
UDRX X-ray powder diffraction by reflection with monochromatic Cu K $\alpha$ 1 radiation

UDRX UDRX Special Measurements in X'Pert PRO MRD diffractometer.

Textures, residual stresses, reciprocal space maps

#### Fluorescence

UDRX Wavelength dispersive X-ray fluorescence/quantitative analysis/semi-quantitative analysis/trace element analysis.



## SPECTROSCOPY AND CORRELATION UNIT

### SERVICES:

Ellipsometry

Imaging Ellipsometry or Brewster Angle

Ellipsometry Thickness measurement

Ellipsometry Photonic correlation spectroscopies

Angular intensity distribution

Photonic correlation spectra

Differential refractive index

Infrared spectroscopy

IR spectra analysis / database search

FTIR spectrum with grazing incidence / FTIR spectrum with microscope

FTIR spectrum in ATR / FTIR spectrum in transmission Infrared mapping

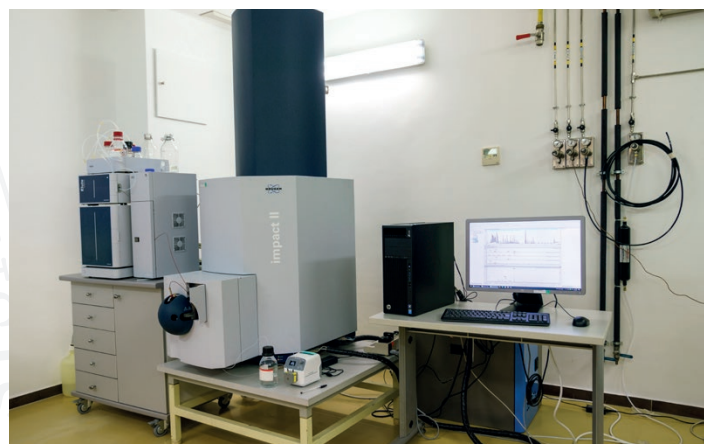
KBr pellet preparation

Raman spectroscopy

Raman spectrum or micro-Raman

Confocal Rayleigh imaging

Raman map



## ELEMENTAL MICROANALYSIS UNIT

### SERVICES:

CHN/CHNS Analysis

## MASS SPECTROMETRY UNIT

### SERVICES:

Quantitative analysis

Data analysis

Non-routine analysis

Accurate mass determination of pure compound

Gas chromatographic

Liquid chromatographic separation trial

Mass spectra of pure compound

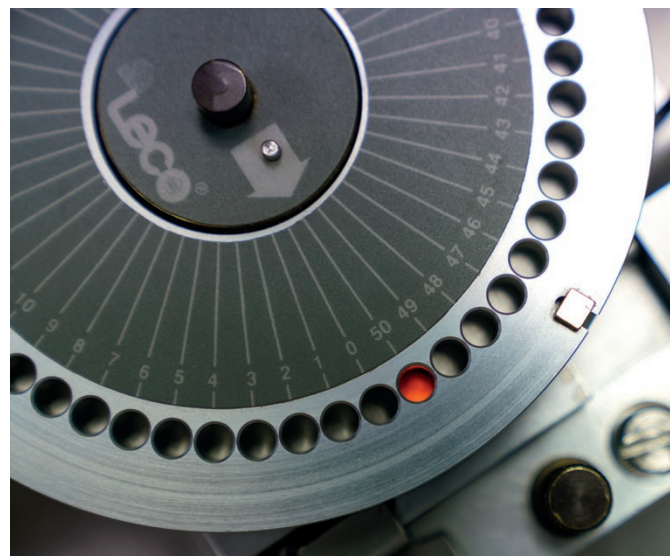
MS-MS fragmentation study



## ULTRAFAST LASER UNIT

### SERVICES:

Laser ablation, laser desorption/ionisation and MALDI of solid samples with time-of-flight mass spectrometry  
 Characterisation of femtosecond laser pulses (FROG, Dazcope)  
 Design and preparation of optical and charged particle detection systems (ions, photoelectrons)  
 Photochemistry, photodissociation and molecular photofragmentation by speed mapping with ion and photoelectron imaging and nanosecond and femtosecond laser pulses  
 fsPLD  
 Irradiation of electronic devices with femtosecond laser pulses  
 Femtosecond laser pulses  
 MALDI  
 Measurements of fluorescence lifetimes  
 Laser Induced Breakdown Spectroscopy (LIBS)  
 Photoluminescence measurements of solid and liquid samples  
 Microprocessing of materials with femtosecond laser pulses  
 Surface modification of materials with pulsed lasers  
 Molding of femtosecond laser pulses  
 Assembly and set-up of experimental systems  
 nsPLD  
 Production of nanostructured materials and thin films by femtosecond pulsed laser deposition (fsPLD)  
 Use of fiber optic ICCD camera (UV-VIS-IR)  
 Use of UV-VIS-IR fiber optic spectrometers (200-1700 nm)  
 Use of laser radiation  
 VMI



## MAGNETIC RESONANCE IMAGING UNIT

### SERVICES:

AV 400 MHz WB (solid state NMR). Equipment use and sample preparation  
 AV 500 MHz - Sample preparation  
 AV 500 MHz - Use of the equipment (with technician) during daytime/night-time  
 AVIII 700 MHz - Use of the equipment (with technician) during daytime  
 AVIII 700 MHz - Use of equipment at night-time  
 AVIII 700 MHz - Sample preparation  
 AVIII HD / DPX 300 MHz - Sample preparation  
 AVIII HD 300 MHz BACS-60 - Use of the equipment  
 Deuterated Solvents  
 Cryogenic gases and liquids for variable temperature  
 Neo 300 MHz - Daytime/night-time use of the instrument  
 RSE Bruker EMX - Sample preparation  
 RSE Bruker EMX - Equipment use



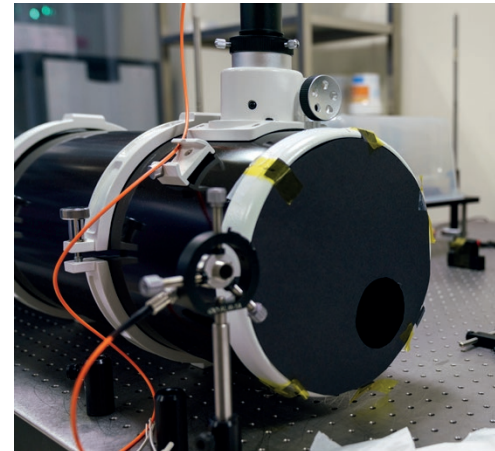


# CAI PHYSICAL TECHNOLOGIES

## ADVANCED SCIENTIFIC INSTRUMENTATION UNIT (LICA)

### SERVICES:

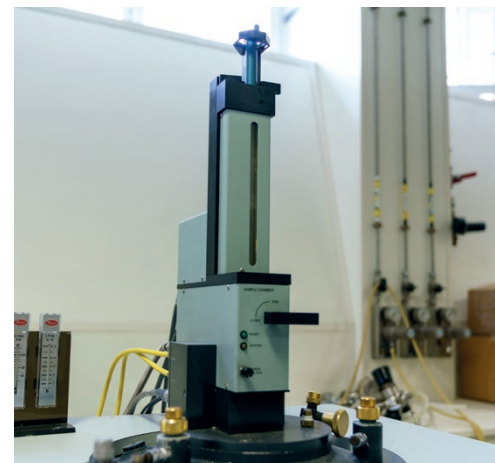
- Calibration of digital cameras
- Characterisation of optical fibers and other elements
- Characterisation of CCD detector
- Characterisation of an optical filter
- Spectral characterisation of lamps
- Characterisation and documentation of a holographic network
- Ultrasonic cleaning
- Diagnostic services of optical and detection systems



## MAGNETOMETRY AND CRYOGENICS UNIT

### SERVICES:

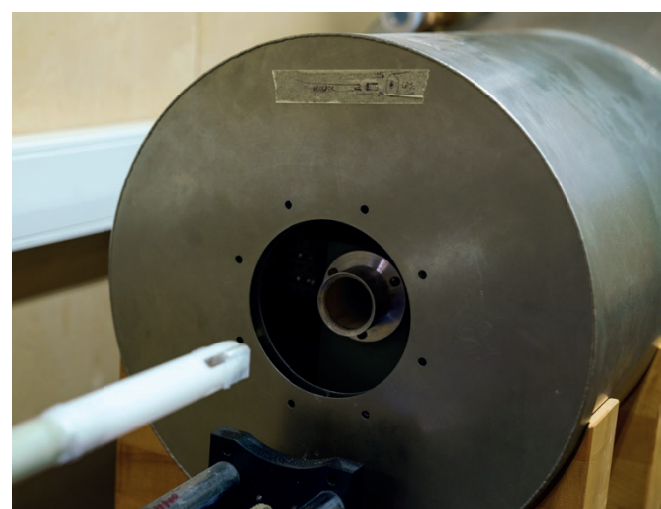
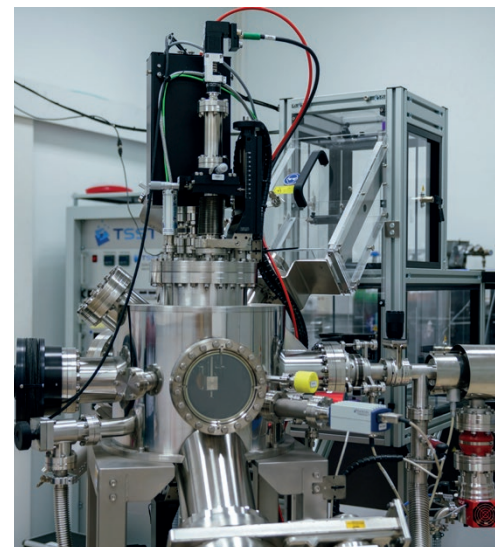
- High pressure and temperature synthesis
- Liquid nitrogen supply
- Variation with temperature of electrical resistivity at low temperatures
- Variation of magnetisation with magnetic field at high temperature
- Variation of magnetisation with magnetic field at low temperature
- Thermal variation of heat capacity at low temperatures
- Thermal variation of magnetisation at high temperatures
- Thermal variation of magnetisation at low temperatures



## HIGH PRESSURE OXYGEN SPUTTERING AND LITHOGRAPHY UNIT

### SERVICES:

- Conditioning and optimisation of unavailable target
- Thin film, heterostructure or superlattice growth
- Sputtering target bonding
- Reservation of the high-pressure oxygen sputtering unit
- One use of the spinner to deposit resin on the sample
- One hour of RAITH 50-unit use with technician

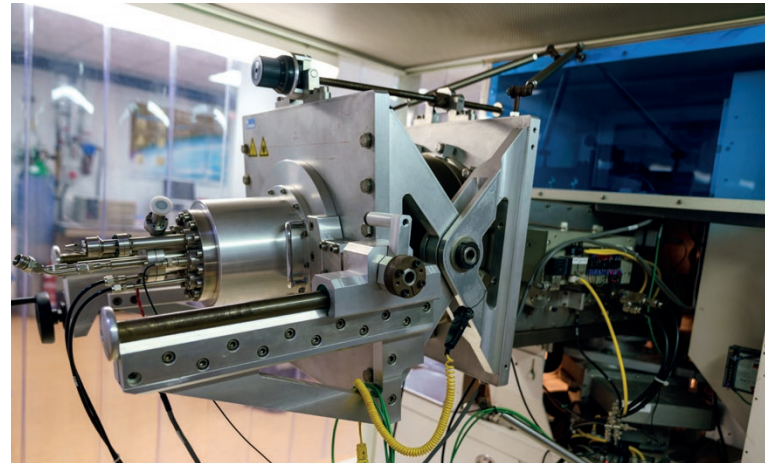




## IONIC IMPLANTATION UNIT

### SERVICES:

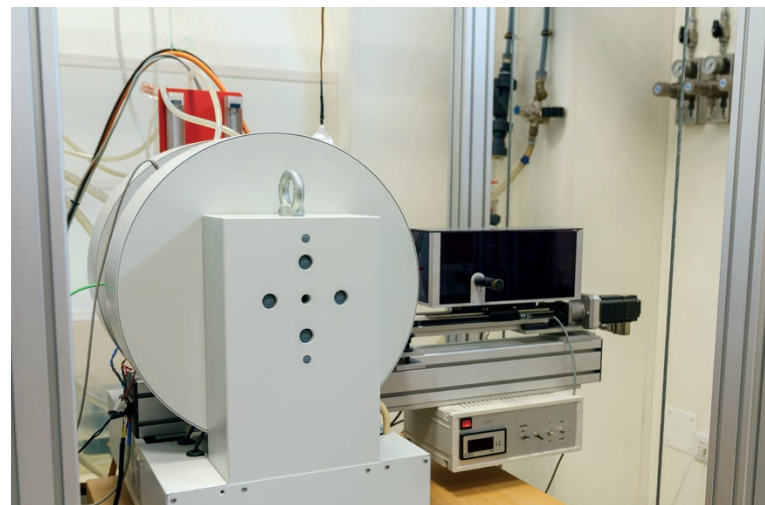
Technical consultancy  
Leak detection  
ECR CVD  
Evaporation  
Ionic Implantation  
Lithography  
RTA  
Clean room use



## PALEOMAGNETISM UNIT

### SERVICES:

Hysteresis cycle at room temperature (field max = 1 T)  
Thermomagnetic curve (TMAX 700 °C)  
HP demagnetisation  
Thermal demagnetisation  
Measurement of natural remanent magnetisation NRM  
Reservation and use of 2G magnetometer  
Reservation and use of the entire laboratory  
Reservation and use of the bartington  
Reservation and use of the furnace

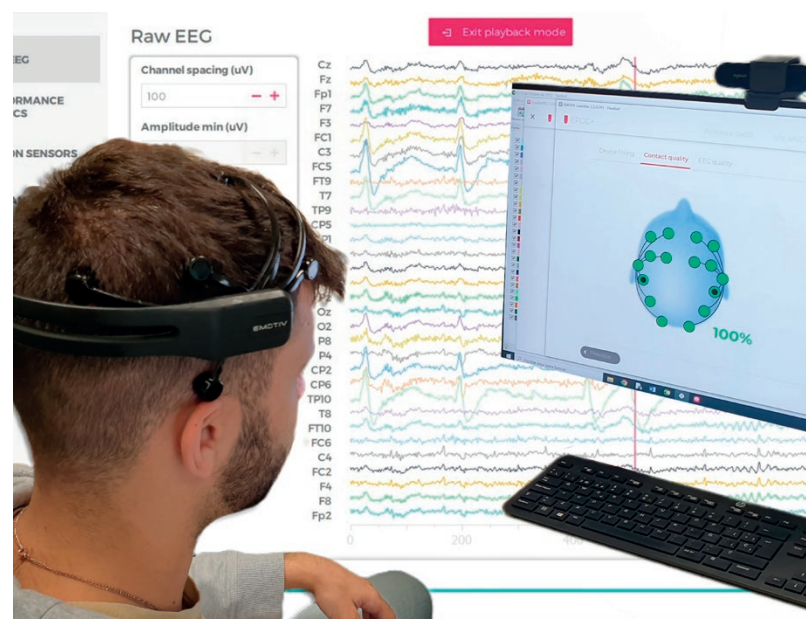


## CAI BEHAVIOURAL ANALYSIS TECHNIQUES

## BEHAVIOURAL ANALYSIS UNIT

### SERVICES:

Audiometer  
Viewing room  
Digitisation / duplication  
Video editing  
ENG / HD mobile video equipment  
IOPI 2.3  
Ocular movements and pupillometry  
MultiTENS  
MyoPlus 2 Pro  
Neurobit with Bioexplorer  
Psious  
Pulse oximeter  
Audio / video realisation  
SCAN / SCAN analysis  
HD recording set  
Sound level meter  
Tachistoscope





## ANIMAL FACILITY PLATFORM

### Advice on the approach and development of experimental trials regarding:

- Maintenance and conservation of animal colonies
- Management of the acquisition and maintenance of different species of experimental animals
- Housing of the different species and strains under desired conditions
- Handling, inoculation, protocols and fluid extraction
- Anaesthesia of animals
- Humane slaughter of experimental animals
- Advice on compliance with the protocols required by the UCM Animal Experimentation Committee
- Alternatives to the use of experimental animals
- Prevention and sanitary treatment of animals housed in the "Animal Facility" regarding the use of antiparasitic agents and post-surgical treatments, among others.
- Control of animal waste (faeces, nesting, carcasses) to avoid potential environmental risk

## AUDIOVISUAL AND DIGITAL CONTENTS FOR TEACHING AND RESEARCH PLATFORM

### SERVICES

- Dissemination of scientific events, meetings, gatherings and conferences using life streaming technology via the web
- Scientific and informative documentaries
- Reports, pieces and news in audio-visual media
- Scientific and informative documentary series
- Techniques and processes
- Didactic units focused on teaching and teaching innovation. MOCCs

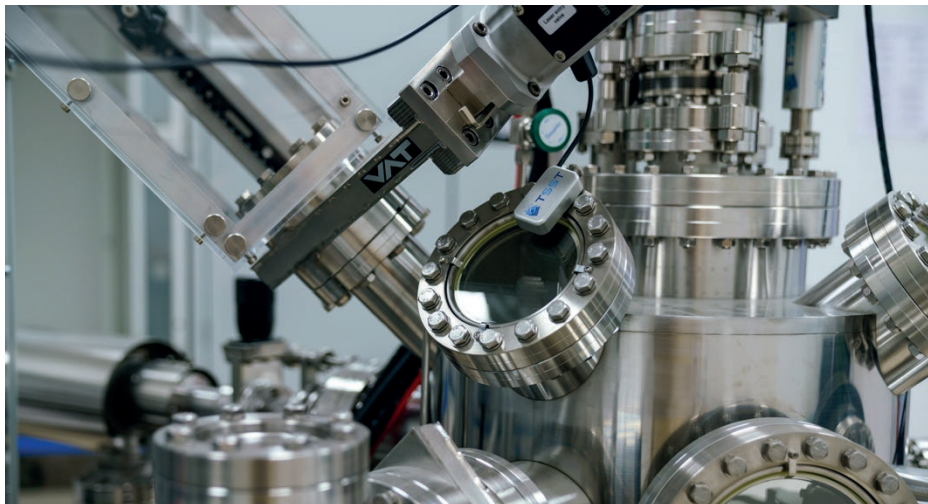
## RESEARCH SUPPORT WORKSHOPS PLATFORM

### SERVICES:

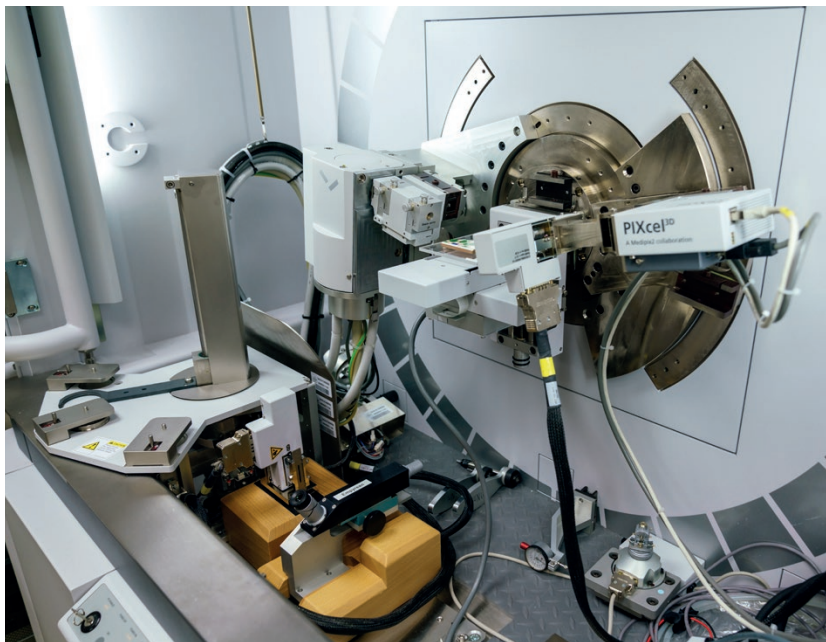
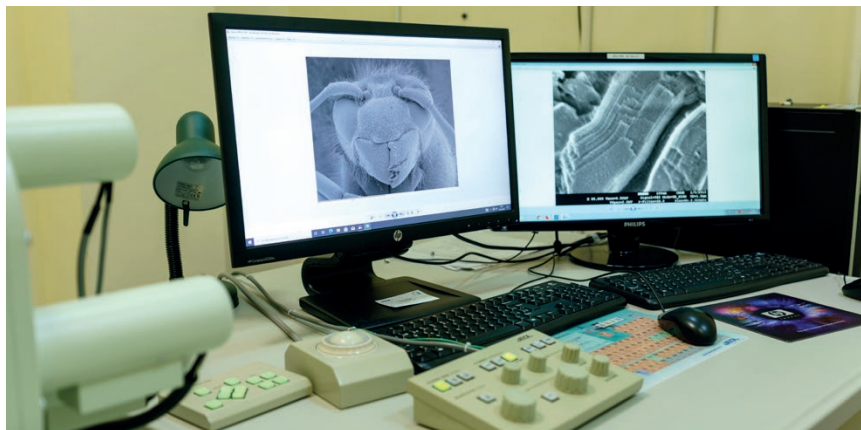
- 2D/3D drawing design
- Electromechanical systems design
- Vacuum ampoule manufacturing
- Vacuum plant manufacturing
- Manufacture of parts
- Manufacture and repair of borosilicate glass prototypes
- 3D printing
- LABVIEW/ARDUINO programming
- Electromechanical equipment repair



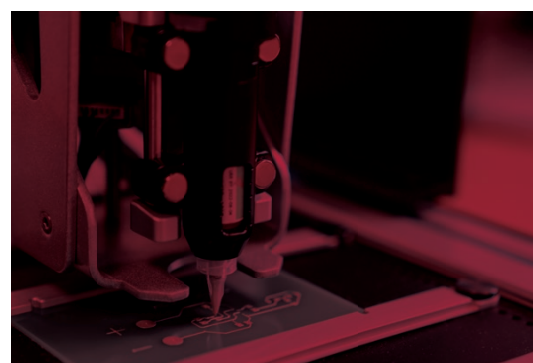




**CHOOSE US**








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