

Annex - SRFs

Table 2. List of SRFs open to service

Unit	Acronym	Model and brief description	Technique
UniMilano Bicocca	AFM_1	AFM SOLVER P47 – NT. The AFM Solver P47 – NT offers both qualitative and quantitative information on many physical properties including size, morphology, surface texture and roughness. Statistical information, including size, surface area and volume distributions, can be determined as well. The AFM instrument has a vertical resolution of 1 nm and X-Y resolutions of around 10 nm. It scans areas up to 30x30 square micron and is employed for the characterization of polymeric materials in ambient air.	Microscopy
UniRoma Tor Vergata	AFM_FLEX	Quantum Design FlexAFM by Nanosurf. Compact Atomic Force Microscope. Allows quick morphological analysis of any surface on which it can stand. Endowed with all main scanning force operational modes. It also locates quickly the area of interest at the micrometer scale, so that the probe scan speed can be reduced	Microscopy
CNR-DSCTM	AFM_ICLDS	Local Dielectric Spectrometer based on a Veeco Multimode AFM with Nanoscope IIIa controller, modified by external electronic instrumentation, both commercial and home-made, designed to perform local dielectric spectroscopy in intermittent-contact mode, with spatial resolution on dielectric properties as high as 3nm. The setup includes temperature and gaseous environment control. Typical application is to polymer glass formers ultrathin films, phase-separated blends, self-assembled nanostructures, hybrid nanocomposites.	Microscopy
CNR-DSCTM	AFM_RAMAN/TER S	XploRa Nano – Horiba. Micro-Raman spectrometer coupled with AFM/STM/Shear-Force Microscopes for colocalized μ Raman/ μ PL - AFM, Tip-Enhanced Raman- (TERS) and Tip-Enhanced Photoluminescence (TEPL) Microscopy with excitation at 638 nm and 785 nm. The system is provided with a station for the fabrication of electrochemically etched TERS tips, providing enhancement factors of 10 ⁴ -10 ⁵ and spatial resolution down to 10 nm. Excitation at 60 degrees insures applicability on both transparent and opaque samples. Spectral resolution down to 0.9 cm ⁻¹ (Diffraction gratings 600, 1200 and 1800, 2400 grooves/mm) CCD light detector Peltier Cooled at - 60 °C (spectral range 400 – 1100 nm). The AFM/STM/Shear-Force system is a SmartSPM-1000, working in different configurations, including Kelvin Probe Force Microscopy (KPFM). The MicroRaman spectrometer is also coupled with a Olympus BX41 microscope (objectives: 5X, 10X, 50X, 50X LWD and 100X) for confocal μ Raman/ μ PL analysis with diffraction limited spatial resolution.	Microscopy
UniRoma Tor Vergata	AFM_SEM	Quantum Design AFSEM. Atomic Force Microscope for Correlative AFM during SEM measurement able to work both in the SEM chamber and outside the SEM. It also locates quickly the area of interest at the micrometer scale, so that the probe scan speed can be reduced	Microscopy
CNR IBFM	BIOCHEM_AN_1	YSI 2950 biochemistry analyser. An easier way to investigate the major biochemical species: YSI 2950 biochemistry analyzer, the Gold Standard in bio-analytical instruments with highly accurate sensors and rapid results. YSI 2950 is the easiest to use and most cost effective way to measure the following chemistries in a wide range of matrices: Glucose, Lactate, Glutamine, Glutamate, Ammonium, Potassium, Ethanol, Methanol, Sucrose, Galactose, Lactose, Choline, Glycerol, Hydrogen peroxide.	Bio-Chemical- Magnetic Characterization

CNR IBFM	BIOCHEM_AN_2	Seahorse XF24. An easier way to investigate the major biochemical species: Seahorse XF24, that uses label-free technology to detect discrete changes in cell bioenergetics in real-time, providing a window into the critical functions driving cell signaling, proliferation, activation, toxicity and biosynthesis.	Bio-Chemical-Magnetic Characterization
UniRoma Tor Vergata	BONDER	West Bond 4KE with microscope. Automatic Wire Bonder. Allows wire bonding on micrometer structured electronic circuits under microscope observation. The wire bonds are performed using ultrasonic transducers that convert a high frequency electronic signal to mechanical energy in the ultrasonic range (63kHz).	Materials Processing
CSGI- UniFirenze	CA_1	Contact Angle model 300 Ramèr-Hart (USA) equipped with an automatic programmable dispenser for static drop or advancing / receding drop measurements. The instrument allows the measurement of the contact angle at the solid / liquid interphase both in equilibrium conditions and as a function of time.	Photons
CNR-DSCTM	CA_2	DSA 30S Krüss Optical system. Such system allows to characterize properties like: Contact angle of sessile drops on a surface, both static and dynamic; surface tension of liquids, calculated with the pendant drop method; surface energy of solids. Camera with acquisition speed up to 2000 fps. Accuracy of 0.3° for contact angle measurements, 0.3 mN/m for surface tension measurements. Maximum sample size 320 mm × ∞ × 275 mm (width x depth x height) (132 mm × 132 mm × 27 mm for measurements in the TC40 chamber). Two PT100 probes to monitor the temperature on the surface and in the syringe. Possibility to establish automated measurement and dispensing routines. Equipped with a tilting table for sliding angle measurements. Equipped with a TC40 chamber with a Peltier cell for measurements at temperatures ranging from -25 to 150°C.	Photons
CSGI- UniFirenze	CD	Circular dichroism. The Jasco J-715 circular dichroism measures the difference in the absorption coefficient of active samples against circularly polarized light in both directions. It is the ideal method for the study of conformational differences, such as the secondary and tertiary structure of proteins, in the study of folding and unfolding mechanisms, or in the study of the purity of optically active molecules.	Spectroscopy
UniMilano Bicocca	CISP	HYPERSPEC VNIR. This system is a hyperspectral imaging system useful for spectroscopy analysis of different surfaces. The camera is a Headwall Nano-Hyperspec system, operating in the 400-1000nm spectral range, with 270 spectral bands, and a spectral resolution of 6nm. Typical applications are for airborne and ground remote sensing. An hypercube of reflectance is generated from a dedicated processing chain and used for precise mapping of forest, agricultural, water and snow parameters.	Bio-Chemical-Magnetic Characterization
UNIMILANO BICOCCA Milan	COLD_LAB	Eurocold Lab. EUROCOLD lab - integrated laboratory with controlled atmosphere for simulate the mean antarctic environmental conditions. Cold rooms till -50°C at very clean environmental conditions are available.	Preparation Laboratories
UniRoma Tor Vergata	CONF_AFM_RAMAN	Horiba Xplora Nano. Atomic Force Microscope with integrated Raman spectroscopy and confocal microscopy for microRaman applications and allowing Tip-Enhanced Raman Spectroscopy (TERS): Atomic Force Microscope with integrated Raman spectroscopy and confocal microscopy for microRaman applications and allowing Tip-Enhanced Raman Spectroscopy (TERS):a) microRaman, b) microluminescence; c)confocal microscopy; c) tip enhanced Raman spectroscopy; d) Tip enhanced fotoluminescence; e) AFM; f) STM	Microscopy

UniMilano Bicocca	CONF_FLUO	Leica TCS SP5 II. Allows to increase radial resolution down to 60 nm exploiting the excited state depletion operated by a doughnut shaped beam at 592 nm. Equipped with AOBs and AOTF devices, coupled 454, 476, 488, 514, 562, 633 nm laser lines; it has a resonant scanning head operating at 8 KHz of line scanning frequency therefore allowing to perform fluxes measurements up to several mm/s. Other optical instrumentation available: UV-Vis-NIR spectrophotometer Jasco V570; UV-Vis fluorimeter Varian, with temperature control; FTIR spectropolarimeter Jasco; dynamic light scattering (homemade set-up); frequency domain fluorimeter K2 (ISS) for lifetime measurements that can be coupled to an Argon ion laser (2025 Spectra Physics) or to modulated diodes (378 nm, 430 nm, 633 nm).	Microscopy
UniRoma Tor Vergata	CONF_MIC_1	Leica Microsystems Stellaris. Confocal Microscope. Detects optical signals from micrometric section of the sample under observation. Scanning the focus position along the z axis allows 3D reconstruction of the sample, typically living cells	Microscopy
UniMilano Bicocca	CONF_MIC_2	Nikon A1R. The Nikon A1R confocal optical microscope is equipped with a hybrid scanner with the possibility of classical (galvanometric) and Resonant scanning to perform ultrahigh temporal resolution acquisitions ranging from 20 to 420 fps. The instrument is equipped with a 32-channels spectral detector (400- 750 nm) for accurate spectral separation of overlapping fluorescence. A digital camera (Andor Zyla) and a micro incubator (Okolab) allow measurements in epifluorescence and controlling temperature and CO2 respectively.	Microscopy
UniMilano Bicocca	CONF_MIC_3	Operetta CLS High-Content Analysis System – PerkinElmer. The Operetta High Content analysis system is a highly automated, high resolution confocal microscope suited to analysis of many samples in microplates. It allows quantitative image analysis of both fixed and live cells and the study of complex cell systems (e.g., spheroids, organoids). Its hardware/software integration allows advanced assays such as FRET to investigate conformational changes and protein-protein interactions, radiometric imaging and robust phenotypic fingerprinting.	Microscopy
UniMilano Bicocca	CONF_RAMAN_2	Renishaw InVia Qontor. Class 1 Qontor confocal Raman microscope, equipped with 532 and 660 nm laser sources, with autofocus and motorized stage allowing micrometric resolution. It can be used for 2D and 3D characterization of natural and synthetic materials.	Microscopy
UniMilano Bicocca	CYFM_1	CytoFLEX S B2-R3-VO-Y4. Benchtop flow cytometer, equipped with three lasers and nine fluorescent channels. Cytexpert software is very user friendly, and 561 nm laser enables optimal detection of fluorescent reporter proteins. In details: 488nm blue laser, 525/40 - 690/50 BP filters; 561nm yellow-green laser, 585/42 -610/20 – 690/50 – 780/60 BP filters; 638 nm red laser, 660/20 – 712/25 – 780/60 BP filters	Photons
UniMilano Bicocca	CYFM_2	BD FACSMelody™ Cell Sorter. Cell sorter of the latest generation with fixed alignment and “cuvette based”. BD FACSMelody is able to detect up to 11 parameters simultaneously: 9 fluorescences and 2 physical parameters. It has 3 spatially separate lasers; Blue 488 nm (20mW), Red 640 nm (40mW), Violet 405 nm (40mW). The Counting chamber is a gel-coupled quartz, to minimize background noise and to ensure maximal sensitivity. It can acquire up to 40,000 events / second on eleven parameters. It is equipped with a BD FACSMelody Reflection optical system and full digital electronics for signal processing and data acquisition.	Photons
CSGI- UniFirenze	DLS_1	Brookhaven BI900AT. Multi-angle Brookhaven system based on light scattering for the study of colloids using quasi-elastic dynamic light diffusion and static light diffusion. The	Photons

		instrument allows the study of the dimensions, the shape and scattering properties of objects dispersed in colloidal systems.	
CSGI- UniFirenze	DLS_2	Brookhaven BI-90. Instrument for the determination of particle sizes and Zeta (electrokinetic) potential based on light scattering, model Brookhaven BI-90, for the study of dispersed systems, both for the determination of the dimensions of the objects responsible for the scattering of light and for their surface charge.	Photons
CSGI- UniFirenze	DLS_3	Mastersizer 3000. Instrument for the granulometry measurement based on light diffraction, model Laser Mastersizer 3000, with additional accessories for the study of solid powders in dispersion samples and emulsions, with dimensions between 50 nm and few millimetres.	Photons
CNR-IPCB	DLS_4	Malvern Zetasizer. Instrument for the determination of average particle size, particle size distribution and zeta (electrokinetic) potential of dispersed systems based on dynamic light scattering (DLS), model Zetasizer Nano ZS (Malvern Instruments),	Photons
UniRoma Tor Vergata	DNA_SEQ	Illumina NextSeq 550. Automatic DNA sequencer for genomic sequence determination. Its fast DNA-to-results workflow enables rapid sequencing of exomes, targeted panels, and transcriptomes in a single run, with the flexibility to switch to low- or high-throughput sequencing as needed.	Bio-Chemical- Magnetic Characterization
UniMilano Bicocca	ELLI	Woollam Inc. Corp. VASE. The VASE UV-Vis-NIR ellipsometer is an accurate and versatile ellipsometer for research on all types of materials: semiconductors, dielectrics, polymers, metals, multi- layers, and more. It combines high accuracy and precision with a wide spectral range.	Spectroscopy
UniMilano Bicocca	ESMF	R2Sonic 2022. The R2Sonic 2022 is a wideband high resolution shallow water multibeam echosounder (i.e.: an offshore surveying tool able to map a swath of the seabed), that can operate at multiple frequencies (from 170 to 450 kHz) providing variable swath coverage selections from 10° to 160° to generate reliable and remarkably clean bathymetric measurements through all range settings to roughly 400m. TruePix™ Backscatter at multiple frequencies and Raw Water Column data can also be collected. The 60 kHz signal bandwidth collects up to 1024 soundings per ping at a maximum speed of 11.1 knots for full coverage. The system is integrated with an Inertial Navigation System (I2NS™) and a sound velocity sensor.	Bio-Chemical- Magnetic Characterization
CNR-IPCB	FDM_1	Flashforge Creator Pro. Fused deposition modelling (FDM) 3D printer equipped with a versatile dual extruder that allow printing a wide range of materials, including ABS, PLA, HIPS, Flex, T-glass, and composites. The main features of the machine are: build volume of 227×148×150 mm, max. extruder temperature: 260°C, Max. heated bed temperature: 120°C,	Fabrication
CNR-IPCB	FDM_2	CreatorBot F430. High temperature FDM 3D printer for processing high performance materials as PEEK and PEI. F430 equipped with dual extruders, The left 260°C hotend is able to print with PLA, ABS, PC, Nylon, Carbon fiber, Flexible, etc. The right 420°C hotend is able to print High performance material like PEEK, ULTEM. The main features of the machine are: build volume of 400×300×300 mm, max. extruder temperature: 260-420°C, Max. heated bed temperature: 140°C, max chamber temperature: 70°C.	Fabrication
CNR-IPCB	FDM_3	I3D PivotMaker FULL. This FDM 3D printer allows realizing large objects and prototypes in a single print. The main features of the machine are: very large build volume (850x850x850 mm), resolution layer Z axis: 100 – 500 µm.	Fabrication
CNR-IPCB	FDM_CFC	Anisoprint Composer A3. It is a continuous fiber 3D printer. The Composer works both with the patented CFC technology (Composite Fiber Coextrusion) and with standard FFF 3D	Fabrication

		printing technology. Composer A3 offers a build volume of 420 x 297 x 210 mm.	
CNR-IPCB	FDM_CFR	Markforged Mark Two. FDM 3Dprinter able to print polymer object with continuous fibres reinforcement. The main features of the machine are: build dimension 320x132x154 mm, Z-axis max resolution 100 µm.	Fabrication
UniRoma Tor Vergata	FEMTO-LASER	Onefive Origami 10 XP - APE pulseCheck SM 2000. Femtosecond Laser and High-resolution and high-sampling rate autocorrelator. High average and peak power and repetition rate up to 1 MHz at 1030 nm allow fast micromachining of hard materials as well as efficient vaporization of solids for pulsed laser ablation and deposition.	Fabrication
CNR-IPCB	FTIR_1	FTIR spectrometer (Spectrum One Perkin Elmer) equipped with Universal ATR accessory, for chemical analysis of organic and inorganic materials. Wavelength range 7,800 – 350 cm ⁻¹ . Resolution 0.5 cm ⁻¹ to 64 cm ⁻¹	Spectroscopy
UniRoma Tor Vergata	FTIR_2	Thermo Fisher Scientific. A portable Fourier transform infrared (FT-IR) spectrometer to carry out chemical analysis of materials by collecting data in the mid-IR spectral range using a variety of accessories including attenuated total reflection (ATR), and reflectance mode.	Spectroscopy
UniMilano Bicocca	FTIR_3	Jasco mod.6200FV. Fourier transform infrared spectrophotometer. The FT/IR-6200 is an Infrared spectrometer operating from 50 to 4000 cm ⁻¹ in transmission and reflection mode. It has a sample compartment operating in full or partial vacuum or in nitrogen or argon atmosphere, with separate control of the interferometer and optical pathways. It has been equipped with a continuous closed cycle refrigerator cryostat in order to collected spectra from 10 K to 450 K	Spectroscopy
UniRoma Tor Vergata	FTIR_4	Thermo Fisher Scientific Nicolet iS20. Attenuated Total Reflectance–Fourier Transform Infrared. Spectral Resolution Better than 0.25 cm ⁻¹ . Applications Polymers and Plastics; Analytical Services; Quality Control QA/QC; Pharmaceuticals; Education; Forensics; Gemstone Analysis.	Spectroscopy
CSGI- UniFirenze	GAS_ADS_1	3Flex Micromeritics. The system is a physical adsorption analyser for gas porosimetry at high pressures, (adsorption gas: N ₂ , with the possibility to use other gases). It allows the determination of the specific surface area, starting from 0.01 square meter per gram, and of the distribution of dimensions of pores between 3.5 and 5000 Angstrom.	Bio-Chemical-Magnetic Characterization
CNR-IPCB	GAS_ADS_2	Micromeritics 3FLEX. High-performance gas adsorption analyzer for measuring surface area, pore size, and pore volume of powders and particulate materials, microporous and mesoporous materials. Main specifications: 3 analysis ports with pressure transducer of 1000 mmHg, 10 mmHg and 0.1 mmHg; P0 port with dedicated pressure transducer for continuous monitoring of saturation pressure; Isotherm data collection begins in the 10 ⁻⁶ torr range; ECR (Enhanced Chemical Resistance) treatment of the surfaces; Compatible for analysis with N ₂ , O ₂ , Ar, CO ₂ , CO, H ₂ , butane and with corrosive gases.	Bio-Chemical-Magnetic Characterization
CNR-DSCTM	GAS_ADS_3	ASAP 2020 K C MP, (Micromeritics) Apparatus for Physis-Chemisorption (N ₂ , Kr, CO ₂ , H ₂ , O ₂ , CO) equipped with vapours (H ₂ O, organics) adsorption module. Suitable for characterization of textural properties (micro- meso-porosity, surface area) of materials (organic, inorganic, composites, bulk, nano, films), determination of active surface of nanomaterials; adsorption properties of small molecules vapours (H ₂ O, solvents, organics)	Bio-Chemical-Magnetic Characterization
UniRoma Tor Vergata	GC_AUTO	HTA HT2850T. Gas-Chromatography Autosampler. The HT280T is an all-in-one autosampler that combines in a single unit a traditional liquid sample injection, a headspace and a SPME (Solid Phase micro-extraction) autosampler.	Bio-Chemical-Magnetic Characterization

UniRoma Tor Vergata	GC_IMS	GAS FlavourSpec. Gas Chromatograph with Ion Mobility Spectrometer. FlavourSpec: Sensitive Analyser for Food, Flavour and Beverage testing. The FlavourSpecE comprises advantages of a Gas Chromatograph (GC) with regard to selectivity and outstanding sensitivity of an Ion Mobility Spectrometer (IMS) enabling the analysis of volatiles in the headspace of liquids and solid samples without any sample pre-treatment.	Mass Spectrometry
UniRoma Tor Vergata	GC_MS	Shimadzu GCMS-QP2020. Gas Chromatography - Mass Spectrometry FOR Testing/inspection of food, pharmaceutical, chemical and environmental applications. With excellent performance and smart operability, the instrument satisfies a wide range of needs for single quadrupole GC-MS systems, e.g. testing/inspection of food, pharmaceutical, chemical and environmental applications.	Mass Spectrometry
UniMilano Bicocca	GC_TQ_AS	GC CP 3800 e triplo quadrupolo 320-M. Gas Chromatograph with triple quadrupole and autosampler for the analysis of organochlorine micropollutants.	Bio-Chemical-Magnetic Characterization
UniMilano Bicocca	GEN_AN	3100-Avant Applied Biosystems. The 3100 Genetic Analyzer is a multi-color fluorescence-based DNA analysis system with 16 capillaries operating in parallel, which offers high-quality data and efficient sample processing.	Bio-Chemical-Magnetic Characterization
UniRoma Tor Vergata	GP_RAD	Ekko 100 A. Ground Penetrating Radar Pulse Ekko 100 A with three different types of antennas (50 Mhz, 100 MHz e 200 MHz) characterized by a low system noise which easily allow high resolution investigations for subsurface stratigraphy in geological, geotechnical, glaciological and archaeological problems. A borehole antenna is also available for downhole surveys. Presently a new GPR COBRA CBD wireless georadar system has been acquired with a CBD antenna capable to transmit three frequencies 70/200/400/800 MHz antennas that can replace multiple antennas which can be used both on-board of a DIJ M600 UAV or on the ground by a smart cart. This allows for rapid investigations over large areas.	Bio-Chemical-Magnetic Characterization
CNR-DSCTM	HI_FI	Hi-FIF. The facility covers the entire value chain from the fabrication to the photophysical and electrophysiological characterization of complex bio-nanostructured interfaces and systems. The facility enables (i) the realization of organic, inorganic and bio-hybrid interfaces and systems with non-conventional deposition techniques,(ii) the definition and investigation of new paradigms for stimulating, revealing, and modulating biological events at the interface with functional materials and devices and (iii) the implementation of innovative tools for biomedical research, biodiagnostics, and neuro-regenerative medicine.	Fabrication
CNR-DSCTM	HYP	In-house built Magnetic Heating Equipment equipped with a CELES MP6 generator, operating in the 50-450 kHz frequency range with magnetic fields up to 19 kA/m for magneto-thermal measurements	Bio-Chemical-Magnetic Characterization
UniMilano Bicocca	ICP_OES	ICP OES OPTIMA 7000 DV. The ICP OES OPTIMA 7000 DV is used for the identification and determination of most of the periodic table elements, particularly alkaline earth metals and transition metals, for which sensitivity is optimal. The limits of detection vary from a few ug/L to mg/L. It has high robustness and a high linearity dynamic range, which allows the simultaneous determination of many elements in the same sample, even if they are present at very different concentrations. Applications concern the determination of metals after acid digestion of samples, including drinking water, soils, sediments, plant extracts, foods and biological fluids.	Spectroscopy
UniRoma Tor Vergata	IMP	Cicci Research Srl. Time Resolved Photo Luminescence (TRPL) upgrade Sistema CHARON -Archeo + n. 1 multichannel system for the characterization of electronic devices in terms of	Bio-Chemical-Magnetic Characterization

		cyclovoltammetry, chronopotentiometry and independence spectroscopy in controlled temperature,	
CNR-DSCTM	LIBS	LIBS. The Laser-Induced Breakdown Spectroscopy (LIBS) is a type of atomic emission spectroscopy which uses a highly energetic laser pulse as the excitation source that lets the in-situ elemental analysis (from % to ppm scale) on most types of substance (solids, liquids, gases, conductive materials, etc) without sample preparation. A number of applications of the LIBS technique have been proposed in the fields of materials science, industrial process control, environmental protection and cultural heritage conservation and study. ICCOM has one conventional and one mobile instrument.	Spectroscopy
UniRoma Tor Vergata	MACHINE_SHOP	Machine Shop including milling and turning tool, cutting machine, small drill press, grinder, micro lathe, and a numerically controlled milling machine.	Materials Processing
CNR-IPCB	MECH	LITeM. The device is used for the measurements of mechanical properties of polymer composite specimens, coupling static and dynamic measurements (including fatigue characterization). The maximum force is 7kN.	Bio-Chemical-Magnetic Characterization
CNR-IPCB	MELTMIX	Melt mixer Brabender Plastograph EC Plus, for the mixing of thermoplastic polymers, with speed and temperature setting and torque measurement system, suitable for material development, optimization of the production process and lab-scale production of polymer blends and composites	Materials Processing
CNR IBFM	METABOLOMICS	Agilent Technologies 7200 GC-QTOF & Agilent Technologies 6550 Ion-Funnel LC-QTOF. A metabolomics facility with complex mass spectrometers, and complementary instruments: Mass spectrometers, coupled with gas or liquid chromatography: Agilent Technologies 7200 GC-QTOF, with an associated automatic samples preparation instrument (Agilent Sample Prep Workbench), that provides consistent precision and eliminates errors associated with mundane sample preparation procedures, such as dilutions, internal standard additions, and derivatization; Agilent Technologies 6550 Ion-Funnel LC-QTOF, coupled with the UHPLC 1290	Mass Spectrometry
CNR-DSCTM	MICRO_DIG	HIROX RH-2000. Last generation digital microscope equipped with two staves: one for contact analysis with magnification from 6 to 160x, and one with 3 objectives with magnification in the 35-5000x range. The column staves have Z axis motorized and reclined up to 90° in both right and left directions. Motorized sample holder table that allows programming the XY movement with micrometric precision (0.04 micron) for a 40x40 displacement and automatic surface topographic 3D reconstruction. Possibility to carry out 2D and 3D measures. The microscope is provided with a motorized optical head able to rotate 360° on the optical axis enabling the observation of specimens from all directions without need to move the sample. This instrument is particularly suited for failure analysis, but also to analyze highly porous components.	Microscopy
UniMilano Bicocca	MICRO_FLUO_1	Olympus Bx51. System for in vivo imaging in controlled atmosphere composed by an upright microscope (BX51, Olympus, Japan) operating with a high working distance objective (N.A. = 0.95, wd=2 mm, 20X, water immersion, XLUMPlan FI, Olympus, Japan) equipped with a confocal scanning head (FV- 300, Olympus, Japan) operating in a home-made three-channels non-descanned mode. The laser source is a mode-locked Ti:sapphire laser (Mai Tai HP, Spectra Physics, CA), 80 MHz pulse repetition frequency (FWHM is estimated to be 220-240 fs on the sample plane and it is controlled by a DeepSee unit (Spectra Physics, CA) which optimizes the pulse width at the selected wavelength in order to maintain an efficiency of penetration depth. The microscope is updated to perform Fluorescence Lifetime Imaging (FLIM).	Microscopy

CNR-DSCTM	MICRO_FLUO_2	Advanced inverted microscope ECLIPSE Ti-E – NIKON. The Ti-E is equipped with a unique Perfect Focus System (PFS) that automatically corrects focus drift in real time during a prolonged period of time-lapse imaging. The Ti-E utilizes Nikon's NIS-Elements software allowing operations from advanced image acquisition to analysis and measurement by integrating control of microscope, camera and peripherals. Ti-E also enables exceptionally well-integrated and fast acquisition of multipoint, multi-colour time-lapse imaging and Z-axis data capture. Objectives: Plan Fluor 10x, Plan apo 20x, Super Plan Fluor 40x, Plan apo oil 63x. Filters: DAPI, FITC, TRITC. Camera: High resolution DC-QiMc	Microscopy
CSGI- UniFirenze	MICRO_FLUO_PT	Particle Tracking. Fluorescence microscope Nikon Ti2-S, equipped with a 4 wavelength LED illuminator (CoolLED PE300-Ultra) and a high-speed/large CMOS camera (Hamamatsu Orca Flash v4). It allows the high-rate acquisition of time-series of images of fluorescently labeled objects (particles, cells, bacteria, ...), that can be analyzed by particle tracking for investigating passive and active transport phenomena, such as diffusion in complex environments or flow in microfluidic channels.	Microscopy
CSGI- UniFirenze	MICRO_FTIR	Nicolet Nexus 870. Instrument for FT-IR spectroscopy and microscopy, model Nicolet Nexus 870, equipped with external optical table, two external detectors (MCT e TRS), GeATR, one Hind photoelastic modulator, and one IR Continuum microscope.	Microscopy
UniMilano Bicocca	MICRO_RAM_1	HR Evolution – Horiba. The spectrometer has a focal length of 800 mm, two grids (1800 and 600 grooves / μm), and a CCD detector (1024x256 px, -60 °C). There is also a 9-position filter system (from 100 to 0.01%) for EDGE and ULF (Ultra Low Frequency). The green Nd laser source (532 nm) has a power of 300 mW. High visualisation is by an Olympus BXFM petrographic microscope for transmitted and reflected light, connected with a 5Mpx camera (objectives: 5X, 10X, LWD 50X, and 100X). The presence of a motorised sample holder stage and the confocal system enables the acquisition of two- and three-dimensional profiles and maps in 2D and 3D at the (sub) μm scale. The system is compatible with a LINKAM THMS600 heating/freezing stage for analysis in the temperature range from 300 to -180°C.	Microscopy
UniMilano Bicocca	MICRO_RAM_2	Dilor-Jobin-Yvon, Labram. Micro-spectrophotometer LabRAM HR (Horiba - Jobin Yvon) in backscattering configuration for micro-Raman and micro-photoluminescence analysis and mapping, with Ar laser at 488 nm and HeNe laser at 633 nm as light sources, light signal collection by a polychromator and a charge-coupled-device with a final resolution of about 1 cm^{-1} , with sample temperature control in the range 77-350 K by means of a cryostat working with liquid nitrogen flux and programmable heater with a final stabilization within ± 2 K	Microscopy
UniMilano Bicocca	MICRO_RAM_3	Jobin Yvon T64000. The Jobin-Yvon T64000 Raman spectrometer is a 640 mm focal length triple stage spectrometer that can be used in triple subtractive and single spectrometer configuration. The triple spectrometer configuration allows measuring spectra down to 5 $1/\text{cm}$ with any excitation laser, also with deep-UV excitation. The setup is connected to a microscope for sub-wavelength spatial resolution. A thermal stage can be connected in order to change the temperature of the samples.	Microscopy

CNR-DSCTM	MICRO_RAM_4	HR800 – Horiba - Micro-Raman spectrometer coupled with an Olympus BX41 microscope (objectives: 5X, 10X, 50X, 50X LWD and 100X) for confocal μ Raman/ μ PL analysis with diffraction limited spatial resolution. The system is coupled with different lasers for multiwavelength excitation at 454, 476, 488, 515, 561, 633, 785nm. Spectral resolution down to 0.4 cm^{-1} (Diffraction gratings 600, 1200 and 1800) CCD light detector Peltier Cooled at $-60\text{ }^{\circ}\text{C}$ (spectral range 400 – 1100 nm). InGaAs array detector LN cooled (900 – 1600 nm). The system can perform mapping using both a motorized (Merzhauser) and a high precision piezoelectric (PI 200x200 μm) stage. The system is coupled with a Linkam heating/cooling stage for variable temperature measures.	Microscopy
CNR-DSCTM	MICRO_RAM_FT	RamanScope III – Bruker. Raman spectrometer with NIR (1064nm) excitation and Fourier Transform spectrometer (VERTEX70) for measurements of solid and liquid samples. The system is coupled to an optical microscope that allows for the acquisition of Raman spectra and maps with micrometric spatial resolution (~ 10 micron). Spectral range: 20 cm^{-1} and 15000 cm^{-1} . Spectral resolution better than or equal to 0.4 cm^{-1} . Minimum measurable stoke shift of 50 cm^{-1} . Light source: 1064nm Nd: YAG laser, 1 W power, Automatic power variation system, automated control linear polarization, TEM00 emission mode, line width $<0.5\text{ cm}^{-1}$. Liquid nitrogen cooled germanium detector for Raman spectroscopy in the near infrared (NIR). Possibility of Macro measurements with backscattering and 90° collection. The microscope is equipped with 2 objectives, (10X, 40X magnification) optimized for NIR focusing and collecting light.	Microscopy
CNR-DSCTM	MICRO_RAM_TW	Optical Tweezers setup coupled with a Raman spectrometer (Horiba Triax). The system exploits a single laser beam, tightly focused, to optically trap individual micro and nanoparticles in liquid environment and perform their spectroscopic (Raman/PL) analysis. Individual nanoplastics (300nm), nanotubes and graphene flakes can be investigated. Lasers at 515, 633, 785nm are used for trapping and excitation. Microscope objectives: 100X, oil and water immersion (NA 1.3). The spectrometer is equipped with a 1200 lines/mm grating giving a spectral resolution of 8 cm^{-1} , and coupled to a silicon Peltier-cooled CCD camera (spectral range 400 – 1100nm). A CMOS camera is used for particle visualization and size determination (down to the diffraction limit). The sample cell can be translated with a piezoelectric stage (PI, 200 x 200 μm) with nanometric precision.	Microscopy
CNR-DSCTM	MICRO_RAMAN_IR	IR and Raman vibrational spectroscopy facility. Confocal micro- Raman spectrometer equipped with cw laser sources (632, 514 and 488 nm) with 1 micron lateral resolution. FT-Raman spectrometer with 1064 nm excitation laser source. FT-IR spectrometer equipped with microscope with 25 microns lateral resolution and capable to perform time resolved measurements.	Microscopy
UniMilano Bicocca	MICRO_TOMO_1	CT/DR BIR ACTIS 130/150. X-ray computerised microtomography (microCT). The industrial micro CT system available at UniMilano Bicocca is a BIR Actis 130/150, upgraded in 2017. Resolution of the images depends on the position of the specimen with respect to the X-rays source (maximum theoretical resolution 7 microns).	Photons
UniMilano Bicocca	MICRO_TOMO_2	Skyscan 1176. High performance in vivo and ex vivo micro-CT scanner for the investigation of the morphology of the samples in a non-destructive manner in preclinical research. The image field of view is 68 mm allowing full body mouse and rat scanning or distal limb in larger animals, such as rabbits, at resolution of 9, 18 and 35 μm . Allows imaging in diverse research applications: from lungs to abdominal organs (with contrast agents) up to teeth or bones.	Photons

CNR-IPCB	MICRO_TOMO_3	High resolution computed tomography (CT) X-ray nano-microscope, which can be used to visualize the internal three-dimensional structure of small objects with a resolution of several hundred nanometers (at least 400nm for small samples, 7-800nm for samples in the range of a few mm and a few microns for samples of at least 2cm ³), usable for the characterization of samples of traditional and innovative composite materials with nano and microparticles, biological samples and biomaterials, gels and scaffolds, films, fibers, coating and foams. The contrast level allows the identification of carbonaceous materials in a polymer matrix.	Photons
CNR-DSCTM	MOKE	MOKE Longitudinal Magneto Optical Kerr effect magnetometer equipped with He-Ne laser and electromagnet (H _{max} =0.3T).	Bio-Chemical-Magnetic Characterization
UniMilano Bicocca	MSPEC_1	Nu Instruments Noblesse. Multicollector mass spectrometer equipped with a Nier source and three collectors: one Faraday collector and two ion counters. It is designed to measure the isotopic compositions of He, Ne, Ar, Kr and Xe. The applications include ³⁰ Ar- ⁴⁰ Ar dating of minerals; the noble gas diffusivities of apatite and feldspar, and to study the noble gas and halogen geochemistry of mantle rocks.	Mass Spectrometry
UniMilano Bicocca	MSPEC_2	TSQ Quantum Access Max. Triple quadrupole mass spectrometer, an LC-MS/MS instrument with high sensitivity, specificity, and flexibility. The detection mass range is up to m/z 3000 to support a wide range of applications. This mass spectrometer can meet the quantitative and qualitative needs of a wide range of applications	Mass Spectrometry
UniMilano Bicocca	MSPEC_3	RAPIFLEX. This MALDI-TOF / TOF mass spectrometer is of high accuracy and sensitivity. It has a resolution of over 40,000 RP and a mass accuracy of better than 2-5ppm. The sensitivity is in the order of a few femtomoles. It is specifically designed for MS imaging with a spatial resolution of 10-20 μm. It allows "Imaging" by mass spectrometry (MSI) to obtain the spatial distribution and relative intensity of the molecules of interest directly in tissues and cells.	Mass Spectrometry
UniMilano Bicocca	MSPEC_4	Bruker Daltonics. This MALDI-TOF / TOF mass spectrometer is of high accuracy and sensitivity. It has a resolution of over 40,000 RP and a mass accuracy of better than 2-5ppm. The sensitivity is in the order of a few femtomoles. In particular, this instrument allows "Imaging" by mass spectrometry (MSI) to obtain the spatial distribution and relative intensity of the molecules of interest directly in tissues and cells.	Mass Spectrometry
CNR-DSCTM	MSPEC_5	High Resolution ESI-Mass Spectrometer, Q-Exactive Orbitrap Thermo. The Thermo Fischer Q-Exactive Hybrid Quadrupole-Orbitrap Mass Spectrometer is a mass spectrometer system combining quadrupole precursor ion selection with high-resolution, accurate-mass Orbitrap detection, with electrospray ion source (ESI). The system can be coupled with UHPLC UltiMate 3000 Dionex equipped with an autosampler that allow to analyze a big number of samples in a short time. Capillary and nano columns can be used to small analyte concentration. The flexible capabilities of the Q-Exactive instrument allow the identification and characterization of wide spectrum of compounds, ranging from small molecules to large polymers and reaching accuracy (nanomolar), sensitivity and resolution suitable for many applications	Mass Spectrometry

CNR-DSCTM	MSPEC_6	MALDI TOF/TOF Mass Spectrometer 5800 AB SCIEX. The AB SCIEX 5800 MALDI is a mass spectrometer with TOF/Reflectron analyzer. It provides improved protein identification results for single spot analysis. The MALDI source enables deeper analysis into each sample, even if mixed with salts, and much faster acquisition. A variable rate 1000Hz laser increases the speed of each acquisition by collecting more spots per unit time. The instrument is equipped with a TOF/reflectron mass analyzer. The Time Of Flight (TOF) analyzer enables an ultra-sensitive analysis. The Reflectron mode improve the high resolution analysis. The extended mass range linear detector provides enhanced sensitivity up to m/z of 300,000. These acquisition features provide high quality MS/MS data with minimized sample consumption (ng).	Mass Spectrometry
UniMilano Bicocca	MSPEC_ICP	Element XR Thermo-Fisher. ICPMS Thermo Fisher Element XR Thermo-Fisher: high resolution magnetic ICPMS for ultra-trace element analysis	Mass Spectrometry
UniMilano Bicocca	MSPEC_TIMS	timsTOF flex. SpatialOMx platform, timsTOF fleX, that offers dual capability for MALDIimaging and Omics in a single high-performance MS platform equipped with the novel Trapped Ion Mobility Spectrometry (TIMS) for unparalleled mobility resolution and reproducibility. SpatialOMx is the integration of MALDI imaging with LC-MS/MS.	Mass Spectrometry
UniRoma Tor Vergata	Nd_YAG	JK LASERS. Nd YAG nanosecond Pulsed Lasers with second, third and fourth harmonic	Spectroscopy
UniMilano Bicocca	NGS	Ion GeneStudio S5 Prime System. The Ion GeneStudio S5 Prime System is a semiconductor-based next-generation sequencing (NGS) system that enables simple targeted sequencing workflows. It works with a rapid turnaround time from a benchtop NGS system enabling breadth and depth, from large panels or exomes to clinical oncology research. The system is simple to use and offers scalability and flexibility. It supports a broad range of high- throughput sequencing for clinical research and research applications from microbial genomes and gene panels to exomes and transcriptomes (from 3M to 130 M reads).	Bio-Chemical- Magnetic Characterization
UniMilano Bicocca	NMR_1	Bruker Advance III 600 MHz. Equipped with probes suitable for the analysis of liquid (cryo, 1H, 13C, 15N, 31P), solid (MAS, 1H, 13C, 15N) and heterogeneous (HR-MAS, 1H, 13C, 15N) samples. The cryo-probe shows a sensitivity about 40 times higher than a conventional probe. The HR-MAS probe allows the analysis of the molecular composition of cells and tissue fragments from biopsies (e.g., concentration and relative abundance of specific metabolites, biological membrane compositions).	Bio-Chemical- Magnetic Characterization
CNR-DSCTM	NMR_2	Bruker Avance NEO 500 MHz NMR. It allows the characterization of the most relevant structural and dynamic properties, on wide spatial (0.1-100 nm) and time (10 ⁻¹² - 1 s) scales and as a function of temperature, both in solids and in liquids. Thanks to the multinuclear methods, important information on the synthesis, structure, and activity relations could be obtained.	Bio-Chemical- Magnetic Characterization

CNR-DSCTM	NMR_3	600 MHz Bruker DRX (14.1T), 1H/BB BBI 5mm Z axis gradient probe (50 gauss/cm); TXI 5mm triple resonance probe, 1H (direct detection), 13C and 15N (inverse detection), Z axis gradient unit (50 gauss/cm). Working temperature range: T = -20°C +60°C. Material research, Life Science, Food, OMICS. 600 MHz Bruker Avance Neo (14.1 T), high sensibility probe, liquid nitrogen cooled (Prodigy, triple resonance) with 5 and 3mm shaped inserts, multi receiver acquisition system, with 4 channel simultaneous acquisition, automatic matching and tuning, Z axis gradient unit (60 gauss/cm). Working temperature range: T = -20°C +60°C. Thermostatic autosampler (24 slots), specific integrated software for: a) metabolomics, b) automatic resonance assignment of small molecules, c) relaxation data analysis, d) protein dynamic center, e) statistical data analysis. Material research, Life Science, Food, OMICS	Bio-Chemical-Magnetic Characterization
CNR-DSCTM	NMR_4	Bruker Avance III 300 MHz with gradient field spectroscopy Features: Two probes for high-resolution analysis of liquids: BBI (1H-13C-15N-31P) and BBFO (1H-13C-15N -31P). Other accessible nuclei: 11B, 19Ag, 23Na, 29Si, 27Al, etc. Probe for solid-state: CP-MAS multinuclear 1H/31P-15N. Expertize with 13C, 29Si, 31P, 27Al. T range: -200 - +400°C	Bio-Chemical-Magnetic Characterization
UniMilano Bicocca	ONAB	CGH-Agilent. The platform enables to quickly and reliably identify aneuploidies, microdeletions, microduplications, as well as other types of chromosomal aberrations across the genome, starting from any type of sample (blood, cells, fresh frozen tissues and FFPEs). Agilent's CGH platform offers real comparative genomic data thanks to the 2-color approach, and unlimited flexibility in terms of format and content.	Bio-Chemical-Magnetic Characterization
UniRoma Tor Vergata	PARR	As the only electrochemical workstation available with the ability to provide you with a 4 A maximum current range, 40 pA minimum current range, 48 V of compliance voltage and frequency bandwidth up to 10 MHz, all standard, the PARSTAT 4000A provides today's researchers with the most functionality for your investment. Ideal for Energy Storage, Physical Electrochemistry, Nanotechnology Research and Corrosion Studies of the analyzed battery	Bio-Chemical-Magnetic Characterization
UniRoma Tor Vergata	PLA_PLD	ND:YAG Quantel Brilliant B, 0,9W average power. Pulsed Laser ablation (PLA) AND Pulsed Laser Deposition (PLD) system. Allows microstructuring of surfaces including drilling and realization of highly controlled thin films in small areas. Can be interfaced also to the Origami femtosecond laser	Fabrication
CNR-DSCTM	PPMS	Quantum Design - Physical Property Measurement System – PPMS Equipped with: Vibrating Sample Mode and AC susceptometer (10-10000 Hz) for static and dynamic magnetic properties measurements; Experimental setup for electrical and magnetic transport measurements. The instrument operates in the 0-9 T magnetic field range and in the 2-400 K temperature range.	Bio-Chemical-Magnetic Characterization
UniRoma Tor Vergata	PRINT_3D_1	Ultimaker S5 Pro Bundle. 3D Print for polymer and composite materials, allowing multi-material printing. Unlock easy, always-on 3D printing with automatic material handling, efficient air filtering, and filament humidity control.	Fabrication
UniRoma Tor Vergata	PRINT_3D_2	Ultimaker S5. 3D Print for polymer and composite materials, allowing multi-material printing. Allows quick and cheap prototyping of experimental parts as well as preparation of sub-millimeter patterned specimens	Fabrication
CNR-IPCB	PRINT_BIO_1	Rokit Dr. INVIVO 4D2. Clean-chamber 3D bioprinter (HEPA filter, UV lamps for disinfection) capable of printing freeform cell suspensions, hydrogels, thermoplastic filaments, pastes, and other composite materials, enabling both hard and soft tissue engineering.	Fabrication

CNR-DSCTM	PRINT_BIO_2	CELLINK BIO X 3D Printer. 3D bioprinter allows for printing and combining biomaterials, in order to fabricate structures that maximally imitate natural tissue characteristics. A complete standalone system, providing flexibility with exchangeable printheads and features (Heated printheads. Cooled printheads. Heated print bed. Cooled print bed. Clean Chamber Technology. Piston-driven syringe head. Pneumatic printheads. Multi well-plate printing. Touchscreen control.)	Fabrication
UniRoma Tor Vergata	PRINT_MAT	Fujifilm Dimatix DMP-2850. The Dimatix Materials Printer (DMP) is a cost-effective, easy-to-use precision materials deposition system. It has leveraged its piezoelectric inkjet technology and MEMS fabrication processes with its extensive inkjet product and system knowledge to produce a materials printer specifically designed for R&D and feasibility testing.	Fabrication
UniRoma Tor Vergata	PWVA	ALAM MEDICAL Complior Analyse. With Complior Analyse, it is possible to assess arterial stiffness and central pressure in a single acquisition Complior Analyse uses non-invasive pressure sensors to simultaneously record pulse wave velocity and central pressure.	Bio-Chemical-Magnetic Characterization
UniMilano Bicocca	RAMAN	Spettroscopio Raman, Renishaw – InVia Laser: 532 nm, 785 nm. Class 1 inVia™ confocal Raman microscope, equipped with 532 and 785 nm laser sources, with 3 axes motorized stage and micrometric resolution. It can be used for the characterization of natural and synthetic materials applied to Chemical, Environmental and Earth Sciences and to non-destructive analyses in Archaeology and Cultural Heritage.	Spectroscopy
UniMilano Bicocca	RAMAN_XRF_1	BWTech iRaman/Madatech. The Bruker Artax 200 portable XRF spectrometer is equipped with a Mo anode X-ray tube performing a beam collimated at 0.65 mm diameter (sample excited area 0.33 mm ²) and a SSD detector. The system presents an exchangeable filter slide with three positions and its sensitivity ranges from 2 to 40 keV. The compact portable Raman spectrometer I-Raman Plus BW Tec works with fibre optic configuration. The probe has a flexible fibre coupling encased in a protective jacketing material that performs Rayleigh scatter rejection as high as 10 photons per billion. It could be fixed to a xyz stage for micrometric positioning and the latter placed on a tripod. It is equipped with a diode laser emitting at 785 nm (max power at the sample 60 mW), a TE Cooled Linear Array detector (2048 pixel; pixel size 14µm x 200µm). The spectral range is 200-3000 cm ⁻¹ , while the spectra resolution is about 3–5 cm ⁻¹ .	Spectroscopy
UniRoma Tor Vergata	RAMAN_XRF_2	Bruker. A portable spectrometer designed to carry out in situ, fast and non-destructive combined elemental and molecular analyses, by means of the complementary ED-XRF and Raman techniques. The device works in a complete contactless mode with an optimal focus distance of about 1 cm from the sample.	Spectroscopy
UniMilano Bicocca	ROV_THERM	DJI Matrice 210 RTK. Drone equipped with a multi-sensor system in a compact payload for collecting spectral reflectance and surface temperature data useful for different environmental applications. The onboard sensors are represented by a VNIR multispectral camera 9 bands (MAIA S2) a radiometric thermal camera (DJI Zenmuse XT2) integrated with an RGB camera. This system allows to estimate net radiation, apparent thermal inertia of materials, physical parameters of snow, bio-optical water quality parameters, biophysical and structural vegetation parameters and some characteristics of rocks and soils.	Preparation Laboratories
UniMilano Bicocca	ROV_UW	Remotely Operated Vehicle Under Water. The Steelhead inspection-class ROV (Remotely Operated Vehicle) is a portable, lightweight and stable underwater robotic system equipped with a standard definition NTSC/PAL zoom camera, optimized for lowlight conditions, and 4 powerful thrusters that allow variable speed & directional ROV control. The system has a depth rating of 300m and can be remotely operated using standard umbilical lengths of 165m. It includes an integrated controller and LCD monitor module with auto depth, auto heading, and a digital video recorder. USBL (Ultra Short	Preparation Laboratories

		BaseLine) positioning is available when operated from a boat/vessel.	
CSGI- UniFirenze	SAXS	S3 Micro Hecus. SAXS S3 Micro Hecus with point-like collimation and Kratky camera, equipped with two 1D Position-Sensitive Detectors (Methane/Ar) and Genix generator. The scattering wavevector range is for SAXS between 0.008 and 0.6 Å ⁻¹ , for WAXS (concurrently available) between 18 and 26 degrees (Bragg's spacings between 0.34 and 0.49 nm).	Photons
CNR-IPCB	SAXS_WAXD	Saxspace Anton-Paar. X-ray scattered in the angular range of 0 – 10° detected by CCD or imaging plate, and up to 60° detected by using an imaging plate for the systems coupling SAXS and Wide Angle X-Ray Scattering, WAXS. Samples can be measured at different temperature, humidity, high pressure and under mechanical stress/strain conditions. Special features: - TrueFocus: self-alignment with X-ray beam; - TrueSWAXS: simultaneous SWAXS studies up to 60° 2θ; - StageMaster: YZ stage with auto- recognition of sample stages. Accessible q range 0.03 nm ⁻¹ to 40.7 nm ⁻¹ , 200 nm > d > 0.15 nm. System resolution q _{min} : 0.03 nm ⁻¹ .	Photons
UniMilano Bicocca	SEM	Zeiss Gemini 500. Accelerating voltage between 1 kV to 30 kV, nominal resolution of 1.2 nm. In addition to the common “in-camera” BSE and SE detectors, the instrument is equipped with “in-lens” detectors (BSE/SE) for high-resolution imaging and with a STEM detector. The FEG-SEM is also equipped with a Bruker integrated EDS/WDS micro-analytical system, specially designed for light elements. Finally, the FEG-SEM is equipped with an EBSD detector (Bruker) for the crystallographic analysis of the sample surface. The EBSD comes with the Argus FSE and BSE detector for the acquisition of orientational contrast images.	Microscopy
UniRoma Tor Vergata	SEM_EDS_SPM	Tescan Vega (4th Series). This Scanning Electron Microscope (SEM) is equipped with X-Ray microanalysis (EDS) and Scanning Probe Microscopy (SPM). It is also equipped with BSE, low vacuum, water vapour detectors and co-localized SPM analysis	Microscopy
UniRoma Tor Vergata	SEM_FE_1	Thermo Fisher Scientific Phenom Pharos. Field Emission Scanning Electron Microscope offers a resolution of 2.0 nm at 20 kV. Such performance shows the shape of nanoparticles, imperfections in coatings, or other features that would be missed by tungsten SEMs or other tabletop SEMs.	Microscopy
CNR-IPCB	SEM_FE_3	FEI Quanta 200 FEG. Scanning Electron Microscope with field emission source, equipped with SE, BSE and Environmental (GSED) detectors, EDS system (Oxford Inca Energy System 250), heating stage (FEI) and tensile/compression test module (Gatan MST200).	Microscopy
CNR-DSCTM	SEM_FE_4	Sigma Zeiss SEM-.FEG: high-resolution scanning electron microscope with field emission gun and accelerating voltage from 0.02 to 30kV. The Gemini in-lens detection ensures efficient signal detection by detecting secondary (SE) and/or backscattered (BSE) electrons minimizing time-to-image. The maximum resolution can reach ~1nm. The SEM is equipped with energy-dispersive X-ray spectroscopy (EDS) system that enables sample element analysis and a sputter coater for the preparation and coating of non- conductive samples with thin layers of Au or Cr.	Microscopy

UniRoma Tor Vergata	SIG_AN	Keysight Technologies N9000B. Signal Analyzer with a wide frequency range of 9 kHz to 26.5 GHz with up to 25 MHz analysis bandwidth, Performs	Bio-Chemical-Magnetic Characterization
UniMilano Bicocca	SIVA	FMT1500 Perkin Elmer. The FMT imaging system is the leading platform for tomographically quantitating a broad range of in vivo imaging biomarkers, disease pathways and therapeutic response levels in vivo. The PerkinElmer FMT system available at theUniMilano Bicocca U8 animal facility preserves a linear relationship between activity in vivo and detector signal when imaging deep (non-surface) targets and biologies by reconstructing threedimensional (3D) maps of fluorophores inside living animals.	Photons
CNR-IPCB	SLS	Sharebot Snowwhite. Selective laser sintering 3D printer capable of process a wide range of materials including thermoplastic polymer and composites. The main features of the machine are: CO2 Laser Power 14W, laser spot dimension 0,3 mm, temperature range up to 190 C° degrees, laser speed range up 3.500 mm sec, tank powder from 200 gr to 1,5 Kg.	Fabrication
UniRoma Tor Vergata	SOLAR_SIM	GreatCell Energy Hyperion III. LED Solar Simulator, compact design, emission band 360 nm -1100 nm;22 cm X 22 cm illumination area; user friendly driving software interface, top quality LEDs, spectrum customizable by user portable	Preparation Laboratories
CSGI- UniFirenze	SPM	Park-Systems XE-7. Scanning Probe Microscope, using atomic force microscopy Park Systems (https://www.parksystems.com) model XE-7, operating in contact mode, True Non-Contact® and tapping, equipped with temperature control and liquid sample container.	Microscopy
UniRoma Tor Vergata	SPM_CRYO	Low-Temperature Scanning Probe Microscope. The system comprises a loadlock chamber for sample introduction, a preparation chamber and an analysis chamber. All the chambers are under ultra-high vacuum (base pressure better than 2x10 ⁻¹⁰ mbar). The preparation chamber is used to clean and prepare samples in a clean and controlled environment thanks to the presence of a heating stage (both radiative and resistive heating methods), a sputter gun, a molecular evaporator and an e-beam evaporator. A quartz microbalance can be used to calibrate fluxes during deposition. A low-energy electron diffraction/Auger electron spectroscopy (LEED/AES) system is also present for surface characterization. Several leak valves for gas insertion are available. The analysis chamber features a scanning probe microscope working at a base temperature of 10 K able to perform both scanning tunneling microscopy and non-contact atomic force microscopy (qPlus sensor) measurements. Omicron-style sample holders are used in LT-SPM.	Microscopy
CNR-DSCTM	SPM_HV	HV-SPM The Scanning Probe Microscope (HV Smena Stand alone, NT MDT) operating in HV (10 ⁻⁶ mbar) with specification to perform bimodal imaging thanks to Forcetool bi-modal control unit, producing two different vibrations simultaneously. Additional two high vacuum chambers have been home built for in situ electrical measurements of OFET after thin film deposition and for electrical measurement of OFET performed in closed gas atmosphere.	Microscopy
CNR-DSCTM	SPRITZ	SPRITZ. State-of-the-art infrastructure for digital technologies targeted to materials and applications focused on data-driven technologies (artificial intelligence and big-data), virtualization, simulation and multi-scale modelling. Computing and data processing facility constituted by a locally-managed HPC cluster with high-performance CPUs (Intel Xeon and AMD Epyc) and Nvidia GPUs, including nodes with interconnected A40 GPUs (slots with 384 TB of connected GPU RAM for ML/DL applications), high performance network (100Gbps InfiniBand), high-performance and scalable (>100TB) storage. The infrastructure includes a cloud- based scalable and data sharing facility with multiple 10Gbps external links, enabled by	Bio-Chemical-Magnetic Characterization

		the CNR/GARR network and connected to the European GEANT network (up to 100Gbps).	
CNR-IPCB	SPUT_COAT	Emitech K575. Sputter coater for coating of non-conductive samples. The system employs a magnetron target assembly, which enhances the efficiency of the process using low voltages and giving a fine-grain, cool sputtering. Main specifications: Target: 54mm diameter x 0.2mm thick; specimen Stage 60mm diameter, rotating stage with tilt facility; vacuum gauge range 1×10^{-3} - 1×10^{-4} mbar; deposition current 0-150mA; deposition rate 0-20nm/Minute; sputter timer 0-4 minutes; turbomolecular pump 60 litres/second (ultimate vacuum 1×10^{-8} mbar). Au/Pd target installed. Further targets can be mounted on request.	Materials Processing
CNR-DSCTM	SQUID_1	Quantum Design - Magnetic Property Measurement System - MPMS: SQUID magnetometer operating in the 1.8-400 K temperature range, with AC susceptibility option (0,1 - 1000 Hz), static magnetic field up to 5 T, single crystal rotator and set-up for photomagnetic measurements.	Bio-Chemical-Magnetic Characterization
CNR-DSCTM	SQUID_2	Quantum Design MPMS XL-5 SQUID magnetometer ($\mu_0 H_{max} = 5$ T, $T = 2.5 - 400$ K) equipped with DC and RSO transport, AC susceptometer, and ultra-low-field measurement facility. Measurement of sample magnetization as a function of temperature (2.5-400 K) and applied field (± 5 T). Sample can be solid or liquid, mass in the mg to μ g range. Sensitivity: 10-6 emu. Typical experiments: ZFC and FC magnetization, IRM and TRM, hysteresis loops, DCD, magnetic memory and viscosity, AC magnetization.	Bio-Chemical-Magnetic Characterization
UniRoma Tor Vergata	STM_UHV	Ultra-High Vacuum Vessel with Scanning Tunnelling Microscope and Access to Laser Beams and microscopy light collection with spectroscopic analysis	Microscopy
UniRoma Tor Vergata	TA_DMA_1	METTLER TOLEDO DMA 1. The sample is subjected to a periodic stress in one of several different modes of deformation to measure the mechanical and viscoelastic properties of materials such as thermoplastics, thermosets, elastomers, ceramics and metals.	Bio-Chemical-Magnetic Characterization
CNR-DSCTM	TA_DMA_2	Dynamic Mechanical Analyzer, DMA Q800, TA Instrument. Dynamic Mechanical Analysis measures the viscoelastic properties of materials as a function of time, temperature, and frequency. These analyses allow the determination of: mechanical properties, such as moduli, strength, strain at break, damping; glass transition temperature, degree of crystallinity, additives/fillers effect, etc.. Output values: Complex Modulus, Storage Modulus, Loss Modulus, Complex/Dynamic Viscosity, Time, Creep Compliance, Stress/Strain, Frequency, Tan Delta (δ), Static/Dynamic Force, Sample Stiffness, Temperature, Displacement. Modes of Operation: • Multi strain or multi stress, Multi Frequency/Strain or multi frequency/stress, Creep, Stress relaxation, Controlled force, Iso-strain, Strain rate.	Bio-Chemical-Magnetic Characterization
CSGI- UniFirenze	TA_DSC	DSC TA Instruments 2500 Discovery. Last-generation calorimeter with advanced Tzero® technology for the optimization of the measured baseline. The instrument is equipped with an automated sample changer with 54 positions, ideal for the study of different thermal events including heat transfer or variations in the thermal capacity (phase transitions, chemical reactions, structural variations, etc..) allowing the determination of enthalpies and kinetic properties of processes (velocity constants, activation energies, kinetic laws, etc.). The temperature range available is between -90°C and 725 °C.	Bio-Chemical-Magnetic Characterization
CSGI- UniFirenze	TA_DTA	TA Instruments SDT650 Discovery. Differential Thermal and Thermogravimetric Analysis. Horizontal dual-beam design for superior heat flow and weight measurements. The instrument allows the concurrent determination of heat flux and gravimetric variations in the temperature range between room temperature and 1500 °C.	Bio-Chemical-Magnetic Characterization

CSGI- UniFirenze	TA_RHEO	TA Instruments Discovery Hybrid HR3. The Rheometer operates in controlled conditions of shear stress in the torque range between 0.5 nN.m and 200 nN.m. The instrument allows all standard rheological tests for the mechanical characterization of complex fluids, including the dynamic viscosity, the viscoelasticity (components G' and G'' of complex viscosity), and creep and yield stress tests. The system is equipped with a Peltier plate allowing temperature control in the range between -40 °C and 200 °C. Available geometries include smooth plate, and coarse plate, both with 40mm diameter. The system is also equipped with DMA operating in tension mode, allowing the direct measurement of the Young modulus in the temperature range between -160 °C and 600 °C.	Bio-Chemical- Magnetic Characterization
CSGI- UniFirenze	TDI_1	Kruss Force Tensiometer. The instrument measures the interphase tension through the method of the Du Nouvy ring, of the Wilhelmy plate, or directly using solid surfaces. The instrument is equipped with two automated dispensers for the study of the critical micellar concentrations.	Bio-Chemical- Magnetic Characterization
CSGI- UniFirenze	TDI_2	IT Concepts "The Tracker". The Tracker is an instrument for dynamic interphase tensiometry. The instrument measures the interphase tension using the method of the pendant drop over temporal scales from 500 ms to hours. The instrument can measure both the static tension at equilibrium and the dynamic through the deformation of the drop and the controlled variation of the surface of the drop, so as to determine the viscous-elastic properties of the interphase.	Bio-Chemical- Magnetic Characterization
UniMilano Bicocca	TEM_1	JEOL JEM 2100 Plus. Equipped with a LaB6 emitter. The accelerating voltage can be set between 80 and 200 kV. The high- resolution objective pole piece allows a point-to-point resolution of 0.24 nm in TEM mode. The instrument can operate in STEM (scanning) mode and can acquire BF (Bright Field) and HAADF (High Angle Annular Dark Field) images. The microscope is equipped with and 80 mm ² Oxford EDS for spot analysis and chemical mapping and with a 9 Mpixel Gatan CMOS camera for image acquisition. A special in-gap aperture allows to reduce the damage on beam sensitive materials, as biological samples. The wide tilt range along with the wide range of detectors and the high- resolution capability, makes this instrument a very versatile one.	Microscopy
CNR-IPCB	TEM_2	FEI Tecnai G12. Transmission Electron Microscope with LaB6 source (120 kV) and BF detector and FEI Eagle 4k CCD camera (bottom mounted). It is foreseen that in 2024 it will be replaced by a new Cryo-TEM (cost about Eur 1.000.000).	Microscopy
CNR-DSCTM	TEM_HR_SCITEC	200kV ZEISS LIBRA200FE is a High-Resolution Transmission Electron Microscope (HR-TEM) that combines the second- generation OMEGA filter in column with a high efficiency Field Emission gun as electron source. It operates in standard mode (TEM/HR-TEM), as well as in energy filtered mode (EFTEM), and in scanning (STEM) mode. Its configuration allows for quantitative chemical analysis by EELS (low-Z elements) and EDS/EDX (high- Z elements), and spatially resolved chemical analysis (elemental maps) with nanometer resolution by EFTEM and EDS/EDX. The Cryo-holder for soft materials is also available. Tomographic reconstruction of the 3D shape of the specimen is also possible in TEM and STEM mode. Ultra-cryo-microtome Leica EM FCS, equipped with specific diamond blades, allows to obtain thin (tens of microns) and ultra-thin (50 nm) sections of massive samples. The sectioning can be carried from room temperature down to about -140 °C. It allows for the preparation of samples for TEM, SEM, AFM, and OM.	Microscopy
CNR-IPCB	TGA_FTIR	Evolved gas analysis system based on thermogravimetric analysis combined with FTIR: TGA Perkin Elmer Pyris 1 coupled to a Perkin Elmer Spectrum™ Frontier FTIR spectrometer by a TL 8000 transfer line with a 10 cm gas cell. The transfer line and gas cell can be heated to 300 °C to avoid condensation of organic compounds.	Spectroscopy

CNR-IPCB	ULTRA_MICROT	Leica EM UC6/FC6. Cryo-ultramicrotome for sectioning of TEM samples, that allows for the preparation of semi- and ultra-thin sections, as well as perfectly smooth surfaces required for different microscopy analysis. It is equipped with a touchscreen control. Using the FC7 cryochamber, ultrathin cryo-sections at temperatures between -15°C and -185°C can be realized, allowing for the TEM analysis of a variety of samples ranging from frozen biological material to polymers and rubbers.	Preparation Laboratories
CNR-DSCTM	UPLC	Waters ACQUITY UPLC H-Class PLUS – XEVO TQS Micro The Waters Xevo TQS allows separation of complex mixtures of organic contaminants (pesticides, pharmaceuticals, ..) in water and quantification with detection limits low to ppt level. In particular, it is optimized for PFAS analysis at trace level in water.	Mass Spectrometry
CSGI- UniFirenze	UV_VIS_NIR	UV-Vis-NIR spectrophotometry. Perkin Elmer Lambda 900 spectrophotometer with accessories for polarization / depolarization and acquisition of absorption spectra, kinetic measurements and linear dichroism. The instrument is equipped with a temperature probe and optical fibers for experiments on unconventional samples (air-water interphase, thin films, ...)	Spectroscopy
UniRoma Tor Vergata	VASC_AN	DMT Pressure Myograph System 114P. The device is used to measure small arteries, veins, and other vessels physiological function and properties. It allows studying pharmacological effects of drugs and other vasoactive compounds on small, isolated vessels under near-physiological conditions.	Bio-Chemical-Magnetic Characterization
CNR-DSCTM	XMI_LAB	X-ray MicroImaging Lab. Imaging X-ray diffraction facility for molecular and atomic scale analysis of fabrics, natural or engineered biotissues, thin films, nanocomposites, nanostructured surfaces, nanocrystal assemblies, polymers. Rotating anode Fr-E+ superbright microsource (CuK α) coupled to a SMAX3000 camera (Rigaku). Beam spot of 70 to 100 microns diameter. Detectors: multiwire Triton, up to 2 m sample-to-detector distance (SDD); Image Plate (IP) with RAXIA scanner, for a 3 cm up to a 20 cm SDD. Kapton windows can be inserted to keep the sample at atmospheric pressure (flight tube at about 10-1 mbar). Data collection: small and wide-angle scattering data in transmission (SAXS / WAXS) or reflection mode (GISAXS / GIWAXS), absorption; scanning SAXS and simultaneous average WAXS; simultaneous SAXS and WAXS. Microscopies processed by the in-house developed software (SUNBIM).	Photons
CNR-DSCTM	XPS	Thermo Scientific™ ESCALAB™ Xi+. XPS Microprobe. XPS with parallel imaging and high-resolution mapping; UPS, ISS and REELS; Al and Ag monochromatic sources; Al and Mg non-monochromatic sources; cluster ion gun "MAGCIS"	Spectroscopy
UniRoma Tor Vergata	XRD_1	Rigaku SmartLab SE. X-ray Diffractometer Powder diffraction, thin film diffraction, SAXS, pole figure, residual stress and non-ambient experiments. Highly versatile multipurpose X-ray diffractometer with built-in intelligent guidance: automatic alignment	Photons
UniMilano Bicocca	XRD_2	Rigaku SmartLab SE 2D. The powder X-ray diffractometer is dedicated to the study of organic, inorganic and hybrid crystalline materials and thin films and is equipped with an apparatus for collecting variable temperature powder patterns from 200 K to 750K. Crystal structure determination by Rietveld refinement and phase transition are routinely carried out. In situ experiments under controlled atmosphere such as nitrogen and carbon dioxide can be performed. It is endowed with a high flux energy source and a high- energy-resolution 2D multidimensional detector which allows to obtain accurate diffraction patterns.	Photons

CNR-DSCTM	XRD_3	Crystallography Lab. Suite of X-ray diffractometers for qualitative and quantitative crystallographic analysis of powders, thin films, single crystals. Powders: Rigaku 18kW rotating anode, copper target, asymmetric Johansson Ge(111) monochromator, NaI scintillator counter and Silicon strip D/teX Ultra detector. Thin films: Bruker D8 3.3KW tube, Goebel Mirror, NaI(Tl) scintillator and Eureka Cradle; Single Crystals: 3kW KappaCCD Bruker-Nonius, graphite monochromator, CCD detector; nitrogen cryostat (80-400 K). Data analysis performed with in-house developed software (EXPO, SIR, QUALX, OCHEMDB).	Photons
CNR-DSCTM	XRD_4	XRD1 beamline is a multipurpose X-ray diffraction beamline. The beamline source is a multipole wiggler producing an intense beam in the 4-21 keV energy range where a tuneable double crystal monochromator allows for a rapid selection and optimization of the anomalous scattering condition. XRD1 allows for macromolecular and small-molecules single-crystal crystal X ray diffraction crystallography, powder diffraction, also at variable temperature, and grazing-incidence diffraction measurement. A laser-based sample alignment facility together with a helium-path for low energies measurements are available for grazing-incidence condition.	Photons
UniMilano Bicocca	XRF	Varian Cary Eclipse. It is a fluorometer for fluorescence, phosphorescence, chemiluminescence, and bioluminescence measurements from polymeric solutions. It is equipped with programmable temperature control that allows to perform thermodynamic studies. It hosts up to 6 samples. Fast data collection enables kinetics measurements with millisecond resolution.	Spectroscopy
UniMilano Bicocca	XRF_ED	EDXRF Malvern Panalytical Epsilon 3 XL. Benchtop energy dispersive x-ray fluorescence (EDXRF) spectrometer. It can handle solids, pressed and loose powders, liquids and filters, weighing from a few grams to larger bulk samples. It allows for data treatment through advanced spectrum processing and correction quantification algorithms. It is enhanced by standardless, fingerprinting and regulatory compliance modules. The Epsilon 3 XL conforms to the requirements of relevant international standards such as ASTM, ISO and DIN.	Spectroscopy
CNR-DSCTM	XRF_NANP	Nanoparticle Tracking Analysis System (NTA) Nanosight NS300 equipped with Green Laser module. provides an easy-to-use, reproducible platform for nanoparticle characterization and specifically rapid analysis of the size distribution and concentration of all types of nanoparticles from 0.01 - 1 μm^* in diameter. Equipped with interchangeable laser modules and motorized filter wheel to analyse different fluorescent labels, can be analysed. Sample temperature is fully programmable through the Nanoparticle Tracking Analysis (NTA) software. This instrument is able to count and size synthetic nanoparticles as well as liposomes and biological nanoparticles such as extracellular vesicles.	Spectroscopy