



Other support system to nurture innovation

1. Centre for Advanced Research and Development (CARD)

Centre for Advanced Research and Development (CARD) has been established to promote research among faculty members, research scholars and students. The primary objective of CARD is to create research culture among the stake holders. A structured cadre has been established for promoting research. A strong contingent of 45 persons belonging to all disciplines such as Engineering, Life Sciences, Pharmaceutical Sciences, Basic Sciences and Management are devoting their full time on research and development. The team is working on Wind and Solar energy, Environmental engineering, Alternative fuel, Nano-technology, Plant tissue culture, Animal Biotechnology, Fish Immunology, Stem cell research, Drug designing & Drug testing, Digital Innovations, Bigdata, Virtualization etc. The University has established CARD with a senior academic with a lot of expertise in research and administration, under which an active Innovation Club and Incubation Centre are functioning, which promotes original quality and innovative research. Various committees have also been formed to achieve smooth functioning of the university.

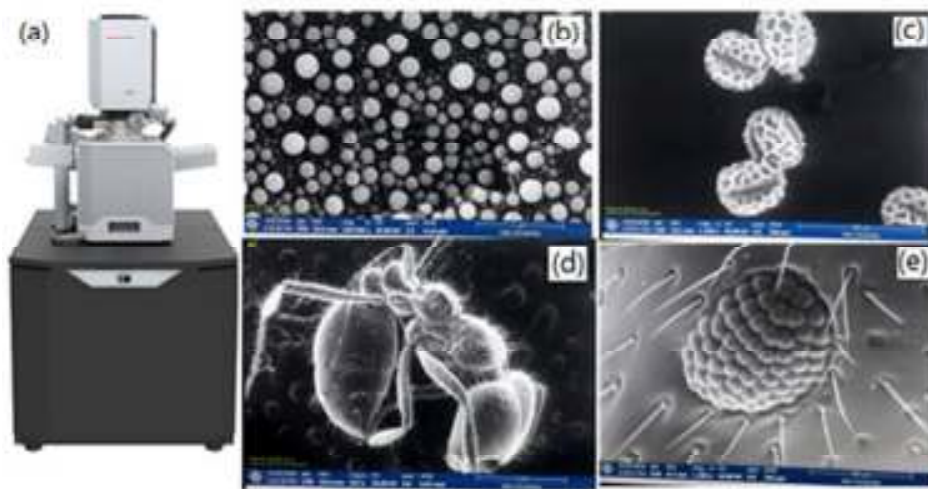
Central Instrumentation Laboratory : The Central Instrumentation Facility is an integrated sophistic analytical equipment centre established by VISTAS in 2017 to help the scientific community for their advanced research with nominal charges. Currently, the centre is housed with the state-of-the art field emission scanning electron microscope (FE-SEM), X-ray diffractometer (XRD), BET surface area & pore volume analyzer and particle size analyzer.

Values

- To serve the needs of the researchers within VISTAS, other academic institutions and industrial partners with utmost sincerity and dedication.
- Work in an ambience of transparency, with the commitment of maintaining the confidentiality of the work of the users/researchers.
- Periodical review of all measurements conducted, to impart actionable insights so as to value to the efforts of the researchers.

(a) Field Emission Scanning Electron Microscopy (Quattro ESEM)

Ultra-high resolution scanning electron microscopy with unique environmental capability coupled with materials spectroscopy tools. The Quattro environmental scanning electron microscopy (ESEM) represents the latest development in Thermo Fischer's SEM technology, comprising of various analytical accessories including energy dispersive X-ray spectroscopy (EDS) with a unique environmental mode. While the Quattro's field emission gun (FFG) ensures excellent resolution, the adjustment in the vacuum condition provide flexibility to accommodate the widest range of samples in their natural state. Thus the unique environmental mode (ESEM) allows scientists to study materials in a range of conditions, such as wet/humid, and/or reactive environments.



Picture of Quattro ESEM installed in VISTAS and the high resolution images of gold nanoparticles (b), pollen grains (c), ant specimen (d) and its specific part (e) taken from Quattro ESEM

Features

- Ultra-high resolution imaging at low kV.
- Fully integrated electron backscattered detector for compositional information
- Low kV BSE imaging at short working distance: WD = 1mm
- Easy operation through Windows based Smart SEM control software
- Suitable for imaging of non-conductive specimen without sputter coating
- Environmental mode ensuring the imaging and analytics of the samples in its natural state.

Applications

- Metals and alloys, fractures, welds, polished sections, magnetic and superconducting materials
- Ceramics, semiconductors, biological samples
- Thickness measurements of films/coatings
- Soft materials, polymers, pharmaceuticals, filters, gels, tissues, plant materials

- Nanoparticles, porous materials, fibers, foam materials
- Fracture and failure analysis
- Elemental composition and defect analysis
- Correlation of surface appearance and morphology.

(b) X-ray diffraction (Rigaku Smart Lab)

Rigaku Smart Lab is the newest and most novel high-resolution X-ray diffractometer (XRD) with the new unique Smart Lab Studio II software, which provides the user with an intelligent user guidance expert system functionality that guides the operator through the intricacies of each experiment. Coupling a computer controlled alignment system with a fully automated optical system, and the user guidance functionality within the Smart Lab Studio II software, ensures the easy handling with high accuracy of results.



Picture of Rigaku Smart Lab X-ray diffractometer installed in VISTAS

Features

- Highest flux X-ray source: PhotonMax
- HyPix-3000 high energy resolution 2D detector
- New CBO family, with fully automated beam switchable CBO-Auto and high-resolution micro area CBO- μ
- Various operando measurements with the new Smart Lab Studio II

Applications

- Powder and thin film samples
- Inorganic complexes
- Minerals, alloys, clays, semiconductors etc.
- Nanomaterials, polymer samples, metals etc
- Textile, corrosion and environmental samples.

(c) BET surface area and pore size analyzer (BELSORP)

The BELSORP-max is designed for wide range adsorption isotherm for surface area and pore size distribution analysis. Adsorption isotherms ranging from relative pressure as low as 1×10^{-8} (N₂ at 77K, Ar at 87K), using a 13.3Pa pressure transducer can be measured. Adsorption isotherms with high accuracy can be obtained as new method (ASF_M) for free space measurement has been employed in this equipment.



Picture of BET surface area and pore size analyzer installed in VISTAS

Features

- Specific surface area, pore size distribution, vapor adsorption and chemisorption (OP) can be measured.
- Adsorption measurements from extremely low pressures ($P/P_0 = 10^{-4}$ – 0.997).
- Upto 3 samples can be measured simulatenously
- Coolent level controller is no longer necessary and high reproducible data can be obtained.
- BELSim, which analyze the pore size distribution by NLDFT and GCMC simulation method can be incorporated into the powerful data analysis software, BELMaster.

Applications

- Specific surface area and pore size distribution of the activated carbon
- Surface area of catalyst such as mesoporous silica and layered clay minerals
- Surface area of pharmaceutical powders, ingredients, API's and excipients
- Inner surface area of hardened cement paste
- Surface area of the nanoparticles and electrode materials

(d) Particle size analyzer (Nanotrac Wave II)

Nanotrac Wave II is the accurate particle size zeta potential analyzer ideal for characterizing materials across the widest concentration range. Data's on particle size, zeta potential, molecular weight and concentration of colloidal systems can be obtained with high accuracy in Nanotrac Wave II as it employs Reference Beating method, which amplifies the signal back to the photodetector. The Nanotrac Wave II provides user with superior particle analysis capability by taking advantage of an enhanced optical signal, innovative probe technology, and advanced algorithms. Whether your material is ppm or near finished product, the Wave II obtains fast, sensitive, and precise measurements of materials ranging from sub-nanometer to several microns.



P

Picture of Nanotrac Wave II installed in VISTAS

Features

- 180° backscatter collection enables fast and precise measurement across the widest concentration range—from ppm to near solids (40 %).
- Measures particles in the size range of 0.3~10,000 nm.
- Measures Zeta potential (measurement range -200 to +200mV) closer to iso-electric point by eliminating the errors caused by electro-osmotic flow.
- Simultaneous measurement of size and concentration

Applications

- Nanoparticle dispersions
- Pharmaceuticals/biotechnology
- Food/Beverages
- Polymer and coating samples
- Ink and adhesives



Industry Institution Interface

S.No	Company Name
1	Metal Electroplater, Thirumudivakkam
2	Evergreen Enterprises, Chennai
3	Marina Labs, Chennai
4	Astagiri Herbal Foundation, Chennai
5	Kowsic Pharmaceuticals, Chennai
6	Mohina Eco Solutions, Chennai
7	Plasma Scientific, Chennai
8	Rajendra Herbal Research Centre, Periyakulam, Theni
9	Mahathi Biotech, Chennai
10	REFSYN Biosciences Pvt. Ltd. Puducherry
11	ARMATS Biotek, Chennai
12	Swim Bio Pharma, Chennai
13	BioNeemtec Pvt Ltd., Chennai

14	Yekova Construction, Chennai
15	Natural Solutions, Gujarat
16	Next Gen Automation, Nolambur, Chennai
17	CADDAM Technologies Private Limited, West Tambaram
18	Vel Sakthi Engineering Works, Chennai
S.No	Company Name
19	Teja Tech, Pollachi
20	Calibsoft Technologies, Chennai,
21	Harsath Traders, Chennai
22	JENI Export International, Chennai
23	Lodha-Honda, Chennai
24	G BOOM Technologies, Chennai
25	Asian Analytical Laboratories Pvt. Ltd , Chennai
26	Avanz Biotech Pvt. Ltd ,Chennai
27	Einel solutions, Gowrivakkam, Chennai
28	Bio Vision Medical System, Chennai
29	Barola Technologies, Chennai
30	Jhosh Nutritions, Kallakurichi
31	Cape Biolabs, Kannyakumari District
32	Shivaksi Textiles, Theni
33	Areete Life Sciences, Chennai
34	Scitus Pharma Limited, Chennai
35	Gandhiji Gramodhyog Centre, Chennai

36	RAUNAQ Steelstrading Pvt. Ltd, Chennai
37	SS Ryders Ind Pvt Ltd, Chennai
38	Ideal Sensor Limited, Chennai
39	Innovative Solutions Limited, Chennai
40	Interlogicx Embedded Systems Pvt, Pondicherry
41	Saveetha Dental College, Chennai
42	M/s.Waste is Gold, Chennai
S.No	Company Name
43	Acme Projen, Chennai
44	Agni Sai Enterprises, Chennai
45	M/s. Results Marine Limited, Chennai
46	M/s. ESRO Limited, Chennai
47	Microtronix System Solutions, Chennai
48	NOHA Marine, Coimbatore
49	Inbiotics Labs, Kannyakumari
50	Apex Biotech, Chennai

