

Applications

Microanalysis, micro-spectroscopy, materials characterization, failure analysis, quality control, nano engineering, nano fabrication, plus others

Analysis of:

Materials Science: metals, polymers, ceramics, glasses, composites, semi conductors, micro-electronic devices, electronic materials, particle contamination identification, archaeomaterials, museum specimens and artifacts, particle analysis, Micro-Electro-Mechanical Systems (MEMS), optical materials, optical fibers, quantum dots, geological, mineralogical, construction materials, adhesion, corrosion and plus others

Pharmaceuticals and Food Analysis: coating, filler and excipient identification, polymorphism studies, aqua culture, liposome delivery systems

Biomedical Devices: polymers, disease prevention, arterial grafts and stents, heart valves, prosthetics, joints, bone grafts and regeneration

Forensic Science: identification of explosives, drugs, fibers, pigments, modern and ancient fabrics, many others

Biological and Agricultural Sciences: virus identification, cellular structures, bacterial structures, tissue organization, phenotype and genotype, plant and animal disease diagnosis, biological failure analysis, biofilm identification, organism identification, water samples, soil samples, plant and animal tissue samples, archaeomaterials

Environmental and Air Quality: particulates, contamination, identification

Water Analysis: suspended particulates, bio-film, bacterial content, viral contamination, protozoa

Our facilities are able to collaborate and develop applications to suit your research.

IMAGE CREDITS: **Image 1:** Hydroxyapatite, Microscopist: Sarah Biedrzycki, Research by: Szivek - orthopaedics, Date: 22 July 1996, 25 kV, Instrument: Hitachi S-2460N. Bar=2microns **Image 2:** Unpyrolyzed polyacrylonitrile coated Cobalt nanoparticles. Image by Bryan D. Korth, Unpublished results provided by the Pyun group from the Department of Chemistry using the Hitachi S-4800.



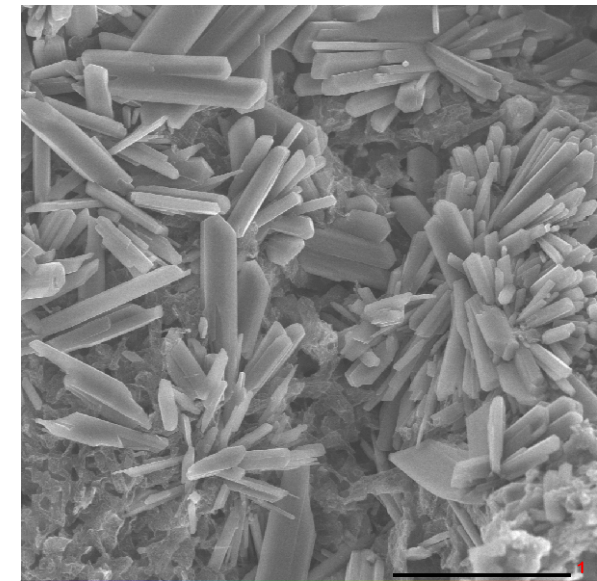
Main Campus

Marley Building #101
1145 E 4th Street
Tucson, AZ 85721-0107

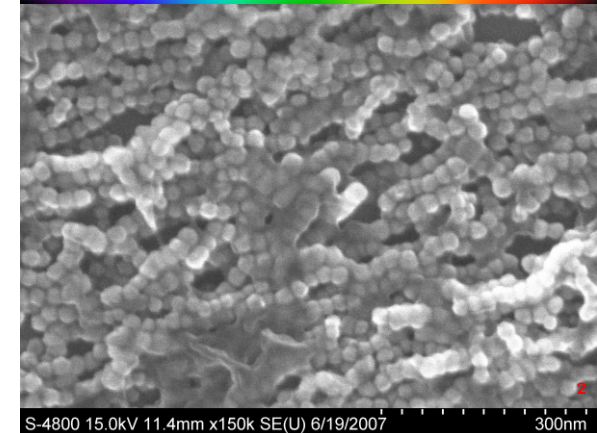
Tel: (520) 621-5097
Email: usif@email.arizona.edu
Web: usif.arizona.edu

Mailing Address

University Spectroscopy and
Imaging Facilities
The University of Arizona
P. O. Box 210036
Tucson, AZ 85721-0036



University Spectroscopy and Imaging Facilities



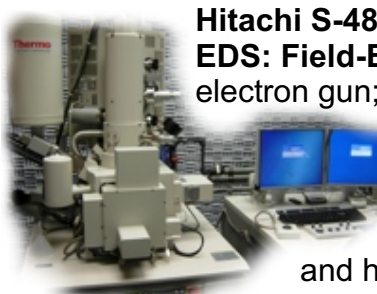
S-4800 15.0kV 11.4mm x150k SE(U) 6/19/2007 300nm



USIF

Envision Tomorrow

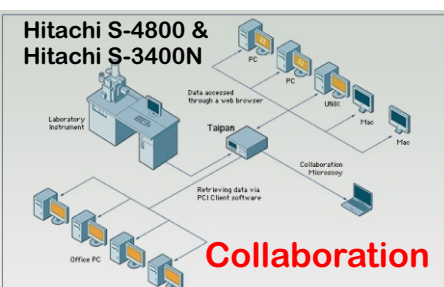
<http://usif.arizona.edu/>



Hitachi S-4800 Type II / ThermoNORAN NSS EDS: Field-Emission SEM - Cold field emission electron gun; Resolution 1nm at 15 KV, 1.4nm at 1KV; Magnification 20X to 800,000X; Imaging voltages 100V to 30KV; STEM detector; BSE low and/or high angle; EDS detection range Boron and higher; EDS Quant, line, map, imaging.



Hitachi S-3400N Type II / ThermoNORAN NSS EDS: Variable Pressure SEM - Tungsten thermionic emitter, Quad Bias; Resolution 30nm at 3KV, 3nm at 30KV; SE and BSE; Samples as tall as 30mm; Chamber pressure 6 to 270 Pa in variable pressure mode; EDS detection range Boron and higher; EDS Quant, line, map, imaging.



Real-Time Collaboration and Data Management System
The Hitachi S-4800 and S-3400 systems are facilitated by Quartz Taipan Server and Data Acquisition System. Real-time interactive sessions are possible through the internet.

Cathode-Luminescent (CL) Spectrometer: Renishaw Structural and Chemical Analyzer - **InVia Raman Spectrometer;** 514nm, 50mW laser; CL from 400 to 1060nm.



Hitachi S-2460 / ThermoNORAN NSS EDS: Variable Pressure SEM - Tungsten thermionic emitter, SE and BSE; Samples as tall as 30mm; Chamber vacuum 0.01-2 Torr in variable pressure mode; EDS detection range Boron and higher; EDS Quant, line, map, imaging.

Visit us on the web for other equipment and services.

Web-based instrument booking and scheduling, general-purpose file server data storage, laboratory database management, web-based collaboration capabilities.

Hitachi S-4500: Field Emission Scanning Electron Microscope
1.5 nm resolution, 0.5 - 30 kV accelerating voltage, 3 stage electromagnetic lens, 2 secondary electron detectors, 1 backscattered electron detector, x-y-z translation, -5 degrees to + 45 degrees tilt, 360 degree rotation (continuous) 50 mm diameter specimen size Sun IPC running Noran's Voyager, digital image and x-ray spectra acquisition system.



JEOL 100 CX II
100X-200,000X. Good resolution with excellent screen contrast. Film based data collection.



The Hitachi H8100 TEM - The Hitachi H8100 is a 200kV conventional TEM with high brightness LaB6 electron source and large specimen-tilt (> 30 degrees) capabilities. It offers phase contrast resolution of better than 0.26 (point) and 0.14 nm (line). It is equipped with small probe forming lenses for nanodiffraction, CBED and hollow-cone illumination. A heating stage (up to 1000C) and a LN2 cooling stage coupled with CCD high resolution camera allows unique dynamic in-situ experiments.

Services

- * **Scanning Electron Microscopy**
 - > **Field Emission SEM**
 - > **Variable Pressure SEM**
- * **Transmission Electron Microscopy**
 - > **Materials and Biological TEM**
- * **X-ray Diffraction**
- * **Professional Assistance and Collaborations**
- * **Professional Education and Training**
- * **Outreach**

Fees

Please visit our website for current rate structures. To get started, please contact us to discuss your projects.

Contact Us

General Inquiries, Materials/Biological SEM and EDS: Al Agellon

Materials SEM, CL, PL, Raman Spectroscopy and EDS: Steven Hernandez

Materials TEM/XRD: Phil Anderson

Director: Supapan Seraphin, Ph. D.,

usif@email.arizona.edu

<http://usif.arizona.edu/> 520-621-5097