Quantum Design

LATIN AMERICA

Raising The Science

Materials Science

Spectroscopy

Cryogenics

Optics

Nanoscience

Sample Synthesis

Biotechnology & Chemistry

Industries

Microscopy

Quantum Technology

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qd-latam.com

Durham Magneto Optics

England

Quantum Design
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Durham Magneto Optics is specialized in advanced scientific instrumentation for nanotechnology research and development, producing equipment in two categories, a family of magneto-optical Kerr effect magnetometers (NanoMOKE3) and a family of direct-write optical lithography machines (MicroWriter ML).

MicroWiter ML3 family is designed for highly demanding individual research groups or for central clean room facilities. The optical microscope contains a full set of high performance bright and sharp infinite conjugate objectives up to x20 with a software controlled automatic lens changer, allowing large substrate areas to be searched rapidly and individual sub-micron objects such as nanowires and crystal flakes to be accurately located. An additional lens offering 0.4 µm minimum feature size and x50 microscope is available as an option.

In addition to the optical surface profilometer tool and automated wafer inspection tool, there is a Virtual Mask Aligner mode in which the pattern to be exposed is displayed on top of the real-time microscope image, allowing the machine to be used like a traditional mask aligner. A backside alignment camera for aligning double-polished wafers is available as an option.

All the machines have fast writing speeds and have an impressive array of advanced features usually only found in high-end machines. Also, they are designed for use by PhD students and post-docs in a research environment and so have an attractive, intuitive and simple Windows® user interface while offering the flexibility and high levels of access to machine operation for those who want to develop new techniques.

The machines handle the small millimetre-size chips often used in R&D, as well as large wafers. By sharing a common technology platform, you can upgrade your system to a more complete version in the future.

Key features:

- 195 mm x 195 mm maximum writing area
- 230 mm x 230 mm x 15 mm maximum wafer size
- Resolutions: 0.4 um, 0.6 µm, 1µm, 2 µm and 5 µm
- Automatic selection of minimum feature size via software – no manual changing of lens required.
- Long-life lights source: 405, 385 or 365 nm
- Very fast writing speed - up to: 17 mm²/min (0.6 µm minimum feature size) and 180 mm²/min (5 µm minimum feature size)
- Acceptable file formats: CIF, GDS2, BMP, TIFF, JPEG, PNG, GIF
- Grey scale exposure mode for 3-dimensional patterning (255 grey levels)
- Includes on-site installation by trained service technician.
- Competitively priced for University and industrial R&D budgets
- Low ownership cost and easy to operate

Most common applications:

- Microelectronics and semiconductors
- Spintronics and sensors
- MEMS / NEMS
- Microfluidics and lab-on-a-chip
- Nanotechnology
- Materials science and materials development

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Materials Science | Sample Synthesis

Spectroscopy

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NanoMOKE3® is a new generation of ultra-high sensitivity magnetooptical magnetometer and Kerr microscope. Building on the success of NanoMOKE2®, it offers high performance laser magnetometry and video-rate Kerr microscopy in a single machine. It is sensitive to the longitudinal, transverse and polar magnetooptical Kerr effects and is ideally suited to measuring the magnetic properties of thin magnetic films and magnetic nanostructures.

LX Pro 3 allows the laser to be moved so as to locate specific areas, allows complex applied field patterns to be easily generated, records hysteresis loops and allows post-processing of the loops to filter noise, remove artefacts and automatically measure key loop parameters such as coercivity and remanence. It also allows real-time display of images during rastering, capture of photographic quality images and basic image processing such as contrast-brightness correction and profile measurement. LX Pro 3 also includes a macro language which can be used to interface NanoMOKE3® to other software routines that you may wish to write and to automate complex measurements.

Auxiliary electronic inputs and outputs allow NanoMOKE3® to be connected to your own experimental control. The auxiliary laser input port allows NanoMOKE3® to use an existing laboratory laser instead of the built-in laser.

Most common applications:

- Magnetic thin films
- Magnetic nanostructures
- Magnetic tunnel junctions
- MRAM
- Hard disk read / write heads
- Spintronic devices
- Magnetic sensors
- Magnetic material development
- Magnetocaloric and thermomagnetic materials

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Materials Science | Sample Synthesis

Spectroscopy

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Key features:

- Ultra-high sensitivity and stability
- Very low noise (< 0.5 mdeg)
- Highly focused laser spot (2 µm, in high-mag polar)
- Video-rate microscope to allow precise positioning of laser spot on sample and domain imaging
- Flexible optics and electronics for novel experiments
- 3.3 K-350 K Helium free cryostat or 4 K-500 K cryostat available as options
- 0.26 T applied field in x and y or z; 0.65 T field in x or z available as option
- Sensitive to Longitudinal, Transverse and Polar Kerr rotation and ellipticity
- Supplied with LX Pro, our easy to use and flexible control software

FlowView

Taiwan

Quantum Design
LATIN AMERICA

FlowVIEW Tek combines the experience in the National Measurement Laboratory of ITRI and 3 core technologies to break through the technical barrier and develop the total solution of liquid sample inspection. Our technology can create an atmospheric environment in the vacuum chamber of SEM and help you observe the original sample in situ under SEM. Combined with AI image analysis software, we offer you wet sample total analysis services and help global customers research more efficiently and improve product qualities.

If you'd like to observe in-situ liquid sample inspection, this product is designed to satisfy basic observation needs and is customizable to various brands of SEMs. The anti-vacuum sample holder of Aquarius Starter Kit possesses nano-membrane and microfluid channels, which can create an atmospheric environment in the SEM and keep the liquid sample remain its original state.

Most common applications:

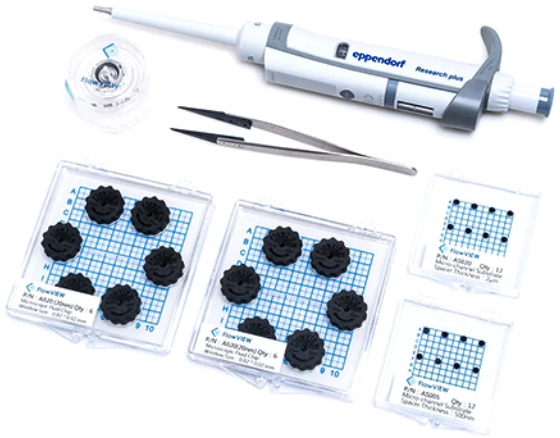
- Biochemistry
- Pharmaceuticals
- Semiconductor
- Electronic Industry
- Energy

BIG AREAS

Biotechnology and Chemistry
Industries | Materials Science
Nanoscience | Optics

Key features:

- Many areas of application: semiconductor electronics, energy and environmental engineering, biomedical materials, etc.
- Examples of samples: biological material, cosmetics, polymers, gels, pastes, milk etc.
- Chip thickness: 20, 30 and 50 nm
- Window size: 20, 150 and 250 μm



FlowVIEW

GETec

Austria

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GETec was founded in 2011 and is composed by a multidisciplinary team consisting of specialists in the fields of physics, electrical and mechanical engineering, biological sciences, semiconductor and MEMS processing to develop ways helping customer achieving their unique results and correlated data.

The AFSEM™ from GETec provides a powerful new capability that joins the forces of AFM and SEM. AFM imaging in all the conventional AFM modes is now possible simultaneously under an SEM beam without disruption to either technique, whether with or without add-ons such as EDX or micro-indenter. Through its unique design and the use of self-sensing cantilevers, the unit is the first crossplatform AFM that can be integrated into all major commercial SEMs. Providing all the advantages described above, it represents an accessible innovation with significant capability enhancement for materials science research. It does not matter the size of your sample – AFSEM goes to the sample, wherever it is.

Key features:

- Correlated microscopy: AFM and SEM data simultaneously and on the same area
- Fast & Easy image acquisition due to novel self-sensing cantilever technology
- Electrical cantilever readout: no interferometer (lot less space)
- FIB-assisted nanomechanical 3D reconstruction possible
- AFM/SEM/EDX combined
- Sub-nm Z-resolution

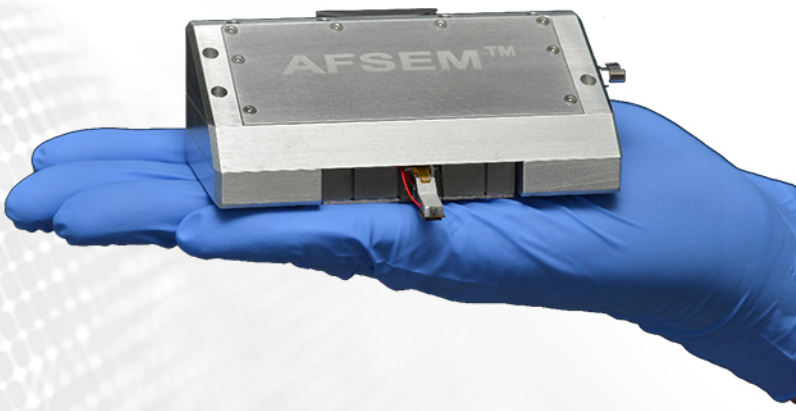
Most common applications:

- Measure electrical & magnetic properties
- Measure mechanical properties and fractures
- Fracture Mechanics
- Electrical Characterization
- Nano-Indentation
- Electron Backscatter Diffraction
- Biological samples: spores, bones, cells, soft tissues
- 2D materials: nanomechanics
- Roughness Analysis
- Real 3D topography

BIG AREAS

Biotechnology and Chemistry | Industries
Materials Science | Nanoscience
Microscopy

GETEC



ICSPI

Canada

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ICSPI designs, manufactures and sells single-chip scanning probe microscopes for educational, research and industrial applications, including failure analysis and quality control. We push the limits of what is possible in nanoscale metrology with our team of engineers of the highest calibre working on our patented CMOS-MEMS technology. ICSPI is headquartered in Kitchener-Waterloo, Ontario, Canada.

The nGauge AFM is a laserless system: the integrated piezoresistive sensor allows for alignment-free operation and a fully automatic approach – so you can collect your data effortlessly. All of the sensors and scanners of traditional AFM instruments have been integrated onto a single 1 mm x 1 mm chip.

Most common applications:

- Polymers and composites
- Microfabrication
- Metals and minerals
- Thin films
- Lithography
- Biology and life science

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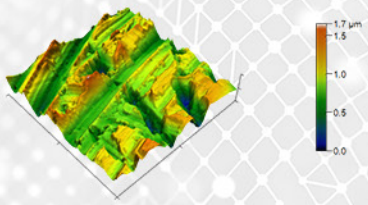
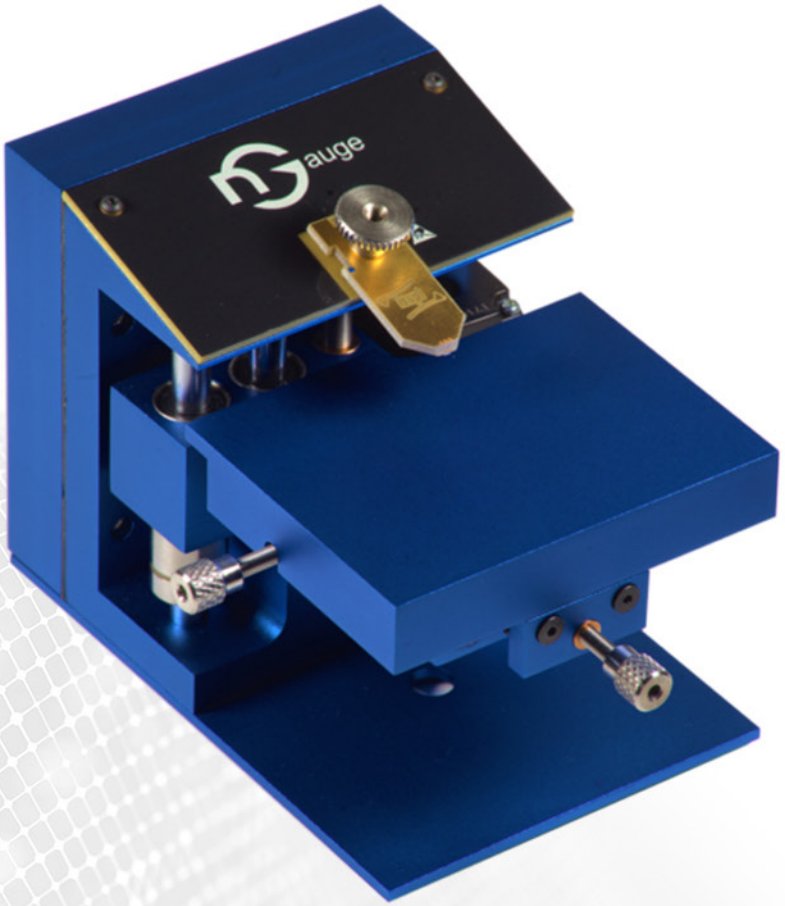
Nanoscience | Optics

Key features:

- Scan types: Topography, Phase
- Scan size: 20 µm × 20 µm
- Scan size (25 stitched) : 100 µm × 100 µm
- XY Scanner Resolution: <0.5 nm
- Vertical Scan Range: 10 µm
- Noise floor: <0.5 nm
- Quick scan: 16 sec
- Routine scan: 80 sec
- High-resolution scan: 5 min
- Max resolution: 1024 x 1024 pixels





icspi

Imtek Cryogenics

Turkey

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Imtek Cryogenics is a full-service cryogenic engineering company providing innovative solutions to unique cryogenic problems. Their cryogenic systems can produce cryogens for Healthcare, LNG and Biogas, Research, Universities and Industry, or re-liquefy cold gas in closed loop systems for Observatories, Space simulation chambers, MRI or NMR magnet cooling, cryogenic test and measurement systems. All Nitrogen, Oxygen and Argon Generators work with Purity >=99%, Noise Level <65 dB@1 meter, Operating Pressure 1.5 bar

Cryogenic Storage System - 120 Liter

The CSS 120 - Cryogenic Storage System - provides stable cryogenic storage and easy sample retrieval of up to 8400 1.5/2.0 ml vials in a square outer package. This LN2 freezer has worlds maximum storage density (70 vials/L) and the longest holding time. The CSS120 can be operated in vapor, although engineered for storage in liquid using liquid storage accessory packs.

The control system continually monitors and records parameters like freezer top temperature, 4 bottom temperature, LN2 level and supply tank pressure at fixed interval, manages auto filling when needed and provides audio/visual alarms based on a triggered alarm by advanced alarm management system which allows send e-mails and text messeages to various recipients. All the data are stored in the controller, which are available at any time to check the operating status of freezer, insuring sample safety. Meanwhile, history data can be transferred into a computer.

CSS120 has two LN2 filling option; auto and manual. By default, auto mode will fill LN2 into freezer. However, if auto mode fails, manual valve located at the back can be used to fill LN2 to ensure normal LN2 supply. The tiny crystals of the samples in vapor nitrogen is in glass transition. When LN2 is poured into the freezer, the strenous vibration will cause fatal influence to samples.

Most common applications:

Store and cryopreservation of:

- Cells
- Viruses
- Gametes
- Food transport

Coolant for:

- Chemical processes and reactions in research and industrial scales
- Superconductors
- Vacuum pumps
- CCD cameras
- Reactors

Production of very dry nitrogen for:

- Chemicals and Pharmaceuticals
- Healthcare
- Food & Beverages
- Metal Manufacturing & Construction
- Rubber & Plastic
- Others

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Biotechnology and Chemistry

Cryogenics | Industries

Key features:

- Can be used for liquid or vapor storage
- Fully automatic LN2 Level control and temperature monitoring
- Autofill features
- Tracks and displays LN2 consumption
- Defined audio/visual alarms including High Temperature, Low Level, Liquid Usage, Fill Timeout and more
- No maintanence
- Transportable in emergency cases
- 5 liquid level sensors are available to control liquid level and refill
- Safety password protection at different levels
- Optional backup battery provides a full load of up to three days of operation including LN2 auto-filling

IMTEK CRYOGENICS

Imtek Cryogenics

Turkey

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Liquid Nitrogen Plants – From 10 up to 480 L/day

Since its foundation 30 years ago, Imtek Cryogenics has developed and manufactured cryogenic test and measurement systems, cryogenic liquid plants, and customer-specific engineering solutions.

You can fill your dispensing thermos or transfer LN2 via a flexible hose to an external dewar with a simple push of the button. LN2 transfer is independent from the system's operation mode. The PLC automatically re-starts when the level drops to 70% in the internal storage dewar, then will stop the plant when the dewar is full and goes into standby mode until some LN2 is transferred.

The ultra precision machining laboratory at Imtek Cryogenics houses a range of ultra precision turning and milling machines from leading suppliers. Machined work pieces have been manufactured to micron size and sub-micron geometric tolerances with very low surface roughness (down to Ra=0.010 µm). Examples are optical components and air bearing systems. The metrology laboratory is a high class measuring facility dedicated to perform geometrical measurements with extreme high accuracies. With a focus on 3D-metrology and forms measurements are carried out on high-end standard equipment or own built apparatus.

Most common applications:

- Cryotherapy and Animal Husbandry Centers
- R&D Labs
- Clean Rooms
- Dermatology
- Food and Beverages
- Rubber & Plastic
- Healthcare

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Biotechnology and Chemistry | Cryogenics Industries | Materials Science

IMTEK CRYOGENICS

Key features:

- Production rate: 10/20/30/60/120/180/240/360/480 L/day
- Dewar Volume: 60 up to 1000 L
- Nitrogen Purity: >99%
- Cooling Water Flow Rate: 9 up to 72 L/min @4 bar for (except 10/20/30 L systems)
- Operating Pressure: 1.5 bar
- Lowest Power Consumption: 2.5 kW@50 Hz; 3.9 kW @60 Hz
- Highest Power Consumption 56 kW @50 Hz; 64 kW @60 Hz
- Electrical Options: 380/400/415 VAC, 3 Ph, 50 Hz; 480 VAC, 3 Ph, 60 Hz
- Color Graphic Touch Screen: 6" and 8"
- Noise Level: <65 db @1 meter

Intercovamex

Mexico

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Intercovamex assembles high vacuum deposition systems with only high-quality components from world leading companies. There are hundreds of scientific papers using its systems such as sputtering, thermal evaporation, pulsed laser deposition and CVD. Configurations are often specially adapted to customers technical and budgetary needs.

Among the different systems aiming thin film deposition, Intercovamex offers standard or customized CVD (both plasma and hot filament CVD), PVD, PLD, sputtering and so on. The customer can choose different shapes of chambers to fit his experiments and his budget as well as choose several options and configurations, such as hot plate, target rotation, carrousel of targets and so on.

Most common applications:

- Materials science
- Inorganic thin film deposition
- Stoichiometric deposition
- Ceramics
- Metal alloys
- Glasses
- Surface coating – research or industrial

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Industries | Nanoscience
Sample Synthesis

Key features:

- Top loading and cleaning with a hinge
- Single compact frame (vacuum chamber + electronics)
- Evaporation or Co-evaporation
- Sputtering or Co-sputtering
- Multi-technique system (Evaporation and Sputtering)
- Loading chamber optional
- Assembled with high quality components from worldwide leaders

INTERCOVAMEX®
... as versatile, as you need

J.A. Woollam

USA

Quantum Design
LATIN AMERICA

J.A. Woollam Company was founded in 1987 by Dr. John A. Woollam. Starting as a spin-off from the University of Nebraska, the the company has rapidly grown to become a worldwide leader in spectroscopic ellipsometry. We have been perfecting our technology for over 30 years and have secured over 200 patents.

The M-2000® line of spectroscopic ellipsometers is engineered to meet the diverse demands of thin film characterization. An advanced optical design, wide spectral range, and fast data acquisition combine in an extremely powerful and versatile tool. The M-2000 delivers both speed and accuracy. The VASE® 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 – up to 193 to 3200 nm. The RC2® design builds on 25 years of experience. It combines the best features of previous models with innovative new technology: dual rotating compensators, achromatic compensator design, advanced light source and next-generation spectrometer design. The RC2 is a near-universal solution for the diverse applications of spectroscopic ellipsometry.

Most common applications:

- Dielectric films
- Self-assempled monolayers
- Very thin films
- Absorbing films
- Coating on glass
- Liquid Crystals
- Semiconductors
- Photosensitive Materials
- Chemistry/Biology: liquid cells
- Conductive Organics
- Photovoltaics

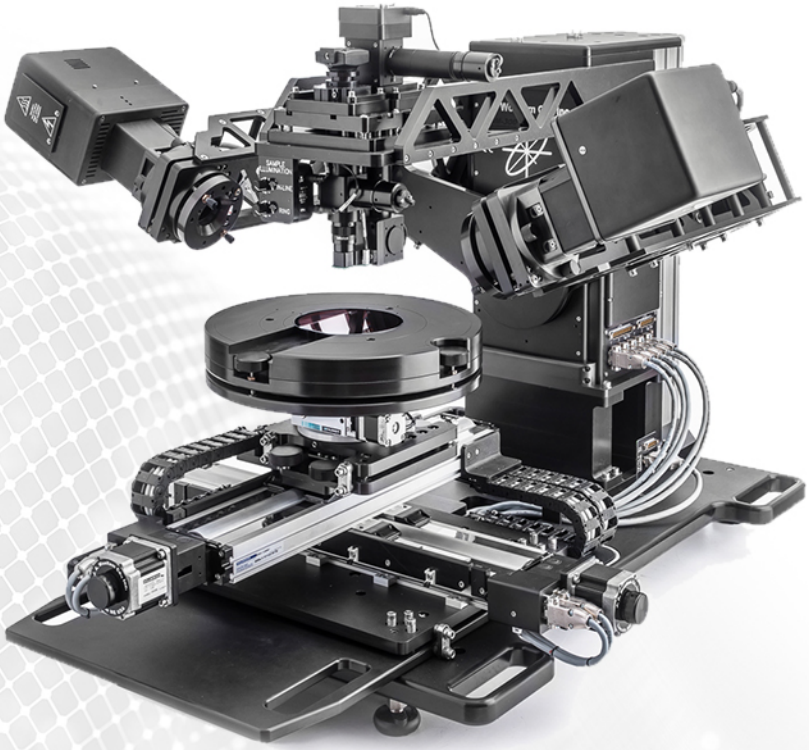
BIG AREAS

Industries | Materials Science
Optics | Spectroscopy

J.A. Woollam

Key features:

- Compact
- Fast CCD Detection
- Auto Alignment
- Transmission mount
- Translation samples
- Focusing option
- Low or high temperature options
- In situ analysis for MBE, Sputtering, ALD, e-beam evaporators
- Dual Rotating Compensators
- Wide Spectral Range



Janis Research

USA

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Since 1961 Janis Research Company has been providing the scientific and technical community with the highest-quality cryogenic equipment for research, characterization, and industrial applications. Over the years, the family of customers has grown to include some of the world's largest corporations and best-known research centers and institutions. The reasons for this record of success are simple: precision engineering and quality manufacturing; ease-of-operation; day-after-day reliability and performance; and a level of service and support unmatched in the industry.

Systems for Raman Spectroscopy

Most standard Janis optical cryostats that cool the sample in a vacuum environment are suitable for Raman measurements. For customers that wish to use a closed cycle cryostat, the 10 K CCS-150 and CCS-100/202 are the most affordable choices. The model SHI-4-2 is the most popular 4 K closed cycle system for Raman measurements. For customers that prefer a lower-cost system that uses LHe, the continuous flow ST-100 is the most affordable open-cycle LHe system.

Cryostats for Fourier Transform Infra-Red (FTIR) Spectroscopy

The SuperTran and SuperTran-VP systems for FTIR include a high-efficiency transfer line for low cryogen consumption, and feature additional spacers for minimal vibration. The pulse tube system for FTIR features very low vibrations - particularly on the room temperature housing - allowing the cryostat to be mounted directly on the spectrometer. The flexibility of Janis' design and the range of options available, combined with a reputation for quality, make the Janis FTIR cryostats the ideal choice for efficient and high quality FTIR measurements.

Cryostats for Microscopy Applications

Microscopy applications typically require a short working distance and very low levels of vibration. The sample being studied must be close to the microscope objective lens and must stay within the lens field of view for the duration of the measurement. Janis Research offers a range of cryostats to meet these twin requirements, plus a range of options for maximum versatility.

Micro-manipulated Cryogenic & Vacuum Probe Systems for Chips, Wafers and Device

Janis micro-manipulated probe stations are designed for non-destructive electrical testing using DC, RF, and fiber-optic probes. They are useful in a variety of fields including semiconductors, MEMS, superconductivity, electronics, ferroelectrics, material science, physics and optics. Either LHe/LN2 or a mechanical closed cycle refrigerator provides cooling. Different models locate the sample in ultra-high vacuum (UHV), ultra-high temperature (to 675 K), and magnetic field.

Working in NANO-scale Science and Technology at Low Temperatures?

Janis Research offers systems that cover the entire low temperature range you need, in a variety of environments. They include magnetic fields, optical access, fiber optic cables, shielded high frequency coaxial cables and a variety of other customized options as dictated by your experimental requirements.

Key features:

- Liquid Nitrogen Cryostat
- Liquid Helium Cryostat
- 10 K Closed Cycle Refrigerators (Two-stage Gif ford-McMahon [G-M] Refrigerator Systems)
- 4 K Closed Cycle Refrigerators (Two-stage Gif ford-McMahon [G-M] Refrigerator Systems)
- 1.5 K Continuous Closed Cycle Refrigerator Cryostat
- Pulse Tube Refrigerators
- Superconducting Magnet Systems
- Micro-manipulated Probe Stations
- Detector Cooling Systems

Most common applications:

- Aerospace and Astronomy
- Fourier Transform Infra-Red (FTIR)
- Hall Studies
- High TC
- Magneto Resistivity
- Materials Characterization
- Microphotoluminescence
- Micro-Raman spectroscopy
- Microscopy
- Mössbauer
- NMR Spectroscopy
- Photoluminescence
- Raman Spectroscopy
- UV, VIS, IR, FTIR

BIG AREAS

Cryogenics | Industries
Materials Science | Optics
Microscopy | Quantum Technology

Lake Shore CRYOTRONICS
environment by JANIS

Lake Shore Cryotronics

USA

Quantum Design
LATIN AMERICA

Serving the needs of the research community since 1968 Lake Shore has grown its product solutions to keep pace with evolving interests in scientific exploration, from the physics lab to deep space.

The 8600 Series vibrating sample magnetometer raises the bar for magnetometer performance and convenience. These VSMs combine high sensitivity (15 nemu), rapid measurement speed (10 ms/pt), and simple operation for more accurate measurements, faster.

The system's software simplifies control of the VSM. Standard predefined measurement routines are combined with configurable field and measurement loops to provide a flexible data acquisition environment. In addition, the software features an integrated scripting tool, which enables the user to extend the existing routines with an open-ended software scripting language that can be used to perform customized measurement protocols and interface with third-party lab equipment.

Most common applications:

- Natural magnets (rocks, sediments, etc.)
- Nanoscale wires, particles, nano-crystalline alloys, etc.
- Magnetic semiconductors
- Ferrofluids
- Magnetic thin films and multi-layers
- Ferrites and permanent magnets, including rare-earth materials
- Magnetocaloric effect materials

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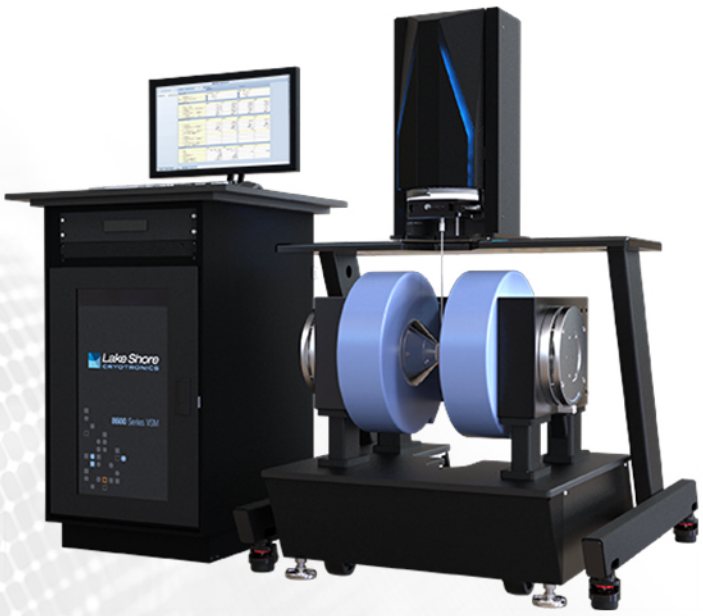
Industries | Materials Science

Lake Shore CRYOTRONICS
ADVANCING SCIENCE

Key features:

- 0.15 × 10-7 emu noise floor at 10 s/pt
- 10 ms/pt data acquisition rate
- 10,000 Oe/s field ramp rate
- Rapid, repeatable temperature option exchange
- High stability—±0.05% per day
- Fields to 3.62 T
- Widest available temperature range—4.2 K to 1273 K
- Includes fully automated FORC data acquisition software
- Kit available for integrating NanOsc room temperature 2 to 40 GHz FMR sample holder, sense coils, and instruments



Magritek

Germany

Quantum Design
LATIN AMERICA

Spinsolve is a revolutionary multinuclear NMR spectrometer that provides the best performance of any benchtop system available today. The Spinsolve spectrometers come in 90, 80, and 60 MHz models and can be equipped with unique features. With its small footprint, low weight, and low cost you can have powerful, high resolution NMR spectroscopy in the chemistry lab.

The Ultra high field homogeneity of this model has been achieved to obtain the highest performance from solvent suppression methods. This technique is particularly useful to measure compounds dissolved even at sub-millimolar concentrations in protonated solvents.

Measure multiple X nuclei over a broad frequency band without the need of any user intervention. The Spinsolve Multi X switches between different nuclei in a fully automatic way, making it possible to run a series of multinuclear experiments unattended. By combining this new technology with the Spinsolve sample changer a powerful level of automation can be achieved. Since the whole library of protocols available for each nuclei is pre-calibrated, the queueing function in the Spinsolve software can be used to measure several X-nuclei on a series of samples.

Most common applications:

- Chemistry Education
- Reaction Monitoring
- Polymers
- Forensic Drug Analysis
- Food and Drinks
- Petrochemical
- NMR Research

BIG AREAS Biotechnology and Chemistry | Industries

Spectroscopy

magritek

Key features:

- Highest Sensitivity: >240:1 (Dual channel for 1% Ethyl Benzene1)
- ^{1}H and ^{19}F on all systems + X nuclei for dual channel systems
- Resolution Spinsolve 90 MHz: <0.4 Hz (50%) / <16 Hz (0.55%)
- 3D PFG gradients optimized for gradient-enhanced methods
- Optional PFG gradients for diffusion spectroscopy (>0.5 T/m)
- No cryogens
- External Hardware Lock with no need for deuterated solvents
- Unparalleled stability
- Suitable for on-line reaction monitoring
- Easy to operate
- Available with automatic sample changer
- Benchtop size and weight
- Dimensions: 66 x 45 x 43 cm (25,9" x 17,7" x 16,9")
- Weight: 115 kg (253,5 lb)

Montana Instruments

USA

Quantum Design
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The CryoAdvance® is the latest evolution of Montana Instruments' Cryostation® best-in-class system to accelerate quantum discovery. Utilizing a purposeful modular design strategy, CryoAdvance® is a high-performance product built to serve our customers and their needs to reach and maintain low and stable temperatures quickly.

The CryoCore® is a standardized, turn-key member of the Cryostation® product line designed to accelerate quantum research and jump-start hands-on quantum education. The single as-sold configuration is built for investigators who need the versatility of a Montana Instruments Cryostation® in a package that fits their budget and project timeline.

Most common applications:

- Thin-films
- Spectroscopy
- Semiconductors
- Photon-experiments
- Optical-crystals
- Quantum computing
- Quantum education

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Cryogenics | Spectroscopy | Industries
Materials Science | Nanoscience | Optics
Microscopy | Quantum Technology

Key features:

- 3.4-350K temperature range
- Configurable modular design
- Standard RF & DC I/O included
- Sample-in-vacuum, cryogen-free
- Automated temperature & vacuum control
- Touchscreen system controller
- Remote operation and monitoring

MONTANA INSTRUMENTS
COLD SCIENCE MADE SIMPLE

Nanosc

Sweden

Quantum Design
LATIN AMERICA

Interest in Ferromagnetic Resonance (FMR) spectroscopy at room temperature and cryogenic temperatures is rapidly increasing. This is to a large part due to novel phenomena such as spin pumping, the spin Hall effect, and the inverse spin Hall effect (ISHE). NanOsc Instruments has launched a family of FMR spectrometers to greatly facilitate the experimental study of FMR and ISHE in magnetic thin films and multilayers.

The FMR spectrometers working in three frequency ranges, from 2 to 40 GHz, for both room temperature and cryogenic applications. Each instrument comes with its easy-to-use software and analysis utilities to get your measurements up and running in a very short time. The sensitivity and signal-to-noise ratio surpasses VNA based set-ups allowing for direct characterization of ultrathin films and patterned structures. The instruments are used by both industrial and academic customers, in many cases around the clock for routine characterization and statistical process control of critical magnetodynamical properties.

Key features:

- Turn-key FMR spectrometer with easy to use software interface
- Broadband FMR using a coplanar waveguide
- Measures effective magnetization (Meff), anisotro py (K), gyromagnetic ratio (γ), damping (α), inhomo geneous broadening (Δ Ho), exchange stiffness (A), inverse spin Hall effect (ISHE) voltage
- Revolutionary variable temperature turn-key FMR spectrometer
- Extracts the temperature dependent MS, damping, inhomogeneous broadening and gyromagnetic ratio
- Avaliable for Montana Instruments Cryostation and Quantum Design PPMS
  - Frequency 2 - 17 GHz
  - Temperature from 10 K to 350 K
  - Easy to use LabView interface

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Industries | Materials Science

NanOsc Instruments

Quantum Design

USA

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Quantum Design develops and manufactures automated temperature and magnetic field testing platforms for materials characterization, as well as portable liquid Helium plants. These systems offer a variety of measurement capabilities and are in widespread use in the fields of physics, chemistry, biotechnology, materials science, nanotechnology, and quantum information research.

The Quantum Design PPMS® represents a unique concept in laboratory equipment: an open architecture, variable temperature-field system, designed to perform a variety of automated measurements. Available measurement options include all required hardware and electronics to immediately begin collecting publication-quality data, while the system is also easily adapted to custom user experiments. The expandable design enables combining many features in one instrument to make the PPMS the most versatile system of its kind.

Quantum Design PPMS® DynaCool™

The PPMS DynaCool uses a single two-stage Pulse Tube cooler to cool both the superconducting magnet and the temperature control system, providing a low vibration environment for sample measurements in a truly cryogen-free package. It offers continuous low temperature control and precise field and temperature sweep modes. The PPMS DynaCool also comes standard with an integrated cryopump, which makes it compatible with all available PPMS measurement options, or any other user-designed experiments.

Key features:

- No need for liquid cryogens
- Temperature range of 1.8 K – 400 K
- 9 T, 12 T and 14 T magnets available
- Continuous Low-Temperature Control – maintains temperatures below 4.2 K with smooth temperature transitions when warming and cooling through 4.2 K
- Controlled temperature Sweep Mode
- Fully automated operation of available PPMS measurement options
- Built-in Cryopump for high vacuum applications ($<10^{-4}$ Torr)
- New electronics built using CAN architecture for improved reliability
- Standby mode conserves power while requiring only a short recovery time

Most common applications:

- Electrical Transport:
  - AC Resistance (ETO); DC Resistance
  - Horizontal Rotator; Pressure Cell (Transport)
- Magnetometry:
  - VSM + Large Bore; VSM Oven
  - AC Susceptibility (ACMS II); FORC Software
  - Fiber Optic Sample Holder (FOSH)
  - Pressure Cell (Magnetometry); Torque Magnetometer
- Thermal Measurements:
  - Heat Capacity; Thermal Transport (TTO); Dilatometer
- Sub-Kelvin Capabilities:
  - Dilution Refrigerator; Helium-3 Refrigerator
  - Adiabatic Demagnetization Refrigerator (ADR)
  - Sub-Kelvin Measurement Options (AC Resistance, DC Resistance, Heat Capacity, AC Susceptibility)
- Multi-Function Probes:
  - User-designed experiments using MFPs
  - Photoconductivity; CryoFMR
  - Optical Multi-Function Probe
- Raman & FMR Spectroscopy:
  - Raman Laser and Spectrograph
  - CryoFMR and PhaseFMR
- Optics:
  - Light Sources; Optix Breadboard
- PPMS Microscopy:
  - SPM for PPMS

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DynaCool™
PPMS®

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The Quantum Design PPMS® represents a unique concept in laboratory equipment: an open architecture, variable temperature-field system, designed to perform a variety of automated measurements. Available measurement options include all required hardware and electronics to immediately begin collecting publication-quality data, while the system is also easily adapted to custom user experiments. Sample environment controls include fields up to ±16 T and a temperature range of 1.9 - 400 K. The expandable design enables combining many features in one instrument to make the PPMS® the most versatile system of its kind.

Key features:

- Compatible with more than 20 Quantum Design Measurement Options that seamlessly integrate with the MultiVu software environment
- Versatile sample mounts couple easily to the 12 electrical leads built into the cryostat insert for consistently reliable electrical acces
- Software controls for the temperature and magnetic field readily enable the automation of complex data acquisition procedures
- Sample chamber has 2.6 cm diameter to accommodate custom probes
- Interface with external 3rd party instruments, whether controlling these from within MultiVu or directing the PPMS from external software, such as NI LabVIEW
- Select from 9, 14 or 16 T longitudinal, or 7 T split-coil transverse magnet

PPMS®
Physical Property Measurement System

Most common applications:

- Electrical Transport:
  - AC Resistance (ETO); DC Resistance;
  - Horizontal Rotator; Pressure Cell (Transport)
- Magnetometry:
  - VSM + Large Bore; VSM Oven;
  - AC Susceptibility (ACMS II); FORC Software;
  - Fiber Optic Sample Holder (FOSH);
  - Pressure Cell (Magnetometry); Torque Magnetometer
- Thermal Measurements:
  - Heat Capacity; Thermal Transport (TTO); Dilatometer
- Sub-Kelvin Capabilities:
  - Dilution Refrigerator; Helium-3 Refrigerator;
  - Adiabatic Demagnetization Refrigerator (ADR);
  - Sub-Kelvin Measurement Options (AC Resistance, DC Resistance, Heat Capacity, AC Susceptibility)
- Multi-Function Probes:
  - User-designed experiments using MFPs;
  - Photoconductivity; CryoFMR;
  - Optical Multi-Function Probe
- Raman & FMR Spectroscopy:
  - Raman Laser and Spectrograph;
  - CryoFMR and PhaseFMR
- Optics:
  - Light Sources; Optix Breadboard
- PPMS Microscopy:
  - SPM for PPMS

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Quantum Design PPMS® VersaLab™

Quantum Design's PPMS® VersaLab is a portable, cryogen-free cryocooler-based material characterization platform. With a temperature range of 50 – 400 K, this 3 Tesla platform is perfect for accomplishing many types of materials characterization in a limited space.

As with all Quantum Design instruments, the PPMS® VersaLab is a fully automated turnkey system with a user-friendly interface. It is specifically designed for material characterization up to 3 Tesla and over a wide temperature range without the need of liquid cryogens or high power infrastructure. This makes the PPMS VersaLab perfect for small laboratories where space is at a premium, as well as educational labs that might not have the full facilities of major laboratories.

Most common applications:

- Electrical Transport:
  - AC Resistance (ETO); DC Resistance
  - Horizontal Rotator; Pressure Cell (Transport)
- Magnetometry:
  - VSM + Large Bore; VSM Oven
  - AC Susceptibility (ACMS II); FORC Software
  - Fiber Optic Sample Holder (FOSH)
  - Pressure Cell (Magnetometry); Torque Magnetometer
- Thermal Measurements:
  - Heat Capacity; Thermal Transport (TTO)
- Multi-Function Probes:
  - User-designed experiments using MFPs
  - Photoconductivity; CryoFMR
  - Optical Multi-Function Probe
- Raman & FMR Spectroscopy:
  - Raman Laser and Spectrograph
  - CryoFMR and PhaseFMR
- Optics:
  - Light Sources; Optix Breadboard
- PPMS Microscopy:
  - SPM for PPMS

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PPMS® VersaLab™

Key features:

- Compact size and portability requires less lab space
- No need for liquid cryogens
- Runs almost all PPMS measurement options
- No high power requirement for operation
- A perfect solution for physics education classes and labs

Quantum Design

USA

Quantum Design
LATIN AMERICA

Quantum Design develops and manufactures automated temperature and magnetic field testing platforms for materials characterization, as well as portable liquid Helium plants. These systems offer a variety of measurement capabilities and are in widespread use in the fields of physics, chemistry, biotechnology, materials science, nanotechnology, and quantum information research.

Quantum Design's MPMS3 represents the culmination of more than 30 years of development and design in the world of SQUID Magnetometry. Providing users with the sensitivity of a Superconducting Quantum Interference Device magnetometer and the choice of multiple measurement modes, the MPMS3 offers new levels of performance in magnetic research while including those aspects of past Quantum Design SQUID magnetometers that customers have grown to appreciate and depend on.

The MPMS3 incorporates major advances in data acquisition, temperature control and magnetic field control with $\leq 10^{-8}$ emu sensitivity. The award- winning design of Quantum Design's MPMS3 also provides expanded software functionality within its user-friendly MultiVu interface. Combining the highest level of system performance with the possibility of using all previously available MPMS measurement options, the Quantum Design MPMS3 truly represents the next generation of advanced SQUID magnetometry.

A variety of options and measurement modes are offered for the MPMS3, such as: VSM and DC-Scan modes, AC susceptibility, Ultra-low field (ULF) capability, 1000 K Oven option, High-vacuum, Electrical Transport, Sample Rotator, Fiber Optic sample holders and light sources for the investigation of photomagnetism, Pressure Cell up to 1.3 GPa and a Helium-3 Refrigerator capable of reaching 500 mK.

Most common applications:

- Thin Magnetic Films
- Superconductors
- Magnetic powder samples
- Nanoparticles
- Spin Glasses
- Geomagnetism
- Photomagnetism
- Magnetic Anisotropy
- Magnetoelectric Multiferroics
- Biomagnetism

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MPMS®3

Key features:

- SQUID Sensitivity
- 7 Tesla Magnet with QuickSwitch™ technology
- Maximum ramp rate: 700 Oe/sec
- Temperature Range: 1.8 – 400 K with Rapid Temp™
- 300 to 1.8 K in 25 min. (typical)
- Multiple measurement modes (DC, VSM and AC Susceptibility)
- Software controls for the temperature and magnetic field readily enable the automation of complex data acquisition procedures
- Cryogen Free with EverCool®

Quantum Design

USA

Quantum Design
LATIN AMERICA

Helium Liquefiers, Purifiers and Recovery Systems

Quantum Design's full line of liquefiers and innovative helium recovery, storage and purification systems allow you to recover and liquefy the helium gas currently being lost from the normal boil off and helium transfers of your cryogenic instruments. A perfect helium recycling solution for research and medical cryostats, Quantum Design's helium liquefiers and recovery systems allow you to break your dependence on cryogen suppliers and no longer be subject to higher costs and undependable supply. You will also be doing your part to conserve a precious natural resource which is vital to scientific research and medical treatment.

Quantum Design liquefiers are mobile and easy to move around your laboratory, which makes the transfer of liquid helium more convenient than ever. Liquefiers are doorway- and ramp-friendly, and the transfer process is as easy as transferring from your current storage Dewars. Our helium recycling technology is also modular so that systems can be designed for needs small or large, and then expanded as needs grow.

Most common applications:

- NMR
- MRI
- MEG
- Cryostats and any instrument whose magnet is cooled by helium

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Cryogenics | Materials Science

Industries

NexGen
LIQUEFIERS

Liquefier Features:

- Easy-to-Use, Fully Automated Touch Panel Operation
- Portable Liquefiers for Easy Transfers
- 160 or 250 Liter Capacity, 25+ L/day
- Self-Cleaning, Uninterrupted Service
- Software with Intuitive User Interface for Easier Operation
- Modular Design: Your System Can Grow as Your Helium Needs Evolve

Purifier Features:

- Purifies 30 liters of helium gas per minute to 99.9995%
- Fail Safe Operation – Stops operation before "dirty" gas passes through system
- Full regeneration of system only takes 5 hours
- Regeneration easily accomplished through automated software
- Ensures highest liquefaction rates possible
- Hydrogen removal option protects instruments from plugging

Quantum Design
NORTH AMERICA

Quantum Design

USA

Quantum Design
LATIN AMERICA

Quantum Design OptiCool®

The OptiCool by Quantum Design is a new optical cryostat using an innovative design that puts the sample volume in the heart of your optical environment. A custom 3.8 inch bore, split-coil, conical magnet offers fields perpendicular to the optical table up to ±7 tesla. The highly integrated design means, even with a magnet, your sample isn't buried inside a large cryostat, far away from the optics. Seven side optical ports and one top optical port allow for optical access to your sample from a wide array of directions.
The OptiCool optical cryostat is a cryogen-free system with automated software to control temperature and magnetic field. At the push of a button you can change your sample temperature from 1.7 K to 350 K, with or without an applied magnetic field. A generous 89 mm diameter by 84 mm tall sample volume provides exciting possibilities in experiment design.

Sample Pods

The OptiCool's Sample Pod provides a place to build and customize your experiment on the bench. When you are ready to make a measurement, the Sample Pod easily plugs into the pre-wired temperature control column. Having multiple experiments arranged on multiple pods allows you to switch experimental hardware quickly. Sample Pods are available in both a standard configuration and a large-volume configuration depending on the experimental needs. Each type of pod can be further configured by changing the riser pieces (available in three lengths; included with the system) to adjust the height of the mounting plate.

Standard Sample Pod – Allows for mounting plate positions at 56.4 mm, 32.8 mm and 12.4 mm below the magnet center. Large-Volume Sample Pod – Allows for mounting plate positions at 131.3 mm, 111.0 mm and 87.4 mm below the magnet center.

Key features:

- 8 Optical Access Ports:
- 7 Side Ports (NA > 0.11)
- 1 Top Port (NA > 0.7)
- Temperature Range: 1.7 K to 350 K
- 7 T Split-Coil Conical Magnet
- Low Vibration: <10 nm peak-to-peak
- 89 mm x 84 mm Sample Volume
- Automated Temperature & Magnet Control
- Cryogen Free

Most common applications:

- MOKE / CryoMOKE
- Raman / FTIR Spectroscopy
- Photoluminescence
- UV / VIS Reflectivity & Absorption
- AFM / Microscopy
- NV / Color Defect / Vacancy Centers
- Nanomagnetism
- Time Resolved Magnetic Spectroscopy
- Quantum Optics
- Spintronics

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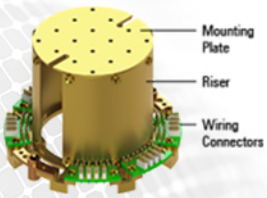
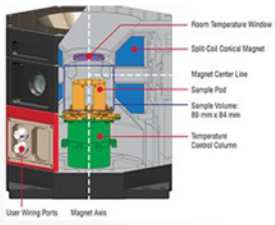
Cryogenics | Materials Science
Nanoscience | Optics | Spectroscopy

Quantum Design
NORTH AMERICA

OptiCool®
By Quantum Design





Quantum Design

Japan

Quantum Design
LATIN AMERICA

Quantum Design IR Image and Laser Furnaces

The high-performance, compact IR Image Furnace from Quantum Design offers unsurpassed performance in a convenient, stand-alone design. Rivaling much larger and more costly IR furnaces, it uses the Floating Zone (FZ) method to promote single crystal growth from a polycrystalline rod. This method has been shown to be extremely effective for a wide class of materials. Now, more easily than ever before, you have the ability to synthesize superior quality single crystal specimens in your own laboratory. This furnace is available in both 2- and 4-mirror versions.

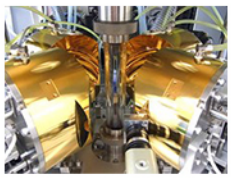
The 1 kW and 2 kW laser furnace for single crystal fabrication is based on a design and developed in close cooperation with the RIKEN Center for Emergent Matter Science. Both melting zones have 5 lasers each, which guarantees a high uniformity of power density in the melting zone range. The laser profile has been optimized to reduce thermal stress during the crystal growth process. In addition, the system includes an integrated temperature sensor for real-time temperature monitoring. Temperatures up to 3000 °C can be reached and therefore materials with a very high vapor pressure, a narrow temperature range of the melt, a high thermal conductivity coefficient and incongruent melts can be melted.

Most common applications:

- Mirror IR Image Furnace:
  - Monocrystalline metal compounds
  - Monocrystalline semiconductors
  - Monocrystalline optical crystals
- Laser-Based Floating Zone Furnace:
  - Materials with narrow melting range and incongruent melting
  - Volatile materials near melting point
  - Metals with high conductivity coefficients

BIG AREAS Sample Synthesis | Materials Science | Nanoscience | Optics

Quantum Design
JAPAN



IR Image Furnace Features:

- Unsurpassed Performance in a Convenient, Stand-Alone Design
- 2100° Celsius Temperature in Floating Zone Region
- Excellent IR Power Stability
- No External Cooling Requirements
- Available in 2-Mirror and 4-Mirror Designs

Laser-based Floating Zone Furnace Features:

- Wide temperature range from 400 °C to 3000 °C
- Reduction of thermal stresses due to adapted laser profile
- Real-time temperature monitoring
- Suitable for degassing materials
- High laser stability due to patented design
- High vision full HDTV camera for growth monitoring
- Control by PC/Smartphone for remote monitoring/control of the crystal growth process

Qutools

Germany

Quantum Design
LATIN AMERICA

Qutools started from the idea to provide 'tools" for 'quantum physics". The company was born from quantum physics lab at Ludwig-Maximilians-University in Munich, in 2005.

Beginning with the development of receiver modules for quantum cryptography, our expertise increases with every challenge that we take on and the ensuing innovation that we uncover. That is how the demonstrator for quantum entanglement quED was born and later transformed into a complete setup for student laboratories, courses and lectures. A similar application suitable for pupils and high-school students and designed primarily for education purposes is the Quantenkoffer. This initial device already included a time-to-digital converter to correlate two APD signals, so it did not take long until the quTAU came to life, measuring timestamps with a resolution of <100ps and calculating coincidences and correlations. This has finally evolved into our newest baby, quTAG, which is faster and more precise.

Most common applications:

- Time-Correlated Single Photon Counting (TCSPC)
- Time Resolved Fluorescence
- Quantum Optics/Information/Communication
- Fluorescence/Phosphorescence Lifetime Measurements / Imaging (FLT / FLIM)
- Fluorescence (Lifetime) Correlation Spectroscopy (FCS / FLCS)
- Stimulated Emission Depletion Microscopy (STED)
- Foerster Resonance Energy Transfer (FRET)
- Single Photon Emitter Characterisation
- LIDAR
- DNA sequencing
- Single Photon Experiments, with and without interference

Key features:

- Study of quantum entanglement
- Violation of Bell's inequalities
- Quick entanglement verification
- Multiple Add-ons
- Timing jitter < 2.3 ps RMS
- Up to 32 channels
- Digital resolution 1 ps
- Quantum Cryptography
- Hong-Ou-Mandel 2-Photon Interference
- Hong-Ou-Mandel Interference + Hanbury Brown & Twiss
- Franson Interference

BIG AREAS

Industries | Materials Science
Optics | Spectroscopy
Quantum Technology

qutools

Scienta Omicron

Germany

Quantum Design
LATIN AMERICA

Scienta Omicron is a leading innovator in surface science and nanotechnology. At their technology centers in Uppsala, Sweden and Taunusstein, Germany develop and produce high-tech instruments sold and serviced from the four regional hubs in USA, China, Japan and Germany to support top researchers globally.

Provides top capabilities in electron spectroscopy, scanning probe microscopy and thin film deposition, all in ultra-high vacuum (UHV).

Focusing on the race for new unique materials and solutions, in areas like – smarter batteries, next generation electronics, quantum technologies, solar energy, intelligent sensors and advanced materials. Scienta Omicron drive the surface science towards the future and offers a wide range of standard modular solutions and continuous access to new technologies through significant investments in R&D.

The technology can be acquired as a single component all the way to large configurable clusters of systems – solutions called 'Materials Innovation Platforms (MIP)".

Core technologies:

Spectroscopy:
PES – Photoelectron Spectroscopy, tool for measuring the chemical and electronic states in different materials.
The technology has been developed in several directions, e.g. ARPES for electronic structure, HAXPES for analysis of chemical states in the bulk of materials and APPES for analysis of gas-solid and liquid-solid interfaces.

Microscopy:
SPM - Scanning Probe Microcopy, measures the physical structure of a surface.

Thin film deposition:
MBE - Molecular Beam Epitaxy, technology for building materials as samples for advanced research.

BIG AREAS

Biotechnology and Chemistry | Cryogenics
Industries | Materials Science
Nanoscience | Sample Synthesis
Spectroscopy | Microscopy
Quantum Technology

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