

*A summary of new products and services
for materials research...*

Science and Engineering Software:

Apple Computer's 52-page catalog lists Macintosh science and engineering software. Featured are packages related to chemistry databases, chemical drawing and molecular modeling, chromatography, spectroscopy, curve fitting, data acquisition, image processing and analysis, and medicine. Dictionaries and spreadsheets also are listed.

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Eight-Point Adjustable Ring Light:

Chiu Technical's R-90M Munchkin provides cool, balanced light with a user-variable convergence point. The glide system is activated via a side-mounted, milled edge thumb wheel that simultaneously adjusts the eight point light sources from 0 to 90°. Temperature operating range is -40°F to +600°F (-40°C to 312°C). In addition to the small size (attaching ring interior diameter of 66.5 mm), features include simultaneous light pinpointing and nonreflective black anodized coating.

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Reflectance Difference Spectrometer:

Instruments SA/Jobin Yvon's compact NISEL is suitable for surface analysis and monitoring of III-V and II-VI compound semiconductor growth. The system offers sensitivity of better than 2×10^{-5} at acquisition time of 0.5 s. Users can monitor in real-time CBE, MBE, or MOVPE with submonolayer resolution. NISEL covers from near-uv to near-IR. Real-time and IR multiwavelength options are available.

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Effusion Cell Technology for MBE:

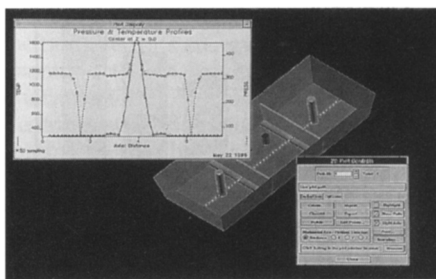
EPI's SUMO™ technology combines a shielding cap and novel crucible design that provide advantages over open-faced crucible technology. The SUMO crucible does not include a PBN support lip. The cell is capped with heat shielding rather than thermally transparent PBN to provide high heating efficiency and reduced thermal radiation loss. The cell incorporates two independent filaments, each monitored with EPI's band thermocouple.

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Multichannel Tunable Laser Source:

E-TEK's MTLs mechanically tunable external cavity laser source delivers more than +10 dBm optical output power at either 1530 ±45 nm or 1300 ±25 nm. Modulation options are available. The mainframe chassis holds up to four compact plug-in modules. Each module has two-layer temperature control: one for laser temperature stabilization and one for cavity temperature stabilization.

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Fluid Dynamics Software: Adaptive Research's CFD2000® helps users solve design problems involving fluid flow, heat transfer, and chemical reaction phenomena. As a preview to the software, an interactive CD guides users through virtual prototyping, in which computer simulation of the effects of gas and fluid flow support the engineering and design process. The software has applications in the fields of aerospace, biomedical, chemical processing, and electronics cooling.

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Cryogenic Temperature Controller:

Lake Shore's Model 340 features a 24-bit A/D converter which, when combined with low-noise circuit design, produces temperature resolution as low as 0.1 mK at 4.2 K when reading temperature sensors. The unit's two universal temperature inputs can be set from the front panel for diodes, platinum RTD, carbon-glass, Cernox, germanium, ruthenium oxide, and other resistive temperature sensors with resistance of 0–300 kΩ. The heater supplies up to 100 W of power, and a second control loop provides up to 1 W.

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Scanning Tip Microwave Near-Field Microscope:

Lawrence Berkeley National Laboratory has developed a microwave microscope that achieves micron-level resolution while retaining high sensitivity. The device allows nondestructive inspection and analysis of surfaces that need high spatial resolution impedance characterization. Unlike a conventional aperture tip, the STMM uses a sharp point tip. The microwave field generated at the tip of the STMM provides more signal strength and eliminates the tradeoff of sensitivity and resolution required with aperture tips.

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Material Electrical Characterization System:

ASMEC from InOmTech Products incorporates charge deep level transient spectroscopy (Q-DLTS), C-V, I-V, emission current, kinetics of free and trapping charge measurements, and photo-stimulated internal field transient spectroscopy. Q-DLTS can handle conventional and wide bandgap

semiconductors, dielectrics, and Mott barriers. The system provides data on bulk and interface trap activation energy and capture cross section, interface states energy spectrum, conductivity, and dielectric constants.

Surface Tension Software:

AST Products offers software for measurement of liquid-vapor or liquid-liquid interfacial tension based on the shape of a pendant drop. When a droplet is suspended, surface tension forces create a pull, which causes a spherical shape. Gravitational forces cause the droplet to elongate. The computer video capability captures the image of the droplet suspended in equilibrium and automatically calculates surface tension.

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Global Spray Characterization:

The Optical Patternator from Aerometrics is a laser-based nonintrusive diagnostic system incorporating a planar liquid laser-induced fluorescence technique to provide information on the spatial distribution of the liquid mass in sprays. The GUI software package uses advanced image processing and data representation techniques, including volumetric visualization for global characterization of the spray and as a means to analyze the internal structures of the spray.

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Precious Metal Compounds and Pure Elements:

Alfa Aesar's Premion® line features 130 pure elements such as Ru, Os, Rh, Ir, Pd, Pt, Ag, and Au. Each element is available in various forms, sizes, and purity levels. The line also includes more than 70 precious metal compounds, each with a minimum purity of 99.95%. Compounds are provided with an assay for the respective precious metal element and are useful in synthesis and homogeneous catalysis.

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Spectroscopic Ellipsometer:

MicroPhotonics' ES850 uses a diode array detector to provide multichannel data acquisition across the uv visible spectrum from 250–850 nm. This is combined with FT spectroscopy for the IR region of 850–1700 nm. Users can determine film thickness, refractive index, and reflectance spectra of single and multilayer films. These data can be used to extract information such as doping levels, stoichiometry, and composition from film under test. Users also can perform real-time analysis and process monitoring and control in thin-film growth processes.

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