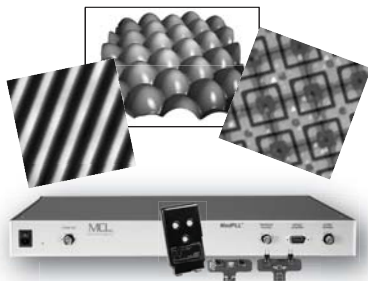


Introducing MadPLL™

Instant AFM and NSOM- just add science.

MadPLL™ includes software, digital PLL controller, probe and amplifier boards, and is fully compatible with Mad City Labs nanopositioning systems.

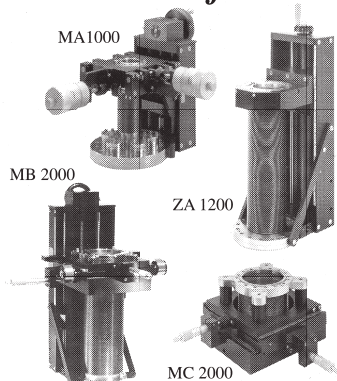


- Low cost imaging tool
- Automated control
- Integrated package
- Integrated z- axis control loop
- Suitable for resonant probes
- Build your own closed loop AFM!

MCL
MAD CITY LABS INC.

+1 608 298-0855
sales@madcitylabs.com
www.madcitylabs.com

The ABCs of X-Y-Zs



PRECISION X-Y-Z MANIPULATORS

- Up to 2" (50mm) X-Y travel standard
- 1.39 - 4.0" bellows ID standard
- Bakeable to over 200°C (without removing micrometers)
- Easy access X micrometer and Z scale may be mounted on either side
- Z axis strokes from 2 - 36" standard
- A style for every application

Call 1-800-445-3688 for more information.

McAllister Technical Services
Manufacturers of surface analytical instruments and devices

West 280 Prairie Avenue
Coeur d'Alene, Idaho 83814

formed a new generation of physicists to whom he transmitted his particular approach to knowledge.

After becoming emeritus in 1993, he kept a constant interest in cosmological problems and continued working at the Université Libre de Bruxelles and at both the Perimeter Institute for Theoretical Physics and the University of Waterloo in Canada, where he frequently visited. Some two years ago he fell terminally ill. During that ordeal he was helped day and night by his loving wife Kathy, whom he had married after the loss of Martine; he passed away close to her in their home in Brussels on 3 May 2011.

François Englert

Université Libre de Bruxelles
Brussels, Belgium

Jay Gregory Dash

With the passing of Jay Gregory Dash on 28 November 2010, the scientific community lost an innovator in the study of low-dimensional matter. His work had a profound influence on disciplines ranging from superfluidity to phase transitions and on the role that dimensionality plays in them.

Greg was born in Brooklyn, New York, in 1923 and obtained his BS in physics from City College in 1944. After serving in the US Navy during World War II, he entered graduate school at Columbia University. Under Henry Boorse and Mark Zemansky, he earned his PhD in physics in 1951 for studies on the flow of helium films, in the normal and superfluid states, on insulators, metals, ferromagnets, and superconductors. Throughout his career, Greg maintained his interest in superfluidity and thin films, which were an ideal fit for the research being conducted in the low-temperature group that he joined in 1951 at Los Alamos National Laboratory. There he studied superfluid hydrodynamics and was involved in one of the first direct measurements of the heat of mixing of liquid ^3He and ^4He at low temperatures.

His helium research led to a Guggenheim fellowship, which he spent at the University of Cambridge in 1957–58. On his return to New Mexico, Greg and Fred Reines founded the Los Alamos Philosophical Society. At its meetings Greg learned of the new area opened up by Rudolf Mössbauer's discovery of recoilless resonance absorption of gamma rays. Greg and his colleagues were the first to confirm the Mössbauer effect, and Greg refined the technique to great advantage as a probe



Jay Gregory Dash

of many basic physical processes. After visiting Seattle in 1960, he chose to move to the University of Washington instead of accepting an invitation from Reines to join him at Case Western Reserve University.

During the following two decades, Greg sought to understand what happens to the phase behavior of matter when the dimensionality is reduced. That basic question can be traced to the work of Felix Bloch, who showed that a planar, two-dimensional magnet could have no spontaneous magnetization because it would be destroyed by spin waves, and the work of Rudolf Peierls, who similarly demonstrated that a 2D solid could have no long-range positional order, since that order would be destroyed by phonons. Greg hoped to realize systems confined to two dimensions by adsorbing gases, such as helium, on smooth surfaces. The principal difficulty lay in obtaining a surface that was sufficiently smooth. Greg's student Michael Bretz eventually used a substrate of exfoliated graphite and obtained a helium heat capacity signal that approached Boltzmann's constant at high temperature, the long-desired signal of a 2D ideal gas.

Greg's next period of discovery included observing and interpreting the differences in the behavior of ^3He and ^4He due to their different statistics and an intriguing $\sqrt{3} \times \sqrt{3}$ order-disorder transition shown to be in the universality class of the three-state Potts model.

By 1970 Peierls was drawn back into questions of 2D physics and went to Seattle, where he and Greg collaborated and traveled together between two and three dimensions. With more than a decade of research, Greg formed the

foundation of his widely used 1975 book *Films on Solid Surfaces: The Physics and Chemistry of Physical Adsorption* (Academic Press). For that corpus of work, Greg was awarded the 1985 Davisson-Germer Prize of the American Physical Society.

The adsorption experiments sparked Greg's interest in how the properties of a 2D system would cross over to those of a 3D system as the adsorbate thickness increased. His experiments on film growth renewed the surface physics community's interest in the theory of wetting and its experimental realizations. Greg was drawn to the phenomenon of surface melting—the wetting of the solid-vapor interface by its own liquid as the triple point is approached—and to the way in which the surface properties of crystals, such as their facets, are lost as the temperature of the solid is increased. With colleagues and students, Greg investigated the basic physics and the geophysical consequences of surface layers of water on ice and related phenomena in other materials.

Despite branching out in new directions, Greg never lost interest in physical adsorption, which he pursued with an infectious enthusiasm. His final paper, published last year, described a

nanotube balance that uses the change in the tube's resonant frequency to measure adsorbed mass; its sensitivity is a few atoms.

Greg was known for a strong social conscience. From 2000 to 2009, Greg and Ernest Henley taught at the University of Washington's Transition School for gifted high school students. He wrote articles for the *Bulletin of the Atomic Scientists* because issues of peace were close to his heart. Greg was on the board of the World Without War Council of Greater Seattle and was chair of the university's graduate committee on conflict studies and of advisory committees to two US representatives. His scientific curiosity blended together with his conscience in a project to create impermeable ice barriers to contain hazardous nuclear waste, a problem of particular current interest.

With his passing, we have lost a probing and inquisitive physicist, a wise and valued mentor, and a warm and cherished friend.

Michael Schick
Oscar Vilches

*University of Washington
Seattle*

John Wettlaufer

*Yale University
New Haven, Connecticut*

Anthony Milner Lane

Anthony Milner Lane, one of the leading theoretical nuclear physicists of his generation, died from cancer at his home in Oxford, UK, on 9 February 2011. From the 1950s to the 1970s he made many significant advances in the theories and understanding of nuclear reactions and structure.

Tony was born in Trowbridge, UK, on 27 July 1928, and in 1946 he was awarded a grant to attend Selwyn College at Cambridge University, where he graduated in mathematics in 1949 and physics in 1950. Although he began his research in nuclear physics at Cambridge for his PhD, he completed it at Birmingham University under Rudolf Peierls, one of the innovators of nuclear science. His thesis was entitled "The Application of the Shell Model to Nuclear Reactions." Tony joined the theoretical physics division at the Atomic Energy Research Establishment in Harwell, which spearheaded nuclear science research in the UK. At the time, the division employed many talented physicists, including Tony Skyrme of skyrmion fame, John Hubbard, and John Bell, known for the hidden-variable theorem.

Optical Liquids Catalog



Write or call
for free catalog.

New catalog of specialty optical liquids features high-transmission, safe-handling, laser liquids, plus fused silica matching liquids, and specific refractive index liquids ($1.300\text{--}2.11 n_D$). Now includes comparative diagrams of glasses and optical liquids.



Cargille Laboratories Inc.

55 Commerce Road, Cedar Grove, NJ 07009

973-239-6633 • Fax 973-239-6096

cargillelabs@aol.com • www.cargille.com

that's really low

Extra Low Thermal Expansion Coefficient

Adhesive EP30LTE-LO

- Unmatched dimensional stability
- NASA low outgassing approved
- Cures at room temperature



154 Hobart Street, Hackensack, NJ 07601 USA

+1.201.343.8983 • main@masterbond.com

www.masterbond.com