

High Tech Maui

University of Hawaii to Operate the Maui High Performance Computing Center



Maui High Performance Computing Center

On May 31, 2001 the Air Force Research Laboratory Directed Energy Directorate announced that the University of Hawaii has been awarded the Air Force Contract for the operations and management of the Maui High Performance Computing Center (MHPCC). The University will manage and provide all computer support, research, maintenance and operations at the MHPCC.

The contract, which becomes effective October 1, 2001, is for a 4-year basic/core period of performance that may be extended to 10 years and has a potential value of \$181 million.

The Center, which now ranks as the 12th most powerful computing center in the world, supports the Maui Space Surveillance System (MSSS), the Department of Defense High-Performance Computing Modernization

Office and other Department of Defense users on the island. Additionally, the Center fosters technology exchange with U.S. industry, stimulates economic development and establishes high performance computer educational programs.

Under the new contract, the University will lead the management team with the support of two major corporate partners, Science Applications International Corporation (SAIC) and Boeing Rocketdyne Technical Services, along with the Ohio Supercomputing Center, New Mexico Institute of Mining and Technology, and Textron, Inc. A major defense contractor, Boeing operates the MSSS, the other major Air Force research & development facility on Maui. SAIC is a Fortune 500 company and the nation's largest employee-owned research and engineering firm.

The University of New Mexico has been managing the Center at the Maui site under a Cooperative Agreement with the Air Force since 1993. RTM



Meeting Visions 2001
The second annual "Meeting Visions 2001," a conference focused on the impact of emerging technology on meeting planning, is scheduled for December 6 - 10, 2001 at the Wailea Resort on Maui. Through roundtables, panel presentations and plenary sessions, senior level corporate meeting planners will hear about trends in Data Management, Internet, Imaging, Smart Facilities, Wireline/Wireless Communications and Best Practices. To apply to register, please visit: www.mauiotechnologyforum.com.

Friends of Maui
Over 120 Silicon Valley executives joined Friends of Maui for their first quarterly meeting and dinner on June 14, 2001 in Palo Alto to learn more about Maui's growing high tech industry and tax incentives. The Friends of Maui seeks to foster Northern California high tech investment, relocation or start up in Maui County by creating liaison opportunities between the Silicon Valley and the Valley Isle. To view the web cast and to register for participation, please visit www.friendsofmaui.com.

Investors Choice Seminar
On June 20 and 21, the International Wayne Brown Institute Investors Choice seminar, an equity capital conference designed for and by venture capitalists which showcases the best new emerging high growth Investor Ready™ firms, featured Maui's Destination Technologies, Inc. and IndSea-HI. Of the 14 companies presenting, seven were from Hawaii and include Hawaii Biotechnology Group, Nascent Pharmaceuticals, OptimEyes Supply Corp, PixelWorld Networks, Inc., and Viata Online. Visit www.venturecapital.org for more information.

Bold New Tax Incentives Spur High Tech Business Investment

This year, Hawaii substantially expanded the technology tax provisions enacted in two prior legislative sessions, making Hawaii a very attractive location for technical and non-technical businesses. The strides made in tax credits, net operating loss carryovers, and exemptions in 1999 and 2000 have created a strong foundation for Act 221 to build upon. For full details, visit www.state.hi.us/tax.

100% high tech investment credit
Although many other states offer tax incentives as a means of encouraging high technology firms to expand or to spur the growth of new industries, Hawaii's investment tax credit is by far the most progressive in the nation according to the National Conference of State Legislatures website. Only a few states, such as Maine, Vermont and West Virginia, even come close to Hawaii's credit with up to a 50% tax credit. This new provision is unprecedented and shows Hawaii's commitment to fostering the growth of the technology industry. Structured as a 100% return on cash investments in a qualified high tech business (QHTB) on a front-loaded basis over 5 years—35% credit in the year of investment, 25% in the following year, 20% in the second year following, then 10% each in the third and fourth year following.

Stock option income tax exclusion
Stock options issued by the holding company of a QHTB, including equity interests in entities other than corporations, are exempt.

Royalty income tax exclusion
Royalty income from the sale or licensing of intellectual property is exempt from both general excise tax and income tax.

Expanded QHTB Definitions
"Qualified research" is now expanded to include sensor and optic technologies, ocean sciences, astronomy, non-fossil fuel energy-related technology, and performing arts products in addition to the existing QHTB research

& development (R&D) work, computer software programming, and biotechnology. The added activities play on Hawaii's unique geography and natural resources.

20% refundable R&D income tax credit
Hawaii piggybacks onto the federal R&D credit for the same 20% amount, but improves by being refundable.

NOL sale provisions improved
QHTBs can sell up to \$500,000 of unused NOLs per year accumulated up to two prior years, subject to a minimum sale price of 75% of the tax benefit sold.

Infrastructure remodeling income tax credit
A 4% nonrefundable income tax credit for renovation work on office buildings that support high tech tenants by providing high volume digital or analog telecommunications, physical security systems, environmental systems, and backup power systems is offered.

GET and PSC exemption for IDCs
Internet Data Centers (IDCs) are exempt from the general excise tax (GET) and public service company (PSC) tax. IDCs are defined as facilities designed to house data centers, operate continuously, have redundant utility systems, and provide Internet-related data and complex web hosting services.

GET related party exemption
The general excise tax related party exemption includes IT services, use of software and hardware, and database management services. RTM

Integreliance Develops New Alternative to Software Leasing



Derek Rowley
President & CEO
Integreliance, Inc.

Integreliance, Inc. is the newest addition to the high tech incubator facility Maui Research & Technology Center (MRTC), a project of the State's High Tech Development Corporation (HTDC). Founded in 1998, Integreliance, Inc. will provide business consulting services, application domain hosting and user-friendly business applications under the direction of President and CEO Derek Rowley. Within the next 12 months, Integreliance plans to lease custom-built software applications and offer client server alternatives. Though Integreliance has only been around for a few years, it has quickly grown to provide world-class backend net services solutions for a number of prominent clients such as Novell, IntegrityLink, Seagate, WorldNow, Blue Lance, ImageCast and iArchives. Integreliance has developed its own Internet-centered intellectual property based on key open systems technology such as Java J2EE, Oracle, XML/XSLT and others.

Rowley chose Maui for its central location in the Pacific Rim, lucrative high tech business State tax incentives, the Maui Research & Technology Center's supportive incubation program, and access to capital that is comparable to the Mainland. As a former resident of Utah, Derek and his wife also liked the idea of living on a balmy, tropical island. Within the next two months, Integreliance will be offering Reliant Custom Server Solutions that enable the customer to specify the hardware, software, configuration and services to include on their server and have it maintained at the Integreliance offsite data center. The customer would then reap the benefits of a large, established network that small to medium sized businesses could otherwise not afford, such as 24-hour technical account management systems and network operations center support, physical security from theft and disasters, virtual security from hackers and data loss, scalable high-speed bandwidth and extensive data storage capabilities.

Later this year, Integreliance will roll out their new content management tool which will enable users to quickly and easily create the look and feel of their website via pre-designed and customizable templates. Rowley considers their most exciting opportunity in the coming year to be the Software Leasing programs that allow an application to be remotely installed on the customer's machine for a specified, pre-paid time period. This option is very appealing to small businesses and start-ups that need to leverage large initial costs, corporations wanting to stay abreast of the latest technologies, and computer game enthusiasts that can master a game in just a few weeks. The customer pays for the software only during the period they wish to use it, much like renting a movie video. Integreliance's special patented technology prevents use of the software without a current license and lease certificate.

By utilizing their proprietary engineering methodology to develop flexible user-friendly net business applications, Integreliance can create custom-order applications in record time. Such software programs include call resource management, document management, client-side productivity applications, and general accounting programs. Though Integreliance has the technology to immediately begin leasing custom software, they are waiting for the country's infrastructure to catch up to their high bandwidth requirements, as customer access to DSL is an important aspect of the leasing. RTM

Quiz Center Tests Students Online

Teachers are now able to create, administer and grade quizzes online without any knowledge of HTML by using Quiz Center - a free, flexible and comprehensive web-based application. With little extra effort, teachers can attach photographs, graphics, sound files, foreign languages and links to different internet sites and resource documents and create quizzes for kindergarten to graduate school levels.

Tom Wright, along with Richard Shadian, developed Quiz Center at the Maui Research & Technology Center, a project of the State's High Technology Development Corporation, under the auspices of the Maui Educational Technology Research and Development Center banner, which is a program of the University of Hawaii Office of Technology Transfer and Economic Development (OTTED). Though retired from a 30-year teaching career, Tom's vision is to continue developing educational



software to make teachers' lives easier and to help familiarize students with technology. "My biggest chore as a teacher," says Tom, "was creating and grading quizzes. Through Quiz Center, teachers save time and have more energy to focus on their students."

Quiz Center uses a Common Gateway Interface (CGI) script written in Perl, called CorrectQuiz, which compares the student's answers to an answer key stored on the server and reports which answers are right or wrong. A script called

QuizMail emails the answers to the student and CorrectMail emails the answers to the teacher. These scripts are a vast advancement over the software's beginnings in 1996, when answers were emailed to

Tom, who passed the unformatted URL-encoded text through a BASIC program to extract the information. He would then email a reply to the user telling them which answers they got right.

Quiz Center tests may be utilized at a computer lab in a controlled environment or as practice tests where students can submit their answers and receive the results later, have additional opportunities to correct wrong answers, or immediately see the

correct answers to questions they missed. Teachers are able to review and store each student's results online without the time-consuming task of using an answer key.

One user from George Brown College in Canada says, "Much of my work is with college faculty along the lines of curriculum development, instructional design, and educational technology. A current focus is the use of the Internet as an educational resource tool. The Quiz Center addresses a major interest in online evaluation of student performance." A Maui Community College teacher has found that Quiz Center is enhancing their long distance curriculum because students can access the quizzes from anywhere and, "It is so rewarding to have the students respond so quickly."

As Quiz Center is written in HTML code, a server is needed to use the software. For this reason, most teachers opt to log on as one of the 100,000 members of Discovery.com's Custom Classroom. Over 130 institutions have purchased Quiz Server, the licensed version of Quiz Center software, for internal use on their own institutional web server, including all of the community colleges in Texas. Quiz Server is currently available only for Microsoft Windows and UNIX web servers. RTM

Wargames at Maui High Performance Computing Center "To know, to know more, and to know more sooner"



with tangibles such as the number of combatants, fire-power, communication range, and amount of ammunition.

The large computational demands of the program are supported by MHPCC's new 520-processor IBM Netfinity Linux Supercluster, as well as by a number of PC clusters installed at MHPCC and MCCDC. Both are developing methodologies and tools that can be used for the large-scale analysis of agent-based land combat models, including the

processing and data reduction required for statistical analysis of such simulations, as well as the development of tools that allow analysts to visualize and comprehend the data from the simulations. This initiative has led to a continuing evolution and refinement of what may prove to be the next generation of analytical models for an "electronic battlefield."

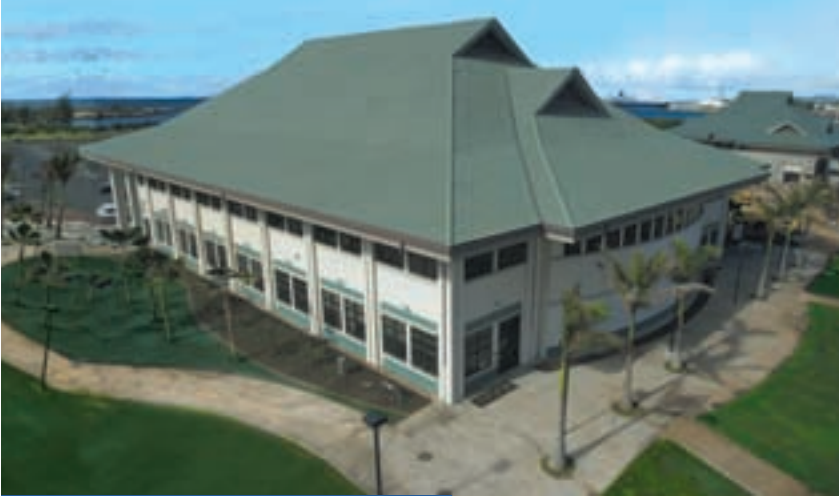
The Department of Defense (DOD) places a high priority on its science and technology programs, with goals of producing weapons and systems for the warfighter that are not only technically superior, but are affordable, longer lived, and improved via the integration of cutting-edge technology.

Computer-based modeling and simulation technologies can significantly reduce the cost of war both in lives and equipment. These technologies reduce the risks associated with new products or processes, save time in the development and production phases, and promote the efficient use of scarce resources. High performance computing modeling and simulations have already made major contributions to DOD defense readiness and Project Albert will be used to train forces, to aid decision-makers, and to acquire new weapons systems. RTM

Researchers and scientists from around the world attended the International Project Albert Conference held at the Maui High Performance Computing Center (MHPCC) on May 16-18, 2001. Military representatives from the U.S. Marine Corps, U.S. Pacific Command, New Zealand, and Australia and University representatives from Rice University in Texas, Mary Washington University in Virginia, and the University of New Mexico gathered alongside attendees from Emergent Technologies and the Mitre Corporation to learn about the international research effort of modeling and simulation of land warfare.

The Marine Corps Combat Development Command (MCCDC) Analysis Division (Quantico, VA) has partnered with MHPCC on Project Albert, named for Albert Einstein, under the direction of Dr. Alfred G. Branstein, Scientific/Senior Analyst of the Marine Corps and William Buckley of MHPCC.

Success in combat depends largely on the collective capability of military leaders to make and execute effective decisions under physical and emotional stress. Project Albert uses modeling to vary the rules of human behavior on the battlefield with intangibles, such as unit cohesion, aggression, courage, and leadership, as well as



The new Media, Technology and Distance Education Center at Maui Community College.

State-of-the-Art Media and Technology Education Center Opens at Maui Community College

Maui Community College has responded to Maui County's rapidly expanding high technology sector needs by building a 38,000 sq. ft. Media, Technology and Distance Education Center. The new facility, "Ka'a'ike" (ka-ah-ee-keh), which is Hawaiian for "Transfer of Knowledge," promises to be the premiere high tech education center in the State. Maui County's high tech business needs will be the beneficiaries of Maui Community College's newest facility for technology.

Beginning this Fall, college-level programs and degrees will be available in telecommunications, video and television production, computer science, electronics, engineering technology and digital media. Ka'a'ike will also support outreach educational centers on the islands of Lanai and Molokai and the remote area of Hana, and accommodate more students in upper level graduate IT degrees through the University of Hawaii's distance learning courses.

In addition to 11 microcomputer classrooms, 7 specialized labs and 3 smaller labs at each of the outreach sites, the cutting-edge facility will add over 100 workstations, high performance PC cluster, cable TV classroom, TV production studio, 2,000 sq. ft. soundstage, 8 video teleconferencing rooms to enhance distance education, and specialized computer labs for electronics, digital media, computer science, and instructional design.

As the hub site for various telecommunications networks, all video services on campus will be distributed through the Technology Center, which will house the microwave, fiber optic and cable transmission facilities for full-motion interactive video teleconferencing through SkyBridge, the Hawaii Interactive Television System (HITS), and MCC's own cable TV station. High speed data lines from Molokai, Lanai, Oahu and the Maui High Performance Computing Center will terminate at the Technology Center and be connected to the Campus Network, which provides access to the Internet, online courses, and the Library's CARL system. Other related video connections to the Department of Education, County and State, both analog and digital, will converge there for switching and routing. (HTM)



National Mentoring Program for Women Expands to Hawaii

Four Hawaii campuses have been added to the prestigious MentorNet program, an electronic mentoring project that matches women who are studying engineering or science with professional scientists and engineers to form email-based mentoring relationships. Last year, Maui Community College was one of the first community colleges to be selected for the program, and boasted more participating students than schools such as Rochester Institute of Technology, Brown University, and California Institute of Technology. This year, MentorNet will expand to include the University of Hawaii-Hilo, the University of



Hawaii-Manoa, Hawaii Community College and Kauai Community College. According to Leslie Wilkins, Women In Technology Project Program Director, "It is a great honor to have our Hawaii campuses selected for participation in this program. Our statewide collaborations between education, industry, government and community are what made us stand out nationally as a model jurisdiction for the MentorNet program." Electronic

mentors are now being recruited nationwide for the program. For more information, please visit www.mentornet.net. (HTM)

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Micro Gaia Completes First Harvest of Anti-Oxidant Single Cells



Micro Gaia's current farm of 1000 Bio-Domes.

Micro Gaia Inc. (MGI), a year-old company in the Maui Research and Technology Park that produces highly potent anti-oxidant microalgae for the global market, has completed its first harvest and production of astaxanthin (as-tuh-zan-thin) powder and oil bulk products along with retail softgels and tablets for distribution in Japan. Using their patented, totally closed microalgae cultivation process known as the Bio-Dome System™, the subsidiary of Fuji Chemical Industry Co., Ltd is committed to producing high quality natural microalgal ingredients to support human health and is harvesting and drying microalgae every week. Of the 1000 domes currently operational, 30% make up the initial 'green stage' and the remaining 70% are stressed to produce the 'red stage,' which is where astaxanthin is accumulated. After harvesting, the microalgal biomass is spray-dried and packaged for shipment to Japan for further processing and distribution.

MGI has already begun Phase II of their expansion project and is preparing another five acres for production. Completion of Phase II is slated for the end of November, which will bring the total number of domes to approximately 2400. More than half of the 24 employees working at MGI were hired locally, with plans for six more to join the team during Phase II construction.

Astaxanthin has been widely studied in peer-reviewed scientific publications for its strong antioxidant properties; high levels of vitamins A, C, and E; and anti-cancer, anti-inflammatory and immune system enhancing qualities. Potential uses for MGI's product include nutraceuticals, infant formulas, food and beverages, elderly care, cosmetics, pigments and aquaculture feed. MGI is presently planning to enter the Hawaii market later this summer with retail tablets, and they expect their product to flourish in the Japanese dietary supplement and food and beverage markets. (HTM)

Are you interested in the incubation/phase-in program at Maui Research & Technology Center, a project of the State's High Technology Development Corporation? Contact Steve Perkins, Program Manager, at steve@mrtc.org or (808) 875-2432.

For more information, visit the High Tech Maui web site at: <http://www.hightechmaui.com>

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Women In Technology Project Hosts Leadership Training Workshop

Hawaii is coping with the workforce shortages that many communities across the U.S. are experiencing by encouraging and supporting females and under-represented groups to pursue and succeed in science, technology and engineering (ST&E) careers. Given Hawaii's high tech goals, it is critical that all available resources are tapped to stay competitive in the global marketplace. The Women In Technology Project (WIT) hosted the "Preparing Our Technology Workforce" Leadership Training Workshop which brought together representatives from education, industry, government and the community to learn skills to increase the enrollment and retention of women, girls and under-represented groups into ST&E. According to the National Science and Technology Council, "It is in the national interest to vigorously pursue the development of domestic ST&E workers from all ethnic and gender groups. We should pay special attention to groups that are currently under-represented in the ST&E workforce, because it is with these groups that much of our nation's growing talent pool resides." The recent Leadership Workshop is just another example in a growing effort to meet the State's technology work force initiatives.

The U.S. Department of Labor Women's Bureau selected the Women In Technology Project to host the Region Nine Workshop this June at the University of Hawaii-Manoa in Honolulu. Response to the workshop was extremely positive and surveyed participants said that they would actively support females in pursuing and thriving in ST&E careers and would share what they learned with their colleagues.

National data indicates the best way to encourage women and girls in the ST&E workforce is by creating supportive educational and employment environments. The June workshop was based upon a model national training program that has helped to dramatically increase the recruitment of high school girls into ST&E courses. In Maui, a similar Women In Technology Project Leadership Training increased the enrollment of females in technology classes at a local high school from less than 10% to 30% in just one year, and resulted in a 9% increase in female enrollment in a local baccalaureate computer science program.

Last April, The Women In Technology Project spoke about its equity-based training and programs at the Joint National WEPAN/NAMEPA Conference in Arlington, Virginia. An article entitled "Aiming At Systemic Change By Addressing Equity Head On" was published in the 2001 Joint National WEPAN/NAMEPA Conference Proceedings and is also available online at www.hightechmaui.com/womenintech.

The Women In Technology Project is a project of the Maui Economic Development Board, the Kauai Economic Development Board and the Hawaii Island Economic Development Board. ETA

WOMEN IN TECHNOLOGY

Paradise

SCIENCE BEHIND

Glass and Plastic Recycling Promises Pristine Future on Maui

Waste management in Hawaii requires more care than many mainland cities due to the Islands' limited amount of space for landfills and fewer opportunities to process recyclable waste.

Here on Maui, that used to mean the option between a cost-prohibitive boat ride to a recycling center on the mainland or in Asia, or wastefully sending tons of usable plastic and glass to the Pu'unene landfill. In 1992, Tom Reed helped launch Aloha Glass Recycling Inc. (AGR), and in 1993, Aloha Plastic Recycling Inc. (APR), to meet Maui's growing need for more responsible waste management. "I feel good about what we're doing because we're creating jobs, encouraging recycling and the use of recycled products on Maui, and helping to preserve Maui's pristine environment for residents and visitors," says Reed.

APR started with a 1959 Extruder machine that had a control panel made from an old Whirlpool oven - not very high tech, but it did the job of processing plastic bags and bottles into a reusable product. Until 2000, the administrative office for both companies was located at the Maui Research & Technology Center, while all processing occurred off-site. Currently, APR diverts an average of 20 tons of plastic per month from local landfill and manufactures it into a variety of plastic lumber and parking lot car stops. Despite the high environmental awareness of Maui's residents, Reed estimates that they are only recovering three to five percent of the plastic waste available on Maui. To meet the company's manufacturing needs, plastic is bought routinely from neighbor islands and, less often due to expense of shipping, from the mainland.

Maui County has used the plastic lumber for picnic tables, benches, and trash receptacles at most of the public parks and all of the community centers. In addition, the US Navy, Army and Air Force, and the County of Oahu have all been major purchasers of the recycled plastic products. Due to the labor intensive process of sorting and cleaning plastic waste and the high electrical needs for processing, plastic lumber costs 2 1/2 times more than wood. Its value, however, lies in a long life cycle and the fact that plastic lumber never needs repainting, won't rot in Hawaii's rainy areas, and doesn't tempt termites. "Although plastic lumber is still too flexible for structural material," says Reed, "we currently offer a mineral additive product that is 2 1/2 times stronger than traditional plastic lumber. It is used for picnic table tops and is a great product for decking."

AGR purchases an average of 160 to 180 tons of glass per month from local disposal companies, the County's recycling box program and the general public, including several bars and restaurants.

After a local crew sorts and cleans the recyclable glass, a rotating hammer pulverizer machine crushes the glass into different grades of product at the rate of five tons per hour, from multi-colored pebble-sized chunks down to a very soft, sand-like powder. AGR sells these different grades back to the community for water filter material, non-skid paint, "glassphalt" for County roads, decorative landscaping, arts and crafts and a more effective, non-carcinogenic alternative to silica sandblasting. There are dozens of uses for glass, many of which haven't even been explored yet on Maui, such as termite barriers and golf course sand. The Maui Ocean Center uses the recycled glass to filter ocean water for their aquariums, as do many of the resorts for their koi pond filters. ETA



Tom Reed sifts through the pulverized glass, which is safe to handle.

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