

# ISRAEL HIGH-TECH & INVESTMENT REPORT

A MONTHLY REPORT COVERING NEWS AND INVESTMENT OPPORTUNITIES  
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JOSEPH MORGENSTERN, PUBLISHER  
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## The 100th smallest country, with less than 1/1000th of the world's population

In less than five decades this country has produced two Nobel Prize winners in chemistry, an astronaut, hundreds of computer specialists, inventors and countless entrepreneurs. These world class individuals are just a part of the nucleus, of a society that participates in globalization and increases the economic standard of the citizens of this country.

Most of this country's outstanding scientific and technological developments have been mentioned, over the years, in individual issues of our Israel High-Tech & Investment Report. However, on the occasion of the 57th Day of Independence we take the opportunity of listing together, some of these achievements.

Computer technology and telecommunications rank high on the list.

We recall that the cell phone was first developed at the Motorola plant in Israel.

Most of the Windows NT and XP operating systems were developed by Microsoft-Israel.

The Pentium MMX Chip technology was designed at Intel Israel.

Both the Pentium-4 microprocessor for desktop computers and the Centrino processor for laptops were entirely designed, developed and produced in Israel.

Voice mail technology was developed in Israel. The Israeli company Amdocs is the largest company in the world in this field.

Both Microsoft and Cisco built their only foreign-based research and development facilities in Israel.

The program ICQ, which is the technological basis for AOL Instant Messenger, was developed in 1996 by four young Israelis.

Disk on Key - a portable, virtual hard disk - was developed by the Israeli company M-Systems. When we travel we never neglect taking vital material on this miniature hard disk, with us..

This love affair with computers is evident in that Israel has the highest number of personal computers per

capita in the world.

Israeli software company Check Point is the global leader in Virtual Private Network (VPN) and firewall technologies.

In proportion to its population, Israel has the largest number of start-up companies in the world. In absolute terms, Israel has the largest number of start-up companies, than any other country in the world, second only to the US.

With more than 3,000 high-tech companies and start-

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**The 100th smallest country, with less than 1/1000th of the world's population**

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**Summary of Israeli High-Tech Company Capital Raising - Q1 2005**

**New 'Hanging' Strawberry Plant a Hit in Europe**

ups, Israel has the highest concentration of hi-tech companies in the world – with the exception of Silicon Valley.

Israel is ranked #2 in the world for venture capital funds, right behind the United States.

Outside the United States and Canada, Israel has the largest number of companies listed on NASDAQ.

A 12th century physician Moshe ben Maimon-Rambam (Maimonides) is the role model for a generation of Israeli physicians who became active not only in the care of the sick but in the development of treatments and medical systems.

They developed the first fully computerized, no-radiation diagnostic instrumentation for breast cancer. An Israeli company developed a computerized system for ensuring proper administration of medications, thus removing human error from medical treatment. Every year in U. S. hospitals 7,000 patients die from treatment mistakes.

Israel's Given Imaging developed the PillCam - the first ingestible video camera, which is so small it fits inside a pill. Used to view the small intestine from the inside, the camera helps doctors diagnose digestive disorders of the small intestine and esophagus without invasive treatment.

C2Cure is producing disposable miniature imaging medical devices. The viewing systems consist of miniature, disposable video camera and a light source that are assembled on the tip of endoscopes. The technology is suitable for minimally invasive surgery (MIS) endoscopic market and the intra-vascular segment.

A new acne treatment developed in Israel causes acne bacteria to self-destruct - all without damaging surroundings skin or tissue.

A new brain implant has been developed in Israel that can lower the risk of stroke, by diverting blood clots away from sensitive areas of the brain.

Primate research at Hebrew University is leading to the development of a robotic arm, that can respond to the brain commands of a paralyzed person.

Two Israeli researchers are creating cancer-killing molecules that will recognize cancerous cells and target them aggressively, while not affecting normal cells.

Israeli researchers developed a novel stem cell therapy to treat Parkinson's Disease - using a patient's own bone marrow stem cells to produce the missing chemical that enable the restoration of the motor movement.

Insightec developed an ultrasound system for removing tumors without surgery.

Researchers at the Technion have developed an antibiotic that destroys anthrax bacteria as well as the toxins it secretes into the bloodstream of the infected body.

Elta is responsible for the world's first civilian aircraft equipped with technology designed to protect airliners from a missile attack.

## **Agricultural Technology**

Israel has, for many years, held the world record in milk production.

Drip irrigation - the system that is based on using plastic pipes that release small amounts of water next to roots of plants - was developed by the Israeli engineer Simcha Blas in the 1970's. The invention caused a revolution in agriculture and has been adopted by farmers in many countries

Israeli company Silent Communications has developed

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a type of silent conversation system for cell phones, so users can carry on conversations without saying a word.

The Israeli company Wondernet is currently dominating the world market in document signature authentication, with its unique scientific method of verifying handwritten signatures.

The Quicktionary, a pen size scanner that scans a word or a sentence and translates it to a different language, was developed by the Wizcom Company, based in Jerusalem.

Professor Ehud Keinan from the Technion Israel Institute of Technology developed a pen that identifies an improvised explosive.

All this from Israel the 100th smallest country, with less than 1/1000th of the world's population

### **Teva Invests in “Ubiquitin Start-up”- Proteologics**

Teva Pharmaceuticals (Nasdaq:TEVA) is backing Nobel prize winners Avram Hershko and Aaron Ciechanover. It has entered a strategic agreement with a biotechnology company Proteologics to examine the feasibility of developing cancer treatments based on their discoveries related to ubiquitin. Ciechanover and Hershko are on Proteologics' advisory board and they were the first to describe these phenomena.

Ubiquitin is a chain of amino acids that marks proteins destined for destruction inside the cell.

Ubiquitin serves as a regulator of cellular activity, and is responsible for detecting up to 90% of the mishaps in cellular function.

They also found a link between ubiquitin and diseases such as cancer, cystic fibrosis, and degenerative conditions of the nervous system, such as Alzheimer's and Parkinson's diseases. Teva is now coming out with a proprietary treatment for Parkinson's: Rasagiline, which is being marketed in Europe under the brand name Azilect. But the ubiquitin approach marks a totally new direction.

With the backing of millions of dollars from Teva, Proteologics hopes to identify ubiquitin ligases, which are enzymes that identify target proteins designated for dissolution, that are relevant to cancers. The second stage of the research, according to company statements, would be to develop inhibitors to the ligases. Proteologics is also working on

developing a treatment for AIDS based on ubiquitin. Teva would retain the option to continue drug development and commercialization itself, in exchange for royalties to Proteologics, contingent on milestones.

Proteologics has no revenues and is at least three years from clinical trials.

### **Benchmark Completes \$250m. Second Israel Fund**

Benchmark Capital announced that it had completed raising a second fund, specializing in Israeli high tech investments. The \$250 million fund, Benchmark Israel II, will continue to invest in early stage software, Internet and communications companies.

Benchmark Israel II follows the firm's first Israel fund of \$240 million, raised in March 2001. That fund has invested in 21 Israeli companies, among them Adimos, Finjan, Blue Security, and Qlusters.

Investors in the first fund included Benchmark US, Cdb Web Tech, Cisco, Horsley Bridge, Infineon, Mercury, and Rational Software,

The new fund will be headed by Benchmark Israel general partners, Mark Kremer, Arad Naveh and Nachman Shelef.

### **Carmel Ventures Closes New \$200m. Fund**

Carmel Ventures has announced the successful raising of \$200 million for Carmel Ventures II. The new fund will focus on software and communications investments.

The current investors participating in the new fund included Grove Street Advisors LLC, the Partners Group, DPartners, Pomona Capital, Citigroup and Siemens Venture Capital.

In addition Carmel attracted several new investors including Horsley Bridge International, JP Morgan Fleming, a leading Asian Government Agency, LGT Capital Partners, NY State / HarbourVest Partners, The Kauffman Foundation, Swiss Re Private Equity Partners III, Wilshire Associates and Goldman Sachs. Carmel II general partners are Shlomo Dovrat, Avi Zeevi, Harel Beit-On, Rina Shainski and Ori Bendori. Founded in 2000, Carmel is an information technology focused fund. Carmel has offices in Herzliya, Israel and London.

## **Vizrt Raises \$5.8m on Oslo Exchange**

Vizrt studios, raised capital and dual listed its share on the Oslo Stock Exchange. Vizrt raised \$5.8 million in an issue of one million shares at 36.50 Norwegian krone per share (about €4.50).

Vizrt cut its issue price from 39 krone to 36.50 krone. Trading in Vizrt's share on the Oslo Stock Exchange began on May 12.

In addition to raising capital, by dual listing on the Oslo Stock Exchange Vizrt intends to increase the liquidity of its share. "We definitely hope that listing in Oslo will increase the liquidity of the share and our exposure to additional customers and investors," said Brown.

Vizrt is a provider of real-time 2D and true 3D broadcast graphics. The company's software suite offers a complete graphics solution including: character generation, content management and newsroom integration, 3D tickers, virtual studio, weather data integration, virtual sports analysis, information display and virtual effects.

The world's leading broadcasters, such as CNN, CBS, BBC, Sky, ITN, ZDF, Star TV, TV Today and NHK, use Vizrt's solutions in conventional digital and high definition content delivery. Production houses and corporate institutions, including the New York Stock Exchange, are Vizrt customers.

## **Drilling for Oil Armed with a Bible**

The U.S.-based Zion Oil & Gas Corporation, led by an Evangelical Christian is using biblical prophecy to search for oil in Israel.

Zion's 165-foot oilrig is located in an inland field between the central and northern Israeli cities of Tel Aviv and Haifa. Israeli and Texas State flags flutter at the entrance to the fenced compound, where digging goes on 24-hours a day -- except on the Sabbath and Jewish holidays.

A sign at the site says, "The Joseph Project is an oil and gas exploration project based on scripture and geological evidence".

But Zion Oil & Gas founder John Brown believes biblical prophecies will point the way to Israel's hidden oil wealth.

Brown first visited Israel 20 years ago. Inspired by a few key Bible passages, Brown established his

company more than a decade later.

"He firmly believes we'll find oil here for the benefit of Israel and restoration of the land," Zion Oil's Executive Vice President Glen Perry," recently told Cybercast News Service.

Brown has worked for years with the Israeli Ministry of National Infrastructure, and in May 2000, he began drilling in an area encompassing 95,800 acres.

Perry, a petroleum engineer from Texas, has worked in the oil and gas field for 25 years. He said he met Brown, who had no background in the oil industry, five years ago and admits he had doubts at first about the Israeli project.

Perry said he and other experts discovered an underground anomaly, called a reefal structure, indicating possible oil reserves.

"There could be a tremendous amount, according to published articles -- almost 500 million barrels," Perry said. That works out to about \$2.5 billion worth of oil.

Zion has cleaned out the old well and drilled much deeper than the original 7,500 feet. It plans to drill to a depth of 15,000 feet, at a cost of about \$3 million.

Israel has one well off the coast of the Israeli city of Ashkelon on the Mediterranean Sea, which has been producing oil since 1956, he said. Its output is very low -- only about 80-100 barrels a day, Nimran, an oil geologist, said in a telephone interview.

## **Plans to Raise billions on TASE**

No fewer than 85 prospectuses have been submitted to the Israel Securities Authority, indicating plans to raise capital by the end of May 2005. This phenomenon is seen as a growing business optimism. Most of the planned issues would be either straight bonds or convertible bonds, reflecting the low local interest rates. Market observers point out that the equity market is not yet ready to accept large share offerings.

## **Talia Technology to Raise \$19m. on London's AIM**

Talia Technology develops imaging systems for the retina and a device for diagnosing and treating ophthalmic diseases. Its flagship product, the Retina Thickness Analyzer (RTA), is designed to diagnose three of the commonest retina diseases before they develop: glaucoma, age-related macular degeneration (AMD), and diabetic retinopathy, a complication of diabetes affecting the retina.

The company expects to raise \$19 million at a

company value of \$57 million, after money on London's Alternative Investment Market (AIM) with the UK investment house Code Securities Ltd. serving as its underwriter.

### Cancer Treatment

If each one of us is biologically unique, why are our ailments so often treated with one-size-fits-all drug regimens? Optimata, an Israeli company based in Ramat Gan, aims to help doctors customize cancer treatments by building a software "clone" of each patient. The company's system starts with a mathematical model that incorporates several hundred equations representing different bodily processes. Doctors then plug in data specific to the patient and his or her disease—the growth rates of the tumor and blood vessels, for example. The software allows the doctor to try out in the digital realm various combinations of drugs and dosing schedules in order to find the treatment regimen that will do the best job of fighting the cancer with the fewest side effects. Researchers are currently testing the system on breast cancer patients at the UK's Nottingham City Hospital. If those trials are successful, Optimata could begin marketing the software as a workstation tool for physicians by 2007. The company is also developing digital treatment-optimization tools for diseases other than cancer.

### AudioCodes: 76% Gain in Q1 revenues

VoIP technology company AudioCodes (Nasdaq: AUDC; TASE: AUDC) has reported 76% growth in its first quarter revenue, from \$15.3 million in the first quarter of 2004 to \$26.9 million in the first quarter of 2005.

Net profit for the first quarter of 2005 was \$3.0 million, or \$0.07 per share, compared with a net loss of \$43,000, (\$0.00 per share), for the corresponding period last year.

"We had our fourteenth consecutive quarter of revenue growth, coupled with continued increase in our income and net profit. We experienced solid progress across our operating core technology and networking businesses and continued to enjoy increased demand from OEMs and service providers for our wireline VoIP products, with growing activity and new leads in emerging cable and wireless VoIP networks," said AudioCodes president and CEO Shabtai Adlersberg.

### Ki-Bi taps \$19m. from London Investors

Start-up Ki-Bi Mobile Technologies Ltd., a supplier of electronic cards for sending content to handsets, has received an investment from several parties, including a telecommunications equipment manufacturer to the tune of \$19 million. The investment was done at a company valuation of \$38 million.

The company plans to float its shares on London's AIM Market. and will be traded on the AIM under the symbol KIB.

Since its establishment, Ki-Bi has raised \$2.5 million financing, including from the Siemens Communications Acceleration Division, the Ministry of Industry and Trade and private investors. Another investor is Emblaze (LSE:BLZ), an Israeli video-streaming company, which has floated several companies in London.

Ki-Bi is still a small company, operating in Tel Aviv. Of its 20 employees, 17 work in London. Its revenues in 2004 amounted to a few million dollars without reaching profitability.

### IBM, Israeli Ministry to Back Open-Source Start-Ups

IBM and the chief scientist of Israel's Ministry of Industry, Trade and Labor said that they have agreed to a pact to foster development of open-standards technology by Israeli start-ups. The pact calls for IBM to provide hardware, technology expertise and sales and marketing support, while the Israeli Ministry of Industry, Trade and Labor will supply funding to Israeli start-ups. No financial terms were disclosed.

IBM officials said individual companies might stand to receive government grants of up to \$100,000 or more. IBM is the biggest, but not the only, technology vendor taking part in the Israeli industrial research and development program.

IBM is the world's largest computer company. In recent years it has sought to pick up the pace of its partnerships with hundreds of software companies as well as with venture capitalists and start-up firms to increase the level of innovation in its own mix of hardware, software and services.

“It is not only money that we are providing,” said Meir Nissensohn, IBM Israel general manager. “We are providing access to technology, experts, (research) centers and access to global markets.” IBM seeks to combine such innovations into their own broader lines of hardware and software, he added.

Israel is home to 4,000 technology companies, second only to California’s Silicon Valley in its concentration of technological innovation.

IBM is working with more than 700 software vendors in Israel, and has active marketing or sales relationships with 150 firms.

Israeli companies that already are working with IBM include start-ups like Actimize, CashU and Item Field, along with established companies such as Nice Systems Ltd. (NICE.Nasdaq) and Retalix Ltd. (RTLX.: Nasdaq)

Gabriel Tal, an executive working with IBM’s sales and distribution in Israel, is looking to support software developers in the area of computer security systems and storage management. 3.

The goal of the agreement is to help accelerate the adoption of open standards in Israel, while at the same time helping Israeli start-ups to expand in Israel and globally.

Open standards is an approach to technology development in which inventors make the underlying programming code publicly available for other developers to build on and extend. It contrasts with the proprietary, or closed development approach that most major technology companies, led by Microsoft Corp., have used to maximize their control over products they build.

IBM and the ministry’s chief scientist, Dr. Eli Opper, plan to jointly select independent software vendors working in emerging technology areas in which IBM specializes such as radio-frequency identification, pervasive computing “grids” and Linux, the leading open-source software alternative.

In a related push, IBM is working with 40 venture capital firms in Israel, including early stage funders Israel Seed Partners, with 40 portfolio companies, and Genesis Partners, with more than 20 portfolio companies, to identify start-ups that fit into IBM’s business strategy.

## Celltick Technologies Signs \$30M Contract with Russia’s VimpelCom

Israeli company Celltick Technologies has signed a large contract rumored to be worth \$30 million, with VimpelCom, Russia’s second-largest mobile operator. Celltick, founded in 2000, specializes in idle-screen applications and interactive mobile broadcast technologies.

VimpelCom launched its Chameleon service yesterday, powered by Celltick’s LiveScreen technology, which broadcasts live content directly to the phone screens of millions of subscribers. Two million of VimpelCom’s 28 million subscribers can now receive streams of free reports, including news headlines, sport updates, weather coverage, gossip and games directly to their screens.

By year-end the service should reach 10 million users.

Just like a screen saver, the messages appear silently, only when the cell phone is not in use. Customers can access a variety of data service with a single click. In a pilot program during the summer of 2004, 40 percent of users clicked to get more information, increasing their monthly expenditure on cellular by about 15 percent. Sources near the deal say VimpelCom should be paying about \$30 million over five years. It is paying \$10 million up front.

Celltick Technologies has 60 employees. Headquartered in London, Celltick keeps its research and development in Israel, and also has offices in Beijing, Mumbai and Moscow.



## OTI: “Basel Project” Border Crossing Extended

Smart card developer OTI - On Track Innovations (Nasdaq: OTIV) announced that the Basel Project, a border crossing system that includes contact less smart cards and biometrics for identifying Palestinians wishing to enter Israel, is being extended to more access points.

OTI develops contact less microprocessor-based smart card solutions for homeland security, payments, petroleum payments and other applications. The Basel

Project is currently the only operational project to use a contact less smart card with biometrics and public key information (PKI) infrastructure.

The Basel Project contract for the Erez border crossing at the Gaza Strip was awarded in September 1999 to a consortium including OTI, which is furnishing the front end solution based on its SmartID product, including ISO 14443 compliant cards, readers and related software.

The biometric-based contact less smart identification system monitors the entrance and exit of Palestinians while assuring a completely secure, exceptionally fast border crossing. The project is the most advanced exit/entry border control system in the world using encryption, contact less smart card technology and both hand (hand geometry and fingerprints) and facial biometrics as the primary methods of identification.

OTI stated that the new gates are currently under construction in different areas, and that the first cards have already been issued.

Those wishing to cross into Israel will request from the Civil Administration a contact less smart card that will be programmed with hand and facial biometrics and include recent photos and personal information. These are programmed on a contact less chip embedded in the card. In order to cross the gates, which is expected to take no more than nine seconds, Palestinians will be required to place the card on a contact less reader and place their hand on a biometric sensor for identification. Once the identity has been confirmed, an automatic gate will open allowing the person to cross into Israel. If there is a problem with identification, the person is directed to another gate for additional security checks.

### **Israeli Home Unit for Stroke Rehab Wins FDA Approval**

Israeli company Curatronic Ltd. has announced that it has obtained US Food and Drug Administration (FDA) marketing approval for the Biomove 3000 Stroke Rehabilitation system. The Biomove 3000 system was specifically developed for home therapy following a stroke. The highly affordable battery-powered device detects extremely small electrical EMG signals that persist in paralyzed muscles after a stroke and uses these tiny signals to initiate an electrical stimulation impulse to the muscles, resulting in actual muscle

movement by the patient. Curatronic Ltd. was founded in 2000 as a privately held R&D company dedicated to developing affordable, easy to use state-of-the-art stroke rehabilitation and therapy devices for use by patients at home and by professional therapists.

### **Most innovative Nanotech Winners**

Start-ups CimaNanoTech Israel Ltd., Nutralease Ltd., and Sol-Gel Technologies Ltd. have been awarded this year's Most Innovative Israeli Nanotechnology (MI2NT) prize.

The U.S.-Israel Science and Technology Foundation (USISTF), Chicago Microtechnology & Nanotechnology Community (CMNC), ARCH Venture Partners, Ardesta LLC, O'lala Foods, and the Trendlines Group were the competition's sponsors.

The award winners will receive business development services from Trendlines, a VIP invitation to the NanoBusiness Conference in New York, and private meetings with leading nanotechnology VCs. The award ceremony recognizing the companies and their technologies will be held in Chicago, after the shortly to be held NanoBusiness Conference.

The program is underwritten by USISTF, which promotes collaborative opportunities in high technology for American and Israeli entities.

Originally, there were to have been only two winners but, according to O'lala Foods CEO Neil Wyant, "the USISTF and CMNC agreed to add a third award winner because of the high-quality of candidates in Israeli nanotech."

**Cima NanoTech** develops conductive ink jet printing systems and transparent conductive coatings (TCC). The company's nano-metal dispersions represent enabling technology for next-generation digital inkjet printing of microcircuits and transparent conductive coatings for electronics. Applications include plasma displays, EMI shielding, electroluminescence, and other conductive coatings. Cima NanoTech Israel is located in Caesarea. Dr. Fernando de la Vega is the company's CEO.

**Nutralease** focuses on microemulsion technology for liquid nano-encapsulation of nutraceuticals, cosmeceuticals, and essential oils and drugs for incorporation into food, pharmaceuticals, and

cosmetics. Applications include functional foods, flavor houses, and nutraceutical preparations. The company is located in Mishor Adumim. Dr. Eli Pinthus is the company's CEO.

**Sol-Gel Technologies** develops UV Pearls™, the world's first nano-encapsulated sunscreen. It is the only product that enables absorption of UV light without any contact of the UV filters with the skin. This product utilizes the company's unique nano-engineering technology that allows a range of active ingredients to be encapsulated in highly transparent silica glass matrices or nanospheres. Sol-Gel is located in Bet Shemesh. Dr. Alon Seri-Levy is the company's CEO.

### £450,000 Grant for NanoPass

Start-up **NanoPass Technologies** announced that it, together with GlaxoSmithKline's Biopharmaceutical Centre of Excellence for Drug Discovery, has secured a £450,000 grant from the Britech Foundation to optimize a new method of vaccine delivery.

Called the MicroPyramid technology, this method offers the possibility to effectively and painlessly administer vaccines intra-epidermally. Conventional needles are too large to do this, and other transdermal technologies are either incapable of, or are inefficient at delivering large molecules.

NanoPass founder Shuki Yeshurun noted that, "there is potential this technology may lower the amount of dose required to provide the same immune response, reduce the need for booster shots, or potentially improve the protection rate by stimulating multiple immune pathways."

NanoPass CEO Dr. Yotam Levin MD said that grant, "will support our development efforts for the next two years, and will allow us to expedite our progress. Britech officials have been extremely supportive throughout the process of the application and its approval."

NanoPass has several active collaborations underway in various application fields and is about to launch a new round of financing. Founded in 2000, the company is venture backed by the Israeli Ofer Group.

The Britech Foundation is a government-backed bilateral organization providing active support for collaborative R&D ventures between UK and Israeli companies.

### PC Shipments Grew Over 10% in Quarter

Personal-computer shipments around the world grew by 10% to 11% in the first three months of the year, fuelled largely by strong sales in Europe and Latin America, according to two widely followed reports on PC shipments.

The reports were compiled by two research firms Gartner Inc. and IDC. According to Gartner, PC shipments worldwide grew 10.3% in the first quarter, with worldwide PC shipments totalling 50.4 million units, up from 45.7 million units in the year-earlier period. Meanwhile, IDC said total PC shipments increased 10.9% in the first quarter to reach 46.1 million units.

Growth was particularly robust outside of the U.S. in Europe, Latin America, Africa and the Middle East, both research firms said. "A weakening dollar helped create market momentum, as strong international currencies, particularly the euro, made dollar-denominated purchases attractive," said Roger Kay, an IDC analyst.

Dell Inc. remained the world's top PC vendor. Dell, of Round Rock, Texas, had first-quarter market share of 16.9%, up from 16.5% 4% a year ago, said Gartner. IDC said Dell's market share was 18.9%, up from 18.5% a year ago. Dell was followed by Hewlett-Packard Co. and then International Business Machines Corp.

### The First Matter

When the first matter came into being right after the big bang, what was it like? It may not have been quite as scientists have been describing. That's one of the possibilities raised by four international teams of researchers that are about to publish important results three years into an experiment to recreate the primordial matter of the universe. Weizmann Institute scientists are among those who participated in the creation of matter that may be the "quark-gluon plasma" thought to be the first matter in the universe.

Scientists studying the unique physical properties of the quark-gluon plasma attempted to recreate the primordial matter using an accelerator, called RHIC, built especially for this purpose at the Brookhaven National Laboratory on Long Island, New York. The RHIC creates two beams of gold ions and accelerates them one towards the other, causing a head-on

collision. The power of the collisions (about 40 trillion electron volts, also termed 40 tera electron volts) turns part of the beams' kinetic energy into various particles (a process described by Einstein's well-known equation  $E=mc^2$ ).

The first stage in the creation of these new particles, like the first stage of the creation of matter in the Big Bang, is thought to be the quark-gluon plasma. In this stage, the jets of blazing matter that dispersed in all directions in the first few fractions of a second in the existence of the universe contained a mixture of free quarks and gluons. Later on, when the universe cooled down and became less dense, the quarks and gluons "organized" into various combinations that created more complex particles called hadrons, a group that includes protons and neutrons. Since then, in fact, quarks or gluons have not existed as free particles in the universe.

But, while many of the experimental results fit in with predictions of how particles in the quark gluon plasma should behave, others have been a surprise. For instance, some analyses of the data show the plasma, created at a heat up to 150,000 times hotter than the center of the sun, behaves not as a super-hot gas, as expected, but more like a liquid.

The Weizmann Institute scientists participate in the experiment known as "PHENIX," together with an international team of 460 physicists from 12 countries. A number of the particle detectors installed for the original PHENIX experiment were designed and built by Prof. Itzhak Tserruya of the Weizmann Institute's Particle Physics Department and his team. These detectors are capable of providing three-dimensional information on the precise location of the particles ejected from the collision area. The particles' direction, together with their energy and identity, help characterize the matter's properties within the collision area. The team is now working on an upgrade of the PHENIX set-up that entails the addition of a new detector, called the Hadron Blind Detector, which will allow scientists to focus on specific particle pairs.

These particles are electrons and their antimatter opposites, called positrons. When they show up in pairs, they can give the scientists valuable clues as to the processes taking place in the matter. The new detectors are now in the construction phase, and Tserruya hopes to install them in time for the new

experiments next year.

### **Bio-Oz Seeks AIM IPO at \$100m Value**

Bio-Oz Biotechnologies, controlled by Kibbutz Yad Mordechai, plans to raise £20-25 million (\$47 million) on London's Alternative Investment Market (AIM), at a company value of \$100 million, after money. After the issue, Bio-Oz will be the first Kibbutz Industry Association company listed in London, just as Shamir Optical Industries Ltd. (Nasdaq:SHMR) became the first kibbutz company listed in New York.

Kibbutz Nahal-Oz founded Bio-Oz in 1996, after four years of field trials in collaboration with Agricultural Research Organization of Israel (ARO) - the Volcani Center. Bio-Oz was seeking a solution to a lethal virus attacking crops across Israel.

"The company's first idea was to inject a weakened virus into plants, so they could develop immunity to the vicious virus," said Bio-Oz co-founder and CEO Dr. Gal Yarden. "Kibbutz Nahal-Oz underwent a financial and social crisis in 2000, which prevented us from investing additional resources in the company. At the same time, I and other company managers decided to leave the kibbutz. As a result, Nahal-Oz decided to sell Bio-Oz to Kibbutz Yad Mordechai."

Bio-Oz currently has four categories of products. The first is a vaccine for plants that uses weakened viruses. The second is a vaccine for plants based on naturally occurring viruses that are injected into the plants. The third is an industrial-scale system for injecting viruses (a machine that injects the vaccine into the plant tissue). The fourth is viral technology for manipulating plants to improve their immunity.

### **Flying a Helicopter Without Leaving Home**

Combining a patented computer program and Global Positioning Satellite (GPS) with an existing minicomputer, an Israeli company has developed an unmanned aerial vehicle (UAV) that could be the next homeland security defense tool.

The craft does not have a pilot -- not even one who controls it remotely from the ground. All the aspects of flight -- takeoff, hovering and landing -- are completely autonomous, making this UAV a first.

"This is the first system that can guide a helicopter through its entire flight without any human intervention,"

says Amir Rochman, CEO of Steadicopter, Ltd., the company that developed the UAV. "There are miniature helicopters that can be flown with remote control or from a ground-control station, but none that are completely autonomous like ours." He adds that even the big-budget developments coming out of the U.S. Army and Navy are controlled by an operator in a ground station.

The technology for Steadicopter was conceived in 1999 at the Technion-Israel Institute of Technology, and was nurtured in the Technion Entrepreneurial Incubator Company. Its first prototype was stolen last fall, but a new one is ready for demonstration.

Currently, the system uses a 5-foot, 18-pound minicopter, but the technology can work with any helicopter, from hobby-sized to a full-sized, rotating-wing aircraft. Before the flight, an operator -- who needs no special training -- enters flight instructions and routes into a standard PC. The helicopter flies at an altitude of a few hundred feet with an operating range of six miles from ground control for about 90 minutes, and can adjust to winds of up to 25 knots. Changes in direction, flight speed and altitude can be made throughout the flight. The helicopter can be outfitted with cameras that survey areas up to 8.8 miles away, and transmit real time video images.

Steadicopter has both security and civilian uses. Military surveillance, search and rescue, and inspection of damage in hard-to-reach places hit by terror or natural disasters are among its many security options. Civilian uses include high-tension wire inspections, forest fire monitoring, media coverage of live events, and traffic control.

Traditional unmanned helicopters have good vertical manoeuvrability and the advantage of being able to remain in one position for long time periods. However, due to the need for expensive equipment and highly trained operators, they are mostly limited to use by the military and the movie industry.

The most important advantage of the Steadicopter is that anyone can "fly" it, eliminating the need for a trained pilot or operator. In addition, it can fly anywhere within its range, and is not limited to the operator's field of vision. In case of lost communication, it will continue its mission, return and land safely. Another advantage is its relatively low price. The current

model will cost \$125,000-\$150,000. In addition to the minicopter, the package includes a camera with real-time transmission capabilities, a PC with special software, and a monitor.

The company has raised about \$1 million from the Israel Ministry of Defense for a joint project with Israel Aircraft Industries, and from private investors for the technology development phase. Now it needs to raise an additional \$1.5 million from private investors. The current market for UAVs is about \$2 billion, and is expected to double over the next decade, according to a study by the Teal Group, a research company specializing in the aerospace and defense industries.

Israel is recognized as a world leader in the development of pilotless reconnaissance aircraft.

### **Dental Robot Makes Implants Less Painful, and Less Expensive**

The company, Rehovot-based Tactile Technologies, recently obtained US Food and Drug Administration marketing approval for its novel dental implant location software. The software is a three-dimensional surgery planning solution, which will soon be marketed in the U.S.

The company's flagship product, which is in the final stages of development, is an Implant Location System (ILS) that uses a disposable micro-robot for carrying out dental implant procedures. The company promises that when this product hits the market, the process of getting dental implants will be less painful and less expensive.

A series of animal trials has been successfully completed and clinical trials on humans are slated for this July. The company has already signed cooperation agreements with a number of leading medical research centers, including Vienna General Hospital, Boston University Hospital, and New York University.

The bone-sensing technology will enable precision three-dimensional measurement of bone tissue covered by soft tissue, without the need for invasive surgical procedures. The Implant Location System applies tactile sensing technology to offer intra-oral image-guided navigation specifically for dentists. Its computer-guided sensing, navigation and guiding suite for placement of dental implants is designed both for

the general practitioner and the expert.

Tactile Technologies was founded in 2003 by a group of physicists, among them Dr. Zvika Slovin, 39, who serves as CEO of the company.

Slovin said that when their group looked at the dental implant market, they found a highly lucrative niche “in which not a lot had changed in the past 20-30 years, and high technology has not yet made an impact.”

“Every implant is a titanium screw and they are afraid of perforating a bone or damaging a nerve,” Slovin said

Inserting dental implants in their proper location in the jaw is a surgical procedure that requires a great deal of experience, knowledge and expertise. Wrong placement of implants may cause implant failure and irreversible damage to anatomical structures.

According to Slovin, current devices still suffer from inaccuracy, high procedural complexity and high prices. 90 percent of all implant procedures are performed by only 4% of dentists, he added.

Their technology is the very first to offer accurate image-guided navigation relying on low-cost disposable elements, without involving any special sophisticated or expensive equipment.

“We’re adopting the Hewlett-Packard printing strategy, where the basic equipment is affordable, and the profit is made on the cartridges,” Slovin said.

The company says that the miniaturized disposable Implant Location System will be accurate, simple to use and flexible, and a safe and easy tool for planning and carrying out dental implant placement procedures.

Tactile Technologies’ tactile sensing technology provides a mechanical image of the bone contour without removing any gum tissue. Bone contour measurements are compared to pre-operative radiological information and used for determining the exact location of the system on the patient’s anatomy.

The sensor uses a matrix of micro-needles that are inserted through the gum tissue until contact with bone is attained. The needles used are ultra-thin with specially designed geometry to ensure negligible

trauma. Their insertion is measured using miniature position encoders accompanied by digital signal processing electronics, achieving exceptionally high measurement accuracies. Once the optimal implant location is determined it needs to be carried out in a precise and safe manner.

The use of the Implant Location System enables implant placement without the need for painful flap surgery, which is often accompanied by potential marginal bone loss and soft tissue recession, which reduces success rate and may result in bad aesthetic results.

### Israeli Innovates Arabic Touch-Typing

An Israeli company Sight and Sound, has come up with the first successful Arabic touch-typing programme.

The company says it has successfully tested the course in a pilot program in Israeli Arab schools and hopes to market it soon to the rest of the Arab world. “Learning to touch type in Arabic is more complicated than in English or Hebrew - the touch typing machines and the computer keyboards are totally different and it can cause a lot of confusion. Our Touch Typing Technology (TTT) has adapted the touch typing machines to the computer keyboards so what the students are learning is applicable right away,” a company spokesman said.

According to the company, the TTT system works in a specific way. “In the first few lessons, like in any touch typing course, you learn how to place your hands and where to place your fingers on the letters. But that’s not enough - any computer software can do this. The problem is after you place your fingers, you may start touch-typing, but pretty quickly you’ll go back to your old way of using two fingers. In the Sight and Sound technique, you also acquire speed and have to practice so that you type more than 18 words per minute in order to pass the course - Of course some people can go up to as high as 60 or 80 words a minute. Our course is also quick - approximately 24 hours - and the recommendations are to do it between one and two weeks,” the spokesman said.

The TTT program is based on a combination of sight, sound and rhythm. The keyboard is graphically displayed on the student’s computer screen. The different keys are shown in various colours. The student receives instructions via his earphones. After a brief explanation the narrator commences with the first lesson. The narrator calls out the required letter

to be typed, the called letter lights up on the coloured keyboard shown on the screen, and the narrator then gives the instruction to strike the key.

The student first sees, then hears and finally acts. All the natural reactions of the student are utilised, making the learning process effortless and ensuring that this process is not built on a system of boring practice and remembrance used by other methods.

**Summary of Israeli High-Tech Company Capital Raising - Q1 2005**



This Survey, conducted with the cooperation of the Israel Venture Association (IVA), reviews capital raised by private Israeli high-tech companies from Israeli venture capital funds and from other investors. The Survey is based on reports from 105 venture investors of which 58 are Israeli management companies and 47 are other – mostly foreign – investment

entities.

In the first quarter of 2005, 102 Israeli high-tech companies raised \$350 million from venture investors – both local and foreign. The amount was down four percent from the \$366 million raised by 113 companies in the previous quarter and was eight percent higher than the \$323 million raised by 111 companies in the first quarter of 2004. “Israeli companies raised an average of more than \$350 million per quarter since the start of 2004,” said Efrat Zakai, Director of Research at IVC. “We are projecting that \$1.5 billion will be raised by Israeli high-tech firms in 2005.”

The average company financing round increased by six percent from the previous quarter and 18 percent from the first quarter of 2004 to \$3.4 million. Sixty-eight companies attracted more than \$1 million. Of these, 16 companies raised between \$5 million and \$10 million each and five companies raised more than \$10 million each.

**New ‘Hanging’ Strawberry Plant a Hit in Europe**

Tutlui, a strawberry that grows on a bed suspended

in midair, is one of the most successful agricultural inventions of the past two years. The innovation is expected to change the way this veteran yet problematic crop - a vegetable that is actually a fruit - is grown.

Strawberries are problematic because they grow in sandy soil, and are thus contaminated both by the sand



and by fungi that grow because the strawberry rests exposed on the ground. The strawberry has also acquired a dubious reputation for using pesticides. In Europe, Israel’s strawberry export market, pesticides are virtually a synonym for cancer.

The idea of raising the strawberry off the ground and growing it on detached beds (30-meter boxes

suspended in midair inside greenhouses) came from agronomist Dr. Menachem Dinar, who until recently served as director of the vegetable development division of the Agriculture Ministry’s plant protection service.



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