

## ELECTRONICS REPORT

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### BUSINESS & MARKET NEWS

**Steve Jobs Leads the Way Right Past the Doubters** - A few months ago, many phone pundits were asking why all the fuss about the iPhone. Some went on to explain why the launch would be a non-event. *The background soundtrack at iTunes is Steve Jobs laughing as he leaves for the bank.* The Apple iPhone led Smartphone sales in the United States in July, beating Research In Motion's BlackBerry, the Palm Treo, and other rivals. Not bad for a very expensive piece of hardware. iSuppli attributed the meteoric rise of the iPhone, in large part, to demand built up by months of hype leading up to the gadget's release on June 29. **OK, but this is just Jobian Marketing.** The first full month of sales is impressive, given that the iPhone beat out well-entrenched competitors. The typical iPhone buyer held a four-year college degree (62% college educated or higher) and 57% were 35 years old or younger, 52% male, and 48% female. In addition, one out of four iPhone buyers switched wireless carriers to AT&T. **Cool is cool, especially when it works well and is intuitive. The surprise to many good engineers is that off-the-shelf technology can build a very successful product if it's put together in a clever form factor.** Source: EE Times.



**Apple iHype** **More Jobs, Steve, that is** - Steve Jobs just unveiled an iPod with a touch screen that can browse the Internet wirelessly. [*Right, this was the next obvious thing to do, but timing is critical, too*]. Jobs, who also showed off an iPod nano with a video screen, said the company plans to refresh its entire line of music players. In addition, Apple's iTunes Web music store will begin selling songs over wireless connections. The new touch-screen iPod will have many of the features of Apple's hit iPhone, including a touch screen, the ability to connect to the Internet wirelessly using Wi-Fi technology, and a mini Web browser. "We've built in Wi-Fi and we've made it usable," Jobs said. [*iTunes seems to be selling everything, but also giving away plenty. Those who are fans of History Channel's "Modern Marvels" can download the 1-hour programs for \$1.99 compared to \$24.95 for DVDs. You can find hundreds of free university lectures and loads of other freebies at the sight.*] Source: Reuters.

### TECHNOLOGY FOREFRONT

**Medical Electronics and Miniaturization** - Here's an ultra-portable ultrasound system for quick complementary diagnosis that has been launched by Siemens. The advantages of the new system are its portability, easy handling as well as its fast and consistent availability to the physician. The device is barely larger than a Blackberry and weighs just a little more than 700 grams. In emergencies, for example, this translates into

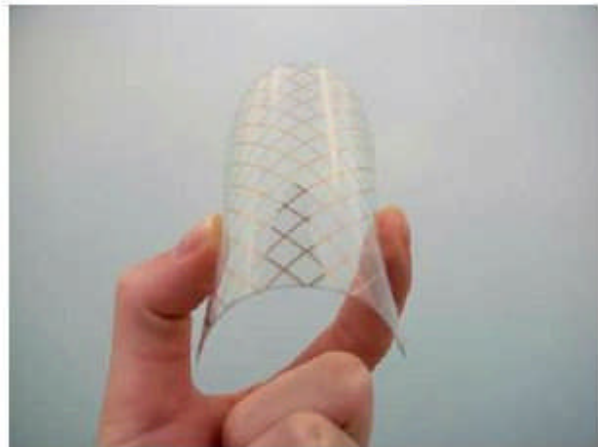
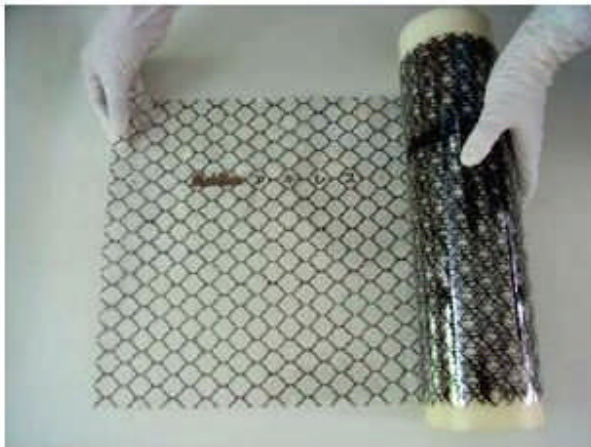


earlier, faster and more accurate screening and triage decisions. Its emergency applications include

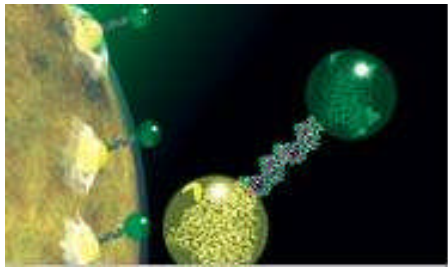
FAST (Focused Abdominal Sonography for Trauma) for detecting fluid, determining cardiac activity and pericardial effusion as well as for detecting abdominal aortic aneurysms and performing pelvic exams. Instead of having to rush the patient to the technology, P10 brings the technology to the patient, which can reduce critical minutes, particularly when a patient is in cardiac distress or with trauma patients, who have multiple injuries. The flexibility and portability of the P10 mark significant changes in the way diagnostic and emergency care are administered, changes that could alter the face of the physical exam and, ultimately, lead to better patient outcomes. In addition to cardiac and emergency care, the ACUSON P10 offers applications in other medical specialties, most notably obstetrics where it can be used during labor and delivery. Specifically, the device can determine fetal viability, fetal positioning, amniotic fluid volume, bleeding and miscarriage. Source: Emergency Medicine.

### **NANOTECH ELECTRONIC EMPHASIS**

**New Nano or Old Colloidal?** Achilles Corp. developed a technology to *plate the surface of plastic with "nano-dispersed" polypyrrole solution. [Is this electroless-phoretic, aka autophoretic coating? Colloidal suspensions, that range from 1-nm to 1000-nm, can be deposited using electric current - old stuff!]* The company plans to apply the new technology to electromagnetic wave shielding film, transparent film antenna, IC tag, etc. and some of these products are currently under development with a view to commercialization by spring 2008. A high adhesive plating film can be formed on various kinds of plastic base materials, according to Achilles. This can be done just by using two kinds of solutions, catalyst imparting and plating solutions, after the application of the nano-dispersed polypyrrole solution. For example, materials that otherwise have low adhesion, such as polyethylene terephthalate (PET), polyvinyl chloride and polyolefin, can be plated with high adhesion, i.e. 2.0 N/mm in a peeling test. More than seven kinds of pretreatment solutions, such as mixtures of chromium acid and sulfuric acid, and organic solvent and water, are presently applied in accordance with the material used. The latest technology, however, only requires one or two kinds of pretreatment solutions. As a result, continuous electroless plating can be conducted, thereby reducing the time required for the pretreatment to about 1/10. In the new technology, plating is deposited on the portion applied with the nano-dispersed solution. With the use of this characteristic, pattern plating is also possible. A pattern with a line width of 50- $\mu$  can be formed by printing a thin line with a general-purpose gravure printing machine. The company will aim to produce fine patterns having the line width of 10- $\mu$ m or narrower by improving the printing method. Source: TechOn. *[New nano, viewed through the sub-nano eye of the chemist often looks like old alchemy]*



**NanoPrinter** - IBM has come up with a way to essentially print images at 100,000 dots per inch for



research applications. Their is potential use in creation of semiconductors or the creation of "metamaterials" in which the printed structures are as small as the wavelength of light, and therefore act as if they were a single lens with unusual properties. The researchers chose to print Robert Fludd's 17th-century image of the sun, the alchemists' symbol for gold. It is printed out of roughly 20,000 gold particles, each of them 60-nm in diameter. The IBM high-resolution printing uses a

directed self-assembly process that controls the arrangement of nanoparticles on the printing plate or template. The entire assembly is then printed onto a target surface, whereby the particle positions are precisely retained at a resolution that is three orders of magnitude higher than in conventional printing. The printing template geometries explored include lines to produce closely-packed nanoparticle wires, which could be used in molecular electronics; regularly spaced arrays of gold particles as seeds for nanowire growth; and arbitrary arrangements, such as the printed replica of the sun. The long-range accuracy, which measures the deviation from the desired arrangement on a large area, is similar to that of microcontact printing methods. The next steps will be to refine the method to achieve even higher accuracies, as would be required for large-scale integration in microelectronics, as well as to extend the method to print even smaller particles. Source: ExtremeTech.

**Carbon Nanowires** - The University of Pittsburgh has invented an assembly technique that



provides a way to construct nanowires. With only sub-micron dimensions, these wire products could form the building blocks of extremely tiny man-made machines in the future. The process begins at the atomic level. Copper atoms form a flat crystalline plane like a sheet of paper. Then, copper oxide ( $\text{CuO}_2$ ) molecules are chemically deposited on top of the plane, like rows of corn, but with a full copper-atom left exposed between the oxygen rows which are not molecularly bonded to the  $\text{CuO}_2$  rows. This creates a type of trough, which serves as a mold for construction. Next, the Carbon-60 Buck Balls are introduced and a self-assembly process begins. The molecular chains of varying lengths are formed within the molds. While the mold itself is less than 2-nm wide, nearly perfectly aligned single-molecule wires in excess of 100-nm have been created. The molecules are spaced approximately 0.76-nm apart. In the future, it should be possible to remove these tiny structures from the copper mold. Once extracted, they could then serve as foundational raw materials which might be resized and moved into position for whatever practical use is required. These nanowires then form Carbon-60 structures which exhibit a most desirable property. When conducting electricity at these nano-scale levels there is only a minimal loss due to their one-dimensional nature. Electrons cannot be scattered in the other two dimensions and are forced down the one-dimensional path. This could make them ideally suited for micro-leads in future ultra-tiny MEMS (NEMS) which could operate in the picoamp range with possibly only 100s to 1000s of atoms comprising the entire structure. Their natural molecular chain-like structures forms the requisite wire shape. Their natural property of electrical conveyance makes them ideally suited for small electrical loads. Similar nanowires constructed from other organic molecules in the future could also form the most basic of insulating, structural and conductive components and circuits. This research could make those future devices not only more controllable and programmable, but also built using components which are relatively easy to construct, test and deploy. *[This is only one of many methods for producing carbon-nanowires, but it doesn't appear to lend its self to patterning that would be required for circuitry].* Source: TG-Daily.

## MATERIALS

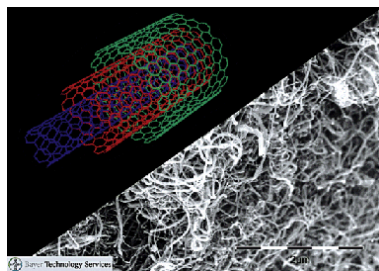
**China is the Copper Scrap Magnet** - China's imports of copper scrap in the first 7-months grew steadily to 2.99 million tons, up 17.7 % on the same period last year. The imports were valued at over \$3-billion, soaring 86.8% per ton, up 58.7% to greatly squeeze profits of domestic copper processing enterprises. Since copper prices began to surge in 2003, copper scrap, a relatively cheap secondary raw material, has become increasingly important to China, which is becoming the global processing center. The fact that the nation lacks a sound copper scrap recycling system added to the short supply of copper



domestically, according to the customs. China cancelled import tariffs on copper scrap from the beginning of this year, a move to encourage copper scrap imports and ease the material shortage of domestic copper processing enterprises. The government must establish a scrap copper recovery system to help the processing industry to develop healthily. The industry should also update techniques to prevent environmental hazards involved in copper processing. Source: Xinhua.

**Asian Hot Flex** - DuPont Taiwan reported that there was a fire at its double-sided flexible copper clad laminates production line in September. Shipments to Taiwan and other Asian customers will not be affected since this line is not scheduled to enter production until 2008. The cause of the fire was oil leakage at the new production line during testing. There has actually been an over-supply of double-sided flex in Asia for several years mostly because of expansion in Korea; Thinflex and other Korean players had expanded several years ago. Source: DigiTimes.

**Carbon Nanotube Supply Expanding** - Bayer MaterialScience AG is opening a second production facility for Baytubes®, its carbon nanotubes, or CNTs, in the town of Laufenburg on the German-Swiss border. The new facility has an annual capacity of 30-metric tons. Together with the pilot production plant for Baytubes® already located at the site, this now gives Bayer MaterialScience a total annual capacity of 60-metric tons in Laufenburg. This makes it the world's leading manufacturers of CNTs. Bayer MaterialScience is also planning to build a large-scale Baytubes® production facility in Germany with an annual capacity of 3,000 metric tons. Source: WEBWIRE.



## TELECOM

**Mobile TV Expanding** - Worldwide annual consumer spending on mobile broadcast TV services is expected to exceed \$6.6-billion by 2012 per Juniper Research. Nearly 120-million mobile users in more than 40 countries are expected to receive broadcast TV services by 2012, compared to less than 12-million in 2007; DVB-H will be the dominant standard. However, the report cautions that services face significant technological and regulatory hurdles both prior to launch and as they bid to build a critical mass of subscribers. Regulators need to make optimal UHF spectrum



available as soon as is practicably possible for vendors to ensure that broadcast TV chipsets are rapidly introduced into a wide range of mass market handsets to facilitate adoption. If companies are serious about achieving widespread adoption of mobile TV, it is essential for chipsets to filter down very rapidly from top of the range handsets into the mass market models so that everyone has the opportunity, at least, to sample mobile TV services. The US will be the largest single market for mobile broadcast TV services in 2012, followed by Japan and Italy. Streamed TV packages will gradually evolve to complement mobile broadcast TV. Advertising will contribute an increasing proportion to overall mobile TV revenues, but in most cases will provide a supplementary revenue stream, with most services relying on both subscriptions and pay-per-view for the majority of revenues. Source: Juniper Research.

**Year of the WiMAX?** - Can Intel activate WiMAX? Mobile connectivity is a major thrust for Intel.



They want to make 2008 "The year of WiMAX," and by reigniting interest in the handheld devices. Apple took over this space in dramatic fashion with its ARM-based iPhone. *[And it is amazing how fast Apple can turn over the apple cart - or upright it.]* Intel has promoted the WiMAX wireless broadband standard, along with Sprint/Nextel, Samsung and Motorola in efforts to hasten the widespread adoption of WiMAX technology. Intel said that there are hundreds of trial deployments of WiMAX worldwide, although areas that have already heavily committed to 3G technology like GSM,

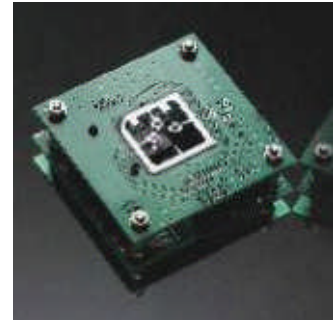
most notably the European wireless markets, have been slow to warm up to the idea of the WiMAX standard. Intel said its 45-nm Penryn-based Montevina processor technology, due in 2008, would be the company's first Centrino processor for notebooks to offer the option of integrated Wi-Fi and WiMAX wireless technologies - code-named Echo Peak. The option would handle 3G and WiMAX. Montevina also boasts the capability to run both HD-DVD and Blu-ray standards for media applications. Intel believes that the United States will lead the charge for WiMAX, followed by operators in Asia, and European operators will be the last *[or never]*. Source: Electronic News.

## **BIOMEDICAL**

**MEMS Drug Injector** - Hewlett-Packard is working with Crospon Ltd (Ireland) to commercialize an inkjet-based skin patch for painless, controlled release of one or more drugs. The patch delivers medication intradermally just below the surface of the skin and enables precise control of dosage timing, access to dosage history, patient activation mechanisms and inherent safety protocols for preventing adverse drug interactions. Transdermal patches (which rely on absorption through the skin) for nicotine delivery have become a mainstay for smoking cessation programs; however, they have not been a widely effective delivery mechanism for many drugs because the skin acts as a natural barrier. The HP-developed skin patch uses microneedles that barely penetrate the skin; this radically reduces discomfort compared to traditional hypodermic needles and enables the technique to be used with a much wider variety of drugs and biopharmaceuticals. The microneedles allow medication to quickly enter the bloodstream, resulting in the potential delivery of lower and more precise dosages. HP initially developed the drug delivery technology as a way to repurpose its inkjet technology for use in new markets. The technology in the skin patch is similar to that employed in HP's patented process for its inkjet cartridges. Source: Medgadget.



**A Lab-on-Chip Bird Flu Bio-detector** - Researchers at the Institute of Bioengineering and Nanotechnology (IBN), Institute of Molecular and Cell Biology (IMCB) and Genome Institute of Singapore (GIS) have successfully developed a miniaturized device that can be used to detect the highly pathogenic avian flu (H5N1) virus. This device could be deployed in affected regions for pre-emptive surveillance of nascent avian flu epidemic. The implemented device would be able to detect the presence of the H5N1 virus directly from throat swab samples on-site in less than 30-minutes. The device comprises a unique platform that uses magnetic force to manipulate individual droplets containing silica-coated magnetic particles. The droplets act as a pump, valve, mixer, solid-phase extractor and real-time thermocycler. Complex biochemical tasks can thus be processed in a fashion similar to that of a traditional biological laboratory on a miniature scale. The single device is superior to commercially available products because it integrates the entire workflow of viral RNA isolation, purification, preconcentration, and detection. The platform is as sensitive as, and around 10 times faster than available tests, yet it could potentially be 40 to 100 times cheaper. The Lab-on-Chip system can also be adapted for other infectious diseases such as SARS, HIV and hepatitis B, by extracting nucleic acids from other body fluids such as blood, urine or saliva. Source: Medgadget.



## INTELLECTUAL PROPERTY



**IP Litigation Rising** - Patent litigation in the semiconductor world, over the last 10- years, has been rampant. It takes a detailed scorecard to determine how many suits have been brought about and who all has sued or been sued. In the United States, *almost 900 patent lawsuits involving the semiconductor industry* have been filed in Federal District Courts since 1997. Indeed, there have been more suits filed halfway through 2007 (53 suits in all) than were filed in all of 1997. In the last ten years, suits have more than doubled. Many different companies have been involved in all these suits. Nevertheless, there are some regulars: Intel (involved some 6.5% of the time); Broadcom Corp. (3.6%); Texas Instruments Inc. (3.4%); Samsung Semiconductor Inc. (2.5%); LSI Corp. (2.3%); and International Rectifier Corp. (2.2%). Rounding out the cast are Applied Materials Inc., Micron Technology Inc., STMicroelectronics, and Atmel Corp. each of which have been involved in roughly 2 % of these suits. Intel has been involved in about 8 cases a year since 1997, with the notable exceptions of 2005 (20 cases) and this year (zero cases). In 2003, Broadcom was involved in 10 cases, followed by 7 the next year. Texas Instruments has seen a steady decline since it was involved in 13 cases in 1998. In 2006, the top 10 companies involved in semiconductor litigation were, in descending order of frequency: Intel, Broadcom, Micron, Altera Corp., Analog Devices Inc., Amberwave Systems Corp., On Semiconductor Corp., Promos Technologies Inc., STMicroelectronics and LAM Research Corp. Halfway through 2007, the big names, in descending order, in the litigation arena have been: Atmel Corp., Microsemi Corp., Fairchild Semiconductor International Inc., Monolithic Power Systems Inc., Samsung Semiconductor, Renesas Technology America Inc., Freescale Semiconductor Inc., Altera, JDS Uniphase Corp. and LSI Corp. In general, efforts by large chip companies to enforce their patent rights have remained stable during the last two decades. In contrast, smaller chip-design firms have been quite litigious.

To establish proprietary rights in niche markets, these firms have been said to be so bold as to legally enforce roughly four out of every 100 patents they own. Almost half of the suits in the last decade have been filed in the Ninth Circuit, primarily in California courts. The Patent Local Rules in the Northern District of California and the physical location of many firms in the semiconductor industry help account for such filing statistics. The Fifth Circuit, with its pro-patentee Eastern District of Texas, has seen roughly 18% of the filings. Next is the Third Circuit, which includes Delaware, with 13%. The next circuit, the Fourth Circuit, drops dramatically, to around 4%. In 2005, a whopping 97 percent of cases were filed in only two district courts: the Ninth Circuit (60 percent) and the Fifth Circuit (37 %). In 2006, filings decreased to some extent, with the Ninth and Fifth Circuits coming in around 50% and 27% respectively. Source: EETimes.



**Rambus**

**Rambus Ambush and the EU** - For more than four years Rambus participated in the Joint Electron Device Engineering Council's (JEDEC) standard-setting process for DRAM, a type of electronic memory. Rambus did not disclose the existence of patents or patents-pending relating to the technologies ultimately adopted as part of the JEDEC's standard. Therefore, any manufacturer wishing to produce a DRAM chip has to either acquire a license from Rambus or litigate Rambus' asserted patents – commonly known as a patent ambush. Rambus fared poorly in US courts. The Federal Trade Commission found that Rambus had engaged in illegal monopolization and imposed a remedial order applicable to US patents and foreign patents to the extent that they relate to import or export of relevant products into or from the US. Now it's the EU's turn. The European Commission sent Rambus a Statement of Objections alleging an infringement of Article 82 of the EC Treaty (abuse of a dominant position). This alleged breach stems from the unreasonably high royalties, enabled by the patent ambush, charged by Rambus for use of the relevant patents. The Statement of Objections preliminarily concludes that an appropriate remedy for this kind of breach would be that Rambus charge a reasonable and non-discriminatory royalty rate. Standard setting organizations would typically recommend cross licensing should be on a F.R.A.N.D. basis (Fair, Reasonable and Non Discriminatory). Source: IP FrontLine.

**Major IP Case** - The Supreme Court will consider a patent case that could have far-reaching ramifications for computer makers and other industries with global supply chains. The case was brought by a group of Taiwanese computer makers, who have accused a South Korean rival of using its patents in an effort to "shake down the entire computer industry for several billion dollars in duplicative licensing fees." At issue is whether a patent holder can seek royalties from multiple companies as a patented product works its way through the manufacturing process. The Taiwanese firms, led by Quanta Computer Inc., are asking the justices to overturn a 2006 federal appeals court ruling that they say would open the door for patent holders to do just that. Quanta and the other companies manufacture computers under contract for U.S. companies such as Hewlett-Packard Co., Gateway Inc. and Dell Inc. The three U.S. corporations filed court papers in support of Quanta. They said the ruling, by the Court of Appeals for the Federal Circuit, "threatens to impose a huge financial and impractical burden on manufacturers of technology products." The companies outsource much of the assembly of their computers to companies like Quanta, the world's largest contract manufacturer of laptop computers. The case began in 2000 when the Taiwanese companies were sued by South Korea-based LG Electronics Inc. for allegedly infringing several patents LG holds on computer chip technology. The case is Quanta Computer Inc. v. LG Electronics, 06-937. Source: Technology Review.



## INTERNATIONAL NEWS

**Today, Delay is Death** - India's delays in formulating a government policy to encourage chip manufacturing prompted Intel to look elsewhere, including China and Vietnam. Intel chairman Craig Barrett said the delay in announcing a chip policy forced Intel to look elsewhere in Asian to locate its manufacturing centers; the Indian government policy was not timely. They didn't have a well-documented plan when we began discussions. Intel will still considering India, but right now, there are no plans to set up a plant there; there's enough capacity and no need for any new plant. Intel, which has a large R&D center in Bengaluru, will expand its engineering and software development activities there. Source: Hindu Business Line.



**Digging for Chips in China** - Intel just held a groundbreaking ceremony in China to build its first chip factory in Asia, Fab 68, with an initial investment of USD 2.5 billion. The plant is being built in Dalian Economic and Technological Development Zone in the northeastern port city of China. The project is set to begin construction immediately and be operational in 2010. Fab 68 will cover 163,000 m<sup>2</sup> of factory space and have a 15,000 m<sup>2</sup> clean room. Intel investment in Fab 68 sets its total in China to close to \$4-billion. Intel has established two assembly and test plants in Shanghai and Chengdu, along with R&D centers and labs in Beijing, Shanghai and elsewhere in China. Dalian estimates the plant can provide about 1,700 jobs. According to Intel, India lost out because the government was slow to announce policy decisions *[There may be more to this than has appeared in the press, however]*. Source: SI

**Traffic Race** - Not to be outdone by China's attempt for the Crown of Jams (traffic), India is moving smartly along the new car frontier. Car sales in India rose 18% in August from a year ago, helped by the success of new models and dealers' expectation that demand would remain robust in the upcoming festival season, according to data released by a trade body Tuesday. Domestic car sales totaled 98,893 units in August. The stronger-than-expected numbers are a reversal of the trend seen in earlier months, when car sales were hit by rising interest rates and growth slowed. In the April-July period, the first four months of the current fiscal year, sales rose about 12% from a year ago, compared with 22% growth the year ended March 2007. The sales figures showed the growth was driven by new models, most of which have done well. Maruti Udyog Ltd., which is majority-owned by Japan's Suzuki Motor Corp., began selling the SX4 sedan in May, just weeks after France's Renault SA introduced its low-cost Logan in India through a joint venture with local automaker Mahindra & Mahindra Ltd. Sales of both models have steadily increased in successive months. In April, General Motors introduced the Chevrolet Spark, an entry-level compact, to boost its presence in India, where the market is dominated by small cars. The Spark has helped the U.S. automaker's recent sales in India double from a year ago. Also lifting the sales figures were expectations for strong demand during the Hindu festival season starting next month. Dealers typically place larger orders with manufacturers in August and September to build up inventory ahead of the season, which Indians consider an auspicious time to buy assets. India's current car sales are lower than China's but are growing faster. Car sales totaled 1.1 million units last year. Source: Manufacturing.net.

