Sign Up | Login

RED HERRING THE BUSINESS OF TECHNOLOGY

Click here to learn more about our user-centric solutions. Because the world is Always on. Alcatel·Lucent

NEWS BLOG EVENTS RESEARCH VIDEO AWARDS

TOP STORIES FINANCE INTERNET CLEANTECH COMMUNICATIONS MEDIA COMPUTING BIOSCIENCES SECURITY MAGAZINE ARCHIVES

Lab Rat: Small talk

on 04 October 2000, 22:00
by Niall McKay

listen now

For decades, skeptics have dismissed molecular nanotechnology as the dream of crackpots, fools, and technology visionaries.

The skeptics were wrong. Not that the science of manufacturing objects atom by atom has produced cell-sized robots that rush around the bloodstream chomping on cancer cells, injecting miracle serums, and knitting damaged tissue back to its former glory. But in the last two years, there have been new discoveries that may revolutionize the fields of medicine, microprocessors, and synthetic materials. Discoveries such as Northwestern University's new nanolithography techniques used for designing transistors smaller than a molecule, Cornell University's work on how to turn a living cell into a motor, or NASA 's progress on the development of carbon nanotubes -- super-strong, lightweight materials for use in future spacecraft.

Nanotechnology, it seems, is progressing from the science fiction of books like Neal Stephenson's Diamond Age to science fact. NASA, Sun Microsystems , IBM , and DARPA are among those financing a bevy of new research projects.

MAKING IT REAL

One startup that straddles the worlds of science fiction and reality, perhaps even more than the propeller-heads at the various research institutions, is Zyvex , based in Richardson, Texas.

More akin to a research institution than a startup, Zyvex is dedicated to developing a molecular manufacturing assembler: a device that can build materials by manipulating individual atoms. In theory, an assembler could build practically any material -- gold, diamonds, even wood. Of course, in practice, just picking up one atom, placing it next to another, and getting them to bind together is next to impossible.

I first met Jim Von Ehr -- a soft-spoken Texan who made his fortune by selling Altsys's FreeHand desktop publishing software company to Macromedia for $69 million in 1994 -- in 1998. Then, molecular nanotechnology was little more than a pipe dream. Serious money wouldn't touch it. Wowed by a speech given to the Texas Instruments Young Innovators Awards by the controversial nanotech prophet K. Eric Drexler in 1994, Mr. Von Ehr decided that he would use his money to finance the world's first nanotech startup.

"I couldn't find anybody who was both interested in and capable of creating a startup, so I decided to do it myself," says Mr. Von Ehr, founder and CEO of Zyvex. "I calculated that I could put in $2 million a year indefinitely. I believed that it could take between 10 to 15 years before we came up with an assembler."

NANO MILESTONE

Zyvex has passed its first milestone. Last year, the company and Washington University in St. Louis managed to pick up single atoms by using a scanning probe microscope (a type of atomic force microscope). Placing the atom with any precision, however, is quite another story.

"Unfortunately, the atomic force microscope does not give us the precision we need," he notes.

So Mr. Von Ehr decided that it was time to go back to the drawing board and rethink the company strategy.

He created three separate divisions: the "bottom-up" lab, composed of molecular chemists trying to get atoms to bind to each other; the "top-down" lab, dedicated to using microelectromechanical systems (MEMS) as the basic cogs and wheels of the nano-assembler; and the "advanced systems" group, dedicated to finding the properties of individual atoms.

"We are trying to hit a single molecule with light and detect the molecule's excitation," says Mr. Von Ehr.

SEARCH

Google Search

GOOGLE TRANSLATIONS FOR RED HERRING

CHI FRA GER HEB ITA JAP KOR RUS SPA

RED HERRING'S GLOBAL VC 100

The Global 100 VC Winners
For the first time and after many weeks of evaluation, Red Herring is proud to announce the following 100 VC firms from around the Globe have won the 2009 Global VC 100. Click here to find out who the lucky winners are.

The World's Top VCs
Red Herring is busy searching for the top 100 global venture capital firms. The 200 finalists have been announced. Please click here to see the best 200 performers from over 30 nations.

RED HERRING 100 EVENTS

Red Herring 100 Europe, Berlin, Germany
The Red Herring 100 is a mark of distinction and prestige. Only 200 companies are chosen as finalists from across Europe. The 100 Winners have been announced. Click here to see the lucky winners.

Red Herring 100 N. America, San Diego, CA
The Red Herring 100 is a mark of distinction and prestige. Only 200 companies were been chosen as finalists from a pool of thousands. The 100 Winners were announced at the award ceremony. Click here to see all the winners.

RED HERRING'S BLOG

Strolling Along to a Different iTune
Can Amie Street break Apple's download dominance?

HIT: Where Healthcare Meets Tech
The buzz surrounding healthcare IT provider, Cerner

Listen Up
Able Planet's new headset offers up solid aural vibes.

Gmail BETA, See You Lata
Google's gmail loses its "BETA" label.

Bada Bing, Bada Boom?
Microsoft's Bing.com gets some traction in online search, according to the numbers in from ComScore.

Calpers to Pump up PE Stake
The nation's largest pension fund is mulling a 40 percent increase in its private equity investments.

Peripheral Madness
The living room is a jungle of plastic and wires – I say enough already.

ADVERTISEMENT

FEEDS

rpc
opml
RSS for this group
All Articles
Comments
News
Events
WIKI
Custom RSS feeds

ADVERTISEMENT

Why bother? Because it's the only way that the company will be able to tell if it's using the right building blocks when it does try to build something.

Currently, the basic raw materials for Zyvex are carbon nanotubes. These are sheets of hexagonal atoms wrapped into the shape of a cylinder. They have a diameter of approximately 1/10,000 the size of a human hair, are capable of carrying a very high current, and are about 100 times stronger than steel. They are also more expensive than cocaine (costing around $1,000 per gram) and are produced by universities and research institutions.

MEMS THE WORD

But to progress to the next stage, Mr. Von Ehr and his team need to use MEMS, or micron-scale devices that integrate sensing and movement with traditional computer control systems. MEMS are used in everyday applications such as automobile air-bag sensors.

Here the company is having difficulty, because most microprocessor fabrication plants are running at maximum capacity making chips for the cell phone industry. "We are considering buying our own facility because most plants are not interested in producing custom-designed MEMS," says Mr. Von Ehr. "But [this] will cost us in the region of $10 million."

What Zyvex needs is a MEMS gripper and handle (about the size of five human hairs). These will be used in a very simple manufacturing unit that will be controlled by a computer-aided design software package. The machine's first task will be to build a smaller and better version of itself.

Mr. Von Ehr acknowledges that a full working version of the nano-assembler will be some time away, but in the meantime, the development of MEMS could become a lucrative spin-off for the company, and Mr. Von Ehr believes that Zyvex could generate revenues as early as 2005.

Niall McKay is a contributing editor to Red Herring and can be reached at www.niall.org.

Topics: Small, Lab, Rat

del.icio.us digg NewsVine YahooMyWeb

COMMENTS

No comments on this article.

Wii Storage Ups Strong Bad Sales
One company is feeling the love because of Nintendo's Wii storage solution: Telltale's Strong Bad.

Amazon Sells Xbox Live Games
No more leftover points–buy XBLA games off Amazon.

GDC 09 Keynote: What About Wii?
Satoru Itawa's keynote touched on both systems, but it seems like the Wii got the short end of the stick.

Steam Vaporizes DRM and Piracy
Steam's added anti-piracy measure does away with DRM.

ADVERTISEMENT

Understand IP Telephony
Free eBook: 11 Chapters on VoIP. Guide to Enterprise Deployment.
ShoreTel.com/11-Chapter-VoIP-eBook

Working at a Startup?
Get More Work Done Faster. Build a Virtual Team, Pay by the Hour.
www.oDesk.com

Private Equity Database
30 Day Free Trial => Directory of firms, investments, and employees
www.PEdatabase.com

VIDEOS

ADVERTISEMENT

MOBILE READER
News on your mobile device
Click Here

RH2009

TOPICS

Apple Cassimir Medford China Cisco Google Ibm Intel Internet Ipo Microsoft Motorola MSFT Nokia Security Sony Vc Venture Capital Verizon Wireless Yahoo

more topics

RH2009

FINANCE
iPhone Enterprise Outlook Rocks RIM
Allegis' Ackerman: U.S. Innovation 'Stalling'

INTERNET
iPhone Enterprise Outlook Rocks RIM
Allegis' Ackerman: U.S. Innovation 'Stalling'

CLEANTECH
A123 IPO Juices 40 Percent
Index Ventures: Envy of Industry

MEDIA
Allegis' Ackerman: U.S. Innovation 'Stalling'
Top 100 Global Venture Capitalists

AT&T Unleashes MMS for iPhone
Rubicon to Buy Others Online
Accel: No. 1
HP's Earning Fall 19 Percent

COMPUTERS
iPhone Enterprise Outlook Rocks RIM
Allegis' Ackerman: U.S. Innovation 'Stalling'
AT&T Unleashes MMS for iPhone

COMMUNICATIONS
iPhone Enterprise Outlook Rocks RIM
Allegis' Ackerman: U.S. Innovation 'Stalling'
A123 IPO Juices 40 Percent

BIOSCIENCES
Index Ventures: Envy of Industry
Accel: No. 1
Medsphere Injected With $12 Million

SECURITY
Top 100 Global Venture Capitalists
HP's Earning Fall 19 Percent
Cisco Engulfs Tidal Software for $105M

blogtronix

RedHerring © 2009
About us | Advertising Info | Privacy Policy | Contact Us | Careers