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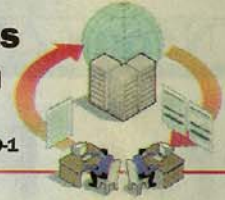


Local scientist is man behind Mud-to-Parks project

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Technology helps detect plagiarism

— IN CIRCUITS, D-1



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Heather Coit/The News-Gazette

University of Illinois Professor John Rogers is studying transistors that may let us make flexible computing devices, like screens people can roll up and put in pockets or electronic newspapers.

Computers: A flexible future

UI professor says devices using new pliable chips should be available in about two years

By GREG KLINE
News-Gazette Staff Writer

The newspaper in your hand might one day be a thin plastic sheet you can roll up and put in your pocket.

It could work something like a flexible laptop computer screen and change dynamically with new information via a wireless link.

University of Illinois Professor John Rogers thinks basic flexible displays, albeit not full-blown electronic newspapers, employing circuits printed on plastic sheets are just around the corner.

"It's probably two years out," the materials science and chemistry professor said recently, noting that consumer electronics giant Phillips and DuPont, which is working with UI researchers, are among those aiming to bring the technology to market.

"They already have sophisticated prototypes working in-house," Rogers said. "It's really a matter of cost and reliability, not technical feasibility."

Two keys to deploying the technology are understanding just how the flexible chips and their components work and being able to mass-produce them cheaply.

Enter Rogers, whose specialty is the use of soft materials for high-tech applications. The UI professor and his colleagues have developed a way to, in essence, create the single-crystal organic transistors integral to the technology by printing them, kind of, with a rubber stamp.

Rogers mused over the notion of a Palm Pilot-like device of the future that's pen-sized and whose display rolls up inside it, among other things.

Besides flexible computer displays and electronic paper, the technology might end up in cheap, ubiquitous radio frequency identification tags.

With the electronics of a computing device and a chemical composition designed for sensing purposes, such tags on food packaging could, for example, notify you wirelessly when the meat has spoiled or the milk is on its way to becoming cottage cheese.

Moreover, the technology might power animated packages designed to draw your attention to a product, or put the Internet on the back of your cereal box, as well as lighten the electronic burden of the modern soldier.

"You can shape them and mold them," Rogers said of plastic chips. "They're lightweight. They're not fragile and brittle."

Rogers and his collaborators build transistor components on a piece of silicone rubber and then lay a thin crystal film over that to complete the assembly. Natural forces draw the two pieces into perfect contact and they bond, creating a flexible device that can be attached to plastic.

An article about the technique appeared last month in the journal *Science*. Collaborators included Etienne Menard at the UI, Vitaly Podzorov and Michael Gershenson at Rutgers University, and Vikram Sundar, Jana Zaumseil, Robert Willett and Takao Someya at Bell Labs, where Rogers first began working on electronic paper before moving here.

The National Science Foundation and the U.S. Department of Energy funded the research.

The stamping process avoids the heat, chemicals, pressure and other rigors of traditional chip processing, which basically involves etching hard silicon.

That's important because the thin crystals in their raw

"You can shape them and mold them. They're lightweight. They're not fragile and brittle."

— UI Professor John Rogers

Please see TECHNOLOGY, A-8

Debate heats up over terror memo

Former Illinois governor doesn't fault president

CRAWFORD, Texas (AP) — How that it is public, a pre-Sept. 11 briefing memo on al-Qaida as President Bush and his critics giving opposing versions of whether he should have acted more aggressively to avert the terrorist attacks.

Released late Saturday under pressure, the intelligence memo from Aug. 6, 2001, showed that Bush received reports from as recent as May 2001 and that most of the current information focused on possible plots in the United States.

"I was satisfied that some of the matters were being looked into" and had any specific intelligence pointed to threats of attacks on New York and Washington, "I would have moved mountains" to prevent it, Bush said Sunday during a visit to Fort Hood, Texas, 50 miles from his ranch here.

The document has "nothing about an attack on America. It talked about intentions, about somebody who hated America — well, we knew that," he said.

A Republican member of the Sept. 11 commission backed that up today.

Former Illinois Gov. Jim Thompson told ABC's "Good Morning America" that "no reasonable American could hold the president responsible for

Related stories:

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- New hunt begun for terror suspects, bin Laden, A-7.

the attack."

"If I'm the president and I get a special briefing that I've asked for, and he asked for this, and said the FBI is conducting 70 field investigations about this, then I assume the FBI is on top of the job," Thompson said. "The president is not an FBI agent."

Commission member Jamie Gorelick, a former deputy attorney general in the Clinton administration, told NBC's "Today" show "there is a major game of finger-pointing going

on around here. Our job is to get to the bottom of it."

Sen. Evan Bayh, D-Ind., said public figures "shouldn't be scapegoating" and said he believes serious questions must be raised about whether the FBI is equipped to deal with terrorism.

Bayh said most Western governments have separate counterterrorism departments. "We don't. We need to ask ourselves, maybe the time has come to do that," he told CBS's "The Early Show."

The memo specifically told Bush that al-Qaida operatives had reached American shores, had a support system in place and were engaging in "patterns

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WEATHER



Mostly cloudy Tuesday. Chance of light rain mixed with light snow early. Chance of rain in afternoon. High in the low 50s

Memo

bombers may try to get close to American forces, Lt. Col. Brennan Byrne said.

Sanchez, the top U.S. commander in Iraq, acknowledged that a battalion of the Iraqi army refused to fight in Fallujah — a sign of Iraqi discontent with the siege.

Asked about the battalion's refusal on NBC's "Meet The Press," Sanchez said, "This one specific instance did in fact uncover some significant challenges in some of the Iraqi security force structures. ... We know that it's going to take us a while to stand up reliable forces that can accept responsibility."

Some 900 members of the Iraqi Civil Defense Corps are with three battalions of Marines. U.S. forces on Sunday examined a captured insurgent cache of suicide belts, raising concerns of a deadly new tactic in the city's fighting.

Bush held out hope for the Fallujah talks, saying the United States was "open to suggestions" on reducing the violence.

Meanwhile, a rash of kidnappings continued. Seven Chinese civilians were abducted by insurgents in central Iraq Sunday evening, China's government said. A Czech television reporter, cameraman and radio reporter were also missing and believed kidnapped, their employers said.

In the last week, militants have kidnapped more than 30 civilians from at least 12 countries.

Mohsen Abdul-Hamid, a Sunni Muslim, who is also the head of the Iraqi Islamic Party, said up to 12 foreigners taken hostage had been released, but he did not identify the nationalities of the hostages or where they were.

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of suspicious activity ... consistent with preparations for hijackings or other types of attacks."

The memo's contents are somewhat of a surprise because for two years, national security adviser Condoleezza Rice starting with a May 2002 news conference left the impression that the document focused on historical information and that any current threats mostly involved overseas targets.

Rice first outlined the then-classified memo's contents at a news conference in May 2002. The "overwhelming bulk of the evidence" before Sept. 11, she declared, was that any terrorist attack "was likely to take place overseas."

The 500-word document mentioned two current threats: suspected al-Qaida operatives might have caused federal buildings in New York and that, according to a phone call to an American embassy in the Middle East, a group of supporters of al-Qaida leader Osama bin Laden was in the United States

to plan attacks with explosives.

The FBI later concluded that two Yemeni men photographing buildings in New York were tourists.

To accentuate the potential domestic threat, the memo told Bush the FBI had 70 investigations related to bin Laden under way. Richard Ben-Veniste, a Democrat on the commission investigating the Sept. 11 attacks, saw as significant the memo's references to May 2001 intelligence about a possible al-Qaida explosives plot inside the United States.

The "leadership at the top," he said Sunday, should have "battered heads together, get them in the same room, and then pulse the agencies: 'What do you know?'" Get all of your agents out there with messages to say, "Tell us everything you know at this moment."

Should the memo — a major topic on the Sunday talk shows — have raised "more of an alarm bell than it did? I think in hindsight that's probably true," said Sen. John McCain, R-Ariz. He said the Clinton and Bush administrations bear responsi-

bility for Sept. 11.

To Sen. Bill Nelson, D-Fla., however, the memo should have created a sense of urgency.

"If you are having a brief that is entitled 'Bin Laden Determined to Strike in the U.S.," and then it lays out specific things... you would think that that would raise enough caution flags that you would haul in the FBI, that you'd put out an all-points bulletin," he said.

Slade Gorton, a Republican on the commission, said the memo "did talk about potential attacks in the United States," but "it didn't give the slightest clue as to what they would be or where they would be."

"The FBI has more questions to answer than Condoleezza Rice or (former presidential anti-terrorism adviser) Dick Clarke or anyone we've had testify before us so far," said Gorton, a former senator from Washington state.

Gorton said the reference in the memo sent to the president about 70 FBI investigations "would be sort of comforting to the person who read it the first time around."

Technology

Continued from A-1

state, before being married to rubber and plastic, are fragile and subject to contamination.

Rogers sees a variant of the process eventually being used to mass produce flexible chips by the millions on plastic rolls, like newspapers are printed on rolls of paper. He thinks the devices could become as inexpensive as ink on paper.

From the researchers' perspective, the stamping technique gives them pristine

samples to use in exploring the basic physics of the flexible transistors.

The aim is to learn how to construct the devices for improved performance. Rogers said the technology is at a point now similar to hard silicon technology 20 years ago.

"It's still in its infancy," he said.

Among other things, the researchers are exploring "mobility" in the transistors — the current they can generate

and, more importantly, how fast they can turn on and off — a central factor in the speed at which they can operate.

Rogers said the speed now, in kilohertz ranges, is fine for display purposes since it's still faster than the human eye can adjust to changing images. But uses like radio frequency tags with wireless communications capability will require much faster speeds, he said.

You can reach Greg Kilne at (217) 351-5215 or via e-mail at Kilne@news-gazette.com.

Tycoon pays record price for mansion

these horrible things that were happening, that thousands of Iraqi people would suffer from a swift exit."

Jan Pretzel, the sisters' grandmother, told the Milwaukee Journal Sentinel that by February, Michelle had an inkling her unit might soon ship out of Iraq because members were told to tell their families to stop shipping packages.

"This is a REALLY GOOD SIGN!!" she wrote in an e-mail. "The redeployment process (though it may be long) is finally beginning! There is finally a light at the end of the tunnel!"

LONDON (AP) — A British newspaper reported that an Indian steel tycoon paid \$128 million for a mansion in the British capital, breaking the world record for the most expensive house purchase.

The Sunday Times said Lakshmi Mittal, named by Forbes magazine as one of the richest people in the world, bought the 12-bedroom house in London's Kensington district from Formula One car racing boss Bernie Ecclestone.

A Mittal representative was unavailable for comment today

and a call to Ecclestone's Formula One Management company went unanswered.

The Sunday Times reported that three real estate agencies were involved in the sale. The offices of all three companies were closed for Easter Monday.

Guinness Publishing also could not be contacted for comment on the report. The Sunday Times said the sale of the property near Kensington Palace, the former home of Princess Diana, broke the record for the world's most expensive house sale. It said the previous record

was set in Hong Kong in 1997 when a property sold for \$101.6 million.

Mittal, 53, owns the LNM Group, one of the world's biggest steelmaking companies, and is based in Britain. In February, Forbes magazine ranked him 62nd in its list of the globe's richest billionaires with a fortune worth \$6.2 billion.

The Sunday Times said the property has garage space for 20 cars, Turkish baths, a ballroom, an oak-paneled picture gallery and an ornate basement pool.