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United Press International

Tiny 'nuclear batteries' unveiled

Researchers have demonstrated a penny-sized "nuclear battery" that produces energy from the decay of radioisotopes.

BBC News

As radioactive substances decay, they release charged particles that when properly harvested can create an electrical current.

Nuclear batteries have been in use for military and aerospace applications, but are typically far larger.

The **University of Missouri** team says that the batteries hold a million times as much charge as standard batteries.

They have developed it in an attempt to scale down power sources for the tiny devices that fall under the category of micro- and nano-electromechanical systems (Mems and Nems). The means to power such devices has been a subject of study as vigorous as the development of the devices themselves.

Liquid solution

Nuclear batteries are an attractive proposition for many applications because the isotopes that power them can provide a useful amount of current for phenomenally long times - up to hundreds of years or more.

As a result, they have seen use in spacecraft that are fired far off into the cosmos. But for applications here on Earth, their size has limited their use.

The Missouri team, led by Jae Wan Kwon, employed a liquid semiconductor to capture and utilise the decay particles.

Most nuclear batteries use a solid semiconductor to harvest the particles, but the particles' extremely high energies means that the semiconductors suffer damage over time. This means that to build a battery that can last as long as the isotope inside, they must be built larger.

The team's solution incorporates a liquid semiconductor, in which the particles can pass without causing damage. They are now working to further miniaturise the batteries.

And although the whole idea hinges on the use of radioactive materials, the devices are safe under normal operating conditions.

"People hear the word 'nuclear' and think of something very dangerous," Dr Jae said.

"However, nuclear power sources have already been safely powering a variety of devices, such as pacemakers, space satellites and underwater systems."

ST. LOUIS POST-DISPATCH

Spotlight shines on Missouri, Nebraska

BY VAHE GREGORIAN

OF THE POST-DISPATCH

10/19/89

COLUMBIA, MO. — Unlike playing on national television on a Saturday saturated with college football games on various networks, the spotlight on a Thursday night is singular.

And the exposure of being the only game going was irresistible for Mizzou and Nebraska, especially since each was coming off a bye week.

"(It's) like 'Monday Night Football'; that's a no-brainer," MU coach Gary Pinkel said earlier this week, adding, "It's great, not only for our football program but for the University of Missouri and the town of Columbia. It was a win-win in every way."

The game, televised by ESPN, was the first on a Thursday at Faurot Field since 17 years ago to the day against Colorado.

In similarly miserable weather, MU lost 6-0 to Colorado.

Thursday's game represented the third straight week the Tigers didn't play on Saturday. MU took up another opportunity for exclusive exposure by playing at Nevada on Friday, Sept. 25, and had the bye last week.

The Tigers resume more conventional scheduling Oct. 17 at Oklahoma State.

DARKNESS ON THE

Edge Of Campus

At approximately 6:53 p.m., just over an hour before the scheduled start of the game, the outdoor lights and main stadium scoreboard went out.

The Tigers were on the field warming up at the time, then retreated into the locker room moments later. No immediate word on whether the teams were left in the dark in the locker rooms.

Nebraska and MU skill position players took the field again before the lights came back on at about 7:06.

But the new, \$3.8 million scoreboard remained out as of game time, and the public-address and audio systems also were conked out — sadly leaving country singer Sara Evans of New Franklin, Mo., crooning the national anthem largely to herself.

"Welcome to Faurot Field," Missouri media relations director Chad Moller announced in the press box, where the internal audio remained functional.

There was no immediate explanation for the blackout, other than a message on the still-functioning south scoreboard: "We are experiencing a campus power outage. Stand by for more details."

TOUGH CROWD

Forty-five minutes before game time, only a smattering of fans were in the stands as hundreds of cars could be seen stuck in the inclement weather outside the stadium. But that changed radically before kickoff. The stadium may not have been crammed to its 71,004 capacity, but it appeared full.

Storms cause power outage at Memorial Stadium

By Missourian staff

October 8, 2009 | 10:40 p.m. CDT

COLUMBIA — Few heard Sara Evans perform the national anthem to the crowd at Memorial Stadium on Thursday night, but she sang on anyway.

With less than an hour to go before Missouri's football team took on Nebraska, the power went out around the stadium. An announcement on a scoreboard on the south end of the field attributed the problems to a campuswide power outage.

The stadium's new video scoreboard, which came with a \$3.5 million price tag, remained dark.

Although partial power was restored around 7:10 p.m., the audio and public address systems remained down well past the start of the game.

With no audio system available, Evans — a country singer from New Franklin who's also famous for a third-season appearance on "Dancing With the Stars" — knew she would be singing with no sound. According to an official with Columbia/Boone County Public Safety Joint Communications, Evans still wanted to perform anyway. The show went on.

There was little panic at the stadium. The band still played for the team's entrance on to the field, but there was no introductory video for the players before they took the field. The game started on time.

Several buildings near the stadium also lost power, including Lathrop, Laws and Jones residence halls. A security officer at the Missouri Psychiatric Center said the center lost power throughout the building, including on the patients' floors. Partial power was later restored with a generator.

University Hospital also relied on power from a generator.

MU Campus Facilities could not be reached for comment Thursday evening.

A run on ponchos

After rainy forecasts, Tiger fans flooded to Columbia retailers to grab ponchos Thursday afternoon.

By 2 p.m., few ponchos were left on the shelves, and most of those remaining were red. Tiger fans were left scrambling to find an alternative way to stay dry at the game.

All three Walmarts in Columbia sold out of ponchos. The West Broadway location ran out Wednesday.

Walgreens, MC Sports, Dick's Sporting Goods and the MU Bookstore also sold all their stock Thursday.

But ponchos were not the only pieces of rain gear running low.

"Nobody has rain boots," Cynthia Speckman said Thursday. "People were fighting over them at Shoe Carnival."

Parking problems minor

Despite fears that the parking situation would be chaotic, officers with the MU Police Department, had encountered few problems an hour after public lots opened.

"Parking's going fine," Weimer said. "It's normal."

While parking issues were minor, many tailgaters had to adapt to the weather.

In the Maryland Avenue parking garage, fans tailgated in the aisles between vehicles, grilled food and tossed footballs.

With less than an hour before kickoff, crowd control officer Lezlie McCarty patrolled the area outside the entrance gates of Memorial Stadium, informing ticket holders by megaphone to leave their umbrellas outside.

Those who did not return to their cars were allowed to leave their umbrellas outside the gates near where event staff stood checking tickets. Robbie McMorris, a member of the

event staff, estimated that three-fourths of those with umbrellas left them outside the gates; the rest took them back to their cars.

Missourian reporters Anna Moeslein, Hayley Tsukayama, Caitlyn Emmett, Han Cheung, Nikki Tekeei, Sam Wilson, Jeremy Essig and Kaylee Nelson contributed to this report.

the maneater

MSA proposes tailgating alternatives to Reactor

Two possible tailgating solutions were proposed to Scroggs.

By Megan Pearl

Published Oct. 9, 2009

Thursday marked the silent "Rally for Reactor" in which students wore neon T-shirts in support of gaining an area to tailgate.

"Wherever you were on campus today, you could see students wearing neon yellow shirts under their jackets," Student Communications Director Tim Noce said.

Noce said the campaign was successful even with the daunting weather because the school is moving toward a solution to tailgating.

"I wore the T-shirt today because I felt like Reactor was a fun place for student to get together before the game and I feel like we should have that opportunity," junior Julie Willbrand said. "I'll probably be tailgating at a friend's house tonight."

The closing of Reactor Field earlier this year eliminated 800 parking spots. Missouri Students Association President Jordan Paul and Noce worked together to develop two proposals for solutions to tailgating for discussion with the administration.

The proposals were submitted Monday.

"I've looked over them briefly, but I really haven't had a chance to read the proposals yet," Vice Chancellor of Student Affairs Cathy Scroggs said. "We have to get through the Nebraska game today and then we'll begin working with the proposals."

The proposals submitted by Paul and Noce emphasized creating a tailgating culture more closely associated with MU.

The ideas for reformed tailgating mirror the traditions of other schools, most specifically The Grove at the University of Mississippi.

The proposals cite increased safety, more closely monitored drinking and higher game attendance as benefits in making tailgating an event.

"We're getting the group of administrators and students that we have met with previously together again to go over the finer details of the proposals," Paul said. "Hopefully we will be able to schedule this meeting in the near future."

The proposal written by Noce suggests tailgating should be spread out through a few lots on campus to equate the quantity of spaces that were lost with Reactor Field.

"Students are going to find a way to tailgate and if they're not channeled to a good place, they're going to end up where people may not want them to be," Noce said. "MU can improve upon giving students a place to tailgate instead of giving them leftover parking lots."

The proposal suggests being closer together increases accountability between tailgaters.

"I think giving them a place that's nice, close to the stadium and big enough for many social circles to come together will increase the feeling of ownership, and therefore, pride in that area," Noce said.

Paul's proposal suggests a tailgating tradition like that of The Grove.

It gives a detailed outline of how The Grove tailgating functions from yearly landscaping rituals to the distribution and recollection of trash cans.

The suggested space for tailgating is the Carnahan Quadrangle because it is not regularly used by any groups and could therefore withstand use by tailgaters. It is also more accessible because of nearby parking garages.

"The Grove is one of the most successful tailgating places in the country," Paul said. "We tried to think about what the differences would be and we made adjustments within the plan. I think we have an analogous situation here."

Support among the student body has been increasing over the past weeks. There have been 2,549 signatures accumulated on the online petition and 4,271 people have joined the Facebook group supporting a solution.

"We'd like to try a sort of pilot even if we couldn't make it into a major event," Paul said. "I think we have a valuable opportunity to try something this season."



Officials downplay Forsee's link to Cerner

MU had previous company bonds.

By Janese Heavin

Thursday, October 8, 2009

University of Missouri President Gary Forsee and Cerner Corp. CEO Neal Patterson have known one another for years, but that professional relationship had nothing to do with the university's decision to outsource health information technology services, a UM administrator said.

And it's the university, not Forsee, that stands to "gain significantly from the agreement now being fleshed out by Cerner and university health system officials," UM Chief of Staff David Russell said in an e-mail.

Russell is trying to dispel theories that Forsee's ties to Patterson played a role in the formation of the Tiger Institute, a new partnership between MU Health and Cerner, a Kansas City-based health information technology provider. The institute is expected to improve electronic health records and generate new revenue for both entities.

The Tribune originally reported that Forsee and Patterson serve on at least two boards together, but Forsee does not serve on one of the boards originally referenced. They are both trustees on the Midwest Research Institute Advisory Board, according to the institute's Web site. Russell said Forsee wasn't aware that Patterson was also a trustee.

Midwest Research Institute trustees serve as a support group to offer expertise in various fields, spokeswoman Linda Cook said. That's not the same as the board of directors, which provides overall governance of the operation.

Forsee's son-in-law, Brandon Bell, has worked for Cerner for six years and sells applications to emergency rooms across the country. But, Russell said, "he is not even remotely part of the management chain at Cerner and was not involved or even aware of the exploratory talks about the Tiger Institute."

Russell said Forsee and Patterson instead knew each other because of their shared status "as residents of Kansas City who shared a commitment to community activities and as CEOs of corporations with headquarters there," referring to Forsee's previous position as CEO of Sprint.

MU Health IT workers — most of whom will become Cerner employees when the Tiger Institute contract is finalized — have been skeptical about Forsee's past at Sprint and his former business

dealings with Cerner. One employee, speaking this morning on condition of anonymity, said those rumors festered because higher-ups kept the deal secret for months.

“It’s just curious that some of the decisions didn’t involve a whole lot of people here,” he said, referring to health care administrators. “The staff, the faculty council, a ton of people were totally in the dark about the whole thing ... That gives this whole atmosphere of distrust.”

Russell stressed that the university and Cerner have worked together for years, preceding Forsee’s administration.

“It was that long-term relationship that led naturally to talk about a more ambitious relationship that could benefit our health care system on a previously unimaginable scale,” Russell said. “Forsee joined the conversation and helped bring the negotiations to a successful conclusion.”

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