

Towards a Chemical War in Syria ?

# CBRNE Newsletter Terrorism

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**Explosive News**



[www.cbrne-terrorism-newsletter.com](http://www.cbrne-terrorism-newsletter.com)

## Marines Look for New Ways to Spot Wood and Fertilizer Bombs

Source:[http://www.wired.com/dangerroom/2012/11/non-metallic-bomb-detector/?utm\\_source=feedburner&utm\\_medium=feed&utm\\_campaign=Feed%3A+WiredDangerRoom+%28Wired%3A+Blog+-+Danger+Room%29](http://www.wired.com/dangerroom/2012/11/non-metallic-bomb-detector/?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+WiredDangerRoom+%28Wired%3A+Blog+-+Danger+Room%29)



An IED attack in Iraq 2004 *Photo: Aaron Keene/Flickr*

Finding a roadside bomb was never easy, even back when insurgents made their improvised explosive devices (IEDs) from old artillery shells and other metal parts. But now that militant bomb-makers favor wood and fertilizer as the main components for their IEDs, detection has become a complete nightmare.

That's why the U.S. Marine Corps wants to build an entirely new kind of bomb detector, one that doesn't rely on spotting the metal in the IED.

As far as improvised bombs go, the U.S. military is ensnared in a counterinsurgency game of constant one-upmanship. Just as the military finds a way to better detect an improvised bomb, the enemy finds a way to outsmart them and keep the bomb hidden until it's too late.

For a while the insurgent's bomb of choice used to be radio detonated, so the military used expensive jammers to block the radio

signal and prevent the explosion. But insurgents soon moved on to bombs that responded to pressure, be it a foot or a tank, rather than radio waves – cue metal detectors. Check mate, insurgents. Well, until they decided to build metal-free bombs from wood and fertilizer.

In a recent call for design proposals, the Navy hopes that the new mine detectors will “be the material solution to the capability gap that exists in the detection of explosive devices” by locating both bombs made of metal and wood and fertilizer.

The Marines want the “low metallic signature mine detector” to be “a light-weight, man-portable, handheld detection system that is capable of detecting traditional, low metallic and non-metallic mines and explosive devices.”

They also want the detector to expose IEDs whether they're buried



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in sand, clay or river rock – and it should be able to function at temperatures between -25 and +120 degrees Fahrenheit with a continuous performance time of 16.5 hours “without degradation of system performance.” The handheld detector will weigh in at less than 9 pounds, about the same as a small bowling ball and it will need to have an “instant-on button” with a “start-up time of less than 90 seconds.”

The new detector should be able to identify improvised non-metallic devices, such as the wood-fertilizer bomb, at a minimum detection probability of 85 percent and a maximum false alarm rate of ten percent. In other words, it doesn’t have to be perfect — just an improvement over today’s maddening status quo.

**Secret New Sensors Sniff For Afghanistan’s Fertilizer Bombs**

Source:<http://www.wired.com/dangerroom/2010/08/armys-secret-new-sensors-sniffing-out-afghanistans-fertilizer-bombs/>

Improvised explosive devices, the signature



enemy weapon of the wars in Iraq and Afghanistan, aren’t just a lethal threat here. They’re also near-impossible to spot with traditional means. The U.S. military is launching a new experimental program, known as Project Ursus, to sniff them out.

Earlier this year, the Pentagon’s top anti-IED organization, known as JIEDDO, acknowledged that insurgents in Afghanistan weren’t using the same kinds of materials to make bombs as insurgents did in Iraq. Specifically, they’re using fertilizers to concoct an explosive charge, much like Oklahoma City bomber Timothy McVeigh did. JIEDDO’s leader, Lieutenant General Michael Oates, told bloggers on a March conference call that the Afghan IED threat “centered around two types of fertilizer: potassium chloride and ammonium nitrate.”

Afghan President Hamid Karzai banned the substances in February. But the fertilizer bombs have continued. And the metal-detection efforts the military employed to find bombs built around old ordnance shells and other metals in Iraq wouldn’t work. “We still

have a technological challenge for detection [for] these low-metallic/non-metallic bombs,” Oates admitted.

Project Ursus is an answer to Oates’ challenge.

In a kind of ironic symmetry, Project Ursus is operated by Task Force ODIN, the secretive bomber-targeting team that became famous for fighting IED networks in Iraq. But much as the IED threat has evolved — from Iraq to Afghanistan; from metals to fertilizers — so has ODIN. The task force is now geared around getting ground commanders robust tactical intelligence and going after insurgent IED networks, typically leaving the hunt for the bombs themselves to a different Afghanistan-based task force, known as Paladin. But ODIN’s leaders, Lieutenant Colonel Kevin Diermeier and his executive officer, Major Jason Periatt, are making an exception. Diermeier and Periatt would only discuss Project Ursus in the vaguest of terms. But Ursus is aimed at finding what Diermeier and Periatt were allowed to call “generic homemade explosive observables.” To cut through the bureaucratise, Ursus is a surveillance program housed in a pod on the bottom of a piloted commercial King Air twin-engine turboprop plane (the MC-12 is one such modified aircraft) that hunts down the chemical signatures of fertilizers used in Afghanistan’s IEDs.

It’s an experimental program, barely out of the first month of a six-month trial run, so ODIN-Afghanistan’s leaders says it’s too soon to tell how successful it is. But so far, Ursus hasn’t accidentally



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confused any latrines or farms with bomb factories.

“Project Ursus is one of my few platforms specifically tied into Task Force Paladin’s mission set,” Diermeier says. “Initial indications are that it’s proving its value on the battlefield.” He all but apologizes for not being able to say more, promising that the Ursus is powered by “cool stuff I’d love to tell you about.”

It’s unfortunate — if not unexpected — that operational security restrictions prevent

Diermeier from discussing how Ursus works. But ultimately, he won’t need to talk about Ursus. He’ll need to show how it can curb the escalating pace of IED assaults in Afghanistan — a threat that’s risen from 300 incidents a month in December 2008, when ODIN arrived in Afghanistan, to 1,128 in May 2010 (although most of those incidents didn’t kill anyone). Ursus could be a tool to get homemade bombs under control.



## Improving the sensitivity of airport security screening



Source: <http://www.homelandsecuritynewswire.com/dr20121115-improving-the-sensitivity-of-airport-security-screening>

Scientists are reporting a simple way to improve the sensitivity of the test often used to detect traces of explosives on the hands, carry-ons, and other possessions of passengers at airport security screening stations. Their report appears in the American Chemical Society's *Journal of Physical Chemistry C*.

An American Chemical Society release reports that Yehuda Zeiri and colleagues explain that most tests for traces of explosives begin by rubbing a swab made from glass fiber, Teflon, or cotton over the suspect material. Analysis of the swab in a detector — usually a device called an ion mobility spectrometer — alerts agents to any explosive residues on the swab material.

Common explosives like TNT are solids with very low vapor pressure at room temperature,

so the best way to detect them is to search for particulate traces that rub off on clothing and luggage. To help security agencies prevent attacks more successfully, the researchers studied how explosive particles adhere to surfaces and how they could improve swabs to pick up even smaller amounts of explosives.

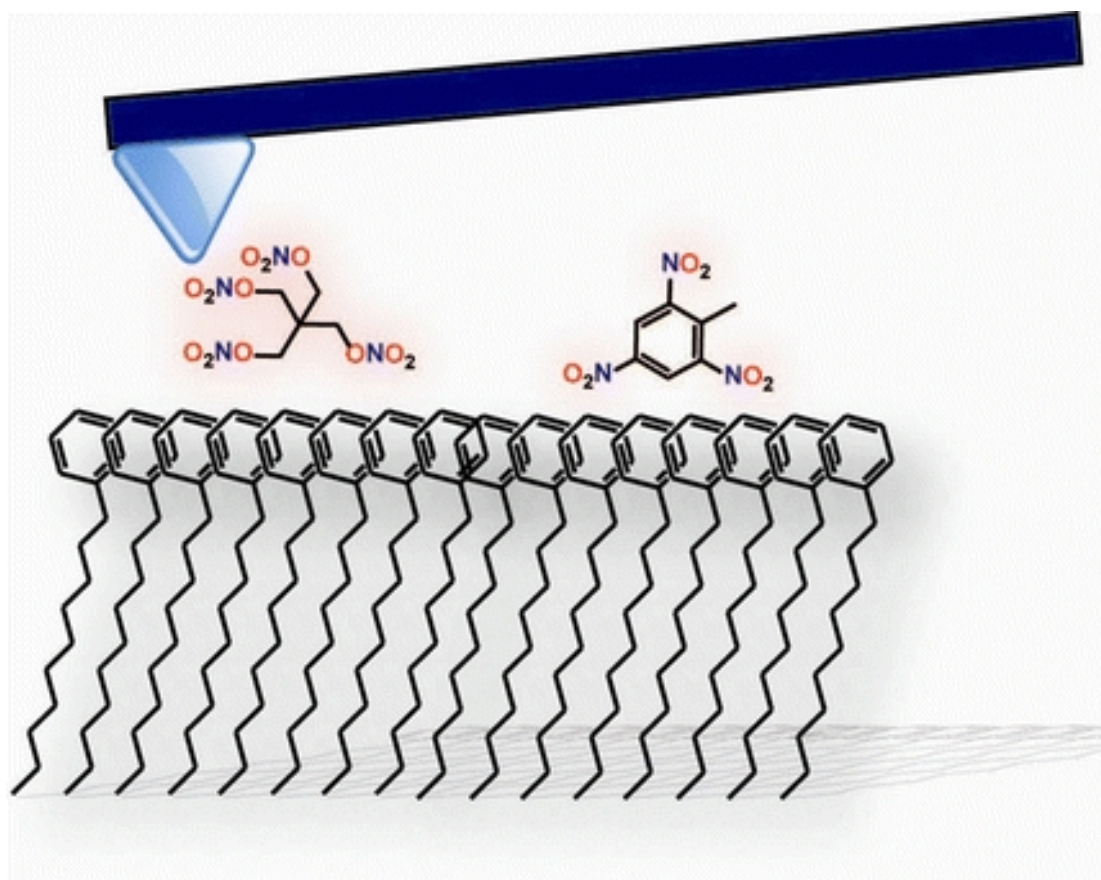
Using an atomic force microscope to measure the adhesive forces between explosive particles and different self-assembled monolayers, the scientists concluded that swab fabrics could be improved to collect smaller amounts of explosives by peppering them with hydroxyl, phenyl and amine functional groups. They believe that such additions could enhance the binding between the swab and irregularly shaped explosive particles.

— Read more in Yevgeny Zakon et al. "Adhesion of Standard Explosive Particles to Model Surfaces," *Journal of Physical Chemistry C* 116, no. 43 (8 October 2012): 22815–22



**ABSTRACT**

The adhesion of explosive particles to substrates with tailored chemical nature was analyzed by atomic force microscopy (AFM). Four different explosives were studied: TNT, RDX, HMX, and PETN. Two types of measurements were performed: in the first, a self-assembled monolayer (SAM) with different



end groups was deposited on the tip and used to measure adhesion forces to an explosive particle surface. In the second type of experiment, the explosive particle was glued to the cantilever, and its adhesion force to a SAM-covered gold-plated glass substrate was measured. All experiments were performed both in ambient air and under water. The study shows that -OH and -C<sub>6</sub>H<sub>5</sub> end groups lead to increased adhesion. In addition, we found that capillary forces have significantly contributed to the adhesion of explosive particles.

**Homemade Explosives Detection Kit – An Urgent Response to the Warfighter**

Source: <http://news.cbrnresourcenetwork.com/newsDetail.cfm?id=115>

With terrorist attacks occurring regularly across the globe, the need for an easy-to-use, lightweight and reliable homemade explosives (HME) detector is critical. ECBC has leveraged proven colorimetric technology and engaged an advanced rapid prototyping process to engineer, from the ground up, a purpose-designed prototype for screening HME

precursors with the needs of the end-user in mind: the U.S. Army Infantry Squad Soldier. The ECBC-developed Squad HME Screening/Cueing Kit is a field prototype based upon proven colorimetric chemistry designed to screen for certain materials that are commonly used to make HME across the current theaters of operation. The kit is small, lightweight and doesn't require a power source. Chemical reagents stored within the



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device produce color changes in reaction with four select HME precursors: two fuels and two oxidizers. Materials that include both a fuel and an oxidizer could possibly be explosives. The capability to determine if either or both are present in a single sample with one quick test allows the warfighter to take action immediately.

The kit is a rapid development response to an urgent need expressed by user representatives at ECBC and the U.S. Army’s Maneuver Support Center of Excellence and Maneuver Support Battle Lab (MSBL) in Fort Leonard Wood, Mo.

The ECBC prototype empowers Infantry Squads and similar organizations with a self-contained capability to screen unknown materials to determine if they are legitimate agricultural or industrial products, or prohibited chemical precursors suitable for fabrication of HME.

“The Army needs this capability,” said Mike Cress, ECBC technical representative to the MSBL. “And to meet their need, ECBC has

created a very lightweight product—less than one percent of soldier load—that is very easy to use, needing not more than a few minutes of training, is multi-functional and is reasonably inexpensive.”

The first-generation model of the kit was successfully evaluated in a Military Utility Assessment conducted by the MSBL in June 2011. The lab concluded that the kit enabled soldiers to rapidly screen HME precursors, in samples presented to them as randomized blind trials, with accuracy and confidence after minimal training.

Once the kit is fully tested and fielded, it will not only be available to the warfighter but to first responders who—due to budget, storage and time constraints—will also benefit from the device’s affordability, small size and usability.

With the ever-present threat of terrorism, “this kit is built with one intention, which is to save lives,” shared James Genovese, chief of ECBC’s Innovative Development Engineering Acquisition Team.

**Editor’s Note:** The CBRN Resource Network would like to thank Don Kennedy, ECBC Public Affairs Officer, for providing permission to use this article.

**Aminat Kurbanova, Female Suicide Bomber, Kills Influential Russian Muslim Leader Said Afandi**

Source: [http://www.huffingtonpost.com/2012/08/29/aminat-kurbanova-said-afandi\\_n\\_1839601.html](http://www.huffingtonpost.com/2012/08/29/aminat-kurbanova-said-afandi_n_1839601.html)

Russian police on Wednesday identified the female suicide bomber who killed an influential

radical Islamists and moderate Muslims in the volatile Caucasus region.



Said Afandi, 74, the powerful leader of a Sufi Muslim brotherhood in Russia’s unstable province of Dagestan, was killed Tuesday along with six other people, including an 11-year-old boy, in the central village of Chirkei by the bomber, who approached his house disguised as a pilgrim. Afandi’s tens of thousands of followers included influential officials, clerics and businessmen.

Muslim leader in a terrorist attack that could worsen a longstanding confrontation between

that the bomber was Aminat Kurbanova, a 30-year-old resident of



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Dagestan's capital, Makhachkala. The Interfax news agency claimed she was an ethnic Russian woman who had converted to Islam



© Photo ITAR-TASS/ITAR-TASS Photo/Corbis

after marrying an Islamist militant. Afandi's killing follows a string of attacks on moderate Muslim leaders in the Caucasus who have publicly denounced the spread of radical Islamic groups known as Salafis whose followers advocate an independent state, or emirate, that would include Caucasus and parts of southern Russia that contain a significant Muslim population. Afandi had recently initiated peace talks between Sufis and Salafis. Dagestan, a multiethnic and predominantly Muslim province of nearly 3 million people on the oil-rich Caspian Sea, is a focal point of the Islamic insurgency in the Caucasus, and shootings, bombings and police operations against rebels occur there almost daily. Human rights groups accuse security forces and police of fueling the insurgency through extrajudicial killings, abductions and other abuses. The mystical Muslim orders of Sufis have for centuries been popular in Dagestan and neighboring Caucasus provinces, and their leaders and adherents survived decades of Communist persecution. The Sufi brotherhoods are fiercely opposed to radical and militant Salafis that have mushroomed across the

region. The Sufis often pray over the tombs of revered saints, and Salafi puritans condemn worshipping over graves as idolatry.

Tens of thousands of people attended Afandi's funeral Tuesday, and thousands more flocked to his grave Wednesday to pray as Dagestan's secular authorities declared a day of mourning.

The killing of the white-bearded cleric, who appeared in public wearing a traditional hat made of astrakhan lamb fur, could lead to more violence in Dagestan and the Caucasus, experts say.

"These are attempts to abort peacekeeping efforts in the region and to escalate the situation in southern Russia," Ruslan Gereyev of the Center of Islamic Studies in

Dagestan's provincial capital, Makhachkala, told the Kavkazsky Uzel online publication.

If the killing goes unpunished, the authority of Afandi's influential followers will be questioned, said Alexei Malashenko of the Carnegie



Moscow center. "If the main figure is killed and his followers are silent, this will lead to a major reappraisal of values" in Dagestan, he told The Associated Press.

Female suicide bombers are often called "black widows" in Russia because many of them are the wives, or other relatives, of militants who have been killed by security forces. Some women are driven more by personal revenge for slain relatives than by promises of martyrdom and reward in the afterlife, while others are sent on such attacks against their will, experts say.





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In April 2010, two women from Dagestan blew themselves up on Moscow's subway system, killing 40 people and wounding 121 during a morning rush hour.

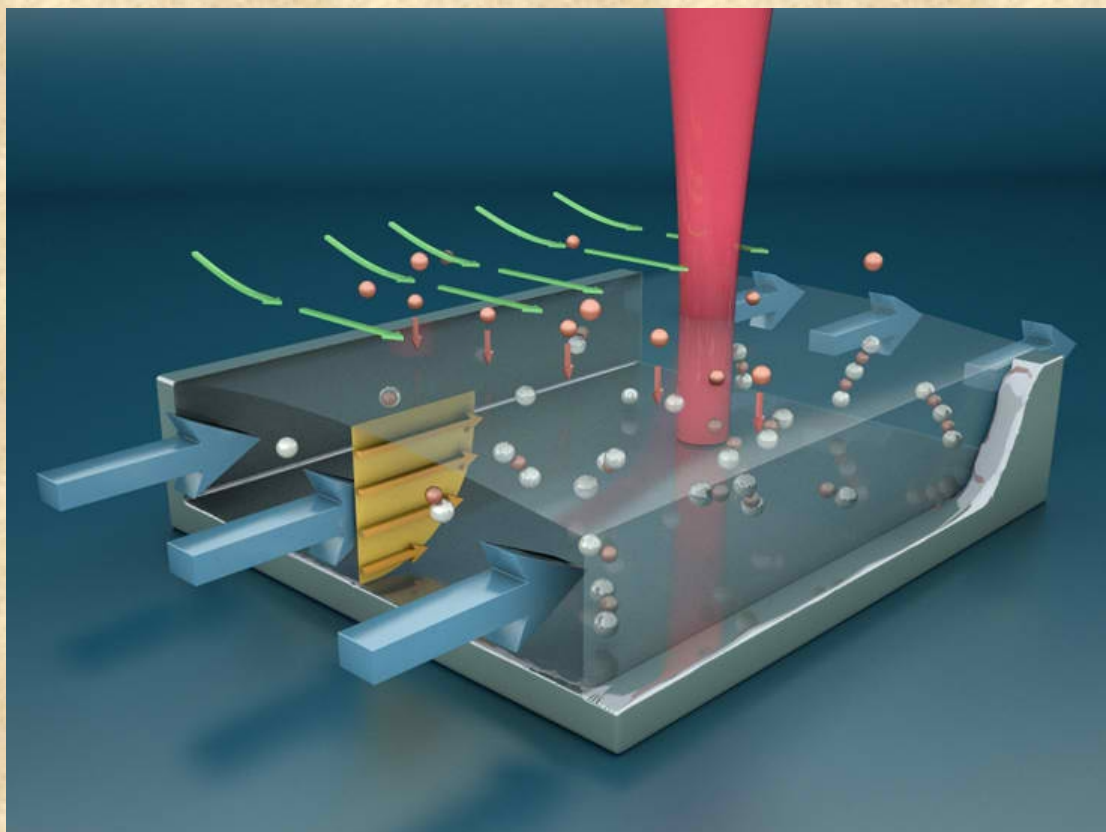
At least two dozen female suicide bombers have carried out terrorist attacks on security officers and civilians in Russian cities and

aboard trains and planes in the country since 2000.

Dagestan's provincial leader, Magomedsalam Magomedov, said Wednesday that civilian paramilitary squads should be created to prevent and repel attacks by radical Islamists.

### Nanotech Device Mimics Dog's Nose to Detect Explosives

Source: <http://engineering.ucsb.edu/news/673>



Concept illustration of the microscale free-surface microfluidic channel as it concentrates vapor molecules that bind to nanoparticles inside a chamber. A laser beam detects the nanoparticles, which amplify a spectral signature of the detected molecules.

Portable, accurate, and highly sensitive devices that sniff out vapors from explosives and other substances could become as commonplace as smoke detectors in public places, thanks to researchers at University of California, Santa Barbara.

Researchers at UCSB, led by professors Carl Meinhart of mechanical engineering and Martin Moskovits of chemistry, have designed a detector that uses microfluidic nanotechnology to mimic the biological mechanism behind canine scent receptors. The device is both highly sensitive to trace amounts of certain vapor molecules, and able to tell a specific substance apart from similar molecules.

"Dogs are still the gold standard for scent detection of explosives. But like a person, a dog can have a good day or a bad day, get tired or distracted," said Meinhart. "We have developed a device with the same or better sensitivity as a dog's nose that feeds into a computer to report exactly what kind of molecule it's detecting." The key to their technology, explained Meinhart, is in the merging of principles from mechanical engineering and chemistry in a collaboration made possible by UCSB's Institute for Collaborative Biotechnologies.

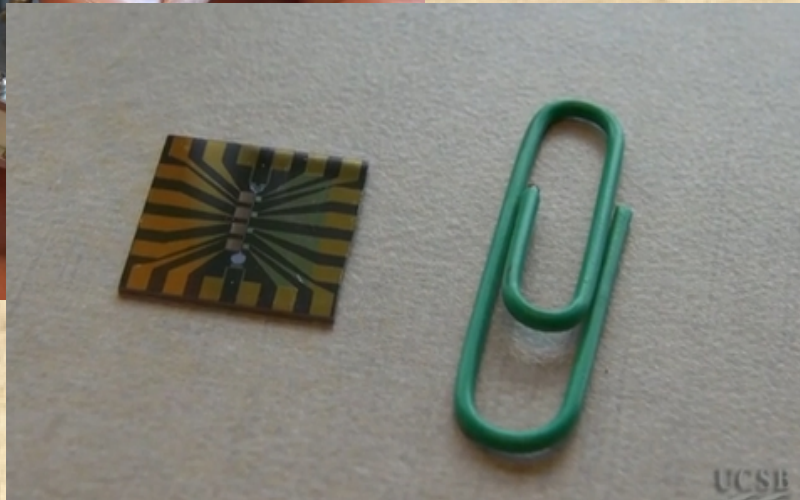


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Results published this month in *Analytical Chemistry* show that their device can detect airborne molecules of a chemical called 2,4-dinitrotoluene, the primary vapor emanating from TNT-based explosives. The human nose cannot detect such minute amounts of a substance, but “sniffer” dogs have long been used to track these types of molecules. Their technology is inspired by the biological design

concentrates the molecules by up to six orders of magnitude. Once the vapor molecules are absorbed into the microchannel, they interact with nanoparticles that amplify their spectral signature when excited by laser light. A computer database of spectral signatures identifies what kind of molecule has been captured.

“The device consists of two parts,” explained Moskovits. “There’s a microchannel, which is like a tiny river that we use to trap the molecules and present



and microscale size of the canine olfactory mucus layer, which absorbs and then concentrates airborne molecules.

“The device is capable of real-time detection and identification of certain types of molecules at concentrations of 1 ppb or below. Its specificity and sensitivity are unparalleled,” said Dr. Brian Piorek, former mechanical engineering doctoral student in Meinhart’s laboratory and Chief Scientist at Santa Barbara-based SpectraFluidics, Inc . The technology has been patented and exclusively licensed to SpectraFluidics, a company that Piorek co-founded in 2008 with private investors.

“Our research project not only brings different disciplines together to develop something new, but it also creates jobs for the local community and hopefully benefits society in general,” commented Meinhart.

Packaged on a fingerprint-sized silicon microchip and fabricated at UCSB’s state-of-the-art cleanroom facility, the underlying technology combines free-surface microfluidics and surface-enhanced Raman spectroscopy (SERS) to capture and identify molecules. A microscale channel of liquid absorbs and

them to the other part, a mini spectrometer powered by a laser that detects them. These microchannels are twenty times smaller than the thickness of a human hair.”

“The technology could be used to detect a very wide variety of molecules,” said Meinhart. “The applications could extend to certain disease diagnosis or narcotics detection, to name a few.”

Moskovits added, “The paper we published focused on explosives, but it doesn’t have to be explosives. It could detect molecules from someone’s breath that may indicate disease, for example, or food that has spoiled.”

The fundamental research was developed through an interdisciplinary collaboration between Professors Meinhart and Moskovits, and carried out by former doctoral researchers Dr. Piorek and Dr. Seung-Joon Lee. Their project was funded in part by UCSB’s Institute for Collaborative Biotechnologies through the Army Research Office and DARPA.



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### New sensor detects undetonated bombs on sea floor

Source: <http://www.homelandsecuritynewswire.com/dr20121126-new-sensor-detects-undetonated-bombs-on-sea-floor>

Scientists at the Commonwealth Scientific and Industrial Research Organization (CSIRO) have developed a sensor to detect undetonated explosives on the sea floor. It is based on technology used to find mineral deposits underground.

The sensor was developed as part of a project

which affect underwater magnetic fields," Leslie said.

"In mineral exploration, near surface deposits are being exhausted, leading our search for minerals deeper underground, where targets are more difficult to detect with traditional surface and airborne measurements."



with U.S. government agency, the Strategic Environmental Research and Development Program (SERDP) and U.S.-based research organization Sky Research.

A CSIRO release quotes CSIRO electrical engineer Dr. Keith Leslie to say that the method for finding undetonated underwater explosives is very similar to that used to detect underground mineral deposits.

"Our highly sensitive sensor — the high temperature superconducting tensor gradiometer — delivers significantly more information about the target's magnetic field than conventional sensors used for this type of detection," he said.

"It provides data on the location, characterization and magnetic qualities of a target — whether it is a gold deposit or an explosive."

More than ten million acres of coastal waters are contaminated by undetonated explosives, according to SERDP. Typically these small explosives rust and corrode at sea, making them even more dangerous.

"The marine environment is difficult to sample due to electrical currents produced by waves,

The CSIRO sensor can provide valuable geological information that discriminates between prospective and non-prospective areas or targets. It avoids unnecessary drilling and minimizes the risk of overlooking valuable mineral deposits.

"Our sensor has a critical advantage for small targets such as undetonated explosives, where only one or two measurements may be near the target," Leslie said.

"In mineral exploration, a string of measurements of the gradients of the magnetic field down a drill hole can determine the direction to the target."

Eventually the technology may renew exploration efforts at abandoned sites where drilling programs were based on insufficient or inaccurate information. It also has the potential to help clear landmines.

The sensor has been proved in a stationary laboratory environment. Trials have been conducted to prove it in motion, in preparation for anticipated underwater trials.



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### Stopping a Would-Be Terrorist

#### Who was One Chemical Away from Building a Bomb

Source: <http://www.fbi.gov/news/stories/2012/december/would-be-terrorist-was-one-chemical-away-from-building-bomb/would-be-terrorist-was-one-chemical-away-from-building-bomb>

The 20-year-old Saudi Arabian man living in Lubbock, Texas was intent on waging jihad against Americans—possibly even a former U.S. president—and he was one ingredient away from being able to build a powerful bomb.

But Khalid Ali-M Aldawsari's deadly plans began to unravel **when a shipping company's suspicions were raised**—illustrating once again how the FBI relies on private industry and the general public in the fight against terror.

In early February 2011, a Lubbock shipping firm received a package from a North Carolina chemical company containing 10 bottles of phenol intended for Aldawsari. Combined with just two other chemicals, phenol can be used to make a potent explosive. Delivering such poisonous chemicals to an individual's home is not common, so the shipping company contacted the North Carolina firm. Both decided that the phenol should not be delivered and that local law enforcement should be alerted. A Lubbock Police Department officer was called to the scene.

"That officer and his supervisor—because of their relationship with the FBI (see sidebar)—decided that this was something we needed to know about," said Special Agent Frazier Thompson, who works in our Dallas Division. "Our initial focus was to identify Aldawsari to see if he had a legitimate reason for purchasing phenol."

In a matter of days, members of our North Texas Joint Terrorism Task Force learned that although Aldawsari had once been a chemical engineering student at Texas Tech, he was no longer enrolled there and had no affiliation with the university.

"He was trying to pass himself off as a Texas Tech student doing research on cleaning products," said Special Agent Mike Orndorff, who worked the investigation. "Those credentials, if legitimate, would have allowed him to buy the phenol."

Most alarming was that Aldawsari had already purchased the two other chemicals needed to make his bomb, along with test tubes, beakers, and protective gear. Through covert operations, investigators learned he had disassembled clocks and cell phones and stripped the wires off Christmas lights in apparent attempts to fashion timers and initiating devices.

#### Setting Tripwires

**The FBI depends on private industry and the general public to help fight terrorism. Weapons of mass destruction coordinators in each of the 56 FBI field offices, along with other agents, regularly meet with representatives from industry and academic institutions, public health officials, local law enforcement, and first responders to raise awareness about threats to our national security.**

**These efforts are known as setting tripwires, and the intent is to establish an early-warning network where those closest to an emerging situation—such as the Lubbock shipping company in the Aldawsari case—are aware of potential risks and are prepared to inform the FBI when suspicions are raised.**

**"If not for those established tripwires and the liaison with the local police department—and them making the right decision to notify the FBI—I shudder to think what might have happened in the Aldawsari case," said Special Agent Frazier Thompson. "If Aldawsari was able to get the phenol, there is no doubt in my mind he would have manufactured a very potent explosive device."**

**Thompson added, "Establishing and maintaining tripwires is critical to our national security, and the cooperation we received across the board on the Aldawsari case proved it."**





Evidence of Aldawsari’s attempts to fashion timers and initiating devices.

“His apartment bedroom was basically a storage room where he kept his chemicals and equipment,” Thompson said. “He was sleeping in the living room on the couch or the floor.”



Surveillance image of Khalid Ali-M Aldawsari.

The investigation revealed troubling things about Aldawsari, who had come to the U.S. legally in 2008 on a student visa. “Based on evidence from the Internet and his journal entries,” Thompson said, “Aldawsari was radicalized before he ever came to the U.S. It appears he



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started planning this attack when he was a teenager and sought a scholarship to study specifically in America.”

By this point, surveillance teams were monitoring Aldawsari around the clock. “He was searching online for large targets such as dams and electrical plants,” Thompson said. He also searched for ways to conceal explosives in baby dolls and carriages and even sought the Texas address of former President George W. Bush.

On February 23, 2011, after agents were certain that Aldawsari was working alone, he was arrested and charged with attempted use of a weapon of mass destruction. In November, after being convicted by a jury, he was sentenced to life in prison.

“Aldawsari wanted to take out a lot of people,” Thompson said. “It scares me to think what might have happened if we hadn’t stopped him.”

**Company illegally stores 6 million pounds of explosives, neighboring town evacuated**

Source: <http://www.homelandsecuritynewswire.com/dr20121204-company-illegally-stores-6-million-pounds-of-explosives-neighboring-town-evacuated>

The 800 residents of the town of Doyline, located about 270 miles northwest of New Orleans, were hastily evacuated Friday, and may be forced to stay away until today

Fox News reports that boxes of propellant pellets were piled and packed in unauthorized buildings at Explo Systems Inc., and some were spilling. Edmonson said that the



(Tuesday), after the authorities found more the six million pounds of explosives illegally stored on the grounds of Camp Minden, which used to house the Louisiana Army Ammunitions Plant. Col. Mike Edmonson, state police superintendent said that boxes and small barrels of the M6 artillery propellant were found both outdoors and crammed into unauthorized buildings.

company’s “careless and reckless disregard made it unsafe for their own employees, for schoolchildren in Doyline, for the town of Doyline.”

Explo is located on a portion of the closed ammunition plant’s 15,000 acres, which is leased for commercial use. Capt. Doug Cain, a state police spokesman, identified the product as



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M6 propellant, used in howitzers and other artillery. Yahoo reports that the pellets are compressed nitrocellulose, also known as guncotton.

Police had estimated the total at one million tons after an investigator looking into a 15 October explosion at Explo Systems saw cardboard boxes on long rows of pallets behind a building.

When crews returned to the site on Saturday to begin and remove the boxes to bunkers located two miles away on the site, they noticed more boxes stored in sheds and warehouses.

“It wasn’t in their storage magazines. They had it hidden on the property, away from the storage magazines where

we would expect to find it,” Cain said.

Edmonson said, “It was stuffed in corners. It was stacked all over.”

He told Fox News that in two days, crews have moved just under a million pounds from the tightest-packed buildings into approved containers and onto twenty-seven tractor-trailers to move to storage bunkers. Another 250,000 pounds has been moved a safe distance from the bulk of the material.

Edmonson said that there is no need to remove every last pound of explosives into bunkers before the residents of the city could go back to their homes. The important thing is to divide the propellant into amounts which would not threaten the town if some ignites, with each area a safe distance from the others.



Location of Doyline in Louisiana



Location of Louisiana in the United States



**Doyline residents get OK to return home**

Posted: Dec 08, 2012 2:56 AM Updated: Dec 08, 2012 2:56 AM

Source: <http://www.ksla.com/story/20292406/doyline-residents-get-ok-to-return-home>

Doyline residents got the all clear from authorities this afternoon, and the roads into town were reopened.

Now, residents just want to forget about what's happened during the past several days.

KSLA News 12 visited with residents on Friday, and many of them were sitting back and enjoying some prep basketball at Doyline High School. The occasion marks the first time that people in the community have come together since the evacuation.

"It's good to be back home, be back in Doyline where ... our kids being back together," one Doyline resident said before the game.

A KSLA reporter witnessed residents hugging each other, cheering, sharing and enjoying the good mood.

Officials have halted clean-up for the weekend and plan to resume on Monday. But they say that residents are safe because the propellant has been secured and packed in different groups.

**A new tool supports humanitarian demining**

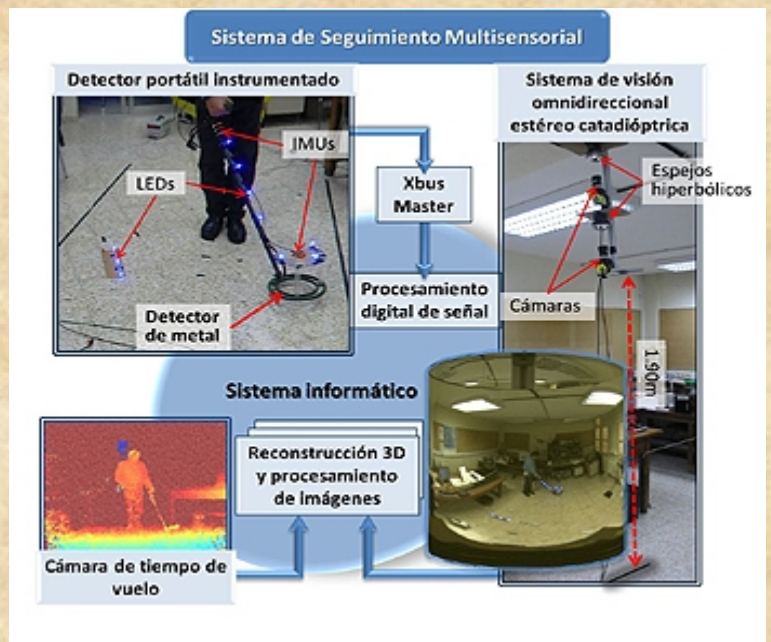
Source: <http://www.homelandsecuritynewswire.com/dr20121212-a-new-tool-supports-humanitarian-demining>

Researchers at the Center for Automation and Robotics, a joint center of the Universidad Politecnica de Madrid and the Spanish National Research Council (UPM-CSIC), have developed a training tool to improve the use of hand-held detectors in humanitarian demining and to increase user security.

The proposed tool opens a wide range of possibilities, particularly to improve the current training techniques used in this field. In the first place, this tool has allowed researchers to study expert operators in order to quantify certain indicators that can be used later as reference values during training sessions. Secondly, it enables experts to assess new operators by providing relevant information to improve the skill of the tool during training sessions.

A Centro de Automática y Robótica release reports that landmines and other abandoned

active during decades threatening humans in the



explosive ordnance are part of sad legacy of many conflicts. These devices can remain

affected areas and depriving them of their lands and resources.

Today, a huge part of these tasks of humanitarian demining are still conducted by using hand-held detectors, particularly, metal detectors, though other detectors are being introduced gradually. They are based on new technologies such as nuclear resonance, geo-raders and explosive chemical detectors.





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Although the design of new sensors can contribute to reduce the time needed to detect a landmine, it does not mean that it increases operator safety responsible for the demining tasks because a mere mistake can cost them their lives. For this reason, training is an essential aspect when we refer to enhance security and efficiency of demining tasks.

The research carried out by the Centre for Automation and Robotics CSIC-UPM, within the European Project of the Seventh

used with any type of hand-held detector and can be used to acquire information in two different scenarios.

Firstly, the tool can be used to study abilities of experts in different environments and with different types of hand-held detectors. From the information compiled we can extract, asses and quantify some critical variables for the performance, so that they can be used later as reference values during trainings and courses. Amongst these variables we can highlight the



Framework Program, TIRAMISU (Toolbox Implementation for Removal of Anti-personnel Mineles, Submunitions and UXO) have resulted in a monitoring tool capable of analyzing the performance of operators of portable detectors of landmines.

The tool consists of a human-machine interface and a sensory tracking system of monitoring for hand-held detectors based on inertial measurement units, a system of catadioptric stereo omnidirectional vision and a flight time chamber. This tool can be easily adapted to be

advance distance detector, the sweep velocity, the scan height and the inclination of the hand-held detector head with respect to the ground.

Secondly, this tool can be used to assess the efficiency of operators in information process, feeding back the information in real time to enhance their skills during training sessions.

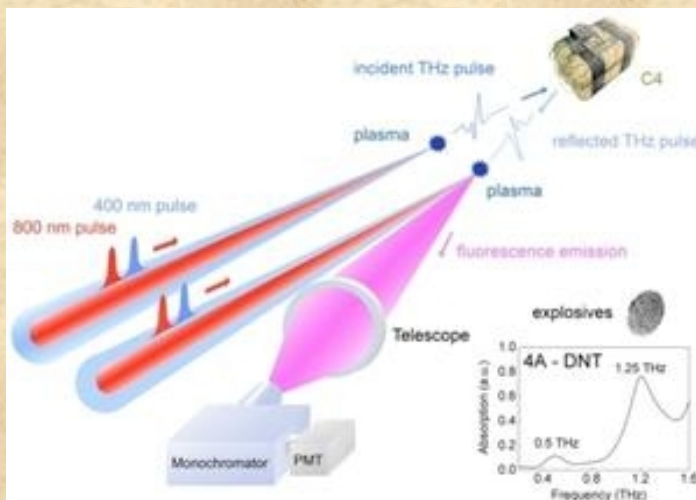
Accordingly, the proposed tool will allow researchers to develop and to implement new training methodologies based on scientific analysis of problems and the educational evaluation.

— Read more in Roemi Fernandez et al., “Design of a training tool for improving the use of hand-held detectors in humanitarian demining,” *Industrial Robot-An International Journal* 39, no. 5 (2012): 450-63

► **TIRAMISU Website:** <http://fp7-tiramisu.eu/>

**Terahertz waves for explosives detection**

Source: <http://www.homelandsecuritynewswire.com/dr20121211-terahertz-waves-for-explosives-detection>



Schematic of explosives detection using terahertz-band waves // Source: uobabylon.edu.iq

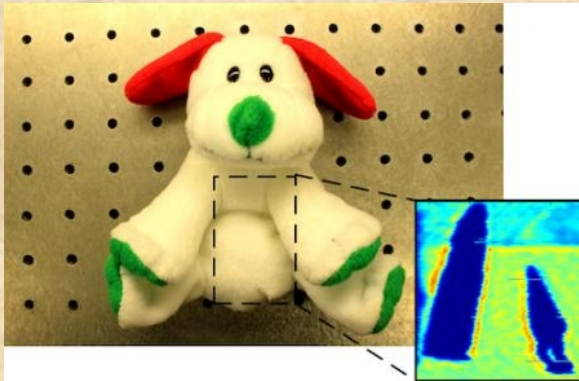
A secret agent is racing against time. He knows a bomb is nearby. He rounds a corner, spots a pile of suspicious boxes in the alleyway, and pulls out his cell phone. As he scans it over the packages, their contents appear onscreen. In the nick of time, his handy smartphone application reveals an explosive device, and the agent



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saves the day.

Is this science fiction? In fact, it is a real possibility, thanks to tiny inexpensive silicon microchips developed by a pair of electrical engineers at the California Institute of Technology (Caltech). The chips generate and radiate high-frequency electromagnetic waves, called terahertz (THz) waves, which fall into a



largely untapped region of the electromagnetic spectrum — between microwaves and far-infrared radiation — and which can penetrate a host of materials without the ionizing damage of X-rays.

A Cal Tech release reports that when incorporated into handheld devices, the new microchips could enable a broad range of applications in fields ranging from homeland security to wireless communications to health care, and even touchless gaming. In the future, the technology may lead to noninvasive cancer diagnosis, among other applications.

“Using the same low-cost, integrated-circuit technology that’s used to make the microchips found in our cell phones and notepads today, we have made a silicon chip that can operate at nearly 300 times their speed,” says Ali Hajimiri, the Thomas G. Myers Professor of Electrical Engineering at Caltech. “These chips will enable a new generation of extremely versatile sensors.”

Hajimiri and postdoctoral scholar Kaushik Sengupta (Ph.D. ‘12) describe the work in the December issue of *IEEE Journal of Solid-State Circuits*.

Researchers have long touted the potential of the terahertz frequency range, from 0.3 to 3 THz, for scanning and imaging. Such electromagnetic waves can easily penetrate packaging materials and render image details in high resolution, and can also detect the chemical fingerprints of pharmaceutical drugs, biological weapons, or illegal drugs or explosives. Most existing terahertz systems,

however, involve bulky and expensive laser setups that sometimes require exceptionally low temperatures. The potential of terahertz imaging and scanning has gone untapped because of the lack of compact, low-cost technology that can operate in the frequency range.

The release notes that finally to realize the promise of terahertz waves, Hajimiri and Sengupta used complementary metal-oxide semiconductor, or CMOS, technology, which is commonly used to make the microchips in everyday electronic devices, to design silicon chips with fully integrated functionalities and that operate at terahertz frequencies — but fit on a fingertip.

“This extraordinary level of creativity, which has enabled imaging in the terahertz frequency range, is very much in line with Caltech’s long tradition of innovation in the area of CMOS



technology,” says Ares Rosakis, chair of Caltech’s Division of Engineering and Applied Science. “Caltech engineers, like Ali Hajimiri, truly work in an interdisciplinary way to push the boundaries of what is possible.”

The new chips boast signals more than a thousand times stronger than existing approaches, and emanate terahertz signals that can be dynamically programmed to point in a specified direction, making them the world’s first integrated terahertz scanning arrays.

Using the scanner, the researchers can reveal a razor blade hidden within a piece of plastic, for example, or determine the fat content of chicken tissue. “We are not just talking about a potential. We have actually demonstrated that this works,” says Hajimiri. “The first time we saw the actual images, it took our breath away.”

Hajimiri and Sengupta had to overcome multiple hurdles to



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translate CMOS technology into workable terahertz chips — including the fact that silicon chips are simply not designed to operate at terahertz frequencies. In fact, every transistor has a frequency, known as the cut-off frequency, above which it fails to amplify a signal — and no standard transistors can amplify signals in the terahertz range.

To work around the cut-off-frequency problem, the researchers harnessed the collective strength of many transistors operating in unison. If multiple elements are operated at the right times at the right frequencies, their power can be combined, boosting the strength of the collective signal.

“We came up with a way of operating transistors above their cut-off frequencies,” explains Sengupta. “We are about 40 or 50 percent above the cut-off frequencies, and yet we are able to generate a lot of power and detect it because of our novel methodologies.”

“Traditionally, people have tried to make these technologies work at very high frequencies, with large elements producing the power. Think of these as elephants,” says Hajimiri. “Nowadays we can make a very large number

of transistors that individually are not very powerful, but when combined and working in unison, can do a lot more. If these elements are synchronized — like an army of ants — they can do everything that the elephant does and then some.”

The researchers also figured out how to radiate, or transmit, the terahertz signal once it has been produced. At such high frequencies, a wire cannot be used, and traditional antennas at the microchip scale are inefficient. What they came up with instead was a way to turn the whole silicon chip into an antenna. Again, they went with a distributed approach, incorporating many small metal segments onto the chip that can all be operated at a certain time and strength to radiate the signal en masse.

“We had to take a step back and ask, ‘Can we do this in a different way?’” says Sengupta. “Our chips are an example of the kind of innovations that can be unearthed if we blur the partitions between traditional ways of thinking about integrated circuits, electromagnetics, antennae, and the applied sciences. It is a holistic solution.”

IBM helped with chip fabrication for this work.

— Read more in Kaushik Sengupta and Ali Hajimiri, “A 0.28 THz Power-Generation and Beam-Steering Array in CMOS Based on Distributed Active Radiators,” *IEEE Journal of Solid-State Circuits* (December 2012)



Asymmetric innovation in war zones – Gaza, Operation Cast Lead (2008)



**Terrorism threat: Cellular services suspended in Karachi for a day**

Source: <http://tribune.com.pk/story/485826/terrorism-threat-cellular-services-suspended-in-karachi/>

Cellular services were suspended by Pakistan Telecommunication Authority (PTA) in Karachi on Friday from 11am-6pm in light of terrorism threats, *Express News* reported.

According to an intelligence report, a major act of terrorism was suspected in Karachi, which was expected to be carried out through a cell phone.

Network operators were informed at 9am of the suspension.

Later during the day, Interior Minister Rehman Malik chaired a meeting to review the security situation in the country. During the meeting, Malik said that no target killing took place in Karachi on Friday due to the mobile service suspension.

He said that those who want to disturb the peace in Karachi cannot succeed in their nefarious designs.

Suspending cellular services in light of terrorism threats on important days like Eid and Ashura has become a norm, however service suspension on such days comes with prior notice



"Honestly Roger! You join the bomb squad and suddenly *everything's* a suspicious package"

