Defense Systems
NEWS DIGEST

15 AUGUST 2017 - THE LATEST IN DEFENSE SYSTEM NEWS

Weaponized AI and the "Terminator Conundrum"

Earlier this month, Russian weapons manufacturer Kalashnikov Group revealed it has developed combat robots that are fully automated and use artificial intelligence (AI) to identify targets and make independent decisions. The question of removing human oversight from automated military operation has been debated for some time. Known inside the Pentagon as the "Terminator conundrum"…

Advanced Materials

Discovery May Offer New Energy Source

U.S. Army Research Laboratory researchers discovered that water splits apart spontaneously when coming into contact with their unique nano-galvanic aluminum-based powder. The hydrolysis is very fast –one kilogram of powder can produce 220 kilowatts of energy in just three minutes. That's the fastest rate known without using catalysts such as an acid, base, or high temperatures…

Scientists Develop Molecular Code for Melanin-Like Materials

Melanin—pigments that give color to skin, hair and eyes—has numerous useful qualities, including providing protection from UV radiation and free radicals, electronic conductance, adhesiveness and energy storage. Scientists have developed an approach to control specific…

Autonomous Systems

Army Releases Counter-Unmanned Aircraft Systems (c-UAS) Training Document

The Army has been sounding alarm bells about the threat from small, commercial drones, and recently outlined in greater detail exactly what forces might be up against. The document, “Army Techniques Publication (ATP) 3-01.81 Counter-Unmanned Aircraft System Techniques,” goes into depth regarding the planning considerations for defending against low, slow, small (LSS) unmanned…

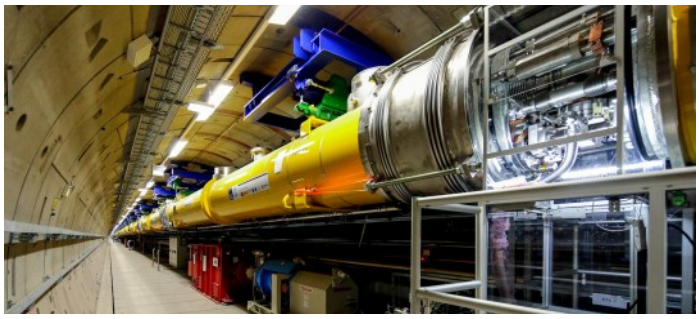
Test Site for Autonomous Vehicles Opens

Norway's Trondheim Fjord will be the world's first technological playground for pilotless vehicles that move below, on and above the water's surface. Snake robots, underwater drones, unmanned ships and flying drones are craft you will soon be able to see on Trondheim Fjord, Norway's third-longest fjord located in the west-central part of the country. The area is being established as a test lab for autonomous technology – which could replace the crews on ships, among many other…

Directed Energy

Israeli ADA System Protects Avionics from GPS Jamming

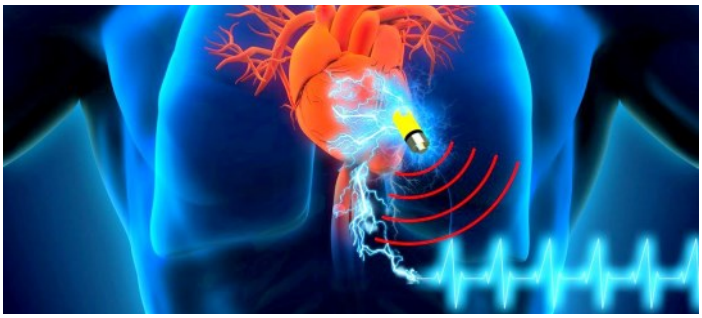
Israel Aerospace Industries (IAI) has unveiled ADA — an advanced system that protects avionic systems from GPS jamming. ADA has already been integrated into several systems and platforms operating both in Israel and abroad. The system recently won a tender from Israel’s Ministry of Defense for integration into one of the main platforms of the Israel Air Force. ADA was developed…



Biggest X-Ray Laser in the World Generates its First Laser Light

The European XFEL, the biggest X-ray laser in the world, has reached the last major milestone before the official opening in September. The 3.4 km long facility, mostly located in underground tunnels, has generated its first X-ray laser light. It can now begin to direct X-ray flashes through the last tunnel section into the experiment hall, and then start commissioning of the experiment…

Energetics



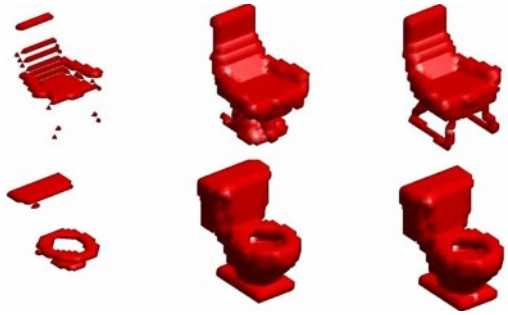
Flexible Ultrathin Graphene–Protein Supercapacitor Draws Energy from Human Body

Researchers from UCLA and the University of Connecticut have designed a new biofriendly energy storage system called a biological supercapacitor, which operates using charged particles, or ions, from fluids in the human body. The supercapacitors could be combined with nanogenerators or other implantable energy harvesting devices to provide endless power for lifelong implantable…

NASA's Longshot Bet on Revolutionary Plasma-Based Rockets May Pay Off

The Ad Astra VASMIR rocket engine starts with a neutral gas feedstock, in this case, argon. The first stage of the rocket ionizes the argon to produce a "cold" plasma. The plasma is then injected into the second stage, the booster, where it is subjected to ion cyclotron resonance heating. Essentially, the booster uses radio frequency energy to excite the ions, which resonate and gain energy…

Military Sensing



Helping Robots Learn to See in 3-D

Autonomous robots can inspect nuclear power plants, clean up oil spills in the ocean, accompany fighter planes into combat and explore the surface of Mars. Yet for all their talents, robots still can't make a cup of tea. That's because tasks such as turning the stove on, fetching the kettle and finding the milk and sugar require perceptual abilities that, for most machines, are still a fantasy. Among them is the ability to make sense of 3-D objects. While it's relatively straightforward for robots to "see"…

Manned and Unmanned Submarine Teaming for Anti-Submarine Warfare

The U.S. military is asking defense contractors to develop bistatic sonar for anti-submarine warfare (ASW) that teams manned and unmanned submarines to capitalizes on the benefits of active sonar without compromising the stealth of U.S. attack submarines. The project seeks to use unmanned underwater vehicles (UUVs) as pingers and manned fast attack submarines as listeners to…

Non-Lethal Weapons

Air Force Studying Feasibility of Combat Aircraft EMP Weapons

High-power electromagnetics (HPEM) experts at the Raytheon Co. will help the U.S. Air Force determine the feasibility of using electronics-killing electromagnetic pulse (EMP) weapons aboard combat aircraft under terms of a $15 million contract announced on Tuesday. An HPEM weapon, in theory, would emit a short EMP burst that would damage or destroy targeted electronic systems…

Less-Lethal: Making Impact

The pressure on American law enforcement agencies to field tools that can subdue dangerous armed and unarmed individuals without using deadly force has never been greater than today. The answer according to many experts is less-lethal weapons that can be fired from a distance and effect subjects with blunt force or chemical irritant or both. These tools are not new but the philosophy about using them, when to use them, and which officer should have them is changing…

RMQSI

Building Readiness: Romanian Base Gets an Overhaul to Strengthen NATO Forces

Some major improvements are underway at the Joint National Training Center in Romania that are designed to ultimately strengthen capability across NATO forces, and it's being made possible largely by U.S. funding through the European Reassurance Initiative (ERI). The ERI's purpose is to improve training capabilities and capacity throughout Eastern Europe for the U.S. and our allies…

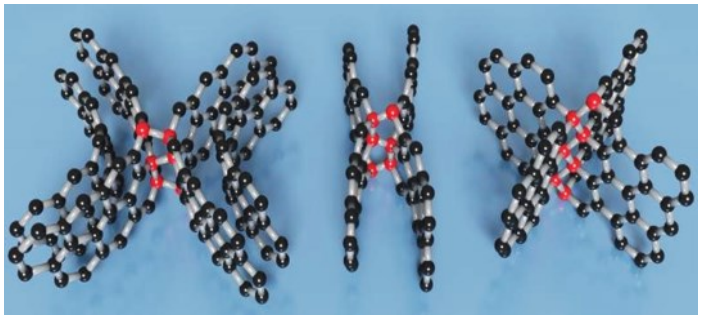
A More Sustainable Way to Refine Metals

A team of chemists in Canada have developed a way to process metals without using toxic solvents and reagents. The system, which also consumes far less energy than conventional techniques, could shrink the environmental impact of producing metals from raw materials or from post-consumer electronics. The approach uses organic molecules, instead of chlorine and hydrochloric acid, to help purify germanium –experiments have shown the same technique can be used with other metals…

Survivability & Vulnerability

Army Shows off Its Lightest Combat Helmet Ever

Army equipment officials said Thursday that the service's newest combat helmet will feel significantly lighter to soldiers while providing the same protection. The Advanced Combat Helmet Gen II will replace the legacy Advanced Combat Helmet, which was fielded about 15 years ago. The service earlier this month awarded Revision Military, based in Essex Junction in Vermont, a contract worth…



New Form of Carbon That's Hard as a Rock, yet Elastic, like Rubber

Carnegie scientists have developed a form of ultra strong, lightweight carbon that is also elastic and electrically conductive. A material with such properties could serve a wide variety of applications from aerospace engineering to military armor. To create the new strong and elastic carbon, scientists pressurized and heated a structurally disordered form of carbon called glassy carbon…

Weapon Systems

General Atomics Continues Testing of Railgun System

An advanced electromagnetic railgun (EMRG) cannon prototype developed by General Atomics for the Navy is preparing for testing, according to the company. The 10-megajoule medium-range multi-mission railgun system, one of two prototypes in development for the service, has completed final assembly and factory acceptance test, General Atomics Electromagnetic Systems (GA-EMS)…

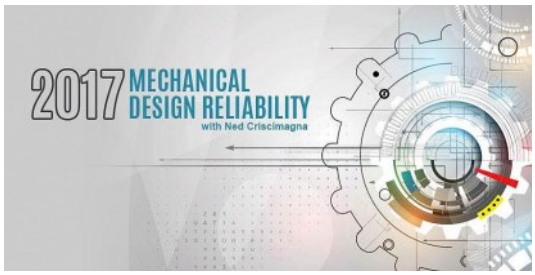
Interceptor Test May Push Missile Defense Forward

The Missile Defense Agency scored a success May 30 when the ground-based mid-course defense system's kill vehicle directly collided with its intended target. As the first major demonstration of the system in more than three years, and the first to be declared a success since 2008, experts interviewed now say the agency appears on course to meet its acquisition targets for interceptors...

Announcements & Events

ATEDS 2017

The 23rd Advanced Technology Electronic Defense Systems Conference, hosted by NAVSYSCOM PMA272, provides an annual forum between the warfighter, program management and field activities, military research labs, intelligence community, T&E activities, other services and industry to explore use of the EM environment to improve aircraft survivability.
DATE: August 29-30, 2017



2017 Mechanical Design Reliability Course

Presents a practical application of fundamental mechanical engineering to system and component reliability. Designed for the practitioner, the course covers the theories of mechanical reliability and demonstrates the supporting mathematical theory. For the beginner, the essential tools of reliability analysis are presented and demonstrated.
DATE: October 3-5, 2017

IARPA MORGOTH'S CROWN Challenge

The IARPA Challenge, Modeling of Reflectance Given Only Transmission of High-concentration Spectra for Chemical Recognition Over Widely-varying Environments (MORGOTH'S CROWN), invites participants to develop algorithms to predict changes in a chemical's infrared (IR) spectrum caused by changes in its molecular environment.
DATE: July-September 2017

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