

# Defense Systems

## NEWS DIGEST

28 FEBRUARY 2017 - THE LATEST IN DEFENSE SYSTEM NEWS



## Demystifying the A2/AD Buzz

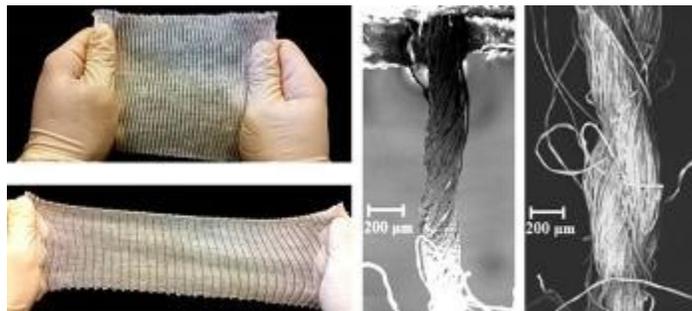
Anti-access and area denial — best known by its shorthand A2/AD — has crossed the buzzword threshold. It's a quite impressive feat for such a distinctively non-user friendly and technical concept, which alludes to that family of military capabilities used to prevent or constrain the deployment of opposing forces into a given theater of operations and reduce their freedom of maneuver once in...

## Advanced Materials



### Cyber Forged – Advanced Computer Tech Speeds Materials Development

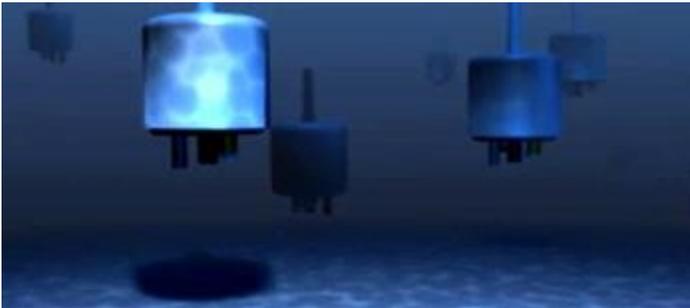
Materials — natural substances altered by humans to meet specific needs — are critical to technology. Today's advanced materials make possible rocket engines, smartphones, medical machines, anti-pollution devices, and much more. Traditionally, materials have been developed slowly, by trial and error. Today, 21st century...



### Knitting and Weaving Artificial Muscles

A need exists for artificial muscles that are silent, soft, and compliant, with performance characteristics similar to those of skeletal muscle, enabling natural interaction of assistive devices with humans. By combining one of humankind's oldest technologies, textile processing, with electroactive polymers, we demonstrate here the feasibility of wearable, soft artificial muscles made by weaving...

## Autonomous Systems



### Miniature Autonomous Underwater Explorers Mimic Ocean Life

Underwater robots developed by researchers at Scripps Institution of Oceanography at the University of California San Diego offer scientists an extraordinary new tool to study ocean currents and the tiny creatures they transport. Swarms of these underwater robots helped answer some basic questions about the most abundant life forms in the ocean—plankton. Scripps research...



### Microsoft AirSim: Open Source System Trains Drones to Move Safely on their Own

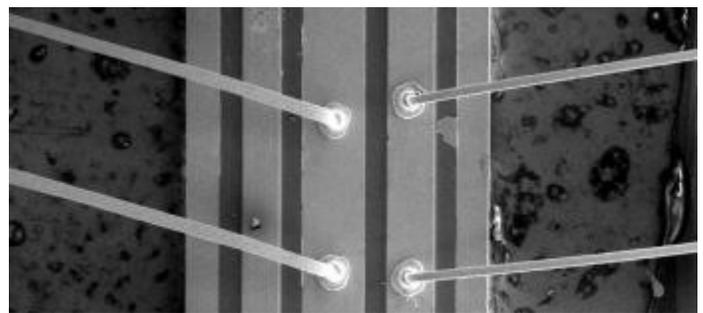
The ability to differentiate and anticipate comes easily to humans but it's still very difficult for artificial intelligence-based systems. That's one big reason why self-driving cars or autonomous delivery drones are still emerging technologies. Microsoft researchers are aiming to change that. They are working on a new set of tools that other researchers and developers can use to train and test...

## Directed Energy



### New Amplifier Could Double Capacity of Fiber-Optic Cables

By designing a new fiber optic cable that suppresses lasing at the traditional 1,064 nm and 920 nm wavelengths, Lawrence Livermore National Laboratory researchers discovered they could achieve significant positive optical gain in the 1,390 nm to 1,460 nm region. Additionally, the new fiber generated laser power and optical gain with relatively good efficiency. This discovery...



### Researchers Set Record for Terahertz Quantum Cascade Laser Continuous Power

Researchers have nearly doubled the continuous output power of a type of laser, called a terahertz quantum cascade laser, with potential applications in medical imaging, airport security and more. Increasing the continuous output power of these lasers is an important step toward increasing the range of practical applications. Terahertz radiation sits between microwaves and infrared light on...

## Energetics



### Deployable Waste-to-Energy Conversion

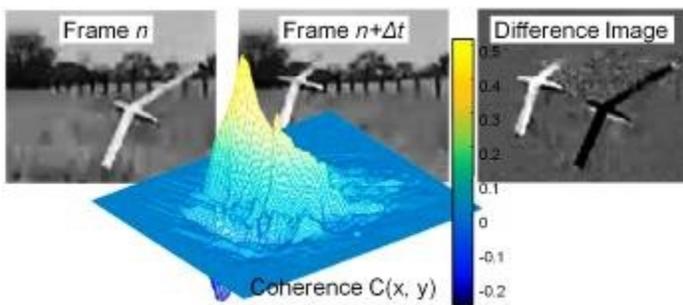
In cooperation with the Army Research Lab (ARL) and Air Force Civil Engineer Center (AFCEC), Eco Waste Solutions (EWS), demonstrated a Deployable Waste-to-Energy Conversion (DWECC) system at Tyndall Air Force Base, Florida, on January 12, 2017. The event provided Government and industry personnel a first-hand demonstration of simple and effective destruction of waste as well as the production of hot water. The DWECC evolved from systems EWS currently produces for military and...



### NASA Spacecraft to Test 'Green' Propellant Passes Major Preflight Milestone

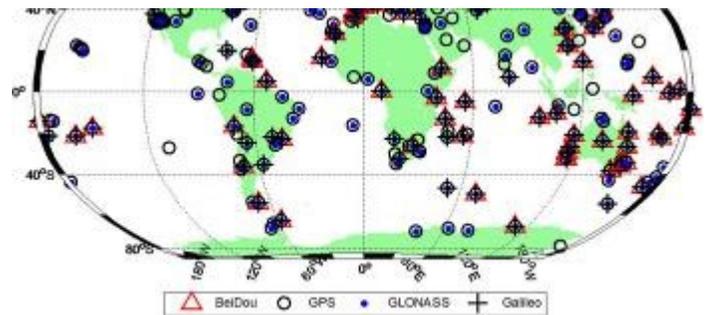
Like all rocket engines, the small thrusters that a spacecraft or satellite fires to maintain or change positions need fuel. Currently, many use hydrazine - a toxic and corrosive fuel that requires special handling and equipment. NASA's Green Propellant Infusion Mission (GPIM) recently took another major step toward demonstrating the capabilities of a new propellant that is safer to...

## Military Sensing



### Detection of UAVs Using a Low-Cost Visible Camera System

Unmanned aerial vehicles (UAVs) flown by adversaries are an emerging asymmetric threat to homeland security and the military. To help address this threat, we developed and tested a computationally efficient UAV detection algorithm consisting of horizon finding, motion feature extraction, blob analysis, and coherence analysis. We compare the performance of this algorithm against...



### Global Ionospheric Modeling Using Multi-GNSS: BeiDou, Galileo, GLONASS and GPS

The emergence of China's Beidou, Europe's Galileo and Russia's GLONASS satellites has multiplied the number of ionospheric piercing points (IPP) offered by GPS alone. This provides great opportunities for deriving precise global ionospheric maps (GIMs) with high resolution to improve positioning accuracy and ionospheric monitoring capabilities. In this paper, the GIM is developed...

## Non-Lethal Weapons



### IAI Unveils Multichannel Controlled Reception Pattern Antenna GPS Anti-Jam Solution

Israel Aerospace Industries (IAI) is introducing an export-approved system to defend against GPS jamming. Called ADA after the special adaptive antennas developed by the firm's MALAM division, the system is operational in Israel. Measuring about 20 cm by 20 cm, the laptop computer-sized system is based on the firm's multichannel Controlled Reception Pattern Antenna (CRPA)...



### French Air Force Training Eagles for Counter-Unmanned Aerial Vehicle Ops

In its fight to prevent future terrorist attacks on its soil, France has found an unlikely ally: the royal eagle. The French Air Force is currently training birds of prey to take down remote-controlled objects following reports that ISIS recruits are weaponizing consumer markets drones to carry out attacks against enemy fighters. The air force first acquired four royal eagles eggs last spring and...

## RMQSI



### The Three Dimensions of Interoperability for Multinational Training at the JMRC

Setting the theater requires sustainment formations that are prepared to receive, stage, onward move, and sustain divisions and corps of expeditionary forces and our allies. Sustainment formations must build and maintain reflexive competency to execute mission essential warfighting tasks in a high tempo, full-spectrum environment where interoperability is key. As sustainment units operate in a...



### Army Needs Highly Flexible, Responsive Internet of Things for the Battlefield

The Internet of Things is coming to the military in a big way, probably sooner than most think, according to the Army's John Pellegrino. To make sure that tomorrow's warfighters have all of the tools they need to take advantage of IoT, the Department of Defense and armed services branches will need highly flexible and responsive networks that can deal with limited bandwidth, he said...

## Survivability & Vulnerability



### ECBC Working to Weave Chemical Agent Protection into Army Combat Uniform

The U.S. armed services have long wished chemical warfare agent protective material could be inherently incorporated in everyday clothing, scarves, and even tents. Existing protective materials rely on carbon filtration, which only traps rather than reacts with the bonds of chemical agents, so they quickly reach saturation and can leach chemical agent out later. Also, they require a...



### Everfly APSARA Drone: Delivers Medicine, Supplies, then Decomposes

When most people hear the word “drone” they either think of uncrewed military aircraft or those multi-rotor mini-copters that could one day deliver packages to your doorstep. But what if the package is the plane? That’s the idea behind the Aerial Platform Supporting Autonomous Resupply Actions (APSARA) drone, a cardboard glider that carries about two pounds of cargo. “It looks like a pizza box that’s been shaped into a wing,” says Star Simpson, an engineer at San Francisco robotics...

## Weapon Systems



### Army Picks Sig Sauer's P320 Handgun to Replace M9 Service Pistol

The U.S. Army on Thursday awarded Sig Sauer a contract worth \$580 million to make the next service pistol based on the company's P320 handgun. Sig Sauer beat out Glock Inc., FN America and Beretta USA, the maker of the current M9 9mm service pistol, in the competition for the Modular Handgun System, or MHS, program. “We are both humbled and proud that the P320 was...



### Lethal Miniature Aerial Munition System Program to Improve Loitering Munitions

Small drones are lethal battlefield weapons. Soldiers can launch them from behind cover, then locate, identify, and engage a target several miles away without ever exposing themselves to the enemy. The grenade-sized warhead can destroy a light vehicle, and because it can attack from any direction – including a vertical dive – a drone negates most cover. So armies want them. And...

## Announcements & Events



### 2017 Aircraft Survivability Short Course

An overview of the aircraft combat survivability discipline for those working in fields such as survivability modeling and simulation, ballistic and vulnerability testing, susceptibility and vulnerability reduction, and systems engineering. The course will also benefit personnel working program management and acquisition of DoD aircraft.

DATE: April 4-6, 2017



### TARDEC Industry Days

Hear the latest information about U.S. Army Tank Automotive Research, Development and Engineering Center's 30-Year Strategy and the research and development initiatives taking place at the Detroit Arsenal. TARDEC business group leaders highlight their key projects to present actionable information and engage their industry counterparts in two-way dialogue.

Date: April 25-26, 2017



### WCX 17

WCX17 is a full-sensory event experience that immerses you in the forefront of the automotive and mobility industries. The event emphasizes active learning and increased collaboration through interaction and dynamic new event elements. In a setting of education and relationship building, these elements foster knowledge-sharing and review of the evolving industry.

DATE: April 4-6, 2017

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