



WELCOME TO THE OCTOBER/NOVEMBER 2013 EDITION of the M&S Newsletter. This issue presents articles ranging from predicting the intensity of hurricanes to training for nuclear disasters. Additional articles feature an atomic clock simulation, the transformed DoD modeling and simulation (M&S) catalog, and two newly approved standards. This edition also includes a list of upcoming events within the M&S Community. Please note that the complete or original articles are available through the links provided.

We hope the October/November 2013 M&S Newsletter provides valuable insight into the world of M&S and we welcome your comments.

—M&S Newsletter Staff

Eighth Army Trains for Task Force Mission During Ulchi Freedom Guardian

Photo Credit: U.S. Army file photo



Eighth Army continued its transformation to a combined and joint task force headquarters during exercise Ulchi Freedom Guardian 2013.

EIGHTH ARMY CONTINUED ITS TRANSFORMATION to a combined joint task force headquarters during exercise Ulchi Freedom Guardian, held Aug. 19-30.

Operating out of its mobile command post named after first Republic of Korea Army four-star general, Gen. Paik Sun-yup, the U.S. Army's top operational

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Eighth Army Trains for Task Force Mission During Ulchi Freedom Guardian

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command in Korea trained for its new mission as an operational-level headquarters capable of commanding combined and joint corps-level formations.

“[Ulchi Freedom Guardian] is a great opportunity to train with allies and ensure we are ready to deter aggression or fight and win if deterrence ever fails,” said Eighth Army Commander Lt. Gen. Bernard S. Champoux. “This exercise enables us to leverage the full might of our combined defense team.”

Champoux said Ulchi Freedom Guardian, or UFG, is designed to bolster the readiness and interoperability of the Republic of Korea-United States Alliance.

In addition to American and South Korean forces, seven United Nations Sending States were scheduled to participate in the exercise, including Australia, Canada, Denmark, France, New Zealand, Norway and the United Kingdom.

Ulchi Freedom Guardian is one of the largest computer simulation exercises in the world, involving units and personnel from bases in the United States and across the Pacific region.

The command-and-control exercise incorporated the lessons learned from the U.S. military’s operations in Iraq and Afghanistan during the past decade and from previous exercises on the Korean Peninsula.

This article originally appeared on the U.S. Army website. For complete article, [click here](#).

Navy Scientists Predict Killer Hurricanes

WHEN THE TV WEATHERMAN predicts sunshine and it rains, people get wet. When meteorologists are wrong about a hurricane, people can die. While forecasters are now able to predict where a hurricane will land, they have not been able to reliably determine how strong a storm will be.

However, Navy researchers say they have developed a computer model that can predict the intensity of hurricanes up to five days out. The Coupled Ocean/Atmosphere Mesoscale Prediction System-Tropical Cyclone, or COAMPS-TC, is now being used by the Navy’s Fleet Numerical Meteorology and Oceanography Center as well as the National Oceanic and Atmospheric Administration. It was developed by the Naval Research Laboratory (NRL), Office of Naval Research (ONR) and several universities.

Civilians will benefit from better storm intensity forecasts, but so will the Navy, which has a weather gap in the Pacific that COAMPS-TC can help fill.

“Unlike the Atlantic Ocean, there are no operational tropical cyclone reconnaissance flights in the Western Pacific

basin, an area of strategic importance for the U.S. Navy,” said Simon Chang, a scientist with the Naval Research Laboratory.

COAMPS-TC, conceived in 2006, is a mesoscale model, which means it is designed for regional weather phenomena of 5 to 1,000 kilometers in length—such as hurricanes. It is a supplement to the basic COAMPS model, which has been around for about 15 years but could only predict a storm’s track. What has been missing is basic data needed to model the intensity of hurricanes (and cyclones and typhoons, which are the same thing).

“Historically, measurements at very high wind speeds near the ocean surface were almost nonexistent, because it’s such a harsh environment,” said Ronald Ferek, ONR’s program officer for COAMPS-TC. Without data of high-wind-speed conditions, meteorologists had to extrapolate from low-wind-speed models.

This article originally appeared on the Training and Simulation Journal website. For complete article, [click here](#).





JILA Researchers Discover Atomic Clock Can Simulate Quantum Magnetism

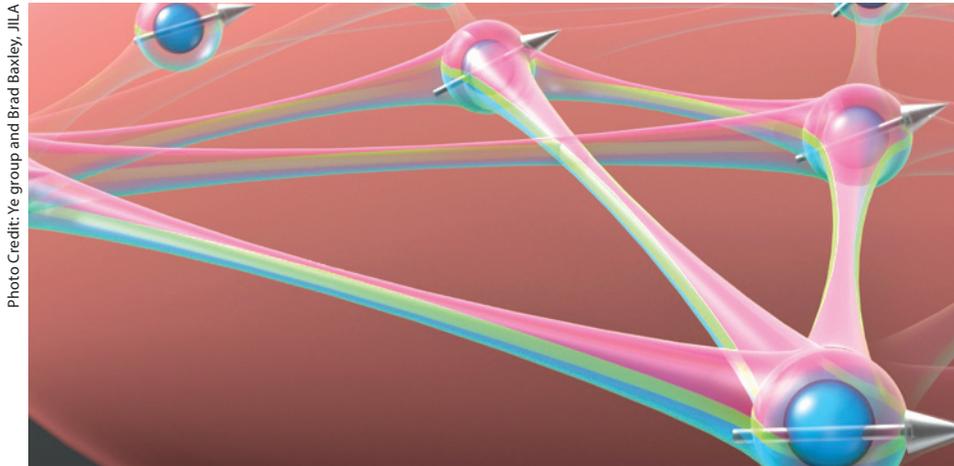


Photo Credit: Ye group and Brad Baxley, JILA

Artist's conception of interactions among atoms in JILA's strontium atomic clock during a quantum simulation experiment. The atoms appear to all interact (indicated by the connections), leading to correlations among the atoms' spins (indicated by arrows), according to patterns JILA scientists found in collective spin measurements. The interacting atoms might be harnessed to simulate other quantum systems such as magnetic materials.

JILA IS ONE OF THE LEADING PHYSICAL SCIENCE RESEARCH institutes in the United States.

Researchers at JILA, formerly known as the Joint Institute for Laboratory Astrophysics, have for the first time used an atomic clock as a quantum simulator, mimicking the behavior of a different, more complex quantum system.

Atomic clocks now join a growing list of physical systems that can be used for modeling and perhaps eventually explaining the quantum mechanical behavior of exotic materials such as high-temperature superconductors, which conduct electricity without resistance. All but the smallest, most trivial quantum systems are too complicated to simulate on classical computers, hence the interest in quantum simulators. Sharing some of the features of experimental quantum computers—a hot research topic—quantum simulators are “special purpose” devices designed to provide insight into specific challenging problems.

JILA is operated jointly by the National Institute of Standards and Technology (NIST) and the University of Colorado-Boulder (CU-Boulder).

As described in the Aug. 9 issue of Science, the JILA experiment was performed with an atomic clock made of

about 2,000 neutral strontium atoms trapped in intersecting laser beams. The researchers were surprised to discover that, under certain conditions, the clock atoms interact like atoms in magnetic materials.

“This was completely unexpected,” says JILA/NIST Fellow Jun Ye, an adjunct professor of physics at CU-Boulder. “We were not looking for this at all, we were just naively trying to understand the particle interactions as part of our effort to further improve the clock. We were pleasantly surprised to find we can now use a clock as a powerful quantum apparatus to study magnetic spin interactions.”

The strontium clock atoms are arranged like a stack of 100 pancakes, each containing about 20 atoms. Normally the atoms react individually to red laser pulses, switching between two energy levels. But researchers discovered the atoms also can interact with each other, first in pairs and eventually all together. Until now researchers were trying to eliminate these interactions, which are undesirable in atomic clocks but they can turn into a powerful feature for a quantum simulator.

This article originally appeared on the CU-Boulder website. For complete article, [click here](#).



“Vibrant Response” Trains Troops for Nuclear Disaster

Photo Credit: Staff Sgt. Tomora Clark, 13th Public Affairs Detachment



Soldiers with the 53rd Civil Support Team, Indiana National Guard, Joint Force Headquarters Ind., check their radio equipment before a route reconnaissance mission, Aug. 12, 2013, during the Vibrant Response 13-2 exercise at the Muscatatuck Urban Training Center, IN.

IT IS NOT A SCENE ONE WOULD WISH TO ENVISION: an explosion in an American town, with the emergency response broadcast blaring a message of caution over loud speakers to concerned citizens affected by the blast. Burning buildings, clothes scattered in every direction, debris blocking once passable roadways, all are merely a small portion of a nightmare scenario.

During the field training exercise Vibrant Response 13-2, or VR 13-2, which ran Aug. 10-17, at the Muscatatuck Urban Training Center, or MUTC, civil support teams trained for the unexpected.

“The venues at MUTC, along with ability to use multiple smoke and flame effects, enhance the training and make it as real as it gets,” said Paul Condon, joint exercise planner, U.S. Army North (Fifth Army).

About 5,700 service members and civilians from the local, state and federal agencies flooded in to the MUTC and Camp Atterbury training areas to train on responding to a catastrophic domestic incident. VR 13-2, a major field training exercise conducted by U.S. Northern Command and led by U.S. Army North, is designed to help all components respond to disasters in a timely manner as they provide assistance to the American people.

The MUTC is a 1,000-acre urban training site near Camp Atterbury, IN., that specializes in real-world training scenarios. The training center is designed to add realism by simulating an actual American city in turmoil.

“The environment replicates an actual American town,” said Jay Norris, an observer controller/trainer division chief with Army North, who hails from Edinburg, MS. “It has all the facilities of a typical small town, and that is the type of environment we’ll be operating in after a disaster strikes. The scenario is set in an American city where there has been a nuclear detonation, and these units are responding to that disaster.”

“This (the MUTC) looks like the very first episode of the TV series ‘The Walking Dead’ with all of the signs hanging, fires blazing and the appearance of absolute desertion,” said Sgt. Nicholas Erridge, a chemical, biological, radiological and nuclear, or CBRN, specialist from Portage, Ohio. He serves with the 51st Civil Support Team, or CST, Michigan National Guard, Joint Force Headquarters, out of Battle Creek, MI. “This is a unique, realistic training environment.”

This article originally appeared on the U.S. Army website. For complete article, [click here](#).



Chicago Lakeside Development to Benefit from Computation-Enabled Design

Photo Credit: Courtesy of Argonne National Laboratory



An artist's rendering of the planned Chicago Lakeside Development, a 600-acre development on the coast of Lake Michigan on the city's South Side that will eventually be home to 50,000 people and millions of square feet of retail, commercial and public space.

RAPID URBANIZATION AROUND THE WORLD is leading to the construction of real estate developments at a scale and pace far beyond human experience. Among these efforts is Chicago Lakeside Development, a 600-acre development on the coast of Lake Michigan on the city's South Side that will eventually be home to 50,000 people and millions of square feet of retail, commercial and public space.

Planning for Chicago Lakeside will necessitate augmenting traditional tools with data and scientific computation, allowing developers to model the complex interplay between energy, waste and water infrastructures. To address this need, a collaboration between the University of Chicago, Argonne National Laboratory, the Computation Institute, Skidmore, Owings & Merrill, and McCaffery Interests will develop a prototype computational framework for Chicago Lakeside Development, called LakeSim.

“Urban designers, architects, and developers have ample experience and tools optimized for single buildings or

developments in the 20 to 30 acre range. But these do not scale to the 600 acres of a site such as Chicago Lakeside,” said Charlie Catlett, director of the Urban Center for Computation and Data and co-investigator on the LakeSim project. “The need to deliver sustainable and financially viable urban plans requires a science-based approach, bringing the power of computational models to city design.”

LakeSim will connect existing urban design tools with scientific computer models to create detailed simulations relevant to large-scale development. Instead of planning separately for different pieces of the infrastructure, the framework will allow developers to simulate how various designs influence the environment, transportation, and business spheres in Chicago Lakeside under a range of possible scenarios, over hundreds of acres and decades of time.

This article originally appeared on the Argonne National Laboratory website. For complete article, [click here](#).



Video Gamers Really Do See More

HOURS SPENT AT THE VIDEO GAMING CONSOLE not only train a player's hands to work the buttons on the controller, they probably also train the brain to make better and faster use of visual input, according to Duke University researchers.

"Gamers see the world differently," said Greg Appelbaum, an assistant professor of psychiatry in the Duke School of Medicine. "They are able to extract more information from a visual scene."

It can be difficult to find non-gamers among college students these days, but from among a pool of subjects participating in a much larger study in Stephen Mitroff's Visual Cognition Lab at Duke, the researchers found 125 participants who were either non-gamers or very intensive gamers.

Each participant was run through a visual sensory memory task that flashed a circular arrangement of eight letters for just one-tenth of a second. After a delay ranging from 13 milliseconds to 2.5 seconds, an arrow appeared, pointing to one spot on the circle where a letter had been. Participants

were asked to identify which letter had been in that spot.

At every time interval, intensive players of action video games outperformed non-gamers in recalling the letter.

Earlier research by others has found that gamers are quicker at responding to visual stimuli and can track more items than non-gamers. When playing a game, especially one of the "first-person shooters," a gamer makes "probabilistic inferences" about what he's seeing—good guy or bad guy, moving left or moving right—as rapidly as he can.

Appelbaum said that with time and experience, the gamer apparently gets better at doing this. "They need less information to arrive at a probabilistic conclusion, and they do it faster."

Both groups experienced a rapid decay in memory of what the letters had been, but the gamers outperformed the non-gamers at every time interval.

This article originally appeared on the Duke University website. For complete article, [click here](#).

DoD Transforms the M&S Catalog

The Department of Defense (DoD) Modeling and Simulation Coordination Office (M&SCO) recently transformed its Modeling & Simulation (M&S) Catalog. The transformed DoD M&S Catalog provides the same continuity and discovery abilities of M&S metadata found in its former version, but it now boasts an enhanced user interface. The revised interface will support both novice and advanced users with a simple keyword search. It has specific filtering options that help refine and tailor the users' search results.

Over the next few months, M&SCO will continue to expand the DoD M&S Catalog by adding additional features. One of the new DoD M&S Catalog features will allow users to upload sharable data directly to the DoD M&S Catalog. This added functionality will help other users discover data easier and assure the data is compliant with the M&S Community of Interest Discovery Metadata Specification (MSC-DMS).

A second new feature will provide organizations the ability to maintain their own registry of resources and electronically provide metadata descriptions to the DoD M&S Catalog through a system-to-system web service architecture. A third new feature will allow users to establish a profile in the DoD M&S Catalog and create customized search alerts. This search alert feature will allow all users to receive automatic email notifications when their items of interest changes.

The DoD M&S Catalog relies on the M&S community to share resources and information for the reuse of technology and its support of the DoD Net-Centric strategy. Soon the DoD M&S Catalog team will contact catalog providers on behalf of M&SCO to validate or refresh their metadata.

Access the DoD M&S Catalog at <https://mscatalog.msco.mil>. For more information about the DoD M&S Catalog, contact MSCatalogHelpDesk@mscatalog.msco.mil.





FEATURED HIGH LEVEL TASK

High level tasks are special technology-related projects that will enhance the applications of M&S throughout the DoD for the benefit of our Warfighters. By focusing on the goals stated in the “Strategic Vision for DoD Modeling and Simulation,” these high level tasks are delivering solutions that will contribute to closing fundamental gaps in current M&S capabilities.



Newly Approved Modeling and Simulation Standards

TWO NEW STANDARDS developed under the DoD Modeling and Simulation (M&S) Steering Committee-endorsed High Level Task (HLT) for the Live Virtual Constructive Architecture Roadmap (LVCAR) were recently approved through their respective standards bodies: the Institute for Electrical and Electronics Engineers (IEEE) and the Simulation Interoperability Standards Organization (SISO).

- The first standard is the Distributed Multi-Architecture Overlay (DMAO). The DMAO is an update to the existing IEEE Distributed Simulation Engineering and Execution Process (DSEEP). The current version of the DSEEP provides for single architecture systems engineering process. On the updated standard, the overlay update provides a systems engineering process for simulation events that combines different simulation runtime architectures (e.g., HLA, DIS, and TENA). The DMAO standard (IEEE 1730.1) was approved by IEEE on August 23, 2013.
- The second standard is the Federation Engineering Agreements Template, known as FEAT. The FEAT standard is an “electronic to-do list” that provides simulation event architecture engineers with a methodology to account for and record communication and data exchange agreements. The FEAT is based on an extensible markup language (XML) schema and allows for collaboration to facilitate distributed simulations. The FEAT is simulation domain agnostic which makes it useful to all types of simulation events (e.g., test, experimentation, training, etc.). The FEAT (SISO-STD-012-2013) was approved by SISO on September 3, 2013.

Both of these standards provide system engineering processes to improve the engineering reliability of designing LVC simulation events.

According to Dr. Gary Allen, Modeling and Simulation Coordination Office (M&SCO) Associate Director for Data, there are a number of benefits for members of the M&S community who will use the standards. The standards will: 1) shorten the time it takes to design a simulation event, 2) reduce error rates, 3) provide the capability for collaboration and consistency in the design, and 4) provide better repetition, i.e., users will have an electronic copy if they want to redo the simulation event.

The two standards were initiated and developed based on suggestions brought to the LVCAR team from the modeling and simulation user community. “We polled [the community] about what kinds of tools they needed that would respond to what they didn’t already have. We listened to the people who actually do the work,” said Dr. Allen.

The LVCAR team coordinated with IEEE and SISO to develop the two international standards. Broad coordination among the multi-layered organizations typically takes five years to complete. But the LVCAR team was able to shave two years off the process, reaching consensus for both LVC standards. “It was because of the dedicated support and speedy efforts we received from our partners that we were able to complete the standards process for LVC in three years, versus the five years it typically takes,” said Dr. Allen.

M&SCO is DoD’s Lead Standardization Activity (LSA) for managing modeling and simulation standards and methodologies.

For more information about the LVCAR international standards, contact osd.pentagon.ousd-atl.list.msco-ask-msco@mail.mil.



M&S WHAT AND WHEN

MODELING & SIMULATION CALENDAR OF EVENTS

Interservice/Industry Training, Simulation and Education Conference (I/ITSEC) 2013

December 2 – 5, 2013
Orlando, FL

***Visit M&SCO Booth #1981**

30th Annual Flight and Ground Vehicle Simulation Course

January 20 – 24, 2014
New York, NY

25th Annual SO/LIC Symposium & Exhibition

February 10 – 12, 2014
Washington, DC

Association of the United States Army's Institute of Land Warfare (AUSA ILW) Winter Symposium & Exhibition

February 19 – 21, 2014
Huntsville, AL

MODSIM WORLD 2014

April 15 – 17, 2014
Hampton, VA

ITEC 2014

May 20 – 22, 2014
Cologne, Germany

Promote an Event

If you would like to place an M&S event on the calendar, please email the event information to:

osd.pentagon.ousd-atl.list.msco-ask-msco@mail.mil



The M&S Newsletter

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