1st International Caribbean Atlantic Homeland Security Conference

To be held in St. Thomas, US Virgin Islands 13-15 October, 2010 at the University of the Virgin Islands

Topics of Discussion:

- Border and Maritime Security
- Critical Infrastructure Protection (physical/cyber)
- Transportation Security
- Surveillance and Screening Technologies
- Improvised Explosive Device (IED) Detection and Defeat
- Weapons of Mass Destruction (WMD) Detection (chem/bio/nuc)
- Disaster Response and Post-Incident Mitigation
- Threat/Risk Assessment

For information contact: Dr. Edward Tarver, Conference Chair.
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University of the Virgin Islands #2 John Brewer’s Bay St. Thomas, Virgin Islands 00802

On-Site Registration Begins at 9:00AM in the Administration and Convention Center

(ACC Building)
Benefits for Conference Participants

1. Learn about the most current homeland security issues facing the Virgin Islands, Puerto Rico and the Caribbean/Atlantic region.
2. Hear firsthand about the critical issues facing our country in the fight against terrorism.
3. The conference offers the opportunity to engage in the dialogue on critical issues with key academic, government and industry representatives.
4. Discuss new ideas and perspectives in the digital age, understand how we can integrate today’s technology with tomorrow’s innovations and create effective networking partnerships between the public and private sectors, at home and abroad.
5. Speakers will identify and discuss emerging threats, cutting-edge technological resources, share expertise in conducting risk assessments, assist in the formulation of appropriate response strategies, and facilitate the development of inter-disciplinary partnerships to ensure the safety and security of our nation.
6. Our goal is to educate and inform all communities locally, regionally and nationally, ensuring that all safety, police, fire, security, rescue, response, medical and civilian personnel will matrix with all their skills and efforts to: prepare and protect, respond and resolve, safeguard and secure all of our people and resources in an efficient and effective effort for all homeland security concerns.
7. The conference will bring together leaders from the public and private sector to provide a forum to establish situational awareness through information sharing and analysis, develop concepts of operation and operation protocols to ensure effective response, provide planning, integration and discussions of lessons learned.

SPEAKER BIOGRAPHIES:

**Plenary Session Speaker:** Dr. Mitchell Erickson, Director of Northeast and Caribbean Operations. New Jersey to Maine, Puerto Rico and US Virgin Islands (ST-1301) Interagency and First Responder Programs (IAD), Science and Technology Directorate, United States Department of Homeland Security. Dr. Mitchell is responsible for vertical integration among the various organizations in the Northeast and horizontally across all threats. Dr. Mitchell was Director of DHS Environmental Measurements Laboratory for over a decade. PhD. in analytical chemistry, University of Iowa (1976) Author of two books, Analytical chemistry of PCB’s and Remediation of PCB Spills Author of over 150 technical publications and given over 160 technical presentations.

**Keynote Speaker:** Dr. Aleksey Bolotnikov, Brookhaven National Laboratory. Dr. Bolotnikov is a physicist at Brookhaven National Laboratory. He graduated from Moscow Engineering and
Physics Institute, Russia in 1983 and got Ph.D. from the same institute in 1991. He moved to the U.S. in 1991. Before joining Brookhaven National Laboratory in 2003 he was working at Columbia University, NASA Marshal Space Flight Center and Caltech. He has direct and extensive experience working in the areas of different types of nuclear radiation detectors and material characterizations. He has published over 70 scientific and technical papers and patents more than 40 of which are related to the CdZnTe and others room-temperature semiconductor detectors. He is a co-author of a book “Noble Gas Detectors”, published by WILEY-VCH in 2006. For the development of CdZnTe detectors he received two R&D Magazine's R&D 100 Awards in 2006 and 2009, which honors the top 100 inventions of the year. He has been named the 2006 recipient of the Charles Hirsch Award, which is given annually to a member of the Long Island Section of the Institute of Electrical and Electronic Engineers (IEEE). Dr. Bolotnikov is a member of the SPIE and IEEE. Dr. Bolotnikov has kindly agreed to present on behalf of Dr. Ralph James, Associate Laboratory Director of Brookhaven National Laboratory.

**Keynote Speaker:** Ms Lynn Canton, Executive Director Federal Emergency Management Agency (FEMA), Region II Regional Administrator, serving New York, New Jersey, Puerto Rico and the Virgin Islands. She rejoins the region after serving from 1995 to 2000. Ms Canton then served as Deputy Comptroller for New York State. As Deputy Comptroller she was the Division of State Government Accountability, Tracking transparency and accountability through audits and financial services. During her first tour as Region II regional Administrator she won FEMS Senior Executive Peer Award in 2000. Prior to FEMA, Ms Canton was the Executive Director of the New York State Division of Minority and Women’s Business Development and was appointed by Governor Mario Cuomo as Commissioner of the New York State Board of Parole. She holds a BA in Afro-American Studies and a MS in Education from the State University of New York at Albany.

**Invited Speaker:** Mr. Jose M. Alvelo, Senior Research Analyst; Institute for Advanced Sciences Convergence (IASC), Norwich University Applied Research Institutes (NUARI), Herndon VT. Mr. Alvelo currently provides scientific management and program advisement to Norwich University Applied Research Institutes, the Defense Threat Reduction Agency and previously for Northrop Grumman Corporation. He also provides support for revolutionary and disruptive technology analysis and assessment support across IASC programs. He provides intra and interagency coordination across the CW enterprise between Department of Homeland security, Department of Energy, Department of Defense (TSWG), NASA, Defense Threat Reduction Agency, and the Defense Advanced Research Projects Agency.

**Invited Speaker:** Mr. John Avolio, Senior Technical and Business Consultant. He serves as a science and security advisor in the area of CBNRE for both industry and government. His primary focus is the development of new technologies for counter-drug and counter-terrorism programs. Prior to this he was Vice President of Technology for Law Enforcement and First
Response as well as Vice President of Product Development for ICxT. He has served as Director of Cargo, Aviation and Government affairs for L3 Communications working closely with DHS, TSA, DOD and DOE researchers and security personnel.

**Invited Speaker:** Dr. Nadine Noorhasan, Director, Division of Environmental Protection, Department of Planning and Natural Resources. St. Thomas, Virgin Islands. Dr. Noorhasan has been the Director for the Division of Environmental Protection-Department of Planning and Natural Resources (DEP-DPNR) since March 12, 2007. Dr. Noorhasan has oversight of the environmental protection and the enforcement of environmental laws and regulations in the US Virgin Islands, which includes over ten (10) regulatory programs between the St.Croix and St. Thomas/St. John District. The mission of the Division is to provide protection and conservation of the natural resources within the Territory. Dr. Noorhasan received a Ph.D. in Analytical Chemistry from Florida Tech in Melbourne, Florida. She has done research at Florida Tech in Melbourne, FL; Eotvos Lorand University, Department of Nuclear Chemistry in Budapest, Hungary; Brookhaven National Laboratory in Long Island, New York; Harvard School of Public Health in Cambridge, MA; Kennedy Space Center in Cape Canaveral, FL; and Boston University School of Medicine in Boston, MA. Dr. Noorhasan has publications in chemistry journals such as *Inorganica Chimica Acta, Dalton Transactions,* and *Water Research.*

**Guest Speaker:** Lieutenant Commander Daniel Buchbaum, Supervisor, United States Coast Guard Marine Safety Detachment. St. Thomas, Virgin Islands. United States Coast Guard Display presented by Rosemarie Moscia, Criminal Intelligence Analyst, Virgin Islands Department of Justice and United States Coast Guard Auxiliary

**Guest Speaker:** Chief Roderick Pullen, University of the Virgin Islands Chief of Security. Chief Pullen has served as Chief of Public Safety at Community College of Baltimore, Lieutenant and Chief of Police Operations at Bowie State University, 30 years with the Baltimore Police department as Detective Sergeant and Deputy District Commander, Unit Commander, Criminal Investigations and Drug Enforcement. Chief Pullen holds a BS degree in Criminal Justice from the University of Baltimore. He was an adjunct faculty member at Community College of Baltimore and served as an instructor at the Maryland Police and Corrections Commission.

**Guest Speaker:** Dr. Rudy Mattai, Dean of the School of Education, University of the Virgin Islands, St. Thomas

**Guest Speaker:** Col. Steve Whitmarsh, US Army Special Forces, Division Chief; Contingency Operations, Technical Support Groups and Nuclear Forensics. Defense Threat Reduction Agency (DTRA). Col. Whitmarsh was recently deployed to Afghanistan and won’t be able to present. He sends his regards.

**Guest Speaker:** Dr. O.Opolonin\(^1\), Institute for Scintillation Materials, National Academy of Science of Ukraine, Kharkiv, Ukraine. New Neutron Detectors Based on Inorganic Scintillators
Using Inelastic Scattering  V.D. Ryzhikov¹, O.Opolonin¹, G.Onyshchenko¹, L.Piven¹, B.Grinyov¹, S.Galkin¹, O.Lysetska¹, T. Pochet², C. F. Smith³

¹ISMA of STC “Institute for Single Crystals”, NAS of Ukraine, Kharkov, Ukraine
²International Atomic Energy Agency, Vienna, Austria
³Lawrence Livermore National Laboratory, Livermore, USA

At present great attention is paid worldwide to problems of nuclear safety and security aspects aimed at prevention of nuclear terrorism. The most common RM detection systems use organic scintillators of large volume in their gamma-radiation detection blocks, and the neutron radiation detection blocks use 3He-proportional counters placed in moderators of polyethylene.

In this work our studies aimed at practical application of the highly efficient method of detection of fast and thermal neutrons, which uses the process of inelastic scattering on nuclei of inorganic scintillators and radiation capture in systems for detection of illegal transportation of radioactive substances. The use of the inelastic scattering mechanism has allowed to do without the moderator and to detect both “fast” and “slow” neutrons, since the scintillator crystals used (BGO, GSO, ZnWO, CWO) are characterized by high effective atomic number and density.

Our experimental results show that total detection efficiency of neutrons obtained with different crystals using a fast neutron source (without source moderator) correlates with the effective atomic number of the scintillator and is within 40–60% in the 20–300 keV gamma-radiation detection range. This result is in agreement with data known from literature and does not contradict the dependence of neutron inelastic scattering cross-section on the atomic mass. Detection efficiency of fast and thermal neutrons using inelastic scattering is 20–30 times higher as compared with traditional methods (LiI column). In traditional methods of fast neutron detection by solid-state scintillators, detection efficiency does not exceed 10%. In particular, ⁶LiI(Eu) detectors of dimensions Ø10x8 mm and ⁶Li enrichment about 96% show efficiency in (n, α)-reaction ~ 1 % [11]; with NaI(Tl) detector Ø2.5x2.5 cm³ in (n, n’γ) reaction, it was 4 %.

High efficiency of fast neutron detection by oxide scintillators allows creation of sufficiently small detectors (using “scintillator-PMT” system) for stationary detection systems. Thus, according to our estimates, replacement of conventionally used neutron detectors based on ³He counters with moderator by four detectors based on CdWO₄, Ø40x50 mm, will substantially reduce the size and weight of the instrument, preserving the neutron detection parameters.

The obtained experimental results, which demonstrate up to 70 % efficiency for detection of neutrons by solid-state scintillators, can be useful for development of new types of devices and instruments for neutron detection. High detection efficiency of fast neutrons allows creation of sufficiently small-sized detectors (of Sc – PMT type) for stationary inspection systems. Among advantages of the proposed method, one should note its high sensitivity in detection of nuclear and fissionable materials with substantially (not less than by 10 times) smaller dimensions and mass of the detector. A limitation of the method is that in the working energy range up to 300
keV accompanying external gamma fields can also be recorded. This drawback can be partially removed by introduction of additional lead protection. For such low energy range, a screen of up to 1 cm thickness can be sufficient.

**Guest Speaker:** Dr. Edward Tarver, University of the Virgin Islands, Analysis and Detection of Explosives. *The Next Generation of Ion Mobility Spectrometers, External Second-Gate, Fourier Transform Ion Mobility Spectrometry for Detection and Identification of Weapons of Mass Destruction*. E. E. Tarver. Ion mobility spectrometry (IMS) has long been recognized by military and security agencies as one of the most sensitive techniques for real-time analysis of chemical warfare agents (CWA), high explosives (HE), toxic industrial chemicals (TIC) and contraband narcotics. We present an alternate method of data acquisition for IMS that improves the sensitivity, resolution and extends the molecular weight range of the target compounds. This method is “external second-gate Fourier transform ion mobility spectrometry” or FT-IMS.

Conventional IMS operates at a fixed gating frequency, sampling ions with a mere 1% duty cycle and requiring averaging of multiple scans to achieve useful response. This signal-averaging method (SA-IMS) also reduces spectral resolution by incorporating scan to scan variations in the final spectrum. FT-IMS samples with a continuously variable gating frequency that provides a 50% duty cycle and does not require averaging. The 50% duty cycle affords 10-16 times greater signal-to-noise and frequency-ramped gating allows tunable resolution capable of separating closely spaced and overlapping peaks that would be impossible to distinguish using conventional SA-IMS. With FT-IMS, the entrance gate opening frequency is ramped from ten Hertz up to forty kilo Hertz over the analytical cycle. The gate pulse is opened and closed for equal durations by a square wave (50% duty cycle) and the ion signal that results is probed with a second, synchronous “exit gate” pulse in the electronics, external to the time-of-flight tube. Hence the name, External Second Gate. The second gate interacts with the ion signal generated at all gate-open frequencies. The resulting interference pattern or interferogram encodes all of the frequency-domain information of the transmitted ions. This frequency interferogram is Fourier transformed to recover the normal time-domain ion mobility spectrum. The desired resolution can be selected by choice of the high-end frequency of the analysis, i.e. ten, twenty or forty kilo Hertz. In addition, the filtering action of the second gate eliminates the peak tailing observed with SA-IMS.

**Schedule:**

**Wednesday, October 13, 2010.**

**8:00 AM:** Speakers Breakfast Mixer, ACC Building, University of the Virgin Islands campus

**9:00 AM:** On-Site Registration Begins

**9:30:** **President David Hall**, University of the Virgin Islands, Conference Welcome
9:30 AM: **Plenary Session Speaker, Dr. Mitchell Erickson**, Director of Northeast and Caribbean Operations. New Jersey to Maine, Puerto Rico and US Virgin Islands

**Keynote Speaker:** Dr. Aleksey Bolotnikov, Brookhaven National Laboratory.

**Invited Speaker:** Mr. Jose M. Alvelo, Senior Research Analyst; Institute for Advanced Sciences Convergence (IASC), Norwich University Applied Research Institutes (NUARI), Herndon VT

**Guest Speaker:** Chief Roderick Pullen, University of the Virgin Islands Chief of Security.

**Guest Speaker:** Dr. O. Opolonin, Institute for Scintillation Materials, National Academy of Science of Ukraine, Kharkiv, Ukraine.

12:00 PM: **Lunch is Served**

**Thursday, October 14, 2010.**

8:00 AM: Speakers Breakfast Mixer, ACC Building, University of the Virgin Islands campus

9:00 AM: **Opening Remarks:** Dr. Edward Tarver, University of the Virgin Islands

9:15 AM: **Keynote Speaker:** Ms Lynn Canton, Executive Director Federal Emergency Management Agency (FEMA) Region II serving New York, New Jersey, Puerto Rico and the Virgin Islands

**Invited Speaker:** Dr. Nadine Noorhasan, Director, Division of Environmental Protection, Department of Planning and Natural Resources. St. Thomas, Virgin Islands.

**Guest Speaker:** Lieutenant Commander Daniel Buchbaum, Supervisor, United States Coast Guard Marine Safety Detachment. St. Thomas, Virgin Islands.

**Invited Speaker:** Mr. John Avolio, Senior Technical and Business Consultant. He serves as a science and security advisor in the area of CBNRE for both industry and government.

**Guest Speaker:** Dr. Edward Tarver, University of the Virgin Islands, Analysis and Detection of Explosives.

**Special Student Presentation:** Mustafa Muhammad and Jerome Rogers, University of the Virgin Islands.

12:00 PM: **Lunch is Served**

**Friday October, 15, 2010**

9:00 AM **Panel Discussion, Workshops and Public Forum**

1200 PM: Thanks to the Speakers and Closing Remarks
Accommodations: located next to the airport closest to the university include the 
Best Western Emerald Beach Resort, 8070 Lindbergh Bay, St. Thomas V.I. 00802
Toll Free Phone: 800-233-4936, E-mail: Reservations@EmeraldBeach.com

Best Western Carib Beach Resort, 70-C Lindbergh Bay, St. Thomas Virgin Islands 00802
E-mail: Reservations@caribbeachresort.com, Website: www.caribbeachresort.com

The Island Beachcomber Hotel, 8071 Lindbergh Bay, St. Thomas Virgin Islands 00802
Phone: 340-774-5250 Website: www.islandbeachcomber.net

The Windward Passage Hotel on Veterans Drive is located on the waterfront in downtown Charlotte Amalie and next to the shopping district (about 2 miles from the university).
Toll Free Phone: 800-524-7389 Website: www.windwardpassage.com

There are many hotels in St. Thomas located at some distance from the university and the airport. Traffic congestion due to tourism makes travel times unpredictable. There are roving shuttles called “safaris” which are always available if you need transportation.
There will be workshops and discussion groups following the presentations at the Administration and Convention Center (ACC Building) on the campus of the University of the Virgin Islands.