

**Sensors, Nanotechnologies, Protective Coatings and More:  
An Explosion of Technologies and Partnering Opportunities**

*Featuring Presentations from the Indian Head Division*

Indian Head Division, Naval Surface Warfare Center

25 June 2009

**DETAILED AGENDA**

- 8:30 am – 9:15 am                   **Continental Breakfast and Registration**
- 9:15 am – 9:30 am                   **Welcoming Remarks**  
Chris Fawls  
Customer Advocate Office, IHDIV, NSWC  
Renee Winsky  
Executive Director, Maryland Technology  
Development Corporation (TEDCO)  
Rick Harris  
Executive Director, Technology Council of Maryland (TCM) –  
*Invited*
- 9:30 am – 9:50 am                   **Opening Remarks and Laboratory Overview**  
Captain Neil Stubits
- 9:50 am – 10:20 am                 **Technical Session I**
- Self-Regulating Power Supply for Micro Electronic  
Mechanical Systems Thermal Actuators (NC # 99,128)**  
**Kevin Cochran**
- Control of devices that use thermal actuators
    - Optical devices
    - Micromotors
    - Electrical relays and switches
  - Monitoring of devices based on resistive concepts
    - Thermocouples
    - Hot wire anemometers
- MEMS INERTIAL SWITCHES**  
**Dr. Daniel Jean, PhD**  
**MEMS Multi-Directional Shock Sensor with Multiple  
Masses (NC # 96,543)**
- Purely mechanical threshold device
  - Small <5 by 5mm for a single sensor
  - Latching system stores shock event
- MEMS Multi-Directional Shock Sensor (NC # 84,847)**
- Consists of spring-mass system that moves in any  
direction within a single plane
  - Purely mechanical; no batteries needed
  - Detects rough product use and handling during shipping

**Multiple Shock Event Sensing Device (NC # 95,544)**

- Mechanically senses magnitude of successive shocks
- Handles multiple events – yet inexpensive
- No power or electronics needed for operation

**Hermetically Packaged MEMS G-Switch (NC # 98,825)**

- Switch closes above designed acceleration threshold (150 G)
- Tested to survive shocks > 50kG
- Hermetically sealed, surface mount component
- Over 100 prototypes successfully tested

**Flow Driven Piezoelectric energy Harvesting Device****Michael Deeds (NC # 98,644)**

- HVAC: sensor feedback for efficient operation
- Automotive: scavenge energy to power remote sensor networks
- Weather: remote, recoverable sensor pods
- Recreational/toys: LED speed indicator

10:20 am – 10:50 am

**Networking and Exhibit Floor**

10:50am – 11:15 am

**Mechanisms For Partnering With IHDIV:**

**Dr. J. Scott Deiter**, Technology Transfer Director, IHDIV  
Chair, Federal Laboratory Consortium

- Available legal instruments
- Federal Laboratory Consortium Locator
- Patent Licensing Process
- Facilities/Capabilities Overview

11:15 am – 11:35 am

**Success Story:**

**IMPASS for Portable Firing Range**  
**Tony Chedrawy, CEO, MetOcean**

11:35am – 12: 05 pm

**Technical Session II****Integrated Maritime Portable Acoustic Scoring & Simulator (IMPASS) (Patent # 6,995,707/NC # 95,919)****Billy McClure**

- Buoy system, battery operated, deploying sensors in temporary situations
- Capable of using hydrophones, chemical/bio sensors on buoys
- Useful at sea, ports, intrusions to ships, piers, dams

**Novel Lightning Locating System (NC # 98,570)****Robert Daily**

- Replace current NLDN system
- Install on existing cell-phone towers
- Fire department/Insurance industry applications

**Functionalization of Carbon Nanotubes (NC # 97,547)****Dr. Farhad Forohar**

- Carbon nanotubes 1-10 nanometers in diameter
- Tubes have high tensile strength and thermal conductivity
- Uses in nano-reinforced nylons, drug delivery vehicles, chemical reactors

12:05 pm – 1:15 pm

**Lunch, Networking, and Exhibit Floor**

1:15pm – 1:30 pm

**Maryland TEDCO Mission and Funding****James A. Poulos, III**

Director, Technology Transfer and Commercialization

1:30 pm – 2:45 pm

**Technical Session III****Perfluoroalkyl Passivated Aluminum (Patent #7,192,549/NC # 83,960)****Dr. Jason Jouet**

- Solution or gas phase applicability for Al passivation
- Applicable for all Al surfaces (films, particles, etc.)
- Robust monolayer prevents oxidation
- Applicable for microelectronics, lithography, pigment, composites

**Common Modular Intermodal Shipping System Technology (C-MISST)****(Patent #7,156,249 B2/7491,024 B2/NC # 97,340)****Mark Heinrichs**

- Modular, stackable, collapsible, locks together, robotic handling
- Commercial uses for manufacturers, suppliers, distributors, trucking companies
- Marinas, FCL and LCL service companies
- Designed for international as well as domestic shipping

**Method for Deposition of Steel Protective Coating (Patent # 7,514,153 B1/NC # 96,666)****Harry Archer**

- Robotic automation and compact arrangement
- Miniaturizable, scalable, separated pure waste streams
- Compact automated jewelry plating

**MEMS MICRO-DETONATOR/INITIATOR FUZING SYSTEMS****Gerald Laib****MEMS Electronic Initiator for a Micro-Detonator (NC # 98,420)**

- Applying electrical charge to initiator in order to directly function a primary

**MEMS Mechanical Initiator for a Micro-Detonator (NC # 98,421)**

- A striker is actuated and driven in to a suitable primary for purposes of initiating

**MEMS Fuze Using a Micro-Detonator (NC # 98,419)**

- Mechanically safe explosive detonating device
- Useful in explosive initiation applications requiring safety, reliability, and small size

**Integrated Thin Film Explosive Micro-Detonator (NC # 97,916)**

- In-situ conversion of thin metal substrate to primary explosive
- Formation of flyer plate and barrel assembly consistent with semiconductor processing
- Integral part of MEMS oriented explosive train and safety and arming devices

**Programmable Microtransformer (NC # 97,132)****Mr. Deran Eaton**

- High energy, non-intrusive field sensors
- Inductive power transfer
- LED Bulk Light Drivers
- Haptic interface field elements
- Applications requiring custom shaped magnetic fields

2:45 pm - 4:00pm

**Networking and Exhibit Floor**