

NPS Lab Tours are an opportunity for Topic Sponsors to gain a more in depth understanding of the specific research lab capabilities at NPS. The NRP will be facilitating hosted NPS Lab Tours on the 10th and 12th of April. Be aware that some tours overlap the start-time of another tour.

NPS NAVAL RESEARCH PROGRAM - NAVAL RESEARCH WORKING GROUP 18 - LAB TOUR SCHEDULE					
TUESDAY 10, APRIL		THURSDAY 12, APRIL			
0700	Topic Sponsor Sync Session (Herrmann Hall - EBC)		0700		
0730			0730		
0800			0800		
0830			0830		
0900	Offensive Cyber Operations (OCO) Lab	Railgun Lab	0900		
0930			0930		
1000	C3O Cyber Lab	Armor Development Lab	1000		
1030		Human Systems Integration (HSI) Lab	1030		
1100	NPS Warfare Innovation Continuum	Common Operational Research Environment (CORE) Lab	1100		
1130	Virtualization/Cloud Computing and Coalition for Open-Source DA Lab		1130		
1200	Lunch Break		1200		
1230	Robo Dojo	Advanced Warfighter Technologies Lab	MOVES Additive Manufacturing Lab	1230	
1300		Atom Interferometry Lab		1300	
1330		Engineering Enclave Maritime Security Lab		Material Characterization Facilities	1330
1400		Sensor Research Lab		Material Characterization Facilities	1400
1430	Break		1430		
1500	Keynote Speakers (All hands in King Hall)		1500		
1530			1530		
1600			1600		
1630	Break		1630		
1700	Poster Session & Social (Herrmann Hall - McNitt Ballroom)		1700		
1730			1730		
1800			1800		
1830			1830		
1900			1900		
1930			1930		
In-Progress Reviews (IPRs) scheduled as necessary between Topic Sponsors, faculty, and students					

COLOR KEY:

Glasgow Hall
Glasgow Hall EAST
Golf Course Annex
Halligan Hall
Herrmann Hall
King Hall
Root Hall
Spanagel Hall
Watkins Hall

Lab Tour attendance generally requires prior registration, with the exception of the RoboDojo. The RoboDojo has drop-in tours available anytime between 1200-1430.

Schedule subject to change. <https://my.nps.edu/nrp/nrwg18-labtours/>

Tour Information Key:

➤ **TOUR TIMEFRAME (Tours are scheduled in 25-55 minutes time blocks. Make sure to note the specific tour time.)**

TOUR TIME – TOUR BUILDING LOCATION – TOUR ROOM NUMBER (TOUR CAPACITY)

TOUR HOSTS/PRESENTERS

TOUR TITLE – TOUR DESCRIPTION

Tuesday, 10 APR - Tour Schedule

➤ **0900-0955**

0900-0955 – Glasgow Hall EAST – Room 104 (20)
Dr. Gurminder Singh, Mr. John Gibson, Mr. Carl Prince and Dr. Peter Ateshian

Developing, Testing and Training for Offensive Cyber Operations (OCO) Lab -- This lab tour will present recent work in the area of Offensive Cyber Operations. The work has been supported by MARFORCYBER and OSD DT&E, among others.

0900-0955 - Golf Course Annex – Bldg 230 (15)
Dr. Andres Larraza and Mr. Ben McGlasson

Railgun Lab -- The mission of the NPS Railgun Lab is to help the Navy weaponize the physics of electromagnetic launch. Our role involves three primary tasks: railgun education, student thesis topics, and basic research to advance the state of knowledge of the national railgun team. Our capability is exclusive among academic institutions, since we have the largest railgun of any university laboratory and we can perform classified research. This will allow us to operate in the 1-2MJ muzzle energy range and ensure we are tackling problems that are relevant to the larger Navy effort. We will also be pioneering basic physics research into mega-Ampere, and mega-Gauss phenomena with our laboratory's inherent ability to produce such high currents and magnetic fields. In addition, we intend to use the laboratory as a great platform for collaboration across the spectrum of academic disciplines at NPS, from operations research into doctrine through war-game simulations, logistical analysis, and TTP development; to improved engineering of Pulsed Power electrical design, materials analysis and development; and overarching Systems Engineering parametric modeling and assessments.

➤ 1000-1055

1000-1055 – Glasgow Hall EAST – Room 218

(15)

Dr. Cynthia Irvine, Ms. Thuy Nguyen and Mr. Michael Thompson

C30 Cyber Lab – The lab tour will present work in cybersecurity and cyber operations including: a tool developed for the DARPA Cyber Grand Challenge to analyze software exploits in the CGC final event; studies of the applicability of Blockchain Technology in DoN, DoD, and US Government contexts; a cyber physical systems testbed, modeled on the Machine Control Systems used in Navy ships, that supports research to discover and mitigate MCS vulnerabilities; and the use of virtualization for cybersecurity and cyber operations skill development and measurement.

1000-1025 - Golf Course Annex – Bldg 216

(20)

Dr. Raymond Gamache

Armor Development Lab – Within this lab new concepts in protective systems for both personal and vehicles are being developed. Current efforts are focused on flexible buoyant body armor and lightweight composite transparent armor. Recently developed lab includes a 40mm powder gun capable of velocities up to 8700 ft/s, 1" light gas gun and a Mann barrel gun system capable of firing from 0.22 caliber up to 20mm. Additional capabilities including hot pressing and high energy ball milling are being implemented to develop improved toughness of ceramics for armor applications.

1030-1055 – Glasgow Hall – Room 221

(10)

Dr. Nita Shattuck

Human Systems Integration (HSI) Lab – The HSI lab is a multi-use, configurable lab designed to measure individual, team and system performance. It has a variety of capabilities that include a team performance lab, usability analysis and eye-tracking, ergonomic and anthropometric measurement, fatigue and crew endurance tools for lab and field data collection, human modeling to include workload and task load of individuals and crews, motion capture, visual and auditory perception, reaction time and decision-making, and tools for designing physical layout of work and living spaces.

➤ 1100-1155

1100-1155 – Root Hall – Room 107

(20)

CAPT Wayne Porter, PhD, USN (Ret.), Dr. Sean Everton, Mr. Dan Cunningham, Mr. Rob Schroeder, Mr. Chris Callaghan and Mr. Mike Aspland

Common Operational Research Environment (CORE) Lab – CORE was established at the Naval Postgraduate School (NPS) in 2007 with the mission to support U.S. and International field operatives in the analytical craft of integrating geospatial, cultural, relational, and temporal data in order to develop a comprehensive understanding of the Irregular Warfare environment. CORE is the only lab in the country that directly focuses visual analytic analysis of Irregular Warfare (IW) problem sets in direct support of Soldiers in the field.

1100-1125 – Glasgow Hall – Room 128

(20)

CAPT Jeffrey Kline, USN (Ret.) and COL Jeff Appleget, PhD, USA (Ret.)

Warfare Innovation Continuum -- This presentation provides an overview of NPS Operations Research programs in developing and advancing naval concepts and tactics through wargaming, red teaming, simulation and campaign analysis. Methods to provide quantitative military assessments and risk assessments of new technologies and concepts of employment for those technologies will be discussed. If your interest lay with advancing and assessing warfighting capabilities this will be a presentation to attend.

1130-1155 – Root Hall – Room 204A

(25)

Dr. T. Camber Warren and Mr. Albert Barreto III

Virtualization/Cloud Computing and Coalition (VCC) for Open-Source DA (CODA) Lab -- The VCC / CODA Lab supports a robust virtualized infrastructure which is used in teaching and research by both Information Science (IS) and Defense Analysis (DA) faculty and students. The lab supports a wide array of research and courses on “big data” applications, including social network analysis, geospatial analysis, and machine learning. We are also focused on the development of hybrid parallel computing architectures, which combine the traditional “horizontal” networked parallelism of HADOOP clusters, with the “vertical” parallelism of multi-terabyte, single-node Random Access Memory (RAM) pools, and the “micro” parallelism provided by high-end Graphics Processing Units (GPUs). By leveraging the rise of “open-source” data and analytic approaches, combined with novel approaches to the design of computational architectures, we aim to foster a new generation of information warriors, capable of operating effectively in complex informational environments. Recent projects have focused on large-scale anomaly detection in online network communications, providing new approaches to cyber forensic analysis, social sentiment analysis, geospatial conflict prediction, and real-time situational awareness in the human domain.

➤ **1200-1430 - - RoboDojo drop-in tours available. No registration required.**

1200-1430 – Root Hall – Room 125A/125B

Ms. Kristin Tsolis

RoboDojo -- The RoboDojo is a dynamic innovation space where students, staff, faculty, and friends can come 'tinker' and learn about robot components and systems. The lab is designed to promote informal hands-on learning with open hours and volunteer mentors to help the NPS community learn about: rapid prototyping (e.g. with 3D printers and laser cutters); embedded computing (e.g., with Arduino and Raspberry Pi); basic electronics (e.g., with various electronics and breadboard components); robotic software programming (e.g., for Robot Operating System in Python); and more! The lab also hosts various community-led workshops and offers tools, space, and user support around emerging technologies. The RoboDojo represents a grassroots initiative to promote collaborative and community learning.

➤ **1230-1325**

1230-1325 - Watkins Hall – Room 267

(25)

Dr. Amela Sadagic and Dr. Don Brutzman

MOVES Additive Manufacturing Lab -- Lab tour introduces a range of Additive Manufacturing (AM) research efforts done by MOVES faculty and students. More specifically the visitors will learn about ModelExchange, NavyMakers, and MarineMakers platforms, as well as research efforts focused on cybersecurity applicable to AM and large scale adoption of AM in Naval domain.

1230-1255 – Spanagel Hall – Room 011

(15)

Dr. Emil Kartalov

Advanced Warfighter Technologies Lab -- An applied physics lab with capabilities in microfluidics, micro fabrication, fluorescence microscopy, and biotech. Current projects include research into new insulation material based on microspheres to be used for diver suits, artificial muscles for UUVs, powered exoskeletons and an implantable nitrogen sensor to help avoid caisson disease (the bends) for divers.

1300-1325 – Spanagel Hall – Room 005

(15)

Dr. Frank Narducci and CDR Michael Manicchia

Atom Interferometry Lab -- Future sensors based on atom interferometers are being developed in this lab. These sensors include a dual accelerometer/gyroscope (for GPS denied navigation) and magnetometers (for ASW applications).

➤ 1330-1425

1330-1355 - Spanagel – Room 303

(15)

Dr. George Dinolt, Mr. Carson McAbee and Prof. Ric Romero

Engineering Enclave Maritime Security (EEMS) -- Creating the infrastructure to study the complex behavior in maritime systems. The Engineering Enclave for Maritime Security (EEMS) will provide the Navy with something unavailable anywhere else, insight into the control systems that make global trade possible. One of the largest economic movements of the last century was globalization, which is entirely dependent on the safe navigation of enormous vessels as they traverse the world's oceans delivering goods. In turn, these vessels are critically dependent on computer aided systems that keep them in communication with the shore, chart their course around the globe, and control their engineering systems. A map of the cyber terrain where global trade could be the most vulnerable. EEMS will be used to build an engineering enclave to study the architectures, components, protocols, firmware, and processors that underpin global trade. This lab includes much of the equipment that is on a ships bridge, including Radar, Electronic Chart Display, Voyage Data Recorder, Emergency Position-Indicating Radio Beacon, etc. along with much test equipment, all working.

1330-1355 – Watkins Hall – Room 228E, 237 and 238

(10)

Dr. Claudia Luhrs and Dr. William Wu

Material Characterization Facilities Lab -- Scanning and transmission electron microscopes, X-ray diffraction, thermal analysis and mechanical testing labs.

1400-1425 – Spanagel Hall – Room 003

(10)

Dr. Gamani Karunasiri and Dr. Fabio Alves

Sensor Research Lab -- This lab is used to conduct research on novel sensors for potential military applications. Current research includes bio-inspired directional sound sensor for sniper fire detection and terahertz (THz) imager for detection of concealed objects.

1400-1425 – Watkins Hall – Room 228E, 237 and 238

(10)

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Thursday, 12 APR – Tour Schedule

➤ 0900-0925

0900-0925 – Spanagel Hall – Room (20)
Dr. Jamie MacMahan, LCDR Tucker Freismuth and LCDR Casey Gon

Nearshore Processes Lab -- Field observations of nearshore environment includes the inner shelf, surf zone, beaches, rocky shorelines, rivers, estuaries, and inlets.

0900-0925 – Halligan Hall – Room 101C (20)
Dr. Joseph Klamo and Dr. Young Kwon

Hydrodynamics Lab -- The hydrodynamics lab contains an operational towing tank with a newly-added wave making capability. This lab will showcase an on-going experimental effort to measure the wave-induced loads on a submerged UUV model.

➤ 0930-1025

0930-0955 – Spanagel Hall – Room 038 (15)
Dr. Kevin Smith and Dr. Paul Leary

Undersea Sensing Systems Lab -- This lab contains various oceanographic and acoustic sensors, including advanced acoustic vector sensors, along with two Liquid Robotics Wave Gliders with acoustic modems integrated into tow-bodies. Research conducted in this lab involves studies of networking between autonomous systems, improved tracking and navigation of submerged systems, environmental remote sensing, and employing advanced acoustic sensors for detecting and tracking underwater targets of interest, including marine mammals.

0930-1025 – Watkins Hall – Room 212A (25)
Dr. Amela Sadagic and Mr. Erik Johnson

MOVES Virtual Environments Lab -- Lab tour introduces a range of research efforts done by faculty and students that use Virtual Reality and Augmented Reality technologies, with emphasis on commercial off-the-shelf systems (COTS). Hands-on experiences with different examples of those technologies and prototype systems developed in our lab are also included in the tour.

1000-1025 – Glasgow Hall – Room 128 (20)
CAPT Jeffrey Kline, USN (Ret.) and COL Jeff Appleget, PhD, USA (Ret.)

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