12th Annual
Strategic Multi-Layer Assessment (SMA) Conference

Biographies of Panel Members, Moderators, and Speakers

KEYNOTE SPEAKER

General Paul J. Selva

Gen. Paul J. Selva serves as the 10th Vice Chairman of the Joint Chiefs of Staff. In this capacity, he is a member of the Joint Chiefs of Staff and the nation's second highest-ranking military officer.

General Selva graduated from the U.S. Air Force Academy in 1980, and completed undergraduate pilot training at Reese AFB, Texas. He has held numerous staff positions and has commanded at the squadron, group, wing and headquarter levels. Prior to his current assignment General Selva was the commander of U.S. Transportation Command, Scott AFB, Illinois.

General Selva is a command pilot with more than 3,100 hours in the C-5, C-17A, C-141B, C-37, KC-10, KC-135A and T-37.

EDUCATION

1980 Bachelor of Science in Aeronautical Engineering, U.S. Air Force Academy, Colorado Springs, Colo.
1983 Squadron Officer School, Maxwell AFB, Ala.
1984 Master of Science in Management and Human Relations, Abilene Christian University, Abilene, Texas
1992 Air Command and Staff College, Maxwell AFB, Ala., distinguished graduate
1992 Master of Science in Political Science, Auburn University, Montgomery, Ala.
1996 National Defense Fellow, Secretary of Defense Strategic Studies Group, Rosslyn, Va.

ASSIGNMENTS

1. June 1980 - July 1981, student, undergraduate pilot training, Reese AFB, Texas
2. July 1981 - December 1984, co-pilot and aircraft commander, 917th Air Refueling Squadron, Dyess AFB, Texas
3. January 1984 - December 1988, co-pilot, aircraft commander, instructor pilot, and flight commander, 32nd Air Refueling Squadron, Barksdale AFB, La.
4. January 1989 - July 1991, company grade adviser to Commander, Strategic Air Command, later, manager of offensive aircraft systems and executive officer, Deputy Chief of Staff, Plans and Resources, Headquarters Strategic Air Command, Offutt AFB, Neb.
5. August 1991 - July 1992, student, Air Command and Staff College, Maxwell AFB, Ala.
6. July 1992 - June 1994, instructor pilot and flight commander, 9th Air Refueling Squadron, later, Commander, 722nd Operations Support Squadron, March AFB, Calif.
7. June 1994 - June 1995, Commander, 9th Air Refueling Squadron, later, Deputy Commander, 60th Operations Group, Travis AFB, Calif.
8. July 1995 - June 1996, National Defense Fellow, Secretary of Defense Strategic Studies Group, Rosslyn, Va.
9. July 1996 - August 1998, assistant to the Director, Office of the Secretary of Defense for Net Assessment, the Pentagon, Washington, D.C.
10. August 1998 - July 2000, Commander, 60th Operations Group, Travis AFB, Calif.
11. July 2000 - June 2002, Commander, 62nd Airlift Wing, McChord AFB, Wash.
12. June 2002 - June 2003, Vice Commander, Tanker Airlift Control Center, Scott AFB, Ill.
13. June 2003 - November 2004, Commander, Tanker Airlift Control Center, Scott AFB, Ill.
14. December 2004 - August 2006, Director of Operations, U.S. Transportation Command, Scott AFB, Ill.
15. August 2006 - June 2007, Director, Air Force Strategic Planning, Deputy Chief of Staff for Strategic Plans and Programs, Headquarters U.S. Air Force, Washington, D.C.
16. June 2007 - October 2008, Director, Air Force Strategic Planning, Deputy Chief of Staff for Strategic Plans and Programs, Headquarters U.S. Air Force, and Director, Air Force QDR, Office of the Vice Chief of Staff, Washington, D.C.

17. October 2008 - October 2011, Assistant to the Chairman of the Joint Chiefs of Staff, Washington, D.C.
18. October 2011 - November 2012, Vice Commander, Pacific Air Forces, Joint-Base Pearl Harbor-Hickam, Hawaii
19. November 2012 - May 2014, Commander, Air Mobility Command, Scott AFB, Ill.
20. May 2014 - July 2015, Commander U.S. Transportation Command, Scott AFB, Ill.
21. July 2015 - present, Vice Chairman of the Joint Chiefs of Staff, Washington, D.C.

SUMMARY OF JOINT ASSIGNMENTS
1. September 1996 - August 1998, Assistant to the Director, Office of the Secretary of Defense for Net Assessment, the Pentagon, Washington, D.C., as a lieutenant colonel
2. November 2004 - July 2006, Director of Operations and Logistics, U.S. Transportation Command, Scott AFB, Ill., as a brigadier general
3. October 2008 - October 2011, Assistant to the Chairman of the Joint Chiefs of Staff, Washington, D.C., as a lieutenant general
4. May 2014 - July 2015, Commander U.S. Transportation Command, Scott AFB, Ill.
5. July 2015 - present, Vice Chairman of the Joint Chiefs of Staff, Washington, D.C.

FLIGHT INFORMATION
Rating: command pilot
Hours flown: more than 3,100
Aircraft flown: C-5, C-17A, C-141B, C-37, KC-10, KC-135A and T-37

MAJOR AWARDS AND DECORATIONS

Defense Distinguished Service Medal
Distinguished Service Medal
Defense Superior Service Medal
Legion of Merit with two oak leaf clusters
Defense Meritorious Service Medal
Meritorious Service Medal with three oak leaf clusters
Air Force Commendation Medal
Air Force Achievement Medal
Joint Meritorious Unit Award

Combat Readiness Medal with two oak leaf clusters
National Defense Service Medal with bronze star
Armed Forces Expeditionary Medal with two bronze stars
Southwest Asia Service Medal with bronze star
Global War on Terrorism Service Medal
Armed Forces Service Medal

EFFECTIVE DATES OF PROMOTION
Second Lieutenant May 28, 1980
First Lieutenant May 28, 1982
Captain May 28, 1984
Major Jan. 1, 1990
Lieutenant Colonel March 1, 1994
Colonel Sept. 1, 1998
Brigadier General Jan. 1, 2004
Major General June 2, 2007
Lieutenant General Oct. 8, 2008
General Nov. 29, 2012

(Current as of August 2015)

KEYNOTE SPEAKER

Lieutenant General John N.T. "Jack" Shanahan

Lt Gen John N.T. "Jack" Shanahan is the Director, Joint Artificial Intelligence Center, Office of the Department of Defense Chief Information Officer, the Pentagon, Arlington, Virginia. General Shanahan is responsible for accelerating the delivery of AI-enabled capabilities, scaling the department-wide impact of AI and synchronizing AI activities to expand joint force advantages.

General Shanahan received his commission in 1984 as a distinguished graduate of the ROTC program at the University of Michigan. He has served in a variety of flying, staff and command assignments, most recently as the Director for Defense Intelligence Warfighter Support, Office of the Under Secretary of Defense for Intelligence, the Pentagon, Arlington, Virginia. He was also the Director of the Algorithmic Warfare Cross-Functional Team (Project Maven), where he led the artificial intelligence pathfinder program charged with accelerating integration of big data, machine learning, and artificial intelligence.

General Shanahan also served as the Commander, 25th Air Force, Joint Base San Antonio-Lackland, Texas, where he led 30,000 personnel in worldwide intelligence, surveillance and reconnaissance operations and also served as the Commander of the Service Cryptologic Component. In this capacity he was responsible to the Director, National Security Agency, and Chief, Central Security Service, as the Air Force's sole authority for matters involving the conduct of cryptologic activities, including the spectrum of missions directly related to both tactical warfighting and national-level operations.

EDUCATION
1984 Bachelor of Science degree in chemistry, with distinction, University of Michigan, Ann Arbor
1990 Distinguished graduate, Squadron Officer School, Maxwell AFB, Ala.
1996 Distinguished graduate, Master of Arts degree in national security and strategic studies, College of Naval Command and Staff, Naval War College, Newport, R.I.
2001 Distinguished graduate, Master of Science degree in national security strategy, National War College, Fort Lesley J. McNair, Washington, D.C.
2006 Program for Senior Executive Fellows, John F. Kennedy School of Government, Harvard University, Cambridge, Mass.
2007 Air Force Senior Leadership Course, Center for Creative Leadership, Greensboro, N.C.
2008 Air Force Enterprise Leadership Seminar, Kenan-Flagler Business School, University of North Carolina at Chapel Hill
2010 Joint Force Air Component Commander Course, Maxwell AFB, Ala.
2011 Senior Joint Information Operations Applications Course, Maxwell AFB, Ala.
2013 Joint Flag Officer Warfighting Course, Maxwell AFB, Ala.

ASSIGNMENTS
1. November 1984 - June 1985, student, undergraduate navigator training, 451st Flying Training Squadron, Mather AFB, Calif.
2. June 1985 - June 1986, student, F-4 Operational Training Course, 308th Tactical Fighter Training Squadron, Homestead AFB, Fla.

3. June 1986 - June 1989, F-4E/G instructor weapons system officer, 90th Tactical Fighter Squadron, Clark Air Base, Philippines
4. June 1989 - February 1991, F-4E instructor weapons system officer and standardization and evaluation flight examiner, 334th Tactical Fighter Squadron, Seymour Johnson AFB, N.C.
5. February 1991 - June 1991, student, F-15E Transition Course, 550th Tactical Fighter Training Squadron, Luke AFB, Ariz.
6. July 1991 - July 1993, F-15E instructor weapons system officer and standardization and evaluation flight examiner, 334th Fighter Squadron, Seymour Johnson AFB, N.C.
7. July 1993 - December 1993, student, F-15E USAF Weapons Instructor Course, Nellis AFB, Nev.
8. December 1993 - July 1995, F-15E Chief of Weapons and Tactics, 334th Fighter Squadron, Seymour Johnson AFB, N.C.
9. July 1995 - June 1996, student, College of Naval Command and Staff, Newport, R.I.
10. September 1996 - September 1997, Theater Battle Management Flight Commander, 607th Combat Operations Squadron, Osan Air Base, South Korea
11. September 1997 - October 1998, operations officer, F-15E Division, USAF Weapons School, Nellis AFB, Nev.
12. October 1998 - July 2000, Commander, USAF Weapons School Support Division, Nellis AFB, Nev.
13. August 2000 - June 2001, student, National War College, Washington, D.C.
14. June 2001 - August 2003, Chief, Regional Exercise Branch, Operations Directorate (J3), Headquarters U.S. Pacific Command, Camp Smith, Hawaii
15. December 2003 - May 2005, Commander, 480th Intelligence Group, Langley AFB, Va.
16. May 2005 - August 2007, senior military assistant to the Assistant Secretary of Defense for International Security Affairs, the Pentagon, Arlington, Va.
17. August 2007 - April 2009, Commander, 505th Command and Control Wing, Hurlburt Field, Fla.
18. April 2009 - March 2011, Commander, 55th Wing, Offutt AFB, Neb.
19. March 2011 - April 2013, Deputy Director for Global Operations (J39), Operations Directorate, Joint Staff, the Pentagon, Arlington, Va.
20. April 2013 - June 2013, Special Assistant to the Deputy Chief of Staff for Intelligence, Surveillance and Reconnaissance, Headquarters U.S. Air Force, Arlington, Va.
21. June 2013 - September 2014, Commander, Air Force Intelligence, Surveillance and Reconnaissance Agency, Joint Base San Antonio-Lackland AFB Texas
22. September 2014 - August 2015, Commander, 25th Air Force, Joint Base San Antonio-Lackland Texas
23. August 2015 - April 2017, Director for Defense Intelligence (Warfighter Support), Office of the Under Secretary of Defense for Intelligence, the Pentagon, Arlington, Va.
24. April 2017-December 2018, Director for Defense Intelligence (Warfighter Support) and Director, Algorithmic Warfare Cross-Functional Team (Project Maven), Office of the Under Secretary of Defense for Intelligence, the Pentagon, Arlington, Va.
25. December 2018 - present, Director, Joint Artificial Intelligence Center, Office of the Department of Defense Chief Information Officer, the Pentagon, Arlington, Va.

SUMMARY OF JOINT ASSIGNMENTS
1. June 2001 - August 2003, Chief, Regional Exercise Branch, Operations Directorate (J3), Headquarters
U.S. Pacific Command, Camp Smith, Hawaii, as a lieutenant colonel and colonel
2. May 2005 - August 2007, senior military assistant to the Assistant Secretary of Defense for International Security Affairs, the Pentagon, Arlington, Va., as a colonel
3. March 2011 - April 2013, Deputy Director for Global Operations (J39), Operations Directorate, Joint Staff, the Pentagon, Arlington, Va., as a brigadier general and a major general
4. August 2015 – December 2018, Director for Defense Intelligence (Warfighter Support), the Office of the Under Secretary of Defense for Intelligence, the Pentagon, Arlington, Va., as a lieutenant general
5. December 2018 – present, Director, Joint Artificial Intelligence Center, Office of the Department of Defense Chief Information Officer, the Pentagon, Arlington, Va., as a lieutenant general

BADGES
Master Intelligence Occupational Badge

FLIGHT INFORMATION
Rating: master navigator
Flight hours: more than 2,800
Aircraft flown: F-4D/E/G, F-15E and RC-135

MAJOR AWARDS AND DECORATIONS
Distinguished Service Medal
Defense Superior Service Medal with oak leaf cluster
Legion of Merit with two oak leaf clusters
Defense Meritorious Service Medal
Meritorious Service Medal with two oak leaf clusters
Air Medal
Aerial Achievement Medal with four oak leaf clusters
Air Force Commendation Medal
Combat Readiness Medal with two oak leaf clusters
National Defense Service Medal with bronze star
Southwest Asia Service Medal with bronze star
Global War on Terrorism Service Medal
Korea Defense Service Medal
Kuwait Liberation Medal (government of Kuwait)

(Current as of December 2018)

OTHER ACHIEVEMENTS
1985 Distinguished graduate, undergraduate navigator training
1993 Top academic graduate and outstanding graduate, F-15E Course, U.S. Air Force Weapons School, Nellis AFB, Nev.
1994 Warrior of the Year, 4th Wing, Seymour Johnson AFB, N.C.
1996 Co-winner, Chairman of the Joint Chiefs of Staff essay contest
1999 Outstanding Instructor Weapons System Officer, F-15E Div., U.S. Air Force Weapons School, Nellis AFB, Nev.
2000 Outstanding Academic Instructor, F-15E Division, U.S. Air Force Weapons School, Nellis AFB, Nev.
2001 Commandant's Award for Excellence in Writing, National War College

EFFECTIVE DATES OF PROMOTION
Second Lieutenant Sept. 2, 1984
First Lieutenant Sept. 2, 1986
Captain Sept. 2, 1988
Major Dec. 1, 1995
Lieutenant Colonel Sept. 1, 1998
Colonel July 1, 2003
Brigadier General June 26, 2009
Major General Sept. 14, 2012
Lieutenant General Aug. 11, 2015

INVITED SPEAKER

Joint Staff/J39

INVITED SPEAKER

Dr. Charles W. Perkins

Dr. Perkins serves as Principal Deputy for Emerging Capability & Prototyping in the office of the Assistant Secretary of Defense for Research and Engineering (ASD(R&E)). Previously he served as the Principal Deputy to the DASD (EC&P). In addition to his responsibilities for oversight and direction of EC&P programs and activities, Dr. Perkins also serves as a member of the OSD Special Program for Missile Defeat, as an advisor to the OSD Strategic Capabilities Office and chairs the Joint Special Operation Command Science and Technology Task Force (JSTTF). Dr. Perkins also serves on a number of DoD and Intelligence Community committees.

Prior to his current assignment, Dr. Perkins served as the Technical Advisor to the Director of Mission Integration Directorate of the National Reconnaissance Office. He was detailed to this position from EC&P. In that position, he provided advice pertaining to solving intelligence problems posed by the Combatant Commands, National Intelligence Managers and other members of the military, US Government agencies and other members of the Intelligence Community.

Prior to Oct 2010, Dr. Perkins was the Director of Complex Systems (CS) in the Rapid Fielding Directorate (now EC&P). CS was responsible for speeding the introduction of new technology and concepts into the hands of warfighters and achieving this innovation in a sustainable manner so that these advanced capabilities could endure. Dr. Perkins was responsible for a number of programs to achieve these goals including the Joint Capabilities Technology Demonstration (JCTD) program, the Comparative Technology program, the Program Integration Office (PIO) and the Technology Integration Office (TIO). Dr. Perkins joined this organization in April 1994.

Prior to joining the Government, Dr. Perkins served various positions in industry including a Senior Technical Advisor at SRI International in Menlo Park, California, Vice President for Technology for SWL Inc., and Vice President and Director of the Special Projects Division of General Research Corporation.

From 1964 to 1966, he served as a First Lieutenant in the U.S. Army at the White Sands Missile Range in New Mexico. There he was a missile flight safety officer and chief of a section providing real-time computing support to the range.

Dr. Perkins holds Doctor of Science (1964) and Masters (1960) degrees from the Massachusetts Institute of Technology in Aeronautics and Astronautics and a Bachelor of Aeronautical and Astronautical Engineering degree from Rensselaer Polytechnic Institute (1959). He is a member of Tau Beta Pi, Sigma Gamma Tau, and Sigma Xi honorary societies and holds two U.S. Patents.

CONFERENCE COORDINATOR

LTC Anthony Gibbs

LTC Anthony Gibbs, a native of Davisville, Missouri, received his commission as an Infantry Officer through the Reserve Officer Training Corps in May, 1997. In his first assignment, he served as a Rifle Platoon Leader and Battalion Adjutant in 1st Battalion, 8th Infantry Regiment (Mechanized), at Fort Carson, Colorado. He was subsequently assigned to the 172d Infantry Brigade (Separate), Fort Wainwright, Alaska, where he served as the Assistant Plans Officer. LTC Gibbs then moved to Fort Richardson, Alaska, where he commanded A Company and Headquarters and Headquarters Company, Task Force 1-501 Airborne (Geronimo). While the A Company Commander, he deployed in support of Operation Enduring Freedom, leading his company through ten months of combat operations in Khowst Province, Afghanistan. Following Company Command, LTC Gibbs served as an Infantry Branch Career Manager at the Army Human Resources Command, Alexandria, Virginia, responsible for professional development and assignments for all Senior (post-company command) Infantry Captains.

In 2009, LTC Gibbs transitioned into the Army Acquisition Corps. He was initially assigned as a Contingency Contracting Officer with the 632nd Contingency Contracting Team at Fort Knox, Kentucky, again deploying in support of Operation Enduring Freedom. He also served as the Operations Officer for the 904th Contingency Contracting Battalion and Mission Contracting Office – Fort Knox. In 2012, LTC Gibbs moved to Warren, Michigan where he served as Assistant Product Manager, Self-Propelled Howitzer Systems and as Executive Officer for Program Executive Office, Ground Combat Systems. In 2014, he transitioned to Program Executive Office Combat Support and Combat Service Support, where he served as a Product Director in Joint Project Office, Joint Light Tactical Vehicles. From July 2015 through July 2017, LTC Gibbs served as Product Manager, Guided Precision Munitions and Mortar Systems at Picatinny Arsenal, New Jersey, responsible for life cycle management of mortar weapons and fire control systems, as well as precision munitions to include the Precision Guidance Kit for 155mm artillery, the Accelerated Precision Mortar Initiative, and the High Explosive Guided Mortar. He currently serves on the Joint Staff as the Program Support Division Chief, J-39 Deputy Director for Global Operations.

LTC Gibbs is a graduate of the Infantry Officer Basic Course, Infantry Captain's Career Course, Combined Arms Services Staff School, Airborne School, Ranger School, Jumpmaster School, the Bradley Leader's Course, and Army Intermediate Level Education. His awards include the Bronze Star Medal, Defense Meritorious Service Medal, Meritorious Service Medal with 6 Oak Leaf Clusters, Army Commendation Medal with 1 Oak Leaf Cluster, Army Achievement Medal with 3 Oak Leaf Clusters, the Combat Infantryman Badge, Expert Infantryman Badge, and Senior Parachutist Badge.

LTC Gibbs is a graduate of the University of Missouri-Rolla in Rolla, Missouri, where he earned a Bachelor of Science degree in Mechanical Engineering. He also holds a Master of Business Administration from the Naval Postgraduate School in Monterey, California, and a Master of Science in National Resource Strategy from the Dwight D. Eisenhower School for National Security and Resource Strategy, Fort McNair, Washington, DC.

CONFERENCE COORDINATOR

Ms. Gia Harrigan

Gia Harrigan is currently employed by the Department of Homeland Security, Science and Technology Directorate and serves as the Program Manager for DHS Centers of Excellence. Ms. Harrigan is on-site at the Naval War College, War Gaming Department and supports Homeland Security/ Homeland Defense activities. Prior to joining DHS, Ms. Harrigan served as Science Advisor at the CNO Executive Panel in Washington, DC. She began government service at the Naval Undersea Warfare Center Division, Newport, Rhode Island and has led strategic initiatives for organizational transformation, in the areas of Technology Insertion Strategies, Business War Gaming, Balanced Scorecard, and Knowledge Management.

Ms. Harrigan has completed an Advanced Studies Program in System Dynamics at the Massachusetts Institute of Technology. She has a Master of Business Administration degree from the University of Rhode Island and an undergraduate degree in Mathematics from Boston College.

Panelists and Moderators

Collin A. Agee

Collin Agee became the Senior Army Operations Advisor to the NGA in July 2017. Prior to his current assignment, he served as the Army Intelligence Senior Advisor for IC Engagement for six years, following two years as the Deputy for NGA's Future Warfare Systems Office. In 2008, he served as Deputy CJ2 Forward, the senior military intelligence officer in the US Embassy Baghdad and the Green Zone, where his duties included providing intelligence to the MNF-I staff and Strategic Intelligence Engagement with the Iraqi intelligence services and senior Iraqi officials. He was the Army's Director for ISR Integration for two years, highlighted by the Actionable Intelligence Initiative and numerous intelligence Quick Reaction Capabilities in support of OIF and OEF, most notably Constant Hawk, which redefined Wide Area Persistent Surveillance. This followed four years as a contractor for Booz Allen Hamilton in support of the Army G-2 as a member of Task Force Actionable Intelligence, the US Army G2 ISR Integration Directorate and the Army Intelligence Master Plan (AIMP), where he was a co-author of the Army Intelligence Transformation Campaign Plan (AI-TCP). He served over 20 years as an Army Intelligence Officer, with assignments including J2 Operations for US forces in Haiti, XVIII Airborne Corps ACE Chief, and Senior Intelligence Officer (G2) of the 10th Mountain Division. He commanded Headquarters Company, 125th MI Battalion, Schofield Barracks, Hawaii and the Los Angeles Recruiting Battalion.

Mr. Agee has a Masters in Military Arts and Science from the School for Advance Military Studies (SAMS), a BS in National Security and Public Affairs from the US Military Academy at West Point and is a graduate of the Post Graduate Intelligence Program (PGIP). Mr. Agee is co-chairof the Geospatial Training, Tradecraft and Professional Development Subcommittee (GT2PDS) for the Geospatial Functional Manager. He is the US lead for the US Army,-French Army Intelligence Working Group. In his last assignment, he was a charter member of the Intelligence Community Senior Studies Group (ICSSG) and Intelligence Community Transparency Working Group (ICTWG); and is a member of the Special Multi-Layer Assessment (SMA) program, the Armed Forces Communications and Electronics Association's (AFCEA) Intelligence Committee; the US Technology Leadership Council (USTLC) and a high school and collegiate umpire as a member of the Northern Virginia Baseball Umpires Association (NVBUA).

Fergus Anderson

Dr. Allison Astorino-Courtois

Dr. Allison Astorino-Courtois is Executive Vice President at NSI, Inc. She has also served as co-chair of a National Academy of Sciences study on Strategic Deterrence Military Capabilities in the 21st Century, and as a primary author on a study of the Defense and Protection of US Space Assets. Dr. Astorino-Courtois has served as technical lead on a variety of rapid turn-around, Joint Staff-directed Strategic Multi-layer Assessment (SMA) projects in support of US forces and Combatant Commands. These include assessments of key drivers of political, economic and social instability and areas of resilience in South Asia; development of an analytic approach used to identify PACOM requirements for humanitarian support in a Megacity (case study: Dhaka, Bangladesh); development of a methodology for conducting provincial assessments for the ISAF Joint Command; production of a "rich contextual understanding" (RCU) to supplement intelligence reporting for the ISAF J2 and Commander; projects for USSTRATCOM on deterrence assessment methods; and, work for USSOCOM on operationalizing its "gray zone" concept.

Previously, Dr. Astorino-Courtois was a Senior Analyst at SAIC (2004-2007) where she served as a STRATCOM liaison to U.S. and international academic and business communities. Prior to that Dr. Astorino-Courtois was a tenured Associate Professor of International Relations at Texas A&M University in College Station, TX (1994-2003) where her research focused on the cognitive aspects of political decision making and how to "market" peaceful conflict resolution to adversarial actors. She has received a number of academic grants and awards and has published articles in multiple peer-reviewed journals. She has also taught at Creighton University and as a visiting instructor at the U.S. Military Academy at West Point. Dr. Astorino-Courtois earned her Ph.D. in International Relations and MA in and Research Methods from New York University. Her BA is in political science from Boston College. Finally, Dr. Astorino-Courtois also has the distinction of having been awarded both a US Navy Meritorious Service Award and a US Army Commander's Award.

Dr. Fotis Barlos

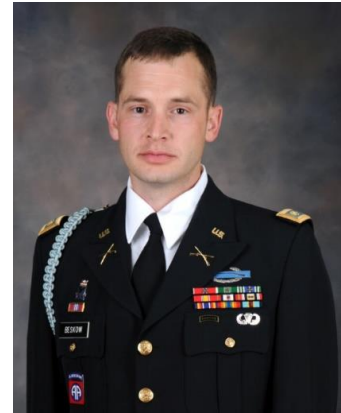**Louise Barton**

AMB Erica Barks-Ruggles

CAPT R. Bremseth

Lieutenant Colonel David M. Beskow

Lieutenant Colonel David M. Beskow is a US Army Operations Research and Systems Analyst. He is currently a Doctoral Candidate in the Societal Computing Program at Carnegie Mellon University in Pittsburgh, Pennsylvania, where his research focuses on developing machine learning algorithms to detect social media bots and characterize the disinformation campaigns they inhabit.

LTC Beskow was commissioned in 2001 from the United States Military Academy at West Point, New York. In 2002 he was assigned to the 82nd Airborne Division, where he served as a Rifle Platoon Leader, Rifle Executive Officer, and Headquarters and Headquarters Company Executive Officer. Major Beskow deployed to Afghanistan in 2003 and Iraq in 2004 with the 82nd Airborne Division. After attending the Infantry Captain Career Course in 2005, he was assigned to the Infantry Officer Basic Course at Fort Benning, Georgia, where he served as a platoon trainer for five classes of Infantry 2nd Lieutenants. Upon assignment to Fort Hood, Texas, Major Beskow served as an Assistant Operations Officer in 1st Special Troops Battalion. After returning to Iraq in 2008, he served on the Brigade Infrastructure Coordination where he assisted in overseeing $100 million dollars of infrastructure improvement projects in Southern Baghdad. While deployed, Major Beskow assumed command of Bravo Company, 1-66 Armor Battalion, supervising battle space in the Eastern Baghdad regions of Fedaliyah and Kamaliyah (containing a combined Iraqi population of 200,000 people). While under his command, Bravo Company assisted in rebuilding security and governance following the Shia uprising in the Spring of 2008.

In 2011 he was assigned to the Systems Engineering Department at West Point where he served as an Instructor, Assistant Professor, and Analyst. While assigned there, he taught classes in Operations Research Modeling as well as Small Unit Leadership. He has assisted in numerous research projects for the Department of Defense, including modeling stability/peace, portfolio optimization with open source microfinance data, geospatial modeling, installation services cost modeling, and process improvement.

In 2015 he was assigned to the US Army Intelligence and Security Command, where he assisted in incorporating data science into intelligence workflows. While there he stood up the first data science course for Open Source Intelligence Analysts and assisted in other data science efforts that supported insider threat security operations, human intelligence operations, as well as other intelligence projects.

Lieutenant Colonel David Beskow is a graduate of Ranger School, Airborne School, Sniper Employment Course and the Stryker Leader's Course. He graduated from the Infantry Captain's Career Course in December 2005 and from Command and General Staff College in August 2014. He holds a Bachelors of Science Degree in Civil Engineering from the United States Military Academy and a Master of Science in Operations Research from the Naval Postgraduate School.
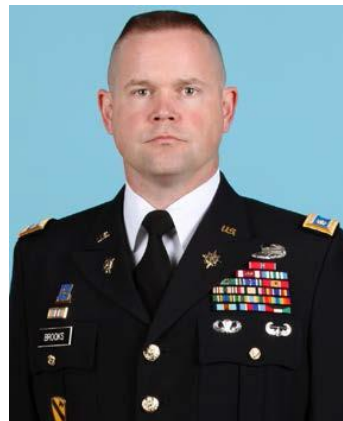
Dr. Jill Brandenberger

COL Paul "Tim" Brooks

COL Paul "Tim" Brooks was born and raised in Syracuse, New York. He received his Bachelors of Arts from the University of Notre Dame in May 1990. In March 2004, he earned a Masters of Science degree in Information Operations from the Naval Post Graduate School in Monterey, California.

In May of 1990 he was commissioned through the Reserve Officer Training Corps program as a 2LT in the Armor Corps and was assigned to Germany where he served as a tank platoon leader, tank company XO and Headquarters and Headquarters Company XO with the 2nd Armored Cavalry Regiment and the 2nd Battalion, 37th Armored Regiment, 3rd Infantry Division.

COL Brooks transitioned to the Military Intelligence Corps in 1994 and was posted to Fort Campbell, KY where he served in a variety of intelligence positions including Battalion and Brigade S-2 as well as Direct Support Military Intelligence Company Commander in the 101st Airborne Division (Air Assault). After command COL Brooks was reassigned to the Battle Command Training Program in Fort Leavenworth, KS, where he had the opportunity to work with Army National Guard units throughout the U.S. to develop their staff skills and procedures.

Following his promotion and selection as an IO Officer, he was reassigned to Camp Red Cloud, Korea, as the 2nd Infantry Division's IO Officer for 15 months. Upon returning from Korea, COL Brooks was assigned to the 1st Cavalry Division in Ft Hood, TX where he served as the Effects Coordinator for the 3rd "Greywolf" Brigade, the Secretary to the General Staff and the Division G-7. While assigned to the division he deployed to Iraq twice from 2006 to 2008 and later from 2009 to 2010, serving in IO leadership positions during both tours.
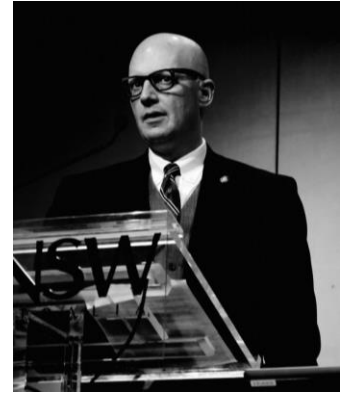
Upon completion of his tour with the 1st Cavalry Division, COL Brooks was assigned as the IO Plans and Policy Lead for NATO International Military Staff focusing on enabling committees and working groups tasked with developing various Alliance policies and doctrine. In JUL 14, upon promotion and completion of the U.S. Army War College, COL Brooks was assigned as the G-7, 8th Army in Yongsan, Korea. His duties included coordinating IO activities and strategic communications for the command.

COL Brooks returned to the U.S. in JUL 16 and was assigned as the Mission Assurance Division Chief, Department of the Army Management Office – Cyber, HQDA G-3. He was responsible for the development of cyber vulnerability assessment programs for critical weapon systems as well as installations. COL Brooks was subsequently assigned to his current position as the Chief, Communication Strategy Analysis Division, Joint Staff, J-39 where he is responsible for supporting the CJCS's role as global integrator in the development and synchronization of military messaging guidance for the Joint Force.

Col Shawn Budd

Dr. Robert E. Burnett

R.E. Burnett, Ph.D., is Interim Dean of Faculty and Academics and Professor of International Security Studies at National Defense University. He is an analyst and theoretician in the field of emerging technologies who has been a featured speaker and researcher to the National Intelligence Council's RDAWG science and technology committee. In 2018, Dr. Burnett was a plenary speaker on Artificial Intelligence to the NATO Center for Excellence at CYCON X in Tallinn, Estonia and in 2015, Dr. Burnett was invited by the Australian Department of Defence's Defence Science and Technology Organization (DST) to give the Keynote Lecture on Humans and Autonomous Systems to the Emerging Disruptive Technologies Assessment Symposium at the University of New South Wales in Sydney, Australia. His recent publications include a chapter on UAVs and ubiquitous networks in Command and Control: Tools, Systems, and New Dimensions, Lexington/Rowan Books and his work on the evolution of human-machine symbiosis for advanced situational awareness in intelligence and combat spaces was featured in two separate issues of the IEEE Technology & Society Magazine and Homeland Security Review. He has a forthcoming publication on the legacy of the Eisenhower "military-industrial complex" speech that will appear in the French Language in Politique Americaine in 2019. Also, in 2019, he has a contributing chapter on human-machine symbiosis in conflict and war that will be published in the SMA/CENTCOM/DHS series on the Third Offset.

Dr. Burnett has conducted research and analysis for the National Intelligence Council, the Institute for Defense Analyses, the Joint Military Intelligence College, and the Homeland Security and National Defense Education Consortium. He has also been an active defense community expert in the UAV policy community through the IEEE society in the United States and Australia. Dr. Burnett has previously been professor at Virginia Military Institute (2005-2013), where he was also Director of the Science and National Security Program in Washington, DC. He was also Director of the VMI-National Defense University of Hungary International Exchange Seminar in Budapest, in which he has taught for the last seven summers. In 2003, at VMI, he held the Moody-Northen Endowed Chair in Economics and was also the 2007 & 2009 winner of the Hinman Award for Excellence in Research. From 2000 to 2005, Dr. Burnett was Associate Professor of Integrated Science & Technology at James Madison University, where he was awarded the Most Captivating Lecturer Award in 2005. From 1993 to 2000 he was Assistant Director and Assistant Professor of the Patterson School of Diplomacy & International Commerce. He holds a Ph.D. in Political Science (Outside Field -Philosophy) from the University of Missouri and an M.A. in International Affairs from the Elliot School of International Affairs at The George Washington University.

Ms. Sarah A. Canna

Ms. Sarah A. Canna is a Principal Analyst at NSI. In this capacity, Ms. Canna applies her open source analysis skills to regions of vital concern to US Combatant Commands, particularly the Middle East and South Asia. To help military planners understand the complex socio-cultural dynamics at play in evolving conflict situations, Ms. Canna developed a Virtual Think Tank (ViTTa) tool, which is designed to rapidly respond to emergent crises by pulsing NSI's extensive subject matter expert (SME) network to provide deep, customized, multidisciplinary analysis for defense and industry clients. This tool has been used to study the so-called Islamic State as well as Eurasian cooperation and conflict. Ms. Canna is also a lead editor and integrator of white papers, reports, and proceedings focused on violent extremism, influence and deterrence, and adversarial intent. Ms. Canna also supported durability analyses using the NSI State Stability (StaM) model for Afghanistan, Pakistan, Nigeria, and (at the megacity level) Dhaka, Bangladesh.

Prior to joining NSI, she was an associate within the Social Science Program at Strategic Analysis, Inc. (SA), where she supported multidisciplinary projects ranging from developing and assessing computational social science models, evaluating state instability forecast models, and developing cultural aptitude taxonomies. Additionally, Ms. Canna provided analytic support to the Defense Science Board (DSB) 2008 task force on Understanding Adversaries, the 2007 DSB summer study on Challenges to Military Operations in Support of US Interests, and the 2006 DSB summer study on 21st Century Strategic Technology Vectors. Prior to joining SA, she was a research associate at Intellibridge Corporation in Washington, D.C. where she provided daily open source analysis to the Commander, US Southern Command and the Commandant, US Coast Guard. She also managed a network of 200-plus subject matter experts, upon whose knowledge Intellibridge analysts relied. Ms. Canna has a MA degree from Georgetown University in Technology and Security Studies. Ms. Canna holds a translation certificate in Spanish from American University and is learning Dari.

Dr. Kathleen M. Carley

Experience Dr. Carley is a Professor of Computer Science in the Institute for Software Research, IEEE Fellow, and Director of the Center for Computational Analysis of Social and Organizational Systems at Carnegie Mellon University. She joined Carnegie Mellon in 1984 as Assistant Professor Sociology and Information Systems. In 1990 she became Associate Professor of Sociology and Organizations, in 1998 Professor of Sociology, Organizations, and Information Technology, and in 2002, attained her current role as Professor of Computation, Organization, and Society. She is also the CEO of Carley Technologies Inc. aka Netanomics.

Dr. Carley's research combines cognitive science, sociology, and computer science to address complex social and organizational issues. Her most notable research contribution was the establishment of Dynamic Network Analysis (DNA) – and the associated theory and methodology for examining large high-dimensional time variant networks. Her research on DNA has resulted in tools for analyzing large-scale dynamic networks and various multi-agent simulation systems. Her group has developed tools for extracting sentiment, social and semantic networks from social media and other textual data (AutoMap), simulating epidemiological models (BioWar), simulating covert networks (DyNet), and simulating changes in beliefs and practice given information campaigns (Construct). Her ORA system is one of the premier network analysis and visualization engines supporting geo-temporal analysis of social network and meta-network data. It is used worldwide and at several of the combatant commands. Illustrative projects include assessment of IRS outreach activities, assessment of impact of NextGen on airline re-rerouting, counter-terrorism modeling, counter-narcotics modeling, assessment of design of public-health departments, mapping the global cyber-attack network, and social media based assessment of crises such as Benghazi, Darfur, and the Arab Spring.

Education Dr. Carley received SB degrees in Economics and in Political Science from M.I.T., and a PhD degree in Sociology from Harvard University.

Publications Among Dr. Carley's many scientific publications, she co-authored papers "Exploring Characteristics of Suspended Users and Network Stability on Twitter" (2016), "Transition Networks in a Cohort of Patients with Congestive Heart Failure" (2015), "Remote assessment of countries' nuclear, biological, and cyber capabilities: joint motivation and latent capability approach" (2015), "Destabilizing Terrorist Networks" (2003), "The Impact of US Cyber Policies on Cyber-Attacks Trend" (2016), "Rapid Modeling and Analyzing Networks Extracted from Pre-Structured News Articles" (2012), "An Incremental Algorithm for Updating Betweenness Centrality and k-Betweenness Centrality and Its Performance on Realistic Dynamic Social Network Data" (2015).

Honors Dr. Carley is an IEEE Fellow. She is the recipient of the Allen Newell award for research excellence. She has served as President of the North American Association for Computational and Organizational Simulation (2003-2004) and of the Mathematical Sociology Section of the American Sociological Association (1999-2000). She received the Lifetime Achievement Award from the Sociology and Computers Section of the ASA (2001). In 2011 she received the Simmel Award for advances in the area of social networks from INSNA and became a senior member of the IEEE. She has served as a Task Force Member of the Defense Science Board and of Geographic Information Science Panel of the Strategic Command. She has served on a committee and several panels of the National Research Council including ones on the military, big data, and geo-spatial analytics and was a member of the DHS-HSSTAC.

Dr. William D. Casebeer

William D. Casebeer, PhD (USAF LTCOL, RET.) is the Senior Research Area Manager in Human Systems and Autonomy for Lockheed Martin Advanced Technology Laboratories. He has a decade of experience in program management and leading teams of scientists and engineers in multiple settings.

Before ATL, Bill was a DARPA PM in the Defense Sciences Office and the Biological Technologies Office, where he started the Narrative Networks and Low-Cost EEG programs, and led the Accelerated Learning, Education Dominance, Strategic Social Interaction Modules, Young Faculty Award and other programs. His last command position was as Deputy Director of the Technology Advancement and Warfighter Training Department for the 500-person Joint Warfare Analysis Center (a DoD modeling and simulation unit), and he has multiple tours with deployed time as an intelligence officer. He has a joint PhD in Cognitive Science and Philosophy from UC-San Diego, MA in National Security Affairs from the Naval Postgraduate School, MA in Philosophy from the University of Arizona and a BS in Political Science from the USAF Academy. Publications include an *MIT Press* neural network and ethics book (here), a neuroethics article in *Nature Reviews Neuroscience* (here), and a book on violent non-state actors (here).

Dr. Vincent P. Clark

Dr. Vincent P. Clark is Director of the Psychology Clinical Neuroscience Center and a Professor of Psychology and Neuroscience at the University of New Mexico, and is the former Scientific Director and currently Professor of Translational Neuroscience at the Mind Research Network. Dr. Clark uses neuroimaging (EEG, MEG, sMRI, fMRI, DTI/DSI and MRS) and neurostimulation (electrical, magnetic, light, and ultrasound) to examine neural mechanisms of attention, perception, and memory. His 97 publications examine the use of neuroimaging and neurostimulation for the study of healthy humans, diagnosis and treatment of neurological and psychiatric disorders, and for the development of new technologies for cognitive enhancement in healthy volunteers, including neurostimulation guided using neuroimaging, mindfulness, and other techniques. His research in neuroimaging and brain stimulation has been supported by DARPA, ARL, NRL and AFRL, along with DOE, IARPA, NIH, NSF and private foundations, and has been described in print, online and on TV, including *Nature, Science, The New York Times, The New Yorker, Forbes, NPR, BBC, ABC Nightline*, *SmartDrugSmarts* and other media outlets in the US and internationally. He has chaired a number of scientific meetings and has helped to organize 20 different courses and seminars on cognitive neuroscience in the US, Canada, Asia, Australia, and Europe. He is also founder and Chair of the Brain Stimulation and Imaging Meeting (BrainSTIM, http://brainstim-meeting.org), with its 5th annual meeting scheduled for June 2019 in Rome.

Dr. Douglas Derrick

Dr. Diane DiEuliis

Dr. Diane DiEuliis is a Senior Research fellow at National Defense University. Her research areas focus on emerging biological technologies, biodefense, and preparedness for biothreats. Dr. DiEuliis also studies issues related to dual use research, disaster recovery research, and behavioral, cognitive, and social science as it relates to important aspects of deterrence and preparedness.

Prior to joining NDU, Dr. DiEuliis was the Deputy Director for Policy, (and served as Acting Deputy Assistant Secretary for Policy and Planning) in the Office of the Assistant Secretary for Preparedness and Response (ASPR), U.S. Department of Health and Human Services. While there, she coordinated policy in support of domestic and international health emergency preparedness and response activities, including implementation of the Pandemic All-Hazards Preparedness Act, the National Health Security Strategy, and the Public Health Emergency Medical Countermeasures Enterprise (PHEMCE).

From to 2007 to 2011, Dr. DiEuliis was the Assistant Director for Life Sciences and Behavioral and Social Sciences in the Office of Science and Technology Policy (OSTP) in the Executive Office of the President. During her tenure at the White House, she was responsible for developing policy in areas such as biosecurity, synthetic biology, social and behavioral science, scientific collections, ethics, STEM education, and biotechnology. Dr. DiEuliis also worked to help coordinate agency response to public health issues such as the H1N1 flu.
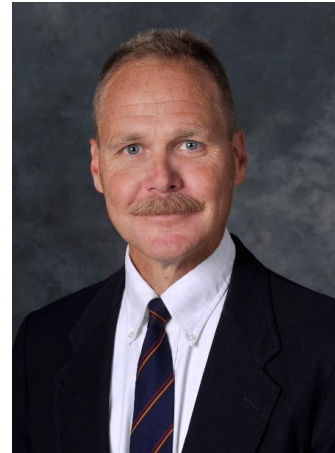
Prior to working at OSTP, Dr. DiEuliis was a program director at the National Institutes of Health (NIH), where she managed a diverse portfolio of neuroscience research in neurodegenerative diseases. She completed a fellowship at the University of Pennsylvania in the Center for Neurodegenerative Disease Research, and completed her postdoctoral research in the NIH Intramural research program, where she focused on cellular and molecular neuroscience. Dr. DiEuliis has a Ph.D. in biology from the University of Delaware, in Newark, Delaware.

Areas of Expertise: Biodefense; Biosecurity; Deterrence (Neuroscience & Neurobiology); Emergency Management; Ethics & Leadership (Life Sciences/Human Subjects); WMD Preparedness/Response

Dr. David Dorondo

David R. Dorondo earned the degree of B.A. cum laude in history from Armstrong State College in 1980 and the M.A. in German and European diplomatic history from the University of South Carolina in 1984. From 1984 to 1987, he was a member of St. Antony's College, Oxford and was admitted to the degree of D.Phil. from the University of Oxford in 1988. He earned a Fulbright Fellowship to attend the Otto-Friedrich-Universität Bamberg in the Federal Republic of Germany for the academic year 1985-1986, having already spent the year 1981-1982 at the same institution as a graduate exchange student. Since 1987, he has served as a member of the Department of History of Western Carolina University and teaches both graduate and undergraduate courses in modern European military and political history and the history of international relations. His most recent publications is "The US Army, the Nuclear Posture Review, and Nuclear Deterrence: A European Historical Context."

Dr. Dorondo is a member of US Strategic Command's Deterrence and Assurance Academic Alliance; the Society for Military History; the Association of the US Army; and the US Army Historical Foundation. He serves on the Executive Council and the Brewster Award Committee of the North Carolina Association of Historians. From 2013 to 2016, he served as Creighton Sossoman Professor of History at Western Carolina University. He received WCU's Last Lecture Award for teaching in 2011-2012 and the College of Arts and Sciences Teaching Award for the year 2000-2001. Since 2000 he has served as Faculty Advisor to the Pi Psi Chapter of Phi Alpha Theta History Honor Society. In 1996 he received the Medal of Scholarship from Pi Gamma Mu International Honor Society in Social Sciences. He founded and moderates The Carolina Round Table on the World Wars and co-founded and co-moderates WCU's Global Spotlight Series on International Affairs. An avid horseman and hiker, he lives below Flat Gap in the Cowee Mountains of Jackson County, North Carolina.

Lt General (Ret) Robert Elder, D.Engr

Lt General Robert Elder (USAF, retired) joined the George Mason University faculty as a research professor with the Volgenau School of Engineering following his retirement from military service as the Commander of 8th Air Force and U.S. Strategic Command's Global Strike Component.

He currently conducts research in the areas of command and control, deterrence, escalation control, competition short of armed conflict, crisis management, and international actor decision-making. General Elder served as the Central Command Air Forces Deputy Commander for Operation Enduring Freedom, Air Operations Center Commander and Deputy Air Component Commander for Operation Iraqi Freedom, and Commandant of the Air War College. He was the first commander of Air Force Network Operations and led the development of the cyberspace mission for the Air Force. He received his Doctorate in Engineering from the University of Detroit.

Dr. Dana Eyre

Dana Eyre PhD is a sociologist specializing in the analysis, planning, and evaluation of social change and strategic communications campaigns. He is currently Director of Design, Studies and Evaluation and Penior Social Scientist for System of Systems Analytics (SOSACorp). Recently he lead the Model Enhanced Analysis, Design, and Execution program for ASD-SOLIC's Combatting Terrorism Technology Support Office. Prior to joining SOSA, he was an independent consultant, working a number of strategic communications campaigns for multiple clients, including the US and UK governments, and the UN. He served as senior consultant to SIGIR, guiding the writing of the SIGIR report "Hard Lessons" and was a Jennings-Randolph Fellowship at USIP where he studied coalition democratization and social change efforts in Iraq. Prior to that he was a Senior Advisor for the US Agency for International Development Iraq reconstruction effort, including 17 months service with the USAID Mission in Iraq. In Kosovo he served as senior policy advisor to the Deputy Special Representative of the Secretary General (European Union – Economic Development), as well as Deputy Head of UNMIK's Economic Policy Office. He has also served in Bosnia-Herzegovina as part of the Civil-Military Task Force within the NATO Stabilization Force. He holds a PhD in sociology from Stanford University and has been on the faculty of the US Naval Postgraduate School (Department of National Security Affairs), George Mason University (Program on Peace Operations Policy), the United States Military Academy (West Point) (Department of Behavioral Sciences and Leadership), and the Lester B. Pearson Canadian International Peacekeeping Training Center.

Adam Fields

Lieutenant Colonel Christopher D. Forrest

Lieutenant Colonel Christopher D. Forrest is an Active Duty Air Force A-10C fighter pilot and Airpower Strategist, serving as the Division Chief of Air Force Checkmate's Indo-Pacific Division. Air Force Checkmate directly serves the Air Force Deputy Chief of Staff for Operations and the Chief of Staff of the Air Force with operational strategy and best military advice on current and near-term future operations. His portfolio entails assessment, operational planning support, innovation, and clean-sheet strategy and concepts for the China and North Korea problem sets. His recent work involves a deep-dive project on Great Power competition and China competitive strategy.

Prior to his assignment to Air Force Checkmate in 2018, Lt Col Forrest served as the Chief of Strategy and Plans and Chief of Targeting in the 613th Air Operations Center, HQ Pacific Air Forces, Oahu Hawaii. In his role as Chief of Strategy and Plans in the Strategy Division of the Air Operations Center, Lt Col Forrest conducted operational planning, CONOP development, and strategy directly for the Commander, Pacific Air Forces, and Theater Joint Force Air Component Commander to CDRUSINDOPACOM. In his role as Chief of Targeting, Lt Col Forrest was responsible for targeting strategy and operational planning for INDOPACOM operational plans in crisis and contingency. Prior to assignment in Hawaii, Lt Col Forrest served in various roles and locations as an A-10C combat fighter pilot, to include leadership positions as Director of Operations for the 455th Expeditionary Operations Support Squadron, Bagram Air Base Afghanistan, and Chief A-10C Evaluator and Instructor Pilot at the 23rd Fighter Group, Moody Air Force Base Georgia. In addition to his roles and assignments in the A-10C, Lt Col Forrest completed multiple tours as an Instructor Pilot in the T-38C as a lead instructor and initial cadre for the Air Force Introduction to Fighter Fundamentals course at Randolph Air Force Base Texas. He is a Command fighter pilot with over 3000 hours and multiple combat deployments to the Middle East.

He holds a Masters in International Relations from the Fletcher School of Law and Diplomacy, Tufts University, and a Bachelor of Science in Political Science as a Distinguished Graduate of the US Air Force Academy. Additionally, Lt Col Forrest earned advanced certificates in Nuclear Policy and Nuclear Surety from the Defense Nuclear Weapons School (Defense Threat Reduction Agency), is an alumni Fellow at the National Defense University's Center for the Study of Weapons of Mass Destruction (Program for Emerging Leaders) and is a 2014 White House Fellowship Program Regional Finalist. He has completed multiple Fellowships for the Chief of Staff of the Air Force, to include DARPA's Service Chiefs Fellows Program and Johns Hopkins School of Advanced International Studies summer fellowship on China competitive strategy. He is a published author in multiple peer reviewed journals, most recently publishing in Joint Forces Quarterly on new Strategic Shaping concepts for deterrence and escalation control. He and his family live in the National Capital Region.

CAPT Geoffrey Gage

Captain Geoffrey "Strain" Gage currently serves as Deputy Director of Strategy on the Navy staff, OPNAV N50B. A career naval aviator with over 4,500 flight hours and 688 arrested landings during training and combat, he has flown in support of Operations DENY FLIGHT, DELIBERATE FORCE, SOUTHERN WATCH, IRAQI FREEDOM and ENDURING FREEDOM. Captain Gage graduated with honors from Harvard College in 1987; graduated with highest distinction from the College of Naval Command and Staff in 2005, where he was a member of the Halsey Group; and attended the North Atlantic Treaty Organization Defense College Senior Course in 2008. During 2016-17, he served at the Brookings Institution in Washington, DC, as a Federal Executive Fellow, focusing on U.S. strategic interests in the Indo-Pacific.

Dr. James Giordano

James Giordano PhD is Professor in the Departments of Neurology and Biochemistry, and Chief of the Neuroethics Studies Program of the Pellegrino Center for Clinical Bioethics at the Georgetown University Medical Center, Washington DC, where he also serves as the Co-director of the O'Neill-Pellegrino Program in Brain Science and Global Health Law and Policy. He is Distinguished Visiting Professor of Brain Science, Health Promotions and Ethics at the Coburg University of Applied Sciences, Coburg, Germany, and was formerly Fulbright Visiting Professor of Neuroscience and Neuroethics at the Ludwig- Maximilians University, Munich, Germany.

Prof. Giordano currently serves as Chair of the Neuroethics Subcommittee of the IEEE BRAIN Project, and has served as a Donovan Fellow at SOFWERX; Senior Fellow and Task Leader of the European Union Human Brain Project Sub-project on Dual Use Neuroscience; as a consultant in brain science, neurotechnology and biological and chemical weapons to the Organisation for Economic Cooperation and Development (OECD); as an appointed member of the Neuroethics, Legal and Social Issues Advisory Panel of the Defense Advanced Research Projects Agency (DARPA), and the Department of Health and Human Services (HHS) Secretary's Advisory Committee for Human Research Protection (SACHRP); and as Senior Science Advisory Fellow of the Strategic Multilayer Assessment Group of the Joint Staff, Pentagon. Additionally, he has served as scientific advisor to the United States Navy and Marine Corps, US Naval War College, United States Air Force, Federal Aviation Administration, Lawrence Livermore National Laboratory, and the German Air Force (*Deutsche Bundesluftwaffe*). His current work focuses upon the international use, misuse and control of brain science as bioweapons, and the engagement of advanced biotechnologies to assess and affect advanced neuro-cognitive capabilities to optimize the training and operational effectiveness of Special Forces' intelligence and warfighter personnel.

A neuroscientist and ethicist with over 30 years' experience in basic and translational research, he is the author of over 285 publications,7 books, and 15 governmental whitepapers on bioscience, biotechnology and biosecurity. His recent book *Neurotechnology in National Security and Defense: Practical Considerations, Neuroethical Concerns* (CRC Press) is widely used in a number of national defense, security and policy curricula.

In recognition of his ongoing work and achievements, Prof. Giordano has been elected to the European Academy of Science and Arts (EC); the Dana Alliance of Brain Initiatives (DABI), is a Fellow of Royal Society of Medicine (UK), and has been named as a Distinguished Lecturer of the *Institute for Electrical and Electronics Engineers* (IEEE).

Manlee Herrington

Dr. Rebecca Goolsby

Dr. Goolsby currently serves as a program officer for the Office of Naval Research in Arlington, Virginia. For the past eighteen years, she has developed research in social network analysis and computational social science, the first to hold the position of computational social scientist in the U.S. government. She taught at the University of Washington and Evergreen State College in Washington State before joining ONR in 2000, where she collaborated with ONR-funded scientists to address the problem of understanding big data of terror networks. Her early program involved the development of computational social science models, algorithms, and visualizations for understanding unique and novel threats. She has published many articles in peer-reviewed journals on a variety of topics including understanding terrorist networks, ethics in military research, humanitarian disaster communications concerns, and diffusion of propaganda via social media. Well known internationally for her research and program development in strategic communication, her 2013 publication for the Woodrow Wilson Center for International Scholarship was the first to identify the potential of Internet and mobile phone communications as a vector for rumor, crowd manipulation and social hysteria propagation.[1] Among her honors, she was awarded a Fulbright Award and a Special Commendation from the Navy. She is the lead on NATO Research Technology Group, HFM-293 "Digital and Social Media Assessment For Effective Communication And Cyber Diplomacy." She is a technical advisor for the NATO Digital Working Group, and a member of the NATO Digital Working Group's Core "Tiger" Team for Information Environment Assessment project.

[1]Goolsby, Rebecca (2013). "On Cybersecurity, Crowdsourcing and Social-Cyber Attack," Woodrow Wilson Science and Technology Innovation Program, Commons Lab Memo. Number 1. https://www.wilsoncenter.org/publication/cybersecurity-crowdsourcing-and-social-cyber-attack

Mr. Mark Hoffman

Mr. Mark A. Hoffman is the manager for the Model Based Reasoning Group at Lockheed Martin Advanced Technology Laboratory. He has over 30 years of experience specializing in the development and management of advanced concepts and systems that incorporate state of the art information technology and analytics into revolutionary Transportation Logistics, Intelligence Analysis, and Decision Support systems.

Mr. Hoffman has been the Program Manager and Principle investigator for more than 30 DARPA, IARPA, and Service Lab programs and projects. This includes that DARPA Integrated Crises Early Warning System (ICEWS) demonstrating social science analytics and forecasting of worldwide unrest events. These capabilities represent the first successful transition of computational social science to a DOD Program of Record. He was also the Principle Investigator for the DARPA Genoa (Crisis-Net) Program, and was instrumental in the development of the DARPA Dynamic Analysis and Replanning Tool (DART) for USTRANSCOM for visualizing and managing troop deployments during Desert Shield.

Mr. Hoffman served as a member of the US DoD Defense Science Board summer study in 2016 on Constrained Military Operations (Gray Zone conflicts). Mr. Hoffman has authored over 25 scientific peer-reviewed conference papers and publications, and three book chapters. He has a B.S. in Computer Science and Numerical Analysis from the University of Washington and an M.S. in Computer Science from Rensselaer Polytechnic Institute. He is a member of the ACM, IEEE, AFCEA, and AFHE.

Dr. Molly Jahn

Dr. Molly Jahn is a professor at the University of Wisconsin-Madison where she holds appointments in the Department of Agronomy, the Nelson Institute, and the Global Health Institute. She is Adjunct Senior Research Scientist at Columbia University, Guest Scientist at Los Alamos National Laboratory, and a Special Government Employee at NASA. She previously served as the 12th Dean of the College of Agricultural and Life Sciences, Director of the Wisconsin Agricultural Experiment Station, Deputy and Acting Under Secretary of Agriculture where she oversaw four USDA research and statistical agencies, and was appointed Joint Faculty at Oak Ridge National Laboratory from 2012-2018.

Dr. Jahn has >100 peer-reviewed publications, >60 active commercial licenses, holds several patents, and has authored a series of influential reports on defense and intelligence implications of changing risk profiles of global food systems with partners such as Lloyd's of London, Cargill, the Geneva Association, Thomson Reuters the US Army War College, the US National Geospatial Intelligence Agency, the International Institute for Applied Systems Analysis, the International Food Policy Research Institute and NASA. Her innovative approaches to inter-sector partnership and integrated large projects have been highlighted widely in the academic and popular press. She has served on many boards and expert advisory panels globally including the US National Academies of Science Board on Agriculture and Natural Resources, NASA's Applied Sciences Advisory Committee, the Santa Fe Institute Science Board, the International Agricultural Research Center System (CGIAR) Consortium Board, Government of Canada Standing Selection Committee for National Centres of Excellence, the International Life Sciences Institute Research Foundation Board of Trustees, the Advisory Board to the UN Special Representative for Disaster Risk Reduction, the Science Board of Conservation International, and for universities and company science and strategy advisory boards in N. America, Europe, Asia and Australia. In 2016, she was selected to lead a Cooperative Research and Development Agreement for the US Government entitled "Food security, food systems and national security interests." From 2013 to the present, Dr. Jahn co-directs a major USDA grant on U.S. dairy and, from 2017 to present, serves as director of strategic outreach for NASA's Harvest Consortium where she supports outreach to operational USG agencies to catalyze decision-relevant science on risk at the land/water/energy/human security nexus.

Dr. Jahn received the BA with Distinction in Biology from Swarthmore College, holds graduate degrees from MIT and Cornell University, and has been awarded Honorary Doctor of Science degrees in both the US and UK. She was named the first Lilian Martin Fellow at the University of Oxford's Martin School in 2015, is a Fellow of the American Association for the Advancement of Science and of the Wisconsin Academy of Arts, Sciences and Letters. She has received numerous awards, fellowships including USDA Secretary's Honor Award, the highest honor at the department, for her work in government. In 2017, her team of partners in the Milwaukee Public Schools was recognized with their top honor, the Excellence in Education Award. Professor Jahn consults globally for business and finance, governments, philanthropic organizations, and international multi-lateral institutions focused on agriculture, food systems, risk, life sciences, development, national security and environment.

Mr. Steve Jameson

Mr. Steve Jameson was a program manager in DARPA's Information Innovation Office (I2O), having joined DARPA in August 2014. His current research focuses on technologies to enable situation understanding, improve effectiveness and timeliness of decision-making, and build trust between humans and autonomous reasoning systems. Specific interests include knowledge representation, techniques for causal modeling, reasoning, and inference, as well as technologies to support mixed initiative reasoning, with a focus on enabling non-expert users to effectively interact with automated reasoning systems.

Mr. Jameson manages three programs at DARPA. Causal Exploration seeks to develop a modeling platform to aid military planners in understanding and addressing underlying causal factors that drive complex conflict situations. The technologies embodied in the Causal Exploration platform will enable users to rapidly create, maintain, and interact with a causal model that has been tailored for the operational environment they are facing.

Big Mechanism aims to develop technologies for a new kind of science in which research is integrated more or less immediately—automatically or semi-automatically—into causal, explanatory models of unprecedented completeness and consistency. The domain of the program is cancer biology with an emphasis on signaling pathways. Big Mechanism technologies read research abstracts and papers to extract pieces of causal mechanisms, assemble these pieces into more complete causal models, and reason over these models to produce explanations.

Insight addresses the need for new tools and automation to enhance intelligence analyst capabilities and performance, developing an adaptable, integrated system for intelligence, surveillance and reconnaissance (ISR) information to augment intelligence analysts' support of time-sensitive operations on the battlefield. The Insight system receives, indexes and stores incoming data from multiple sources; analyzes and correlates that information; and requests and shares other relevant information with analysts and data providers. Insight's analysis capabilities include pattern analysis and course of action assessment algorithms to help analysts discover and identify potential threats and explore hypotheses about those threats' potential activities.

Mr. Jameson joined DARPA following a 27-year career in advanced technology development at Lockheed Martin Corporation where his research focused on artificial intelligence, sensor and data fusion, and unmanned autonomous systems. He holds a Bachelor of Science degree in electrical engineering from Johns Hopkins University and a Master of Science degree in computer science from the University of Pennsylvania.

LTC (Ret) David E. A. Johnson

LTC David Johnson, US Army (Ret.) is the Executive Director of C4ADS (the Center for Advanced Defense Studies), a Washington, DC-based, non-partisan non-profit dedicated to addressing cross-cutting global security challenges. The Center, an innovator in multi-disciplinary analysis of publicly available information, is a technology partner and test bed for Palantir, Windward, and Amazon Web Services among others. A graduate of the United States Military Academy at West Point, the Command and General Staff Course, and the Joint Defense College at the Ecole Militaire in Paris, Dave holds a Master's degree in the History of Strategy from La Sorbonne. He also studied cognitive informatics at the Centre de Recherche en Informatique under Dr. Colette Rolland and Dr. Newton Howard. A decorated Special Forces combat veteran and Army strategist with service on six continents and multiple overseas contingency operations, his career is outlined in the Congressional Record. Before coming to C4ADS, he worked for Intel Corporation as Director of Digital Security Products in the Software and Solutions Group. Dave presented to the Defense Science Board summer study group on Constrained Military Operations in 2016. He has written and spoken about the application of artificial intelligence, serving as the security chair for the 2017 IEEE Intelligent Systems Conference. LTC Johnson was also a panelist at Brain Bar 2018 in Hungary, discussing the challenges of a resource constrained future. He speaks French, Russian, and Arabic.

Mr. Robert C. Jones

Bobby Jones is a retired U.S. Army Special Forces Colonel; a former Deputy District Attorney; and the Senior Strategist at U.S. Special Operations Command. Currently serving as a member of the SOCOM J5 Donovan Group, Mr. Jones is responsible for leading innovative thinking on the strategic environment and understanding how it impacts factors critical to national security, such as competition, the character of conflict, deterrence and societal stability.

Mr. Jones's principle focus is on the fundamental human aspects of political conflict. In a rapidly evolving strategic environment, good strategy is rooted in understanding what remains constant and why; while good tactics demands a realistic appreciation for what is different or changed. Successful campaigning demands a fusion of the two. He enjoys "wire brushing" concepts by routinely standing in front of tough audiences. None of these is tougher than those he faces in his role as a fixture in the Joint Special Operations University's Enlisted Academy, applying a commonsense perspective to bring our most experienced Special Operators strategic insights they can actually use. This is also the third consecutive year that Mr. Jones has addressed the Air War College class during the Operational Design phase of their curriculum, sharing practical insights gleaned from his experiences.

He has been a featured speaker at Universities as storied as Oxford, St Andrews, Stanford, and Harvard; and has led professional development events with operational units across the SOCOM enterprise. Mr. Jones is also a Fellow with the Center for Advanced Defense Studies (C4ADS).

"If war is the final argument of Kings, then revolution is the final vote of the people." RCJ

Ms. Regina Joseph

Regina Joseph is the co-founder of pytho, a US-based firm, and the founder of Sibylink, an international consultancy based in The Hague. Both organizations provide strategic foresight through quantitative forecasting, training programs and decision science-led solutions development. Joseph is an IARPA ACE program Superforecaster and was a member of the IARPA- funded Good Judgment Project research team.

An information systems designer with a record of award-winning product development over 25 years, Joseph is also a political scientist whose work and research assists public and private sector organizations. Her corporate work spans the world, from Sony to Hearst to Liberty Global. Her public sector work aids European government agencies and multilateral organizations. Her most recent endeavors include developing a cyber forecasting program (for the Netherlands' National Cyber Security Centre and TNO); the creation of a strategic foresight training program for The Ministry of Foreign Affairs of The Netherlands; and the invention of digital tools like NEUERtm, a quantified structural analytic technique (patent pending). She also continues her applied research into the nexus between foresight, information design and human-machine interaction as a performer in IARPA's current Hybrid Forecasting Competition (HFC) program.

In her career, Joseph has been recognized as a pioneer and thought leader in both the analog and digital worlds: she was the founder and editor-in-chief of Blender, the world's first digital magazine; she was the founder and creative director of Engine.RDA, one of the earliest digital development agencies; and she has been responsible for several technical firsts in the fields of media technologies and telecommunications. She is a published author, and her writing has appeared in a variety of outlets including Reuters, the Washington Post, the New York Times, Forbes, AdWeek, the International Relations & Security Network at ETH-Zurich, Foreign Policy and many others. Joseph is a Thomas J. Watson Fellow and holds a B.A. from Hamilton College (magna cum laude and Phi Beta Kappa) and an M. Sci from New York University.

Ms. Elsa Kania

Elsa B. Kania is an Adjunct Fellow with the Technology and National Security Program at the Center for a New American Security (CNAS). Her research focuses on Chinese military innovation in emerging technologies in support of the Artificial Intelligence and Global Security Initiative at CNAS, where she also acts as a member of the research team for the new Task Force on Artificial Intelligence and National Security. Her analytic interests include Chinese military modernization, information warfare, and defense science and technology. She has been invited to testify before the House Permanent Select Committee on Intelligence (HPSCI) and the U.S.-China Economic and Security Review Commission (USCC). Elsa is an independent analyst, consultant, and co-founder of the China Cyber and Intelligence Studies Institute. She was a 2018 Fulbright Specialist and is a Non-Resident Fellow with the Australian Strategic Policy Institute's International Cyber Policy Centre. Elsa works in support of the China Aerospace Studies Institute through its Associates Program, and she is a policy advisor for the non-profit Technology for Global Security. Elsa has been named an official "Mad Scientist" by the U.S. Army's Training and Doctrine Command.

Elsa is a PhD student in Harvard University's Department of Government, and she is also a graduate of Harvard College (summa cum laude, Phi Beta Kappa). Her thesis on the evolution of the PLA's strategic thinking on information warfare was awarded the James Gordon Bennett Prize. Her prior professional experience includes time with the Department of Defense, the Long Term Strategy Group, FireEye, Inc., and the Carnegie-Tsinghua Center for Global Policy. While at Harvard, she has worked as a research assistant at the Belfer Center for Science and International Affairs and the Weatherhead Center for International Affairs. Elsa was a Boren Scholar in Beijing, China, and she has professional proficiency in Mandarin Chinese.
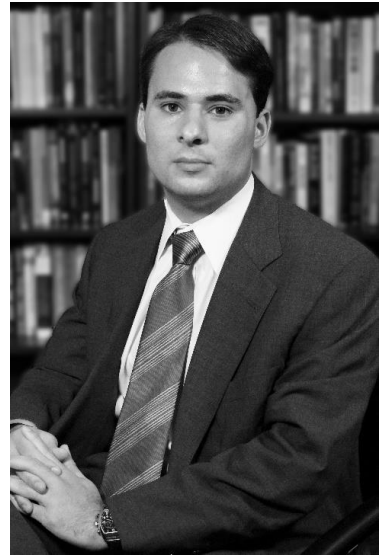
Dr. Brian Kettler

Dr. Brian Kettler is a Program Manager in the DARPA Information Innovation Office (I2O), effective March 2019. Prior to that, he was a Lockheed Martin Fellow and Chief Scientist for the Informatics Lab of Lockheed Martin Advanced Technology Laboratories. He has over 25 years' experience in applying Artificial Intelligence and other advanced technologies to research and development programs for DARPA, the Air Force Research Lab, the Office of Naval Research, and the Intelligence Advanced Research Projects Activity (IARPA). These include applications in multi-domain command and control, computational social science for decision support in complex operational environments (e.g. megacities), and knowledge discovery for intelligence analysts. At ATL, he was the Principal Investigator for a flagship effort at DARPA in computational social science, the Integrated Crisis Early Warning System (ICEWS), that transitioned into operational use for worldwide country instability tracking and forecasting. His current research interests also include human-computer symbiosis, automated planning systems, and understanding cyber-social systems. Prior to ATL, Dr. Kettler worked for ISX Corporation, Brightware, IBM, and Digital Equipment Corporation. He received his PhD in Computer Science (Artificial Intelligence) from the University of Maryland College Park. He received his BS in Computer Science from the University of Massachusetts at Amherst.

Dr. Barnett S. Koven

Barnett S. Koven is a Senior Researcher, and the Political Instability, Counterterrorism and Gray Zone Portfolios Lead at the University of Maryland's (UMD) National Consortium for the Study of Terrorism and Responses to Terrorism (START), a U.S. Department of Homeland Security (DHS) Center of Excellence. He is also an Affiliated Scholar at the Jack D. Gordon Institute for Public Policy at Florida International University, a Professorial Lecturer in Political Science & International Affairs at the George Washington University (GWU), an Associate Member of the Graduate Faculty & a Lecturer in Public Policy at the UMD, an Adjunct Presenter at the U.S. Air Force Special Operations School and a Quantitative Social Scientist at Performance Systems, LLC. Koven received his Ph.D., M.Phil. and M.A. in Political Science, as well as a B.A. in International Affairs and Latin American and Hemispheric Studies from GWU. He also holds a Certificate in Conflict Analysis from the United States Institute of Peace and a Certificate in Advanced Security in the Field from the United Nations System Staff College.

Koven has conducted extensive overseas research in conflict and post-conflict zones. His work employs cutting-edge quantitative and qualitative methods to answer pressing defense and homeland security questions. Specifically, he focuses on issues pertaining to counterinsurgency, counterterrorism, countering violent extremism, counter-narcotics, gray zone conflict, security cooperation, organized criminal violence, weapons availability and conflict onset, post-conflict reconstruction, and the material and non-material sources of military power. Koven has received research funding from the U.S. Department of Defense (DoD), the U.S. Department of State, the DHS and the National Nuclear Security Administration, as well as from the Horowitz Foundation for Social Policy, the GWU and the UMD. A complete list of journal articles, book chapters and policy publications can be found on his personal website: barnettkoven.weebly.com.

In addition to his aforementioned academic affiliations, Koven regularly instructs Combating Terrorism Seminars at the Federal Law Enforcement Training Center in Charleston, SC. He has also lectured during Joint Special Operations University's Special Operations Forces Interagency Collaboration Course, and overseas as part of the Diplomatic Security Service's Global Anti-terrorism Training Assistance/Special Program for Embassy Augmentation and Response Executive Forum on Foreign Terrorist Fighters Consultation. In addition, Koven teaches at the National Reconnaissance Office as part of the Executive Master of Public Management Program. Moreover, he is also a frequent presenter during the various lecture series and conferences curated by the Strategic Multi-layer Assessment Branch of the DoD, as well as to myriad other U.S. government and university audiences. Moreover, Koven routinely provides terrorism analysis on national and international media broadcasts.

Beyond academia, Koven is the Vice President and Director of Events at the Godparents of the Children of Instituto Mundo Libre, a non-profit organization providing safe housing, rehabilitation and vocational training to homeless children in Peru. In addition, Koven is a Board Member at Mindot, a non-profit educational platform for developing the next generation of local leaders and agents of social change. Finally, he is an Advisor at Concordia, a non-profit organization dedicated to expanding public-private partnerships.
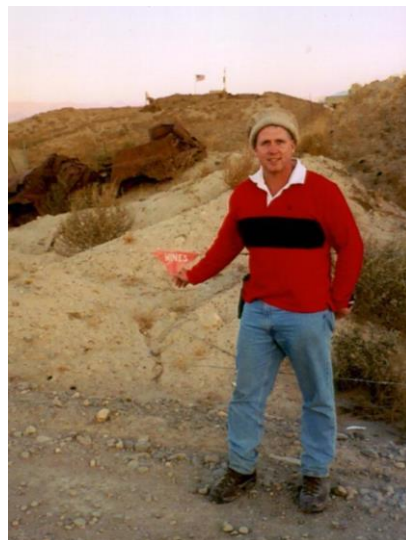
Dr. James Andrew Lewis

James A. Lewis is a Senior Vice President and Program Director at CSIS where he writes on international affairs and technology. Before joining CSIS, he worked at the Departments of State and Commerce as a Foreign Service Officer and as a member of the Senior Executive Service. His government experience includes work on a range of politico-military and intelligence-related issues. Dr. Lewis led the US delegation to the Wassenaar Arrangement Experts Group on advanced civil and military technologies. He was assigned to US Southern Command and US Central Command. He has authored numerous publications since coming to CSIS, including the bestselling "Cybersecurity for the 44th Presidency," and is an internationally recognized expert on cybersecurity. Dr. Lewis was the Rapporteur for the UN's 2010, 2013 and 2015 Group of Government Experts on Information Security and has led a long running Track II Dialogue on cybersecurity with the China Institutes of Contemporary International Relations. He received his Ph.D. from the University of Chicago.

Vern Liebl

Vernie Liebl is an analyst currently sitting as the Middle East Desk Officer in the Center for Advanced Operational Culture Learning (CAOCL). Mr. Liebl has been with CAOCL since 2011, spending most of his time preparing Marines and sailors to deploy to Afghanistan, Iraq, Syria and other interesting locales. Prior to joining CAOCL, Mr. Liebl worked with the Joint Improvised Explosives Device Defeat Organization as a Cultural SME, and before that with Booz Allen Hamilton as a Strategic Islamic Narrative Analyst. Mr Liebl retired from the Marine Corps, but while serving, he had combat tours to Afghanistan, Iraq and Yemen, as well as numerous other deployments to many of the countries of the Middle East and Horn of Africa. He has an extensive background in intelligence, specifically focused on the Middle East and South Asia.

Mr Liebl has a Bachelor's degree in political science from University of Oregon, a Master's degree in Islamic History from the University of Utah, and a second Master's degree in National Security and Strategic Studies from the Naval War College (where he graduated with "Highest Distinction" and focused on Islamic Economics). He has also published extensively on topics ranging from the Caliphate to Vichy French campaigns in WW2. Current projects are chapters for a book on Strategic Culture and a book on Environment and Security, as well as a series of historical articles on conflict between the Ottoman, Mughal, Safavid and Abdali empires.

Dr. Gina Ligon

Dr. Gina Ligon is The Jack and Stephanie Koraleski Professor of Collaboration Science at the University of Nebraska at Omaha. She received her PhD in Industrial and Organizational Psychology with a Minor in Measurement and Statistics from the University of Oklahoma. She is a non-Resident Fellow for the George Washinton University Program on Extremism, and has been part of the Department of Homeland Security (DHS) Centers of Excellence since 2010. She is the Principal Investigator and originator of the Leadership of the Extreme and Dangerous for Innovative Results (LEADIR) database.

Her research interests include profiling leaders from afar, violent ideological groups, expertise and leadership development, and collaboration management. Prior to joining UNO, she was a faculty member at Villanova University in the Department of Psychology. She also worked in St. Louis as a management consultant with the firm Psychological Associates. She has published over 50 peer-reviewed publications in the areas of leadership, innovation, and violent groups, and she is the editor to the academic journal *Dynamics of Asymmetric Conflict: Pathways toward Terrorism and Genocide*.

Elizabeth Lyon

LTC Mike P. Maloney

Lieutenant Colonel Mike P. Maloney currently serves at the United States Army Special Operations Command, culminating two decades working within the Special Operations community. His experience areas include counter-terrorism, transnational criminal activity, and international affairs in Europe, the Middle East, and Latin America. He is currently focusing reseach on the contemporary and emerging global security environment and the United States' return to the great power competition space and the role of Special Operations Forces within that arena.

Dr. Robert McCreight

Robert McCreight retired in 2004 after 20 years with the State Department and other federal agencies, along with 23 years of military service in US Army Special Operations and intelligence work. He has worked on nuclear, chemical and biological weapons issues, treaty verification, global scientific exchanges, counter-terrorism, threat analysis and Soviet defense policy. He has authored or contributed to five books and published over 34 journal articles. His post doctoral work has focused on political science and public administration and he continues to teach graduate school at several universities. He has also been a periodic lecturer at National Defense University and the US Army War College. His current research interests involve advanced dual use technology, foreign and defense policy, intelligence analysis, strategic wargaming and issues central to homeland security and homeland defense.

Dr. Ian McCulloh

Ian McCulloh is the chief data scientist for Accenture Federal Services. His current work focuses on the application of artificial intelligence to improve democracy and government services. He also maintains adjunct faculty appointments at Johns Hopkins University in the Bloomberg School of Public health and the Whiting School of Engineering. His most recent academic papers have been focused on the neuroscience of persuasion and implementation of artificial intelligence programs. He is the author of "Social Network Analysis with Applications" (Wiley: 2013), "Networks Over Time" (Oxford: forthcoming) and has published 55 peer-reviewed papers. Prior to joining Accenture, McCulloh served as associate professor at the Johns Hopkins University School of Public health, senior lecturer in Hopkins' Whiting School of Engineering and senior scientist at the University' Applied Physics Laboratory. His latest research focused on strategic influence in online networks. McCulloh retired as a Lieutenant Colonel from the U.S. Army after 20 years of service with expertise in social network analysis, special operations and improvised explosive device forensics. During his military tenure, he founded the West Point Network Science Center and created the Army's Advanced Network Analysis and Targeting (ANAT) program. In addition, he led interdisciplinary teams of scientists at Special Operations Command Central (SOCCENT) and Central Command (CENTCOM) to conduct global, data-driven, social science research to inform strategy for countering extremism and assessing military operations. McCulloh holds a Doctorate and Master's degree from the Carnegie Mellon University School of Computer Sciences, Masters degrees in Industrial Engineering and Applied Statistics from Florida State University, and a Bachelor's degree in Industrial Engineering from the University of Washington.

Richard McKinley

Dr. Spencer B. Meredith III

Dr. Spencer B. Meredith III serves as an Associate Professor of National Security Strategy at the National Defense University (NDU), College of International Security Affairs (CISA). With two decades of research and support to governance and conflict resolution, his principle areas of expertise are Russian, Eastern European, and Middle Eastern politics. Focused on the Gray Zone and countering peer-adversary influence, he is a Subject Matter Expert for multiple Geographic Combatant Command, Intelligence Community, and Joint Special Operations efforts. He has briefed at the National Security Council, and his current work focuses on democratization and the human domain in Ukraine and the Baltics.

With a doctorate from the University of Virginia in Government and Foreign Affairs, as well as a Fulbright Scholarship to the Republic of Georgia, he has a broad record of scholarship. His first book, *Nuclear Energy Safety and International Cooperation: Closing the World's Most Dangerous Reactors*(2014) resulted from work with key US Interagency and partner nation elites in Eastern Europe. His articles have appeared in peer-reviewed journals ranging from *Communist Studies and Transition Politics*, *Peace and Conflict Studies*, *Central European Political Science Review*, to *Special Operations Journal*; as well as in professional publications including *Strategy Bridge, Small Wars Journal, Inter-Agency Journal*, *Special Warfare*, and *Foreign Policy Journal*. He is a regular contributor to Joint Staff White Papers on cognitive factors in the contemporary and future operating environments.

Mr. Randall Munch

Randall (Randy) Munch supports the TRADOC G-2 as an independent contractor, assisting the Network Engagement Team in developing training courses that operationalize recent doctrine and joint concepts related to network engagement, such as the Joint Concept (JC) for Human Aspects of Military Operations and the JC for Operating in the Information Environment. During 29 years of service in the Army as an Infantry officer and a Foreign Area Officer, he deployed with the 10th Mountain Division to Somalia and Haiti and with the Defense Threat Reduction Agency to Iraq. Following his military retirement in 2005, he worked with the Joint IED Defeat Organization and with TRADOC organizations to help operationalize and institutionalize the concepts of attack the network and network engagement, and he is now using that experience to help advance the concept of cognitive maneuver.

Dr. Sabrina Pagano

Dr. Pagano has extensive experience leading teams and projects both in academia and industry, including both the government and commercial domains. Though supporting a wide variety of projects and proposals at NSI, her work has focused in four main areas: 1) providing support to DoD's Strategic Multilayer Analysis (SMA) projects, including rapid applied analysis for USCENTCOM, 2) serving as the Principal Investigator and Project Manager for a multi-year contract investigating progress in conflict environments, 3) providing project oversight as the project manager for two AAA titles at a top gaming company, and 4) contributing thought leadership as one of two developers for a corporate offering focused on enhancing dignity in interactions with customers and employees. Prior to NSI, Dr. Pagano served as the Director (Acting) of a growing behavioral sciences program, as well as a Faculty Fellow Researcher and Lecturer at UCLA. Her work has spanned a wide variety of topics, with particular depth in intergroup relations, injustice, basic and moral emotions (e.g., empathy, moral outrage), and prosocial/antisocial behavior. She maintains an active knowledge base in the broad field of social psychology, and knowledge that spans multiple fields given her experience and leadership on multidisciplinary projects. Dr. Pagano earned her Ph.D. in Social Psychology (minor in Statistics) from the University of California, Los Angeles, and a dual BA with highest honors in Psychology and Political Science from the University of North Carolina at Chapel Hill.

Dr. Amy Pate

Amy Pate is the Research Director at START. She earned a Ph.D. in Government and Politics (Comparative Politics and International Relations) from the University of Maryland in 2007. Prior to joining START as a researcher in 2011, Pate was research director (2007-2011) and project coordinator (2003-2005, 2006-2007) of the Minorities at Risk Project, based in the Center for International Development and Conflict Management at the University of Maryland. Pate is a specialist in international relations and comparative politics, with particular foci on ethnic politics, democratization, political instability, terrorism, transnational organized crime, and counterinsurgency/ counterterrorism.

Pate earned an M.A. in Government and Politics from the University of Maryland in 2005 and her B.A. in Political Science, History, and Russian from Miami University (Ohio) in 1998.

Dr. Fabiana Perera

Dr. Joshua C. Poore

Dr. Joshua C. Poore is a Senior Principal Research Scientist at BAE Systems, Inc. FAST Labs™. He currently leads capability development, funded projects within the Collaboration, Architecture, and Reasoning Technologies (CART) group. To this role he brings a deep technical background from the Experimental Psychology and Behavioral Neuroscience to applied research on how to use ubiquitous information technology as platforms for measuring and modeling users, as well as unobtrusively eliciting them for information to improve autonomony, feed machine learning services, and shape artificial intelligences.

Dr. Poore received his M.A. and Ph.D. in Psychology from UCLA in 2005 and 2009, respectively, with extensive training in psychometrics, statistics and behavioral neuroscience. In 2011, he completed a post-doctoral fellowship in the Cognitive Neuroscience Section (CNS) at the National Institute of Neurological Disorders and Stroke (NIH/NINDS). Later in 2011, he joined the Charles Stark Draper Laboratory as Senior Member of the Technical Staff. At Draper, he built a portfolio of projects and products designed to capture and model human behavior from thin-client web-interfaces, leading these projects as Principal Investigator and Technical Director. After 7 years at Draper, Dr. Poore joined BAE Systems, Inc. FAST Labs™ as a Senior Principal Research Scientist where his work focuses on knowledge management, user elicitation, and user modeling. He is also on the project management committee for the Apache SensSoft project, an open-source behavioral logging capability for science and technology.

Dr. Moritz Schuberth

Dr. Schuberth is a political scientist with a penchant for interdisciplinary research, most notably on peacekeeping, non-state armed groups, security governance and urban violence. For the past two years he has been working as Monitoring, Evaluation and Research Manager for the global humanitarian agency Mercy Corps in the eastern Democratic Republic of the Congo, where he has been coordinating research projects with the London School of Economics and the London School of Hygiene and Tropical Medicine. Prior to this he has worked at the European Commission, the German Federal Foreign Office and the German Federal Office for Migration and Refugees. He completed his Ph.D. in Peace and Conflict Studies on the challenge of coordinating stabilization, conflict resolution and statebuilding efforts in fragile and conflict-affected states. He consults the US Institute of Peace on a USAID funded research project exploring the possibilities for engaging, managing, and transforming community-based armed groups in Sub-Saharan Africa.

Dr. Schuberth has contributed to a DoD SMA white paper on the implications of cultural cognitive diversity on decision-making and planning and he is the author of recent articles in *Africa Spectrum*; the *Journal of Eastern African Studies, Conflict, Security & Development*; the *Journal of Peacebuilding and Development*; *Contemporary Security Policy*; *Stability: International Journal of Security and Development*; *International Peacekeeping*, and *Environment and Urbanization*.

Dr. Nathan Schurr

Dr. Valerie B. Sitterle

Dr. Sitterle is a Principal Researcher Engineer at the Georgia Tech Research Institute (GTRI), where her current and primary work synthesizes systems science, complex systems, and defense analysis. She is an expert in engineering science, integrating engineering, natural and physical sciences, and mathematics leading to the design and analysis of systems across disciplines. Dr. Sitterle particularly focuses in two areas: (1) evolving analytical methods used in Defense acquisitions to more effectively cope with deep uncertainty and identify driving influences, and (2) integrating operational needs with systems sciences to support design of complex defense systems for equally complex environments.

The former addresses competing materiel development decisions across diverse system types, including characterization of system resilience and functional behaviors. For the latter, she blends sociotechnical environmental analyses across multiple data domains to help characterize potential operational effectiveness for solutions over a broad spectrum of asymmetric warfare challenges in theater. Across both areas, her primary foci involve design, modeling, and analysis methods for situational awareness and cyber-physical systems problems, each with varying degrees of autonomy driving collective performance dynamics. Her efforts have supported various DoD organizations and often included collaboration across other US Government groups, industry, and academia.

Lt Col Jennifer Snow

Dr. Laura Steckman

Laura Steckman, PhD, is a social scientist at the MITRE Corporation. Her work operationalizes theories and methodologies from the social and behavioral sciences to address approaches and solutions to mission-specific problems sets worldwide. She has supported Information Operations (IO) and Military Information Support Operations (MISO) for U.S. Central Command, U. S. Pacific Command and various interagency efforts, and is the former Command Social Scientist for the Marine Corps Information Operations Center (MCIOC). Her current research examines the relationship between societies and emerging technologies, specifically in how the two shape each other and the impact that technology and electronic communications have on culture, language, and behavior.

Dr. Gwyneth Sutherlin

Dr. Sutherlin is a leading expert in socio-cultural analysis--the translation of qualitative research into discrete technology design for decision-making. As a faculty member in the College of Information Cyberspace at the National Defense University, she develops curriculum across the college to advance the leadership concepts for Strategic Operations in the Information Environment. Her teaching and research focus on information influence, emerging technology, and data analysis. Formerly the Director of Human Geography & Analytics Research at a commercial firm, she led teams in technology development, geospatial analysis, and social science research to support the Joint Staff, Global Combatant Commands, the Department of State, and other USG and partner nations' teams. She draws from over a decade of field experience focused on multilingual communications, risk evaluation, and cognitive pattern analysis in conflict environments. Her hands-on experience in designing intercultural conflict resolution and strategic communication programs in North Africa garnered UN recognition for innovation. Dr. Sutherlin speaks and publishes frequently on cultural cognitive variation in UX, social science driven ML, crowdsourcing for decision-making, and localized data analysis models supporting national security policy decisions. Her research appears in security training, textbooks on emerging technology for conflict analysis, UN and NATO special reports. Dr. Sutherlin has a degree in political science from Indiana University and a PhD in peace and conflict studies from the University of Bradford. She has worked in seven languages.

Dr. Griffin Thompson

Griff Thompson is responsible for establishing and managing the strategic direction and programmatic implementation of the office's mission in promoting U.S. foreign policy and national security goals through electricity system reforms, development of functioning power markets, and revised policy and regulatory frameworks necessary for investment in renewable energy and energy efficiency.

The office is focused on national and regional electricity system reform and market development; and the promotion of innovative policy, regulatory and finance renewable energy and energy efficiency models that drive economic growth and expand domestic and regional security. Under his direction, the office identifies the diplomatic linkages between energy service delivery and democracy and good governance; religious and cultural dynamics; conflict resolution; and, the broader contours of economic and political development.

Before joining the Bureau of Energy Resources, Dr. Thompson was Senior Climate Change Program Manager within the Department's Bureau of Oceans, Environment and Science, and Lead Negotiator on Technology for the U.S. Government at the UNFCCC. Previously Mr. Thompson has served as Director of the Office of Energy at the U.S. Agency for International Development (USAID), President of the International Institute for Energy Conservation, and Senior Policy Analyst at the National Renewable Energy Laboratory (NREL).

Dr. Thompson has a B.A. in English from Gonzaga University and a Ph.D. in Political Philosophy from Georgetown University.

Colonel Scott K. Thomson

Colonel Scott K. Thomson is an Army Reserve Psychological Operations officer, serving as the acting director for the Information Operations Directorate in the Office of the Secretary Defense (OSD). His portfolio entails policy and strategy related to Information Operations, Military Information Support Operations policy, implementation of DoD's Strategy for Operations in the Information Environment, and compartmented activities related to Information Operations.

Prior to his assignment to OSD in 2016, COL Thomson completed a National Security Fellowship at Harvard University's John F. Kennedy School of Government, where he focused his research on the application of behavioral science to counter-insurgency and stability operations. Previously, , COL Thomson commanded of the 17th Psychological Operations Battalion in Austin, TX, from 2013-2015, where he provided Military Information Support Operations support primarily to Army South and the United States Southern Command. From 2011-2013, COL Thomson attended the U.S. Army Command and General Staff College and the School of Advanced Military Studies where he studied operational planning and leadership. From 2009-2011, he activated and commanded the 316th Psychological Operations Company at Grissom Air Reserve Base, IN. Activities included manning, equipping, and training the newly-established unit to conduct Military Information Support Operations. From 2007-2009, COL Thomson served as the operations officer of the 16th Psychological Operations Battalion in Fort Sheridan, IL. COL Thomson served seven years in the regular Army as an Armor Officer in multiple armor and cavalry assignments, including duty in Germany and Iraq, and was enlisted as a Cavalry Scout for ten years prior to commissioning.

He holds a Masters of Arts in Communications Management from Webster University, and a Masters of Military Arts and Sciences in Operational Art from the Command and General Staff College. His academic interests include application of behavioral sciences such as complexity theory, systems thinking, social psychology, and behavioral economics to national security issues. He currently serves at the Pentagon, working in the Office of the Secretary of Defense focusing on policy issues related to the use of information and communication in national security. He is father to three children.

Dr. Robert M. Toguchi

Dr. Robert M. Toguchi is currently serving as the Chief, Concepts Division, G9 Directorate, in the U.S. Army Special Operations Command at Fort Bragg, North Carolina. He has spent over 30 years on active military duty while serving as a Functional Area 59 strategist for the U.S. Army. His past assignments included a tour as the Director, Strategic Plans and Chief, ARCIC Initiatives Group, TRADOC. In the Pacific region, he spent a tour with the U.S. Pacific Command while serving as the Deputy Director, J8; and the Chief, Strategic Plans, J5 Directorate, USPACOM. Dr. Toguchi was also assigned to Africa in 2005 while serving as the senior U.S. military observer to the U.N. Mission in Liberia. Previously, he served on the faculty and taught military strategy at the U.S. National War College, National Defense University. Additionally, in the Washington D.C. area, Dr. Toguchi gained valuable experiences within the halls of the Pentagon while serving as a strategist in the DAMO-SSP, Strategy and Policy Division, Army G3/5/7; and as a war planner in DAMO-SSW, War Plans Division, Army G3/5/7, 1996-1999. Dr. Toguchi received a B.S. degree concentrating in Engineering, from the U.S. Military Academy in 1980; and received a PhD in History from Duke University in 1994.

Mr. Jason Werchan

Jason Werchan is a Strategy Program Manager for the Strategy Division and Russia Strategic Initiative (RSI) assigned to the Headquarters of the United States European Command (USEUCOM). He was the Command's primary liaison for the Strategic Multilayer Assessment studies on Russia and the Gray Zone. His duties include developing the USEUCOM Commander's Theater Strategy, Campaign Plan, and annual Congressional Posture Statement. He is the Command's primary inject for inputs into various Defense Department strategic documents to include the National Military Strategy, National Defense Strategy, and Contingency Planning Guidance. Mr. Werchan entered Civil Service in January 2015 after retiring as a Colonel from the USAF. In his last assignment he served as the Chief of Strategy for USEUCOM. He entered the Air Force in May of 1989 after receiving a commission through the Reserve Officer Training Corps at Texas A&M University. During his AF career, he served as an instructor and evaluator navigator in the RC-135, E-8C and T-1A aircrafts. He has also been a student and an instructor at the U.S. Army's Command and General Staff College and was a fully qualified Joint Staff Officer. He has held multiple staff positions at the Pacific Air Forces and the Air Education and Training Command Headquarters to include Branch Chief for Strategic Plans for Education and Training and ISR Operations in the PACOM AOR. He also served as Chief of the Education and Training Command's Future Learning Division, and as the Deputy Commander for the 479th Flying Training Group at Pensacola NAS overseeing the AF's new Combat Systems Officer (CSO) training pipeline. In 2011 he served as the deputy commander of the Kabul International Airport (KIAI) ISAF base installation. He holds a bachelor's degree in Political Science from Texas A&M and a master's degree in managerial economics from the University of Oklahoma. His military awards include the Defense Superior Service Medal and Defense Meritorious Service Medal with one oak leaf cluster.

Dr. Nicholas D. Wright

Dr. Nicholas Wright is a Senior Research Fellow at the University of Birmingham (UK). He applies insights from neuroscience and psychology to decision-making in international confrontations in ways practically applicable to policy. He has conducted work for the UK Government and Pentagon Joint Staff. He was previously an Associate in the Nuclear Policy Program, Carnegie Endowment for International Peace, Washington DC. Prior to joining Birmingham and Carnegie, he examined decision-making using functional brain imaging at University College London (UCL) and in the Department of Government at the London School of Economics. He worked clinically as a neurologist in Oxford and at the National Hospital for Neurology in London. He has published academically (e.g. Proceedings of the Royal Society), in general publications such as the Atlantic or National Interest, and with the Joint Staff at the Pentagon (see www.nicholasdwright.com/publications). He has briefed multiple times at the Pentagon, and also at the UK MoD, French MoD, German Foreign Office and elsewhere. He has appeared on the BBC and CNN.

Wright received a medical degree from UCL, a BSc in Health Policy from Imperial College London, has Membership of the Royal College of Physicians (UK), has an MSc in Neuroscience and a PhD in Neuroscience both from UCL.

SMA Program Office

Dr. Hriar Cabayan

Dr. Hriar "Doc" Cabayan is currently in the Joint Staff/J-39, DDGO where he manages the Strategic Multilayer Assessment (SMA) Program. SMA provides planning support to Commands with complex operational imperatives requiring multi-agency, multi-disciplinary solutions. Solutions and participants are sought from across USG, academia, think tanks, and industry. SMA is accepted and synchronized by Joint Staff/J-39 and executed by ASD (R&E)/RFD. Prior to his current position he was with ASD (R&E)/RFD/RRTO (2007-2013). From 1997 to 2007, he was Special Technology and Science Advisor in the JS Directorate of Operations (J-3) where he provided technical and scientific assistance to the Combatant Commands in the areas of deliberate and crisis action planning. In 2007, Dr. Cabayan received a Joint Distinguished Civilian Service Award by the Chairman of the Joint Chiefs of Staff.

His current focus is on counter-terrorism, counter-WMD (State and non-State), Global & regional socio-cultural assessments, and Individual, state and national-level deterrence studies.

Dr. Cabayan received his doctorate degree from the University of Illinois in Urbana, Illinois. After graduating, he taught mathematical physics for four years at New York University's Courant Institute of Mathematical Sciences and McGill University. In 1977, he joined the Department of Energy's LLNL where he worked on nuclear weapons effects, Strategic Defense Initiative related efforts, and directed energy programs.

Ms. Nicole Peterson

Nicole Peterson is an analyst who assists in qualitative research and strategic analysis in support of Strategic Multi-Layer Assessment (SMA) efforts primarily focused on national security issues and Department of Defense (DoD) concerns. She has contributed to NSI's Virtual Think Tank (ViTTa®) and discourse analyses during her time at NSI.

Nicole coordinates SMA's speaker series, which encompasses a broad range of topics from radicalization of populations and violent extremist organizations to artificial intelligence. She is also the publisher of SMA's weekly newsletter, which summarizes SMA speaker sessions, outlines upcoming events, and disseminates relevant publications.

Nicole began her career at NSI as an undergraduate intern for its commercial sector. In June 2016, she transitioned to an Associate Analyst position and has since been promoted to Analyst. She graduated with honors from the University of San Diego where she received a BA in applied mathematics and a minor in accountancy.

Mr. J.C. Walker

J.C. Walker is the Senior Security Advisor for NSI, Inc., DDGO-IO/SMA Office of the Joint Chiefs of Staff. He is currently pursuing his B.A. in Government Security at American Military University.

He's known in the Pentagon as the "go-to-guy" concerning security matters. He's a great troubleshooter and problem solver in his area of expertise.

J.C. Walker is a Motivational Speaker that targets the adolescent population. He has been the guest speaker for Youth Programs, Graduations, School Assemblies, City & State programs, Juvenile Facilities and Adult Probation/Parole Orientations in the New Orleans Metropolitan Area.

J.C. has also been a guest on many talk shows in New Orleans speaking on topics regarding single parenting and forums on Fatherhood. He's recognized for his compassion for teens encouraging them to strive to do their very best.

He has also participated in programs such as "Baby, Think It Over!" and "The Empathy and Awareness Program" as the Motivational Speaker. JC is now residing in the Washington D.C. Metropolitan Area where he plans to tackle the issues here that are plaguing our youth.

You may have even seen J.C. on the big screen as he is a member of the Screen Actors' Guild with speaking and non-speaking roles in Ray, Skeleton Keys and Glory Road.

He is the Founder and President of the new and exciting Mardi Gras Organization, "The Krewe of Pyros Foundations, Inc." which raises funds for scholarships and aiding in times of need for Louisiana natives residing in the DMV.

Ms. Mariah Yager

Ms. Mariah Yager serves as Deputy for the Strategic Multilayer Assessment (SMA) Program under the Joint Staff/J-39, DDGO. She is a Senior Research Analyst with NSI. From 2010 to 2017, Ms. Yager helped to develop a scientifically valid, replicable, and operationally trainable discourse analysis methodology. This methodology has been used to examine insurgent writings, the expression of trust and worldview, and cognitive complexity, both in the vernacular and English translations.

Ms. Yager received her Master's in Professional Communication from Purdue University of Fort Wayne and Bachelor degrees in Anthropology and Interpersonal and Group Communication, from Indiana University and Purdue University, Fort Wayne (IPFW) respectively. Ms. Yager has taught fundamental communication theory and public speaking at IPFW and previously worked in the private sector in client management and assessments for an executive coaching and consulting firm.

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