

NEW MODELS FOR SOCIO-POLITICAL SYSTEMS

An unclassified colloquium on the dynamics of flourishing and failure

MAY 9, 2016 ■ 1:00-5:00PM ■ CIA HEADQUARTERS

PROGRAM

13:00	OPENING REMARKS Dr. David Honey, <i>Director of Science and Technology, Office of the Director of National Intelligence</i>
13:10	COMPUTER ASSISTED AGENT-BASED MODELING FOR INTELLIGENCE PURPOSES: THE ACTUAL, THE PROBABLE, THE PLAUSIBLE, AND THE IMPOSSIBLE Dr. Ian Lustick, <i>University of Pennsylvania</i>
13:40	IDENTIFYING THE FACTORS THAT MAKE VIOLENT ORGANIZATIONS MORE LIKELY TO BEHAVE THE WAY THEY DO - WHY DO SOME ORGANIZATIONS TURN TO VIOLENCE WHEN SOME DON'T? Victor Asal, <i>University at Albany SUNY</i>
14:10	BREAK
14:20	MODELING THE INTERACTION BETWEEN CULTURE AND INSTITUTIONAL PERFORMANCE, WITH IMPLICATIONS FOR INSTITUTIONAL SEQUENCING AND ROBUST DESIGN Dr. Jenna Bednar, <i>University of Michigan and the Santa Fe Institute</i>
14:50	WHAT IS THE WORLD COMING TO: DEVELOPING GLOBAL CRISIS ANALYSIS, ANTICIPATION AND RESPONSE Dr. Yaneer Bar-Yam, <i>New England Complex Systems Institute</i>
15:20	BREAK
15:30	PANEL DISCUSSION WITH SPEAKERS Moderator: Dr. Allison Astorino-Courtois, <i>NSI Inc.</i>
16:30	ADJOURN

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COMPUTER ASSISTED AGENT-BASED MODELING FOR INTELLIGENCE PURPOSES: THE ACTUAL, THE PROBABLE, THE PLAUSIBLE, AND THE IMPOSSIBLE

For more than twenty years advocates of agent-based modeling type simulation, both inside the government and within academia, have been promoting its revolutionary potential. However, in neither domain have the techniques and the methods of investigation associated with it come to greatly influence let alone dominate the way problems are posed and addressed. There are sociological, scientific, psychological, technological, and political explanations for this “failure to launch.” The issues and misunderstandings involved must be identified if the real opportunities offered by this approach are to be understood and its potential exploited for both intelligence purposes and course of action analysis.



Dr. Ian S. Lustick is the Bess W. Heyman Professor of Political Science at the University of Pennsylvania. Before joining Penn in 1991, he taught at Dartmouth College for 15 years, including a one year stint as an analyst on Israel-West Bank affairs in the State Department’s Bureau of Intelligence and Research. He has sole authored, edited, or co-edited twenty-one books and scores of articles on various topics in Middle East politics, European political history, comparative politics, international relations, social science methodology, and agent-based modeling. His articles have appeared in journals such as *Foreign Policy*, *Foreign Affairs*, *World Politics*, *International Organization*, *The American Political Science Review*, *The Journal of Israeli History*, *Middle East Journal*, *Middle East Policy*, *Comparative Politics*, *Polity*, and *Politics and History*. He has received support for his research from the National Science Foundation, the Carnegie Corporation, the United States Institute of Peace, and the National Endowment for the Humanities. He is considered a pioneer in the development and application of advanced agent-based computer simulation models for forecasting and explanation of patterns of instability in countries and regions across the globe. He is the founder and President of Lustick Consulting, Inc. which has performed on modeling contracts for the intelligence community and the Department of Defense for more than a decade and a half. Dr. Lustick has served as a consultant on Middle East affairs for each of the last seven administrations, focusing often, but not exclusively, on Arab-Israeli relations.

Image Credit: Univ. of Pennsylvania

IDENTIFYING THE FACTORS THAT MAKE VIOLENT ORGANIZATIONS MORE LIKELY TO BEHAVE THE WAY THEY DO - WHY DO SOME ORGANIZATIONS TURN TO VIOLENCE WHEN SOME DON'T?

Understanding the factors that make some organizations more likely or less likely to turn to violence as well as what factors are likely to make certain violent organizations to behave in certain ways that make them so much more dangerous- like targeting civilians or pursuit or use of CBRN? This presentation discusses two datasets – MAROB and BAAD 2 Insurgency- that have been created to identify such factors and investigate other questions as well as presenting findings related to terrorism and CBRN.



Victor Asal is Chair of Department of Public Administration and Policy and an Associate Professor in the Department of Political Science. He received his PhD from the University of Maryland, College Park. He is also, along with R. Karl Rethemeyer, the co-director of the Project on Violent Conflict. Dr. Asal is affiliated with the National Consortium for the Study of Terrorism and Responses to Terrorism (START), a Department of Homeland Security Center of Excellence. Dr. Asal’s research focuses on the choice of violence by nonstate organizational actors and their behavior once they have decided to use violence as well as the causes of political discrimination by states against different groups. In addition, Prof. Asal has done research on the impact of nuclear proliferation and on the pedagogy of simulations.

Image Credit: Univ. at Albany SUNY

MODELING THE INTERACTION BETWEEN CULTURE AND INSTITUTIONAL PERFORMANCE, WITH IMPLICATIONS FOR INSTITUTIONAL SEQUENCING AND ROBUST DESIGN

Institutions are designed to alter human behavior. To remain effective over time, institutions need to adapt to changes in the environment or the society the institution is meant to regulate. Douglas North (1994) referred to this property as *adaptive efficiency* and suggested the need for a model of how institutions change to remain effective. In this presentation I will present theoretical advances in understanding how culture and institutions coevolve and the model's implications for institutional sequencing. I will also briefly comment on the principles of robust institutional design: how to build an institutional system to maintain functionality despite short-term shocks and long-term change, avoiding system failure.



Jenna Bednar is a professor of political science at the University of Michigan and a member of the external faculty at the Santa Fe Institute. Her research combines positive political theory and systems theory to study how formal institutions, such as laws, electoral rules, or constitutions, remain effective in complex environments. She considers institutions not in isolation but as part of a system, with a focus on three questions: (i) how institutions may complement one another to improve their functionality, (ii) how institutional features enable systemic response to perturbations and avoid failures, and (iii) how the interplay between culture and institutions contributes to the production of social goods. She applies these models of multi-institutional analysis to research in three broad categories: first, numerous articles and a book (*The Robust Federation*, Cambridge University Press, 2009) that address the robustness of federal systems; second, theoretical and experimental work on cultural evolution and institutional performance; and the third contains essays, an empirical paper, and public policy related projects that push her ideas into more applied realms such as campaign contributions, transboundary water systems, and environmental sustainability.

Image Credit: Univ. of Michigan

WHAT IS THE WORLD COMING TO: DEVELOPING GLOBAL CRISIS ANALYSIS, ANTICIPATION AND RESPONSE

I will review our analyses of the Global Financial Crisis, Global Food Crisis, European Bond Crisis, Arab Spring, Ebola and Zika epidemics, and the nature of global vulnerability in the face of increasing connectivity. In performing these analyses we developed new analytic approaches and clarified the consequences of global socio-economic changes and government policies that created conditions and triggers for these events. Beyond the immediate policy recommendations that can be inferred, the analysis indicates the vulnerability to and unanticipated consequences of actions by individuals, groups or governments. Given the vulnerabilities that these crises imply, what are the implications for risks at the global scale and what should be done? Two radically different but complementary strategies are indicated: Much more effective distributed governance and an increasing role for advanced scientific modeling of socio-political systems.



Image Credit: New England Complex Systems Institute

Professor Bar-Yam is a prominent scholar in the field of complex systems, contributing both to mathematical foundations and practical applications. He is the author of over 200 publications including *Dynamics of Complex Systems* a core complex systems textbook, *Making Things Work* a popular and practical book on applications of complex systems science to real world concerns, and articles in *Science*, *Nature* and *Physical Review Letters*. He is currently advising the National Security Council and the National Counterterrorism Center on global crises and strategy, and has written multiple papers for the Chief of Naval Operations Strategic Studies Group (CNO-SSG). More generally, he has advised government agencies, non-governmental organizations and corporations about solving problems using principles and insights from complex systems science. These include The Centers for Disease Control and Prevention, The Centers for Medicaid and Medicare Services, a wide variety of healthcare organizations, the Securities and Exchange Commission (SEC), the UN, the World Bank, Asian Development Bank, the Commonwealth of Nations Smart Partnership, various parts of the US military (Navy, Air Force, Army and Department of Defense) and intelligence community (CIA, NSA, TSA) and military and civilian engineering corporations (Boeing, Lockheed-Martin, Raytheon, SAIC). He has advised Congressman Barney Frank as Chairman of the Financial Services Committee, and Congressman Michael Capuano on the financial crisis. His research has been widely cited in the press, and he has appeared on ABC, BBC, CTV, German and Russian national channels. His research on the global food crisis was cited among the top 10 discoveries in science in 2011 by *Wired Magazine*. His scientific visualizations have received multiple press awards. He has been a Visiting Scholar at Department of Molecular and Cellular Biology at Harvard and at the Federal Reserve Bank of Boston. He is currently a research faculty at the MIT Media Laboratory. He received his SB and PhD from MIT in physics.

ABOUT THE COLLOQUIUM

Modern socio-political theory and modeling can enhance the intelligence community process for making estimates and judgments. Emerging tools for socio-political modeling offer important insights regarding society, culture, politics, and behavior. By combining data on interrelated factors, researchers can identify trends and provide insight into real-world concerns such as abrupt social change, changes in power dynamics within a society or country, and adherence to new political ideologies. This half-day colloquium is unclassified and brings together experts for individual presentations followed by a panel discussion where presenters will take questions.

MEET THE MODERATOR



Image Credit: NSI Inc.

Dr. Allison Astorino-Courtois is executive vice president at National Security Innovations (NSI), Inc. She has served as technical lead on a number of Office of the Secretary of Defense Multi-layer Analysis (SMA) projects in support of U.S. forces and combatant commands. Prior to joining NSI, Dr. Astorino-Courtois worked for Science Applications International Corporation (2004-2007) where she served as a U.S. Strategic Command liaison to U.S. and international communities, and 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 foreign policy decision making. She has received a number of academic grants and awards and has published articles in multiple peer-reviewed journals including *International Studies Quarterly*, *Journal of Conflict Resolution*, *Political Psychology*, *Journal of Politics and Conflict Management* and *Peace Science*. 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 PhD in international relations from New York University.