

Strategic Foresight and Global Governance of Critical Technologies & Socio-technical Systems: Implications for Peace and Security 2025-2050

Monday March 24 – Tuesday March 25, 2025

Hintz Alumni Center, Penn State University

Objectives

1. Students are introduced to strategic and systems thinking to understand the global governance challenges of critical technologies and infrastructure systems. The workshop will focus on autonomous systems, which transcend many critical civil and defense infrastructures (see Presidential Policy Directive, PPD-21).

Some of the questions to address are the following: how do technologies that create autonomy become integrated into critical infrastructure systems, what are the social and technical risks generated, who are people and groups that bear the risks and rewards, and what are the strategies and policies needed to manage a spectrum of risks to individuals, organizations, and society? What are the ethical, legal, and social implications of autonomy and autonomous systems?

Chalmers University of Technology and Penn State students, who work on the joint engineering capstone design project with industry sponsorship, will be the student participants in the workshop along with other engineering and science students from Penn State as well as students invited from the School of International Affairs, the Smeal College of Business, and the ROTC at Penn State. Others from Penn State will join and SIREUS (Students, Innovators, Researchers, Entrepreneurs, United States, Sweden) network are invited.

2. Workshop participants identify possible joint research projects to be proposed on trusted, human machine engineering systems and autonomy, together with enabling technologies such as 6G, which are a part of the convergence research agenda and accelerator. The systems engineering research projects and socio-technical systems analysis would include the identification and management of risks and the related ethical, legal, and social implications. The proposed research is linked to education and workforce preparedness.

3. Industrial representatives and national laboratories identify increased and expanded ways to collaborate as partners with Penn State and Chalmers for research and education that have civil and defense related applications. The collaboration will include broader workforce development, including critical trade skills needed for emerging and novel technologies, as well as exploring opportunities for technology transfer, supply chain risk and vulnerability analysis, and advanced manufacturing of hardware and software development, testing, and evaluation.

PROGRAM

Day 1 – Monday, March 24, 2025

8:30–9:00 am – Continental breakfast

9:00 am Welcome and Objectives

Welcome to Penn State (COE - TBD)

Objectives of the workshop (Darryl Farber, Penn State; Mikael Enelund, Chalmers University of Technology)

9:15–10:45 am Block 1 Global Trends, Risks, and Strategy

Darryl Farber, Moderator

Dr. Mat Burrows, Counselor, Executive Office, Stimson Center; Counselor (ret.) U.S. National Intelligence Council.

Dr. Maria Brogren, Counselor for science, innovation and higher education, Embassy of Sweden, Washington, DC.

Ms. Malia Du Mont, Fellow, Strategic Foresight Hub, Stimson Center.

Gen. James Cartwright, USMC (ret.) Board Director at the Atlantic Council; Eighth Vice Chairman of the Joint Chiefs of Staff.

10:45 am BREAK

11:00–12:30 pm Block 2: “Wicked” Problems and Trusted Solutions

Dr. Mikael Enelund, Introductory remarks

Dr. Guru Madhavan, Norman R. Augustine Senior Scholar, Senior Director of Programs, and Director, Forum on Complex Unifiable Systems (FOCUS), National Academy of Engineering

Dr. Akhlesh Lakhtakia, 2022 Jefferson Science Fellow, US State Department; Evan Pugh Professor, Penn State

Ms. Natalya S. Lakhtakia, Board of Education Trustee, Saratoga Springs City School District, New York.

12:30–1:30 pm LUNCH

Professor Dan Cahoy, Department Head of Risk Management, Smeal College of Business, Penn State University – Introduction

Speaker on Leadership and the Management of Strategic Risks – General C. Robert Kehler, USAF (ret.), Commander, US Strategic Command.

1:45–3:15 pm Block 3 Engineering Trustworthy Autonomous Systems: Challenges and Research Needs

Dr. Jason Moore, Mechanical Engineering, Penn State – Moderator

Dr. Amy Pritchett, Aero Space Engineering, Penn State

Dr. Emmanuel Dean, Chalmers University of Technology

Dr. Timo Kero, Asta Zero, Sweden

Dr. Xianbiao Hu, Civil Engineering, Penn State

3:15–3:45 pm BREAK**3:45–5:00pm Block 4** Technology Transfer, Manufacturing, and Workforce Needs

Dr. Sergey Naumov, Supply Chain, Smeal College of Business, Moderator

Dr. Bruce Vojak, Senior Fellow, Conference Board,

Mr. Dennis Gilbert, President, Innovative Manufacturers' Center, Manufacturing Extension Partnership Center – NIST

Dr. Tim Simpson, Senior Advisor for Advanced Manufacturing & Digital Engineering, NASA

Dr. Ola Isaksson, Professor, Chalmers University of Technology.

5:00 pm BREAK (Students meet with Dr. Jared Mondschein to discuss systems analysis and scenario planning for emerging technology)**6:00–8:30 pm Block 5** Reception and panel: Science, technology, and engineering systems tell us what we can do, the liberal arts, values, and ethics inform us what we should do.

Dr. Mitchell Smith, Professor and Director, School of International Affairs, Penn State.
Master of Ceremonies.

Dr. Norman Augustine, retired CEO and Chair, Lockheed Martin.

Panelist I Governance in the International System: Dr. Allison Schwier, Acting Science and Technology Adviser to the Secretary, U.S. Department of State.

Panelist II Mr. Julian Mueller-Kaler, Chief of Staff and Director Strategic Foresight Hub, Stimson Center

Panelist III Ethical, Legal, Societal Implications, Dr. Laura Cabrera, Dorothy Foehr Huck and J. Lloyd Huck Chair in Neuroethics, Penn State.

Day 2 – Tuesday, March 25**9:00 am** – Continental breakfast

Dr. Jared Mondschein, Policy Advisor, U.S. Department of State Office of the Special Envoy for Critical and Emerging Technology (TBC)

9:30–10:45 am Block 6 Student Working Groups – presentation preparation**10:45 am BREAK****11:00–12:30 pm Block 7** Student Presentations**12:30 – 3:00 pm** Lunch and Synthesis

Strategic Foresight Knowledge and Skill Set in Practice

Mr. Munaf Syed Aamir, Ms. Marilee Orr, Brian Miller; Strategic Futures + Policy Analysis Department, Sandia National Laboratory.