Resilience Conference 2017

Responding to Complex Threats: Floods, Blackouts, and Hybrid Attacks

20-21 September 2017
Loughborough University, 3 Lesney Avenue, The Broadcast Centre, Here East Queen Elizabeth Olympic Park, London E15 2GZ
Evacuation Procedures

In the event of fire or any emergency, it may be necessary to evacuate the building. All delegates must read and digest these instructions.

Emergency Evacuation

In the event of an emergency you will be told by a Staff Member via which staircase and/or exit door you should leave the building. There are three stairwells (one at each end of the building and one almost at the centre). The assembly point is at the canal side. You should not use the lift.

Guests must evacuate as per these instructions and remain at the assembly point until they have been accounted for and given permission to leave or return to the building.
Welcome to this year’s Resilience Conference, hosted by the Royal United Services Institute and Loughborough University.

This conference represents the importance of enduring partnerships between think tanks, academia, policy makers and the private sector in assessing risks and delivering resilience. We hope it also helps us promote independent thinking about our collective ability to respond to and recover from the threats we face.

Such fresh thinking is needed now more than ever, with both the threats and responses becoming more complex. Issues that require collaborative research and response include the global spread of ISIL-related terrorist attacks, the increase in extreme weather events and related damage to lives and livelihoods, and the debilitating cyber-attacks from both state and non-state actors, among others.

As the challenges multiply and diversify, it is essential that we work together with others in the field. I am delighted this forum has attracted such a diverse range of participants, which will allow for an exchange of expertise and experience, as well as new partnerships and relationships to be forged.

I would like to take this opportunity to thank Loughborough University, and all the speakers and sponsors whose generosity makes such occasions possible. Finally, it is the contributions of all our delegates that will ensure the discussions are lively and stimulating, so I very much look forward to hearing your questions and comments during the conference and after, as we pursue the research agenda informed by this conference.

If you have any queries about arrangements for the event, or are interested in knowing more about RUSI, please do not hesitate to approach any of my colleagues, who will be delighted to help.

Welcome, again, to the 2017 Resilience Conference.

Dr Karin von Hippel
Director-General, RUSI
Welcome to the Resilience Conference 2017 (Responding to Complex Threats: Floods, Blackouts, and Hybrid Attacks). In today’s interconnected world, the impacts of shocks are wide-ranging and complex, requiring multi-faceted responses. This conference will explore the complexity of assuring societal resilience: through presentations and discussions we shall seek to identify an agenda of the principal research challenges in resilience.

Loughborough University has four research global challenges that bring together cross-campus teams to address multi-disciplinary problems. The Secure and Resilient Societies (SRS) Challenge addresses six themes:

- Disaster Risk Management
- Defence
- Narrative and Communication
- Data and Information
- Sensing and Analysis
- Social Cohesion and Inequality

We shall be delighted to introduce you to our work in these themes during the conference and to explore possible collaborative research opportunities.

Loughborough University is delighted to partner with RUSI to explore these important topics at the 2017 Resilience Conference and wish you an exciting and interesting conference.

Professor Michael Henshaw  
Co-Lead challenge

Professor Alistair Milne  
Co-Lead SRS challenge

Dr Grace Smalley  
Research Development Manager, SRS Challenge
Day One: Wednesday 20 September 2017

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<td>0800 - 0900</td>
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| 0900 - 0915| Session One: Opening Address                | **Professor Steve Rothberg**, Pro Vice-Chancellor for Research, Loughborough University  
**Dr Karin von Hippel**, Director-General, Royal United Services Institute (RUSI) |
| 0915 - 1030| Session Two: Securing Resilience            | **Paola Albrito**, Chief of Regional Office for Europe and Central Asia, The United Nations Office for Disaster Risk Reduction (UNISDR)  
**Commander Chris Bennett**, Strategic Plans & Policy Branch, NATO Allied Command Transformation  
**Professor Tim Broyd**, President, Institution of Civil Engineers  
**Professor Michael Henshaw**, Professor of Systems Engineering and Academic Lead for the Secure and Resilient Societies Research Challenge, Loughborough University  
**Paul McCloghrie**, Deputy Director, National Risks and Infrastructure, Civil Contingencies Secretariat |
| 1030 - 1100| Tea and Coffee                              |                                                                         |
| 1100 - 1215| Session Three: The Resilience Landscape     | **Dr Jennifer Cole**, Associate Fellow, Royal United Services Institute (RUSI)  
**William Breame**, Deputy Chief of Staff, Defence Infrastructure Organisation  
**Professor Jon Coaffee**, Professor of Urban Geography, University of Warwick |
<p>| 1215 - 1315| Session Four: Keynote Address               | <strong>Christine Wormuth</strong>, Director of the Adrienne Arsht Center for Resilience, Atlantic Council and Senior Associate Fellow, Royal United Services Institute (RUSI) |
| 1315 - 1415| Lunch                                      |                                                                         |</p>
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<td>1415 - 1530</td>
<td>Session Five: Environmental Resilience</td>
<td><strong>The Baroness Brown of Cambridge DBE</strong></td>
<td><strong>Professor Greg Bankoff</strong>, Professor of Modern History, University of Hull</td>
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<td><strong>Dr Ilan Kelman</strong>, Reader in Risk, Resilience and Global Health, University College London</td>
<td><strong>Liz Parkes</strong>, Deputy Director Climate Change and Business Services, Environment Agency</td>
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<td><strong>Professor Rob Wilby</strong>, Professor of Hydroclimatic Modelling, Loughborough University</td>
<td><strong>Liz Parkes</strong>, Deputy Director Climate Change and Business Services, Environment Agency</td>
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<td>1600 - 1715</td>
<td>Session Six: Research Methodological Approaches</td>
<td><strong>Professor Tim Wheeler</strong>, Director of Research and Innovation, Natural Environment Research Council</td>
<td><strong>Hamish Cameron</strong>, London Resilience Manager, Greater London Authority</td>
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<td><strong>Dr Ksenia Chmutina</strong>, Lecturer in Sustainable and Resilient Urbanism, Loughborough University</td>
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<td><strong>Professor Peter Johnson</strong>, Professor Department of Computer Science, University of Bath</td>
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<td><strong>Professor Paul Thomas</strong>, Professor of Analytical Science, Loughborough University</td>
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### Conference Programme

**Day Two: Thursday 21 September 2017**

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<td>0900 - 0915</td>
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<td><strong>Speaker</strong></td>
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<td>Professor Michael Henshaw, Professor of Systems Engineering and Academic</td>
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<td>Lead for the Secure and Resilient Societies Research Challenge, Loughborough University</td>
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<td>0915 - 1030</td>
<td><strong>Session Nine: Cyber Resilience for Assets and Infrastructure</strong></td>
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<td>Professor Alistair Milne, Professor of Financial Economics, Loughborough University</td>
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<td><strong>Speaker</strong></td>
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<td>Professor Dan DeLaurentis, Director, Institute for Global Security and Defence Innovation, Purdue University</td>
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<td>Ewan Lawson, Senior Research Fellow for Military Influence, Royal United Services Institute (RUSI)</td>
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<td>Mike St John-Green, Honorary Fellow, University of Warwick</td>
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<td>Dr Peter Trim, Senior Lecturer in Management, Birkbeck, University of London</td>
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<td><strong>Session Ten: Resilient Community Identities</strong></td>
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<td>Dr Chris Zebrowski, Lecturer in Politics and International Relations, Loughborough University</td>
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<td>Professor Samer Bagaeen, Associate Director, Europe and the Middle East, 100 Resilient Cities</td>
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<td>Dr Mohammed Elshimi, Research Analyst, Royal United Services Institute (RUSI)</td>
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<td>Dr Ayesha Siddiqi, Lecturer in Human Geography, Royal Holloway, University of London</td>
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<td>1215 - 1245</td>
<td><strong>Session Eleven: NATO Resilience Conference Brief Back</strong></td>
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<td><strong>Speaker</strong></td>
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<td>James Cassidy, Managing Director, Oakas Limited</td>
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<td>Laurence Marzell, Management Consultant, Serco</td>
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<td>Major General Rob Weighill CBE, Associate, Oakas Limited</td>
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<td>1245 - 1345</td>
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<td>1345 - 1500</td>
<td>Session Twelve: Future Scenarios</td>
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Biographies

**Paola Albrito** is the Chief of Regional Office for Europe and Central Asia at the United Nations Office for Disaster Risk Reduction (UNISDR). In her current role, she supported the delivery of disaster risk reduction coordinated actions and partnership development within the Hyogo Framework for Action implementation and braced the preparation of the Third UN World Conference on Disaster Risk Reduction and the Sendai Framework for Disaster Risk Reduction 2015-2030. Paola joined UNISDR in 2004 during the preparations for the Second UN World Conference on Disaster Reduction, where she fed the conference with the Outcome Analysis Document on the status of risk reduction implementation at the global level. Between 2005 and 2008, Paola worked on policy issues related to disaster prevention, including the development of a number of guidelines on indicators assessing disaster risks, mainstreaming of disaster risk reduction into sustainable development policies. Her previous field experience includes the coordination of Common Country Assessment and the United Nations Development Assistance Framework in Djibouti in the UN Resident Coordinator Office (1999-2003); support to the UN Country Teams in developing sustainable development policies at the United Nations Staff System College in Turin; and programme evaluations as consultant at the International Labour Organisation.

**Professor Samer Bagaeen** is Associate Director Europe and the Middle East at the 100 Resilient Cities/Rockefeller Foundation. Prior to this Samer worked in academia and in the private, public and voluntary sectors across Europe and the Middle East. Most recently, Samer led graduate urban planning education at the University of Brighton in England and was Professor of Architecture and Urban Planning at the University of Jordan. He also holds a position as Visiting Professor of Real Estate at the Institute of Urban Economy in Lima, Peru. He previously served as Director of Urban Studies at the National Resources Investment and Development Cooperation (Mawared) in Jordan with responsibility for master planning former military sites. Prior to that, he served as Training Programme and Master Plan Coordinator with the Welfare Association in Jerusalem. Samer holds a B.A. in Architecture from University College London (UCL), a Masters of Urban Design in Developing Countries from UCL, and a Diploma in International Cooperation from the Universidad Politecnica de Madrid. He also holds a Ph.D. in Planning Studies from UCL and an MBA from the University of Strathclyde in Glasgow, Scotland.
**Professor Greg Banko** is Professor of Environmental History at the University of Hull. He works on community resilience, social capital, and the way societies adapt to hazard and crises as a frequent life experience. For the last 25 years, he has focused his research primarily on Southeast Asia, particularly the Philippines, seeking to understand how societies, both past and present, have learnt to normalise risk in their daily lives and the manner in which communities deal with crisis through a sociological approach that combines archival analysis with fieldwork, community mapping, interviews and focus groups. More recently, he has turned his attention to Central Asia working on building resilience in rural communities and the structural and architectural adaptation of residential buildings to natural hazards along the new “Silk Road” from China to Europe. An active scholar, he has published extensively including ten books and approximately 100 referred journal articles and book chapters. His most recent publications include co-authoring *The Red Cross's World Disaster Report 2014: Focusing on Culture and Risk* and a companion, coedited volume entitled *Cultures and Disasters: Understanding Cultural Framings in Disaster Risk Reduction* (2015).

**Commander Chris Bennett** works in the Strategic Plans & Policy Branch in NATO Allied Command Transformation. A Masters graduate in Business Management, Chris worked as a marketing manager in the information technology sector before joining the Royal Navy in 1998 as a Warfare Officer (Pilot). Since qualifying as a Lynx Attack Helicopter pilot in 2003, Chris has commanded aviation detachments flying close fire support and reconnaissance missions worldwide. The majority of his 2000 flight hours have been flown in support of UK, NATO and coalition ground forces on Operations TELIC (Iraq), HERRICK (Afghanistan) and ALTHEA (Bosnia), and in extreme training environments such as the Arctic and Jungle. A specialist Aviation Warfare Officer, Chris is also a Qualified Helicopter Tactics Instructor and Night Vision Goggle Instructor able to plan, train and lead Composite Air Operations. His extensive staff experience spans the operational and strategic levels. In 2011, he was one of the principal NATO desk officers involved with the planning and execution of maritime operations in support of Operation UNIFIED PROTECTOR (Libya). Within UK headquarters, Chris has worked at Joint Helicopter Command with responsibility for development of joint aviation doctrine, and at Navy Command co-ordinating force generation for Operations GRITROCK (Sierra Leone), WEALD (Mediterranean) and TEMPERER (UK). Following graduation from the Advanced Command and Staff Course, Chris joined NATO Allied Command Transformation in August 2016. Working in the Strategic Plans and Policy directorate, he is leading several strategic initiatives supporting NATO Summit activity including Alliance Resilience and NATO's Military Strategy.
Dr Tim Bird is a Senior Lecturer in the Defence Studies Department of Kings College London. He joined the department in July 2004, following completion of a Master’s degree in Security Studies and PhD in International Relations from the University of Birmingham. In 2007, he was invited by the MoD to undertake, and successfully completed, the Joint Operations Planning Course (JOPC) at the Permanent Joint Headquarters (PJHQ), UK. From September 2008 – August 2009 Dr Bird was on secondment at the MoD’s Development, Concepts and Doctrine Centre (DCDC) as part of the team writing the new British Joint Operational Stabilisation Doctrine (JDP 3-40 Security and Stabilisation: the Military Contribution). From September 2013 – July 2016 he was Dean of Academic Studies at the Joaan bin Jassim Joint Command and Staff College in Qatar where he led the KCL team. He is the author of Afghanistan: How the West Lost its Way (Yale University Press) 2011. Before returning to academic study at Birmingham, he held a number of management positions in the private sector.

William Breame became Deputy Chief of Staff for the Defence Infrastructure Organisation in July 2016. He is responsible for senior and ministerial engagement with respect to the Better Defence Estate Strategy, the DIO’s response to requests for Military Aid to the Civil Authorities and a series of projects on behalf of the DIO’s Chief Executive and Chief of Staff. Will first joined the MOD on the Civil Service Fast Stream in August 2012 and worked in Defence Science and Technology, before working as the International Policy and Planning Desk Officer for Bahrain, Iraq and Kuwait. After a secondment to the Benefits Delivery directorate of the Department for Work and Pensions, Will returned to the MOD as the Private Secretary to the Commander of Joint Forces Command, General Sir Richard Barrons and then General Sir Chris Deverell. Will graduated from Oxford University with a degree in Politics, Philosophy and Economics in 2008.

The Baroness Brown of Cambridge is an engineer. An academic career at Cambridge University led to senior business and engineering roles at Rolls-Royce plc. Returning to academia as Principal of Engineering at Imperial College, she became Vice-Chancellor of Aston University from 2006 - 2016. Her current interests include climate change adaptation and mitigation and the low carbon economy. She serves as: Vice Chair of the Committee on Climate Change and Chair of the Adaptation Sub-Committee of the Committee on Climate Change; non-executive director of the Green Investment Bank and the Offshore Renewable Energy Catapult; member of the WEF Global Agenda Council on Decarbonising Energy. She led the King Review on decarbonising transport (2008), and is the UK’s Low Carbon Business Ambassador. She is passionate about education and engineering; she was a member of the Browne Review on university funding and Lord Stern’s review of the Research Excellence Framework. She now chairs STEM Learning Ltd., a not-for-profit company delivering science teacher continuing professional development, and the Henry Royce Institute for Advanced Materials. She is a Fellow of the Royal Academy of Engineering and of the Royal Society, and was awarded DBE for services to higher education and technology. In 2015 she was elevated to the Peerage as The Baroness Brown of Cambridge. She is a crossbench Peer, and a member of the House of Lords European Union Select Committee.
**Professor Tim Broyd** is Professor of Built Environment Foresight at University College London as well as an Honorary Professor of Civil Engineering at the same university. He recently moved to UCL following a career in industry, and has substantial experience as corporate director of technology, innovation, knowledge management and sustainability for globally operating engineering design consultancies. In addition he was CEO of construction industry research body CIRIA from 2002 to 2007. Within his new role he works with leading individuals in industry, government and academia to understand and prepare for the challenges and opportunities that lie ahead. He is a leading advocate for BIM (Building Information Modelling), was a founding member of the UK Government's BIM Task Group, was lead author of the UK's published strategy on BIM Level 3 ('lifetime BIM') and has provided advice in this area to the development teams of a number of large infrastructure projects. Tim is the current President of the Institution of Civil Engineers.

**Hamish Cameron** is Deputy Head of London Resilience Group. Hamish has been an emergency planner in London since 2005. He has been involved in the multi-agency response to incidents ranging from the July 2005 bombings to industrial action in the public sector. His areas of responsibility include governance and strategy for the London Resilience Partnership. This includes relationships with the business and academic sector. From 1993-2005 he was a United Nations Security Field Security Adviser responsible for assessing risks then preparing and implementing security plans in countries such as South Africa, Somalia, Ethiopia and East Timor. This followed an eleven year career as an Army Officer serving on operations in Northern Ireland, the Gulf and with the United Nations in the Former Yugoslavia. He has an MBA from Cranfield and a BA (Hons) in Geography from Oxford University.

**James Cassidy** is the founder and Managing Director of Oakas Limited. Established in 2008, the company provides consultancy support for Governments, Civil and Commercial sectors as well as the Defence Sector. Oakas is currently operating with The UK Foreign and Commonwealth Office, UK Ministry of Defence, as well as international Governments, including Montenegro as part of their accession process. Oakas also works internationally with Non-Government and Humanitarian Organisations. Prior to establishing Oakas, James served in the British Army where he was selected to serve with both 29th Commando Regiment and 7th Parachute Regiment Royal Horse Artillery. He deployed on numerous operational deployments around the world. He is a specialist in hostile environments including the jungle and arctic. His final operational tour was in command of his unit during Operations in Helmand province, Afghanistan with 16 Air Assault Brigade in Helmand in 2006.
Dr Ksenia Chmutina is a Lecturer in Sustainable and Resilient Urbanism. Her main research interest is in synergies and tensions of resilience and sustainability in the built environment, including holistic approach to enhancing resilience to natural and human-induced threats, and a better understanding of the systemic implications of sustainability and resilience under the pressures of urbanisation and climate change. A well-documented track record of publications and external activities provide testament to the internationally recognised quality of her work. Her research mainly comprises location-based case studies and systemic policy analysis; it brings together quantitative and qualitative research to generate transdisciplinary understanding in the areas of sustainability, resilience, and policy in the context of built environment, and employs various data analysis techniques. She has conducted her research in the UK, India, Indonesia, Japan, Nepal, the Caribbean, and across Europe. Ksenia is a co-author of a textbook ‘Disaster Risk Reduction for the Built Environment’ (Wiley, 2017).

Professor Jon Coaffee is Professor in Urban Geography based in the School of Politics and International Studies at Warwick. He is a recognised international expert in urban resilience. At Warwick he directs the Resilient Cities Laboratory and the Warwick Institute for the Science of Cities. Jon's research focuses upon the interplay of physical, technical and socio-political aspects of urban resilience and he has worked closely with a range of private and governmental stakeholders to ensure his research has real world impact. This work has been published in multiple disciplinary areas and most notably includes: Terrorism, Risk and the City (2003) The Everyday Resilience of the City: How Cities Respond to Terrorism and Disaster (2008) Terrorism, Risk and the Global City – towards urban resilience (2009) Sustaining and Securing the Olympic City: reconfiguring London for 2012 and beyond (2011); Urban Resilience: Planning for Risk, Crisis and Uncertainty; (2016) and Routledge handbook of International Resilience (2016). His work has been supported by a significant number of UK and EU Research Council grants linked to building resilience across different socio-technical systems in response to a range of complex shock and stress events.
Dr Jennifer Cole is an Associate Fellow at RUSI. She was previously Senior Research Fellow, Resilience and Emergency Management from 2007-2017. Her research interests focused on the UK’s emergency preparedness and response capabilities, with particular regard to CBRN(E), pandemics, flood management, cyber security, resilient communications and the role of training and exercising in resilience. In August 2017, she left RUSI to take up the position of Public Policy Health Adviser to the Rockefeller Foundation Economic Council on Planetary Health at the Oxford Martin School, University of Oxford. Jennifer is the editor, author or co-author of a number of reports and academic papers, including Combined Effect: A New Approach to Resilience (RUSI/Serco, 2010), Chemical, Biological and Radiological Materials: An Analysis of Security Risks and Terrorist Threats to India (RUSI/ORF, 2012), Tackling Antimicrobial Resistance: Identifying Future Research Themes (RUSI/STFC, 2013), Flood Risk Management: A National Defence and Security Concern (RUSI, 2014) and Serious Infectious Diseases: Challenges for Security and Defence (RUSI/STFC, 2015). She has a degree in Biological Anthropology from Cambridge University and a PhD in Computer Science and Geography from Royal Holloway, University of London. Her PhD thesis was entitled Online Discussion Forums During a Public Health Emergency, using the 2014-15 West African Ebola outbreak as a case study.

Professor Dan DeLaurentis is Professor in Purdue's School of Aeronautics & Astronautics (Engineering). He also serves as Director of Purdue's Institute for Global Security and Defense Innovation (i-GSDI) in the University's Discovery Park. His primary research interests are in the areas of problem formulation, modeling and simulation, and robust system design and control methods for aerospace systems, transportation architectures, and systems-of-systems (SoS), conducted under grants and contracts from private industry, NASA, FAA, Navy, the DoD Systems Engineering Research Center UARC, and the Missile Defense Agency. Professor DeLaurentis is an Associate Fellow of the American Institute of Aeronautics and Astronautics and served as Chairman of the AIAA's Air Transportation Systems (ATS) Technical Committee from 2008-2010. He is also AIAA's Deputy Director for Aircraft and Atmospheric Systems Group since 2014. Dr DeLaurentis is also a member of the IEEE and INCOSE and active in “systems circles” of those societies. He was the Co-Chair of the System of Systems Technical Committee in the IEEE System, Man, and Cybernetics Community (2009-2014) and is Associate Editor for the Transactions of the IEEE Systems, Man, & Cybernetics: Systems. He is Faculty Fellow of CERIAS (Purdue's Center for Education and Research in Information Assurance and Security).
**Dr Mohammed Elshimi** is a Researcher in RUSI's National Security and Resilience Team. He is one of the leading experts on the Prevent strategy in the UK counter-terrorism policy, as well as on the concept and practice of de-radicalisation. His research focuses on terrorism and political violence, radicalisation and extremism in the Western context, UK counter-terrorism, countering violent extremism, de-radicalisation and the politics of the Middle East and Africa. He has a PhD from the University of Exeter, an MA in International Studies & Diplomacy from SOAS, and a BA in History from UCL. His PhD thesis, *The Concept and Practice of De-radicalisation in the Prevent Strand of the UK Counter-terrorism Strategy: What is De-radicalisation?*, used primary data from key informant interviews to analyse the de-radicalisation component of HMG's Prevent programme. His book, *De-radicalisation Policy in the UK: Security, Identity, Religion*, was published by Routledge in February 2017.

**Professor Pete Fussey** is a professor of sociology in the Department of Sociology at the University of Essex, UK. The Department of Sociology at Essex is internationally regarded as a centre of excellence and consistently ranked first in the UK for the quality of research. Professor Fussey’s main research interests focus on security, surveillance, critical resilience studies, control and the city. He has published widely in these areas and is a director of the Surveillance Studies Network, a global network of over 200 surveillance-focused academics situated in more than 50 countries. He is currently leading research activities on a five-year large-scale ESRC project analyzing ‘big data’ enabled security practices in the US, UK, Brazil, Germany and India. Other recent funded research has included projects analyzing counter-terrorism in the UK’s crowded spaces and, separately, at future urban resilience towards 2050. His other work focuses on organised crime in the EU with particular reference to the trafficking of children for criminal exploitation (with his book *Child Trafficking in the EU: Policing and Protecting Europe’s Most Vulnerable* published by Routledge in 2017). Other recent books include *Securing and Sustaining the Olympic City* (Ashgate) and *Terrorism and the Olympics* (Routledge). A regular media commentator, Professor Fussey has also worked with and advised central and regional governments in the UK and Europe on a number of issues including the regulation of surveillance, public order policing and the security and social implications of urban mega-events. He also serves on the expert advisory panels for a number of large-scale EU initiatives researching human trafficking, urban security and resilience issues.
Lord Toby Harris has been Chair of the National Trading Standards Board, which is responsible for delivering national and cross-boundary consumer protection enforcement activity, since May 2013. He is also the UK Coordinator of the Electrical Infrastructure Security Council. In 2016, he conducted an Independent Review for the Mayor of London on London's Preparedness to Respond to a Terrorist Attack. At the request of the Minister for Prisons, he led an Independent Review on the Deaths of Young People in Prison Custody. The report ("The Harris Review: Changing Prisons, Saving Lives") that was published in July 2015 and is the most substantial review of penal policy for nearly thirty years. He was also Chair of the Independent Advisory Panel on Deaths in Custody that reports to the Ministry of Justice, the Home Office and the Department of Health from 2009 to 2015. He was made a Life Peer in June 1998 and is Chair of the Labour Peers. In 2013, he chaired the House of Lords Committee on the Olympic and Paralympic Legacy. He has been a member of the Joint Committee on National Security from 2016 and previously from 2010 to 2014. He was also a member of the House of Lords Select Committee that reported on Personal Internet Security in 2007. He is Co-Chair of the All-Party Parliamentary Group on Policing and an Officer of the Parliamentary Internet and Communications Technology Forum. He was born in 1953 and graduated from Cambridge University in 1975, having studied Natural Sciences and Economics and where he was President of the Cambridge Union. In October 1998, he established his own public affairs consultancy, Toby Harris Associates, which advises a number of major public and private sector bodies. He is a non-executive director of Cybersecurity Challenge UK, and a number of other companies. He was a member of the London Assembly from May 2000 to June 2004, on which he led the Labour Group and he was the first Chair of the Metropolitan Police Authority (MPA). He continued to sit on the MPA from 2004 until 2012, as the representative of the Home Secretary with a remit to oversee the national and international functions of the Metropolitan Police - primarily its role in counter-terrorism and security. He also oversaw their risk management and audit, and was the interim chair of the Audit Panel for the Metropolitan Police Service and the Mayor's Office for Policing and Crime. He was a member of Haringey Council from 1978 to 2002 and was its Leader from 1987 to 1999, having previously spent five years as Chair of Social Services. He was Chair of the Association of London Government (now London Councils), representing the 33 local authorities in London, from its formation in 1995 until 2000, and is now one of its Joint Presidents. He previously chaired the Association of London Authorities. From 1986 to 1993, he was Chair of the Association of Metropolitan Authorities' Social Services Committee and led for local government in negotiations about the introduction of Community Care and the Children Act. He was also a member of the Executive (and later a Vice President) of the Local Government Association for a number of years. He was also a member of the Executive of the Association of Police Authorities from 2000 to 2006 and was a Vice President from 2006 until 2012. He chairs the Wembley National Stadium Trust, was the first Chair of the Institute of Commissioning Professionals, has been a non-executive director of the London Ambulance Service, a Senior Associate of the Kings Fund, and a member of the Committee on the Medical Effects of Air Pollutants. He is a former member of the Committee of the Regions of the European Union.
Resilience Conference 2017 - Responding to Complex Threats: Floods, Blackouts and Hybrid Attacks

**Professor Michael Henshaw** is Professor of Systems Engineering; he is head of the Systems Division and leads the Engineering Systems of Systems (EsoS) Research Group. His research focuses on integration and management of complex socio-technical systems, with a particular emphasis on the challenges of through-life management of systems and capabilities. The main research topics studied include modelling of Systems of Systems (SoS), Systems Lifecycles, Network Enabled Capability (NEC), management of knowledge for through-life management (TLM), cyber-security, pilot training, C2, and autonomous robotic systems. Within all these areas there is a strong emphasis on the challenges of interoperability between systems and the importance of including humans and organisations as part of the systems. Professor Henshaw graduated in applied physics, and his early research focused on laser-plasma interactions, using computational fluid dynamics to investigate various phenomena in applications such as X-ray lasers. He joined British Aerospace (later BAE Systems) as an aerodynamicist and worked for seventeen years in aeronautical engineering tackling problems associated with unsteady aerodynamics (computational and experimental) and, later, multi-disciplinary integration. He was appointed to a chair in Systems Engineering at Loughborough in 2006 to direct the large (£4M) multi-university, multi-disciplinary programme sponsored by EPSRC and BAE Systems, NECTISE, that ran from Nov 2005 – April 2009. He has an international reputation for his work in systems of systems.

**Professor Peter Johnson** is Professor of Computing Science at University of Bath. He previously held the posts of Professor of Human Computer Interaction and Head of Department of Computer Science at Queen Mary University of London and founding Head of Department of Computer Science at the University of Bath. He has led EPSRC, EU and Industry research grants continuously from 1986 to the present day. He has over 200 publications in leading computing and engineering journals, conferences and books. He has organised and chaired major international conferences for computing and Engineering societies. He was joint founder and vice-president of the British Computer Society Human Computer Interaction Group. He has advised research councils in UK, Canada and Australia. He sat on the UK RAE Panels in 2001 and 2008. Until recently he was the Vice-Chairman of MoD - DSAC (Defence Scientific Advisory Council) and is currently 20% seconded to Dstl as a visiting Senior Fellow. His research addresses theory, engineering and design of Human Computer Systems in complex application areas, particularly emergency response, defence, energy, aviation, safety critical systems and manufacturing. Underpinning this work he has brought together social-psychological and computing theory and methods to establish principles, methods and tools for task working, collaborative working, collective working and human interaction with autonomous systems.
Dr Ilan Kelman is a Reader in Risk, Resilience and Global Health at University College London, England and Professor II at the University of Agder, Kristiansand, Norway. His overall research interest is linking disasters and health, including the integration of climate change into disaster research and health research. This works covers three principal areas.

1. Peace and conflict: How and why disaster-related interventions (disaster diplomacy, including for climate-related hazards) and health-related interventions (health diplomacy, including pandemics) do and do not influence conflict and cooperation.

2. Island sustainability: Creating and maintaining safer and healthier communities on islands and in isolated areas, such as border, Arctic, and mountain regions.

3. Risk education: Increasing the effectiveness and impact of risk education, focusing on health and disaster risks, including related to climate change.

Post-disaster and cure-related investigations are an essential part of this research, but the preference is to prioritise continual disaster and health risk management in order to implement solutions before it is too late.

Dr Randolph Kent has directed the Futures Project at the Royal United Services Institute since 2016. He also serves as a Visiting Professor at the African Leadership Centre, King’s College, London. Prior to these appointments, he directed the Humanitarian Futures Programme at Kings College, London, where he and his staff worked from 2004 to 2015 with a wide range of multilateral, bilateral and non-governmental organisations to strengthen their strategic and planning capacities for dealing with longer-term humanitarian threats. Dr Kent accepted his post at King’s College, London, after completing his assignment as UN Resident and Humanitarian Coordinator for Somalia in April 2002. Prior to his assignment in Somalia, he served as UN Humanitarian Coordinator in Kosovo [1999], UN Humanitarian Coordinator in Rwanda [1994-1995], Chief of the UN Emergency Unit in Sudan [1989-1991] and Chief of Emergency Prevention and Preparedness in Ethiopia [1987-1989].

Ewan Lawson is Senior Research Fellow for Military Influence at the Royal United Services Institute. He researches a range of subjects including strategy and cross-government working, military influence and information operations, law of armed conflict and war crimes, conflict in Africa and cybersecurity. He also oversees conferences, meetings and lectures in these areas. He was previously a Royal Air Force officer, initially as a policing and security specialist but in more recent years in a range of joint warfare appointments. Since graduating from the UK Advanced Command and Staff Course, his experience has included tours as a joint operational planner, as the commanding officer of the UK Psychological Operations Group, as military faculty at both the UK and Kuwait Staff Colleges and as the first Defence Attaché at the British Embassy in South Sudan. His most recent experience was within Joint Forces Command with responsibility for the development of cyber warfare capabilities.
Laurence Marzell leads on the research and innovation activity within the UK & Europe division of Serco Group. He leads Serco Europe’s participation in a number of EU Horizon 2020 projects in: Community policing; virtual reality training of crisis and first responders; and the governance, integration and application of Earth Observation data with the wider information and intelligence mix. Together with the Royal United Services Institute (RUSI), Laurence developed the white paper: Combined Effect: A New Approach to Resilience, and leads on its strategic and operational development and implementation. He is a keen advocate of its adoption to underpin research and innovation projects as well as organisational transformation programmes. He has a particular interest in aligning governance and operational delivery at the intersection and boundaries between organisations, whether public, private, voluntary and community, saying that they need to come together to understand, manage and meet their shared safety, security and resilience needs. Laurence set up and jointly managed alongside the Centre for the Protection of National Infrastructure (CNPI), a cross-government contest funded programme to look at the dependencies and interdependencies of Critical National Infrastructure (CNI). Laurence speaks regularly at security, resilience and critical infrastructure conferences and events and writes for journals and books around policing, critical infrastructure protection and open source intelligence. He sits on the Centric advisory board, representing critical infrastructure, essential services and the governance surrounding public, private and community collaboration for safety, security and resilience.

Paul McCloaghrie is the Deputy Director, National Risks and Infrastructure in the Cabinet Office - Civil Contingencies Secretariat. Paul and his team are responsible for the National Risk Assessment, the National Resilience Planning Assumptions and bespoke contingency planning for high impact risks. Paul and the team act as a risk management centre of expertise; promoting, coordinating and assuring strong risk management activity across Government and facilitating good decision making on preventing risk, mitigating impacts and building capability to respond. Paul’s team also provide cross Government policy leadership on protecting the security and resilience of the UK’s Critical National Infrastructure. Previously Paul has worked in central Government emergency response coordination, leading the COBR secretariat during a number of civil emergencies ranging from flooding and strikes to public health risks. Prior to this Paul worked on renewable energy policy, energy efficiency and improving the use of science by Government – this role drawing on his early career as a research scientist.
Resilience Conference 2017 - Responding to Complex Threats: Floods, Blackouts and Hybrid Attacks

Commander Phil Miles is currently employed within the Developments, Concepts and Doctrine Centre as one of the 2 officers within the Maritime Concepts Team. In his first 10 months in this role he has been the lead officer for writing the 5th Edition of UK Maritime Doctrine with an additional task to developing a think piece on a review of Defence's role in homeland resilience and security in light of the changing global context. Prior to joining DCDC Cdr Miles has also worked in Defence's logistics centre (Defence Equipment and Support (DE&S)) and was involved in a project that saw the Logistics, Commodities and Services (LCS) aspect of the DE&S commercialised. With the US Company Team LEIDOS winning a multi-billion pound contract to run the LCS requirements for 13 years. In addition Cdr Miles has undertaken 2 roles in the Permeant Joint Headquarters, support to senior Naval Officers and a tour to Afghanistan. Last at sea in 2009 as the Head of the Logistics Department in the now decommissioned HMS EDINBURGH. A graduate of ACSC 16, Cdr Miles obtained the MA in Defence and International Studies from KCL. Cdr Miles was also awarded a MSc in Logistics and Supply Chain Management from Cranfield University (Bedford Site), and is a Fellow of the Chartered Institute of Logistics and Transport.

Professor Alistair Milne joined the school in July 2011 as professor of financial economics. He was previously reader in banking and finance at Cass Business School, City University of London and has also held positions at the Bank of England, the University of Surrey, London Business School, HM Treasury and the national statistics office of Malawi. In recent years his principal research has been on bank balance sheet management and regulation, and its relationship to banking performance, monetary transmission and financial stability; and on the network economics of financial infrastructure, including retail payments and securities and derivatives clearing and settlement. He has also worked on a variety of other issues in financial risk management, liquidity risk, central banking, financial regulation, housing markets, development finance and macroeconomics. He is the author of The Fall of the House of Credit (Cambridge University Press, July 2009) which is a comprehensive single volume account of all different dimensions of the global financial crisis and has been a regular media commentator on the crisis and the response by policy makers. He is also a frequent speaker at policy and industry conferences. Since 2005 Alistair has been an annual research visitor at the Monetary Policy and Research Department of the Bank of Finland. He has been a consultant to the Houses of Parliament, the Financial Services Authority, the European Commission, and to several private sector institutions and trade bodies.
Liz Parkes has worked at the Environment Agency since its creation in 1996; and leads a broad portfolio of work across the Agency covering climate change, air quality, and stimulating investment. She combines extensive regulatory experience with the ability to think creatively and strategically about the future. Liz leads the Agency's work with and for BEIS, and on cross cutting issues such as health, responding to environmental incidents and longer term resilience. For a number of years she headed up the Agency's waste and resources function, and prior to that she worked in local government and for the Tidy Britain Group. Liz now lives and works out of Bristol where the Agency's headquarters are based.

Professor Steve Rothberg is Professor of Vibration Engineering and a Fellow of the Institution of Mechanical Engineers. With a first degree and a PhD from Southampton University, he joined the academic staff at Loughborough in 1990 as an industrially funded lecturer. His research in noise and vibration measurement and analysis, particularly in the development of laser technology for vibration and motion measurements, has attracted individual awards from the National Physical Laboratory and the Society of Experimental Mechanics, and contributed to Loughborough's Queen's Anniversary Prizes for Optical Engineering (2000) and High Value Manufacturing (2014). Much of this work has been conducted in collaboration with companies in the instrumentation, sporting goods and automotive sectors. His longstanding commitment to innovation in teaching includes founding the university's Centre for Engineering and Design Education in 1997. In 2007, after six successful years as Head of Mechanical and Manufacturing Engineering, Steve became Dean of the Faculty of Engineering. As Dean, he led the Loughborough team on the £40m Manufacturing Technology Centre project, together with diverse institutional 'first' projects including the campus-wide staff survey and formation of the ethical policy framework. He also led our first ATHENA Swan award submission and he continues to lead in this area at Loughborough. Steve became Pro Vice-Chancellor (Enterprise) in 2011, initiating a culture change across the institution and delivering specific projects such as the new Advanced Technology Innovation Centre on Loughborough University Science and Enterprise Parks. Since 2015, he has been Pro Vice-Chancellor (Research). He is committed to the University's role in driving regional prosperity and he currently chairs the Executive Management Group of Midlands Innovation, the strategic partnership between the Universities of Aston, Birmingham, Leicester, Loughborough, Nottingham and Warwick.
Dr Ayesha Siddiqi is a Lecturer in Human Geography at Royal Holloway University of London. She has been working in the climate change and disasters space as a consultant and then as an academic since 2008. The breadth of her experience is reflected in the range of projects and different geographies she has covered as a consultant and an academic. This includes providing technical assistance to the Government of Tajikistan on the country’s largest climate resilience programme, to supporting UNEP research into mechanisms to reduce conflict in Sudan, to working on environmental challenges in contexts as different as Vietnam, Morocco and Bolivia. Ayesha has an interdisciplinary PhD in War Studies and Geography from King’s College London. Her doctoral research examined the response of the state, Islamist groups and other political actors to one of the largest climatic disasters that affected contemporary Pakistan. Her research asks political questions around the role of the state and Islamist groups’ response to large-scale flooding that affected Pakistan in 2010 and 2011. More recently her Global Challenges Research Fund funded, project examines the impact of Typhoon Pablo in the troubled region of Mindanao in southern Philippines. Aid interventions in the aftermath of disasters in conflict-affected areas often assume ‘state failure’ and a need to counter the growing influence of insurgent groups. Yet empirical evidence from the ground suggests that there is a need deconstruct and contexualise these narratives and move “towards a postcolonial disaster studies”.

Mike StJohn-Green is an independent consultant in cyber security with clients in the City of London and abroad as a subject matter expert. His current work includes developing computer security guidance for the civil nuclear sector and designing resilience into complex systems. Mike retired in 2013 after 39 years in MoD, GCHQ and then the Cabinet Office. His roles in GCHQ included deputy director CESG the information security agency for the UK. Mike is a frequent speaker and writer on cyber security. He is technical advisor to the Information Security Forum, which publishes the internationally-recognised Standard of Good Practice. He co-authored a book on Cyber Resilience, is a Fellow of the IET and an Honorary Fellow of the University of Warwick.
**Professor Paul Thomas** joined Loughborough University in 2007 as a professor in Analytical Science to work within their Centre for Analytical Science team to develop new measurement approaches for non-invasive diagnostics and prognostics. Of particular interest has been the translation of ion mobility techniques (linear and differential) to in-vivo applications with an emphasis on emergency medicine. As well as serving as Head of Department (2010 to 2015) he is an Editor in chief for the *International Journal of Ion Mobility Spectrometry* and a member of the international Advisory Board for the Journal of Breath Research. He is currently the Project Co-coordinator of the H2020 project TOXI-triage and Work stream leader (Ex-clinic analytics) in the MRC project EMBER. Prior to joining Loughborough Paul gained his PhD in Analytical Science at UMIST and was awarded an endowed lectureship in the Department of Instrumentation and Analytical Science where he subsequently established a Volatile Organic Compounds research group. He remained at UMIST and subsequently the University of Manchester until 2007. During this time he was President of the International Society of Ion Mobility Spectrometry and an Associate Editor for the Analyst.

**Dr Peter Trim** is a Senior Lecturer in Management and Director of the Centre for Advanced Management and Interdisciplinary Studies at Birkbeck, University of London. He is also Managing Director of GAMMA (Global Alliance of Marketing and Management Associations) Europe and a Fellow of the Higher Education Academy and the Royal Society of Arts. Peter is also a Member of the Information Assurance Advisory Council (IAAC) Academic Liaison Panel and has published over 50 academic articles in a range of journals including Industrial Marketing Management; the European Journal of Marketing; the Security Journal; International Journal of Intelligence and Counter Intelligence; Disaster Prevention and Management; Journal of Business Continuity & Emergency Planning; and Simulation & Gaming: An International Journal of Theory, Practice and Research. He has worked in several industries and been involved in a number of initiatives such as the Canada-UK Partnership for Knowledge Forum and the Law Enforcement and National Security Global Forum. He has been Principal Investigator on several grants awarded by the Technology Strategy Board and SEEDA, and the FCO in the area of network security and information infrastructure protection. He is the co-author of several reports for government and books on cyber security.
Dr Karin Von Hippel became Director-General of the Royal United Services Institute (RUSI) on 30 November 2015. Karin von Hippel joined RUSI after serving for nearly six years in the US Department of State as a Senior Adviser in the Bureau of Counterterrorism, then as a Deputy Assistant Secretary in the Bureau of Conflict and Stabilization Operations, and finally, as Chief of Staff to General John Allen, Special Presidential Envoy for the Global Coalition to Counter-ISIL. Prior to that, she co-directed the Post-Conflict Reconstruction Project at the Center for Strategic and International Studies in Washington, DC and was a senior research fellow at the Centre for Defence Studies, King's College London. She has also worked for the United Nations and the European Union in Somalia and Kosovo, and has direct experience in over two dozen conflict zones. Dr von Hippel has numerous publications to her name, including Democracy by Force: US Military Intervention in the Post-Cold War World (2000), which was short-listed for the RUSI Westminster Medal in Military History. She holds a PhD from the London School of Economics, an MSt from Oxford University, and a BA from Yale University.

Major General Rob Weighill CBE completed 34 year career in the British Army, much of it spent in international appointments that culminated on the board with NATO’s Southern Flank Headquarters based in Italy. A senior director of operations and experienced planner he has delivered solutions in highly complex situations in challenging parts of the world, including the Balkans, North Africa, Middle East and Afghanistan. He has a long and distinguished record of building and leading strong and cohesive teams, even under extreme pressure of time and uncertainty. In 2011 led the rapid planning for NATO’s joint air and maritime operations in Libya and subsequently held the position of operations director for the duration of the 7 month mission to protect civilians under a UN Mandate. He has written a book on NATO’s operation in Libya (The Cauldron), which will be published by Hurst and released in December this year. Rob has worked with Oakas since 2015 and was instrumental in the delivery of the NATO Allied Command Transformation Interdependency in Resilience Conference which was held in Norfolk Virginia in May this year.
**Professor Tim Wheeler** is Director of Research and Innovation at the Natural Environment Research Council (NERC), the UK's main agency for funding and managing research in the environmental sciences. He is responsible for oversight of the best environmental science research portfolio in the world covering the full range of atmospheric, Earth, biological, terrestrial and aquatic sciences, from the deep oceans to the upper atmosphere and from the poles to the equator. NERC invests £330 million in research and innovation each year, tackling major issues such as climate change, environmental influences on human health, the genetic make-up of life on Earth, and much more. Before joining NERC Tim was Deputy Chief Scientific Adviser at the UK Department for International Development (DFID) for six years. Tim provided science advice to Ministers, including for the 2015/16 El Nino extreme weather event and 2016 Zika virus outbreak. He also oversaw portfolios of climate, energy, water, agriculture and health research and innovation, amongst others, for impact on international development. He has extensive experience of working with policy-makers in the UK and internationally and was Specialist Adviser to the House of Lords in 2009/10. As Professor of Agriculture at the University of Reading, Tim has published more than 170 scientific papers, including in Science and Nature, over the last 25 years on how climate change could impact on the sustainability of agriculture and food, undertaking research in Bolivia, Honduras, The Gambia, Uganda, China, India and elsewhere.

**Professor Rob Wilby** is Professor of Hydroclimatic Modelling at Loughborough University. His research focuses on the management of risks to freshwater and city environments under climate variability and change. Some of his work is about developing drought and flood indices to assess the severity of extreme events or undertaking high-resolution monitoring of water temperatures to evaluate measures for keeping rivers cool. He also co-developed the Statistical DownScaling Model (SDSM). This public domain scenario generator has been used in numerous climate change impact assessments, including for water resources, flood risk (fluvial and tidal surge), air quality and urban heat island intensity. His latest research is exploring smarter approaches to climate risk assessment and decision making under deep uncertainty about the future climate. This shifts the focus onto better understanding then strengthening the climate resilience of human and natural systems. Examples of live projects include seasonal river flow forecasting for hydropower production in Central Asia, predicting extreme rainfall hazards in East Africa, or forecasting surface water flooding and human heat stress at city scales. His recently published book *Climate Change in Practice* seeks to provoke readers into thinking more deeply about the technical, socio-economic and moral questions surrounding the effective deployment of climate science.
Christine Wormuth is director of the Adrienne Arsht Center for Resilience, which was established at the Atlantic Council in 2017 to advance approaches that promote the abilities of nations, cities, communities, and individuals to respond and adapt effectively to disruptions emerging from today’s unpredictable global environment. Ms Wormuth is a frequent writer and speaker on foreign policy, national security, and homeland security issues. Prior to joining the Atlantic Council, she was under secretary of defense for policy (USDP) at the US Department of Defense (DoD) from 2014 to 2016. In that role, she advised both Secretary Chuck Hagel and Secretary Ash Carter on the full range of regional and functional national security issues. As USDP she frequently represented DoD at the White House and spent considerable time on the counter-ISIS campaign, the rebalance to Asia, counterterrorism operations, and US defense relations with countries in Europe, Asia, and the Middle East. From 2012 to 2014, Ms Wormuth was deputy under secretary of defense for strategy, plans, and forces, and led the 2014 Quadrennial Defense Review. She served as special assistant to the president and senior director for defense at the National Security Council (NSC) from December 2010 until August 2012, where she was the primary liaison from NSC to the Pentagon on defense issues. She started in the Obama Administration as principal deputy assistant secretary for homeland defense. Before joining the Obama Administration, Ms Wormuth spent five years at the Center for Strategic and International Studies (CSIS) as a senior fellow, writing and speaking extensively on defense and homeland security issues.

Dr Chris Zebrowski is a lecturer in Politics and International Relations at Loughborough University, UK. His research has investigated the emergence of resilience discourses and their implications for the rationalities and practices of liberal emergency governance. He is an assistant editor of Resilience: International Policies, Practices and Discourses and author of The Value of Resilience: Securing Life in the Twenty-First Century (Routledge: 2016).
Oakas Limited is a global consultancy that specialises in organisational resilience, aiding governments, militaries, non-governmental organisations, the private sector and charitable bodies to develop and train to be more resilient. Of note, Oakas has established itself as the foremost provider of course design, training delivery and exercise support to the various headquarters in NATO with specificity in the joint environment.

In light of the 2016 NATO summit in Warsaw, Oakas was selected by The NATO Supreme Allied Commander Transformation to spearhead a major new international program that explores the issue of NATO, governmental, civil and commercial interoperability and resilience in the 21st Century, with the subsequent task for the development of training to meet this requirement. Beyond NATO, Oakas has provided support to training for the US Marines, US Army, French Gendarmerie, Italian Carabinieri, Spanish Guardia Civil as well as other agencies.

Outside the military sphere, Oakas is actively involved in building and training resilience in the international arena. A standout project for Oakas was being engaged, with scrutiny from the UK Prime Minister’s Office and Cabinet Office, to assist the Ministry of Defence of Montenegro. This required the design, development and delivery of a bespoke training package for Ministers and senior staffs of the Montenegrin government at an exceptionally sensitive time as Montenegro conducted accession into NATO. This work has developed to span various other Montenegrin Ministries. In September, Oakas representation was requested to deploy to Ukraine where we started work with the Ministry of Energy and Coal and a major national energy distributer, to support national authorities in building resilience through improved emergency preparedness, planning, prevention, response and contribute to strengthen capability to protect electricity related Critical Energy Infrastructure.

In the commercial sphere Oakas has worked with organisations across a variety of sectors. Testament to the professionalism, diligence and competence of the Oakas personnel is the fact that since 2008, Oakas continues to maintain relationships and is requested back for repeat business with all our clients.
Serco delivers essential public services in defence, transport, justice, immigration, healthcare and other citizen services across the UK, Europe, North America, Asia Pacific and the Middle East. As such, the company has a particular interest in societal resilience, driven by the fact that millions of people every day rely upon the essential services that we provide including for their safety, security and well-being.

As well as managing the Cabinet Office's Emergency Planning College, which is the UK's leading centre for organisational resilience, Serco is taking part in a number of collaborative initiatives that will enable improved outcomes through better-informed decision-making. Using its knowledge and expertise as an end user and operator of essential services, Serco is working on a number of programmes that will help inform and shape innovation and improvements in information governance. The aim of these programmes is to drive a more 'joined-up', unified and integrated approach to decision making, which can make a real difference to people's lives.

By way of example, Serco is involved in three societal resilience based European Horizon 2020 (H2020) innovation projects where, together with partners across Europe, the company is seeking to apply innovation to decision-making in a practical and meaningful way.

**AUGGMED** is a serious game platform for first responder training. Offering a doctrine-neutral environment for decision-making helping to exercise emotional management, along with critical and analytical thinking against the relevant doctrine, training needs and outcomes required by organisations in crisis situations. [www.auggmed-project.eu](http://www.auggmed-project.eu)

**Unity** Serco leads the design and implementation of a framework of governance for community policing (CP) in this H2020 project together with multiple European partners in law enforcement and academia. Unity supports a governance structure and framework that enables multiagency organisations to work collectively and more effectively together, addressing the challenges of better informed decision-making within the complex community system. [www.unity-project.eu](http://www.unity-project.eu)

**MOSES** is an information platform for water procurement and management agencies in areas such as reclamation, irrigation and managing flood risk, helping reduce their social and economic impact. [www.moses-project.eu](http://www.moses-project.eu)
The Royal United Services Institute for Defence and Security Studies

*The Royal United Services Institute (RUSI) is the world’s oldest independent defence and security think tank.*

RUSI scholars produce practical, innovative analysis to address the complex challenges of the modern world, and the Institute’s research embodies an ethos of quality and objectivity. Through its convening power and membership, RUSI brings together a diverse range of leaders from the public and private sectors to tackle national and global concerns. Today, comprehensive solutions demand a wider pool of expertise than ever before.

Throughout its long history, RUSI has built a reputation as a trusted authority on defence and security the world over. For RUSI to secure its future as one of the world’s leading centres of specialist expertise on defence and security, it now needs to invest in its historic home in the heart of Whitehall.

**Forthcoming RUSI Events**

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<tr>
<td>3 October 2017</td>
<td>Cyber and Electromagnetic Activities Conference: Force Enabler, Force Multiplier or Something More?</td>
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Research Programmes

Centre for Financial Crime and Security Studies
Addresses the challenges and effects of financial crime and terrorist financing to the UK and international security.

Military Sciences
Examines the theory, policy and practical application of military power, focusing in particular on the shape of UK military efforts.

Defence, Industries and Society
Looks at the place of industries in Western defence, together with wider societal aspects of defence (for example, housing and provision for veterans).

National Security and Resilience
Researches security threats and hazards – principally terrorism/violent extremism, serious and organized crime and cyber threats – and how we should respond.

International Security Studies
Monitors security and foreign policy developments throughout the world, with a particular focus on Asia, Russia and the Middle East.

Proliferation and Nuclear Policy
Provides detailed analysis relating to contemporary international nuclear dynamics.

Become a Member

For over 185 years, RUSI members have been offered unique insights into a fast moving and complex world.

Find out more and join www.rusi.org/membership
The Secure and Resilient Societies (SRS) Global Challenge combines Loughborough's disciplinary strengths to develop multi-disciplinary solutions for current challenges to security and resilience.

Resilience is the ability to resist, or achieve timely recovery from, adversity.

Adversity can strike society in many ways; some due to natural phenomena and others as a result of human behaviours. Similarly, the means through which a society is resilient to adversity is achieved through many different means, often acting in concert. The SRS challenge includes six themes that harness a range of Loughborough expertise for research into types of adversity and their remedies.

**Disaster Risk Management**
Includes multi-disciplinary approaches to: anticipation, preparedness, prevention, response, and recovery with respect to a variety of emergency situations natural hazards and human induced threats.

**Defence**
Includes science and engineering technological contributions to capabilities, human and sociological aspects of defence capability, and systems integration.
Detecting and Analysis
Includes: sensor development and interpretation of heterogeneous data sets for threat identification and classification. This theme combines scientific, financial, and cultural disciplines with mathematics and engineering to create and exploit sensor capabilities to maintain physical, resource, financial, societal, environmental and individual security.

Data and Information: Security and Application
Includes the security of, and access to, data, and reliable and timely use of data to monitor, mitigate, and respond to threats.

Social Cohesion and Inequality
Social cohesion is a precondition for avoiding conflict between groups and regions. Inequality undermines social cohesion and can lead to exclusion of individuals and groups from basic economic and social necessities.

Narrative and Communication
Includes the use of various media and formats through which members of society (especially vulnerable members) can convey and understand threats and responses.