



Australian Government

Department of Defence
Science and Technology

EDTAS

EMERGING DISRUPTIVE TECHNOLOGY
ASSESSMENT SYMPOSIUM

ADVANCED MATERIALS
AND MANUFACTURING

dst.defence.gov.au/edtas

 #EDTAS

Defence Science and Technology (DST) Group will be hosting an Emerging and Disruptive Technology Assessment Symposium (EDTAS) on Advanced Materials and Manufacturing. The EDTAS series helps future-proof Australian Defence by utilising the Next Generation Technologies Fund to consider an expansive science and technology topic that heavily impacts Defence and National Security domains over a 20+ year timeframe.

The objective of this symposium is to shape future Defence research and preparations for emerging and disruptive trends in Advanced Materials and Manufacturing (AM&M), with the aim of understanding and shaping the long term vision for Defence and National Security interests.

- This event will consider AM&M Technologies in 2040, Application in 2040 Scenarios, Capability Concepts, and Drivers, Barriers and Implications for AM&M Adoption.
- A key outcome from the symposium will be a Big Picture Assessment Report developed through the workshop contributions of all attendees.
- This symposium will provide a number of opportunities for participants including networking and partnering, an understanding of strategic and S&T challenges and an input to shape long term Defence and National Security guidance.

ADVANCED MATERIALS AND MANUFACTURING

Advances in the field of materials science are progressing at a rapid pace. Ultrathin nanomaterials such as graphene with diverse mechanical, chemical, and optical properties are poised to disrupt a multitude of industries. At the same time, sophisticated computational modelling techniques are also emerging which allow the prediction and characterisation of new materials, including metamaterials which do not exist naturally in nature and which may have unusual and highly desirable properties. In particular, novel self-healing and smart materials are being developed which can dynamically adapt to environmental conditions.

The manufacturing industry worldwide is also currently experiencing rapid and unprecedented advances, with a shift from mass production towards the Industry 4.0 paradigms of agile, advanced and extreme manufacturing. Companies are embracing 'Future Factory' initiatives and the new digital manufacturing paradigm to enhance innovation and achieve greater agility, and energy and resource efficiency. At the same time, readily available 3D printing technology is fuelling the global 'Maker Movement' in which individuals with minimal supporting infrastructure can now easily build and market innovative products.

EDTAS will seek to explore how Defence can exploit this rapid progress in materials and manufacturing to achieve greater agility, responsiveness and effectiveness.

AM&M TECHNOLOGIES IN 2040

Key emerging technology areas to be considered in this symposium include self-healing and smart materials, extreme and agile manufacturing, advanced metals and composites, nanomaterials, advanced additive manufacturing, and the computational modelling of novel materials. How will these technologies and others converge and develop over the next 20 years and beyond? And what new AM&M technologies are conceivable in 2040?

APPLICATION IN 2040 SCENARIOS

Symposium participants will consider immersive future scenarios to explore possible future options and impacts. These scenarios will be developed in collaboration with our academic and industry partners. For example, consider a natural disaster event that has devastated a major city. With buildings and critical infrastructure destroyed, how might authorities utilise AM&M technologies to provide food, water, medical aid and shelter to the surviving inhabitants?

CAPABILITY CONCEPTS

The adoption of AM&M technologies will create unprecedented opportunities for Defence to not only improve future capability, but to improve the means by which new capability is developed and deployed. This symposium will help to identify novel capability concepts for Defence in 2040, and in the process, help to uncover the important research challenges and opportunities that lie ahead which require action by government, academia and industry.

DRIVERS, BARRIERS AND IMPLICATIONS

The EDTAS symposium will explore the broader implications of AM&M technology from a societal perspective, as well as the potential barriers to adoption for Defence. What economic, social, political, Defence and National Security implications will AM&M technology have in the next 20 years and beyond? And what are the legal, ethical and policy issues that may hamper Defence's adoption of AM&M technology?

CONTACT AND FURTHER INFORMATION

For more information please email us at: edtas@dst.defence.gov.au