

# Technical Session (LT1): Protective Materials, Enabling Technologies for Photonics and Semiconductor Switches

## Chairs

Mr Siow Yeen Ping, AD (LEM), SCG1

Mr Ki Cheuw Kon, AD (PS), SCG2



# DIRP 2016-01 : Emerging Fabrication Techniques for Vehicle Armour

Chair: Mr Ki Cheuw Kon, Assistant Director (PS), Systems and Capabilities Group 2

## Invited Presentation: Superelastic and Shape Memory Ceramics at Small Scales

*Dr Du Zehui, TL@NTU*

## DIRP call

*Ms Pauline Chua, Project Manager (Protective Systems), Systems and Capabilities Group 2*

*Dr Lim Geok Kieng, Principal Member of Technical Staff, Emerging Systems, DSO*



## DIRP 2016-02: Enabling Technologies for Photonics

## DIRP 2016-03: Photonics-Enabled Semiconductor Switches

Chair: Mr Siow Yeen Ping, Assistant Director (LEM), Systems and Capabilities Group 1

### Invited Presentation: Twisted EM Waves

*Prof Tan Soon Yim, NTU*

### Invited Presentation: High Power Laser on Chip

*Asst Prof Joel Yang, SUTD*

### DIRP call

*Mr Siow Yeen Ping, Assistant Director (LEM), Systems and Capabilities Group 1*

### Q & A Session



# Invited Presentation: Superelastic and Shape Memory Ceramics at Small Scales

Dr Du Zehui, Senior Research Scientist,  
TL@NTU



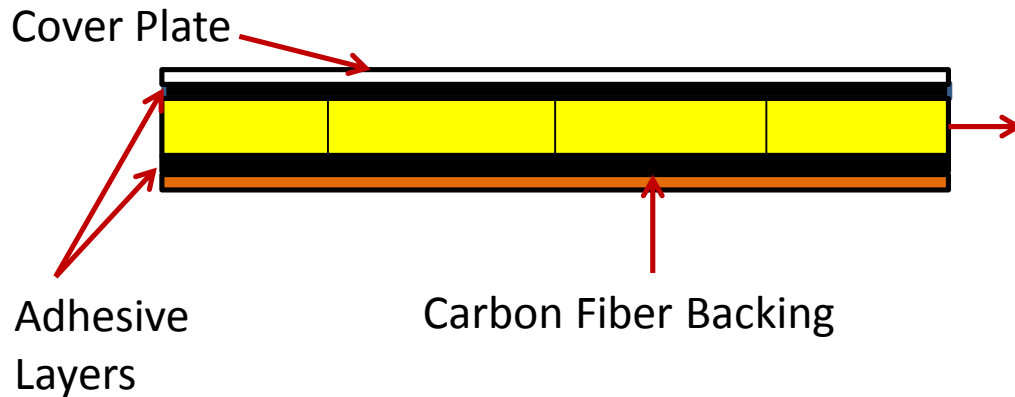
# Emerging Fabrication Techniques for Vehicle Armour

Chair: Mr Ki Cheuw Kon

Panelist: *Ms Pauline Chua*  
*Dr Lim Geok Kieng*



# Ceramic based Composite Armour



**Typical Ceramic Based Composite Armour Module**



## Conflicting Requirements on Ceramic Layer

- Multiple tiles required to achieve multi-hit performance to mitigate crack propagation.
- Smaller tiles more prone to failure from edge effects
- Hard ceramics desirable to fragment projectile upon impact
- Hard ceramics prone to fracture failure from tensile stresses

# DIRP 2016-01: Emerging Fabrication Techniques for Vehicle Armour

This call is to explore scalable ways using 3D printing to realize **novel material architecture and microstructures** for lightweight armour to provide an equivalent level of performance as ceramic-based composite armour. The targeted application is vehicular protection against small caliber rounds in military and counter-terrorism operations.

# Invited Presentation: Twisted EM Waves

Professor Tan Soon Yim, NTU





# Enabling Technologies for Photonics Applications, and Photonics Enabled Semiconductor Switches

Chair:

Mr Siow Yeen Ping

Panelist:

Mr Khoo Sing Soong

Mr Oliver Tong



# DIRP 2016-02: Atmospheric Propagation of Lasers

FSTD is interested in techniques and technologies to overcome atmospheric effects (turbulence and blooming) for long range propagation of high energy laser beams. Key technologies may include adaptive optics, laser beam characteristic optimisation, etc. Expected TRL: 1 - 3

# DIRP 2016-03: Photonics Enabled Semiconductor Switches

FSTD is interested in this technology area and the required supporting technologies that enable fast and synchronised switching of multiple high voltage switches. The integration and synchronisation of these modules is also equally important and should be taken into consideration. Expected TRL: 3 – 5.

# Q & A Session

