**Background**

The mission of STO is to conduct and promote co-operative research and information exchange. STO consists of a three level organization: the Science and Technology Board (STB), the Panels and the Technical Teams. The Applied Vehicle Technology (AVT) Panel is one of the seven Panels under the STB.

The Applied Vehicle Technology Panel strives to improve the advancement of appropriate technologies. The Panel addresses vehicle platforms, propulsion and power systems operating in all environments (land, sea, air, and space), for both new and ageing systems.

To accomplish this mission, the members of the AVT community exploit their joint expertise in the fields of:

- Mechanical systems, structures and materials;
- Propulsion and power systems;
- Performance, stability and control, fluid physics

**Theme**

Structural Health Monitoring (SHM) is an emerging technology, dealing with the development and implementation of techniques and systems where monitoring, inspection and damage detection become an integral part of structures and thus a matter of automation. It does further even merge with a variety of techniques being related to diagnostics and prognostics as such.

SHM emerged from the field of smart structures and laterally encompasses disciplines such as structural dynamics, materials and structures, fatigue and fracture, non-destructive testing and evaluation, sensors and actuators, microelectronics, signal processing and possibly much more. A multidisciplinary approach among these disciplines is therefore required to holistically manage the operation of an engineering structure through its life cycle in the future and to generate breakthroughs in structural engineering.

The objective of this lecture series is to get the experts prepared for the European and other industries to be able to design and manage structural health of engineering structures in the future.

A matching network of experts from European universities and research institutions selected by their technical competence and teaching experience has prepared a lecture series, covering all theory and techniques relevant to the understanding and handling of SHM.

**Topics to be covered:**

LECTURE SERIES PROGRAMME

DAY ONE

8:00  Registration
9:00  Opening Ceremony & STO Overview
      National Authorities
9:15  Introduction & Overview (C. Boller)
9:30  Why SHM? A Motivation (C. Boller)
10:30 Implementation Strategies for SHM in Civil and Military Applications (C. Boller)
11:20  Morning Break
11:40  Fibre Optic Strain Sensors FBG (A. Güemes)
12:30  Lunch Break
13:30  Fibre Optic Distributed Sensing (A. Güemes)
14:30  Vibration-based Methods for SHM (C.-P. Fritzen)
15:20  Afternoon Break
15:40  Load Identification for Structural Health Prognosis (C.-P. Fritzen)
16:40  Methods based on the phenomenon of elastic wave propagation (guided waves).
      Interaction with damage (W. Ostachowicz)
17:30  End of Day 1

DAY TWO:

8:30  Algorithms for damage localization and characterization – estimation of optimal sensors placement. Novel signal processing methods (W. Ostachowicz)
9:30  Lamb Wave Based Piezoelectric Networks and Phased Array Solutions (A. Suleman)
10:20  Morning Break
10:40  Management of Manufacturing Quality, Curing and Life Prognosis of Composite Aircraft Structures (A. Suleman)
11:40  Principles of Time Series Methods for SHM (S. Fassois)
12:30  Lunch Break
13:30  Demonstration Examples with Time Series Methods (S. Fassois)
14:30  Some examples of military SHM projects, and reconsidering the Hunt Class MCMV mid-life update (M. McGugan)
15:20  Afternoon Break
15:40  Offshore Wind – an enabling application for SHM? (M. McGugan)
17:30  End of Day 2

APPLICATION TO ENROL

LECTURE SERIES AVT-220

Berlin (DEU) on 11-12 February 2014

Open to citizens from NATO, Partnership-for-Peace (PfP) and Mediterranean Dialogue (MD) Nations.

Enrolment must be made via internet only at http://www.cso.nato.int/Meetings.aspx

Note: if you enrolled for other RTO-STO activities in the past, please use the same e-mail address as previously. If your e-mail address has changed, please inform the STO-CSO contact before enrolling.

Once your enrolment has been validated, you will receive a General Information Package with the latest information on travel, accommodation and local arrangements. Please note that participants are to make their own travel arrangements and hotel bookings.

If you are unable to enrol via the internet, please contact the CSO enrolment coordinator:
Anne Reboul - anne.reboul@cso.nato.int

Please respect the following dates for enrolment:

Latest Enrolment Dates

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<td>07 February 2014</td>
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<tr>
<td>PfP &amp; MD Nations</td>
<td>21 January 2014</td>
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Contact/Enrolment Coordinator

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