

# Newsletter for SIMoNET

December 2005

1. **National Composites Network.** The National Composites Network (NCN) is a new and unique Knowledge Transfer Network jointly funded by government and industry that will embrace the entire UK Composites industry and its supply chain. NCN is a Company Limited by Guarantee, with a Board drawn from organisations with prominent composites interests. NCN will call upon the expertise of a Strategy Group, representing the breadth of the composites community. The aim of the NCN is to maximise the development potential of the UK composites industry by networking expertise, R&D activity and resources across technologies and industry sector. A link with Simonet has recently been established and a representative from NCN now regularly attends SIMONET steering group meetings.
2. **Notification of forthcoming conference – “Structural Faults + repairs”**, 13-15<sup>th</sup> June 2006, Edinburgh. Organised by Railway Engineering. Further information at [info@structuralfaultsandrepair.com](mailto:info@structuralfaultsandrepair.com)
3. **The Structural Damage and Assessment Network (Sidanet)** is now under the management of the Stress & Vibration Group of the Institute of Physics. Details are on the Sidanet web site [www.sidanet.org](http://www.sidanet.org), including some recent presentations given at conferences.
4. The third **Asranet** international Colloquium is being held in Glasgow between July 10-12<sup>th</sup> 2006. The call for papers ended on 1.10.05. Asranet is the network for integrating structural analysis, risk and reliability. Details of the network and of the planned colloquium are available on the web site [www.asranet.com](http://www.asranet.com).
5. Report of the 2005 Summer Academy on “**Structural Assessment, Monitoring & Control**” is available on the SAMCO web site at [www.samco.org](http://www.samco.org). Information is available on acoustic monitoring and wavelet analysis, advanced bridge monitoring, bridge monitoring and condition assessment, European research practice, forensic engineering, Safepipes etc. Information is also available on the **October 2005 workshop held in Ljubljana**, with presentations on corrosion monitoring of structures, geotechnical monitoring, advanced bridge monitoring and vibration monitoring of cables.
6. **SAMCO “Research Agenda – a Vision for Structural Assessment, Monitoring & Control”**, October 2005 is available on the SAMCO web site [www.samco.org](http://www.samco.org). Structural Assessment Monitoring and Control, by the year 2020, is expected to play a central role in all aspects of any sustainable infrastructure. The vision statement demands that the starting point of the design of future systems and services should be consideration of society’s basic needs and interests. The development of the key elements of SAMCO is seen in brief as:
  - The hardware will develop from isolated systems into integrated sensor networks towards fully embedded systems. Robust reliable and cheap sensors will be embedded everywhere.
  - The methodology will develop from the current isolated methods towards harmonized methods that allow integrating various sources of information and end in standardized methods open to a wide range of users.
  - The use of the technology, which is currently performed by experts only, will develop into common software tools and end into embedded freeware in every application supporting decision making.
  - The application will develop from isolated projects with targeted interest towards an integration of all disciplines and ending in full system integration. SAMCO will be part of everyday life.
7. **“Structural Integrity Monitoring for the Offshore Industry”** – a report prepared by the Marine Technology Directorate in 1993. Details of this are now available on the Energy Institute web site [www.energyinst.org.uk](http://www.energyinst.org.uk).

## 8. EPSRC – Structural Integrity Engineering Programme

In order to facilitate the development of Structural Integrity methods and interactions with industry, the Engineering and Physical Sciences Research Council (EPSRC) funded 45 research projects with a combined value of £7.3M over the last six years in a managed programme. This research programme stemmed from the needs of the Structural integrity industrial community, having a strong focus on the transfer of Structural Integrity methods to new areas and on fostering links between academia and industry.

The Structural Integrity calls emphasised funding interdisciplinary research and the finished projects reflect this with applications from civil engineering to healthcare and to food science, and from manufacturing processes to transportation. Good links with industry were developed and several projects have the potential to give significant improvements to industrial performance. The variety of structural integrity applications can be seen from the list of presented posters which are available from EPSRC

- Development of Reliability Theory for Structural Integrity Assessment of Medical Devices - University of Cambridge (Gregson, Browne et al)
- Fatigue design in Railway Axles - Imperial College London (Smith & Hillmansen)
- In-situ quantitative flaw detection using advanced optical inspection techniques - Loughborough University (Huntley, Nurse & Richardson)
- Intelligent system for automated structural integrity optimisation of automotive structures - University of Leeds (Barton, Brooks et al)
- Linear Matching methods for Life Assessment - University of Leicester (Ponter, Cocks et al)
- Remote bridge health monitoring system using GPS sensor data and computational simulation - University of Nottingham (Roberts, Cosser et al)
- Risk-Cost Optimised Approach to prolonging life of corrosion affected infrastructure - University of Dundee (Li)
- Role of Loading history in the fracture assessment of structures - University of Bristol (Smith, Truman et al)
- Shearography systems for in-service damage monitoring of rotating machinery - Cranfield University (Irving, Tatam et al)
- Structural Integrity by the simulation of laboratory simulation test systems - Napier University (Hay & Roberts)
- Structural Integrity Monitoring of Civil Engineering Structures using Optical Fibre Technology - City University (Boswell, Grattan et al)
- Structural Integrity of bolted joints for putruded GRP (PGRP) profiles (Mottram & Lutz)
- A Guided Wave Array for Structural Health Monitoring - Imperial College (Fromme, Cawley & Lowe)

A review day with poster presentations and discussions was held in October 2004 to review the EPSRC Structural Integrity research programme. Interesting discussions between participants highlighted some of the recent achievements and future research challenges in structural integrity.

Main recent achievements in structural integrity:

- Increased awareness of structural integrity techniques
- Integrated modelling and measurement
- Non destructive testing/ sensor technologies
- Residual stress measurement and analysis using synchrotron/neutron techniques
- Design and Manufacturing
- Practical modelling tools
- Development of computational methods for prototyping and life prediction, including probabilistic methods
- Advances in joining technology

Future Research Challenges

- Sensors , Large complex structures, Hybrid Materials, Medical

The report of the Structural Integrity Review Day is available from EPSRC, which details the findings of the panel and future challenges for sensor technologies, hybrid materials, large complex structures and reliability issues for medical engineering.

<http://www.epsrc.ac.uk/ResearchFunding/Programmes/Engineering/ReviewsAndConsultations/StructuralIntegrityReviewDay/StructuralIntegrityReviewDay.htm>

**9. Materials Knowledge Transfer Network (KTN).** The KTN is an overarching network of networks in Materials, set up to bring together the views of all in business, designers, research and technology organisations, trade associations, the financial market, academia and others in the value network across the materials community. The KTN and its network groups linked to the ‘Advanced Materials Forum’ will provide a range of activities and initiatives to enable the exchange of knowledge and the stimulation of business innovation. Bringing all the materials networks together under the one umbrella will ensure that those involved will work together, optimise resources, spread best practice and provide a one-stop shop for materials advice and expertise to UK manufacturing and service providers.

Key sectors covered by the Web Portal include:

- Materials - structural, functional, Smart materials and systems
- Applications
- Technology, Processing and Characterisation
- Materials innovation and growth team (MatIGT)
- Community and Sector Groups - Materials Faradays and other networks
- Policy and support

The forum is also a tool for communication, and allows individuals to join and influence current debates in the materials sector. The Institute of Materials, Minerals and Mining (IOM3) is pleased to announce an agreement with the DTI to develop and manage this new virtual network to support the materials community. More information at [www.amf.uk.com](http://www.amf.uk.com).

**10. EU Technology Platforms.** The European Commission has identified ‘Technology Platforms’, created under the EU's Sixth Framework Programme, as providing a means to foster effective **public-private partnerships** between the research community, industry and policy makers in order to deliver the impetus to mobilise the research and innovation effort towards achieving a common goal. The role of Technology Platforms in stimulating more effective RTD, particularly in the private sector, can contribute directly to developing the European Research Area. In essence, a Technology Platform (TP)<sup>1</sup> is a mechanism to bring together all interested stakeholders to develop a **long-term vision** to address a specific challenge, create a coherent, dynamic **strategy** to achieve that vision and steer the implementation of an **action plan** to deliver agreed programmes of activities and optimise the benefits for all parties. Current Technology Platforms with some relevance to Simonet are covering the fields of Hydrogen and Fuel Cells, Steel, Waterborne Transport, Industrial Safety.