**Provisional Programme**

**Tuesday 8th September 2009**

08.00   Registration and refreshments – *Buckingham House Foyer*

08.30   Welcoming address - *Buckingham House Lecture Theatre*

**Keynote lecture 1**
Chairman: J M Dulieu-Barton - *Buckingham House Lecture Theatre*

08.40   Vibration and stress analysis in the presence of structural uncertainty
        R S Langley (UK)

09.20   Short break

**Session 1A System Identification**
Chairman: R S Langley - *Buckingham House Lecture Theatre*

09.30   Shape descriptors for mode-shape recognition and model updating
        W Wang, J E Mottershead, C Mares (UK)

09.50   Predicting shock response in uncertain structures using the hybrid method
        L H Humphry, R S Langley (UK)

10.10   Damping identification in multiple degree-of-freedom systems using an energy balance approach
        M Prandina (UK), J E Mottershead (UK), E Bonisoli (Italy)

10.30   Some issues when using Fourier analysis for the extraction of modal parameters
        M Lamb, V Rouillard (Australia)

10.50   Nonlinear parametric vibration of axially moving beams: asymptotic analysis and differential quadrature verification
        L-Q Chen, B Wang, H Ding (China)

**Session 1B Contact Mechanics**
Chairman: A Shukla - *Buckingham House Seminar Room*

09.30   Non-linear friction in reciprocating hydraulic rod seals: simulation and measurement
        A K Bullock, D G Tilley, D N Johnston, C R Bowen, P S Keogh (UK)

09.50   Plain bearing stresses due to forming and oil film pressure
        A Burke-Veliz, D Wang, N Wahdy, P A S Reed, D Merritt, S Syngellakis (UK)

10.10   Modelling flat spring performance using FEA
        B O Fatola, P Keogh, B Hicks (UK)

10.30   Contact problems for rough elastic solids being in nearly full contact or regarded as such for further elaboration
Session 1C  Special Session  MaMiNa Network 1∗
Chairman: V Silberschmidt - Buckingham House First Floor Syndicate Room

09.30 Superhard noncarbonaceous ceramic cvd or pvd coatings on indexable inserts for high speed cutting tools
B G Wendler (Poland)

09.50 Development of free-machining (α+β)-titanium alloys
C Siemers, J Laukart, J Rössler (Germany)

10.10 Chemical vapour deposited diamond for cutting tools
J Gäbler (Germany)

10.30 PVD system for deposition of superhard nc-TiN/a-Si3N4 coatings
I Progalskiy (Poland)

10.50 CVD and PVD hard coatings on Nickel based super alloy CMSX-4 for advanced cutting Tools and standard cutting Tools
M Boota, M Keunecke, J Gäbler (Germany)

11.10 Refreshments - Buckingham House Foyer

Session 2A Biomedical Applications
Chairman: M Lucas - Buckingham House Lecture Theatre

11.30 Stresses in ultrasonically assisted bone cutting
K Alam (UK), A V Mitrofanov (UK), M Bäker (Germany), V V Silberschmidt (UK)

11.50 Biomechanical evaluation of a corporectomy in porcine lumbar specimens using flexible polymer belts

12.10 Real-time surgical simulation for deformable soft-tissue objects with a tumour using boundary element techniques
P Wang, A A Becker, I A Jones, A T Glover, S D Benford, M Vloeberghs (UK)

12.30 The development of a robotic approach to therapeutic ultrasound
Z Qiu, C Xie, S Cochran, G Corner, Z Huang, C Song, S Daglish (UK)

12.50 Mathematical modeling of growth processes in nature and engineering: a variational approach
A V Manzhurov, S A Lychev (Russia)

Session 2B Rotor Dynamics
Chairman: P S Keogh - Buckingham House Seminar Room

11.30 Smart machines with flexible rotors
A W Lees (UK)
11.50 Finite element analysis of a soft mounted 2-pole asynchronous machine concerning vibration stability
   U Werner (Germany)

12.10 Controlling flexible rotor vibrations using parametric excitation
   L Atepor (UK)

12.30 Controlling rotordynamic response without squeeze-film dampers (SFDs)
   S Jiffri, S Garvey (UK)

12.50 Untwisting the Campbell diagrams of weakly anisotropic rotor systems
   O N Kirillov (Germany)

Session 2C  Special Session  MaMiNa Network 2*
Chairman: B G Wendler - Buckingham House First Floor Syndicate Room

11.30 The microstructure-properties-relationship of Ti15V3Cr3Al3Sn alloy
   A Dodonov, C Siemens, J Rösler (Germany)

11.50 Development of advanced beta-titanium alloys
   B Zahra, C Siemens, J Rösler (Germany)

12.10 High strain rate properties of Ti-15-3-3-3 alloy at ambient and elevated temperatures
   T Leemet, M Hokka, V-T Kuokkala (Finland)

12.30 Chip formation and machinability of ageing Ti15V3Cr3Al3Sn alloy during high speed cutting
   D Księżyk, M Girelli, H-W Hoffmeister (Germany)

12.50 Microstructure of Ti-15V-3Al-3Sn-3Cr chips
   P Rokicki, K Saksl (Slovakia)

13.10 Lunch - Murray Edwards – The Dome

Session 3A Manufacturing Processes 1
Chairman: M P Cartmell - Buckingham House Lecture Theatre

14.00 Modal testing and finite element model updating of laser spot welds
   N Abu Husain, H Hoddad Khodaparst, A Snaylam, S James, M Sharp, G Dearden, H Ouyang (UK)

14.20 Dynamic characterization of the cutting conditions in dry turning
   R Serra, H Chibane, R Leroy (France)

14.40 Optimisation of variable helix end milling tools by minimising self excited vibration
   A R Yusoff, N D Sims (UK)

15.00 A finite element model of ultrasonic extrusion
   M Lucas (UK), Y Daud (Malaysia)

Session 3B Structural Integrity Assessment 1
Chairman: I A Jones - Buckingham House Seminar Room

14.00 High temperature life prediction of a welded IN718 component
   D W J Tanner, A A Becker, T H Hyde (UK)
14.20  A review of residual stress analysis using thermoelastic techniques
A F Robinson, J M Dulieu-Barton, S Quinn, R L Burguete (UK)

14.40  Collapse of geometrically imperfect stainless tubes under external hydrostatic pressure
C T F Ross, T Bowler, A P F Little (UK)

15.00  The influence of post-local buckling mechanics on the stress variations, axial stiffness and ultimate failure strength of uniformly compressed thin-walled section struts
J Loughlan, N Yidris, P R Cunningham (UK)

Session 3C  Special Session  MaMiNa Network 3*
Chairman: J Gäbler - Buckingham House First Floor Syndicate Room

14.00 Microstructure of Ti-15V-3Al-3Sn-3Cr chips
P Rokicki, K Saksl (Slovakia)

14.20 Investigation of structure of Ti-15V-Cr-3Al-3Sn alloy
Z Spotz, K Saksl (Slovakia)

Session 4 Posters
Chairman: V Silberschmidt

15.20 Overview of posters - Buckingham House Lecture Theatre

15.35 Refreshments and poster presentations - Murray Edwards - The Long Room
Vibration analysis of atomising discs
H Deng, H Ouyang (UK)
Vibration of a continuous beam excited by a moving mass and experimental validation
D Stâncioiu, S James, H Ouyang, J E Mottershead (UK)
Differential operators associated with the equations of motion and nondissipative heat conduction in the Green-Naghdi theory of thermoelasticity
S A Lychev, A V Manzhirov (Russia)
Innovative unmanned airship structural analysis: dual-hull and exoskeletal configurations
A Cappadona, R Lecca, M Vazzola, P Gili, P Farina, C Surace (Italy)
Finite element prediction of the ultimate axial load capacity of V-section band clamps
S M Barrans, M Muller (UK)

Session 5A Manufacturing Processes 2
Chairman: C Mares - Buckingham House Lecture Theatre

16.00 Vibration of workpieces during aggressive turning operations
X Han (China), M Wang (China), H Ouyang (UK)

16.20 Modeling and optimization of tensile shear strength of titanium/aluminum dissimilar welded component
E M Anawa (Libya), A G Olabi (Ireland), F A Elshukri (Libya)

16.40 Modeling the effect of multiple pulse treatment on deformation processing
G A Tskhondiya (Russia)

17.00 Application of spectroscopic ellipsometry for investigations of compaction and decompaction state in Si-SiO2 systems
W Rzodkiewicz, A Panas (Poland)
**Session 5B Structural Integrity Assessment 2**  
Chairman: P R Cunningham - *Buckingham House Seminar Room*

16.00  A methodology to predict residual life in LCF regime  
C Delprete, A Vercelli (Italy)

16.20  Fatigue crack initiation life prediction of railroad  
P Hosseini Tehrani, M Saket (Iran)

16.40  Characterisation of the fatigue properties of cast irons used in the water industry and the  
effect on pipe strength and performance  
H Mohebbi, D A Jesson, M J Mulheron, P A Smith (UK)

17.00  Numerical analysis of the effect of torispherical head on the buckling of pressure vessels  
M R Khoshravan, A Rahmani (Iran)

**Session 5C Special Session MaMiNa Network 4**  
Chairman: V Silberschmidt - *Buckingham House First Floor Syndicate Room*

16.00  General Discussion

17.30  **Applied Mechanics Group AGM** (All members welcome) - *Buckingham House Lecture Theatre*

18.30  Reception at Gonville & Caius College

*C sessions are by invitation only*
Wednesday 9th September 2009

Keynote lecture 2
Chairman: V Silberschmidt - Buckingham House Lecture Theatre

08.30 Experimental studies on the performance of novel layered materials under highly dynamic loads
A Shukla (USA)

09.10 Short break

Session 6A Composite Structures and Materials
Chairman: O T Thomsen - Buckingham House Lecture Theatre

09.15 Experimental study of thermal stresses in a bonded joint
A Deheeger, C Badulescu, J D Mathias, M Grédiac (France)

09.35 A novel tetrahedral element for static and dynamic analysis of laminated composites
I A Jones, W Ruijter, A C Long (UK)

09.55 Collapse of composite tubes under uniform external hydrostatic pressure
P T Smith C T F Ross, A P F Little (UK)

10.15 Identification of the mechanical behaviour of low density hyperelastic polymeric foams from full-field measurements
F Pierron, B Guo (France)

10.35 Significance of low energy impact damage on modal parameters of composite beams by design of experiments
A Shahdin, J Morlier, Y Gourinat (France)

10.55 Nonlocal conditions for the transition from damage to a localized failure in granular composites under quasistatic loading
A V Zaitsev (Russia)

Session 6B Civil Engineering Applications 1
Chairman: A A Becker - Buckingham House Seminar Room

09.15 The dynamic behaviour of a non-stationary elevator compensating rope system under harmonic and stochastic excitations
S Kaczmarczyk (UK), R Iwankiewicz (Germany), Y Terumichi (Japan)

09.35 An ultrasonic corer for planetary rock sample retrieval
P Harkness A Cardoni, M Lucas (UK)

09.55 Analysis of flexible fabric structures for large-scale subsea compressed air energy storage
A Pimm, S Garvey (UK)

10.15 The effect of inclined soil layers on surface vibration from underground railways using a semi-analytical approach
S Jones, H Hunt (UK)

10.35 Finite-element analysis of thermal-induced stresses around a cased injection well
A Ferla (Belgium), A Lavrov (Norway), E Fjære (Norway)
10.55 Wavelet analysis of beam-soil structure response for fast moving train  
P Koziol (Poland), Z Hryniewicz (Poland), C Mares (UK)

11.15 Refreshments and EMex – Murray Edwards – The Walkway

Session 7 Exhibitor Presentations  
Chairman: J M Dulieu-Barton - Buckingham House Lecture Theatre

11.45 A series of 3-4 minute presentations from the exhibitors  
Fibre Bragg grating strain measurement technology  
M Kreuzer, Hottinger Baldwin Messtechnik GmbH (Germany)  
Applications of optical techniques for strain measurement, vibration analysis and NDT  
R Wood, Dantec Dynamics (UK)  
Application and examples of digital image correlation  
D Hollis, LAVision (UK)  
Dots and spots: The use of advanced image processing for mechanical problem solving  
GOM (UK)  
High resolution point to point video extensometers  
K Potter, Imetrum Ltd. (UK)  
From acquisition to desktop: wired and wireless solutions  
C Warren, Mantracourt (UK)  
Measurement sensors  
I Ramage, Techni-Measure (UK)  
Vic3D - The mother of digital image correlation systems  
Ralf Lichtenberger, Limess GmbH (Germany)  
X-ray diffraction and residual stress measurement systems and services  
R Drake, Proto Manufacturing Ltd (Canada)  
The use of shearography on composite materials  
A Gwynne, Laser Optical Engineering (UK)

12.45 Lunch and EMex - Murray Edwards- The Walkway

Session 8A Advanced Modelling Techniques 1  
Chairman: H Ouyang - Buckingham House Lecture Theatre

13.45 Solving time-dependent problems by an RBF-PS method with an optimal shape parameter  
A M A Neves, C M C Roque, A J M Ferreira, C M M Soares, R M N Jorge (Portugal)

14.05 Volterra methods for constructing structural dynamic observables for nonlinear systems: an extended calculation  
G. Manson, K Worden (UK)

14.25 The new numerically-analytic method for integrating the multiscale thermo elastoviscoplasticity equations with internal variables  
V Kukudzhanov (Russia)

Session 8B Civil Engineering Applications 2  
Chairman: K M Holford – Buckingham House Seminar Room

13.45 Low dimensional models for stick-slip vibration of drill-strings  
M Silveira, M Wiercigroch (UK)
14.05  A computationally efficient software application for calculating vibration from underground railways  
   M F M Hussein, H E M Hunt (UK)

14.25  Raising of a heavy semi-circular vault on a rigid centering  
   D A Parshin (Russia)

14.45  Short Break

**Session 9 Young Stress Analyst Competition**  
Chairman: S Quinn - *Buckingham House Lecture Theatre*

14.50  TBA – Four 15 minute presentations from the competition finalists

15.50  **Refreshments and EMex - Murray Edwards – The Walkway**

**Session 10 Measurements Lecture**  
Chairman: J Shackleton - *Buckingham House Lecture Theatre*

16.15  Materials modeling and design: experiences from aerospace and MEMS  
   S M Spearing (UK)

17.00  **BSSM AGM (All members welcome) - Buckingham House Lecture Theatre**

19.00  Reception followed by Conference Dinner in *Murray Edwards – The Dome*
Thursday 10th September 2009

Keynote lecture 3
Chairman: A W Lees - Buckingham House Lecture Theatre

08.30 Analysis methods for the practical application of fracture mechanics
R A Ainsworth (UK)

09.10 Short break

Session 11A Fracture and Damage 1
Chairman: R A Ainsworth - Buckingham House Lecture Theatre

09.15 Deformation and fracture of plates of finite thickness
A Kotousov, S Harding, J Codrington (Australia)

09.35 Modelling of crack deflection at core junctions in sandwich structures
J Jakobsen, J H Andreasen, O T Thomsen (Denmark)

09.55 Numerical and experimental analysis of the directional stability on crack propagation under biaxial stresses
R Rodríguez-Martínez, G Urriolagoitia-Calderón, G Urriolagoitia-Sosa, L H Hernández-Gómez, E A Merchán-Cruz; R G Rodríguez-Cañizo, J M Sandoval-Pineda (Mexico)

10.15 Curve fitting of mixed-mode isopachics
R I Hebb, J M Dulieu-Barton, K Worden, P Tatum (UK)

Session 11B Impact, Dynamic Loading and Damping 1
Chairman: S Kaczmarczyk - Buckingham House Seminar Room

09.15 Identification of material damping and stiffness in vibrating plates using full-field measurements
A Giraudreau, F Pierron (France)

09.35 High speed image correlation for vibration analysis
T Siebert (Germany), R Wood (UK), K Splitthof (Germany)

09.55 Characterization of the deformation behaviour of PCBs under dynamic loading conditions
P F Fuchs, Z Major, R W Lang (Austria)

10.15 Effect of impact damper on SDOF system vibrations under harmonic and impulsive excitations
S M Zahrai, A F Rod (Iran)

10.35 Refreshments - Buckingham House Foyer

Session 12A Fracture and Damage 2
Chairman: K Worden - Buckingham House Lecture Theatre

10.55 Experimental verification and comparison of mode shape-based damage detection methods
M Radzieński, M Krawczuk (Poland)

11.15 A strain-damage coupled model and its application to near crack tip localization analysis
V A Kovalev, Y N Radayev (Russia)
11.35  Numerical and experimental evaluation of the residual stress relaxation and the influence zone due to application of the crack compliance method
   J M Sandoval-Pineda, G Urriolagoitia-Sosa, G Urriolagoitia-Calderón, L H Hernández-Gómez, J García-Lira, J A Beltrán-Fernández, R Rodríguez-Martínez (Mexico)

11.55  Dynamic response analysis of a heavy commercial vehicle subjected to extreme road operating conditions
   K Chinnaraj, S P Mangalaramanan, C Lakshmana Rao (India)

12.15  Strain limit dependence on stress triaxiality for pressure vessel steel
   Y Deng, G Chen, X Yang, T Xu (China)

Session 12B Novel Sensor Technology 1
Chairman: F Pierron - Buckingham House Seminar Room

10.55  Magnetic shape memory (MSM) actuators in practical use
   K Majewska A Zak, W Ostachowicz (Poland)

11.15  Load estimation from photoelastic fringe patterns under combined normal and shear forces
   V N Dubey, G S Grewal (UK)

11.35  Thermoelastic stress analysis of a 2D stress field using a single detector infrared scanner and lock-in filtering
   G Pitarresi, A Normanno, L D'Acquisto (Italy)

11.55  Combining digital image correlation and projected fringe techniques on a multi-camera multi-projector platform
   T N Nguyen, J M Huntley, R L Burguete, C R Coggrave (UK)

12.15  Measurement of the shear wavespeed in a submerged plate
   A J Hull, B A Cray (USA)

12.35  Lunch – Murray Edwards – The Dome

Session 13A Novel Sensor Technology 2
Chairman: G Pitarresi - Buckingham House Lecture Theatre

13.10  Residual stress relaxation measurements across interface at macro- and micro-scales using slitting and DIC
   A Blair, N Daynes, D Hamilton, G Horne, P J Heard, D Z L Hodgson, T B Scott, A Shertenlikht (UK)

13.30  Capturing higher modes of vibration of micromachined resonators
   K P Venkatesh, R Pratap (India)

13.50  A study on the precision of a confocal probe from its fork frequency and amplitude
   Z R Qiu, K N Yao, B X Chen, X H Li, Y Zhong (China)

Session 13B Impact, Dynamic Loading and Damping 2
Chairman: V Dubey - Buckingham House Seminar Room

13.10  The assessment of vibration absorption capacity of elevator's passengers
   I Herrera (Spain), S Kaczmarczyk (UK)

13.30  Analytical modelling of the transient dynamics of pipes with flowing medium
A Kotousov, R Mohammad (Australia)

13.50 Numerical analysis of the effect of isotropic and kinematic hardening of anisotropic targets in impact loading
M N Krivosheina, S V Kobenko, M A Kozlova (Russia)

Session 14A Structural Health Monitoring
Chairman: C Surace - Buckingham House Lecture Theatre

14.10 Damage detection in turbine wind blades by vibration based methods
Ł Doliński, M Krawczuk (Poland)

14.30 Investigation of the nonlinear dynamics of the partially cracked plate
A Israr (UAE), L Atepor (UK)

14.50 Damage localization from vibration data using hierarchical a priori assumptions
A Huhtala (Finland), S Bossuyt (Belgium)

15.10 Gearbox diagnostics using wavelet-based windowing technique
F K Omar, A M Gaouda (UAE)

15.30 Methods for detecting fatigue cracks in gears
A Belšak, J Flašker (Slovenia)

Session 14B Advanced Modelling Techniques 2
Chairman: A J M Ferreira - Buckingham House Seminar Room

14.10 3D time–domain spectral elements for stress waves modelling
P Kudela, W Ostachowicz (Poland)

14.30 Quadratic partial eigenvalue assignment problem with time delay for active vibration control
J M Pratt, K V Singh B N Datta (USA)

14.50 Hybrid fuzzy and sliding-mode control for motorised tether spin-up when coupled with axial vibration
Y Chen, M P Cartmell (UK)

15.10 Approximation of the Duffing oscillator frequency response function using the FPK equation
E J Cross, K Worden (UK)

15.30 Nonlinear vibrations of an inclined beam subjected to a moving load
M H Kargarnovin, D Younesian, A Mamandi (Iran)

15.50 Thermo-mechanical analysis using a multiphysics approach
C Delprete, F Freschi, M Repetto, C Rosso (Italy)

16.10 Refreshments - Buckingham House Foyer

16.30 Close