**Sunday 14 September 2008**

14.00 Conference registration and poster set-up

17.00 Drinks reception and opening poster session  
   (General poster viewing – all themes)

18.00 Dinner

**Monday 15 September 2008**

07.30 Registration

08.15 Introduction and welcome  
   Conference co-chairs

**Session 1: Design concepts - I**

08.30 **KEYNOTE**  
   Fleet management issues and technology needs  
   P. Hoffman*; NAVAIR, USA

09.10 **Spectrum editing effects on lifing of aircraft structural components**  
   N. Iyyer*¹, R. Merrill¹, S. Sarkar¹, N. Phan²; ¹Technical Data Analysis, Inc., USA, ²U.S. Naval Air Systems Command, USA

09.40 **Prognosis for structural health prognosis using mechanistic multistage fatigue model**  
   Y. Xue*¹, J.B. Jordon¹, M.F. Horstemeyer¹, D.L. McDowell², J. Newman¹; ¹Mississippi State University, USA, ²Georgia Institute of Technology, USA

10.10 **Short crack model development for primary airframe material**  
   M. Liao*, T. Benak, et al; Institute for Aerospace Research, Canada

10.40 Refreshments

**Session 2: Design concepts - II**

11.10 **Generation and analysis of FCG data using a single specimen and \( K_{\text{max}} - \Delta K \) testing matrix**  
   D. Kujawski*, P.C. Sree; Western Michigan University, USA

11.40 **Incorporating residual stress into the crack growth design practice using ACR concepts**  
   M. James*¹, D. Ball², J. Brockenbrough¹, R. Bucci¹, K. Donald¹; ¹Alcoa, USA, ²Lockheed, USA, ³Fracture Technology Associates, USA

12.10 **CDM approach applied to fatigue crack propagation on aeronautical metallic alloys**  
   H.F. Hamon*¹, H.G. Henaff¹, H.D. Halm¹, B.T. Billaudeau ², B.S. Bezamat²; ¹Physical and Mechanical Laboratory of Materials, France, ²AIRBUS, France

12.40 **Poster viewing (Poster session 1 – Theoretical approaches, modeling and life prediction methodologies)**

13:10 Lunch
Session 3: Crack initiation criteria

14.00  **Analysis of fatigue crack nucleation using the unified damage approach**  
K. Sadananda*1, G. Glinka2, A.K. Vasudevan1;  
1Technical Data Analysis, Inc, USA, 2University of Waterloo, Canada, 3Office of Naval Research, USA

14.30  **Development of a dual crack nucleation – crack propagation approach to formalize the fretting fatigue damages**  
S. Fouvry*, K. Kubiak;  
Ecole Centrale de Lyon, France

15.00  **Crack initiation and crack path growth under mutiaxial fatigue loading for structural steels**  
L. Reis, M. de Freitas*, B. Li;  
Instituto Superior Técnico, Portugal

15.30  **On the fatigue behavior of bifurcated cracks under near-threshold conditions**  
Pontifical Catholic University of Rio de Janeiro, Brazil

16.00  **Refreshments**

Session 4: Crack tip plasticity

16.30  **Insights into mechanical mechanisms derived from synchrotron based fatigue crack strain mapping**  
M. Croft*1,2, V. Shukla1, N. Jisrawi3, Z. Zhong4, R. Sadan41, R. Holtz1, P. Pao4 et al;  
1Rutgers, USA, 2NSLS, USA, 3Sharjah, United Arab Emirates, 4NRL, USA

17.00  **On the size and shape of plastic zones ahead of crack tips**  
H.Z. Rodríguez, J.T.P. Castro*, M.A. Meggiolaro;  
Pontifical Catholic University of Rio de Janeiro, Brazil

17.30  **Elastic-plastic stress-strain analysis ahead of a growing fatigue crack**  
A.B. Buczynski1, G.G. Glinka*2;  
1Warsaw University of Technology, Poland, 2University of Waterloo, Canada

18.00  **Close of Day 1**

Tuesday 16 September 2008

Session 5: Fatigue / Environment – Al alloys

08.30  **KEYNOTE**  
Environmental effects in prognosis of airframe aluminum alloys  
R.P. Gangloff*; University of Virginia, USA

09.10  **Effect of environment on fatigue crack growth in ultra-fine grain Al-7.5Mg**  
P.S. Pao*1, A.K. Vasudevan2, R.L. Holtz1, H.N. Jones1, C.R. Feng1;  
1Naval Research Laboratory, USA, 2Office of Naval Research, USA

09.40  **Influence of frequency and loading waveform on the corrosion fatigue crack propagation behaviour of the aluminium alloy 2024-T351**  
F. Menan*, G. Henaff; LMPM-ENSMA, France

10.10  **The effects of aqueous environment on fatigue crack growth in 7075-T6 aluminum alloy**  
A.K. Vasudevan*1, P. Pao*, et al;  
1Office of Naval Research, USA, 2Naval Research Laboratory, USA

10.40  **Refreshments**

Session 6: Fatigue / Environment – Ni alloys

11.10  **Plain and notched fatigue in nickel single crystal alloys**  
W.J. Evans*1, M.T. Whittaker1, R. Lancaster1, A. Steele1, N. Jones3;  
1Swansea University, UK, 2Rolls-Royce plc, UK

11.40  **Environment and time dependent effects on the fatigue response of an advanced nickel based superalloy**  
M.R. Bache*1, J.P. Jones1, M.C. Hardy2, G.L. Drew2;  
1Swansea University, UK, 2Rolls-Royce, UK

12.10  **Oxidation assisted fatigue crack growth under complex non-isothermal loading conditions in a nickel base superalloy. Experiments and modeling**  
S.N. Pommier*, J.A. Ruiz-Sabariego; LMT-Cachan, France

12.40  **Poster viewing (Poster session 2 –Extreme environments, residual stress effects, and spectrum loading)**

13:10  **Lunch**
Session 7: Multiaxial fatigue

14.00 KEYNOTE
Multiaxial fatigue damage
D. Socie; University of Illinois, USA

14.40 An experimental evaluation of critical plane multiaxial fatigue criteria
Y. Jiang*; University of Nevada, USA

15.10 History effect in fatigue under mixed mode loading conditions
P.Y. Decreuse*, S.N. Pommier, L. Gentot, S. Pattolatto; LMT-Cachan, France

15.40 Fatigue damage accumulation in Ti-6Al-4V under simulated multiaxial mission spectra
A.R. Kallmeyer*1, S.K. Suman1, E.T. Goodin1, P. Kurath2; 1North Dakota State University, USA, 2University of Illinois, USA

16.10 Refreshments

Session 8: –Internal stress and pre-strain

16.40 Mean stress relaxation and strain-life fatigue in high strength aluminum alloys
A. Arcari, R. De Vita, N.E. Dowling*; Virginia Tech, USA

17.10 Effect of prestrain on the fatigue properties of Ti-834
W.J. Evans, M.T. Whittaker*; Swansea University, UK

17.40 Notch fatigue resistance of shot peened high strength aluminium alloys: The role of residual stress relaxation
M.B. Benedetti*, V.F. Fontanari, C.S. Santus; University of Pisa, Italy

18.10 Close of Day 2

Wednesday 17 September 2008

Session 9: Probabilistic approaches

08:30 Fatigue variability of a Ni-base superalloy
R.J. Morrissey*, R. John; Air Force Research Laboratory, USA

09:00 Fatigue weakest-link density and strength distribution: Materials fatigue properties
T. Zhai1, J.X. Li1, T. Li1, X.P. Jiang1, J.C. Li1, G.H. Bray2, et al; 1University of Kentucky, USA, 2Alcoa Technical Center, USA

09:30 Study of fatigue variability in Ti-6Al-4V
P.J. Golden*, R. John; Air Force Research Laboratory, USA

10:00 Nondeterministic fatigue crack growth predictive modeling
R.L. Holtz*; US Naval Research Laboratory, USA

10:30 Refreshments

Session 10: Systematic materials studies - I

11:00 KEYNOTE
Crack tip deformation fields and fatigue crack growth rates in Ti-6Al-4V
A.M. Korsunsky1*, D. Dini2, et al; 1University of Oxford, UK, 2Imperial College, UK

11:40 Improved test methods for measuring fatigue crack growth rates in aerospace materials
J.C. Newman1*, Y. Yamada1, J.J. Ruschau2; 1Mississippi State University, USA, 2Office of Naval Research, USA

12:10 Fatigue crack growth of aluminum alloys at ultra high vacuum (10-10 torr)
J.J. Williams1, N. Chawla2*, A.K. Vasudevan1; 1Arizona State University, USA, 2Office of Naval Research, USA

12:40 Effect of load ratio on fatigue lives and crack propagation behavior of the extruded magnesium alloy
S. Ishihara1*, A. McEvily2, M. Sato1, K. Taniguchi1, T. Goshima1; 1University of Toyama, Japan, 2University of Connecticut, USA

Close of Day 3 and free time
### Thursday 18 September 2008

#### Session 11: Systematic materials studies -II

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Presenter(s)</th>
<th>Institution(s)</th>
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<tbody>
<tr>
<td>08:30</td>
<td>Experimental and numerical investigation of thickness effects in plasticity-induced fatigue crack closure</td>
<td>P.F.P. de Matos, D. Nowell*; University of Oxford, UK</td>
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<tr>
<td>09:00</td>
<td>Subsurface fatigue crack generation and strain incompatibility near grain boundaries for a nitrogen-strengthened austenitic steel at cryogenic temperature</td>
<td>O. Umezawa; Yokohama National University, Japan</td>
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<tr>
<td>09:30</td>
<td>3D crack closure measurement using laboratory x ray tomography and extended image correlation</td>
<td>J.-Y. Buffiere*1,2, N. Limodin1, J.-P. Tinnes1, J. Rethore1, S. Roux2,1, F. Hild2,1; Universite de Lyon INSA-Lyon, France, ENS Cachan, France</td>
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#### Session 12: Systematic materials studies - III

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<tr>
<td>10:00</td>
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#### Session 13: Crack initiation and growth from contacts

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<tbody>
<tr>
<td>11:00</td>
<td>Dislocation microstructure evolution in DSS under uniaxial and biaxial cyclic loadings</td>
<td>P. Evrard*1, S. Herenu2, V. Aubin1, I. Alvarez-Armas2, S. Degallaix1; Instituto de Fisica CONICET, Argentina</td>
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<tr>
<td>11:30</td>
<td>Cyclic effects on a nano-particle-strengthened superalloy – in-situ neutron-diffraction and small-angle-neutron scattering measurements</td>
<td>E.-W. Huang*1, P.K. Liaw1, E. Oliver2, Y. Liu3, L. Porcar3, J.-J. Kai4, W.R. Chen5 et al; University of Tennessee, USA, Rutherford Appleton Laboratory, UK, National Institute for Standards and Technology, USA, National Tsing Hua University, Taiwan, Oak Ridge National Laboratory, USA</td>
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<tr>
<td>12:00</td>
<td>An experimental investigation of fatigue crack growth of stainless steel 304L</td>
<td>S. Kalnaus*1, F. Fan1, A.K. Vasudevan1, Y. Jiang1; University of Nevada, Reno, USA, Office of Naval Research, USA</td>
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#### Session 13: Crack initiation and growth from contacts

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<tr>
<td>14:00</td>
<td>The effect of FOD on the fatigue strength of aluminum</td>
<td>D. Lanning*1, B. Slade1, C. Catacora2; Embry-Riddle Aeronautical University, USA, Virginia Tech, USA</td>
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<tr>
<td>14:30</td>
<td>Different approaches to estimate life in fretting fatigue with spherical and cylindrical contact</td>
<td>C. Navarro*, J. Vázquez, S. Muñoz, J. Domínguez; University of Seville, Spain</td>
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<tr>
<td>15:00</td>
<td>Multiaxial fretting fatigue testing for splined couplings</td>
<td>D. Houghton*, P.M. Wavish, S.B. Leen, E.J. Williams, I.R. McColl; University of Nottingham, UK</td>
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<td>15:30</td>
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### Session 14: Analysis and modelling approaches

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<th>Time</th>
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<tr>
<td>16:00</td>
<td>Propagation and interaction of multiple cracks in a tensile specimen using FRANC3D crack growth simulation</td>
<td>K.W. Barlow; Naval Air Systems Command, USA</td>
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<tr>
<td>16:30</td>
<td>Point load weight function solutions for part-through cracks in finite thickness plates</td>
<td>X. Wang*; G. Glinka*; Carleton University, Canada, University of Waterloo, Canada</td>
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<tr>
<td>17:00</td>
<td>Simple stress intensity factor method for a crack from a cutout using a stiffness modified shear only finite element calculation</td>
<td>M.R. Urban*; Sikorsky Aircraft, USA</td>
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<tr>
<td>17:30</td>
<td>New fatigue life calculation method for quenched and tempered steel SAE 4140</td>
<td>P. Starke*, F. Walther, D. Eller; University of Kaiserslautern, Germany</td>
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### Friday 19 September 2008

#### Session 15: Variable amplitude fatigue - I

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<th>Time</th>
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<tbody>
<tr>
<td>08:30</td>
<td>Crack growth prediction for aircraft structural integrity using spectrum fatigue data</td>
<td>W. Zhuang*, M. McDonald, L. Molent; Defence Science and Technology Organisation, Australia</td>
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<tr>
<td>09:00</td>
<td>Enhanced life prediction for airframe structures under variable amplitude fatigue loading</td>
<td>L. Wang, Y. Chen, W. Tiu, Y. Xu*; University of Hertfordshire, UK</td>
</tr>
<tr>
<td>09:30</td>
<td>Application of the UniGrow model to fatigue crack growth prediction under spectrum loading</td>
<td>S.M. Mikheevskiy*, G. Glinka; University of Waterloo, Canada</td>
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<tr>
<td>10:00</td>
<td>The effect of loading sequences on fatigue damage under hard landing</td>
<td>J.X. Tao*; Messier-Dowty Ltd, UK</td>
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<td>10:30</td>
<td>Refreshments</td>
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#### Session 16: Variable amplitude fatigue - II

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<th>Time</th>
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<th>Presenter(s)</th>
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<tr>
<td>11:00</td>
<td>Influence of foreign object damage on fatigue crack growth of gas turbine aerofoils under complex loading conditions</td>
<td>J. Tong*, J. Byrne, R. Hall; University of Portsmouth, UK</td>
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<tr>
<td>11:30</td>
<td>Experimental observation and modeling of the retardation of fatigue crack propagation under the combination of mixed-mode single overload</td>
<td>J. Lee*; B. Choi**; LG Chemicals, South Korea, MecKorea University, South Korea</td>
</tr>
<tr>
<td>12:00</td>
<td>Fatigue of 7075-T651 aluminum alloy under constant and variable amplitude loadings</td>
<td>E.U. Lee*; G. Glinka*; A.K. Vasudevan*; Naval Air Warfare Center Aircraft Division, USA, University of Waterloo, Canada, Office of Navel Research, USA</td>
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<tr>
<td>12:30</td>
<td>Fractographic measurement of crack growth rates for small cracks from simple sequences in AA7050-T7451</td>
<td>P.D. White*, S.A. Barter; Defence Science and Technology Organisation, Australia</td>
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<tr>
<td>13:00</td>
<td>Closing remarks</td>
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<tr>
<td>13:10</td>
<td>Lunch</td>
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