UNIVERSITY OF BIRMINGHAM

Brian J. Connolly

The University of Birmingham
School of Metallurgy and Materials
Edgbaston, Birmingham B15 2TT
United Kingdom
b.j.connolly@bham.ac.uk
+44 (0)121 414 5166

Qualifications

Expertise in corrosion engineering and electrochemical science specializing in the study of stress assisted localized corrosion, environmentally-assisted cracking, the transition from localised corrosion to cracking, hydrogen embrittlement, and high temperature oxidation and creep in aluminium alloys, nickel based alloys, titanium and steels. Over ten years experience in undergraduate and graduate education/instruction with an emphasis on mechanical engineering and materials science.

Experience

Senior Lecturer of Localised Corrosion and Environmentally-Assisted Fracture **2011-present**
School of Metallurgy and Materials, The University of Birmingham, Birmingham, UK

- Deputy Director - Engineering Doctorate Centre (*Engineered Materials for High Performance Applications in Aerospace and Related Technologies*) 2007-present
- Director Undergraduate Studies – Centre for Nuclear Education and Research 2010-present

Lecturer of Localised Corrosion and Environmentally-Assisted Fracture **2006-2010**
School of Metallurgy and Materials, The University of Birmingham, Birmingham, UK

Royal Society USA Research Fellow and Visiting Lecturer **2003-2006**
School of Engineering / Metallurgy and Materials, The University of Birmingham, Birmingham, UK

Visiting Academic Staff **2004-2006**
Manchester Materials Science Centre, UMIST and University of Manchester, Manchester, UK

Assistant Research Professor **2001-2003**
Department of Mechanical Engineering, United States Naval Academy, Annapolis, MD, USA

Corrosion Engineer **1990-1991**
Mobile Bay 823 Project Team / Gulf of Mexico Surface Technical Team
Mobil Exploration & Producing U.S. Inc., New Orleans, LA, USA

Education

Ph.D. (Materials Science and Engineering) **May, 2002**
University of Virginia, School of Engineering & Applied Science, Charlottesville, VA, USA
Thesis: *The Transition from Localized Corrosion to Stress Corrosion Crack Initiation in Advanced Al-Li-Cu Aerospace Alloys as a Function of Temper*
Sponsor: NASA-Langley Research Center (Light Aerospace and Structures Technology Program)
Advisor: Prof. John R. Scully

M.S. (Materials Science and Engineering) **May, 1996**
University of Virginia, School of Engineering & Applied Science, Charlottesville, VA, USA
Thesis: *Water Staining of Aluminum Alloy 3104 Can Body Stock: An Electrochemical Study of Crevice Corrosion*
Sponsor: Reynolds Metals Company
Advisor: Prof. John R. Scully and Prof. Glenn E. Stoner

B.S. (Materials Engineering) **March, 1992**
Georgia Institute of Technology, School of Materials Engineering, Atlanta, GA, USA
Senior Thesis: *An Analysis of High Temperature Creep Deformation and Failure in Ferritic Steels (2 1/4 Cr, 9 Cr) in Fossil Fuel Power Plants*
Advisor: Prof. Ashok Saxena

Citizenship

United States of America
Republic of Ireland (European Union)

RESEARCH PROFILE

Current Research
Environmental degradation has a major impact on many industrial sectors, as it is the major cause of premature, and often catastrophic, failure of engineering structures. It attracts a broad range of industrial collaborators and sponsors, and is particularly appealing to students, who see it as an area with important practical applications. The underlying science is highly interdisciplinary, linking fundamental aspects of electrochemistry and high temperature materials behaviour, physical metallurgy and engineering mechanics.

The goal of my efforts at the University of Birmingham is to establish a major research group in the area of ***Environmental Degradation of Materials for Energy and Electric Power Generation***. The focus of the effort has targeted five industry-based themes:

- Materials degradation (including irradiation damage) in Pressurised water Nuclear power plants
- Materials for advanced/low CO_2 fossil-fuel burning power plants
- Materials for advanced Oil & Gas recovery
- Material embrittlement issues in the infrastructure for the Hydrogen economy
- Materials degradation in aero and industrial turbines

Each of these industrial-based themes present challenging environmental conditions that could limit the reliability and life of structural components. The scope of environmental degradation issues is quite broad and requires specialised knowledge in the following areas:

- Localised Aqueous Corrosion
- Environmentally assisted cracking (corrosion fatigue, stress corrosion cracking, hydrogen embrittlement)
- High temperature oxidation and spallation
- Creep rupture behaviour

I have been able to develop a substantial research group with appropriate laboratory infrastructure for distinctive work in these areas. The group currently consists of 2 research fellow, 4 PhD students, 5 EngD students, and 1 MPhil student, as well as undergraduate research students. Three programmes involve investigation into material issues in nuclear power applications, three programmes involve investigation into material issues in conventional power plant applications, four programmes involve investigation of material issues in advanced oil &gas recovery applications, one programme involves investigation of materials degradation in aerospace/industrial turbines, and one programme involves investigation into hydrogen embrittlement issues of infrastructural materials for use in the hydrogen economy.

The long-term goal of my work is to develop a fundamental understanding of the mechanisms driving stress and corrosion-assisted failures of structural materials, to measure the rates of localised and stress-assisted failure processes, and to use these approaches to develop life-prediction models for critical components. The ecological drivers for improved energy efficiency are placing ever more stringent requirements on the performance of materials. Ever more reliable life prediction is therefore an ongoing challenge that requires a greater understanding of the science underlying the controlling mechanisms of environmentally-assisted failure.

Future Research Strategy
The future strategy or evolution of my research efforts will focus on two additional themes:

- Environmental degradation of advanced materials for ***Ultra-supercritical conventional power plants***
- Environmental degradation of advanced materials for ***Generation IV Nuclear power plants***

Production of a dependable energy supply for the 21st century and beyond, while limiting the emission of green house gases, offers many challenges and opportunities for materials science. Future advanced energy systems, such as those mentioned above, will require new materials that operate at dramatically higher levels of performance with respect to stress, strain, temperature, pressure and chemical reactivity.

The efficiency of conventional fossil power plants is a strong function of increased steam parameters (i.e., temperature and pressure). Significant increases in temperature could increase the efficiency of these plants from the current 35% to near 60%. These operating conditions require new materials that can withstand these environments. Advanced stainless steels and nickel-based super alloys are being developed in world-wide activity to accommodate the increased temperatures and pressures that will exist in next-generation ultra-supercritical power plants and it will be imperative to characterise their high temperature degradation behaviour to ensure safety and plant reliability.

To address the issue of sustainability of nuclear energy, fast neutron reactors must be developed, as they can typically multiply by over a factor of 50 the energy production from a given amount of uranium fuel compared to current

reactors. New materials as well as fabrication and welding processes need to be developed to achieve higher performance and longer lifetimes, as well as to withstand more extreme conditions. Many challenges for materials will also be experienced in the development of Generation IV nuclear reactors where temperatures may approach 900°C. High temperature reactor technology will need a range of new materials such as advanced nickel-based alloys, refractory alloys, ceramics, advanced composites as well as advanced coatings technology. Mechanical and chemical behaviour of these materials need to be characterised and modelled in the new domains of higher temperatures and higher irradiation levels.

RESEARCH GROUP/PROGRAMMES

Post Doctoral Research Fellows (2006-present)

- Dr Chris Cooper (2011-2016), 'Materials for Nuclear Applications' *[UEB – Nuclear Engineering initiative].*
- Dr. Richard Doyle (2011-2012), 'Hydrogen Embrittlement Studies/Cracking of Steels in Sour Service' *[EPSRC Knowledge Transfer Secondment].*
- Dr. Dean Horspool (2011-2012), 'Application of Novel High Pressure/High Temperature Corrosion Fatigue Facility for the Technological Advancement of Flexible Oil and Gas Pipelines' *[EPSRC Knowledge Transfer Secondment].*
- Dr. Chris Cooper (2006-2011), 'Environmental Cracking of Stainless Steels in Nuclear Power Plant as a Function of Platinum Group Alloying (PGM) Additions.' *[Ministry of Defence, EPSRC].*

PhD Students (2003-present)

- John Hewett (2014), 'TBD – Ion Irradiation and High Temperature Oxide Solubility Studies for Nuclear Plant,' *[National Nuclear Laboratory – Industrial Case Award].*
- Ben Palmer (2014), 'Ion Irradiation Damage in Structural Materials for Generation IV Reactors,' *[UEB – Nuclear Engineering initiative].*
- James Rosser (2013), 'Steam Oxidation Behaviour of Austenitic Stainless Steels at High Temperature in Supercritical Plant,' *[RWE N-Power].*
- Richard Doyle (2011), 'Hydrogen Embrittlement of 304 Stainless Steel as a Function of PGM Alloying Additions,' *[Johnson Matthey plc].*
- Sukanta Ghosh (2008), 'Stress and Microstructure Effects on Localised Corrosion in Aluminium Alloys,' *[The Royal Society].*
- David Horner (2008), 'Transition from Localised Corrosion to SCC in Steam Turbine Disc Steels' *[NPL].*
- Cristiano Padovani (2007), 'Laser Surface Treatment for Improved Corrosion Resistance in Aerospace Aluminium Alloys' *[BAE Systems].*

PhD Students with Integrated Studies (2010-present)

- Danial Khoshkou (2014), 'X-ray Tomography studies of Thermal Barrier Coatings,' [*Rolls-Royce Aerospace*].

EngD Students (2003-present)

- Matthew Bass (2013), 'Effects of Microstructure on Steam Oxidation of Austenitic Stainless Steels,' *[Doosan-Babcock].*
- Jonathan Morrison (2013), 'Minimising Corrosion in Nuclear Reactors: mechanisms of corrosion product formation, transport and deposition,' [*Rolls-Royce Marine*].
- Igor Nowack (2013), 'Development of Creep and Oxidation Properties for Heat Resistant Alloys,' *[Doncasters-Paralloy].*
- Matthew Walters (2013), 'Corrosion Test Development for H_2S Cracking in Steels,' *[Bodycote plc / Exova].*
- Dean Horspool (2011), 'Corrosion Fatigue in Corrosive Oil and Gas Well Environments,' *[Bodycote plc / Exova].*
- Sam Tulloch (2010), 'Effect of Dispersions on Localised Corrosion in 316L Stainless Steels in Secondary Side PWR Environments,' *[Rolls-Royce Marine].*
- John Forde (2010), 'Optimisation of Mechanical Properties of Aluminium Cast Alloys for High Temperature Pump Body Applications,' *[Goodrich].*
- Chris Goodfellow (2007), 'Corrosion and Stress Corrosion Cracking of 7xxx Friction Stir Welds,' *[TWI].*

MPhil Students (2006-present)

- TBD (seconded – 2014), TBD *[Bodycote plc / Exova].*
- Phil Dent (seconded - 2011), 'Stress Corrosion Cracking of 13 Cr Steels in Sour Gas Environments as a Function of Sub-ambient Temperature.' *[Bodycote plc / Exova].*

MRes Students (2004-present)

- Philip Baldock (2012), 'The Degradation of Material Properties in Ceramics under Large Doses of Ionising Radiation' [EERA Pilot Programme / UEB – Nuclear Engineering initiative].
- Henry Simms (2010), 'High Temperature Oxidation Behaviour of Austenitic Stainless Steels for Supercritical Plant,' *[RWE n-Power].*
- James Gunson (2010), 'Pit to Crack Transitions, Hydrogen Embrittlement and Corrosion Fatigue Characterisation in 5xxx Aluminium Alloy,' *[ALCOA].*

- Andrew Williams (2009), 'Microstructural Analysis of AA2096 as a Function of Heat Treatment' *[ALCOA]*.
- John Ahearne (2007), 'Corrosion and Stress Corrosion Cracking of Dissimilar Metal Friction Stir Welds' *[Airbus]*.
- Sebastian Fox (2007), 'In Situ X-Ray Tomography of Localised Corrosion Development' *[The Royal Society]*.
- Robert Bell (2006), 'Localised Corrosion and Corrosion Fatigue of Friction Stir Welded 6xxx Aluminium Alloys' *[Airbus]*.
- Richard Doyle (2006), 'Fatigue of Aluminium Friction Stir Welds as a Function of Surface Treatment' *[Airbus]*.

MSc Research Students (Physics and Technology of Nuclear Reactors)

- Adam Thompson (2011), ' *[BOC]*.
- John Hewitt (2011), ' *[UEB – Nuclear Engineering initiative]*.
- Ben Palmer (2010), 'Ion Irradiation Damage in Structural Materials,' *[UEB – Nuclear Engineering initiative]*.
- Jennifer Angus (2008), 'Electrochemical Characterisation of 304 Stainless Steel as a Function of PGM additions' *[Ministry of Defence]*.
- Liliana Donosa (2007), 'Effect of Ruthenium Alloying Addition on the Stress Corrosion Cracking Behaviour of 304 Stainless Steel,' *[Ministry of Defence]*.
- Yahya Sandali (2007), 'Effect of Paladium Alloying Addition on the Stress Corrosion Cracking Behaviour of 304 Stainless Steel,' *[Ministry of Defence]*.

Final Year Undergraduate Research Students (2003-present)

- Nick Cruchley (2011), 'Investigating the Creep Properties of 25Cr-35Ni Alloys for Hydrogen Generation'.
- Ellie Walton (2011), 'Corrosion Fatigue of FSW AA6013'.
- Keri Farrow (2011), 'Fatigue of Armour Wire for CO_2 Oil Well Evnironments'.
- Jennifer Harmer (2009), 'Oxidation of PGM-doped Type-304 Stainless Steel'.
- Ben Taylor (2008), 'Mechanical Properties of Weldable 13 Cr Steels at Sub-ambient Seabed Temperatures'.
- Gareth Locke (2008), 'Fatigue and Corrosion Fatigue of Friction Stir Welded AA6013'.
- Nicola Ray (2007), 'Mechanical and Stress Corrosion Cracking Properties of Al-Li-Cu Alloy AA2099 as a Function of Temper Heat Treatment'.
- James Gunsen (2007), 'Electrochemical and Corrosion Fatigue Properties of Al-Li-Cu Alloy AA2099 as a Function of Temper Heat Treatment'.
- James Pearson (2005), 'Mechanistic Study of Crevice Corrosion Commonly observed in Aluminium Coiled Sheet used in the Manufacture of Beverage Cans'.
- Ashley Dunstan (2005), 'Surface Melting Processes for Corrosion Protection of Nickel Aluminium Bronze Propellers'.
- John Brett (2005), 'Effect of Microstructure on Corrosion of Magnesium Alloys', co-advised with Dr. A.J. Davenport.
- Richard Jones (2004), 'Stress Effects on Localized Corrosion of Aluminum Fusion Welds for Automotive Applications'.
- Mathew Stanton (2004), 'Localized Corrosion of Friction Stir Welded 6XXX Series Aluminum Alloys'.
- Richard Doyle (2004), 'Effects of Laser Surface Melting on the Fatigue Lifetime of Friction Stir Welded AA2024'.
- Robert Bell (2004), 'Electrochemical Behavior of Laser Surface Treated Friction Stir Welded AA2024', co-advised with Dr. A.J. Davenport.
- Sebastian Fox (2004), 'Formation of and Corrosion Evaluation of Nanocrystalline/Amorphous laser Surface Processed Alloys', co-advised with Dr. A.J. Davenport.
- Robert Winsley (2004), 'Electrochemical Behavior of Laser Surface Alloyed AA2024', co-advised with Dr. A.J. Davenport.

French Undergraduate Training Students

- Guillaume Lefebvre (2007), Ecole Nationale Superieure des Ingenieurs en Art Chimiques et Technologiques – Toulouse, 'Stress Effects on the Localised Corrosion Behaviour of AA2096,' (co-advised with Prof. Ian Jones).

Argentinean Undergraduate Training Students

- Juan Manuel Ranalli (2004), University of San Martín, 'Assessing and Optimizing Elemental Concentrations in Surface Laser Alloyed AA2024', (co-advised with Dr. A.J. Davenport).

FUNDING OBTAINED (2003-present)

- Pump UEB Nuclear Engineering Initiative
- £20 k Rolls Royce Marine, Equipment grant to support EngD studentship,
- Minimising Corrosion in Nuclear Reactors: mechanisms of corrosion product formation, transport and deposition, Rolls Royce Marine, Equipment grant to support EngD studentship, **£43 k**, Principal Investigator: B.J. Connolly, 2011.
- Application of Novel High Pressure/High Temperature Corrosion Fatigue Facility for the Technological Advancement of Flexible Oil and Gas Pipelines, EPSRC Knowledge Transfer Secondment, **£37 k**, Principal Investigator: B.J. Connolly, 2011-2012.

- High Temperature Oxide Solubility Studies for Nuclear Plant, National Nuclear Laboratory, Industrial Case studentship, **£40 k**, Principal Investigator: B.J. Connolly, 2011-2014.
- X-ray Tomography studies of Thermal Barrier Coatings, Rolls-Royce Aerospace, EngD studentship, **£40 k,** Principal Investigator: B.J. Connolly, 2010-2014.
- Long Term, In Situ Material Degradation Studies Utilizing High Resolution Laboratory X-ray Tomography, EPSRC [EP/H025286/1], **£124 k**, Principal Investigator: B.J. Connolly, 2010-2012.
- Minimising Corrosion in Nuclear Reactors: mechanisms of corrosion product formation, transport and deposition, Rolls Royce Marine, Equipment grant to support EngD studentship, **£90 k**, Principal Investigator: B.J. Connolly, 2010.
- Effects of Microstructure on Steam Oxidation of Austenitic Stainless Steels, Doosan-Babcock, EngD Studentship, **£40 k**, Principal Investigator: X. Wu, co-investigator: B.J. Connolly, Industrial Supervisor: P. Moody, 2009-2012.
- Doctoral Training Partnership (DTP) in Structural Metallic Systems for Gas Turbine Applications-Universities of Cambridge, Swansea and Birmingham, EPSRC [EP/H022309/1], **£6495 k**, Principal Investigator: Prof. P. Bowen (University of Birmingham), co-investigators: Prof. N. Green (University of Birmingham), Dr B.J. Connolly (University of Birmingham), Dr C. Rae (University of Cambridge), Dr W. Clegg (University of Cambridge), Dr H. Stone (University of Cambridge), Dr M. Whittaker (University of Swansea), Dr K. Perkins (University of Swansea) and Dr M.R. Bache (University of Swansea), 2009-2016.
- Minimising Corrosion in Nuclear Reactors: mechanisms of corrosion product formation, transport and deposition, Rolls Royce Marine, EngD studentship, **£36 k,** Principal Investigator: B.J. Connolly, Industrial Supervisor: A. Banks, 2009-2012.
- Development of Creep and Oxidation Properties for Heat Resistant Alloys, Doncasters-Paralloy, EngD studentship (seconded), **£18.8 k**, Principal Investigator: B.J. Connolly, co-investigator: H.E. Evans, Industrial Supervisor: Z. Zhang, 2009-2012.
- Corrosion Test Development for H_2S Cracking in Steels, Bodycote PLC / Exova, EngD studentship, **£28 k**, Principal Investigator B.J. Connolly, Industrial Supervisor: C. Fowler, 2009-2012.
- Steam Oxidation Behaviour at High Temperature in Supercritical Plant, RWE N-Power, MRes/EngD/PhD studentship, **£75 k**, Principal Investigator B.J. Connolly, co-investigator H. Evans, Industrial Supervisor: T. Lant, 2008-2011.
- Stress Corrosion Cracking of 13 Cr Steels in Sour Gas Environments as a Function of Temperature, Bodycote PLC / Exova, MPhil studentship (Seconded), **£ 6.4 k**, 2009-2011.
- Corrosion Fatigue in Corrosive Oil and Gas Well Environments, Bodycote PLC / Exova, EngD studentship, **£28 k**, Principal Investigator B.J. Connolly, Industrial Supervisor: C. Fowler, 2007-2010.
- Multiscale Approaches to Enhance Materials Performance: Environmentally Assisted Degradation, Ministry of Defence [R&T/1/0231], **£100 k**, Principal Investigator B.J. Connolly, co-investigator J.F. Knott, 2007-2009.
- In Situ X-ray Tomography of Intergranular Corrosion in Stainless Steels as a Function of Pd Group Alloying Additions, Advanced Photon Source – Argonne National Laboratory, **synchrotron beam time, travel support**, Principal Investigator: B.J Connolly, co-investigators: A. Sherry (Univ. Manchester), S. Lyon (Univ. Manchester), 2006.
- In Situ X-ray Microtomography Study of Intergranular Corrosion of Aluminum Alloys, Advanced Photon Source – Argonne National Laboratory, **synchrotron beam time, travel support**, Principal Investigator: A.J. Davenport, co-investigators: B.J. Connolly, Mardalen Jostein (SINTEF), Thomas Suter (EMPA), 2005.
- Multiscale Approaches to Enhance Materials Performance: Environmentally Assisted Degradation, Ministry of Defence [R&T/1/0231], **£200 k**, Principal Investigator B.J. Connolly, co-investigator J.F. Knott, 2005-2007.
- Effect of Dispersions on Localised Corrosion in 316L Stainless Steels in Secondary Side PWR Environments, Rolls-Royce Marine, EngD studentship, **£28 k**, Principal Investigator P. Fryer, co-investigator B.J. Connolly, Industrial Supervisor: V. Evans, 2005-2009.
- Platform Grant: Fracture, Fatigue, and Durability of Advanced Alloys and Composites for High Performance Applications, EPSRC [EP/D50029X/1], **£431.5 k**, Principal Investigator P. Bowen, co-investigators J. Knott, A.J. Davenport, and B.J. Connolly, 2005-2010.
- In Situ Corrosion of a Mg-Y Alloy, Swiss Light Source – Paul Scherrer Institut, **synchrotron beam time, travel support**, Principal Investigator: A.J. Davenport, co-investigators: B.J. Connolly, M. Preuss (Univ. Manchester and UMIST), T.J. Marrow (Univ. Manchester and UMIST), N. Stevens (Univ. Manchester and UMIST), 2005.
- Intergranular Corrosion Studies of 'Special' Grain Boundary Engineered Stainless Steel, Swiss Light Source – Paul Scherrer Institut, **synchrotron beam time, travel support**, Principal Investigator: B.J Connolly, co-investigators: V. Randle (University of Wales – Swansea), 2005.
- Aluminium alloys for high temperature pump body applications, Goodrich, EngD studentship, **£28 k**, Principal Investigator B.J. Connolly, co-investigator N. Green, Industrial Supervisor: T. Hirst, 2004-2008.
- Stress Effects on Pit Initiation and Intergranular Corrosion Propagation in Friction Stir Welded Aluminium Alloys, Office of Naval Research and NACE International Research Seed Grant Program [N00014-02-1-0024], **$40 k**, Principal Investigator B.J. Connolly, 2004-2005.
- High Resolution, In-Situ Analysis of Stress Assisted Localised Corrosion and the Transition to Short Environmentally Assisted Cracking in Friction Stir Welded Aluminium Alloys via Synchrotron X-ray Tomography, Swiss Light Source – Paul Scherrer Institut, **synchrotron beam time, travel support**, Principal

Investigator: B.J Connolly, co-investigators: M. Preuss (Univ. Manchester and UMIST), T.J. Marrow (Univ. Manchester and UMIST), A.J. Davenport, N. Stevens (Univ. Manchester and UMIST), 2004.

- Pitting and Stress Corrosion Cracking, NPL, **£21 k** , Principal Investigator A.J. Davenport, co-investigator B.J. Connolly, 2004-2007.
- Localised Corrosion of Fusion and Friction Stir Welded AA5xxx and AA7xxx Alloys, ALCAN International, **£30 k**, Principal Investigator A.J. Davenport, co-investigator B.J. Connolly, 2004-2007.
- Tomography Studies of Intergranular Corrosion in Friction Stir Welds of a High Strength Aluminium Alloy, Swiss Light Source – Paul Scherrer Institut, **synchrotron beam time, travel support**, Principal Investigator: M. Preuss (Univ. Manchester and UMIST), co-investigators: A.J. Davenport, B.J Connolly, N. Stevens (Univ. Manchester and UMIST), T.J. Marrow (Univ. Manchester and UMIST), 2004.
- Laser Surface Alloying of Aerospace Alloys, Airbus Germany, partial funding for PhD Project and undergraduate projects, **£6.5 k**, Principal Investigator A.J. Davenport, co-investigator B.J. Connolly, 2004.
- Evaluation of the Intergranular Corrosion of Laser-cut Aluminium Parts, SONACA, **£3 k**, Principal Investigator A.J. Davenport, co-investigator B.J. Connolly, 2004.
- Corrosion and Stress Corrosion Cracking of 7xxx Friction Stir Welds , TWI, EngD studentship, **£28 k**, Principal Investigator A.J. Davenport, co-investigator B.J. Connolly, Industrial Supervisor: C. Lee, 2003-2007.
- Laser Surface Alloying of Aerospace Alloys, Airbus UK, PhD Project and undergraduate projects, **£41 k**, Principal Investigator A.J. Davenport, co-investigator B.J. Connolly, 2003-2006.
- Science and Technology Engagement Program / Visiting Scientist Program, Office of Naval Reasearch-Global [N00014-03-1-4158], **$6 k**, Principal Investigator B.J. Connolly, 2003.
- Stress Corrosion Cracking in High Strength Alloys, Royal Society [TB/USA/15523], **£146 k**, Principal Investigator B.J. Connolly, 2003-2006.

Specific Proposals Submitted to EPSRC, TSB, EU etc

- "Long Term, In Situ Material Degradation Studies Utilizing High Resolution Laboratory X-ray Tomography," Dr B.J. Connolly (University of Birmingham), 2009.
- "Doctoral Training Partnership (DTP) in Structural Metallic Systems for Gas Turbine Applications-Universities of Cambridge, Swansea and Birmingham," Prof. P. Bowen (University of Birmingham), Prof. N. Green (University of Birmingham), Dr B.J. Connolly (University of Birmingham), Dr C. Rae (University of Cambridge), Dr W. Clegg (University of Cambridge), Dr H. Stone (University of Cambridge), Dr M. Whittaker (University of Swansea), Dr K. Perkins (University of Swansea) and Dr M.R. Bache (University of Swansea), 2009.
- "Challenging Engineering: Metallurgical Challenges in Efficient and Sustainable Power Generation," Dr B.J. Connolly (University of Birmingham), 2009.
- "EngD Centre in Structural Materials for High Performance Applications in Aerospace and Related Technologies," Prof. P. Bowen (University of Birmingham), Prof. N. Green (University of Birmingham), Dr B.J. Connolly (University of Birmingham), 2009.
- "An Interdisciplinary Scanning Electron Microscope with Focussed Ion Beam Machining Capability," Prof I. Jones (University of Birmingham), Prof S. Abell (University of Birmingham), D P. Anderson (University of Birmingham), Dr D. Book (University of Birmingham), Dr B.J. Connolly (University of Birmingham), Dr H. Dong (University of Birmingham), Prof H. Evans (University of Birmingham), Prof N. Green (University of Birmingham), Dr R. Greenwood (University of Birmingham), Dr W. Griffiths (University of Birmingham), Prof R. Harrison (University of Birmingham), Dr J. Lead (University of Birmingham), Prof M. Loretto (University of Birmingham), Prof L. MacAskie (University of Birmingham), Prof R. Palmer (University of Birmingham), Dr N. Rowson (University of Birmingham), Dr R. Shelton (University of Birmingham), Dr A. Williams (University of Birmingham), Prof Z. Zhang (University of Birmingham), Dr R. Sammons (University of Birmingham), Dr D. Hu (University of Birmingham), Dr S. Kukureka (University of Birmingham), Prof A. Smith (University of Birmingham), Dr A. Pacek (University of Birmingham), Dr J. Haris (University of Birmingham), Dr A. Davenport (University of Birmingham), 2006.
- "Mechanisms of Hot Corrosion in Nickel Based Disc and Blade Alloys in Land Based Gas Turbines," Materials for Energy Supply Call – Materials Research to Improve Current Energy Generation Technology, Prof. P. Bowen (University of Birmingham), Prof. H.E. Evans (University of Birmingham), Dr B.J. Connolly (University of Birmingham), Prof. J.R. Nicholls (Cranfield University), Dr N.J. Simms (Cranfield University), and Dr M.R. Bache (University of Swansea), 2006.
- "Platform Grant: Fracture, Fatigue, and Durability of Advanced Alloys and Composites for High Performance Applications," P. Bowen (University of Birmingham), J. Knott (University of Birmingham), A.J. Davenport (University of Birmingham), and B.J. Connolly (University of Birmingham), 2005.
- "The Role of Materials in Maintaining Capability and Anticipating Future Needs in Nuclear Power Generation, Toward A Sustainable Energy Economy (TSEC) Programme – expression of interest," Prof. P. Bowen, Prof. J. Knott, Prof. H. Evans, Dr B. Connolly, Dr A. Davenport, Dr C. Davis, Dr M. Hall, Prof. I. Jones, Dr K. Simpson, Prof. L. Clark, and Dr N. Gorst, The University of Birmingham, 2004.
- "The Mechanistic Interaction between Crack Tip Environment and Intergranular Stress Corrosion Cracking in Steels," Prof. P. Flewitt (University of Bristol), Dr C. Younes (IAC/BNFL), Prof. R. Faulkner (Loughborough

University), Prof. J. Knott (The University of Birmingham), and Dr B. Connolly (The University of Birmingham), 2004.

- "Grain Boundary Microstructures and Corrosion Susceptibility of Low Stress No Distortion Welds in Aluminium Alloys, Austenitic Stainless Steels, and Nickel Base Alloys," Prof. R. Faulkner (Loughborough University), Dr A. Davenport (The University of Birmingham), and Dr B. Connolly (The University of Birmingham), 2004.

TEACHING EXPERIENCE

- School of Metallurgy and Materials, The University of Birmingham 2008
  Lecturer: (MEng Module on Environmentally Degradation) Developed and lectured Masters level course in the fundamental aspects of intergranular corrosion and stress corrosion cracking.
- Department of Metallurgy and Materials, The University of Birmingham 2006-07
  Lecturer: (Undergraduate Mechanics of Materials Module: Mechanics in Sports and Bio - MT 1MSBa) Undergraduate course for first year sports materials students in basic mechanics.
- Department of Metallurgy and Materials, The University of Birmingham 2006,-07,-08,-09
  Lecturer: (Eng D Module on The Physical Metallurgy of Aluminium Alloys) Developed and lectured graduate level course in the physical metallurgy and mechanical properties of aluminium alloys.
- Metallurgy and Materials, The University of Birmingham 2006,-07,-08,-09,-10
  Lecturer: (Eng D Module on Team Skills / Organisational Behaviour) Lectured graduate level course on Teams Skills and Organisational Behaviour.
- Metallurgy and Materials, The University of Birmingham 2005
  Lecturer: (Undergraduate Module on Aerospace Materials/Metallurgy – L3) Developed and lectured undergraduate level course in the physical metallurgy and mechanical properties of aluminium alloys for aerospace applications.
- Metallurgy and Materials, The University of Birmingham 2004,-05,-06,-07,-08,-09,-10
  Lecturer: (Eng D Module on Environmentally Degradation of Alloys) Developed and lectured Doctorate level course in the fundamental and applied aspects of corrosion and environmental fracture.
- Metallurgy and Materials, The University of Birmingham 2003
  Lecturer: (MRes Module on Environmentally Assisted Cracking) Developed and lectured Masters level course in the fundamental aspects of intergranular corrosion, stress corrosion cracking, corrosion fatigue and hydrogen embrittlement.
- Metallurgy and Materials, The University of Birmingham 2003
  Lecturer: (Undergraduate Corrosion Laboratory: Properties and Applications of Materials, PAM/MM1) Undergraduate laboratory for first year engineering students in basic electrochemistry and corrosion of structural metals.
- Department of Mechanical Engineering, United States Naval Academy 2002
  Professor: (EM 496 Independent Research) Co-advised/directed two senior level undergraduate students in independent research projects focusing on material properties testing, evaluation, and characterization.
- Department of Mechanical Engineering, United States Naval Academy 2002
  Professor: (EM 313 Materials Science) Lectured junior level undergraduate introductory course and laboratory in the physical and mechanical properties of engineering design materials including metals, ceramics, composites, and polymers, their structures, use in engineering applications, and failure phenomena.
- Department of Mechanical Engineering, United States Naval Academy 2002
  Professor: (EM 495 Independent Research) Co-advised/directed two senior level undergraduate students in independent research projects focusing on material properties testing, evaluation, and characterization.

SCHOOL/COLLEGE ADMINISTRATIVE DUTIES (2006-present)

- College of Engineering and Physical Sciences, The University of Birmingham 2010-present
  Director of Undergraduate Studies:
  - Design/develop new BSc-MEng course in Nuclear Engineering
  - Course accreditation
  - Course advertising
  - Course recruitment
  - Development of new modules for course

- School of Metallurgy and Materials, The University of Birmingham 2007-present
  Post Graduate Tutor (EngD course): Responsible for academic matters (specifically in the areas of assessment and progression) related to all Birmingham registered students (45 students in steady state) within the EngD Centre in

Engineered Materials for High Performance Applications in Aerospace and Related Technologies. Specific duties to date include:

- EngD Inductions
- EngD First Year Assessments
- EngD Third Year Assessments
- Preparation of EngD NDA agreements
- Preparation of EngD contracts
- Chairman EngD Centre annual Conference

DOCTORAL DEGREE ASSESSMENT COMMITTEES (2003-present)

- Flavie Moulinier (academic supervisor: Dr. Alison Davenport), "Effects of a Surface Treatment on the Corrosion and Fatigue Behaviour of a High Strength Aluminium Alloy," Doctor of Philosophy, Metallurgy and Materials, University of Birmingham, Edgbaston, UK, 2003. (Internal Assessor)
- Frederic Blin (academic supervisor: Dr. Maria Forsythe), "Rare Earth Metal Cinnamate Compounds for Corrosion Inhibition of Mild Steel – Efficiency and Mechanisms," Doctor of Philosophy, Department of Materials Engineering, Monash University, Clayton, Australia, 2006. (External Assessor)
- Keith Taylor (academic supervisor: Prof. Paul Bowen), "Fatigue of Titanium Alloys – Advancing Understanding of Range-Mean Behaviour and Improving Methods of Characterisation," Doctor of Engineering, Metallurgy and Materials, University of Birmingham, Edgbaston, UK, 2006. (Internal Assessor)
- Konstantinos Sierros (academic supervisor: Dr. Stephen Kukureka), "Mechanical Properties and Characterisation of Substrates for Flexible Displays ," Doctor of Philosophy, Metallurgy and Materials, University of Birmingham, Edgbaston, UK, 2006. (Chairperson)
- Andrew Sullivan (academic supervisor: Dr. Joseph Robson), "Microstructural Modelling of FSW Welding in Aerospace Aluminium Alloys," Doctor of Philosophy, School of Materials, University of Manchester, Manchester, UK, 2007. (External assessor)
- Moataz Mohammad Mahmoud Attallah (academic supervisor: Dr. M Strangwood, Dr. C.L. Davis), "Microstructure-Property Development in Friction Stir Welds of Aluminium-Based Alloys," Doctor of Philosophy, Metallurgy and Materials, University of Birmingham, Edgbaston, UK, 2007. (Internal Assessor)
- Sarah Louise Pollard (academic supervisor: Prof. Paul Bowen), "Processing and Properties of Titanium Metal Matrix Composites," Doctor of Engineering, Metallurgy and Materials, University of Birmingham, Edgbaston, UK, 2008. (Internal Assessor)
- James Foden (academic supervisor: Prof. Paul Bowen), "An Integrated Solution to Technology Management for Manufacturing Technologies," Doctor of Engineering, Metallurgy and Materials, University of Birmingham, Edgbaston, UK, 2008. (Chairperson)
- Caroline Simcock (academic supervisor: Prof. Paul Bowen), "Material and Structural Integrity Issues in the Design of Critical Components for High Duty, Long Life Cryogenic Products," Doctor of Engineering, Metallurgy and Materials, University of Birmingham, Edgbaston, UK, 2008. (Chairperson)
- Ian Edmonds (academic supervisor: Prof. Hugh Evans; external assessor: Prof. John Nicholls), "The Oxidation Performance of Fourth Generation Single Crystal Nickel-based Superalloys," Doctor of Engineering, Metallurgy and Materials, University of Birmingham, Edgbaston, UK, 2009. (Internal Assessor)
- Rhiannon Webster (academic supervisor: Prof. Tim Button), " ," Doctor of Philosophy, Metallurgy and Materials, University of Birmingham, Edgbaston, UK, 2009. (Chairperson)
- Friedrich Daus (academic supervisor: Prof. Paul Bowen, Dr. H.Y. Li; external assessor: Dr Michael Preuss), "Process, Microstructure and Property Relationships in Dissimilar Nickel Base Superalloy Inertia Friction Welds," Doctor of Philosophy, Metallurgy and Materials, University of Birmingham, Edgbaston, UK, 2009. (Internal Assessor)
- Daniel Cogswell (academic supervisor: Prof. Paul Bowen; external assessor: Prof. Andrew Sherry), "Statistical Modelling of the Transition Properties of Low Alloy Pressure Vessel Steels," Doctor of Engineering, Metallurgy and Materials, University of Birmingham, Edgbaston, UK, 2010. (Chairperson)
- Dung Trung Tran (academic supervisor: Prof. Ian Jones, Prof. Roy Johnston; external assessor: Dr Francesca Baletto), "Gold Containing Bimetalic Nanoparticles," Doctor of Philosophy, Metallurgy and Materials, University of Birmingham, Edgbaston, UK, 2010. (Chairperson)
- Mohammed Al-Rabie, " Doctor of Philosophy, School of Materials, University of Manchester, Manchester, UK, 2011. (External assessor)
- IIT Bombay, 2011. (External assessor)
- Claire (academic supervisor: Prof. Paul Bowen), (Internal assessor)

AWARDS and HONOURS

1. Chairman, *Symposium on 'High Resolution Characterization of Corrosion Processes 2'*, 218th Meeting of the Electrochemical Society, Las Vegas, USA (ECS: October, 2010).
2. Chairman, *Symposium TEG186x (Environmentally Assisted Cracking),* CORROSION 2010, San Antonio, USA (NACE-International: March, 2010).
3. Editorial Advisory Board member, *Materials Characterisation – an international journal on materials structure and behavior*, ELSEVIER B.V., 2006-2008.
4. NACE-International / Office of Naval Research University Research Seed Grant Fellowship, 2004-2006.
5. US Office of Naval Research (Global) Visiting Scientist Fellowship, 2003.
6. Royal Society USA Research Fellowship, 2003-2006.
7. Gwendolyn B. Wood Section Excellence Award (The Electrochemical Society) – 2nd Vice Chairman / Program Chair of Section, 2003.
8. Mars Fontana Award: First Place Student Research Paper/Poster, CORROSION 99 (National Association for Corrosion Engineers - International), 1999.
9. MEPTEC (Mobil Exploration and Producing Technical Center) Fellowship, 1998-99.
10. NASA Virginia Space Grant Consortium Fellowship, 1996.
11. Mars Fontana Award: First Place Student Research Paper/Poster, CORROSION 95 (National Association for Corrosion Engineers - International), 1995.

PROFESSIONAL SOCIETY MEMBERSHIPS

1. The National Association of Corrosion Engineers (NACE-International)
   - *Reviewer, Corrosion Journal 1998-present*
   - *NACE UK Section Board of Trustees 2004-present*
     (Education Chair 2004)
     (Academic Liaison Officer 2005-present)
   - *Vice Chairman, Technical Symposia TEG186x (Environmentally Assisted Cracking), CORROSION 2009.*
   - *Chairman, Technical Symposia TEG186x (Environmentally Assisted Cracking), CORROSION 2010.*
2. The Electrochemical Society (ECS)
   - *Regional High School Science Fair Judge 2000*
   - *Vice-Chairman National Capital Section 2002-03*
   - *ECS-NCS Foley Award Committee member 2003*
   - *Chairman, Symposia on 'High Resolution Characterization of Corrosion Processes* 2', 218th Meeting of the Electrochemical Society, Las Vegas, USA (2010).
3. Institute of Corrosion
   - *Lionel Shreir Award Committee member 2003*
   - *Reviewer, Corrosion Science 2005-present*
4. Materials Research Society:
   - *Reviewer, Journal of Materials Research 2002-present*
5. The Minerals, Metals, and Materials Society (TMS)
6. The American Society for Metals (ASM)
   - *Editorial Advisory Board – Materials Characterisation 2006-2008*
7. Institute of Materials

PROFESSIONAL INDUSTRIAL EXPERIENCE

Mobil Exploration & Producing U.S. Inc., New Orleans, LA, USA **1991**
Gulf of Mexico Surface Technical Team
Corrosion Engineering Intern: Assisted corrosion engineers in impressed current cathodic protection and sacrificial anode installation projects, pipeline and tubular failure analysis, and vendor contract administration
Project: A Study of the Effects of Different Heat Treatments on the Corrosion Resistance of Nickel Alloy 625 and Nickel Alloy 825
Mentor: David M. Currie

Mobil Exploration & Producing U.S. Inc., New Orleans, LA, USA **1990**
Mobile Bay 823 Project Team
Corrosion Engineering Intern: Assisted in developing a materials selection strategy for a highly corrosive H_2S environment located in Mobile Bay and offshore Alabama (Mary Ann Gas Field)
Project: Development of a Test Program for Low-VOC Coating Performance in the Gulf of Mexico (Main Pass)
Mentor: David M. Currie

PUBLICATIONS

Refereed Papers in Primary Journals / Chapters in Books

1. B.J. Connolly, R.S. Lillard, J.R. Scully, G.E. Stoner, "Water Staining of AA3104-H19 Can Body Stock: A Crevice Corrosion Study Utilizing the Double Crevice Assembly Test Method," *Corrosion*, **53(8)**, 644-656 (1997).
2. B.J. Connolly, J.R. Scully, "Stress Corrosion Cracking Susceptibility in Al-Li-Cu Alloys 2090 and 2096 as a Function of Isothermal Aging Time," *Scripta Materialia*, **42**, 1039-1045 (2000).
3. C.P. Ferrer, M.G. Koul, B.J. Connolly, A.L. Moran, "Improvements in Strength and Stress Cracking Properties in Aluminum Alloy 7075 Via Low Temperature Retrogression and Re-Aging Heat Treatments," *Corrosion*, **59(6)**, 520-528 (2003).
4. B.J. Connolly, K.L. Deffenbaugh, M.G. Koul, A.L. Moran, "Environmentally Assisted Crack Growth Rates of High Strength Aluminum Alloys," *Journal of Metals*, **55(1)**, 42-52 (2003). (Invited paper)
5. B.J. Connolly, Q. Meng, A.L. Moran, R.L. McCaw, "Mechanical and Precorroded Fatigue Properties of Coated Aluminum Aircraft Skin System as a Function of Various Thermal Spray Processes," *Corrosion Engineering, Science and Technology*, **39(2)**, 137-142 (2004).
6. B.J. Connolly, M.G. Koul, A.L. Moran, "A Comparison Study of Stress Corrosion Crack Growth Rates for AA7xxx Alloys as a function of Bulk Aqueous Chloride Concentrations," *Corrosion*, **61(10)**, 976-986 (2005).
7. B.J. Connolly, J.R. Scully, "The Transition from Localized Corrosion to Stress Corrosion Cracking in an Al-Li-Cu-Ag Alloy," *Corrosion*, **61(12)**, 1145-1166 (2005).
8. M. Jariyaboon, A.J. Davenport, R. Ambat, B.J. Connolly, S.W. Williams, D.A. Price, "Corrosion Behaviour of a Dissimilar Friction Stir Weld Joining High Strength Aluminium Alloys 2024 and 7010," *Corrosion Engineering, Science and Technology,* **41(2)**, 135-142 (2006).
9. A.J. Davenport, M. Jariyaboon, C. Padovani, N. Tareelap, B.J. Connolly, S. Williams, E. Siggs, "Corrosion and Protection of Friction Stir Welds," *Materials Science Forum*, **519-521**, 699 (2006).
10. A.J. Davenport, Y. Yuan, R. Ambat, B.J. Connolly, M. Strangwood, A. Afseth, G. Scamans, "Intergranular Corrosion and Stress Corrosion Cracking of Sensitised AA5182," *Materials Science Forum*, **519-521**, 641 (2006).
11. B.J. Connolly, "Ch 15: Effects of Applied Stress on Localised Corrosion of Aluminium Alloy Friction Stir Welds," in Local Probe Techniques for Corrosion Research (EFC 45), edited by R. Oltra, Woodhead Publishing Limited, Cambridge, UK, 155-166 (2007).
12. B.J. Connolly, D.A. Horner, S.J. Fox, A.J. Davenport, C. Padovani, S. Zhou, A. Turnbull, M. Preuss, N.P. Stevens, T.J. Marrow, J.-Y. Buffiére, E. Boller, A. Groso, M. Stampanoni, "X-ray Microtomography Studies of Localised Corrosion and Transitions to Stress Corrosion Cracking," *Materials Science and Technology,* **22(9)**, 1076-85 (2006).
13. A.J. Davenport, C. Padovani, B.J. Connolly, N.P.C. Stevens, T.A.W. Beale, A. Groso, M. Stampanoni, "Synchrotron X-ray Microtomography Study of the Role of Y in Corrosion of Magnesium Alloy WE43," *Electrochemical and Solid State Letters*, **10(2)**, C5-C8 (2007).
14. D.A. Little, B.J. Connolly, J.R. Scully, "An Electrochemical Framework to Explain the Intergranular Stress Corrosion Behavior in Two Al-Cu-Mg-Ag Alloys as a Function of Aging," *Corrosion Science,* **49**, 347 (2007).
15. M. Jariyaboon, A.J. Davenport, R. Ambat, B.J. Connolly, S.W. Williams, D.A. Price, "The Effect of Welding Parameters on the Corrosion Behaviour of Friction Stir Welded AA2024-T351," *Corrosion Science,* **49**, 877 (2007).
16. T.J. Marrow, L. Babout, B.J. Connolly, D. Engelberg, G. Johnson, J. –Y. Buffiere, P.J. Withers and R.C. Newman, "High Resolution, in-situ, tomographic observations of stress corrosion cracking," in Environment-Induced Cracking of Materials: Volume 2 – Prediction, Industrial Developments and Evaluation, edited by S.A. Shipilov, R.H. Jones, J. –M. Olive, and R.B. Rebak, Elsevier Ltd., Oxford, UK, 439-448 (2008).
17. F. Eckermann, T. Suter, P.J. Uggowitzer, A. Afseth, A.J. Davenport, B.J. Connolly, M. Larson, F. de Carlo, P. Schmutz, "In-Situ Monitoring of Corrosion Processes within the bilk of AlMgSi Alloys using X-ray microtomography," *Corrosion Science,* **50**, 3455-3466 (2008).
18. P.G. Padovani, A.J. Davenport, B.J. Connolly, S.W. Williams, A. Groso, M. Stampanoni, F. Bellucci, 'Corrosion and Protection of Friction stir Welds in Aerospace Aluminium Alloys,' *Metallurgia Italiana,* **10**, 29-42 (2008).
19. A. Turnbull, D.A. Horner, B.J. Connolly, "Challenges in Modelling the Evolution of Stress Corrosion Cracking from Pits," *Engineering Fracture Mechanics*, **76**, 633-640 (2009).
20. R.W. Fonda, P.S. Pao, H.N. Jones, C.R. Feng, B.J. Connolly, A.J. Davenport, "Microstructure, Mechanical Properties, and Corrosion of Friction Stir Welded Al 5456," *Materials Science & Engineering A*, **519**, 1-8 (2009).
21. B.J. Connolly, D.A.Horner, S. Zhou, A. Turnbull, 'Corrosion to Cracks: new insights into the evolution of failure,' submitted to *Nature Materials* December 2008. (rejected)
22. M. Jariyaboon, A.J. Davenport, R. Ambat, B.J. Connolly, S.W. Williams, D.A. Price, "The Effect of Cryogenic CO_2 Cooling on Corrosion Behaviour of Friction Stir Welded AA2024-T351," *Corrosion Engineering, Science and Technology,* **44(6)**, 425-432 (2009).

23. M. Jariyaboon, A.J. Davenport, R. Ambat, B.J. Connolly, S.W. Williams, D.A. Price, "Effect of Cryogenic Cooling on Corrosion of Friction Stir Welded AA7010-T7651," *Anti-Corrosion Methods and Materials,* **57(2)**, 83-89 (2010).
24. M. Jariyaboon, A.J. Davenport, R. Ambat, B.J. Connolly, S.W. Williams, D.A. Price, "Corrosion behaviour of banded microstructure within nugget of friction stir welds in AA2024-T351," *Materials Science and Technology*, **27(1)**, 208-213 (2011).
25. D.A. Horner, B.J. Connolly, S. Zhou, L. Crocker, A. Turnbull, "Novel Images of the Evolution of Stress Corrosion Cracks from Corrosion Pits," accepted *Corrosion Science*, 2010.
26. D. Saxey, B. Connolly, C. Cooper, J. Knott, Y. Huang, C. Grovenor, G. Smith, S. Lyon, A. Sherry, L. Roswell, A. Pratt, "Understanding Stress Corrosion Cracking of PGM-Doped Stainless Steels Utilising the Latest Generation of Atom Probe," submitted to *Nature Materials* 2011.
27. B.J. Connolly, D.A.Horner, S. Zhou, A. Turnbull, "Corrosion to Cracks: new insights into the evolution of failure," submitted to *Proceeding of the Royal Society A*, 2011.
28. B.J. Connolly, "Effect of Applied Stress on Localised Corrosion of Friction Stir Welded Aluminium Alloys," submitted to *Electrochemical and Solid State Letters*, 2011.
29. B.J. Connolly, G. Lefebvre, J.R. Scully, "Influence of Remote Applied Stress on Localised Corrosion Site Morphology in an Under-aged Temper of Al-Li-Cu-Mg Alloy AA2096," submitted to *Corrosion*, 2011.
30. R.J.P Doyle, S.W. Williams, B.J. Connolly, "Effects of Laser Surface Melting Technique for Corrosion Resistance on the Fatigue Properties of Friction Stir Welded Aluminium Alloys," submitted to *Fracture and Fatigue*, 2011.
31. R.J.P Doyle, M.J. Poad, S.W. Williams, B.J. Connolly, "Effects of Weld Dressing, Laser Surface Melting, and Shot Peening on Fatigue Properties of AA2024-T351," submitted to *Materials Science & Engineering A*, 2011.
32.

Refereed Contributions to Symposium and Compiled Volumes

1. B.J. Connolly, R.S. Lillard, J.R. Scully, "Crevice Corrosion Phenomena Associated with Aluminum Alloy AA3104," in Critical Factors in Localized Corrosion III, R.G. Kelly, P.M. Natishan, G.S. Frankel, R.C. Newman, eds., The Electrochemical Society, Pennington, NJ (1999).
2. B.J. Connolly, J.R. Scully, "Stress Assisted Pit and Fissure Coalescence During Early Stages of Stress Corrosion Cracking in Al-Li-Cu Alloy AA2096," CORROSION/2000, paper no. 367, (Houston, TX: NACE International, 2000).
3. D.A. Little, B.J. Connolly, J.R. Scully, "An Electrochemical Framework to Explain the Intergranular Stress Corrosion Path in Two Al-Cu-Mg-Ag Alloys," in Advances in the Metallurgy of Aluminum Alloys – proceedings of the James T. Staley Honorary Symposium on Aluminum Alloys, (Indianapolis, IN: ASM International, 2001).
4. B.J. Connolly, J.R. Scully, "The Transition from Localized Corrosion to SCC in an Al-Li-Cu-Ag Alloy," CORROSION/2002, paper no. 02434, (Houston, TX: NACE International, 2002).
5. C.P. Ferrer, M.G. Koul, B.J. Connolly, A.L. Moran, "Utilization of Low Temperature Retrogression and Re-Aging (RRA) Heat Treatments to Improve Strength/SCC Properties for Thick Section Components of Aluminum Alloy 7075 for Aging Aircraft Refurbishment," CORROSION/2002, paper no. 02159, (Houston, TX: NACE International, 2002).
6. B.J. Connolly, M.G. Koul, and A.L. Moran, "A Comparison Study of Stress Corrosion Crack Growth Rates for AA7XXX Alloys as a Function of Aqueous Chloride Concentration and Simulated Crack Tip Chemistries," CORROSION/2003, paper no. 03515, (Houston, TX: NACE International, 2003).
7. A.J. Davenport, R. Ambat, M. Jariyaboon, B.J. Connolly, S.W. Williams, D.A. Price, A. Wescot, and P.C. Morgan, "Corrosion of Friction Stir Welds in Aerospace Alloys," in Corrosion and Protection of Light Metal Alloys, R.G. Buchheit, R.G. Kelly, B.A. Shaw, N. Missert, eds., The Electrochemical Society, Pennington, NJ (to be published 2004).
8. R.W. Fonda, P.S. Pao, H.N. Jones, B.J. Connolly, and A.J. Davenport, "Mechanical Property and Microstructural Mapping of Friction Stir Welded Al 5456," in Proceedings of the 14th (2004) International Offshore and Polar Engineering Conference, Vol 4, p. 23-28, 2004.
9. B.J. Connolly, "Localized Corrosion Measurements as a Function of Applied Stress on Aluminum Alloys via a Microelectrochemical Cell," in proceedings of EUROCORR 2004 – Long Term Prediction and Modelling of Corrosion, September 2004.
10. T.J. Marrow, L. Babout, B.J. Connolly, D. Engleberg, G. Johnson, J.-Y. Buffiere, and R.C. Newman, "High Resolution, In-Situ, Tomographic Observations of Stress Corrosion Cracking," in proceedings of the 2nd International Conference on Evironmentally-Induced Cracking of Metals, September 2004.
11. P.S. Pao, R.W. Fonda, H.N. Jones, C.R. Feng, B.J. Connolly, and A.J. Davenport, "Microstructure, Fatigue Crack Growth, and Corrosion in Friction Stir Welded Al 5456," in Friction Stir Welding and Processing III, edited by Kumar V. Jata, M.W. Mahoney, R. S. Mishra, and T.J. Lienert, TMS (The Minerals, Metals & Materials Society), 2005.

12. C. Padovani, A. Davenport, B. Connolly, F. Bellucci, S. Gardiner, M. Poad, " Corrosione atmosferica di una saldatura friction stir welding in lega di alluminio 7010-T7651," in proceedings of Giornate Nazionali sulla Corrosione e Protezione, June 2005.
13. B.J. Connolly, S.J. Fox, D.A. Horner, C. Padovani, A.J. Davenport, M. Preuss, N.P. Stevens, J.-Y Buffiere, T.J. Marrow, M. Stampanoni, and A. Groso, "Three Dimensional Investigation of Localised Corrosion in Aluminium Aerospace Alloys via High-resolution, In Situ Synchrotron X-ray Tomography," in proceedings of the 16th International Corrosion Congress, September 2005.
14. Y Yuan, R. Ambat, B. Connolly, M. Strangwood, G. Scamans, A. Afseth, and A. Davenport, "Intergranular Corrosion and Stress Corrosion Cracking of Sensitised AA5182," in proceedings of the 16th International Corrosion Congress, September 2005.
15. G. Wang, A.J. Davenport, B.J. Connolly, H. Jiao, and J.T.B. Gundersen, "Microstructural Effects in the Corrosion of Aluminium Tube Alloys," in proceedings of the 16th International Corrosion Congress, September 2005.
16. B.J. Connolly, S.J. Fox, D.A. Horner, C. Padovani, A.J. Davenport, M. Preuss, N.P. Stevens, T.J. Marrow, J.-Y Buffiere, E. Boller, M. Stampanoni, and A. Groso, "Quantifying Three Dimensional Localised Corrosion Rates via Synchrotron X-ray Micro-tomography," in proceedings of Euromat 2005 – European Congress on Advanced Materials and Processes, September, 2005.
17. L. Babout, T.J. Marrow, B.J. Connolly, D. Engelberg, "X-ray Microtomography and FIB-SEM Observations of Grain Boundary Breakage in Sensitised Austenitic Stainless Steel," in proceedings of Euromat 2005 – European Congress on Advanced Materials and Processes, September, 2005.
18. A. Davenport, N. Tareelap, C. Padovani, B. Connolly, S. Williams, E. Siggs and D. Price, "Corrosion Protection of Aerospace Aluminum Alloys with Laser Surface Melting", in Proceedings of the 208th Meeting of The Electrochemical Society, October , 2005.
19. A. Davenport, Y. Yuan, R. Ambat, B. Connolly, M. Strangwood, A. Afseth, and G. Scamans, "Intergranular Corrosion and Stress Corrosion Cracking of Sensitised AA5182," in Proceedings of the 4th International Symposium on Aluminium Surface Science and Technology, May 2006.
20. C. Padovani, A. Davenport, B. Connolly, S. Williams, E. Siggs, "Corrosion and Protection of Friction Stir Welds in 7XXX Alloys," in Proceedings of the 4th International Symposium on Aluminium Surface Science and Technology, May 2006.
21. A. Davenport, M. Jariyaboon, B. Connolly, S. Williams, E. Siggs, "Corrosion and Protection of Friction Stir Welds," in Proceedings of the 4th International Symposium on Aluminium Surface Science and Technology, May 2006.
22. A. Davenport, M. Gonzalez-Torreira, A. Fones, C. Padovani, B. Connolly, N. Stevens, T. Beale, M. Stampanoni, A. Groso, "Passivity and Localised Corrosion of Magnesium Alloys," in Critical Factors in Localized Corrosion 5, N. Missert, S. Virtanen, A.J. Davenport, M.P. Ryan, eds., The Electrochemical Society, Pennington, NJ (2006).
23. B. Connolly, D. Horner, S. Fox, A. Davenport, S. Ghosh, C. Padovani, M. Stampanoni, A. Groso, F. De Carlo and X. Xiao, "In Situ, Three Dimensional Quantification of Intergranular Corrosion Rates for Aluminium Alloys and Stainless Steels," in Critical Factors in Localized Corrosion 5, N. Missert, S. Virtanen, A.J. Davenport, M.P. Ryan, eds., The Electrochemical Society, Pennington, NJ (2006).
24. D.L. Engelberg, R. Langford, L. Babout, B.J. Connolly, and T.J. Marrow, "The Characteristics of Crack Bridging Grain Boundaries in Intergranular Stress Corrosion Cracking of Steel," in 13th Conference on Environmental Degradation of Materials in Nuclear Power Systems – Water Reactors, August, 2007.
25. D.A. Horner, B.J. Connolly, and A. Turnbull, "Insights into Pit to Crack Transitions utilizing High Resolution X-ray Tomography," in Proceedings of the 212th Meeting of The Electrochemical Society, October, 2007.
26. B.J. Connolly and J.R. Scully, "An Electrochemical Framework for Intergranular SCC Susceptibility in an Under-Aged Al-Li-Cu-Ag-X Alloy," in Proceedings of the 212th Meeting of The Electrochemical Society, October, 2007.
27. S. Ghosh, A.J. Davenport, B.J. Connolly, R. Oltra and V. Vignal, "Effect of Stress on Initiation and Propagation of Localized Corrosion in Aluminium Alloys," in Proceedings of the 212th Meeting of The Electrochemical Society, October, 2007.
28. O. Delrue, V. Vignal, S. Ghosh, and B.J. Connolly, "Experimental studies and numerical modeling of the corrosion behavior of duplex stainless steels under straining conditions," in Proceedings of the 212th Meeting of The Electrochemical Society, October, 2007.
29. B.J. Connolly and J.R. Scully, "Stress Effects on Localized Corrosion Site Morphology in an Al-Li-Cu Alloy," in Proceedings of the 212th Meeting of The Electrochemical Society, October, 2007.
30. D.A. Horner, B.J. Connolly, S. Zhou, A. Turnbull, "Novel Images of the Evolution of Stress Corrosion Cracks from Corrosion Pits," in proceedings of EUROCORR 2007 – Progress by Corrosion Control, September 2007.
31. R.J.P. Doyle, B.J. Connolly, "Effects of Weld Dressing, Laser Surface Melting and Laser Shot Peening on the Fatigue Properties of Friction Stir Welded AA2024," in Proceedings of the 11th International Conference on Aluminium Alloys, Paper 328, September, 2008.

Other Contributions to Symposium and Compiled Volumes

1. C.P. Ferrer, M.G. Koul, B.J. Connolly, A.L. Moran, "Low Temperature Retrogression and Re-Aging Treatments for Thick Section Components of Aluminum Alloy 7075 for Aging Aircraft Refurbishment," in Proceedings of the 2002 Tri-Service Corrosion Conference, Organized by AFOSR/AFRL (Tri-services Committee on Corrosion, U.S. Department of Defense, 2002).
2. B.J. Connolly, A.L. Moran, R.L. McCaw, J. Pugh, K. Scandell, "Thermal Sprayed Aluminum Alloy Cladding for Aircraft Skin Replacements," in Proceedings of the 2002 Tri-Service Corrosion Conference, Organized by AFOSR/AFRL (Tri-services Committee on Corrosion, U.S. Department of Defense, 2002).
3. B.J. Connolly, J.R. Scully, "Investigation of Localized Corrosion Site Morphologies which Initiate Stress Corrosion Cracking in an Al-Li-Cu-X Alloy Utilizing Replication and In-Situ Measuring Techniques," CORROSION/99, in proceeding of Research in Progress Symposium, NACE International, San Antonio, TX, April 1999.
4. B.J. Connolly, "Stress Effects on Localized Corrosion Initiation of Friction Stir Welds in AA2024," CORROSION/2004, in proceedings of Research in Progress Symposium, NACE International, New Orleans, LA, March 2004.
5. B.J. Connolly, A.J. Davenport, M. Jariyaboon, C. Padovani, R. Ambat, S.W. Williams, D.A. Price, A. Wescott, C.J. Goodfellow,and C.-M. Lee, "Localized Corrosion of Friction Stir Welds in Aluminum Alloys," in proceedings of 5th International Symposium on FSW, September 2004.
6. B.J. Connolly, D.A. Horner, S.J. Fox, A.J. Davenport, M. Preuss, N.P. Stevens, T.J. Marrow, M. Stampanoni, and A. Groso, "In Situ, 3D Observations of Localized Corrosion Evolution in Aluminum Aerospace Alloy 2024," in PSI – Scientific Report 2004 / Volume VII Synchrotron (Radiation / Micro- and Nanotechnology), January 2005.
7. B.J. Connolly, D.A. Horner, S.J. Fox, A.J. Davenport, M. Preuss, N.P. Stevens, T.J. Marrow, M. Stampanoni, and A. Groso, "Utilising In Situ, High Resolution Synchrotron Microtomography for Accurate 3D Characterisation of Localized Corrosion," in First World Congress on Corrosion in the Military – Cost Reduction Strategies, Sorrento, Italy, June 2005.
8. A.J. Davenport, M. Jariyaboon, B.J. Connolly, C. Padovani, N. Tareelap, S. Williams, D. Price, and A. Wescott, "Corrosion of Friction Stir Welds in Aerospace Alloys and their Protection by Laser Surface Treatment," in Proceedings of the 2005 Tri-Service Corrosion Conference, Organized by AFOSR/AFRL (Tri-services Committee on Corrosion, U.S. Department of Defense, 2005).
9. B.J. Connolly, S.J. Fox, D.A. Horner, A.J. Davenport, M. Preuss, N.P. Stevens, T.J. Marrow, M. Stampanoni, and A. Groso, "In Situ 3D Monitoring of Intergranular Corrosion in Airframe Alloys using X-ray Micro-tomography," in Proceedings of the 2005 Tri-Service Corrosion Conference, Organized by AFOSR/AFRL (Tri-services Committee on Corrosion, U.S. Department of Defense, 2005).
10. B.J. Connolly, R.J. Doyle, and S.W. Williams, "Effect of Laser Surface Melting Techniques Used for Improved Corrosion Resistance on the Fatigue Properties of Friction Stir Welded AA2024-T351," in Proceedings of the 2005 Tri-Service Corrosion Conference, Organized by AFOSR/AFRL (Tri-services Committee on Corrosion, U.S. Department of Defense, 2005).
11. D.A. Horner, C. Cooper, B.J. Connolly, S. Zhou, L.N. McCartney, and A. Turnbull, "Providing Physical Inputs of Pit to Crack Transitions for Deterministic Modeling via High Resolution Synchrotron and Focus Tube X-ray Tomography," in proceedings of Corrosion Modeling to Enable Informed Material Selection to Life Prediction, Cernobbio, Italy, July 2006.
12. A. Davenport, C. Padovani, N. Stevens, T. Beale, M. Stampanoni, A. Groso, B.J. Connolly, M. Preuss, "In Situ Synchrotron Microtomography of Localised Corrosion of Magnesium," in proceedings of the 57th Annual Meeting of the International Society of Electrochemistry, Edinburgh, UK, August 2006.
13. S. Ghosh, B. Connolly, A. Davenport, "Effect of Stress on Localised Corrosion Initiation and Propagation in Aluminium Alloys," in proceedings of the 57th Annual Meeting of the International Society of Electrochemistry, Edinburgh, UK, August 2006.
14. C. Padovani, A. Davenport, B. Connolly, S. Williams, E. Siggs, "Use of Laser Surface Melting to Improve Corrosion Resistance of High Strength Aluminium Alloy Friction Stir Welds," in proceedings of the 57th Annual Meeting of the International Society of Electrochemistry, Edinburgh, UK, August 2006.
15. A. Turnbull, S. Zhou, D.A. Horner, B.J. Connolly, "New Perspectives on the Evolution of Stress Corrosion Cracks from Pits," in proceedings of the 1st International Conference on Corrosion and Material Protection (EFC event no. 294), Prague, Czech Republic, October, 2007.
16. A. Turnbull, D.A. Horner, B.J. Connolly, "Challenges in Modelling the Evolution of Stress Corrosion Scracking from Pits," in proceedings of Symposium on Material Damage Prognosis and Life-Cycle Engineering, Snowmass CO, USA, July 2006.
17. B.J. Connolly, C. Cooper, R. Deng, J.F. Knott, D. Saxey, A. Cerezo, G. Smith, C. Grovenor, O. Necib, K. Govender, S. Lyon, A. Sherry, A. Fones, A. Pratt, E. Rowsell, "SCC and Atom Probe Studies of 304 Stainless Steel as a function of Palladium and Ruthenium Alloying Additions," in proceedings of the Research in Progress Symposium (Environmentally Assisted Cracking: Experimental and Theoretical Methods to Predict In-Service Performance), CORROSION2009, NACE International, Atlanta GA, USA, March 2009.

Abstracts and Short Papers

1. B.J. Connolly, R.S. Lillard, J.R. Scully, G.E. Stoner, "Aluminum 3104 Rigid Container Project," Virginia Academy of Science, Harrisonburg, VA, May 1994.
2. B.J. Connolly, "An Investigation of Lubrication Inhibition to Water Staining of Alloy AA3104 Can Body Stock by Electrochemical Methods," CORROSION/95, Student Research Poster Session, NACE International, Orlando, FL, March 1995.
3. B.J. Connolly, R.S. Lillard, J.R. Scully, G.E. Stoner, "Water Staining of Aluminum Can Stock Alloy AA3104-H19," Local Meeting Old Dominion Section of the National Association of Corrosion Engineers, NACE International, Charlottesville, VA, April 1995. (Invited)
4. B.J. Connolly, R.S. Lillard, B.L. Riddle, J.R. Scully, G.E. Stoner, "Comparative Testing of Lubrication Inhibition to Water Staining of Aluminum Can Body Stock by an Electrochemical Method," 50th Annual Meeting of the Society of Tribologists and Lubrication Engineers, STLE, Chicago, IL, May 1995.
5. B.J. Connolly, J.R. Scully, "Localized Corrosion and Stress Corrosion Cracking in Advanced Al-Li-Cu-X Alloys (AA2096, AA2090)," Aeromat '97 – 8th Advanced Aerospace Materials & Processes Conference and Exposition, ASM, Williamsburg, VA, May 1997.
6. B.J. Connolly, J.R. Scully, "Localized Corrosion and Stress Corrosion Crack Initiation in Advanced Al-Li-Cu Alloys," Gordon Research Conference on Aqueous Corrosion, Research Poster Session, New London, NH, July 1998.
7. B.J. Connolly, "Mechanisms of Localized Corrosion and Stress Corrosion Crack Initiation in Advanced Al-Li-Cu Alloys," CORROSION/99, Student Research Poster Session, NACE International, San Antonio, TX, April 1999.
8. B.J. Connolly, M.G. Koul, A.L. Moran, "Evaluation of Environmentally Assisted Crack Propagation Rates of Candidate Aluminum Alloys for Replacement of AA7075-T6 Aircraft Structures," Gordon Research Conference on Aqueous Corrosion, Research Poster Session, New London, NH, July 2002.
9. B.J. Connolly, M.G. Koul, A.L. Moran, "An Environmentally Assisted Crack Growth Study of 7XXX Series Aluminum Alloys in T7XXX Conditions," 43rd Corrosion Science Symposium, UK Corrosion, Cardiff, UK, October 2002.
10. B.J. Connolly, and J.R. Scully, "Development of an Electrochemical Framework for Intergranular SCC Susceptibility as a Function of Isothermal Aging Time for AA2096," 44th Corrosion Science Symposium, Electrochem 2003, Southampton, UK, September 2003.
11. Y. Yuan, A.J. Davenport, B.J. Connolly, M. Strangwood. R. Ambat, "The Effect of Crystallographic Misorientation on Intergranular Corrosion of Aluminum Alloy 5182," 44th Corrosion Science Symposium (Poster Session), Electrochem 2003, Southampton, UK, September 2003.
12. B.J. Connolly, R. Ambat, A.J. Davenport, "Localized Corrosion of Friction Stir Welds in Aerospace Alloys in the Absence and Presence of Stress," Corrosion and Protection of Light Metal Alloys Symposium, 204th Meeting of The Electrochemical Society, Orlando, Fl., October 2003.
13. Y. Yuan, B.J. Connolly, R. Ambat, M. Strangwood, P. Bowen, G. Scamans, A. Afseth, and A.J. Davenport, "Intergranular Corrosion and Stress Corrosion Cracking of Sensitised Al-Mg AA5182 Alloys," 45th Corrosion Science Symposium, Sheffield, U.K., September 2004.
14. G. Wang, A.J. Davenport, B.J. Connolly, and J.T.B. Gundersen, "Microstructure Effects in the Corrosion of Aluminium Tube Alloys," 45th Corrosion Science Symposium (Poster Session), Sheffield, U.K., September 2004.
15. C. Padovani, A.J. Davenport, and B.J. Connolly "Corrosion Behaviour of Friction Stir Welds of Aluminum Alloys 2024 and 7010," 45th Corrosion Science Symposium (Poster Session), Sheffield, U.K., September 2004.
16. G. Wang, A.J. Davenport, B.J. Connolly, H. Jiao, and J.T.B. Gundersen, "Microstructural Effects in the Corrosion of Aluminium Tube Alloys," Midlands Electrochemistry Group Meeting – MEG 2005, University of Warwick, Coventry, UK, April 2005.
17. C. Padovani, A.J. Davenport, B.J. Connolly, F. Bellucci, "Atmospheric Exposure of Friction Stir Welds in a High Strength Aluminium Aerospace Alloy," Midlands Electrochemistry Group Meeting – MEG 2005 (Poster Session), University of Warwick, Coventry, UK, April 2005.
18. B. Connolly, T. Horner, S. Fox, C. Padovani, A. Davenport, M. Preuss, N. Stevens, J. Marrow, J.-Y. Buffiere, E. Boller, M. Stampanoni, A. Groso, A. Turnbull and S. Zhou, "X-Ray Microtomography Studies of Localised Corrosion," Workshop Meeting on Application of X-ray Tomography to Study Fracture and Crack Growth, Churchill College, University of Cambridge, Cambridge,UK, April 2005
19. B.J. Connolly, A.J. Davenport, M. Jariyaboon, N. Tareelap, C. Padovani, J. Ahearne, D. Horner, R. Doyle, S. Fox, S.W. Williams, A. Wescott, E. Siggs, and D. Price, "Corrosion Issues – Solving Problems for Industry and the Military Corrosion and Cracking of Friction Stir Welds in High Strength Aluminium Alloys," Environmental Degradation and Corrosion Workshop, BAE Systems Advanced Technology Centre, Filton, UK, June 2005.
20. S. Ghosh, B.J. Connolly, A.J. Davenport, "Effect of Applied Stress on Localised Corrosion Initiation and Propagation in Aluminium Alloys," 46th Corrosion Science Symposium, Manchester, U.K., September 2005.

21. D.A. Horner, B.J. Connolly, A.J. Davenport, A. Turnbull, S. Zhou, "Methodology for Characterising Pits and Cracks and Their Rates of Propagation," 46th Corrosion Science Symposium, Manchester, U.K., September 2005.
22. C. Padovani, A.J. Davenport, B.J. Connolly, S. Gardiner, M. Poad, S.W. Williams, D. Price, D. Lowhasser, "Corrosion and Protection of Friction Stir Welds of High Strength Aluminium Aerospace Alloys," 46th Corrosion Science Symposium, Manchester, U.K., September 2005.
23. B.J. Connolly, D.A. Horner, S. Ghosh, S.J. Fox, C. Padovani, A.J. Davenport, M. Preuss, N.P. Stevens, T.J. Marrow, A. Groso, and M. Stampanoni, "Corrosion Visualisation and Rate Quantification via X-ray Micro-tomography," Swiss Light Source Users Meeting, Villigen, Switzerland, October 2005.
24. C. Padovani, A.J. Davenport, B.J. Connolly, "Electrochemical Techniques in the Study of the Corrosion Resistance of High Strength Aluminium Alloy Friction Stir Welds," Midlands Electrochemistry Group Meeting – MEG 2006, University of Leicester, Leicester, UK, April 2006.
25. D.A. Horner, B.J. Connolly, A.J. Davenport, A. Turnbull, S. Zhou, "Assessing the Transition from Localised Corrosion to Environmentally Assisted Cracking in Structural Steels," Gordon Research Conference on Aqueous Corrosion, Research Poster Session, New London, NH, July 2006.
26. S. Fox, and B. Connolly, "In Situ, Three Dimensional Quantification of Intergranular Corrosion Rates via High Resolution Synchrotron X-ray Tomography," Gordon Research Conference on Aqueous Corrosion, Research Poster Session, New London, NH, July 2006.
27. S. Ghosh, B.J. Connolly, and A.J. Davenport, "Effect of Stress on Localised Corrosion Initiation and Propagation in Aluminium Alloys," Gordon Research Conference on Aqueous Corrosion, Research Poster Session, New London, NH, July 2006.
28. B.J. Connolly, "Visualisation of Localised Corrosion and Cracking via X-ray Tomographic Techniques," 3rd Annual Meeting of the X-ray Microtomography Users Group, University of Leeds, Leeds, UK, September 2006.
29. D.A. Horner, B.J. Connolly, and A. Turnbull, 'Visualisation of pit-to-crack transitions in turbine disc steels for power plant life prediction utilizing high resolution X-ray tomography,' Inner Space: Science & Fiction of X-ray Tomography, University of Abertay-Dundee, Dundee, UK, September 2007.
30. B.J. Connolly, J.F. Knott, G. Smith, C. Grovenor, A. Cerezo, A. Wilkinson, S. Lyon, A. Sherry, A. Pratt, E. Rowsell, "Effects of Platinum Group Metal Alloying Additions on the SCC Behaviour of 304 Stainless Steel," Gordon Research Conference on Aqueous Corrosion, Research Poster Session, New London, NH, July 2008.

INVITED LECTURES (2003-present)

- B.J. Connolly, "Corrosion of Friction Stir Welds in Aerospace Alloys," Meeting of the Aerospace Materials and Manufacturing Group, Association of Aerospace Universities, Birmingham, UK, 22 April 2004.
- B.J. Connolly, "Stress-Assisted Localised Corrosion and Environmental Cracking of Aircraft Aluminium Alloys," Workshop on The Welding of Light Alloys: State of the Art, Perspective and Potential Applications, University of Naples "Federico II" - Dept. of Materials & Production Engineering, Napoli, Italy, 5 July 2004.
- B.J. Connolly, "Three Dimensional Investigation of Localised Corrosion in Aluminium Aerospace Alloys via High Resolution, In Situ Synchrotron X-ray Tomography," Naval Research Laboratory, Washington D.C., USA, October 2005.
- B.J. Connolly, "Three Dimensional Visualisation and Quantification of Localised Corrosion via High Resolution, In Situ Synchrotron X-ray Tomography," University of Virginia, Department of Materials Science and Engineering, Center for Electrochemical Science and Engineering, Charlottesville, Virginia, USA, October 2005
- B.J. Connolly, "X-ray Tomography Techniques for Localised Corrosion and Environmentally Assisted Cracking Studies," Marine Corrosion Forum, Birmingham, UK April 2006.
- B.J. Connolly, "In Situ, Three Dimensional X-Ray Microtomography Studies of Localised Corrosion and Stress Corrosion Cracking in Aluminium Alloys and Steels," Universite de Bourgogne, Dijon, France, June 2006.
- B.J. Connolly, "Metallurgical Culprits Controlling the Stress Corrosion Cracking of Al-Li-Cu Alloys as a Function of Aging Condition," Alcoa Technology, Alcoa Center, PA, USA, October 2007.
- B.J. Connolly, "Identifying the key characteristics of corrosion fatigue behaviour and cracking in high-risk environments and challenging conditions," Oil & Gas Pipeline Integrity Management Summit, Aberdeen, UK, October 2010.
- B.J. Connolly, "Corrosion Fatigue and Environmental Cracking in Extreme Environments," Oil and Gas Pipelines Conference, London, UK, February 2011.
- B.J. Connolly, "Flow Assisted Corrosion and Deposition in Nuclear Plant," Second International Conference on Advances in Nuclear Materials: Materials Challenges for Future Reactors, Mumbai, India, February 2011.