

## **Anthony P. Reynolds**

Professor, USC Department of Mechanical Engineering  
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### **Education**

Ph.D. Materials Science, University of Virginia, 1990. Dissertation Topic: Liquid Metal Embrittlement of Al Alloys  
M.S. Materials Science, University of Virginia, 1986.  
B.S. Chemical Engineering, University of Virginia, 1982.

### **Academic Experience**

January 2010-present: Herty Bicentennial Chair in Engineering  
August 2007-Present: Professor, University of South Carolina, Department of Mechanical Engineering  
May 2001-August 2007: Associate Professor, University of South Carolina, Department of Mechanical Engineering  
August 1995-May 2001: Assistant Professor, University of South Carolina, Department of Mechanical Engineering  
2004-present: Site Director for the NSF-I/UCRC, Center for Friction Stir Processing

### **Current Research Areas**

Friction Stir Welding, Fatigue and Fracture, deformation processing.

### **Non-academic Experience**

January 1992-July 1995: Senior Scientist, AS&M Incorporated, Hampton, Virginia (at NASA Langley Research Center).  
January 1990-December 1991: National Research Council Post-Doctoral Associate at NASA Langley Research Center, Hampton, Virginia (Mechanics of Materials Branch)  
June 1982-December 1983: Research Engineer, Versar Inc., Pine Bluff, Arkansas

### **Professional Societies**

TMS, AWS

### **Honors**

USC College of Engineering and Computing Research Achievement Award 2009, USC College of Engineering Young Researcher of the Year 2001, 2010 Schwarzkopf Prize for Technology Innovation from the NSF  
**18** Invited Lectures or Seminars (**5** at meetings outside the US, **2** keynote presentations)

### **Service to the Profession and University**

**Proposal Reviewer for:** NSF, NAS, AFOSR, DOE, NEER,

**Referee for:** *Experimental Mechanics*, *Science and Technology of Welding and Joining*, *Fatigue and Fracture of Engineering Materials and Structures*, *Materials Science and Engineering A*, *Scripta Materialia*, *Corrosion*, *Journal of Materials Science*, *Modeling and Simulation in Materials Science*, *Acta Materialia*, *Journal of Engineering Manufacture*

**Board of Review:** *Metallurgical Transactions A* (Key Reader), *Science and Technology of Welding and Joining* (Editorial Board), *International Journal of Fatigue* (Editorial Board)

**Symposia Organized:** (1) Friction Stir Welding (6<sup>th</sup> International Conference on Trends in Welding Research) (2) Friction Stir Welding (2000 Society of Engineering Science Meeting, Columbia, SC)

(3) Scientific Advisory Committee for ***Materials and Processing Defects-5***

**Significant University Committee Work:** UCTP 2009-2012.

### **Graduate Students Supervised**

#### **PhD**

P. D. Peterson, 2000  
T. U. Seidel, 2001  
W. D. Lockwood, 2001  
Junhui Yan, 2004  
T. Long, 2005  
P. Venkateswaran 2010  
P. Uphadyay 2012  
M. Reza-e-Rabby 2015 (expected)  
Xiaomin Huang 2015 (expected)  
Xiao Li 2015 (expected)

#### **Masters**

F. Duval, 1998  
W. D. Lockwood, 1998  
L. Cederqvist, 2001  
D. Kakumani, 2004  
Y. Li, 2004  
Shawn Boggs, 2005  
Elizabeth Hood, 2005  
Jon Pohlman, 2006  
Matthew Moore, 2007

Jason Boyles, 2008

R. Brown 2008

M. Wade 2009

A. Kundu 2010

J. Chrisfield 2011

C. Canaday 2012

Hejun Yu 2013

Dawei Li 2015 (expected)

#### **Visiting Scholars Supervised**

H. Kroninger (University of Karlsruhe)

B. Tomaz (University of Karlsruhe)

K. Lindner (University of Karlsruhe)

Matthias Klaissle (University of Karlsruhe)

Hilaire Teukam (University of Karlsruhe)

Nathalie Fuzier (Pechiney/Alcan)

Gaelle Pouget (Alcan)

Dr. Hanadi Salem (American University in Cairo)

Salvatore Pasta (University of Palermo)

Aur lie Cuenod (University of Nantes)

Maxime Barra (Alcan)

Marine Ledoux (Constellium)

## **Post Doctoral Fellows**

Dr. Wei Tang (2000-2014)

Dr. Zahed Khandkar (2005-2007)

## **Publications**

### **Book Chapters (2)**

1. **Friction Stir Welding and Processing**, Chapter 4: “*Microstructure Development in Aluminum Alloy Friction Stir Welds*”, A. P. Reynolds, edited by Rajiv Mishra, ASM, Materials Park, Ohio, USA, in press.
2. **Handbook of Aluminum Volume 2: Alloy Production and Materials Manufacturing**, Chapter 15, *Friction Stir Welding of Aluminum Alloys*, A. P. Reynolds, eds. G. E. Totten and D. Scott MacKenzie, Marcel Dekker, New York, 2003

### **Archival Journal Publications: Current h-index=37, total citations: >4500 (December 2014)**

1. “Investigation of material flow during friction extrusion process”, H Zhang, X Zhao, X Deng, MA Sutton, AP Reynolds, SR McNeill, X Ke, **International Journal of Mechanical Sciences**, Vol. 85, pp 130-141, August 2014. <http://dx.doi.org/10.1016/j.ijmecsci.2014.05.011>
2. “Stereo Image Based Motion Measurements in Fluids: Experimental Validation and Application in Friction Extrusion”, X Zhao, MA Sutton, H Zhang, X Deng, AP Reynolds, X Ke, HW Schreier, **Experimental Mechanics**, 10.1007/s11340-014-9907-x
3. “Effect of Backing Plate Thermal Property on Friction Stir Welding of 25 mm Thick AA6061”, P Upadhyay, AP Reynolds, **Metallurgical Transactions, A**, vol.45A, April 2014, pp. 2091-2100..
4. “Friction Consolidation of MA956 Powder”, D Catalini, D Kaoumi, AP Reynolds, GJ Grant, **Journal of Nuclear Materials**, Volume 442, Issues 1-3, Supplement 1, November 2013, S112-S118.
5. “Material Flow in Friction Stir Welds”, RW Fonda, AP Reynolds, CR Feng, KE Knipling, DJ Rowenhurst, **Metallurgical and Materials Transactions, A**, vol. 44A, pp. 337-344, January 2013.
6. “Identification of the local elasto-plastic behavior of FSW welds using the virtual fields method”, G Le Louedec, F Pierron, MA Sutton, AP Reynolds, accepted for publication in **Experimental Mechanics**.
7. “Through thickness property variations in a thick plate AA7050 friction stir welded joint”, C. Canaday, M. Moore, W. Tang, and AP Reynolds, **Materials Science and Engineering, A**, vol. 559, pp. 678-682, DOI: 10.1016/j.msea.2012.09.008 Published: JAN 1 2013 .
8. “Effects of Forge Axis Force and Backing Plate Thermal Property on Friction Stir Welding of AA6056”, P Upadhyay and A P Reynolds, **Materials Science and Engineering, A** Volume: 558 Pages: 394-402 DOI: 10.1016/j.msea.2012.08.018 Published: DEC 15 2012
9. “Use of Friction Stir Processing to Eliminate Sensitization in an Al-Mg alloy”, J Chrisfield and A P Reynolds, **CORROSION** Volume: 68 Issue: 10 Pages: 913-921 DOI: 10.5006/0632 Published: OCT 2012.
10. “Factors affecting the properties of friction stir welds between aluminum and magnesium alloys”, P. Venkateswaran, AP Reynolds, **Materials Science and Engineering, A**, volume 545, pp 26-37, May 2012.
11. “Computational Analysis of Material Flow During Friction Stir Welding of AA5059 Aluminum Alloys”, Grujicic M, Arakere G, Pandurangan B, Ochterbeck JM, Yen CF, Cheeseman BA, Reynolds AP, Sutton MA, **Journal of Materials Engineering and Performance**, Vol. 21 Issue: 9 Pages: 1824-1840 DOI: 10.1007/s11665-011-0069-z Published: SEP 2012
12. “Microstructure evolution during friction stir welding of mill-annealed Ti-6Al-4V” A Pilchak, W Tang, H Sahiner, AP Reynolds, J Williams, **Metallurgical Transactions, A**, vol.42A, issue 3, pp. 745-762, Mar 2011.
13. “Quantitative Stereovision in a scanning electron microscope”, T Zhu, M A Sutton, N Li, X Li., AP Reynolds, JJ Orteu, and N Cornille, **Experimental Mechanics** vol. 51, issue, 1, pp. 97-109, Jan 2011.
14. “Production of wire via friction extrusion of aluminum alloy machining chips”, W Tang, AP Reynolds, **Journal of Materials Processing Technology**, vol. 215, no. 15, pp. 2231-2237, Nov 19 2010
15. “Modelling microstructural evolution during multiple pass friction stir welding”, JD Robson, P Upadhyay, AP Reynolds, **Science and Technology of Welding and Joining**, vol. 15, issue 7, pp. 613-618, Oct 2010.
16. “Fatigue crack growth in 2024-T351 friction stir welded joints: longitudinal residual stress and microstructural effects”, L Fratini, S Pasta, and AP Reynolds, **International Journal of Fatigue**, vol. 32, no. 3, pp 495-500, Mar 2010.
17. “Superplastically formed friction stir welded tailored aluminum and titanium blanks for aerospace applications”, D Sanders, P Edwards, G Grant, M Ramulu, A Reynolds, **Journal of Materials Engineering and Performance**, vol. 19, no. 4, pp 515-520, Jun 2010
18. “Tensile Properties of friction stir welded and friction stir welded-superplastically formed Ti-6Al-4V butt joints”, M. Ramulu, PD Edwards, DG Sanders, AP Reynolds, and T Trapp, **Materials and Design**, vol. 31, no. 6, pp. 3056-3061, Jun 2010.

19. "Friction stir weld nugget temperature asymmetry", M. Wade, A. P. Reynolds, **Science And Technology Of Welding And Joining** vol. 15, no. 1 pp. 64-69 Jan 2010..
20. "Effects of thermal boundary conditions on properties of friction stir welded AA7050-T7 Sheets", P. Upadhyay, A.P. Reynolds, **Mater. Sci. Eng. A** vol. 527, no. 6, pp. 1537-1543, MAR 2010, doi:10.1016/j.msea.2009.10.039.
21. "Modelling of 7050 aluminium alloy friction stir welding" Kamp N, Reynolds AP, Robson JD, **Science And Technology Of Welding And Joining** Volume: 14 Issue: 7 Pages: 589-596 OCT 2009
22. "Fatigue Crack Growth of Peened Friction Stir-Welded 7075 Aluminum Alloy under Different Load Ratios", O. Hatamleh, S. Forth, and A. P. Reynolds, **Journal of Materials Engineering and Performance**, vol. 19, no. 1, pp. 99-106, DOI: 10.1007/s11665-009-9439-1, Feb 2010.
23. "Determination of Mechanical Properties of Al-Mg Alloys Dissimilar Friction Stir Welded Interface by Indentation Methods", P. Venkateswaran, Z. H. Xu, X. D. Li, and A. P. Reynolds, **Journal of Materials Science**: Volume 44, Issue15 (2009), page 4140-4147, DOI 10.1007/s10853-009-3607-4
24. "Multi-pass Friction Stir Welding in alloy 7050-T7451: effects on weld response variables and on weld properties", R. Brown, W. Tang, and A. P. Reynolds, **Materials Science and Engineering A** 513–514 (2009) 115–121.
25. "Effect of initial base metal temper on mechanical properties in AA7050 friction stir welds" J. Yan and A. P. Reynolds, **Science and Technology of Welding and Joining**, Volume 14, Number 4, May 2009, pp. 582-587(6).
26. "Improved process stability during friction stir welding of 5 cm thick copper canisters through shoulder geometry and parameter studies", Cederqvist L, Sorensen CD, Reynolds AP, Oberg T, **Science and Technology of Welding and Joining**, vol. 14, no. 2, pp. 178-184, 2009.
27. "Torque, power requirement and stir zone geometry in friction stir welding through modeling and experiments", A. Arora, R. Nandan, A.P. Reynolds and T. DebRoy, **Scripta Materialia**, Volume 60, Issue 1, January 2009, Pages 13-16.
28. "Micro/nanoscale mechanical characterization and in situ observation of cracking of laminated Si3N4/BN composites", Li XD, Zou LH, Ni H, Reynolds AP, Wang CA, Huang Y, **Materials Science & Engineering C- Biomimetic And Supramolecular Systems** Vol 28 no. 8 pp.1501-1508 DEC 1 2008
29. "Residual stress effects on fatigue crack growth in a Ti-6Al-4V friction stir weld", Pasta S, and Reynolds AP, **Fatigue and Fracture of Engineering Materials and Structures**, vol. 31, no. 7, pp. 569-580, July 2008
30. Characterization of superplastically formed friction stir weld in titanium 6AL-4V: Preliminary results, Sanders DG Ramulu M, Klock-McCook EJ Edwards PD Reynolds AP Trapp T **Journal Of Materials Engineering And Performance** Volume: 17 Issue: 2 Pages: 187-192 APR 2008
31. "Flow Visualization and Simulation in Friction Stir Welding", A. P. Reynolds, **Scripta Materialia** Volume 58, Issue 5, March 2008, Pages 338-342 Viewpoint set no. 43 "Friction stir processing".
32. "Evaluation of Residual Stresses During Fatigue Test in a FSW Joint", S. Pasta and A. P. Reynolds, **Strain** vol. 44, no.2, pp 147-152, April 2008.
33. "Residual Stress and microstructure effects on fatigue crack growth in AA2050 friction stir welds", G. Pouget and A. P. Reynolds, **International Journal of Fatigue** Volume 30, Issue 3, March 2008, Pages 463-472.
34. "Scanning electron microscopy for quantitative small and large deformation measurements part i: SEM imaging at magnifications from 200 to 10,000", Sutton, M. A., Li, N., Joy, D. C., Reynolds, A. P., Li, X. **Experimental Mechanics** 47 (6): 775-787 DEC 2007.
35. "Scanning electron microscopy for quantitative small and large deformation measurements - part II: Experimental validation for magnifications from 200 to 10,000", Sutton, M. A., Li, N., Garcia, D., Cornille, N., Orteu, J. J., McNeill, S. R., Schreier, H. W., Li, X., Reynolds, A. P. **Experimental Mechanics** 47 (6): 789-804 DEC 2007.
36. "Process Response Parameter Relationships in Aluminum Alloy Friction Stir Welds", T. Long, W. Tang, and A. P. Reynolds; **Science and Technology of Welding and Joining** 12 (4): 311-317 JUL 2007.
37. "Friction Stir Welding of Single Crystal Aluminum", R.W. Fonda, J.A. Wert, A.P. Reynolds, and W. Tang; **Science and Technology of Welding and Joining** 12 (4): 304-310 JUL 2007.
38. "Processing and banding in AA2524 and AA2024 friction stir welding", J. Yan, M. A. Sutton, and A. P. Reynolds, **Science and Technology of Welding and Joining** 12 (5): 390-401 SEP 2007.
39. "Development of Patterns for Digital Image Correlation Measurements at Reduced Length Scales", W. A. Scrivens, Y. Luo, M.A. Sutton, S.A. Collette, M.L. Myrick, P. Miney, P.E. Colavita, A.P. Reynolds, Xiaodong Li, **Experimental Mechanics**, vol. 47, (1), pp. 63-77, February 2007.
40. "Parametric Studies of Friction Stir Welding by Commercial Fluid Dynamics Simulation", T. Long and A. P. Reynolds, **Science and Technology of Welding and Joining**, 2006, vol. 11, no. 2, pp. 200-208.
41. "Notch tensile response of mini-regions in AA2024 and AA2524 friction stir welds", Yan JH, Sutton MA, Reynolds AP, **Materials Science And Engineering A** 427 (1-2): 289-300 JUL 15 2006.

42. "Limited weld residual stress measurements in fatigue crack propagation. Part I: Complete field representation through least-square finite element smoothing", YZ Ge, MA Sutton, X Deng and AP Reynolds, ***Fatigue and Fracture of Engineering Materials and Structures***, vol 29, no. 7, pp. 524-536, Jul 2006.
43. "Limited weld residual stress measurements in fatigue crack propagation. Part II: FEM-based fatigue crack propagation with complete residual stress fields" MA Sutton, AP Reynolds, YZ Ge, and X Deng, ***Fatigue and Fracture of Engineering Materials and Structures***, vol 29, no. 7, pp. 537-545, Jul 2006.
44. "Predicting residual thermal stresses in friction stir welded metals" Khandkar MZH, Khan JA, Reynolds AP, Sutton MA ***Journal of Materials Processing Technology*** 174 (1-3): 195-203 MAY 25 2006
45. "Microstructure and Mixed Mode I/II Fracture of AA2524-T351 Base Material and Friction Stir Welds", M.A. Sutton, A.P. Reynolds, Junhui Yan, Bangcheng Yang and Ning Yuan, ***Engineering Fracture Mechanics*** vol. 73, issue 4, pages 391-407, March 2006.
46. "Structural and mechanical characterization of nanoclay-reinforced agarose nanocomposites", Xiaodong Li, HS Gao, WA Scrivens, DL Fei Vivek Thakur, MA Sutton, AP Reynolds and ML Myrick, ***Nanotechnology***, 16 2020-2029 (2005)
47. "Process-structure-property relationships for nugget and HAZ regions of AA2524-T351 Friction Stir Welds", Junhui Yan, Michael A. Sutton, and Anthony P. Reynolds, ***Science and Technology of Welding and Joining***, vol. 10, no. 6, pp. 725-736, 2005.
48. "Relationships among weld parameters, hardness distributions, and temperature histories in alloy 7050 friction stir welds", A. P. Reynolds, W. Tang, Z. Khandkar, J. A. Khan, and K. Lindner, ***Science and Technology of Welding and Joining***, vol. 10, no. 2, 2005, pp. 190-199.
49. "Texture in Friction Stir Welds of Timetal 21S", A. P. Reynolds, Elizabeth Hood, and Wei Tang, ***Scripta Materialia***, 52 (2005) 491-494.
50. "Nanomechanical characterization of single-walled carbon nanotube reinforced epoxy composites", X. Li, H. Gao, W. A. Scrivens, D. Fei, X. Xu, M. A. Sutton, A. P. Reynolds, and M. L. Myrick, ***Nanotechnology*** 15 (11): 1416-1423 NOV 2004.
51. "Development of patterns for nanoscale strain measurements: I. Fabrication of imprinted Au webs for polymeric materials" S A Collette, M A Sutton, P Miney, A P Reynolds, Xiaodong Li, P E Colavita, W A Scrivens, Y Luo, T Sudarshan, P Muzykov and M L Myrick, ***Nanotechnology*** 15 1812-1817, 2004.
52. "Modeling Anisotropic Hardening with a Stochastic Cellular Automaton" S. C. Baxter and A. P. Reynolds, ***Probabilistic Engineering Mechanics***, 19, (2004), pp. 3-8.
53. "Structural Evolution and Superplastic Formability of Friction Stir Welded AA 2095 Sheets", H. G. Salem, A. P. Reynolds, and J. S. Lyons, ***Journal of Materials Engineering and Performance***, vol. 13, no. 1, February 2004, pp. 24-31.
54. "Banded microstructure in 2024-T351 and 2524-T351 aluminum friction stir welds: Part I: Metallurgical studies", Bang Cheng Yang, Junhui Yan, Michael A Sutton, Anthony P. Reynolds, ***Materials Science and Engineering A***, A364 (2004) 55-65.
55. "Banded microstructure in 2024-T351 and 2524-T351 aluminum friction stir welds: Part II-Mechanical characterization", Michael A Sutton, Bangcheng Yang, Anthony P Reynolds, Junhui Yan, ***Materials Science and Engineering A*** A364 (2004) 66-74.
56. "Friction Stir Welding of DH-36 Steel", A. P. Reynolds, W. Tang, M. Posada, and J. DeLoach, ***Science and Technology of Welding and Joining*** vol.8 no. 6, pp 455-460, 2003.
57. "Mixed Mode I/II Fracture of 2024-T3 Friction Stir Welds", M. A. Sutton, A. P. Reynolds, B. Yang, and R. Taylor, ***Engineering Fracture Mechanics***, 70 (2003) pp. 2215-2234.
58. "Mode I Fracture and Microstructure for 2024-T3 Friction Stir Welds", M. A. Sutton, A. P. Reynolds, B. Yang, and R. Taylor, ***Materials Science and Engineering, A***, Volume 354, Issues 1-2, 15 August 2003, Pages 6-16.
59. "Prediction of temperature distribution and thermal history during friction stir welding: input torque based model" Khandkar M.Z.H., Khan J.A., Reynolds A.P. ***Science and Technology of Welding & Joining***, 1 June 2003, vol. 8, no. 3, pp. 165-174(10)
60. "Two-dimensional friction stir welding process model based on fluid mechanics" Seidel T.U. and Reynolds A.P. ***Science and Technology of Welding & Joining***, 1 June 2003, vol. 8, no. 3, pp. 175-183(9)
61. "Structure, Properties, and Residual Stress of 304L Stainless Steel Friction Stir Welds" A. P. Reynolds, Wei Tang, T. Gnaupel-Herold, and H. Prask, ***Scripta Materialia*** 48 (2003) 1289-1294
62. "Simulation of the Global Response of a Friction Stir Weld Using Local Constitutive Behavior", W. D. Lockwood and A. P. Reynolds, ***Materials Science and Engineering, A***, January 2003, vol 339/1-2 pp 35-42.
63. "R-Curve Behavior of Friction Stir Welds in Aluminum-Lithium Alloy 2195", H. R. Kroninger and A. P. Reynolds, ***Fatigue and Fracture of Engineering Materials and Structures***, Vol. 25, no. 3, pp. 283-290, March 2002.

64. "Residual Stress Analysis in 2024-T351 Aluminum Friction Stir Butt Weld by Neutron Diffraction", M. A. Sutton, A. P. Reynolds, D. Wang, and C. Hubbard, **ASME Journal of Engineering Materials and Technology**, April 2002, vol. 124, pp. 215-221.
65. "Microstructure and Retention of Super-Plasticity of Friction Stir Welded Super-plastic 2095 Sheet ", H. Salem, A. P. Reynolds, and J. S. Lyons, **Scripta Materialia**, volume 45, no. 5, pp. 337-342, 2002.
66. "Microstructural Studies of Friction Stir Welds in 2024-T3 Aluminum", M. A. Sutton, B. Yang, A. P. Reynolds, and R. Taylor, **Materials Science and Engineering, A**, January 2002, vol. 323/1-2, pp 160-166.
67. "Mechanical Response of Friction Stir Welded AA 2024: Experiment and Modeling", W. D. Lockwood, Borislav Tomas, and A. P. Reynolds, **Materials Science and Engineering, A**, January 2002, vol. 323/1-2, pp. 349-354.
68. "Factors Affecting the Properties of Friction Stir Welded Aluminum Lap Joints", L. Cederqvist and A. P. Reynolds, **The Welding Journal Research Supplement**, December 2001, vol. 80, no. 12, pp. 281-s through 287-s.
69. "Visualization of Material Flow in AA2195 Friction Stir Welds Using a Marker Insert Technique", T. U. Seidel and A. P. Reynolds, **Metallurgical and Materials Transactions, A**, vol. 32A, November 2001, pp. 2879-2884.
70. "Development of Mechanical Properties Database of A285 Steel for Structural Analysis of Waste Tanks", A. J. Duncan, K. H. Subramanian, R. L. Sindelar, K. Miller, A. P. Reynolds, and Y. J. Chao, **ASTM Special Technical Publication number 1406**, 2001, pp. 399-409, ASTM Conshohocken, PA, USA
71. "Measurement of the Effect of Artificial Crack Geometry on the Rate of Bulk H<sup>+</sup> Transport Using Fiber Optic Chemical Sensors", Paul D. Peterson, Anthony P. Reynolds, Michael A. Sutton, **Corrosion**, vol. 57, no. 8, pp. 693-701, 2001.
72. "Finite Element Simulation of Material Flow in Friction Stir Welding", S. Xu, X. Deng, A. P. Reynolds, T. U. Seidel, **Science and Technology of Welding and Joining** vol. 6, no. 3, pp. 191-193, 2001.
73. "Kinematic Hardening in a Dispersion Strengthened Aluminum Alloy: Experiment and Modeling", A. P. Reynolds and S. C. Baxter, **Materials Science and Engineering, A**, vol. A285, June 2000, pp. 265-279.
74. "Visualization of Material Flow in an Autogenous Friction Stir Weld", A. P. Reynolds, **Science and Technology of Welding and Joining**, 2000 vol.5, no. 2, pp. 120-124.
75. "Digital Image Correlation for Determination of Weld and Base Metal Constitutive Behavior", A. P. Reynolds and F. Duvall, **The Welding Journal Research Supplement**, vol. 78, no. 10. pp. 355-s-360-s, October, 1999.
76. "Use and Verification of Digital Image Correlation for Automated 3-D Surface Reconstruction in the Scanning Electron Microscope", W. D. Lockwood and A. P. Reynolds, **Materials Characterization**, vol. 42, pp. 123-134, 1999.
77. "Experimental Investigation of E/M Impedance Health Monitoring of Spot-Welded Structural Joints" Giurgiutiu, V., Reynolds, A., and Rogers, C. A., **Journal of Intelligent Material Systems and Structures** vol. 10, March, pp. 1-11, 1999.
78. "Correlation of grain boundary precipitates parameters with fracture toughness in an Al-Cu-Mg-Ag alloy subjected to long term thermal exposure", B. Q. Li and A. P. Reynolds, **Journal of Materials Science**, vol. 33, pp. 5849-5853, 1998.
79. "Experimental Characterization of Crack Tip Deformation Fields in Alloy 718 at High Temperatures", J. Liu, J.S. Lyons, M.A. Sutton and A.P. Reynolds, **ASME Journal of Engineering Materials and Technology**, January 1998, vol. 120.
80. "Effect of Aluminide Particle Distribution on the High Temperature Crack Growth Characteristics of a Co-Ni-Fe Superalloy", J. S. Lyons, A. P. Reynolds, and J. D. Clawson, **Scripta Metallurgica et Materialia**, vol. 37, no. 7, pp. 1059-1064, 1997.
81. "Isotropic and Kinematic Hardening in a Dispersion Strengthened Aluminum Alloy", A. P. Reynolds and J. S. Lyons, **Metallurgical Transactions A**, vol. 28A, May 1997, pp. 1205-1211.
82. "Prediction of crack growth direction for mode I/II loading using small-scale yielding and void initiation/growth concepts", M. A. Sutton, W. Zhao, M. L. Boone, A. P. Reynolds, and D. S. Dawicke, **International Journal of Fracture** vol. 83, pp. 275-290, 1997.
83. "The effect of thermal exposure on the fracture behavior of aluminum alloys intended for elevated temperature service", A. P. Reynolds and R. E. Crooks, in **ASTM STP 1297, Elevated Temperature Effects on Fatigue and Fracture**, R. S. Piascik, R. P. Gangloff, and A. Saxena, eds., 1997, pp. 191-205.
84. "Comparison of R-Curve Methodologies for Ranking the Toughness of Aluminum Alloys", Anthony P. Reynolds, **Journal of Testing and Evaluation**, vol. 24, no. 6, Nov. 1996, pp. 406-410.
85. "The effect of elevated temperature exposure on fracture resistance and fracture path in a precipitation strengthened aluminum alloy", A. P. Reynolds, Qiong Li, **Scripta Materialia**, vol. 34, no. 11, pp 1803-1808, 1996.

86. "Retained mechanical properties of a new Al-Li-Cu-Mg-Ag alloy as a function of thermal exposure time and temperature", A. P. Reynolds and D. M. Royster, ***Scripta Metallurgica et Materialia***, vol. 30, no. 11, pp. 1485-1490, 1994.
87. "Elevated temperature fatigue of P/M aluminum alloy 8009", A. P. Reynolds, ***Scripta Metallurgica et Materialia***, vol. 28, pp. 201-206, 1993.
88. "Mechanisms of fatigue crack retardation following single tensile overloads in powder metallurgy aluminum alloys", G. H. Bray, A. P. Reynolds, and E. A. Starke, Jr., ***Metallurgical Transactions A***, vol. 23A, pp. 3055-3066, 1992.
89. "Constant amplitude and post-overload fatigue crack growth behavior in PM aluminum alloy AA 8009", Anthony P. Reynolds, ***Fatigue and Fracture of Engineering Materials and Structures***, vol. 15, no. 6, pp. 551-562, 1992.
90. "Elevated Temperature Cracking of RSP Aluminum Alloy 8009: Characterization of the Environmental Influence", W. C. Porr, Jr., A. P. Reynolds, Yang Leng, and R. P. Gangloff, ***Scripta Metallurgica et Materialia***, vol. 25, pp. 2627-2632, 1991.
91. "Cleavage Crystallography of Liquid Metal Embrittled Aluminum Alloys", A. P. Reynolds and G. E. Stoner, ***Metallurgical Transactions A***, vol. 22A, August 1991, pp. 1849-1855.
92. "Effect of Pre-aging Strain on Mercury Embrittlement of 2024 Aluminum Alloy", A. P. Reynolds and G. E. Stoner, ***Scripta Metallurgica***, vol. 23, pp. 1899-1902, 1989.

#### **Partial-Refereed Publications (Conference Proceedings etc.)**

1. "Effect of Tool Pin Features and Geometries on Quality of Weld During Friction Stir Welding", Md. Reza-E-Rabby, Wei Tang, and A. P. Reynolds, ***Friction Stir Welding and Processing VII***, Proceedings of the Friction Stir Welding and Processing Symposium from the TMS annual Meeting, March 4-7, 2013, San Antonio, TX, USA
2. "Effect of Process Parameters on the Microstructure and Mechanical Properties of Friction Stir Welded 2050-T3 Al-Li Alloy", Harpreet Sidhar, Rajiv Mishra, A. P. Reynolds, Lucie Johannes, John Baumann, ***Friction Stir Welding and Processing VII***, Proceedings of the Friction Stir Welding and Processing Symposium from the TMS annual Meeting, March 4-7, 2013, San Antonio, TX, USA
3. "Material Flow and Texture in Friction Extruded Wire", Xiao Li, Wei Tang, A. P. Reynolds, ***Friction Stir Welding and Processing VII***, Proceedings of the Friction Stir Welding and Processing Symposium from the TMS annual Meeting, March 4-7, 2013, San Antonio, TX, USA
4. "Visualization of Material Flow in Friction Extrusion", X Li, W Tang, AP Reynolds, ***Proceedings of the 13<sup>th</sup> International Conference on Aluminum Alloys***, June 2012, Pittsburgh, PA
5. "Effect of backplate thermal properties on friction stir welding of 25 mm thick AA6061", P Upadhyay, AP Reynolds, ***Proceedings of the 9<sup>th</sup> International Symposium on Friction Stir Welding***, May 2012, Huntsville, Alabama.
6. "Thermal Management for Production of Very High Strength alloy 7050 Friction Stir Welds", AP Reynolds, W Tang, ***Proceedings of the 9<sup>th</sup> International Symposium on Friction Stir Welding***, May 2012, Huntsville, Alabama.
7. "Friction Consolidation of Aluminum Chips", Tang W, Reynolds AP, in ***Friction Stir Welding and Processing VI***, Proceedings of the Friction Stir Welding and Processing Symposium from the TMS annual Meeting, February 27-March 3, 2011, San Diego, CA, USA
8. "Effects of Forge Axis Force and Backing Plate Boundary Condition on FSW of AA6056", Upadhyay P, Reynolds AP, in ***Friction Stir Welding and Processing VI***, Proceedings of the Friction Stir Welding and Processing Symposium from the TMS annual Meeting, February 27-March 3, 2011, San Diego, CA, USA
9. "Detection and Repair of Overheating in High Strength Al-Cu-Mg-Zn Friction Stir Welds", AP Reynolds, R. Brown, W. Tang, ***Proceedings of the 8<sup>th</sup> International Symposium on Friction Stir Welding***, Timmendorfer Strand, Germany, May 2010.
10. "Reliable FSW of copper canisters using improved process and regulator controlling power input and tool temperature", L Cederqvist, AP Reynolds, CD Sorensen, O Garpinger, ***Proceedings of the 8<sup>th</sup> International Symposium on Friction Stir Welding***, Timmendorfer Strand, Germany, May 2010
11. "Corrosion of Friction Stir Welded AlMg Alloy AA5083", A.J. Davenport R.J. Winsley G.M. Scamans A. Afseth J. Hunter A.P. Reynolds, ***Proceedings of ICAA 11***, 22-26 September 2008, Aachen, Germany
12. "Process Simulation in Friction Stir Welding: Challenges and Opportunities", A. P. Reynolds, ***8th Seminar 'Numerical Analysis of Weldability'***, 2006, Graz, Austria, September, 2006. **Invited Keynote Paper**, 2007, Verlag der Technischen Universitat Graz, ISBN 978-3-902465-69-6.
13. "Understanding Process and Property Relationships in Aluminum Alloy Friction Stir Welds" A. P. Reynolds, Materials Science Forum, ***Proceedings of Thermec 2006***, Vancouver BC, July 4-8, 2006, **Invited Keynote Paper**.

14. "Combined Simulation and Experiment for Friction Stir Welding Process Development", A. P. Reynolds and T. Long, **Proceedings of the 10<sup>th</sup> International Conference on Aluminum Alloys (ICAA10)**, Vancouver, BC, July 9-13, 2006, **Invited Paper**.
15. "Transverse Tensile Properties of AA2524 Friction Stir Welds: Quasi-static and High Rate Loading", A. P. Reynolds and J. Pohlman, **Proceedings of the 7<sup>th</sup> International Conference on Trends in Welding Research**, Calloway Gardens, Georgia, May 2005.
16. "FSW of Beta Titanium Alloy Sheet", A. P. Reynolds and Elizabeth Hood, **Proceedings of Friction Stir Welding and Processing: III**, 2005 TMS Annual Meeting, February 14-17, 2005, San Francisco, CA, USA (**Invited**).
17. "Process-Structure-Property Relationships in the Nugget and HAZ Regions of 2524-T351 FSW Joints" J. Yan, M. A. Sutton, and A. P. Reynolds, **Proceedings of the 5<sup>th</sup> International Symposium on Friction Stir Welding**, Metz, France, 14-16 September 2004, on CD.
18. "An overview of friction stir welding of Beta-21S titanium", Z. Loftus, J. Takeshita, A. P. Reynolds, and Wei Tang, **Proceedings of the 5<sup>th</sup> International Symposium on Friction Stir Welding**, Metz, France, 14-16 September 2004, on CD.
19. "Friction Stir Welding of Titanium Alloys for Aerospace Applications: Microstructure and Mechanical Behavior", K. V. Jata, P. R. Subramanian, A. P. Reynolds, T. Trapp, and E. Helder, **Proceedings of ISOPE 2004**, vol. 4, pp. 22-28, Toulon France.
20. "Microstructure and Mechanical Behavior of Friction Stir Welded Titanium Alloys", K. V. Jata and A. P. Reynolds, in **Metallic Materials with High Structural Efficiency**, eds. O. N. Senkov et al., pp. 391-400, 2004, Kluwer Academic Publishers, Netherlands.
21. "Evaluation Of Friction Stir Welded HSLA-65", M. Posada, J. DeLoach, A. P. Reynolds, S. R. Bhide, and P. Michaelaris, **Proceedings of the Advanced Marine Materials Conference, Royal Institute of Naval Architects**, London, UK, October 9-10, 2003
22. "Utility of relatively simple process models for understanding process parameter effects on FSW", A. P. Reynolds, Z. Khandkar, T. Long, W. Tang, and J. A. Khan, **Materials Science Forum** vols. 426-432, (2003), pp. 2959-2694.
23. "Rationalization of hardness distributions in alloy 7050 friction stir welds based on weld energy, weld power, and time/temperature history". K. Lindner, Z. Khandkar, J. Khan, W. Tang, and A. P. Reynolds, **Proceedings of the 4<sup>th</sup> International Symposium on Friction Stir Welding**, Park City, Utah, May 2003.
24. "Evaluation of Friction Stir Welded HSLA-65", M. Posada, J. DeLoach, R. W. Fonda, J. Halpin, and A. P. Reynolds, **Proceedings of the 4<sup>th</sup> International Symposium on Friction Stir Welding**, Park City, Utah, May 2003.
25. "Parametric Studies of FSW Using a 2-D, Fluid Based Simulation", A. P. Reynolds, W. Tang, and T. Long, **Proceedings of the Symposium on Hot Deformation of Aluminum Alloys**, TMS Spring Meeting, San Diego, CA, March 2003.
26. "Microstructural and Mechanical Evaluation of HSLA-65 and DH-36 FSW", Maria Posada, John J. DeLoach, and A. P. Reynolds, **Proceedings of Friction Stir Welding and Processing: II**, TMS Spring Meeting, San Diego, CA, March 2003.
27. C.S. Paglia, M.C. Carroll, B.C. Pitts, A.P. Reynolds, R.G. Buchheit, in: **The 8th International Conference on Aluminum Alloys ICAA 8**, 2002, Cambridge, UK, pp. 1677-1684.
28. C.S. Paglia, B.C. Pitts, M.C. Carroll, A.P. Reynolds, R.G. Buchheit, in: **Proceedings of the 6<sup>th</sup> International Conference on Trends in Welding Research**, Callaway Gardens, GA, USA, April 2002,, pp. 279-283.
29. "Input torque Based Thermal Model of Friction Stir Welding of Al 6061-T6", M. H. Kandahar, J. A. Khan, and A. P. Reynolds, **Proceedings of the 6<sup>th</sup> International Conference on Trends in Welding Research**, Callaway Gardens, GA, USA, April 2002, pp. 218-223.
30. "Weld Efficiency and Defect Formation: Correlation Between Experiment and Simple Models", A. P. Reynolds, K. Lindner, Wei Tang, and T. U. Seidel, **Proceedings of the 6<sup>th</sup> International Conference on Trends in Welding Research**, Callaway Gardens, GA, USA, April 2002, pp. 297-301.
31. "Mechanical Property and Microstructural Evaluation of Friction Stir Welded AL-6XN", Maria Posada, J. DeLoach, A. P. Reynolds, and J. P. Halpin, **Proceedings of the 6<sup>th</sup> International Conference on Trends in Welding Research**, Callaway Gardens, GA, USA, April 2002, pp. 307-311.
32. "Modeling kinematic hardening in a dispersions strengthened aluminum alloy using a stochastic cellular automaton" S.C. Baxter and A.P. Reynolds, **WCCM V Fifth World Congress on Computational Mechanics**, Vienna Austria, July 2002.
33. "Modeling Anisotropic Hardening with a Stochastic Cellular Automaton" Sarah C. Baxter and Anthony P. Reynolds, **Fourth International Conference on Computational Stochastic Mechanics**, Corfu, Greece, June 2002.

34. "Effects of Friction Stir Welding on Random Composite Microstructure: Particle Size Distribution" S.C. Baxter and A. P. Reynolds, **ICOSSAR International conference on Structural Safety and Reliability**, Newport Beach CA, June 2001.
35. Reynolds A.P., X. Deng and J. Khan, Development of Coupled Thermal, Mechanical, and Material Transport Models of the Friction Stir Welding Process, **Proceedings of the 2001 NSF Design, Manufacturing and Industrial Innovation Research Conference**, January 7-10, 2001, Tampa, FL
36. "Friction Stir Weld Evaluation of DH-36 and Stainless Steel Weldments", M. Posada, J. DeLoach, A. P. Reynolds, M. Skinner, and J. Halpin, **Proceedings of the Symposium on Friction Stir Welding and Processing**, pp. 159-171, eds. K. V. Jata, M. W. Mahoney, R. S. Mishra, S. L. Semiatin, and D. P. Field, TMS 2001, Indianapolis, Indiana, November 5-7, 2001.
37. "Alloy, Tool Geometry, and Process Parameter Effects on Friction Stir Weld Energies and Resultant Joint Properties", A. P. Reynolds and Wei Tang, **Proceedings of the Symposium on Friction Stir Welding and Processing**, pp. 15-23 eds. K. V. Jata, M. W. Mahoney, R. S. Mishra, S. L. Semiatin, and D. P. Field, TMS 2001, Indianapolis, Indiana, November 5-7, 2001.
38. "Friction Stir Welding of Austenitic Stainless Steels", A. P. Reynolds, M. Posada, J. DeLoach, M. J. Skinner, J. Halpin, T. J. Lienert, **Proceedings of the 3<sup>rd</sup> International Symposium on Friction Stir Welding**, 27-28 September, 2001, Kobe, Japan, distributed on CD.
39. "Characterization of the Reinforcing particle Size Distribution in a Friction Stir Welded Al-SiC Extrusion", S. Baxter and A. P. Reynolds, **Proceedings of the Symposium on Lightweight Alloys for Aerospace Applications**, TMS 2001 Annual Meeting, February 11-15, 2001, New Orleans, LA, p 284-293.
40. "Effect of Friction Stir Welding on the Superplastic Behavior of Weldalite Alloys", H. Salem, A. P. Reynolds, and J. Lyons, **Proceedings of the Symposium on Lightweight Alloys for Aerospace Applications**, TMS 2001 Annual Meeting, February 11-15, 2001, New Orleans, LA.
41. "Deformation, Fracture and Fatigue in a Dispersion Strengthened Aluminum Alloy", A. P. Reynolds, R. Wheeler, and K. V. Jata, **Proceedings of the Symposium on Lightweight Alloys for Aerospace Applications**, TMS 2001 Annual Meeting, February 11-15, 2001, New Orleans, LA.
42. "Recent Advances in FSW Process Physics", A. P. Reynolds, X. Deng, T. Seidel, and S. Xu, **Proceedings of the International Symposium on Joining of Advanced and Specialty Materials**, ASM International Materials Solutions Conference, St. Louis, Missouri, October 9-12, 2000, pp. 172-177.
43. A.J. Duncan, K.H. Subramanian, R.L. Sindelar, B.J. Wiersma, K.M. Miller, A.P. Reynolds and Y.J. Chao, "J-integral Fracture Toughness Testing and Correlation to the Microstructure of A285 Steel for Fracture Analysis of Storage Tanks," *PVP-Vol.413, Understanding and Predicting Material Degradation*, Editor: R. Mohan, pp.143-150, ASME Pressure Vessel and Piping Conference, July 2000, Seattle, Washington.
44. "Properties of Friction Stir Welded Aluminum Lap Joints", Lars Cederqvist and A. P. Reynolds, **Proceedings of the 2<sup>nd</sup> International Symposium on Friction Stir Welding**, Gothenburg, Sweden, 26-28, June 2000
45. "Processing-Property Correlation in Friction Stir Welds", A. P. Reynolds, W. D. Lockwood, and T. U. Seidel, **Materials Science Forum**, Vols. 331-337, (2000) pp. 1719-1724, 2000 Trans Tech Publications, Switzerland (Proceedings of ICAA-7, Charlottesville, VA, April 2000)
46. "Correlation of Weld Temperatures with Material Flow in Solid-State Friction Stir Welds", T. U. Seidel, A. P. Reynolds, **Proceedings of the Southeastern Conference on Theoretical and Applied Mechanics**, April, 2000
47. "Advances in chemical sensing for occluded environments", Paul D. Peterson, Anthony P. Reynolds, and Michael A. Sutton, **Proceedings of the SPIE Conference on Fiber Optic Sensor Technology and Applications**, Boston, MA, September 1999
48. "Visualization of Material Flow in an Autogenous Friction Stir Weld", A. P. Reynolds, T. U. Seidel, and M. Simonsen, **1<sup>st</sup> International Symposium on Friction Stir Welding**, Rockwell Science Center, Thousand Oaks, CA, June 14-16, 1999.
49. "Digital Image Correlation for Determination of Weld and Base Metal Constitutive Behavior", A. P. Reynolds and W. D. Lockwood, **1<sup>st</sup> International Symposium on Friction Stir Welding**, Rockwell Science Center, Thousand Oaks, CA, June 14-16, 1999
50. "In-situ Determination of Different Weld Region's Constitutive Behaviors via DIC", A. P. Reynolds, F. Duvall, and S. R. McNeill, **Proceedings of the 10<sup>th</sup> International Congress on Experimental Mechanics**, June 1999
51. "Topographic Measurements on Surfaces Using Digital Image Correlation and the Scanning Electron Microscope", Darin Lockwood, Jeff Helm, and A.P. Reynolds, **Proceedings of the 10<sup>th</sup> International Congress on Experimental Mechanics**, June 1999
52. "E/M Impedance Health Monitoring of Spot-Welded Structural Joints", V. Giurgiutiu, A. P. Reynolds, C. A. Rogers, Y. J. Chao, and M. A. Sutton, **Proceedings of ASME Adaptive Structures and Materials Symposium**, Nov. 15-20, 1998, Anaheim, CA. 1998 ASME Winter Annual Meeting.



53. "Details of the Electro-Mechanical Impedance Health Monitoring of Spot-Welded Structural Joints", Giurgiutiu, V., Reynolds, A. P., and Rogers, C. A., **Proceedings of SPIE's 6<sup>th</sup> Annual International Symposium on Smart Structures and Materials**, Newport Beach, CA, 1-5 March 1999.
54. "Multi-Scale Full Field Surface Strain Measurement on Loaded Aluminum Alloy Welds", A. P. Reynolds, F. Duvall, S. R. McNeill, and M. A. Sutton, **Proceedings of Trends in Welding Research 1998**, June 1-5, 1998, Pine Mountain, GA
55. "Mechanical and Corrosion Performance of TGA and Friction Stir Welded Aluminum for Tailor Welded Blanks: Alloys 5454 and 6061", A. P. Reynolds, **Proceedings of Trends in Welding Research 1998**, June 1-5, 1998, Pine Mountain, GA
56. "The Effect of Elevated Temperature Exposure on the Damage Tolerant Properties of Aluminum Alloys Intended for Elevated Temperature Application", Anthony P. Reynolds, **Abstract Proceedings of the VIII International Congress on Experimental Mechanics**, SEM, Nashville, TN, June 10-13, 1996, pp. 292-293.

### **Presentations at Technical Meetings**

1. "Critical Issues in Friction Stir Welding of High Strength Aluminum Alloys", AP Reynolds, **invited Keynote Lecture at Thermec 2013**, December 2-6, Las Vegas, Nevada, USA
2. "Effect of Tool Pin Features and Geometries on Quality of Weld During Friction Stir Welding", Md. Reza-E-Rabby, Wei Tang, and A. P. Reynolds, **Friction Stir Welding and Processing VII**, the TMS annual Meeting, March 4-7, 2013, San Antonio, TX, USA. **Invited.**
3. "Effect of Process Parameters on the Microstructure and Mechanical Properties of Friction Stir Welded 2050-T3 Al-Li Alloy", Harpreet Sidhar, Rajiv Mishra, A. P. Reynolds, Lucie Johannes, John Baumann, **Friction Stir Welding and Processing VII** the TMS annual Meeting, March 4-7, 2013, San Antonio, TX, USA
4. "Material Flow and Texture in Friction Extruded Wire", Xiao Li, Wei Tang, A. P. Reynolds, **Friction Stir Welding and Processing VII**, the TMS annual Meeting, March 4-7, 2013, San Antonio, TX, USA
5. "Friction Stir Processing for Mitigation of Sensitization in 5XXX Series Aluminum Alloys, A. P. Reynolds, J. Chrisfield, **Friction Stir Welding and Processing VII**, the TMS annual Meeting, March 4-7, 2013, San Antonio, TX, USA
6. "Visualization of Material Flow in Friction Extrusion", X Li, W Tang, AP Reynolds, **13<sup>th</sup> International Conference on Aluminum Alloys**, June 2012, Pittsburgh, PA
7. "Effect of backplate thermal properties on friction stir welding of 25 mm thick AA6061", P Upadhyay, AP Reynolds, **9<sup>th</sup> International Symposium on Friction Stir Welding**, May 2012, Huntsville, Alabama.
8. "Thermal Management for Production of Very High Strength alloy 7050 Friction Stir Welds", AP Reynolds, W Tang, **9<sup>th</sup> International Symposium on Friction Stir Welding**, May 2012, Huntsville, Alabama.
9. "Friction Consolidation and Extrusion for Wire Production" **The International Conference for Near Net-shape Manufacturing**, November 1-3, 2011, Melbourne Australia (Monash University). **Invited.**
10. "Friction Consolidation of Aluminum Chips", Tang W, Reynolds AP, **Friction Stir Welding and Processing Symposium from the TMS annual Meeting**, February 27-March 3, 2011, San Diego, CA, USA
11. "Effects of Forge Axis Force and Backing Plate Boundary Condition on FSW of AA6056", Upadhyay P, Reynolds AP, the **Friction Stir Welding and Processing Symposium from the TMS annual Meeting**, February 27-March 3, 2011, San Diego, CA, USA (Invited)
12. "Detection and Repair of Overheating in High Strength Al-Cu-Mg-Zn Friction Stir Welds", A Reynolds, R. Brown, W. Tang, **Proceedings of the 8<sup>th</sup> International Symposium on Friction Stir Welding**, Timmendorfer Strand, Germany, May 2010.
13. "Reliable FSW of copper canisters using improved process and regulator controlling power input and tool temperature", L Cederqvist, AP Reynolds, CD Sorensen, O Garpinger, **Proceedings of the 8<sup>th</sup> International Symposium on Friction Stir Welding**, Timmendorfer Strand, Germany, May 2010
14. "Effect of Interface Characteristics on Transverse Tensile Strength of Dissimilar Metal Al-Mg Friction Stir Welds", Venkateswaran P, Chen Y, Reynolds AP, **TMS 2009 Annual Meeting, Symposium on Friction Stir Welding and Processing-V**, San Francisco, CA, USA, February 15-19, 2009.
15. "Speed and Feed Effects on the Surface Texture and Superplastic Forming Performance of Titanium 6Al-4V Friction Stir Welds", Daniel Sanders, M. Ramulu, Paul Edwards, Anthony P. Reynolds, Glenn Grant **TMS 2009 Annual Meeting, Symposium on Friction Stir Welding and Processing-V**, San Francisco, CA, USA, February 15-19, 2009 (**Invited**)
16. "Boundary Condition Effects on Friction Stir Welds in 7050-T7 Sheet", Upadhyay P, Reynolds AP, **TMS 2009 Annual Meeting, Symposium on Friction Stir Welding and Processing-V**, San Francisco, CA, USA, February 15-19, 2009 (**Invited**).
17. "Characterization of Longitudinal Residual Stresses in Friction Stir Welds Using the Cut-Compliance Technique", Reynolds AP, Canaday C, **International Conference on Residual Stress-8**, 4-8 August 2008.

18. "Texture as a Forensic Tool in Friction Stir Welding", Reynolds AP, **15<sup>th</sup> International Conference on Textures of Materials**, June 1-6, 2008, Pittsburgh, PA USA (**invited**)
19. "Residual Stress and microstructure effects on fatigue crack growth in AA2050 friction stir welds", G. Pouget and A. P. Reynolds, **Aeromat 2007**, Baltimore, Maryland, June 25-26, 2007.
20. "Grain and texture development in single crystal FSW's", RW Fonda, JA Wert, AP Reynolds, and W Tang, **6<sup>th</sup> International Symposium on Friction Stir Welding**, Saint Saveur, Canada, October 10<sup>th</sup>-13<sup>th</sup>, 2006.
21. "Effects of FSW Defects on 7075 Joint Strength and Fatigue Life", JE Barnes, J McMichael, AP Reynolds, **6<sup>th</sup> International Symposium on Friction Stir Welding**, Saint Saveur, Canada, October 10<sup>th</sup>-13<sup>th</sup>, 2006.
22. "General features of RPM, torque, and process force relationships in Al alloy FSW", AP Reynolds, G. Pouget, W. Tang, Z Khandkar, **6<sup>th</sup> international Symposium on Friction Stir Welding**, Saint Saveur, Canada, October 10<sup>th</sup>-13<sup>th</sup>, 2006.
23. "Process Simulation in Friction Stir Welding: Challenges and Opportunities", A. P. Reynolds, **8th Seminar 'Numerical Analysis of Weldability'**, 2006, Graz, Austria, September, 2006. **Invited Keynote Lecture.**
24. "Understanding Process and Property Relationships in Aluminum Alloy Friction Stir Welds" A. P. Reynolds, Thermec 2006, Vancouver BC, July 4-8, 2006, **Invited Keynote Lecture.**
25. "Combined Simulation and Experiment for Friction Stir Welding Process Development", A. P. Reynolds and T. Long, 10<sup>th</sup> International Conference on Aluminum Alloys (ICAA10), Vancouver, BC, July 9-13, 2006, **Invited Lecture.**
26. "Defect Formation in Friction Stir Welds" A. P. Reynolds, American Welding Society Meeting, November 13-16, 2005, Chicago, Illinois, (**Invited**)
27. "Transverse Tensile Properties of AA2524 Friction Stir Welds: Quasi-static and High Rate Loading", A. P. Reynolds and J. Pohlman, **Proceedings of the 7<sup>th</sup> International Conference on Trends in Welding Research**, Calloway Gardens, Georgia, May 2005
28. "Correlation of FSW Simulation Results with Experimental Observations", A. P. Reynolds, T. U. Seidel, W. Tang, and T. Long, **2<sup>nd</sup> FSW Modelling and Flow Visualization Seminar**, GKSS Forschungszentrum, Geesthacht, Germany, 31 January-1 February 2005. (**Invited**)
29. "FSW of Beta Titanium Alloy Sheet", A. P. Reynolds and Elizabeth Hood, **2005 TMS Annual Meeting**, February 14-17, 2005, San Francisco, CA, USA (**Invited**).
30. "Superplastic Forming of Friction Stir Welded Ti-6-4 Sheet", Glenn J. Grant, D. Sanders, A. P. Reynolds, and Wei Tang, **2005 TMS Annual Meeting**, February 14-17, 2005, San Francisco, CA, USA
31. "The Effect of Friction Stir Processing on the Microstructure and Strength of Cast Ti-6Al-4V", Mary Juhas, Paul Pavka, David Norfleet, Anthony Reynolds, Jim Williams; **2005 TMS Annual Meeting**, February 14-17, 2005, San Francisco, CA, USA
32. "Process-Structure-Property Relationships in the Nugget and HAZ Regions of 2524-T351 FSW Joints" J. Yan, M. A. Sutton, and A. P. Reynolds, **5<sup>th</sup> International Symposium on Friction Stir Welding**, Metz, France, 14-16 September 2004.
33. "An overview of friction stir welding of Beta-21S titanium", Z. Loftus, J. Takeshita, A. P. Reynolds, and Wei Tang, **5<sup>th</sup> International Symposium on Friction Stir Welding**, Metz, France, 14-16 September 2004.
34. "Utility of relatively simple process models for understanding process parameter effects on FSW", A. P. Reynolds, Z. Khandkar, T. Long, W. Tang, and J. A. Khan, **Thermec 2003**, July 7-11, 2003, Leganes, Madrid, Spain.
35. "Rationalization of hardness distributions in alloy 7050 friction stir welds based on weld energy, weld power, and time/temperature history". K. Lindner, Z. Khandkar, J. Khan, W. Tang, and A. P. Reynolds, **4<sup>th</sup> International Symposium on Friction Stir Welding**, Park City, Utah, May 2003.
36. "Evaluation of Friction Stir Welded HSLA-65", M. Posada, J. DeLoach, R. W. Fonda, J. Halpin, and A. P. Reynolds **4<sup>th</sup> International Symposium on Friction Stir Welding**, Park City, Utah, May 2003.
37. "Band formation and characteristics in 2024 and 2524 FSW's", J. Yan, B. Yang, M. A. Sutton, A. P. Reynolds, and J. Ward, **4<sup>th</sup> International Symposium on Friction Stir Welding**, Park City, Utah, May 2003.
38. "Parametric Studies of FSW Using a 2-D, Fluid Based Simulation", A. P. Reynolds, W. Tang, and T. Long, **Symposium on Hot Deformation of Aluminum Alloys, TMS Spring Meeting**, San Diego, CA, March 2003.
39. "Microstructural and Mechanical Evaluation of HSLA-65 and DH-36 FSW", Maria Posada, John J. DeLoach, and A. P. Reynolds, **Symposium on Friction Stir Welding and Processing: II, TMS Spring Meeting**, San Diego, CA, March 2003.
40. "Local Properties and Strain Distribution in Conventional and Self-Reacting Friction Stir Welds", A. P. Reynolds, W. Tang, **Symposium on Friction Stir Welding and Processing: II, TMS Spring Meeting**, San Diego, CA, March 2003.

41. "Localized Corrosion and Stress Corrosion Cracking of Friction Stir Welds in 7XXX Aluminum Alloys", R. G. Buchheit, C. S. Paglia, and A. P. Reynolds, **Symposium on Friction Stir Welding and Processing: II**, TMS Spring Meeting, San Diego, CA, March 2003.
42. "Effect of FSW Parameters on the Structure and Superplastic Formability of AA 2095 SPF Sheet", H. G. Salem, A. P. Reynolds, and J. S. Lyons, **Symposium on Friction Stir Welding and Processing: II**, TMS Spring Meeting, San Diego, CA, March 2003.
43. "Weld Energy Influence on Hardness Distribution and Post-Weld Heat Treatment Response in Friction Stir Welded 7050 Plate", A. P. Reynolds, K. Lindner, Wei Tang, and T. Seidel, **Aeromat 2002**, June 2002, Orlando, Florida.
44. "Mixed-Mode Fracture of 2524-T3 Friction Stir Welds", M.A. Sutton, A. P. Reynolds, Bang-cheng Yang, **Aeromat 2002**, June 2002, Orlando, Florida.
45. "Microstructures, Mechanical Properties and Weldability of Friction Stir Welds on Ti Sheet Alloys", T.J. Lienert, A.P. Reynolds and W. Tang", **Aeromat 2002**, June 2002, Orlando, Florida.
46. "Mixed Mode I/II Fracture Studies for 2024-T3 Aluminum FSW Joints", M. A. Sutton, A. P. Reynolds, B. C. Yang, and R. K. Taylor, **6<sup>th</sup> International Conference on Trends in Welding Research**, Callaway Gardens, GA, USA, April 2002.
47. "Input torque Based Thermal Model of Friction Stir Welding of Al 6061-T6", M. H. Kandahar, J. A. Khan, and A. P. Reynolds, **6<sup>th</sup> International Conference on Trends in Welding Research**, Callaway Gardens, GA, USA, April 2002.
48. "Weld Efficiency and Defect Formation: Correlation Between Experiment and Simple Models", A. P. Reynolds, K. Lindner, Wei Tang, and T. U. Seidel, **6<sup>th</sup> International Conference on Trends in Welding Research**, Callaway Gardens, GA, USA, April 2002.
49. "Mechanical Property and Microstructural Evaluation of Friction Stir Welded AL-6XN", Maria Posada, J. DeLoach, A. P. Reynolds, and J. P. Halpin, **6<sup>th</sup> International Conference on Trends in Welding Research**, Callaway Gardens, GA, USA, April 2002.
50. "Friction Stir Weld Evaluation of DH-36 and Stainless Steel Weldments", M. Posada, J. DeLoach, A. P. Reynolds, M. Skinner, and J. Halpin, **Symposium on Friction Stir Welding and Processing, TMS 2001**, Indianapolis, Indiana, November 5-7, 2001.
51. "Alloy, Tool Geometry, and Process Parameter Effects on Friction Stir Weld Energies and Resultant Joint Properties", A. P. Reynolds and Wei Tang, **Symposium on Friction Stir Welding and Processing, TMS 2001**, Indianapolis, Indiana, November 5-7, 2001.
52. "Friction Stir Welding of Austenitic Stainless Steels", A. P. Reynolds, M. Posada, J. DeLoach, M. J. Skinner, J. Halpin, T. J. Lienert, **3<sup>rd</sup> International Symposium on Friction Stir Welding**, 27-28 September, 2001, Kobe, Japan,.
53. "Properties of FSW Aluminum Lap Joints", L. Cederqvist and A. P. Reynolds, **Aeromat 2001**, Long Beach, CA, June 11-14, 2001
54. "Modeling the Post-Weld Mechanical Response of Friction Stir Welds", W. D. Lockwood and A. P. Reynolds, **Aeromat 2001**, Long Beach, CA, June 11-14, 2001
55. "Material Flow in Friction Stir Welds of Seven Different Aluminum Alloys", T. U. Seidel and A. P. Reynolds, **Aeromat 2001**, Long Beach, CA, June 11-14, 2001
56. "A Two-dimensional Fluid Mechanics Based Friction Stir Weld Process Model", T. U. Seidel and A. P. Reynolds, **Aeromat 2001**, Long Beach, CA, June 11-14, 2001
57. "Characterization of the Reinforcing particle Size Distribution in a Friction Stir Welded Al-SiC Extrusion", S. Baxter and A. P. Reynolds, **TMS 2001 Annual Meeting**, February 11-15, 2001, New Orleans, LA.
58. "Effect of Friction Stir Welding on the Superplastic Behavior of Weldalite Alloys", H. Salem, A. P. Reynolds, and J. Lyons, **TMS 2001 Annual Meeting**, February 11-15, 2001, New Orleans, LA.
59. "Deformation, Fracture and Fatigue in a Dispersion Strengthened Aluminum Alloy", A. P. Reynolds, R. Wheeler, and K. V. Jata, **TMS 2001 Annual Meeting**, February 11-15, 2001, New Orleans, LA.
60. "Process Development of Friction Stir Lap Joints in AA 7075 and AA 2297 Alloys", Z. Li, W. J. Arbegast, A. P. Reynolds, and K. V. Jata, **TMS 2001 Annual Meeting**, February 11-15, 2001, New Orleans, LA.
61. "Properties of 2297-T8 Al-Li Friction Stir Butt and Lap Joints", W. J. Arbegast, G. Braun, A. P. Reynolds, and K. V. Jata, **TMS 2001 Annual Meeting**, February 11-15, 2001, New Orleans, LA.
62. "Mechanical properties of friction stir welds: experiment and modeling", W. D. Lockwood, A. P. Reynolds, and B. Tomaz, **37<sup>th</sup> Annual Technical Meeting of the Society of Engineering Science**, Columbia, SC October 23-25, 2000.
63. "Material flow simulation in friction stir welding using a CFD tool", T. U. Seidel and A. P. Reynolds, **37<sup>th</sup> Annual Technical Meeting of the Society of Engineering Science**, Columbia, SC October 23-25, 2000.
64. "Properties of friction stir welded aluminum lap joints", L. Cederqvist and A. P. Reynolds, **37<sup>th</sup> Annual Technical Meeting of the Society of Engineering Science**, Columbia, SC October 23-25, 2000.

65. "Measurement of the effect of crack geometry on the rate of bulk H<sup>+</sup> transport using fiber optic chemical sensors", P. D. Peterson, A. P. Reynolds, and M. A. Sutton, **37<sup>th</sup> Annual Technical Meeting of the Society of Engineering Science**, Columbia, SC October 23-25, 2000.
66. "Recent Advances in FSW Process Physics", A. P. Reynolds, X. Deng, T. Seidel, and S. Xu, **International Symposium on Joining of Advanced Materials, ASM International Materials Solutions Conference**, St. Louis, Missouri, October 9-12, 2000.
67. Friction Stir Welding of a Wing Box Prototype", C. A. Ramirez, W. J. Arbogast, A. P. Reynolds, and K. V. Jata, **AeroMat 2000**, Bellevue, WA, June 26-29, 2000
68. Mechanical Response of Friction Stir Welds: Experiment and Modeling" W. D. Lockwood and A. P. Reynolds, **AeroMat 2000**, Bellevue, WA, June 26-29, 2000
69. Material Flow and Average Strain Rates in Friction Stir Welds", T. U. Seidel, W. B. Bailey, and A. P. Reynolds, **AeroMat 2000**, Bellevue, WA, June 26-29, 2000
70. Preliminary Studies of Mixed-Mode Fracture in 2024-T3 Friction Stir Welds", M. A. Sutton, R. Taylor, A. P. Reynolds, and B. Cheng, **AeroMat 2000**, Bellevue, WA, June 26-29, 2000
71. "Processing Property Correlation in Friction Stir Welds", A. P. Reynolds, W. D. Lockwood, and T. U. Seidel, **7<sup>th</sup> International Conference on Aluminum Alloys**, April 10<sup>th</sup>-14<sup>th</sup>, 2000, Charlottesville, VA
72. "Visualization and Modeling of Flow in Friction Stir Welds", A. P. Reynolds, T. U. Seidel, and M. Simonsen, **Best of Aeromat Symposium**, ASM Materials Week, Cincinnati, Ohio, October, 1999. (Invited)
73. "Visualization of Material Flow in an Autogenous Friction Stir Weld", A. P. Reynolds, T. U. Seidel, and M. Simonsen, **1<sup>st</sup> International Symposium on Friction Stir Welding**, Rockwell Science Center, Thousand Oaks, CA, June 14-16, 1999.
74. "Digital Image Correlation for Determination of Weld and Base Metal Constitutive Behavior", A. P. Reynolds and W. D. Lockwood, **1<sup>st</sup> International Symposium on Friction Stir Welding**, Rockwell Science Center, Thousand Oaks, CA, June 14-16, 1999
75. "Constitutive Properties of Microstructural Regions in Friction Stir Welds", A. P. Reynolds and W. D. Lockwood, **AeroMat '99**, Dayton Convention Center, Dayton, Ohio, June 21-24, 1999.
76. "Visualization and Modeling of Flow in Friction Stir Welds", A. P. Reynolds, T. U. Seidel, and M. Simonsen, **AeroMat '99**, Dayton Convention Center, Dayton, Ohio, June 21-24, 1999
77. "Advances in chemical sensing for occluded environments", P. D. Peterson, A. P. Reynolds, and M. A. Sutton, **SPIE Conference on Fiber Optic Sensor Technology and Applications**, Boston, MA, September 1999.
78. "Determination of Constitutive Behavior of Microstructural Regions in Al-Li Alloy Friction Stir Welds", A. P. Reynolds, **Al-Li Researchers Workshop**, Bass Lake Lodge, WPAFB, Dayton Ohio, August 18, 1998.
79. "Kinematic Hardening in a Dispersion Strengthened Aluminum Alloy: Experiment and Modeling", A. P. Reynolds and S. C. Baxter, **NSF-IMM Symposium on Micromechanic Modeling of Industrial Materials in Honor of Prof. T. Mori**, July 20-22, 1998.
80. "Mechanical and Corrosion Performance of TGA and Friction Stir Welded Aluminum for Tailor Welded Blanks: Alloys 5454 and 6061", A. P. Reynolds, **Trends in Welding Research 1998**, June 1-5, 1998, Pine Mountain, GA
81. "Multi-Scale Full Field Surface Strain Measurement on Loaded Aluminum Alloy Welds", A. P. Reynolds, F. Duvall, S. R. McNeill, and M. A. Sutton, **Trends in Welding Research 1998**, June 1-5, 1998, Pine Mountain, GA (Poster)
82. "Experimental Observations of Fracture under Mixed Mode I/II Loading of Thin-Sheet 2524-T3 Al", M. L. Boone, A. P. Reynolds, and M. A. Sutton, **NASA Aging Aircraft Workgroup Meeting**, March 24, 1998, Hampton, VA.
83. "The Microtexture of Fracture in Lithium-Containing Aluminum Alloys" R. Crooks, P.N. Kalu, A.P. Reynolds, TMS General Abstract Session: Mechanical Behavior, **TMS Annual Meeting, February 10, 1997**, Orange County Convention Center, Orlando, Florida
84. "The Effect of Elevated Temperature Exposure on the Damage Tolerant Properties of Aluminum Alloys Intended for Elevated Temperature Application", Anthony P. Reynolds, Presented at the **VIII International Congress on Experimental Mechanics**, June 10-13, 1996, Nashville, TN, session on Aging Aerospace
85. "The effect of thermal exposure on the fracture behavior of aluminum alloys intended for elevated temperature service", A. P. Reynolds and R. Crooks, presented at the **27<sup>th</sup> National Symposium on Fatigue and Fracture Mechanics**, Sponsored by ASTM E-8, June 26-29, 1995, Williamsburg, VA
86. "A Proposed Mechanism for the Temperature and Strain Rate Dependent Deformation Behavior of Dispersoid Containing Aluminum Alloys 8009 and CZ42", A. P. Reynolds and D. M. Royster, presented at the **Hans Conrad Symposium of the Metallurgical Society Spring Meeting**, San Francisco, CA, 1994
87. "Elevated Temperature Fatigue of P/M Aluminum Alloy 8009", A. P. Reynolds, **TMS Fall Meeting**, Cincinnati Ohio, October, 1991

88. "Mercury Embrittlement of an Al-5% Cu alloy", A. P. Reynolds and G. E. Stoner, **TMS Fall Meeting**, Chicago, Illinois, September 1988

#### **Other Invited Lectures and Seminars (12)**

1. **Invited** lecture at CSIRO, Melbourne Australia, November 4, 2011, "Friction-based Processing of Titanium at the University of South Carolina"
2. **Invited** Lecture at the Indo-US Workshop on "Future Trends in Intelligent Processing of Metallic Materials", March 22-24, 2004, Goa, India.
3. Seminar on "FSW Process Simulation" at the Exxon-Mobil Research Center, Annandale, NJ, 12 March 2004.
4. **Invited Keynote** speaker at the International Friction Stir Welding Workshop, April 3-5, 2003, Port Elizabeth, South Africa.
5. "Friction Stir Welding Research at USC", ASM/AWS/MRS regional meeting, Atlanta, Georgia, October 15<sup>th</sup>, 2002.
6. "FSW Research at the University of South Carolina: Emphasizing Naval Applications", A. P. Reynolds, Edison Welding Institute/Naval Joining Center, 6 August 2002.
7. "Friction Stir Welding Modeling: Processing and Performance", Naval Research Laboratory, Washington, DC, June 21, 2001
8. "Friction Stir Welding" A. P. Reynolds, ALCOA Technical Center, Alcoa Center, PA, October 27, 2000
9. "Material Displacement in Friction Stir Welds" A. P. Reynolds, Invited Lecture at the Savannah River Site ASM Chapter Meeting, January, 2000.
10. "Research in Friction Stir Welding at the University of South Carolina", Anthony P. Reynolds, invited presentation at the Oak Ridge National Laboratory, Oak Ridge Tennessee, October 1, 1999.
11. "Determination of Constitutive Behavior of Microstructural Regions in Al-Li Alloy Friction Stir Welds", A. P. Reynolds, **Al-Li Researchers Workshop**, Bass Lake Lodge, WPAFB, Dayton Ohio, August 18, 1998.
12. "Friction Stir Welding at the USC DME" American Welding Society Midlands Section meeting 4/15/98.
13. "The Effect of Elevated Temperature Exposure on the Damage Tolerant Properties of Aluminum Alloys Intended for Elevated Temperature Application", Anthony P. Reynolds, Presented at the VIII International Congress on Experimental Mechanics, June 10-13, 1996, Nashville, TN, session on Aging Aerospace.

#### **Research Funding as Principal Investigator**

Career at USC	\$9.05M
Since initial nomination for this chair	\$2.9M