



# ASM - Atlanta

## October Meeting of the Atlanta Chapter of ASM

Tuesday Evening, October 15, 2002, 6:00 PM

Meeting at the Georgia Tech  
School of Materials Science and Engineering  
Located in the J. Erskine Love Manufacturing Building  
(Please note the change in location! See map below.)

### Friction Stir Welding Modeling: Processing and Weld Performance

presented by

**Dr. Anthony (Tony) P. Reynolds**  
Department of Mechanical Engineering  
University of South Carolina

also

**Comments by Atlanta Area High School Teachers concerning their recent  
experiences at the ASM Summer Camp for High School Teachers**

**For this meeting, the Atlanta Chapter of ASM International will be joint host with  
the Atlanta Chapter of the American Welding Society (AWS) & with the Atlanta  
District of Precision Metal forming Association.**

**Tuesday Evening, October 15, 2002**

**Wine Reception & Social: 6:00 PM**  
**Dinner: 6:30 PM**

**Introductions & Business:** 7:15 PM  
**Comments by High School Teachers:** 7:30  
**Dr. Reynolds' Presentation:** 7:45 PM  
**Costs:** \$20.00 Regular, \$6.00 Students

**Dinner Menu: Casual Cuisine:** Casual Cuisine: Roasted and Sliced Chicken Breast stuffed with a Wild Mushroom Duxelle and served with a wonderful sun-dried cherry sauce; green garden salad with vinaigrette dressing, fresh fruit salad, bakery rolls with butter, assorted dessert bar bits; sweet/unsweet ice tea; water, coffee. Vegetarian or special diet dinners upon request. Wine - extra.

**WHERE -- The Georgia Tech School of Materials Science and Engineering, located in the J. Erskine Love Manufacturing Building.** A map is provided below.

**Reservations: RSVP - by noon on Friday, October 11,**  
to **Marlene White**, Tel: (404) 894-2850,  
Fax: (404) 294-9140, [marlene.white@mse.gatech.edu](mailto:marlene.white@mse.gatech.edu)

**Special note - The last date to make a dinner reservation will be Friday, Oct 11.** This is a new caterer and they will not accept late reservations, as done by Ferst Place. After Friday, members can attend the meeting - but no dinner. If it is necessary for you to eat elsewhere, please know that you are always welcome for the program. Come & meet with your technical friends and make new ones.

**Abstract:**

### **Friction Stir Welding Modeling:**

The friction stir welding research program at the University of South Carolina is based on systematic investigation of the processing/property relationships pertaining to friction stir welding of aluminum and other alloy systems. Combined experimental and numerical approaches are used to improve our understanding of the FSW process and to characterize the performance of friction stir welds in structural applications. In this presentation, examples from both the process modeling and the performance characterization work will be shown. Experimental process characterization includes material flow visualization results and alloy and tool effects on weld energy. Process model results presented will be based on a 2-D CFD approach. The performance modeling will include results of local constitutive behavior measurements obtained using the digital image correlation technique (DIC) and use of these results in FEA simulations

### **About Anthony P. (Tony) Reynolds**

**Dr. Reynolds** received his Ph.D. in Materials Science from the University of Virginia in 1990. Subsequently he spent 5 years at NASA Langley research Center working on aluminum alloy development for High Speed Civil Transport. Since 1995 he has been on the faculty of Mechanical Engineering at the University of South Carolina. In 2001 he was promoted to Associate Professor with tenure. Dr. Reynolds' research interests include mechanical and physical metallurgy, deformation mechanisms, and development of new methods for characterizing material properties. Specifically, fatigue and fracture of metallic materials at elevated and cryogenic temperatures and in aggressive environments, deformation mechanisms in particle hardened systems and the development of automated,

quantitative, fractographic techniques. For the last four years, Dr. Reynolds and his research group have been working primarily in the area of Friction Stir Welding.

Dr. Reynolds Ph.D. Dissertation: Microstructural Effects on Liquid Metal Embrittlement of Aluminum Alloys.

Master of Science in Materials Science, University of Virginia 1986 Thesis: Staining of Aluminum Reroll. Bachelor of Chemical Engineering, University of Virginia 1982.

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**Meeting in the Georgia Tech School of Materials Science and Engineering, located in the J. Erskine Love Manufacturing Building**

