



# The Macrogram

Hartford Chapter of the ASM International  
Build on our Strengths - Leverage our Diversity - Network to Succeed

## MONTHLY MEETING – TOPIC

**January 13, 2009 – CCAT Laser Lab Tour**

**Topic: Advancing Laser Technology to Meet Material Needs**

**Speaker:** Paul Denney

Acting Director; Laser Application Laboratory  
National Center for Aerospace Leadership  
Connecticut Center for Advanced Technology

**Directions: Margaritas Mexican Restaurant** - 350 Roberts St., East Hartford, CT, Ph: (860) 289-7212  
**I-84 Exit 58 Robert Street:** From the East, turn right onto Robert St. and the restaurant is immediate on the left. From the West, turn left on to Robert St. and after the first light the restaurant is immediate on the left.

### Agenda:

CCAT Tour: 4:30 PM  
Cocktails: 5:30-6:30 PM  
Dinner: 6:30-7:30 PM  
Program: 7:30-8:30 PM

### Program Charges:

Regular Members - \$28.00  
Retirees - \$15.00  
Full Time Students - \$15.00

**Technical Chairperson:** Amber Black

**Reservations:** Call Shirley at Service Steel Aerospace (860) 583-3336 by noon January 9th. **Thanks!**

### Tour of CCAT Laser Facilities at 4:30 PM

**Directions to the CCAT Innovation Center at UTRC:**  
**From Points East:**

1. Follow I-84 West to Exit 58 (Roberts St./Silver Lane).
2. At traffic light at the end of the ramp turn left onto Roberts.
3. Follow 3 below (from Points West).

**From Points West:**

1. Follow I-84 East to Exit 58 (Roberts St./Silver Lane).
2. Bear right off the exit ramp.
3. At the intersection with Silver Lane, go straight across onto UTC property.
4. Bear Right (keep going past the first UTRC driveway)
5. At the first (flashing) light turn left.
6. CCAT is located at the back of the building under the blue awning.

### Abstract:



For any manufactured product, how the material is processed into the final assembly has an impact on the product's final performance. Even when fasteners are used to join components, the strength of the fastener, the hole size and spacing in the part, the orientation of the holes, and other

"parameters" will impact how the device will perform.

While physical fasteners are used for some products, the use of thermal processes to join, cut, drill, and "treat" materials is the most common in very high volume/low cost products. By using thermal methods, the material that is being processed will be altered with the degree being determined by the temperature reached and the time. While there are a number of thermal processes that are used to process materials, lasers are one of the most recent and most flexible for materials processing.

Even though the "laser" has been with us for 48 years, many major improvements have occurred in the last 5 years that will increase their utilization in the processing of materials. Diode, fiber, and disk lasers are all making improvements that are leading to increases in numbers and applications. This presentation will discuss some basics of laser materials processing and then discuss recent changes in the laser industry and what it may mean to how and what materials are processed in the future.

### Bio:



Paul Denney has been involved in the development and implementation of laser materials processing for over 25 years. Presently he is the Acting Director for the Laser Application Laboratory (LAL) with the National Center for Aerospace Leadership (NCAL) at the Connecticut Center for Advanced

Technology (CCAT) where he is involved with advanced laser processes and systems for the aerospace and other industries. Mr. Denney was previously the Laser Technology Team Leader at the Edison Welding Institute (EWI) (Columbus, OH), the Head of the High Energy Processing Department at ARL Penn State (State College, PA), a research engineer at the Westinghouse Electric Research & Development Center (Pittsburgh, PA), a metallurgist at the Naval Research Laboratory (NRL) (Washington, D.C.), and a product metallurgist at C.F. & I Steel Corp. (Pueblo, CO). Mr. Denney has his BS and MS from MIT in Material Sciences and Metallurgy respectively. He has been an LIA member since 1984 and is a Fellow and member of the Board of Directors for LIA and has been General and Co-Chair of ICALEO. He has been a member of AWS for 25 years and is on the C7 and C7C Subcommittees for High Energy Beam and Laser processes. He is also a member of ASM. He has 15 patents with most related to laser material processing.