



METALLAGRAM

LONG ISLAND CHAPTER



Volume 61 Issue 1

Chapter website: <http://DoL1.eng.sunysb.edu/asm/>

WELCOME TO THE 2019-2020 YEAR

Next Meeting Wednesday, September 18, 2019

Where Pollo Rico Latin Bistro, Centereach, NY

Topic: Creep-Resisting Cu-Cr-Nb-Zr Alloy Synthesized via Advanced Powder Metallurgy Route

Speaker: Dr. Bin Cheng, Stony Brook University

Social hour ... 6:00 pm Dinner ... 7:00 pm Meeting ... 8:00 pm

Members ... \$25 Guests ... \$27 Students ... \$15

(New and recently transferred-in members free)

Reservations appreciated – call Peter Indrigo at 631-589-6666

Directions to Pollo Rico Latin Bistro

Pollo Rico is located at 2435 Middle Country Road (Rte. 25), Centereach. Probably the simplest way to get there from the LIE is to take Exit 62 (Nicolls Road) and go north on CR 97 (towards Stony Brook). Continue north for about 3 miles then take the exit to Rte. 25. At the traffic signals at the end of the ramp go left and head west (Smithtown). The restaurant will appear after about 1.5 miles, on the right side of the highway. Their telephone number is 631-471-0585. Their website is: <http://www.polloricolatinbistro.com/>

Our Speaker

Bin Cheng is a postdoctoral associate of Materials Science and Chemical Engineering at Stony Brook University. His technical expertise resides in metallic, ceramic and electronic materials, advanced materials manufacturing and mechanical testing, powder metallurgy, and molecular dynamics and Monte Carlo simulations. Specific research interests include the deformation behavior of novel metallic nanostructures, advanced materials sintering and characterization, high performance alloy design and synthesis, and nanomechanical testing. Bin Cheng received his Doctor of Philosophy from Stony Brook University in 2017 and Bachelor of Engineering degree from Nanjing University of Aeronautics and Astronautics majoring in 2011.

The Topic

The development of the modern tokamak nuclear fusion reactor demands high strength and high thermal conductivity materials for extracting fusion energy from the confined plasma. The expected high working temperature of 400°C and high neutron flux inside the fusion reactor present an enormous challenge for standard high heat flux materials. Unfortunately, commercially available high strength and conductivity copper alloys suffer from pronounced thermal creep at temperatures above 300-400°C. A pathway to solving the thermomechanical detriment of traditional Cu alloys involves interface engineering by introducing distributed secondary phases designed to impair the mechanisms responsible for thermal creep effects while retaining high strength. It is in this light that scientists at the Oak Ridge National Laboratory conceived and synthesized a novel Cu-Cr-Nb-Zr alloy in which the microstructure and phase distribution was optimized to achieve a multi-modal precipitate network within the grain structure to better resist coble and dislocation creep at elevated temperatures.

The speaker will describe the implementation at Stony Brook University of a high-throughput powder metallurgy process to synthesize Cu-Cr-Nb-Zr alloys that possess the thermal and mechanical characteristics desired for fusion applications. This involves gas atomization to produce the feedstock Cu-Cr-Nb-Zr alloy powder, subsequent consolidation by spark plasma sintering then heat treatment with a dozen varying processing conditions to provide a range of materials with unique microstructural characteristics. The sintered pellets have been characterized by X-ray diffraction, optical metallography, SEM/EDS, small angle X-ray scattering experiments (carried out at National Synchrotron Light Source II at Brookhaven National Laboratory), and Vickers microhardness testing. The speaker will describe their results and show that they achieved the desired multi-modal precipitate distribution for select processing conditions as identified in simulations from prior work; such that large precipitates are located at grain boundaries, and nano-sized precipitates are distributed throughout the Cu matrix.



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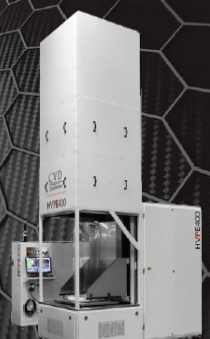
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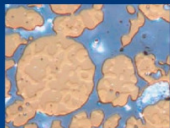
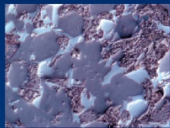
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50th Anniversary

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 Ralph Rosenbaum, Stainless Steel Products

All new members, including those who have transferred in from another Chapter, are invited to dine free at a regular meeting of their choice. Please take us up on this offer - come along to the meeting and introduce yourself. This is an excellent way to meet with other Chapter members and to establish new business and social relationships in the area.



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Long Island Chapter Meeting Schedule

Oct. 16, 2019 Speaker: Dan Migliorino, Reliant Tech
Topic: Infrared Thermography
Place: Pollo Rico, Centereach

Nov. 20, 2019 Student Night
Place: Old Field Club, Setauket

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2019-2020 schedule not yet available