



METALLAGRAM

LONG ISLAND CHAPTER



Volume 61 Issue 5

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

Joint Meeting with the Long Island Section of the American Nuclear Society

Next Meeting Wednesday, January 22, 2020

Where Pollo Rico Latin Bistro, Centereach, NY

***** John Weeks Lecture *****

Topic: Next-generation Moderators for High Temperature Reactors

Speaker: Lance Snead, 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

WELCOME TO THE CHAPTER!

Gary Chawla, Axim Micro Sabrina Hernandez, East Patchogue

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.

The Speaker

Dr Snead received his PhD in Nuclear Engineering from Rennselaer, immediately moving to ORNL where he worked for over twenty years in the area of fusion and fission reactor materials earning the level of Corporate Fellow. He now holds positions at Stony Brook and MIT. His primary area of research irradiation materials science and materials development. He has over 350 published journal articles and is a fellow of the American Ceramic Society and American Nuclear Society.

The Topic

Following development for the Chicago Pile, graphite became the most studied nuclear material and the de-facto moderator for high-temperature reactors, with historic alternative being BeO, Be, and ZrH. While graphite selection was driven by practical considerations of neutron economy, modern reactors are less neutronicly constrained given the availability of higher enriched fuels. A question for advanced reactor design is then, given the inherent life-limitation and safety issues posed by the historic monolithic solid moderators, does it make performance and economic sense to develop composite moderators as safe lifetime reactor components? This talk presents the initial development work of an ARPA-E funded MEITNER project. In the first phase of this processing work, two-phase moderators MgO-Be(x), MgO-BeO(x), SiC-Be(x), and MgO-ZrHx are demonstrated. Materials are processed via direct current sintering. For the consolidation of SiC and MgO the team has taken advantage of the transient eutectoid processing of SiC (using refractory oxide sintering aids.) To suppress the MgO sintering temperature fugitive LiF flux is included in the MgO + Be or BeO powder mix, allowing fully dense compacts at temperature <1000°C. The moderating power of these materials is determined as a combination of the two-phase mixtures, which is quantified using computed X-ray micro-tomography. Results from the tomography directly informs neutronic analysis determining moderating power of development materials.



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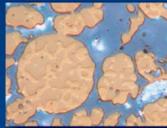
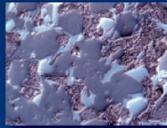
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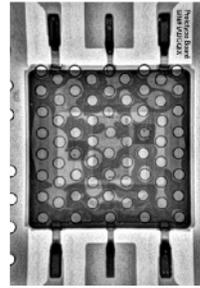
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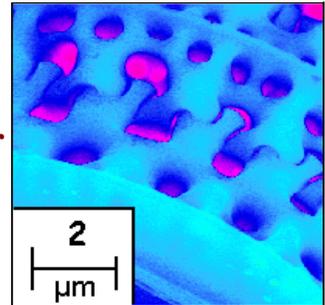
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Long Island Chapter Meeting Schedule

Feb. 19, 2020 Past Chairs Night
Speaker: Anthony Lee, Farmingdale SU
Topic: Nanotechnology
Place Pollo Rico, Centereach

Mar. 25, 2020 Sustaining Members Night
Speaker: Don Weidner, SBU
Topic: Characterization of High Pressure Metals and Oxides
Place Pollo Rico, Centereach

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Jan., 2020 – no meeting
Feb. 2020 – no meeting