

Two New Research Projects!

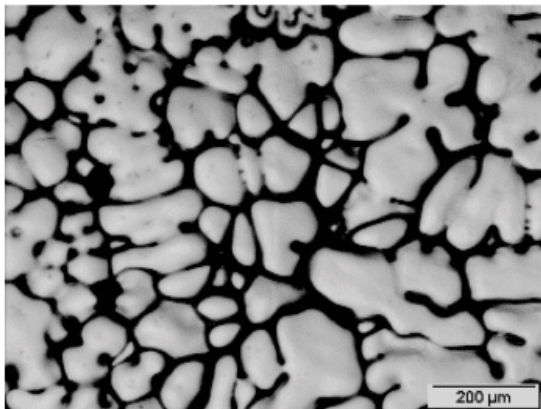
Two new projects are being launched at ACRC this fall. Randy Beals, Chair Emeritus, announced the results of the Board deliberations after reviewing the 12 proposals that were submitted by members. The two projects that are being launched are: **Controlled diffusion solidification (CDS) of Al alloys** and extended it to steels; and the other project is addressing the **fundamental physics of ultrasonic treatment of metals** in the molten stage, as well as during solidification.

Experiments for both of these projects will be completed in the new ACRC facilities of which the foundry, the metal processing laboratory, the Buehler Center for metallography, the Olympus (Evident Scientific) Center for microscopy, the VJT NDE lab (CT scan), and the Arcast vacuum melting facility were showcased during tours earlier this year.

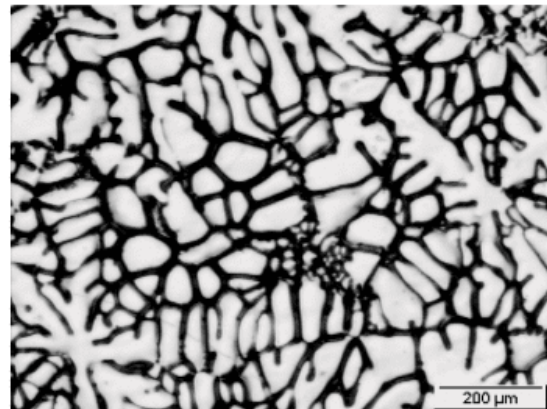
The **controlled diffusion solidification process**, which was initially developed by the ACRC research team of Diran Apelian and Shri Shankar a decade ago, is based on mass diffusion, rather than heat flow for solidification to occur. It enables one to cast wrought alloys such as 7075 with a cellular non-dendritic macrostructure.

7075 Alloy

Cu (wt%)	Mg (wt%)	Zn (wt%)	Cr (wt%)	Al (wt%)
1.6	2.5	5.6	0.23	Balance



CDS



Conventional

Ultrasonic energy utilized properly can be a valuable means of processing the metal in the molten state as well as during the journey from the liquid state to the final solidified state. The fundamental physics and operating parameters for processing Al alloys will be studied both theoretically and experimentally.

