



Brandywine Valley
Chapter

November Hybrid Technical Meeting

Wednesday – November 9, 2022 @ 6.30 PM

The future of 3D printing using pellets

By Distinguished Professor: Michael E. Mackay, PhD

Department of Materials Science and Engineering; Department of Chemical & Biomolecular Engineering; University of Delaware, Newark, DE 19716

Locations: Virtual and In-Person

- **Virtual meeting with Zoom:**
<https://us02web.zoom.us/j/84967693314?pwd=anR3eUx0aVlnREl2SGIPTU1Gcmp0UT09>
- **In-Person at 106 Composites Manufacturing Science Laboratory**
 - **(Center for Composite Materials) - Academy St, Newark, DE 19716**
 - **Parking:** On-street metered parking is available in front of the building on Academy Street and Municipal Lot #1 (west of CCM and accessible from Main Street and Delaware Avenue).

Please sign up for the meeting:

<https://docs.google.com/forms/d/e/1FAIpQLSc7Ya3ixlAhCe3YSIH4z4Ss8PttQXwll2suHNCMDTgsizm-zog/viewform>

Light Dinner/Social hour 6:30 PM, Presentation 7:00 PM

Dinner: Free Students, \$10 ASM Members, \$15 Non-Members

Abstract: A contemporary 3D printer uses a feed fiber that is pushed into a heated barrel, melted and forced through a nozzle. Essentially a 3D printer operates like a hot glue gun in a continuous manner. There are several challenges in using this technology. Firstly, the feed fiber is made from pellets itself which increases the cost over directly using pellets in the 3D printer due to this extra processing step. Also, some polymers exhibit thermal degradation and this extra heating step can add to molecular degradation thereby reducing the final product's physical properties. We have invented a new extruder that can continuously feed pellets into the printer to overcome the above challenges allowing a broad spectrum of polymers to be printed. The new extruder can also be used to 3D print recycled plastics after they are ground up into a powder. These topics and more will be discussed in the seminar to show the benefits of using pellets over the feed fiber technology.



Bio: Michael E. Mackay, PhD, received his undergraduate degree in chemical engineering with distinction from the University of Delaware then worked for Procter and Gamble prior to attending graduate school at the University of Illinois (Urbana) where he received M.S. and PhD degrees in chemical engineering. He subsequently became a postdoctoral fellow at the University of Melbourne (Australia) and then has had academic positions at the University of Queensland (Australia), Stevens Institute of Technology, Michigan State University and is presently a Distinguished Professor in the departments of Materials Science & Engineering and Chemical & Biomolecular Engineering at the University of Delaware. He is an internationally known leader in polymer physics, characterization and processing and recently has used his expertise to understand and improve the additive manufacturing technique of material extrusion or what is commonly called 3D printing

Brandywine Valley Chapter is inviting you to a scheduled Zoom meeting.

Join Zoom Meeting

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