Creating New Materials

Brett Compton
Assistant Professor, Mechanical Engineering

CURRENT RESEARCH

Never-Before-Seen Cellular Structures

3D printing technology has grown rapidly over the course of the last decade. Researchers and engineers have designed increasingly complex parts and more people have access to 3D printers than ever before. Brett Compton, Assistant Professor in Mechanical Engineering at the University of Tennessee, leads research on understanding more about how a 3D printer processes materials. The team works to create better materials with a greater variety of useful properties; stronger, stiffer, more durable.

Compton has already created printed epoxy composites that are 5-10 times better than other polymer materials currently available from commercial 3D printers. This research is different than many other varieties of additive manufacturing research, in that the focus is on understanding how the unique features of the additive manufacturing process can be utilized to create unique hybrid structures that result in better mechanical and functional properties. In this lab, researchers create a wide variety of materials with infinite practical potential; everything from high temperature ceramics to flexible elastomeric foams.

By thinking outside of the box with epoxy composites, high temperature ceramics and unique, graded cellular materials (mostly hollow with materials partially filling space), Compton creates materials that mimic nature and have the potential to enhance our lives. This research will give design engineers greater control over material properties than has ever existed before.

The future of this research includes:

- 3D printing of high temperature ceramic composites from polymer precursors: Hybrid and...

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AFFILIATION

The University of Tennessee, Knoxville

EDUCATION

- Ph.D., 2012, University of California, Santa Barbara
- B.S., 2006, University of Kentucky, Lexington

RESEARCH AREAS

Technology, Materials Science / Physics

FUNDING REQUEST

To keep the research flowing, the lab requires $10,000 in funding per year for consumables, $60,000 per year to support a graduate student, and $10,000 per year to support an undergraduate student.