

## **The Role of Ceramic and Glass Science Research in Meeting Societal Challenges: Report From an NSF-sponsored Workshop**

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Under the sponsorship of the U.S. National Science Foundation, a workshop on emerging research opportunities in ceramic and glass science was held in September 2016. Reported here are proceedings of the workshop. The report details eight challenges identified through workshop discussions: Ceramic processing: Programmable design and assembly; The defect genome: Understanding, characterizing, and predicting defects across time and length scales; Functionalizing defects for unprecedented properties; Ceramic flatlands: Defining structure-property relations in free-standing, supported, and confined two-dimensional ceramics; Ceramics in the extreme: Discovery and design strategies; Ceramics in the extreme: Behavior of multimaterial systems; Understanding and exploiting glasses and melts under extreme conditions; and Rational design of functional glasses guided by predictive modeling. It is anticipated that these challenges, once met, will promote basic understanding and ultimately enable advancements within multiple sectors, including energy, environment, manufacturing, security, and health care.