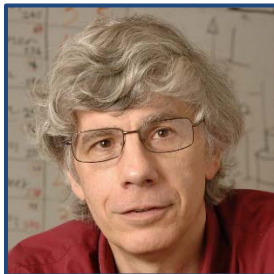
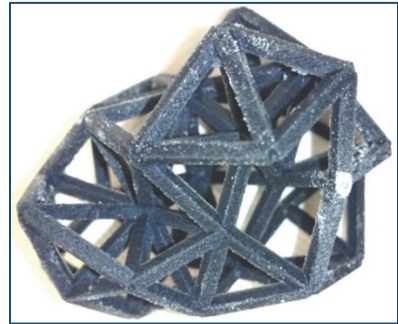

Thursday, February 25, 2021 | 3:00 PM – 4:00 PM
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“Directed aging: using memory and nature’s greed for materials design”

Presented by [Professor Sidney Nagel](#)

*Stein-Freiler Distinguished Service Professor, Department of Physics
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It is a well-known and indisputable fact that materials age and deform over time which often leads to detrimental degradation. In contrast to this view, I will seek to embrace aging and develop it as a methodology to create desired and novel functionality in matter. The central idea is that a material retains a memory of the external stimuli to which it was exposed during its preparation history and, in reaction to those applied cues, can be directed to evolve desired behaviors not easily found otherwise. “Directed aging” thus has the potential to become a general and unconventional methodology for creating material function; it stands in direct juxtaposition to the normal paradigm where materials are designed for specific functions. Just as stem cells evolve differently depending on the environment to which they are exposed, we envisage materials that develop new types of response upon exposure to different cues. We are left with the question: How far can this vision be pushed to generate broad classes of materials with desired functionality?



Sidney Nagel is the Stein-Freiler Distinguished Service Professor in the Department of Physics, the James Franck Institute, and the Enrico Fermi Institute at the University of Chicago. He has served as the Director of the University of Chicago Materials Research Laboratory from 1987 - 1991 and 2006 - 2009 and as Associate Deana in the Physical Sciences Division and the Collect from 1997 - 2000. Prof. Nagel’s research efforts focus on understanding the properties of disordered materials far from equilibrium, such as jammed granular solids, as well as on the glass transition, splashing phenomena, and pattern formation in fluids and solids. Prof. Nagel has earned a long list of impressive honors including an Alfred P. Sloan Fellowship, the 1999 Oliver E. Buckley Condensed Matter Physics Prize from the American Physical Society, and election to the National Academy of Sciences in 2003. He is a Fellow of the American Physical Society, the American Association for the Advancement of Science, and the American Academy of Arts and Sciences.