

MSE SEMINAR

December 1, 2017

113 McBryde Hall

3:30 – 4:30 PM

Refreshments at 3:00 PM

Professor Yoan C. Simon

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The University of Southern Mississippi

“Dumbfounded by smart polymers”

ABSTRACT

Materials that adapt to their environment and respond to it in a desirable manner are particularly interesting both from a fundamental and application-oriented perspective. In order to direct the stimuli-responsiveness of polymeric materials, one must control their overall architectures, both at the molecular and supramolecular level. To achieve this goal, our group takes advantage of polymer chemistry and engineering to fabricate materials that will respond on command upon application of a given cue. Mechanoresponsive materials, i.e. materials that transduce mechanical force into a usable chemical potential will be broached and the design principles for such materials will be exposed. In particular, supramolecular materials that exhibit unique autonomous-mending properties upon application of ultrasonic waves will be discussed. Finally, materials that act as frequency upconverters will be discussed. Examples of polymers and small molecules will be shown in glassy and rubbery materials. In those examples, it appears as evident that composition and morphological control are essential features to promote photon-conversion efficiency.

BIOSKETCH

Yoan holds a Bachelor's and Master's degree from the Ecole Nationale Supérieure de Chimie de Montpellier. His first contact with research was in the labs of Prof. Bernard Boutevin where he learned about controlled radical polymerization. He started a Ph.D. in Polymer Science and Engineering from the University of Massachusetts, Amherst under the guidance of Prof. E. Bryan Coughlin working on hybrid organic/inorganic materials. In 2008, Yoan got an ETH Fellowship to work on two-dimensional polymers under the supervision of Prof. A. Dieter Schlüter at the Swiss Polytechnic Institute of Technology in Zürich. After a year, he took on a position as junior Faculty (maître-assistant) at the Adolphe Merkle Institute in Fribourg, Switzerland where he stayed for six year developing new research avenues in the field of optically and mechanically active polymeric materials. Since January 2016, Yoan has joined the School of Polymers and High Performance Materials at the University of Southern Mississippi as an Assistant Professor.

Yoan's research was recognized at several stages in his career being the recipient of a Leonardo Da Vinci Fellowship, two Massachusetts Space Grant Consortium Grant, an ETH Fellowship. In 2015, Yoan was the Hans and Marlies Zimmer International Scholar at the University of Cincinnati and now holds the Southern Society for Coatings Technology Assistant Professorship in Polymer Science at Southern Miss.