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Replication of Optical Microstructures of *Papilio palinurus* through Biomimicry MOHAN SRINIVASARAO, School of Polymer, Textile and Fiber Engineering, Georgia Institute of Technology, MATIJA CRNE, School of Chemistry and Biochemistry, Georgia Institute of Technology, VIVEK SHARMA, Department of Mechanical Engineering, Massachusetts Institute of Technology, JOHN BLAIR, School of Material Science and Engineering, Georgia Institute of Technology, JUNG OK PARK, School of Polymer, Textile and Fiber Engineering, Georgia Institute of Technology, CHRISTOPHER J. SUMMERS, School of Material Science and Engineering, Georgia Institute of Technology — The coloration of animals in nature is sometimes based on their structure rather than pigments. Structural coloration based on diffraction, multilayer reflection, cholesteric analogues or photonic crystal-like structures is pervasive especially in the world of insects. The color of *Papilio palinurus* results from microbowl lined with a multilayer of air and chitin. The green color is the result of color mixing of the yellow light reflecting from the bottom of the bowl and the blue light reflecting from the sides of the bowl. We have used breath figure templated assembly as the starting point to mimic the structure of *Papilio palinurus*. We were able to produce microbowls which were then coated with a multilayer of alternating titanium oxide and aluminum oxide. The resulting structure exhibits the same color mixing as the original butterfly structure does.

Matija Crne
School of Chemistry and Biochemistry, Georgia Institute of Technology

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