

Abstract Submitted
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The curvy photonics of squid camouflage ALISON SWEENEY, AMANDA HOLT, University of Pennsylvania, MORSE DANIEL, University of California, Santa Barbara, DARIUSZ STRAMSKI, University of California, San Diego, Scripps Institute of Oceanography — Cephalopods (squids and octopuses) ubiquitously possess reflective structures in their skin composed of “reflectin” proteins. Although a few simple laminar, Bragg-stack type optical structures have been known in a handful of common squid species for some time, our extensive survey of optically active tissues of exotic deep-sea species has revealed complex, extended curvatures and topologies in dermal reflectors of these rarely-studied animals. Molecular deep-sequencing has revealed these structures also to be composed of reflectin-like proteins. Here we show a survey of some of these deep-sea reflector structures, and present evidence that each novel structure may be a transform of the radiance in the optical niche in the ocean where each of these species live, such that light reflecting off the sides of these animals in their specific ocean habitat resembles the light that would be transmitted through the animals if they were transparent, from many different viewing angles and possible ocean depths.

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