

Abstract Submitted
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Courtship display dynamics, iridescent structural color and nanostructural pattern formation in ocellated pheasants SUZANNE AMADOR KANE, Haverford College, ROSLYN DAKIN, University of British Columbia, RUI FANG, YABIN LU, Haverford College — Peacocks court females by tilting a fan-like array of feathers decorated with multicolored eyespots (ocelli). Previous research has shown that half of the variation in peacock mating success can be attributed to eyespot iridescence. Several closely-related pheasant species perform similar, but less complex, courtship displays using ocellated feathers with less complex coloration, patterns and underlying nanostructures. This study explores the relationship between the dynamics of male courtship behavior and optical properties and nanostructure of each species' iridescent feather ornaments. In particular, we examined videos of courting males and of individual feathers to measure how the angles used during displays compared to those corresponding to optimal eyespot reflected intensity and iridescent contrast. Bidirectional reflectance spectroscopy was used to measure how the spectrum of reflected light depends on the characteristic angles used during displays, and hence how displays stimulate the four classes of cones found in the color vision systems of these birds. This work reveals a close correlation between the complexity of the angular dependence of iridescent feather reflectance properties and that of the motions used by males of each species.

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