

## Visual Ecology

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### Introduction

A tiny fruitfly, hardly bigger than a speck of dust, drifts along the edge of a pond in the morning, keeping a constant course and height through the unpredictable buffeting of the of the morning breeze. Despite its minuscule size, its silhouette against the empty sky has betrayed the fly's passage to an alert predator. These sentences are not the beginning of an enthralling criminal story, but the prelude to one of the most brilliant textbooks written during the last years. Sensory Ecology is a quite new branch of biological science, focusing on how organisms obtain information from the environment, how they process it and how they use it. The authors are among the leading scientists in the field of visual research: Tom Cronin is professor of biological sciences at the University of Maryland, highly involved for several decades in the visual physiology of invertebrates, especially marine and estuarine crustaceans, but his lab follows the motto: 'If it has eyes, we can study it'. Sönke Johnson is an associate professor of Biology at Duke University, Durham NC, focused on comparative biophysics, N. Justin Marshall is professor at the Brain Institute at the University of Queensland, and works on sensory biology; he is especially interested in understanding how animals perceive their environment. Eric Warrant, professor at the University of Lund, Sweden is fascinated by the combination of physics and sensory biology, especially in the field of vision.

The book starts with basic properties of light and the optical environment. Then it describes how light is perceived in the different

groups of organisms; it considers the different visual pigments and photoreceptors, the designs of eyes and their characteristics, such as sensitivity, resolution, their ability to discriminate contrasts. There follow excellent chapters about spatial vision, color vision, polarization vision, vision in dim light and motion vision, which introduce the reader to the high performances and specialization's of visual designs in the animal realm, which may by far surpass our daily life experience of human vision, which surely is excellent indeed. The book finally shows environmental adaptations of visual systems to attenuating media and to what purposes vision is used, such as orientation and navigation for signaling and camouflage. The book, as presented, is clearly written, excellently illustrated, and fascinates by its ability to offer this complex world of vision and its physics comprehensibly but at a profound and expedient level. Based on more than three decades of flourishing, successful research on visual systems this book provides the first comprehensive textbook in this rapidly evolving, modern, important and rising field of science.

Vision Ecology is a brilliant textbook; a must-have for all students and researchers interested in any field of vision.

### VISUAL ECOLOGY

Thomas W. Cronin, Sönke Johnsen, N. Justin Marshall & Eric J. Warrant

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