# 

An international journal for empirical and theoretical research

### EDITOR

KATHERINE V. FITE UNIVERSITY OF MASSACHUSETTS, AMHERST

CAMBRIDGE UNIVERSITY PRESS

## V I S U A L Neuroscience

#### (ISSN 0952-5238)

#### EDITOR

#### KATHERINE V. FITE University of Massachusetts at Amherst

#### **EDITORIAL BOARD**

#### **Comparative Visual System Organization and Function**

Robert B. Barlow, Syracuse University Vivien Casagrande, Vanderbilt University William Hodos (Associate Editor), University of Maryland Harvey Karten (Associate Editor), University of California, San Diego Michael Land, Sussex University Shu-Rong Wang, Institute of Biophysics, Beijing

#### **Development Processes and Patterns**

Max S. Cynader (Associate Editor), Dalhousie University Helmut Hirsch, State University of New York, Albany Hazel Murphy, Pennsylvania Medical College Carla Shatz, Stanford University Sansar Sharma, New York Medical College Richard Van Sluyters, University of California, Berkeley

#### Photoreception and Transduction

John Lisman, Brandeis University Baruch Minke, Hebrew University Edward Pugh, Jr., University of Pennsylvania

#### Retinal Anatomy: Physiology, Neurochemistry

Nicholas Brecha, University of California, Los Angeles Helga Kolb (Associate Editor), University of Utah Ken-Ichi Naka, New York University Ralph Nelson, National Institutes of Health Robert Shapley (Associate Editor), New York University Jonathan Stone, University of New South Wales

#### Subcortical Visual Pathways, Visuomotor Functions

A. Berthoz, Centre National de la Recherche Scientifique, France Jean A. Buttner-Ennever, Universität München Klaus Peter Hoffman, Universität Ulm James McIlwain (Associate Editor), Brown University David Sparks, University of Alabama Josh Wallman, City College of New York

Thalamo-Cortical Pathways, Visual Cortex, Perceptual Mechanisms Karen DeValois, University of California, Berkeley Ralph Freeman, University of California, Berkeley James Gordon, Hunter College, New York Simon LeVay, Salk Institute Anthony Movshon, New York University John Robson (Associate Editor), University of Cambridge Michael Stryker, University of California, San Francisco David Van Essen, California Institute of Technology

#### Theoretical/Computational Models

Bruce Knight (Associate Editor), Rockefeller University Tomaso Poggio, Massachusetts Institute of Technology Terrance Sejnowski, Johns Hopkins University Nico Spinelli, University of Massachusetts, Amherst Jonathan Victor, Cornell University Medical School

Visual Neuroscience brings together in one journal a broad range of studies reflecting both the diversity and orginality of contemporary research and theory in basic visual neuroscience. Primary emphasis is placed upon studies which address the retinal and brain mechanisms that underlie visually-guided behaviors and visual perception. *Visual Neuroscience* publishes original papers utilizing neuroanatomical, neurophysiological, neurochemical, neuroimmunological, and behavioral methodologies as well as those involving computational models and computer-assisted theoretical formulations. Contributions involving molecular, cellular, local-circuit, and systems-level analyses in both vertebrate and invertebrate species will be presented. Manuscripts based exclusively upon psychophysical or behavioral data will be considered only if presented within the context of visual neural processes and/or mechanisms.

Visual Neuroscience is indexed in Current Contents/Life Sciences; Science Citation Index; Ocular Resources Review; and in the SCISEARCH and ISI/BIOMED databases.

Editorial Office: Katherine V. Fite, Editor, Visual Neuroscience, Neuroscience and Behavior Program, Department of Psychology, Tobin Hall, University of Massachusetts, Amherst, MA 01003, USA. Telephone (413) 545-1503. Electronic mail: KAYFITE @ UMASS.

Publishing, Subscription and Advertising Offices: Cambridge University Press, 32 East 57th Street, New York, NY 10022, USA; and (outside the US and Canada) Cambridge University Press, The Edinburgh Building, Shaftesbury Road, Cambridge CB2 2RU, England.

**Published Monthly.** Annual institutional subscription rates: US \$280.00 in the US and Canada; UK £182.00 elsewhere. Individual rates: US \$120.00 in the US and Canada; UK £84.00 elsewhere. Special rates for students (with certification of status): US \$80.00 in the US and Canada; UK £58.00 elsewhere. Prices include postage and insurance.

#### Copyright © 1989 Cambridge University Press

All rights reserved. No part of this publication may be reproduced, in any form or by any means, electronic, photocopying or otherwise, without permission in writing from Cambridge University Press. *Photocopying information for users in the U.S.A.*: The Item-Fee Code for this publication (0952-5238/89 \$5.00 + .00) indicates that copying for internal or personal use beyond that permitted by Sec. 107 or 108 of the U.S. Copyright Law is authorized for users duly registered with the Copyright Clearance Center (CCC) Transaction Reporting Service, provided that the appropriate remittance of \$5.00 per article is paid directly to: CCC, 27 Congress Street, Salem, MA 01970. Specific written permission must be obtained for all other copying.

Application to mail at second-class rates pending at New York, NY and additional mailing offices. Postmaster: send address changes in the US and Canada to: *Visual Neuroscience*, Journals Department, Cambridge University Press, 510 North Avenue, New Rochelle, NY 10801.