

# Introduction to Fourier Optics

# McGraw-Hill Series in Electrical and Computer Engineering

SENIOR CONSULTING EDITOR

Stephen W. Director, Carnegie Mellon University

Circuits and Systems  
Communications and Signal Processing  
Computer Engineering  
Control Theory  
Electromagnetics  
Electronics and VLSI Circuits  
Introductory  
Power and Energy  
Radar and Antennas

PREVIOUS CONSULTING EDITORS

Ronald N. Bracewell, Colin Cherry, James F. Gibbons, Willis W. Harman, Hubert Heffner, Edward W. Herold, John G. Linvill, Simon Ramo, Ronald A. Rohrer, Anthony E. Siegman, Charles Susskind, Frederick E. Terman, John G. Truxal, Ernst Weber, and John R. Whinnery

# Electromagnetics

SENIOR CONSULTING EDITOR

Stephen W. Director, Carnegie Mellon University

Dearhold and McSpadden: *Electromagnetic Wave Propagation*

Goodman: *Introduction to Fourier Optics*

Harrington: *Time-Harmonic Electromagnetic Fields*

Hayt: *Engineering Electromagnetics*

Kraus: *Electromagnetics*

Paul and Nasar: *Introduction to Electromagnetic Fields*

Plonus: *Applied Electromagnetics*

# Introduction to Fourier Optics

---

SECOND EDITION

**Joseph W. Goodman**

*Stanford University*

**THE McGRAW-HILL COMPANIES, INC.**

New York St. Louis San Francisco Auckland **Bogotá** Caracas Lisbon  
London Madrid Mexico City Milan Montreal New Delhi  
San Juan Singapore Sydney Tokyo Toronto

**McGraw-Hill**

A Division of The McGraw-Hill Companies



## INTRODUCTION TO FOURIER OPTICS

Copyright ©1996, 1968 by The McGraw-Hill Companies, Inc. Reissued 1988 by The McGraw-Hill Companies. All rights reserved. Printed in the United States of America. Except as permitted under the United States Copyright Act of 1976, no part of this publication may be reproduced or distributed in any form or by any means, or stored in a data base or retrieval system, without the prior written permission of the publisher.

This book is printed on acid-free paper.

3 4 5 6 7 8 9 0 FGR FGR 9 0 9 8 7

ISBN 0-07-024254-2

*This book was set in Times Roman by Publication Services, Inc.  
The editors were Lynn Cox and John M. Morriss;  
the production supervisor was Paula Keller.  
The cover was designed by Anthony Paccione.  
Quebecor Printing/Fairfield was printer and binder.*

Library of Congress Catalog Card Number: 95-82033

# Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

## Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

## Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

## Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

## API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

## LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

## FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

## E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.