

Online Library
Introduction To
Fourier Optics 3rd
Introduction To
Edition 2007
Fourier Optics
3rd Edition
2007 Joseph W

***A comprehensive
treatment of
ultrafast optics This
book fills the need
for a thorough and
detailed account of
ultrafast optics.***

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Written by one of the most preeminent researchers in the field, it sheds new light on technology that has already had a revolutionary impact on precision frequency metrology, high-speed electrical testing, biomedical imaging, and in revealing the initial

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steps in chemical reactions. Ultrafast Optics begins with a summary of ultrashort laser pulses and their practical applications in a range of real-world settings. Next, it reviews important background material, including an introduction to

**Fourier series and
Fourier transforms,
and goes on to
cover: Principles of
mode-locking
Ultrafast pulse
measurement
methods Dispersion
and dispersion
compensation
Ultrafast nonlinear
optics: second order
Ultrafast nonlinear
optics: third order**

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**Mode-locking:
selected advanced
topics Manipulation
of ultrashort pulses
Ultrafast time-
resolved
spectroscopy
Terahertz time-
domain
electromagnetics
Professor Weiner's
expertise and
cutting-edge
research result in a**

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***book that is
destined to become
a seminal text for
engineers,
researchers, and
graduate students
alike.***

***Introduction to
Fourier
Optics McGraw-Hill
Science,
Engineering &
Mathematics
Describing and***

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Joseph W

***evaluating the basic
principles and
methods of***

***subsurface sensing
and imaging,***

Introduction to

Subsurface Imaging

is a clear and

comprehensive

treatment that links

theory to a wide

range of real-world

applications in

medicine, biology,

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Joseph M.
security and geophysical/environmental exploration. It integrates the different sensing techniques (acoustic, electric, electromagnetic, optical, x-ray or particle beams) by unifying the underlying physical and mathematical similarities, and

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Joseph V
**computational and
algorithmic
methods. Time-
domain, spectral
and multisensor
methods are also
covered, whilst all
the necessary
mathematical,
statistical and linear
systems tools are
given in useful
appendices to make
the book self-**

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Joseph W.

***contained. Featuring
a logical blend of
theory and
applications, a
wealth of color
illustrations,
homework problems
and numerous case
studies, this is
suitable for use as
both a course text
and as a
professional
reference.***

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This book discusses statistical methods that are useful for treating problems in modern optics, and the application of these methods to solving a variety of such problems This book covers a variety of statistical problems in optics, including both theory and

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Joseph W

applications. The text covers the necessary background in statistics, statistical properties of light waves of various types, the theory of partial coherence and its applications, imaging with partially coherent light, atmospheric degradations of

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images, and noise

limitations in the

detection of light.

New topics have

been introduced in

the second edition,

including: Analysis

of the Vander Pol

oscillator model of

laser light Coverage

on coherence

tomography and

coherence

multiplexing of fiber

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sensors An

expansion of the

chapter on imaging

with partially

coherent light,

including several

new examples An

expanded section

on speckle and its

properties New

sections on the

cross-spectrum and

bispectrum

techniques for

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***obtaining images
free from
atmospheric
distortions A new
section on imaging
through
atmospheric
turbulence using
coherent light The
addition of the
effects of “read
noise” to the
discussions of
limitations***

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***encountered in
detecting very weak
optical signals A
number of new
problems and many
new references have
been added***

***Statistical Optics,
Second Edition is
written for
researchers and
engineering
students interested
in optics, physicists***

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Edition 2007
Joseph M
**and chemists, as
well as graduate
level courses in a
University
Engineering or
Physics Department.
An Introduction
(Second Edition)
Handbook of Optical
Constants of Solids
Introduction to
Modern Optics
Basics of Imaging
and Diffraction for**

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Edition 2007

**TEM and STEM
Solutions Manual**

*Introduction to Optics
is now available in a
re-issued edition from
Cambridge University
Press. Designed to
offer a
comprehensive and
engaging introduction
to intermediate and
upper level
undergraduate*

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*physics and
engineering students,
this text also allows
instructors to select
specialized content to
suit individual
curricular needs and
goals. Specific
features of the text, in
terms of coverage
beyond traditional
areas, include
extensive use of*

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*matrices in dealing
with ray tracing,
polarization, and
multiple thin-film
interference; three
chapters devoted to
lasers; a separate
chapter on the optics
of the eye; and
individual chapters on
holography,
coherence, fiber
optics, interferometry,*

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*Fourier optics,
nonlinear optics, and
Fresnel equations.*

*This textbook is
devoted to the
fundamentals of
optical system design
and analysis. It is part
of series on applied
optics covering the
math and theory of
the Optical
phenomena. This book*

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*starts with short
overview of the wave
optics and transitions
to the theory of
geometric optics and
its limitations. It is
self-contained and
only basics of Fourier
optics are covered that
relate to applications
and design of optical
and imaging systems.
The third chapter*

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*covers concepts of
simple imaging
systems. The last
fourth chapter,
discusses the theory of
third order
aberrations. The text
is more appropriate
for researchers, grad
students, undergrad
students, with interests
in the realm of
Optics. The series is*

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*written in language
that is accessible for
large audience,
however, calculus is
highly recommended
as it goes in depth
discussing the topics.
It does not cover the
use of specific
raytracing software
for optimization. Last
update: 8 January
2019 Length: 216*

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Joseph W

*pages 83 figures in
color*

*Aimed at students
taking practical
laboratory courses in
experimental optics,
this book helps
readers to understand
the components within
optical instruments.*

*Topics covered range
from the operation of
lenses and mirrors to*

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Joseph W
*the laws which govern
the design, layout and
working of optical
instruments.*

*Fourier transform
theory is of central
importance in a vast
range of applications
in physical science,
engineering and
applied mathematics.
Providing a concise
introduction to the*

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Edition 2007
Joseph W

*theory and practice of
Fourier transforms,
this book is invaluable
to students of physics,
electrical and
electronic
engineering, and
computer science.
After a brief
description of the
basic ideas and
theorems, the power
of the technique is*

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Fourier Optics, 3rd

*illustrated through
applications in optics,
spectroscopy,
electronics and
telecommunications.*

*The rarely discussed
but important field of
multi-dimensional
Fourier theory is
covered, including a
description of
Computer Axial
Tomography (CAT*

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Edition 2007

scanning). The book concludes by discussing digital methods, with particular attention to the Fast Fourier Transform and its implementation. This new edition has been revised to include new and interesting material, such as convolution with a

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*sinusoid, coherence,
the Michelson stellar
interferometer and
the van*

*Cittert–Zernike
theorem, Babinet's
principle and dipole
arrays.*

*Fundamentals,
Techniques, and
Applications on a
Femtosecond Time
Scale*

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Ultrafast Optics

Modern Optics

Ultrashort Laser

Pulse Phenomena

Principles and

Applications of

Fourier Optics

*This textbook deals
with fourier analysis
applications in optics,
and in particular with
its applications to
diffraction, imaging,*

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Edition 2007
Joseph W.
*optical data processing,
holography and optical
communications.*

*Fourier analysis is a
universal tool that has
found application
within a wide range of
areas in physics and
engineering and this
third edition has been
written to help your
students understand the
complexity of a subject
that can be challenging*

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to grasp at times.

*Chapters cover
foundations of scalar
diffraction theory,
Fresnel and
Fraunhofer diffraction
moving onto Wave-
Optics Analysis of
Coherent Optical
Systems and Wavefront
Modulation. Joseph
Goodman's work in
Electrical Engineering
has been recognised by*

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Edition 2007

a variety of awards and honours, so his text is able to guide students through a comprehensive introduction into Fourier Optics.

This new edition incorporates corrections of all known typographical errors in the first edition, as well as some more substantive

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Edition 2007
Joseph W.

changes. Chief among the latter is the addition of Chap. 17, on methods of estimation. As with the rest of the text, most applications and examples cited in the new chapter are from the optical perspective. The intention behind this new chapter is to empower the optical researcher with a yet

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*broader range of
research tools.*

*Certainly a basic
knowledge of
estimation methods
should be among these.*

*In particular, the
sections on likelihood
theory and Fisher
information prepare
readers for the
problems of optical
parameter estimation
and probability law*

estimation. Physicists and optical scientists might find this material particularly useful, since the subject of Fisher information is generally not covered in standard physical science curricula. Since the words "statistical optics" are prominent in the title of this book, their meaning needs to be clarified. There is a

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*general tendency to
overly emphasize the
statistics of photons as
the sine qua non of
statistical optics. In
view is taken, which
equally emphasizes the
random medium this
text a wider that
surrounds the photon,
be it a photographic
emulsion, the turbulent
atmo sphere, a
vibrating lens holder,*

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etc. Also included are random interpretations of ostensibly deterministic phenomena, such as the Hurter-Driffield (H and D) curve of photography. Such a "random interpretation" sometimes breaks new ground, as in Chap. This engineering tool provides over 200 time

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Edition, 2007

and cost saving rules of thumb--short cuts, tricks, and methods that optical communications veterans have developed through long years of trial and error.

** DWDM (Dense Wavelength Division Multiplexing) and SONET (Synchronous Optical Network) rules * Information Transmission, fiber*

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optics, and systems
Edition 2007
rules

*Learn how to overcome
resolution limitations
caused by atmospheric
turbulence in Imaging
Through Turbulence.
This hands-on book
thoroughly discusses
the nature of
turbulence effects on
optical imaging
systems, techniques
used to overcome these*

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Edition 2007
Joseph W.
*effects, performance
analysis methods, and
representative examples
of performance. Neatly
pulling together widely
scattered material, it
covers Fourier and
statistical optics,
turbulence effects on
imaging systems,
simulation of
turbulence effects and
correction techniques,
speckle imaging,*

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Edition, 2007
*adaptive optics, and
hybrid imaging.*

*Imaging Through
Turbulence is written in
tutorial style, logically
guiding you through
these essential topics. It
helps you bring down to
earth the complexities
of coping with
turbulence.*

*An Introduction to
Practical Laboratory
Optics*

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Edition 2007

*Introduction to Fourier
Optics*

*Physics of Light and
Optics (Black & White)*

*Fundamentals of
Photonics*

Feedback Systems

Ultrashort Laser
Pulse Phenomena,
Second Edition
serves as an
introduction to the
phenomena of

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ultra short laser
pulses and

describes how this
technology can be
used to examine
problems in areas
such as

electromagnetism,
optics, and
quantum
mechanics.

Ultrashort Laser

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Fourier Optics 3rd
Edition 2007

Pulse Phenomena
combines
theoretical
backgrounds and
experimental
techniques and will
serve as a manual
on designing and
constructing
femtosecond
("faster than
electronics")

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systems or
Edition 2007
Joseph W
experiments from
scratch. Beyond
the simple optical
system, the
various sources of
ultrashort pulses
are presented,
again with
emphasis on the
basic concepts
and how they

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apply to the design
of particular

sources (dye
lasers, solid state
lasers,
semiconductor
lasers, fiber lasers,
and sources based
on frequency
conversion).

Provides an easy
to follow guide

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Fourier Optics 3rd
Edition 2007
Joseph W
through "faster
than electronics"
probing and
detection methods
THE manual on
designing and
constructing
femtosecond
systems and
experiments
Discusses
essential

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technology for
applications in
micro-machining,
femtochemistry,
and medical
imaging

Introductory
Fourier Transform
Spectroscopy
discusses the
subject of Fourier
transform

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Edition 2007
Joseph W

spectroscopy from
a level that
requires

knowledge of only
introductory optics
and mathematics.

The subject is
approached
through optical
principles, not
through abstract
mathematics. The

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Fourier Optics 3rd

book approaches the subject matter in two ways. The first is through simple optics and physical intuition, and the second is through Fourier analysis and the concepts of convolution and autocorrelation.

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This dual
Edition 2007
Joseph W
treatment bridges
the gap between
the introductory
material in the
book and the
advanced material
in the journals. The
book also
discusses
information theory,
Fourier analysis,

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Edition 2007
Joseph W

and mathematical
theorems to
complete

derivations or to
give alternate
views of an
individual subject.

The text presents
the development
of optical theory
and equations to
the extent required

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by the advanced student or researcher. The book is intended as a guide for students taking advanced research programs in spectroscopy. Material is included for the physicists,

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chemists,
astronomers, and
others who are
interested in
spectroscopy.

Principles of
Optics:
Electromagnetic
Theory of
Propagation,
Interference and
Diffraction of Light,

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Sixth Edition
Edition 2007
Joseph W
covers optical
phenomenon that
can be treated with
Maxwell's
phenomenological
theory. The book is
comprised of 14
chapters that
discuss various
topics about
optics, such as

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Edition 2007
Joseph W

geometrical
theories, image
forming

instruments, and
optics of metals
and crystals. The
text covers the
elements of the
theories of
interference,
interferometers,
and diffraction.

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Edition 2007
Joseph W

The book tackles several behaviors of light, including its diffraction when exposed to ultrasonic waves. The selection will be most useful to researchers whose work involves understanding the behavior of light.

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This book
Edition 2007
Joseph W
introduces optics
through the use of
simulations,
namely, Python.
Students,
researchers, and
engineers will be
able to use Python
simulations to
better understand
the basic concepts

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of optics and
Edition 2007
Joseph W
professors will be
able to provide
immediate
visualizations of
the complex ideas.
Readers will learn
programming in
Python.

Throughout this
book, a simulated
laboratory will be

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provided where
students can learn
by "hands on"
exploration. The
text will cover most
of the standard
topics of traditional
optics.

With Applications
in Physics and
Engineering
Fringe 2013

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The Fourier
Edition 2007
Joseph W
Transform and Its
Applications

International

Trends in Optics

Making It all Work

This

handbook--a

sequel to the

widely used

Handbook of

Optical

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Edition 2007
Joseph W

Constants of Solids--contains critical reviews and tabulated values of indexes of refraction (n) and extinction coefficients (k) for almost 50 materials that were not

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covered in the
original
handbook. For
each material,
the best known
 n and k values
have been
carefully
tabulated, from
the x-ray to
millimeter-wave
region of the
spectrum by

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Edition 2007
Joseph W

**expert optical
scientists. In
addition, the
handbook
features
thirteen
introductory
chapters that
discuss the
determination
of n and k by
various
techniques. ***

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Contributors
Joseph W
have decided
the best values
for n and k *
References in
each critique
allow the
reader to go
back to the
original data
to examine and
understand
where the

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values have
come from *

Allows the
reader to
determine if
any data in a
spectral region
needs to be
filled in *

Gives a wide
and detailed
view of
experimental

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Joseph W

**techniques for
measuring the
optical**

**constants n and
 k^***

**Incorporates
and describes
crystal
structure,
space-group
symmetry, unit-
cell
dimensions,**

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Joseph W
number of optic
and acoustic
modes,
frequencies of
optic modes,
the irreducible
representation,
band gap,
plasma
frequency, and
static
dielectric
constant

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Scientists and
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Joseph W
engineers in
optics are
increasingly
confronted with
problems that
are of a random
nature and that
require a
working
knowledge of
probability and
statistics for

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their solution.

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Joseph W

This book
develops these
subjects within
the context of
optics, using a
problem-solving
approach. All
methods are
explicitly
derived and can
be traced back
to three simple

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Edition 2007
Joseph W

**axioms given at
the outset.**

**This third
edition
contains many
new
applications to
optical and
physical
phenomena,
including a
method of
exactly**

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Edition 2007
Joseph W
estimating
probability
laws.

A complete
basic
undergraduate
course in
modern optics
for students in
physics,
technology, and
engineering.

The first half

Page 74/172

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deals with

classical

physical

optics; the

second, quantum

nature of

light.

Solutions.

Presents a

fully updated,

self-contained

textbook

covering the

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Joseph W
core theory and
practice of
both classical
and modern
optical
microscopy
techniques.

7th

International
Workshop on
Advanced
Optical Imaging
and Metrology

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Joseph W

**Imaging Through
Turbulence**

**Introduction to
Design of
Optical Systems
Polarized Light
Electron Nano-
Imaging**

**A comprehensive,
applications oriented
introduction to
geometrical optics,
wave optics and**

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modern optics which does not require students to have previously studied electricity and magnetism. The book covers all the traditional elements of an optics course together with the modern topics that have revolutionised the field - holography, fibre optics, lasers and

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laser beam characteristics, Fourier optics and nonlinear optics. This new edition features several completely new chapters and sections to give greater emphasis to these topics and there are new problems and highlighted worked examples.

In continuation of the

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**FRINGE Workshop
Series this Proceeding
contains all
contributions
presented at the 7.
International
Workshop on
Advanced Optical
Imaging and
Metrology. The
FRINGE Workshop
Series is dedicated to
the presentation,
discussion and**

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Joseph W.
dissemination of recent
results in **Optical
Imaging and
Metrology**. Topics of
particular interest for
the 7. Workshop are: -
**New methods and tools
for the generation,
acquisition, processing,
and evaluation of data
in Optical Imaging and
Metrology (digital
wavefront engineering,
computational**

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imaging, model-based reconstruction, compressed sensing, inverse problems solution) - Application-driven technologies in Optical Imaging and Metrology (high-resolution, adaptive, active, robust, reliable, flexible, in-line, real-time) - High-dynamic range solutions in Optical Imaging and

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**Metrology (from
macro to nano) -**

**Hybrid technologies in
Optical Imaging and
Metrology (hybrid
optics, sensor and data
fusion, model-based
solutions,
multimodality) - New
optical sensors,
imaging and
measurement systems
(integrated,
miniaturized, in-line,**

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Joseph M.
**real-time, traceable,
remote) Special
emphasis is put on new
strategies, taking into
account the active
combination of
physical modeling,
computer aided
simulation and
experimental data
acquisition. In
particular attention is
directed towards new
approaches for the**

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**extension of existing
resolution limits that
open the gates to wide-
scale metrology,
ranging from macro to
nano, by considering
dynamic changes and
using advanced optical
imaging and sensor
systems.**

**Modern Optics is a
fundamental study of
the principles of optics
using a rigorous**

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Introduction To
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Edition 2007
Joseph W. **physical approach
based on Maxwell's**

**Equations. The
treatment provides the
mathematical
foundations needed to
understand a number
of applications such as
laser optics, fiber
optics and medical
imaging covered in an
engineering
curriculum as well as
the traditional topics**

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**covered in a physics
based course in optics.**

**In addition to treating
the fundamentals in
optical science, the
student is given an
exposure to actual
optics engineering
problems such as
paraxial matrix optics,
aberrations with
experimental
examples, Fourier
transform optics**

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Joseph W.
Joseph W.

(Fresnel-Kirchhoff formulation), Gaussian waves, thin films, photonic crystals, surface plasmons, and fiber optics. Through its many pictures, figures, and diagrams, the text provides a good physical insight into the topics covered. The course content can be modified to reflect the interests of the

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**instructor as well as
the student, through
the selection of
optional material
provided in
appendixes.**

**This renowned text
applies the powerful
mathematical methods
of fourier analysis to
the analysis and
synthesis of optical
systems. These
ubiquitous**

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**mathematical tools
provide unique
insights into the
capabilities and
limitations of optical
systems in both
imaging and
information processing
and lead to many
fascinating
applications, including
the field of
holography.**

Vectors, Matrices, and

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Least Squares

Learning by

Computing, with

Examples Using

Maple, MathCad®,

Matlab®,

Mathematica®, and

Maple®

Introduction to

Subsurface Imaging

Introductory Fourier

Transform

Spectroscopy

Optical

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**Communications Rules
of Thumb**

Joseph W

transform theory
is of central
importance in a
vast range of
applications in
physical
science,
engineering, and
applied
mathematics.

This new edition

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of a successful
student text
provides a
concise
introduction to
the theory and
practice of
Fourier
transforms,
using
qualitative
arguments
wherever
possible and

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avoiding
unnecessary
mathematics.

After a brief
description of
the basic ideas
and theorems,
the power of the
technique is
then illustrated
by referring to
particular
applications in
optics,

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spectroscopy,
electronics and
telecommunicatio
ns. The rarely
discussed but
important field
of multi-
dimensional
Fourier theory
is covered,
including a
description of
computer-aided
tomography (CAT-

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scanning). The final chapter discusses digital methods, with particular attention to the fast Fourier transform. Throughout, discussion of these applications is reinforced by the inclusion of

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worked examples.
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no previous
knowledge of the
subject, and
will be
invaluable to
students of
physics,
electrical and
electronic
engineering, and
computer
science.

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This book
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presents current
theories of
diffraction,
imaging, and
related topics
based on Fourier
analysis and
synthesis
techniques,
which are
essential for
understanding,
analyzing, and

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synthesizing
modern imaging,
optical
communications
and networking,
as well as
micro/nano
systems.

Applications
covered include
tomography;
magnetic
resonance
imaging;

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synthetic
aperture radar
(SAR) and
interferometric
SAR; optical
communications
and networking
devices; compute
r-generated
holograms and
analog
holograms; and
wireless systems
using EM waves.

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In this book,
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the bases of
imaging and
diffraction in
transmission
electron
microscopy (TEM)
and scanning
transmission
electron
microscopy
(STEM) are
explained in the
style of a

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textbook. The book focuses on the explanation of electron microscopic imaging of TEM and STEM without including in the main text distracting information on basic knowledge of crystal diffraction,

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wave optics,
electron lens,
and scattering
and diffraction
theories, which
are explained
separately in
the appendices.
A comprehensive
explanation is
provided on the
basis of Fourier
transform
theory, and this

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approach is
unique in
comparison with
other advanced
resources on
high-resolution
electron
microscopy. With
the present
textbook,
readers are led
to understand
the essence of
the imaging

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theories of TEM
and STEM without
being diverted
by other
knowledge of
electron
microscopy. The
up-to-date
information in
this book,
particularly on
imaging details
of STEM and
aberration

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corrections, is
valuable
worldwide for
today's graduate
students and
professionals
just starting
their careers.
New material on
computerized
optical
processes,
computerized ray
tracing, and the

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fast Fourier
transform, Bragg
sensors,
and temporal
phase

unwrapping. *

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sections to all
chapters. *

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discussion on
lasers and laser
principles,
including an

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introduction to
radiometry and
photometry. *

Thorough
coverage of the
CCD camera.

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Optical
Microscopy

Optical
Metrology
Electromagnetic

Theory of
Propagation,
Page 108/172

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Interference and
Diffraction of
Light

Diffraction,
Fourier Optics
and Imaging
Introduction to
Optics

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edition is
intended for a
one semester
course in**

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juniors and
seniors in
science and
engineering. It
uses scripts
from Maple,
MathCad,
Mathematica,
and MATLAB to
provide a
simulated
laboratory**

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where students
can learn by
exploration and
discovery
instead of
passive
absorption. The
text covers all
the standard
topics of a
traditional
optics course.
It contains

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**step by step
derivations of
all basic
formulas in
geometrical,
wave and
Fourier optics.
The threefold
arrangement of
text,
applications,
and files makes
the book**

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by scientists
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of optics.**

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coverage of new
experiments in
quantum optics**

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expanded
edition of a we
ll-established
textbook on
experiments on
quantum optics
covers new
concepts,
results,
procedures, and
developments in**

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state-of-the-art

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experiments. It
starts with the
basic building
blocks and
ideas of
quantum optics,
then moves on
to detailed
procedures and
new techniques
for each**

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metrology,
communications,
and quantum
logic, this new
edition also
places more
emphasis on
single photon
technology and
hybrid
detection. In**

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**addition, it
offers end-of-
chapter**

**summaries and
full problem
sets**

throughout.

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an introduction
to the subject,**

A Guide to

Experiments in

Quantum Optics,

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3rd Edition

presents

readers with

chapters on

classical

models of

light, photons,

quantum models

of light, as

well as basic

optical

components. It

goes on to give

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readers full
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coverage of
lasers and
amplifiers, and
examines
numerous
photodetection
techniques
being used
today. Other
chapters
examine quantum
noise,

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**squeezing
experiments,
the application
of squeezed
light, and
fundamental
tests of
quantum
mechanics. The
book finishes
with a section
on quantum
information**

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before

**summarizing of
the contents
and offering an
outlook on the
future of the
field.**

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new updates to
the field of
quantum optics,
covering the
building**

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and concepts,
latest results,
detailed
procedures, and
modern
experiments**

**-Places
emphasis on
three major
goals:**

**metrology,
communications,**

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**and quantum
logic -Presents
fundamental
tests of
quantum
mechanics
(Schrodinger
Kitten,
multimode
entanglement,
photon systems
as quantum
emulators), and**

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**introduces the
density
function**

**-Includes new
trends and
technologies in
quantum optics
and
photodetection,
new results in
sensing and
metrology, and
more coverage**

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of quantum
gates and
logic, cluster
states,
waveguides for
multimodes,
discord and
other quantum
measures, and
quantum control
-Offers end of
chapter
summaries and

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**problem sets as
new features A
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an ideal book
for
professionals,
and graduate
and upper level
students in
physics and**

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**engineering
science.**
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**Fourier optics,
being a staple
of optical
design and
analysis for
over 50 years,
has produced
many new
applications in
recent years.
In this text,**

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Bob Tyson

presents the

fundamentals of

Fourier optics

with sufficient

detail to

educate the

reader,

typically an

advanced

student or

working

scientist or

edition 2007
Joseph W

**engineer, to
the level of
applying the
knowledge to a
specific set of
design or
analysis
problems. Well
aware that many
of the
mathematical
techniques used
in the field**

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can now be
solved

digitally, the
book will point
to those
methods or
applicable
computer
software
available to
the reader.

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systems—now
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covers the
mathematics
needed to
model, analyze,
and design**

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systems. Now
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friendly than
ever, this
revised and
expanded
edition of
Feedback
Systems is a
one-volume
resource for
students and**

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**researchers in
mathematics and
engineering. It**

**has
applications
across a range
of disciplines
that utilize
feedback in
physical,
biological,
information,
and economic**

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systems. Karl

Åström and

Richard Murray

use techniques

from physics,

computer

science, and

operations

research to

introduce contr

ol-oriented

modeling. They

begin with

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**state space
tools for
analysis and
design,
including
stability of
solutions,
Lyapunov
functions,
reachability,
state feedback
observability,
and estimators.**

The matrix exponential plays a central role in the analysis of linear control systems, allowing a concise development of many of the key concepts for this class of

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Joseph W
models. Åström
and Murray then
develop and
explain tools
in the
frequency
domain,
including
transfer
functions,
Nyquist
analysis, PID
control,

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**frequency
domain design,
and robustness.**

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chapter on
design
principles and
tools,
illustrating
the types of
problems that
can be solved
using feedback**

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chapter on
fundamental
limits and new
material on the
Routh-Hurwitz
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root locus
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exercises at
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solutions**

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textbook for
undergraduate
and graduate
students**

**Indispensable
for researchers
seeking a self-
contained
resource on
control theory**

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Optics, and
Data Testing
Principles of
Optics
Introduction to
Applied Linear
Algebra
Optics
A Problem
Solving
Approach

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Optical Systems:
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engineering, optical
engineering, and
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book will help all
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people sort through the complexity and build electro-optical systems that just work, with maximum insight and minimum trial and error. Written in an engaging and conversational style, this Second Edition has been updated and expanded over the previous edition

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everything from
basic theory and
measurement
principles to design
debugging and
integration of optical
and electronic
systems

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material is available
on an ftp site,
including an
additional chapter
on thermal Control

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and Chapter
problems highly
relevant to real-
world design

Extensive coverage
of high performance
optical detection
and laser noise
cancellation Each
chapter is full of
useful lore from the
author's years of
experience building
advanced

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instruments. For more background, an appendix lists 100 good books in all relevant areas, introductory as well as advanced.

Building Electro-Optical Systems: Making It All Work, Second Edition is essential reading for researchers, students, and

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have systems to
build.

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applied physics.
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coverage includes
detailed accounts of
the primary theories
of light, including
ray optics, wave

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electromagnetic
optics, and photon
optics, as well as
the interaction of
light and matter.

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increasing levels of
complexity,
preliminary sections
build toward more
advanced topics,
such as Fourier
optics and

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holography,
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photonic-crystal
optics, guided-wave
and fiber optics,
LEDs and lasers,
acousto-optic and
electro-optic
devices, nonlinear
optical devices,
ultrafast optics,
optical
interconnects and
switches, and
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applications of
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straightforward
introduction to the
Fourier principles

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behind modern
optics, this text is
appropriate for
advanced

undergraduate and
graduate
students."--Page 4
of cover.

Polarized light is a
pervasive influence
in our world—and
scientists and
engineers in a
variety of fields

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require the tools to understand, measure, and apply it to their advantage. Offering an in-depth examination of the subject and a description of its applications, Polarized Light, Third Edition serves as a comprehensive self-study tool complete with an

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extensive
mathematical
analysis of the
Mueller matrix and
coverage of
Maxwell's
equations. Links
Historical
Developments to
Current Applications
and Future
Innovations This
book starts with a
general description

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of light and
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continues with a
complete

exploration of
polarized light,
including how it is
produced and its
practical
applications. The
author incorporates
basic topics, such
as polarization by
refraction and
reflection,

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polarization
elements,
anisotropic
materials,
polarization
formalisms
(Mueller–Stokes and
Jones) and
associated
mathematics, and
polarimetry, or the
science of
polarization
measurement. New

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to the Third Edition:
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chapter Chapters
on: polarized light in
nature, and form
birefringence A
review of the history
of polarized light,
and a chapter on the
interference laws of
Fresnel and
Arago—both
completely re-
written A new

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appendix on
conventions used in
polarized light New
graphics, and black-
and-white photos
and color plates
Divided into four
parts, this book
covers the
fundamental
concepts and
theoretical
framework of
polarized light. Next,

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Joseph W. Joseph W.
it thoroughly
explores the science
of polarimetry,
followed by
discussion of
polarized light
applications. The
author concludes by
discussing how our
polarized light
framework is
applied to physics
concepts, such as
accelerating

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charges and quantum systems. Building on the solid foundation of the first two editions, this book reorganizes and updates existing material on fundamentals, theory, polarimetry, and applications. It adds new chapters, graphics, and color

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photos, as well as a new appendix on conventions used in polarized light. As a result, the author has re-established this book's lofty status in the pantheon of literature on this important field.

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Experiments in
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applications,
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examples.
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view of work in the
field of optics
throughout the
world. Topics
range from
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optoelectronics for*

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*optical processing
to optics in teleco
mmunications,*

along with

microoptics,

optical memories,

and fiber-optic

signal processing.

Holographic optical

elements for use

with semiconductor

lasers are also

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considered.

*Comprised of 34
chapters, this book
begins with an
introduction to
some of the
practical
applications of
integrated optical
circuits,
optoelectronic
integrated circuits,*

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*and photonic
integrated circuits.*

*Subsequent
chapters deal with
quantum
optoelectronics for
optical processing;
fiber-optic signal
processing;
holographic optical
elements for use
with semiconductor*

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*lasers; potential
uses of
photorefractives;
and adaptive
interferometry that
makes use of
photorefractive
crystals. Water
wave optics and
diffraction are also
examined, together
with the essential*

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Joseph W
*journals of optics
and the opposition
effect in volume
and surface
scattering. The
final chapter is
devoted to optical
computing, with
emphasis on its
processing
functions and
architecture. This*

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Joseph W

*monograph will be
of interest to
students,*

*practitioners, and
researchers in
physics and
electronics.*

*Fourier Optics
Building Electro-
Optical Systems*