



# Colour and the Optical Properties of Materials: An Exploration of the Relationship Between Light, the Optical Properties of Materials and Colour

By Richard J. D. Tilley

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*Colour and the Optical Properties of Materials* carefully introduces the science behind the subject, along with many modern and cutting-edge applications, chosen to appeal to today's students. For science students, it provides a broad introduction to the subject and the many applications of colour. To more applied students, such as engineering and arts students, it provides the essential scientific background to colour and the many applications.

### New to this Edition:

- The chapter framework of the first edition will be retained, with each chapter being substantially rewritten and some material would be relocated. Some chapters will be rewritten in a clearer fashion, e.g. There have been no significant advances in the understanding of rainbows recently, but the text could be clarified and improved.
- Colour has been an important attribute of many nano-particle containing systems, such as quantum dots. This aspect will be included, e.g. the colour of gold ruby glass, described in Chapter 5 as part of scattering phenomena now is better treated in terms of gold nanoparticles and surface plasmons. This would probably be transferred to Chapter 10 and considered in tandem with the colour of metals such as copper, silver and gold. A similar state of affairs applies to silver nanoparticles and polychromic glass.
- Some chapters will include extensive new material, e.g. Chapter 8, colours due to molecular processes [organic LEDs etc], and Chapter 12, Displays, [touch screen technologies].
- For all chapters it would be intended to take into account the current scientific literature up to the time of submission – say up to the end of 2009. The end of chapter Further Reading sections would reflect this up-to-date overview.
- The end of chapter problems will be strengthened and expanded.

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## **Editorial Review**

### Review

"I would strongly recommend the book to anyone starting his or her study of optics ... You can always find an appropriate book, review or a paper, but you can rarely find a reference that is so modern, clearly written and comprehensive." (Optics & Photonics News, 11 November 2011)

### From the Inside Flap

Colour and The Optical Properties of Materials, Second Edition: An Exploration of the Relationship Between Light, the Optical Properties of Materials and Colour

By Richard Tilley, "Emeritus Professor, University of Cardiff, UK"

Our day-to-day world is ablaze with colour. Information we seek is presented in bright colours, via displays ranging in size from small touch screen mobile phones to large screen plasma televisions. An understanding of the scientific principles underlying the generation of colour is increasingly important to a wide range of academic disciplines, including physics, chemistry, biology, materials science and engineering.

Now in its second edition, "Colour and the Optical Properties of Materials" provides a thorough scientific overview of all aspects of colour and its relationship to the chemical and physical properties of materials. Primarily aimed at undergraduate students but of interest to anyone seeking an understanding of colour in its many manifestations, the book focuses attention on the ways that colour is produced and how these govern device applications.

Features: Richly illustrated in full colour throughout. Introduces the science behind the subject whilst closely connecting it to relevant examples of colour in everyday life, such as iridescent butterflies, electronic paper and brightly coloured holographic security markers. Each chapter has been totally rewritten and each diagram redrawn to include extensive new material, including quantum dot nanoparticle colours, OLEDs, photonic crystals and plasmonic crystals and sensors. Includes extensive suggestions for further reading, allowing all topics to be explored in greater depth.

"This book gives a perfect insight into light and colour and I can strongly recommend it to any scientist." ("Chemistry in Britain," 2000)

..".A clear text which I can recommend to anyone who is scientifically aware...[and] also as a good course text for an introductory course on colour...." ("Glass Technology," 2000)

"Richard Tilley has done an excellent job in providing an overview of the ways in which colour can be produced and used." ("Chemistry & Industry," 2000)

"A worthy tome for both library and personal bookshelves." ("Contemporary Physics," 2002)

### From the Back Cover

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### **Users Review**

#### **From reader reviews:**

#### **Winston Craig:**

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**Barry Upshaw:**

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