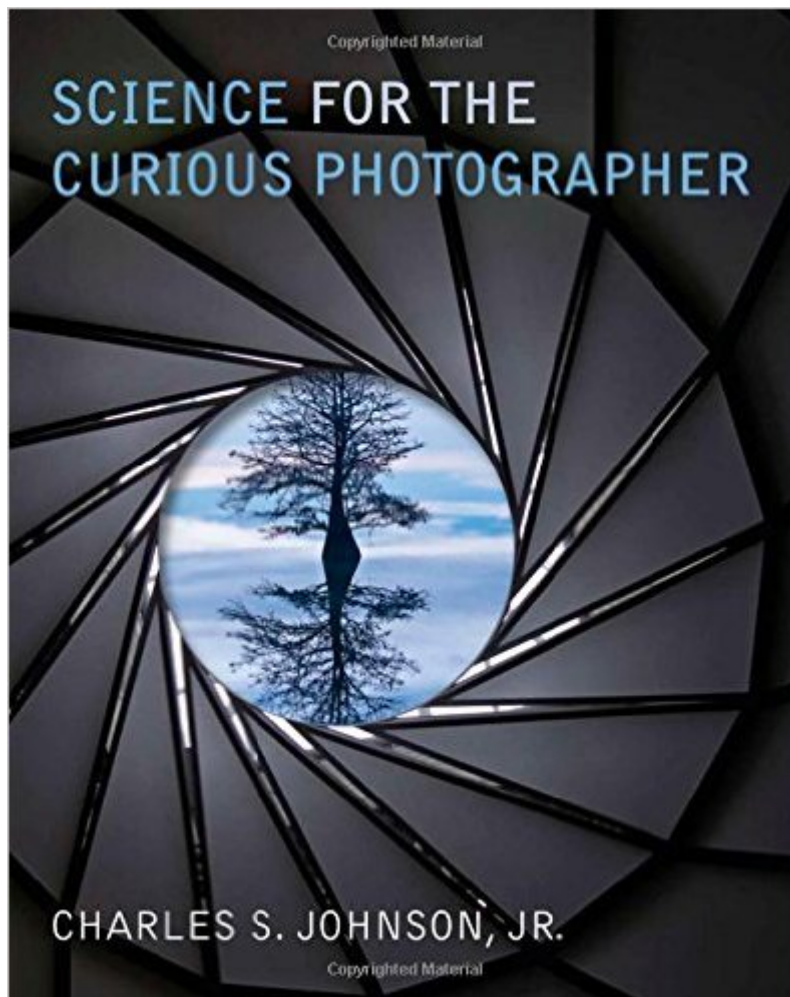


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# Science For The Curious Photographer: An Introduction To The Science Of Photography



## Synopsis

This is a photography book for those who love science and like to understand how things work. It begins with an introduction to the history and science of photography and addresses questions about the principles of photography, such as why a camera needs a lens, how lenses work, and why modern lenses are so complicated. Digital photography raises more questions because enlarged images on computer screens reveal defects in color and resolution that are not obvious in small snapshots. What limits resolution, what is "noise" in images, and what level of detail can be appreciated by an observer? All of these questions and others concerning human perception of color and subjective image quality are treated in detail with some mathematics when appropriate. Finally the creation and appreciation of art in photography is presented from the standpoint of modern cognitive science. This book is appropriate for serious photographers and for students from college freshman to graduate level.

## Book Information

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## Customer Reviews

First off, let me comment on some of the other reviewers mentioning the content being too technical. I disagree on three fronts: 1) Look at the title folks, it is the science behind photography. By its very nature there is going to be some level of math and physics. 2) The math and physics are kept to a minimum. The formulas and equations are also kept to a minimum. If you understand high school algebra and trigonometry then you will have no problem understanding the majority of the technical material. 3) You can still benefit a great deal in learning about the science behind a lot of photography without understanding the math. Your insight into the subject matter will be necessarily

more limited but this is not a limitation of the book so much it is a limitation of the reader. If you really want to understand the world around you on a deeper level and gain new insights into it, then, like it or not, math is the bridge to take you there. It's amazing how much more you can understand just by knowing some algebra and trigonometry. Having said this, the book presents the material in a friendly way and the author is not condescending in any way. He makes learning the material fun and relevant and what he presents always has enough context to gain a deeper understanding. Unlike some dry and boring physics or optics books this book does not present mathematical proofs and is not a rigorous treatment. But it does provide a wealth of information, the majority of what you need to understand the relevant knowledge as it pertains to photography. As with any endeavor worthwhile in life, if you are willing to take the time and invest a little energy then you will find the reward at the end of your journey. I highly recommend this book for anyone wanting more than a superficial understanding of photography but yet doesn't want to spend many long hours of their life reading the long boring math and physics text books! :)

I have found this little book to be a gem. It touches on most of the detailed science/technology underpinning contemporary digital photography. It is not a textbook, rather it is something of a handbook of basic information. There isn't much in it that I hadn't learned about at some earlier time, but it helped me to knit together those bits and pieces of important information or concepts in an enjoyable way. The author has chosen carefully what to include and what not to include, based on his own considerable knowledge. The result is a tight little volume that I am very pleased to have acquired, because it was just what I was looking for. I'm sure that some readers may find it inadequate in some ways, but I didn't. I understood exactly what the author set out to do, and in my opinion he fully succeeded. I am reminded of the apology offered by the author of a very long letter to a friend... I'm sorry that this is so very long, I just didn't have time to write a shorter version.

Science for the Curious Photographer is unique among photography books I have seen for daring to treat light, lenses, sensors, and ultimately vision in a quantitative, scientific way. Yes, you need mathematics, but the required math rarely exceeds the algebra and trig you learned in high school. What you get in return for a bit of paper, pencil, and calculator work is a much deeper understanding and appreciation of the trade-offs involved in the costs, capabilities, and size of cameras. Johnson shows, for example, how you can estimate your camera's minimum effective aperture (i.e., maximum F value) from the physics of diffraction and the camera's sensor size. He also shows how sensor size (something specified in your camera's technical specs) influences

signal-to-noise ratio and thus the maximum usable ISO value. This book will especially appeal to those with an interest in physical science or engineering. It will provide relief to those, like me, tired of the vague, hand-waving generalizations about, say, depth of field found in so many other books and classes. Two shortcomings should be mentioned. First, the book's index is too spotty and incomplete to be useful. The book is far more comprehensive than perusal of the index would suggest. Better to use the table of contents to locate topics of interest. Second, the bibliography could be better integrated with cited references and further reading suggestions. As a whole, the book still warrants all five stars. Perhaps, I hope, these suggestions will be realized in a second edition. Read by college (or precocious high school) students, Prof. Johnson's excellent book might well launch careers in optics, semiconductors, and neuroscience.

Although the title talks about "science," the real grist of this book is a relatively gentle introduction to optics. While the book touches on other topics, the vast majority of it is on that. The discussion employs basic math rather liberally, so folks who dislike equations should stay away. But it never goes beyond basic algebra, so the math is quite accessible to anyone with a decent high school education. On the other hand, if you are looking for a book that emphasizes the practical aspects of taking photos, there isn't a lot to offer you here. There are some very nice practical payoffs sprinkled throughout the book, but they are more like asides than the focus of the discussion. One of my favorite such points is when the author applies the points about perspective to the appropriate relative size of prints of different focal length photos. It was obvious when he made the point, but it had never occurred to me before he said it. All in all, I found this to be a very enjoyable read, but one that I would recommend to fellow photographers only if I knew them to be interested in abstract ideas as well as in taking photographs.

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