DIGITAL INFRARED PHOTOGRAPHY

PHOTO **WORKSHOP**

Develop your digital photography talent

DEBORAH SANDIDGE

DIGITAL INFRARED PHOTOGRAPHY PHOTO WORKSHOP

Deborah Sandidge

WILEY

Wiley Publishing, Inc.

Digital Infrared Photography Photo Workshop

Published by
Wiley Publishing, Inc.
10475 Crosspoint Boulevard
Indianapolis, IN 46256
www.wiley.com

Copyright © 2009 by Wiley Publishing, Inc., Indianapolis, Indiana

Published simultaneously in Canada

ISBN: 978-0-470-40521-5

Manufactured in the United States of America

10 9 8 7 6 5 4 3 2 1

No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, scanning or otherwise, except as permitted under Sections 107 or 108 of the 1976 United States Copyright Act, without either the prior written permission of the Publisher, or authorization through payment of the appropriate per-copy fee to the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, (978) 750-8400, fax (978) 750-4744. Requests to the Publisher for permission should be addressed to the Permissions Department, John Wiley & Sons, Inc., 111 River Street, Hoboken, NJ 07030, 201-748-6011, fax 201-748-6008, or online at http://www.wiley.com/go/permissions.

LIMIT OF LIABILITY/DISCLAIMER OF WARRANTY: THE PUBLISHER AND THE AUTHOR MAKE NO REPRESENTATIONS OR WARRANTIES WITH RESPECT TO THE ACCURACY OR COMPLETENESS OF THE CONTENTS OF THIS WORK AND SPECIFICALLY DISCLAIM ALL WARRANTIES, INCLUDING WITHOUT LIMITATION WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE. NO WARRANTY MAY BE CREATED OR EXTENDED BY SALES OR PROMOTIONAL MATERIALS. THE ADVICE AND STRATEGIES CONTAINED HEREIN MAY NOT BE SUITABLE FOR EVERY SITUATION. THIS WORK IS SOLD WITH THE UNDERSTANDING THAT THE PUBLISHER IS NOT ENGAGED IN RENDERING LEGAL, ACCOUNTING, OR OTHER PROFESSIONAL SERVICES. IF PROFESSIONAL ASSISTANCE IS REQUIRED, THE SERVICES OF A COMPETENT PROFESSIONAL PERSON SHOULD BE SOUGHT. NEITHER THE PUBLISHER NOR THE AUTHOR SHALL BE LIABLE FOR DAMAGES ARISING HEREFROM. THE FACT THAT AN ORGANIZATION OR WEB SITE IS REFERRED TO IN THIS WORK AS A CITATION AND/OR A POTENTIAL SOURCE OF FURTHER INFORMATION DOES NOT MEAN THAT THE AUTHOR OR THE PUBLISHER ENDORSES THE INFORMATION THE ORGANIZATION OR WEB SITE MAY PROVIDE OR RECOMMENDATIONS IT MAY MAKE. FURTHER, READERS SHOULD BE AWARE THAT INTERNET WEB SITES LISTED IN THIS WORK MAY HAVE CHANGED OR DISAPPEARED BETWEEN WHEN THIS WORK WAS WRITTEN AND WHEN IT IS READ.

For general information on our other products and services or to obtain technical support, please contact our Customer Care Department within the U.S. at (877) 762-2974, outside the U.S. at (317) 572-3993 or fax (317) 572-4002.

Wiley also publishes its books in a variety of electronic formats. Some content that appears in print may not be available in electronic books.

Library of Congress Control Number: 2009924576

Trademarks: Wiley and the Wiley Publishing logo are trademarks or registered trademarks of John Wiley and Sons, Inc. and/or its affiliates. All other trademarks are the property of their respective owners. Wiley Publishing, Inc. is not associated with any product or vendor mentioned in this book.

About the Author

Deborah Sandidge has made photography a part of her life since she picked up her first camera — it has evolved into her passion as well as an award-winning profession.

Following her formal study of art and photography at the University of South Florida, she began dedicating her time to the art of digital photography, establishing a name for herself as a leading infrared photographer. Deborah is the cofounder and Creative Director of the League of Creative Infrared Photographers, (www.irleague.com) which was established to promote the joy, excitement, and creativity of infrared photography.

Residing in Oviedo, Florida, allows Deborah easy access to her favorite photography subjects: Florida's birds and other wildlife, as well as its landscapes. Her travels have taken her from border to border of the United States and beyond to yield photography that stretches the imagination. She has had the joy and privilege of photographing areas ranging from Namibia, Africa, with its stunning dunes, primitive tribal villages, beautiful people, and sweeping coastlines; to the cities and towns of Switzerland, Germany, and France with their rich history, majestic mountains, tiny churches, soaring cathedrals, and captivating night scenes.

Deborah's passion is not only capturing images of people, places, and things with her digital cameras, but also in the enhancing, creative work she does in the digital darkroom.

Deborah's tutorials have been published in *Photoshop Creative Magazine* and in *Digital Close-up Photography*. Her photography has been published in *Nikon World Magazine*, *Nikon World Calendar*, and in various Nikon publications and at photography events including PhotoPlus Expo, PMA and Macworld. An interview on her photography is published online at DoubleExposure.

Deborah was a featured photographer at the Orange County Administration Building in Orlando, Florida. Her creative digital image, *Cormorant Conversation*, along with photos from the Orlando Camera Club, earned Best Nature Portfolio by Nature's Best magazine for the prestigious Windland Smith Rice International Award 2008. The image was exhibited at the Smithsonian's National Museum of Natural History, Washington DC.

Deborah's work is represented by Danita Delimont, Positive Images, and Novastock.

Credits

Senior Acquisitions Editor
Stephanie McComb

Project Editor
Chris Wolfgang

Technical Editor
Joe Farace

Copy Editor
Lauren Kennedy

Editorial Director
Robyn Siesky

Editorial Manager
Cricket Krengel

Business Manager
Amy Knies

Senior Marketing Manager
Sandy Smith

Vice President and Executive Group Publisher
Richard Swadley

Vice President and Executive Publisher
Barry Pruett

Project Coordinator
Kristie Rees

Graphics and Production Specialists
Ana Carrillo
Andrea Hornberger
Jennifer Mayberry
Brent Savage

Quality Control Technician
Melissa Cossell

Proofreading and Indexing
Melissa D. Buddendeck
Broccoli Information, Mgt.

Acknowledgments

Rick Sammon, a well-known author and photographer has helped more than a few people get into writing books. I am one of them. His introduction to Barry Pruett, Vice President and Publisher at Wiley Publishing, resulted in this, my first book. So a big thank you goes to Rick and Barry.

During the production of this book, I worked with several talented people at Wiley Publishing. A special thank you to Stephanie McComb, senior acquisitions editor and Chris Wolfgang, project editor, for always being so enthusiastic and supportive of both my photography and words.

A special thank you also goes to Joe Farace for agreeing to be the technical editor for this book. His encouragement and support early on is much appreciated.

My sincerest thanks to the following people:

Lewis Kemper, whose friendship and encouragement is valued. Lewis provided Photoshop support and guidance, and contributed his skills through helping me, and providing wonderful infrared photos for the book.

David Twede, who has a brilliant mind and is a truly creative photographer. David provided expert advice and was the source for the graphs and charts comparison photos for the first chapter. I appreciate being able to ping ideas back and forth and always have a quick response.

Anna Cary, a kindred spirit who is just as likely to share web apps as dessert with me, and who so generously screen-shared to a higher understanding of the world of Mac.

The artistic Tom May, who always levels with me, helps keep me grounded, and makes me laugh.

Jyotsana Agarwal, a most gifted friend who shared with me the experience of spreading our wings to fly in our Carnegie course.

Dimitri Rellos, whose friendship, encouragement and perspective is a gift — "we're never lost, we're exploring new destinations."

The wonderful and talented contributors to this book: Kathleen Carr, Anna Cary, Joe Farace, Lewis Kemper, Jean Miele, Joe Paduano, Ken Sklute, David Twede, and Andy Williams. I am truly inspired by the excellence of their photography and accomplishments.

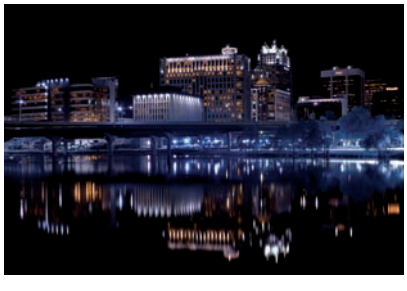
Barry Tannenbaum and Lauren Radigan at Nikon who have been supporters of my work. I appreciate the opportunity to be included in *Nikon World Magazine*, the Nikon World Calendar, and other publications and venues.

Will DeRooy, whose superb editing skills helped me immensely as I wrote this book. Will reviewed every chapter, making suggestions and comments that were invaluable.

A special thank you to my mother, whose tireless support, encouragement and phenomenal editing skills have helped me immensely throughout the creation of this book. Thanks go to my husband and everyone in my family for their patience, help and support as I delved into writing this book. I could not have done it without them.

For my mother, Sally Chambers, who read every word first and was my compass throughout this book. You are a true wordsmith.
Thank you for always being there for me.

Contents



Introduction

I am so excited to be able to write this book and share with you what I have learned about digital IR photography. Infrared photography is easily attainable by the novice and professional alike. Why? Because it's digital! We have transcended film photography and now have the wonderful opportunity to be able to photograph digitally. No darkrooms, no chemicals, no worries about light leaking in and ruining precious film. We are free to experiment over and over; the learning curve is much less steep. We can truly be artists and are limited only by our imaginations.

Does digital mean you have to have fancy or expensive equipment? Not at all; some of my very favorite images have been captured using an IR-converted compact camera. I always have it with me.

Although I enjoyed developing film and making my own black and white prints, I feel much more empowered in the digital darkroom. The tools available are endless and ever changing. If you are able to communicate yourself through your photography, your photography will be able to communicate with others. Your passion will be projected in your photographs.

It's equally exciting to me to be able to open an image in Photoshop and be able to push the boundaries of traditional photography, to create an image that is more artistic than what was captured by the camera. Digital IR allows a lot of leeway with photography. We are not limited to what is captured by the camera. Not only can we create IR images that look like they have been photographed using traditional film techniques, we can create stunning images combining foliage rendered white by IR light with a vivid blue sky and endless other creative possibilities.

Throughout this book, I will be your guide to choosing a method to record in IR, whether that means purchasing an IR filter, or having your camera converted to photograph in IR. I'll walk you through the steps of creating a white balance preset, making the best exposure, and optimizing your images. You'll create beautiful panoramas and HDR images in IR. You'll have fun with various in-camera effects and find fulfillment in artistically enhancing your images in Photoshop.

The tools and techniques that I use are chosen because I love using them, they work for me, and I'm sure they'll work for you too. Use this book as a springboard to experiment and see what works for you! I'm a big fan of Capture NX, Photoshop, Nik, onOne, Lucis Pro, Alien Skin, and Topaz Labs. As I write this, I've come across new Photoshop filters that I'm anxious to explore and see the effect that they have on my IR images. Old images are gifted with new life when portrayed in a different way.

A Greek proverb states that wonder is the beginning of wisdom. It's a way to be inspired and learn more. Let your motto be "what happens if."

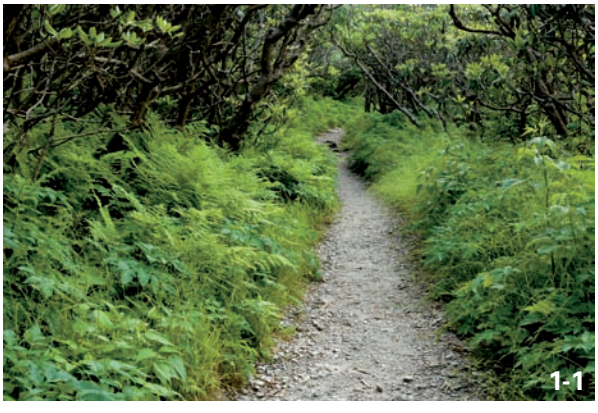
Please contact me at www.deborahsandidge.com if you have questions or just want to show me what you are creating in the world of IR photography! I'd love to hear from you.

CHAPTER 1

INTRODUCING INFRARED LIGHT

Infrared (IR) light surrounds you — you just can't see it. However, when you use a special filter on your digital camera, it is capable of recording IR light. The camera can capture this invisible light to transform ordinary landscapes into something magical and ethereal. Compare what you see in normal light in 1-1 to what the camera sees in IR in 1-2. You can see how incredibly beautiful the world is in this different light.

Photographers from the novice to the professional can photograph in IR. And although you can't detect IR light in your surroundings, you can learn to envision its behavior and effects — see it in your mind's eye — to help you create surreal photographs that utilize its marvelous qualities.



ABOUT THIS PHOTO *A winding path in North Carolina's Craggy Gardens creates an inviting composition in color. Taken at ISO 100, f/16, 1/6 sec. with a Nikkor 28-70mm lens.*

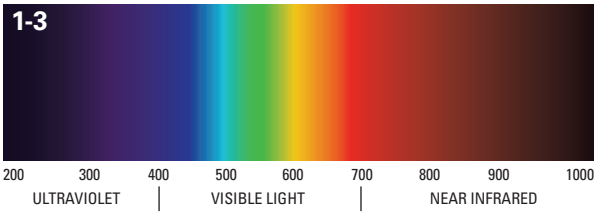
ABOUT THIS PHOTO *Photographed in IR, the same path shown in 1-1 creates a magical composition. Taken at ISO 100, f/16, 1/10 sec. with a Nikkor 24-70mm lens.*

WHAT EXACTLY IS IR LIGHT?

Like sound, light travels in waves. When its wavelength is measured in nanometers (nm) or billionths of a meter, the light you typically see ranges only from around 400nm (the color violet) to around 700nm (the color red). This narrow band, also known as the *visible spectrum*, enables you to see violet, blue, green, yellow, orange, and red colors, and all their combinations.

Light at wavelengths shorter than those for the color violet is aptly named *ultraviolet* (UV) light. Most UV light is invisible to the human eye. The IR spectrum begins at the other end of your range of sight, at wavelengths longer than those for the color red. The range of light from around 700nm to 1,000nm is referred to as *near IR* because it is near the visible spectrum (1-3). Digital cameras can record light in this range when they have an IR filter in place. The sun emits IR light including UV and visible light. You can create exquisite photographs using IR light from the sun (1-4),

ABOUT THIS FIGURE *This chart shows the wavelength ranges of UV, visible, and IR light.*



ABOUT THIS PHOTO *Cloud cover over Cades Cove in the Great Smoky Mountains, North Carolina, makes an exquisite statement in IR. Taken with an IR-converted camera at ISO 100, f/11, 1/25 sec. with a Nikkor 18-70mm lens.*

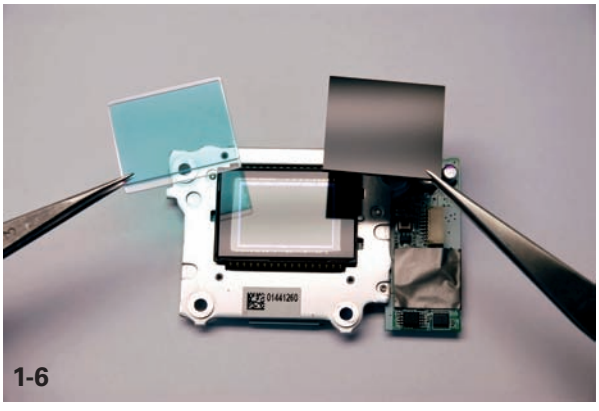
but light from sources such as candles or incandescent bulbs can also be recorded with IR photography. In other words, you can creatively photograph IR light at night (1-5).

SEEING IN IR

You can record invisible light using an IR filter (available at camera stores) on the lens of your digital camera. Alternatively, you can modify your digital camera by removing the *hot mirror* located over the camera sensor, and replacing it with a filter that allows IR light to pass through to the camera sensor. This is shown in 1-6. Either choice allows the camera to record the IR light that you can't see with the naked eye.

1-5

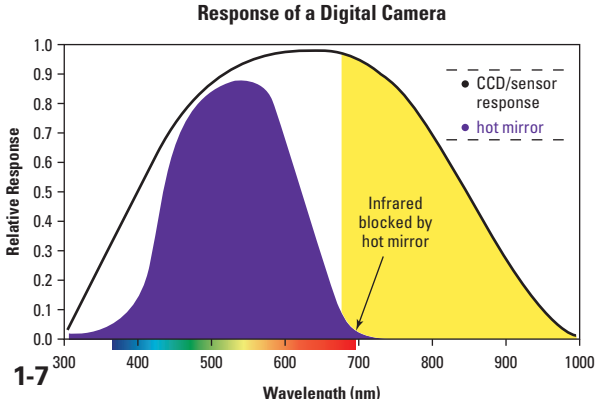
ABOUT THIS PHOTO *Night proved to be more interesting than twilight in this IR photograph taken in downtown Orlando, Florida. Taken with an IR-converted camera (enhanced color IR filter) at ISO 100, f/11, 13 sec. with a Nikkor 18-70mm lens.*



1-6

ABOUT THIS PHOTO *This photo shows the camera sensor, hot mirror, and replacement IR filter. © Life Pixel (www.lifepixel.com).*

A digital camera is a very sophisticated device. Its imaging sensor is responsive to wavelengths from about 350nm to 1000nm. It also can record ultraviolet light in the near UV range (1-7), and with a special filter, light in the near IR range. A digital camera is so sensitive that camera manufacturers place a hot mirror inside the camera. The hot mirror reflects most IR and UV light, serving as a filter, and transmits visible color by allowing it to reach the camera sensor.



1-7

ABOUT THIS FIGURE *This chart shows the response of a digital camera to UV light, visible light, and IR light.*

Using an IR filter on or inside the camera allows IR light to reach the camera sensor but blocks most visible and UV light. The camera can now record IR light and you can create stunning photographs in IR. A whole new world of creativity lies before you. You are an instant artist. When the natural color is removed from the scene, some of the reality is removed, and when some of the reality is removed, your pictures become more creative and artistic.

tip

With a little practice, composing for IR will become second nature. This is covered in Chapter 3.

From a photographic perspective, the world is captivating in an entirely different way. Many subjects reflect or absorb IR differently than they do visible light. In an IR image, the contrast range between the sky and clouds is often quite wide. There is more clarity in shadows, and bodies of water can appear very dark. Foliage appears white and is unexpectedly beautiful and unique.

Skin tones take on an ethereal appearance that is very attractive for wedding photographers and for fine art nude photography. IR photography can look similar to timeless black-and-white photography, yet there is something enchantingly unique about it.

With an IR filter, digital cameras capture light in the near IR range, recording how light is reflected and absorbed by various surfaces, not the actual temperature of the surfaces. When some people think of IR, *thermal imaging* (the capture of recorded temperature patterns) comes to mind.

A common misconception about digital IR photography, or even IR film, is that it records heat patterns or thermal energies — it does not. The much-coveted halation effect that is typically associated with capturing IR images using Kodak

high-speed IR film (HIE) causes a visible aura around the very light areas in a photograph. This is explained by the lack of an anti-halation layer on that specific type of IR film, and is not the outcome of IR light, body heat, or thermal energy. An example of the desired halation effect is shown in a film photograph (1-8) taken by professional photographer and author Joe Paduano.

Thermal imaging sensors, on the other hand, register IR energy emitted by subjects in the mid- and far-IR ranges. This is in comparison to digital cameras recording near IR light that is reflected from subjects. Two interesting applications for thermal imaging processors are night vision for the military, and enhanced vision systems in ultra-sophisticated business jet avionics that employ the use of mid- and far-IR light.

CHECKING YOUR CAMERA FOR IR SENSITIVITY

Many ordinary, unconverted digital cameras can detect IR light. To determine how sensitive your camera is, point your TV remote control at the

ABOUT THIS PHOTO *The much-admired halation effect that occurs with certain kinds of IR film is evident in this image Joe Paduano took of the Acoma Pueblo church in New Mexico. © Joe Paduano*