# Optimizing Depth of Field in Photography
# Process of Focus Stacking

**By George Fellner**

## Focus Stacking

As an alternative response to photographing 3-dimensional objects, *focus stacking* is a strategy that is quite effective. The process involves taking a series of multiple photographs at

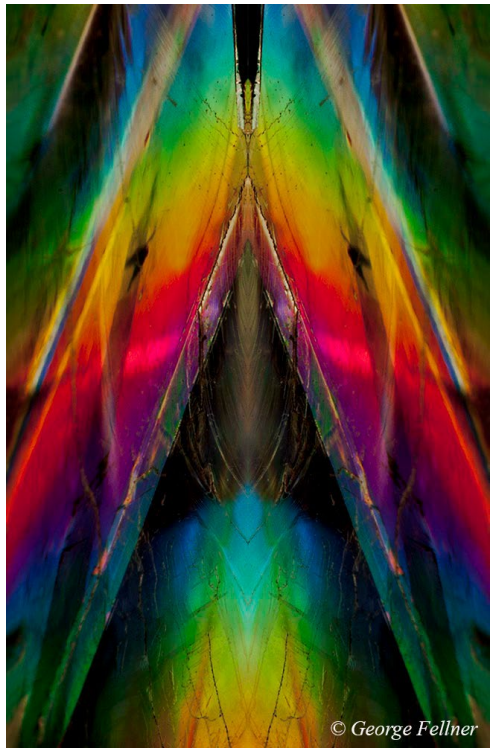
different focus points. Afterwards in post-processing, the images are combined into a single image in sharp focus with optimized depth of field.

## Photo Shoot

Set up the subject with camera on tripod and the appropriate lighting. Mirror lock (for DSLR cameras) should be set and always use a shutter release cable. Determine whether to take a single photo or to use focus stacking. Set the f-stop to f/5.6, f/8, or f/11 for sharpness and some depth of field.

For focus stacking, practice manually setting focus points from front to rear and estimate the number of shots required, using manual focus. Ensure constant lighting and stable position of subject/camera. Take the progression of images at multiple focus points for the series. A visual review of the images to determine catching of the full range of focus planes is important (either on the LCD monitor or tethered to computer). If necessary, re-shoot for a new series.

## Photoshop Workflow



Use the standard RAW workflow for the first selected image, setting exposure, contrast, clarity, curves, and other aspects. Document all setting values in order to retain consistency, then save first image as a TIFF file. Repeat the typical workflow with same settings and save as a TIFF file for each image in the series. Upon completion, place the series in a dedicated folder.

## Focus Stacking Software

There are numerous software programs available for focus stacking. They include Photoshop, Helicon Focus, Picolay, TuFuse, ImageJ, CombineZP, and Zerene Stacker. I find that Photoshop works well.

## Focus Stacking Post-Processing

- On *File* menu, select *Automate*
- Select *Photomerge*
- Set Photomerge option to *Auto*
- Uncheck bottom boxes
- Select *Browse* and locate series folder of images
- Select images and click *OK*
- Images appear on Photomerge window
- Select all images to be highlighted and click *OK*
- Photoshop aligns and places images into the same file
- In turn, images appear open in the layers palette
- Select all images in layers palette to be highlighted
- Go to *Edit* menu
- Select *Auto-Blend Layers*
- Leave setting on *Stack Images*
- Leave bottom box *Seamless Tones and Colors* checked on
- Click *OK*
- Photoshop then processes focus stacking

- Final image is displayed with masks automatically aligned and sampled for optimal focus, along with layers palette displayed
- Go to *Layer* menu
- Select *Flatten Image*
- Crop off blurred edges
- Save final single blended image file

## Final Post-Processing

Perform standard workflow process with cropping, curves, levels, clean-up, sizing, and sharpening. For some images with intended experimentation, I use mirror and quad techniques. Overall, the results should be reviewed and self-critiqued. Fine-tuning and improvement in techniques is inevitable for an evolving learning process.

## Let the Imagination Flow

The propensity of abstract art to stimulate the imagination is the key to endless possibilities. Stones and crystals serve as source subjects for my own visual explorations with *Imaginary Realms*. Nevertheless, there is certainly an endless supply of other types of source subjects to tap using macro photography. For example, one might consider working with sea shells, fossils, plants and flowers, moths, butterflies and the wide range of insects, as well as numerous other tiny creatures of the natural world. In addition, man-made objects including electronic parts, circuit boards, tiny products, and thousands of other possible elements can also serve as source subjects. Letting the imagination flow can set the path for visual discovery through macro photography, thereby promoting the development of creative abstract images that may evoke meaningful insights and messages.

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