



INTRODUCTION TO PHOTOMACROGRAPHY

Presented by

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PHOTOMACROGRAPHY

- Photomacrophography is the discipline of taking photographs of objects at life size, a 1:1 ratio or greater, i.e. 1.5:1 (150% of life size), 2:1 (200% of life size, 3:1, (300% of life size), etc.
- However we will use the vernacular term of macro photography during the class



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USES

- Hobby: reveals otherwise unseen details of the world around us. Favorite subjects include flowers, insects, the human eye, patterns, wood grain, textures, etc.
- Commercial: Scientific applications, product photography, forensics

IMPORTANT TERMS

- Depth of Field (DOF): Portions of a photograph perceived to be reasonably within focus.
- Minimum focusing distance is the minimum distance from the subject to the camera's sensor plane, where the subject is at maximum magnification (1:1).
- Minimum working distance is the distance from the front edge of the lens (not the hood) to the subject at maximum magnification (1:1). A greater working distance means less chance of disturbing living subjects. It also allows for more creative lighting (flash, diffusers, and reflectors).

CAMERA TYPES

- DSLR: Digital Single Lens Reflex camera, a camera with interchangeable lenses.
- Point and Shoot: (P&S) a camera that does not have interchangeable lenses.



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P&S MACRO I

- Because P&Ss have wide-angle lenses (very close to the sensor), they have a greater DOF than DSLR cameras.
- P&Ss generally achieve their macro or near macro capabilities with diopters, or close-up lenses that act as magnifying glasses placed in front of the camera's own lens.

P&S MACRO II

- The Macro function on P&S and DSLR lenses (tulip icon), is not an actual macro function. It forces the camera settings simulate a true macro image, but they cannot achieve a 1:1 life size ratio.
- P&Ss with LCD view screens usually have general focus areas that are not discrete enough for macro photography as it is very hard to determine where the actual focus point is.

P&S MACRO III

- Raynox makes a series of diopters for P&S cameras. www.raynox.com
- Using a Lensmate adaptor, you can add many Raynox diopters to your P&S camera, enhancing its macro capabilities. www.lensmateonline.com



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EXTENSION TUBES

- Extension tubes are hollow tubes that connect between your camera body and a lens. They can create near-macro and macro imagery because the farther a lens is from the camera sensor and the closer the focusing distance to the subject, the greater the magnification.
- Extension tubes are fixed distance extenders, usually sold in sets that can be stacked to create tubes of varying lengths.
- If the extender tube distance equals the focal length of the lens to which it is attached, you will achieve a 1:1 ratio.
- Longer extension tubes will give you a narrower field of view (larger image) and a greater working distance (1:1 can be achieved farther from the subject).

DIOPTERS I

- Also known as Close-up or Auxiliary Lenses, diopters are magnifying glasses placed in front of a camera's normal lens to increase the size of the image being photographed.
- They screw into the lens's filter threads and only increase magnification.
- They do not alter a lens's focal length as a teleconverter does.

DIOPTERS II

They typically come in sets of +1, +2 and +3 power

- They vary widely in quality
- Diopters can be stacked to provide more magnification.
- Place highest power closest to sensor
- DOF will decrease
- They are best used with prime lenses
- Relatively inexpensive



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REVERSE THE LENS

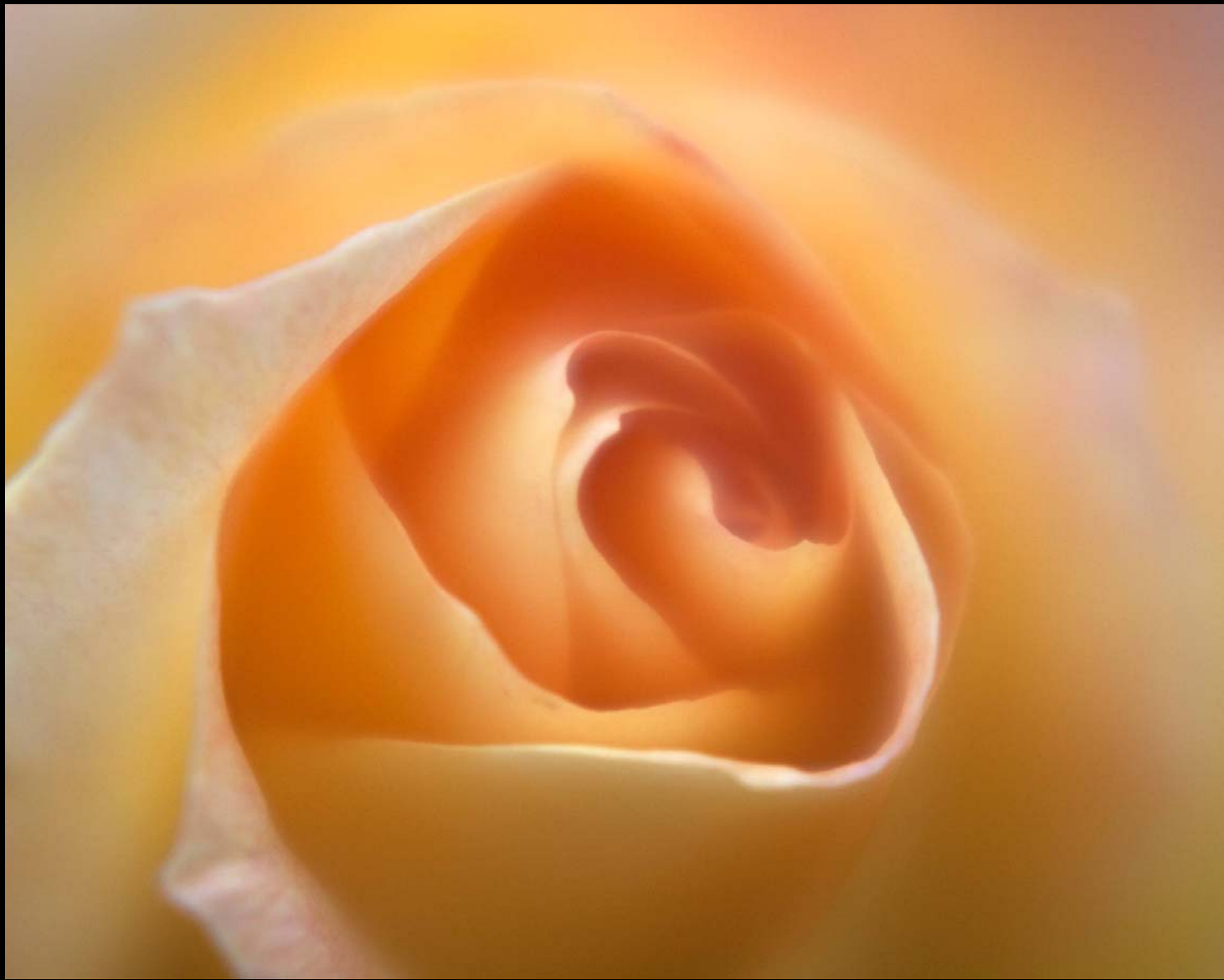
- By reversing, you are not reducing a large image to the size of the sensor, you are increasing the size of a small image to match the sensor.
- A simple reversing ring is mounted to the camera body, with the front of the lens attached to the reversing ring by the lens's filter threads.
- You will not be able to set the aperture and use automatic metering with this technique.

LENS STACKING I

- Using a coupling ring you can reverse a lens and connect it with another one that is normally mounted.
- Reverse a lens of lesser focal length on one of greater focal length, which permits automatic aperture metering.
- Tremendous magnification ratios can be achieved. For example, reversing an 18mm lens on a 300mm lens creates a 16:1 magnification ratio.
- Use a small, light lens on the front so that you do not strain the mounted lens or the mounting bayonet on the camera body itself.

LENS STACKING II

- If you already own a small lens and a large telephoto (prime or zoom), then your costs are very low to use this method.
- Disadvantages include limited aperture control of the reversed lens and a very shallow depth of field. **DO NOT USE AUTOFOCUS.**
- It is best to set the stacked lens' aperture wide open. Vignetting is a likely side effect too and camera shake will be easily noticed.



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OTHER MEANS

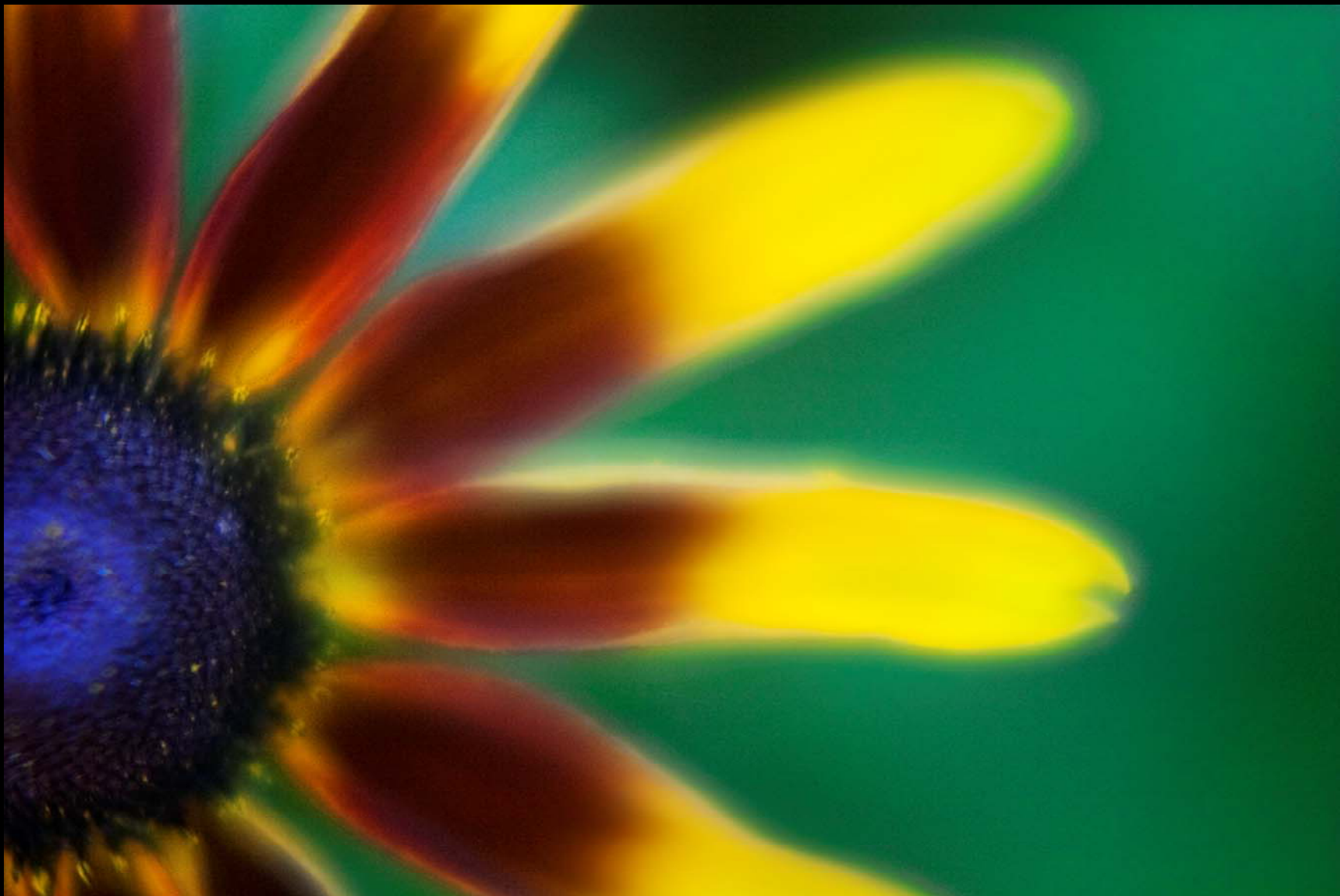
- Macro lenses
- Bellows
- Rails
- Teleconvertors
- Telephoto extenders
- Focus Stacking Software

MACRO CHALLENGES

- Sufficient DoF
- Stabilization (high magnification makes camera / subject shake more easily noticed)
- Choosing the correct focal for storytelling

HANDHELD TECHNIQUES

- Manual focus
- Rocking back and forth
- Multiple shot drive mode on camera
- Only one of many images are good



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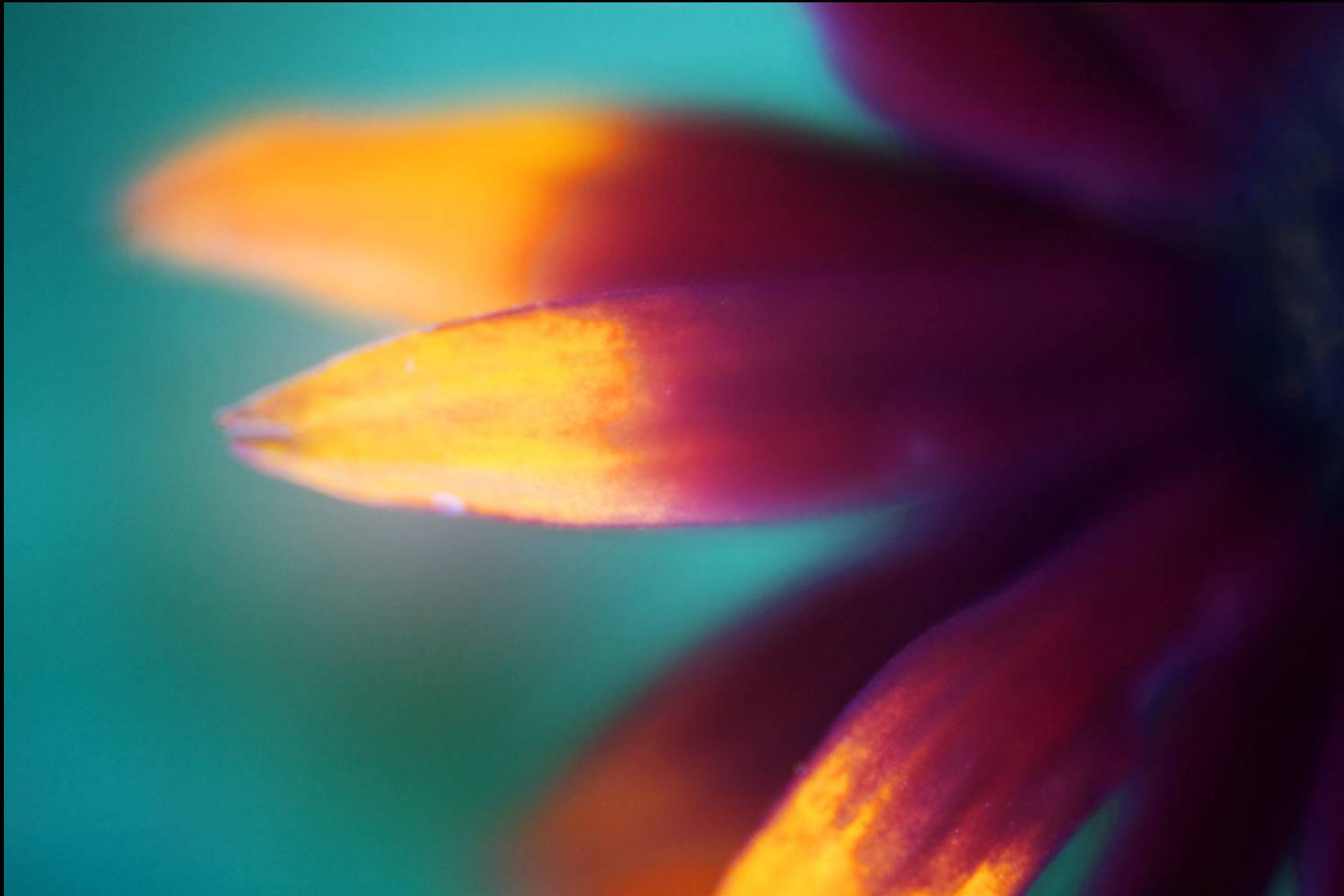


TRIPOD TECHNIQUES

- Manual focus
- Copy stand for fine adjustment
- Horizontal tripod arm
- Bellows / Rails for fine adjustment

LIGHTING

- Ambient / bracket exposures / ISO
- Off camera flash with cord / FEC
- Off camera flash wireless / FEC
- Reflectors
- GoBos



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OTHER TOOLS

- Plamps
- Wind deflectors
- Chicken Wire
- Misting Bottle

WRAP-UP

- **SUMMARY**
- **QUESTIONS & ANSWERS**
- **MACRO HANDS-ON CLASS**
- **THANK YOU**

20/20 PHOTO MACRO DISC

- Macro lenses chart
- Macro class handout
- Circle of Confusion Chart
- Depth of Field (DOF) Software
 - Photo Calc for Windows
 - DOF 2 for Mac
 - DOF Calc v002 for Windows
 - DOF Master v 1.02 for Windows
 - Palm OS DOF Calc
- Focus Stacking software
 - Combine ZM full version for Windows and Mac
 - Combine ZP (newer than ZM)
 - Helicon (30 day trial) (Windows & Mac versions)
 - TuFuse for Windows