How to Close-up and Macro Photography

A quick summary of essential techniques

Presented to the Charlottesville Camera Club

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A new way of seeing

When you “think small,” you reveal to yourself—and to others—a whole new world that often goes unnoticed and unappreciated.

Macro? Close-up? What's the difference?

- "Close-up": Relative term that usually means getting close enough to your subject to magnify it up to "life size" on your image sensor.

- "Macro": Magnifying your subject at life-size and above.

Amount of magnification is sometimes expressed as a ratio

Magnification tools
Close-up lens

Pros:

- Easy to attach; screws on like a filter (some available for P&S)
- Comes in different powers, or diopters (+1 > +10)
- Practically no reduction in light
- Inexpensive ($25 - $50)

Cons:

- Limited magnification (+3 diopter gives only 1:4 ratio)
- Image quality declines at higher ratios

Essential:

- Get the best quality (two-element, multicoated)

Magnification options
Extension tubes

Pros:

- Achieve more magnification than close-up lens
- No added glass = less loss of image quality

Cons:

- Loss of light (two full stops at 1:1)
- Those with electronic connections can be expensive ($170 for set)

True macro lenses

- Provide 1:1 magnification with no attachments.
- Are precision-engineered for sharp, aberration-free images from corner to corner, from closest focus out to infinity.
- Are relatively expensive: $250 - $1,300, depending on brand and focal length.
- Available in various focal lengths (50mm, 55mm, 60mm, 90mm, 105mm, 180mm, and 200mm), each with a different “working distance.”

Working distance?

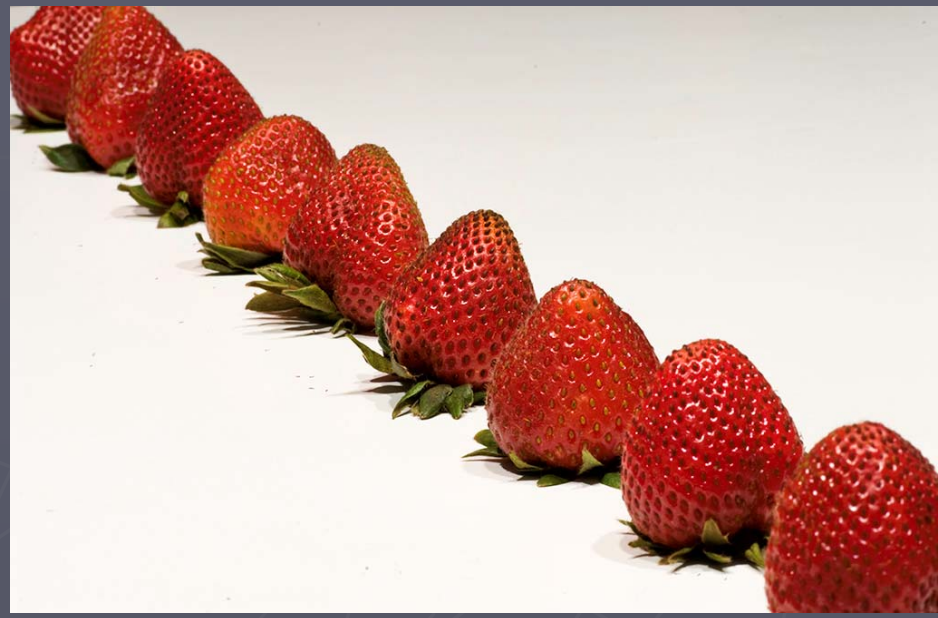
- Working distance = distance between lens and subject at maximum magnification.
- Longer the focal length, the greater the working distance.

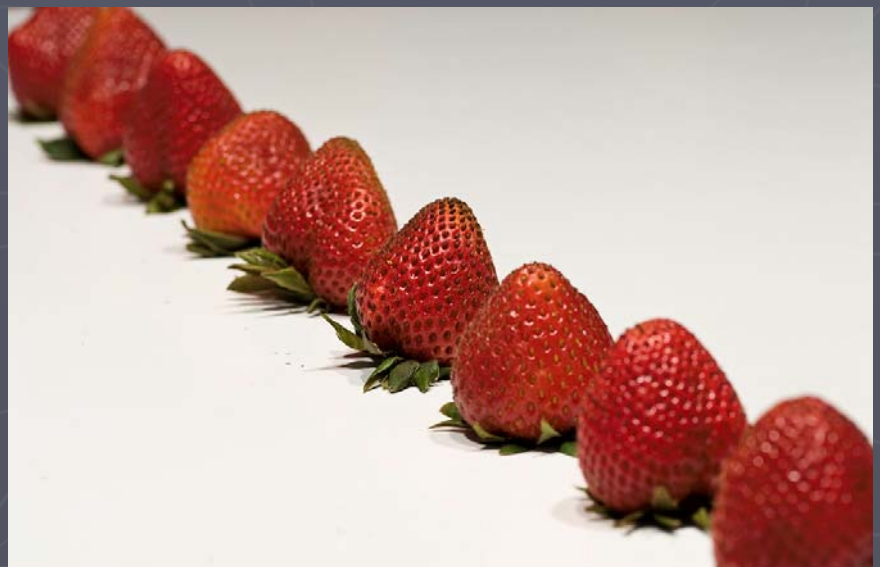
Those are some of the tools . . . and here are some of the challenges

- Magnifying subject = magnifying *motion* of subject and camera
- Magnifying subject = less depth of field

Depth of *what?*

DoF = depth of focus, zone of sharpness





Get to know your apertures

- DoF is determined by (among other things) the *aperture* of your lens.
- Smaller the aperture, the greater the DoF.
- “Aperture priority” best for macro.

Small aperture = big challenges

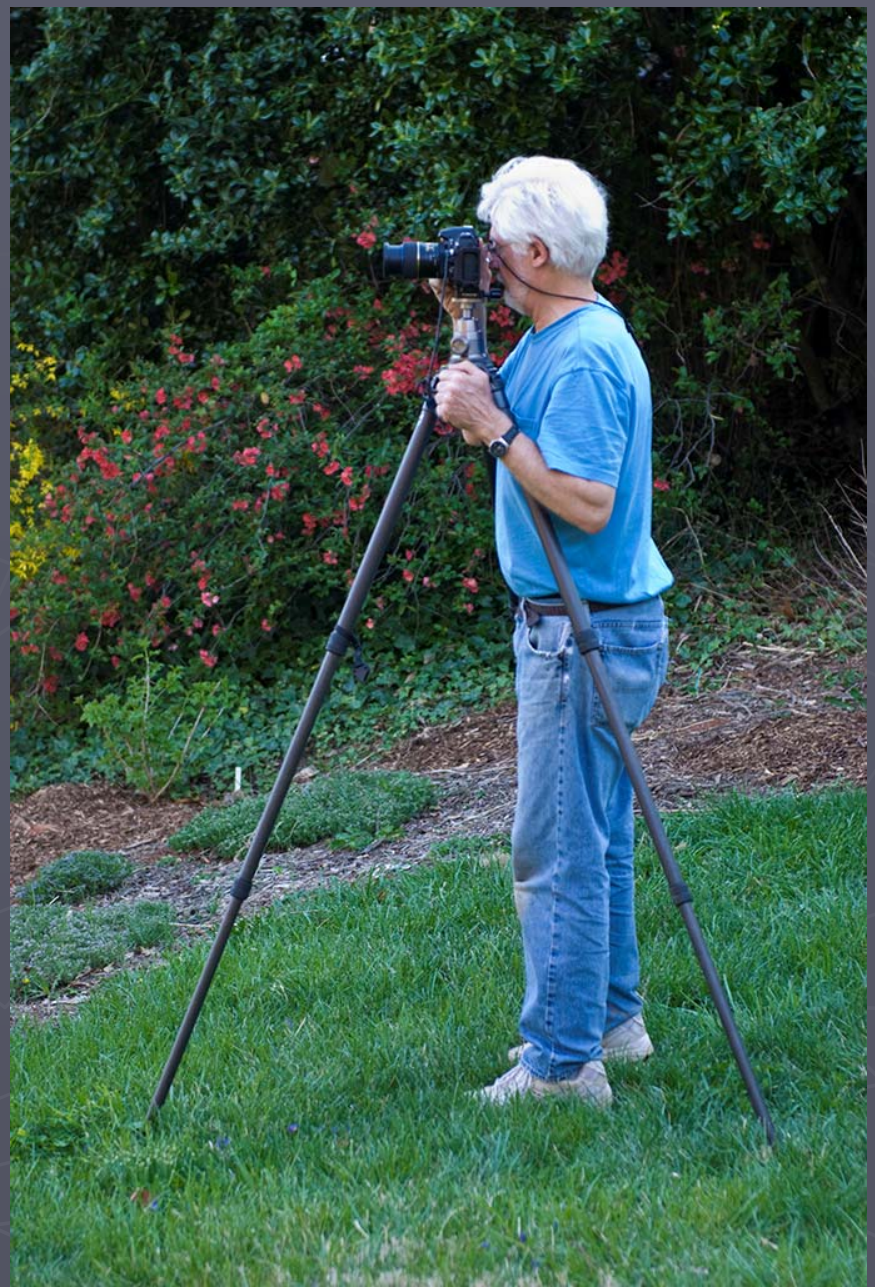
- Smaller aperture lets in *less light*.
- Less light through lens requires a *slower shutter speed* to get correct exposure.

Why shutter speed matters

- Magnifying subject = magnifying motion of subject and camera
- PROBLEM: More motion + slower shutter speed = blurred photos
- SOLUTION: Control the motion

The Essential Tripod

- Buy as large a tripod as you can comfortably carry. (Carbon fiber is best.)
- Should come to eye-level when fully extended.
- Add a ball head big enough to handle your largest lens.



Go low

- For macro, the ideal tripod has no center column and goes flat on the ground.

Steady camera . . . Now what?

- Camera on a tripod is only half the solution to controlling magnified movement.
- Need a steady subject (unless using strobe).
- And this often means you need to deal with the wind. (At high magnification, the slightest breeze is a hurricane.)

Windbreaker

- Blacklock Diffusion Tent

- Make your own with clear or opaque plastic sheeting (available at Lowe's) w/ tent poles, grommets, and stakes (available at camping stores)

Freeze it!

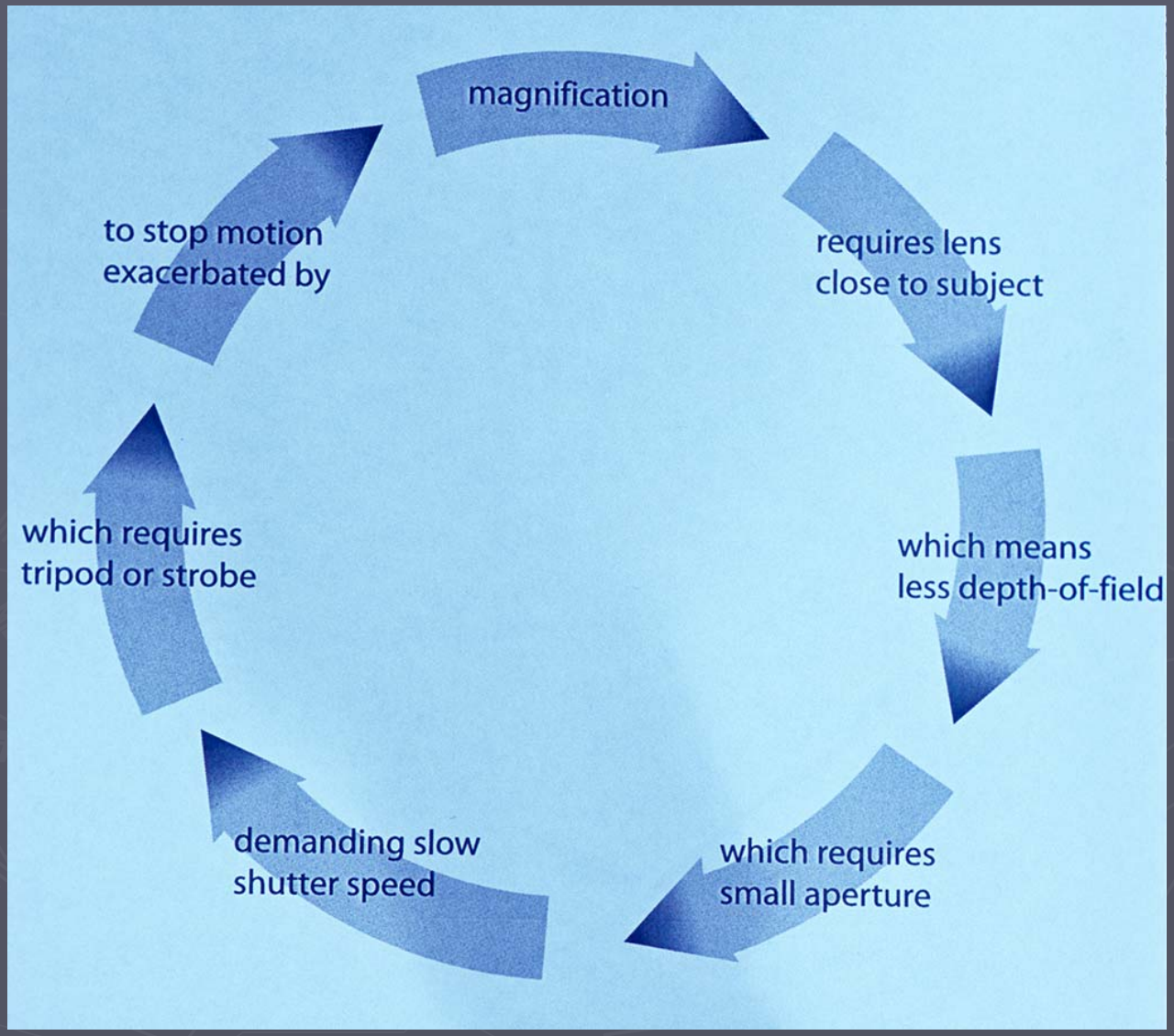
- Can stop all movement (of both camera and subject) by using a strobe.
- Provides burst of light 1/1000 second and faster. (Ambient light, and hence shutter speed, is not a significant factor.)
- May be *only* solution with active subjects and strong wind.

Go lighter and wireless

Strobe = a blast of sunshine

Is it the right light, or not?

Vicious cycle

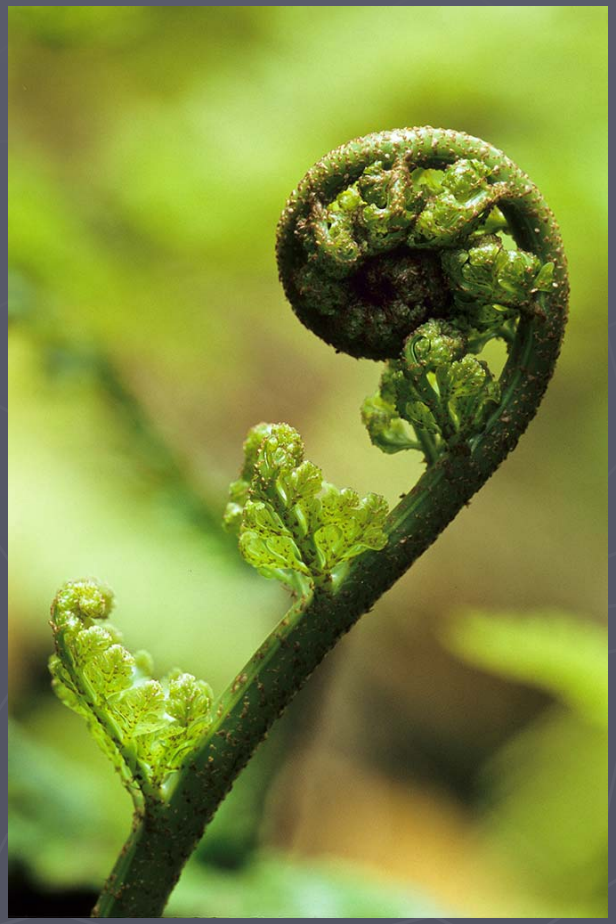


Mind your backgrounds

- Quality of background is key to a quality image—in macro as in all other kinds of photography.
- Most inexperienced photographers concentrate on subject to the exclusion of all else.
- Since you are responsible for everything in your photo, you are responsible for the quality of your background.

Controlling backgrounds

- Problem: Background brighter than your subject
- Solution: Use fill flash or reflector or shade the background



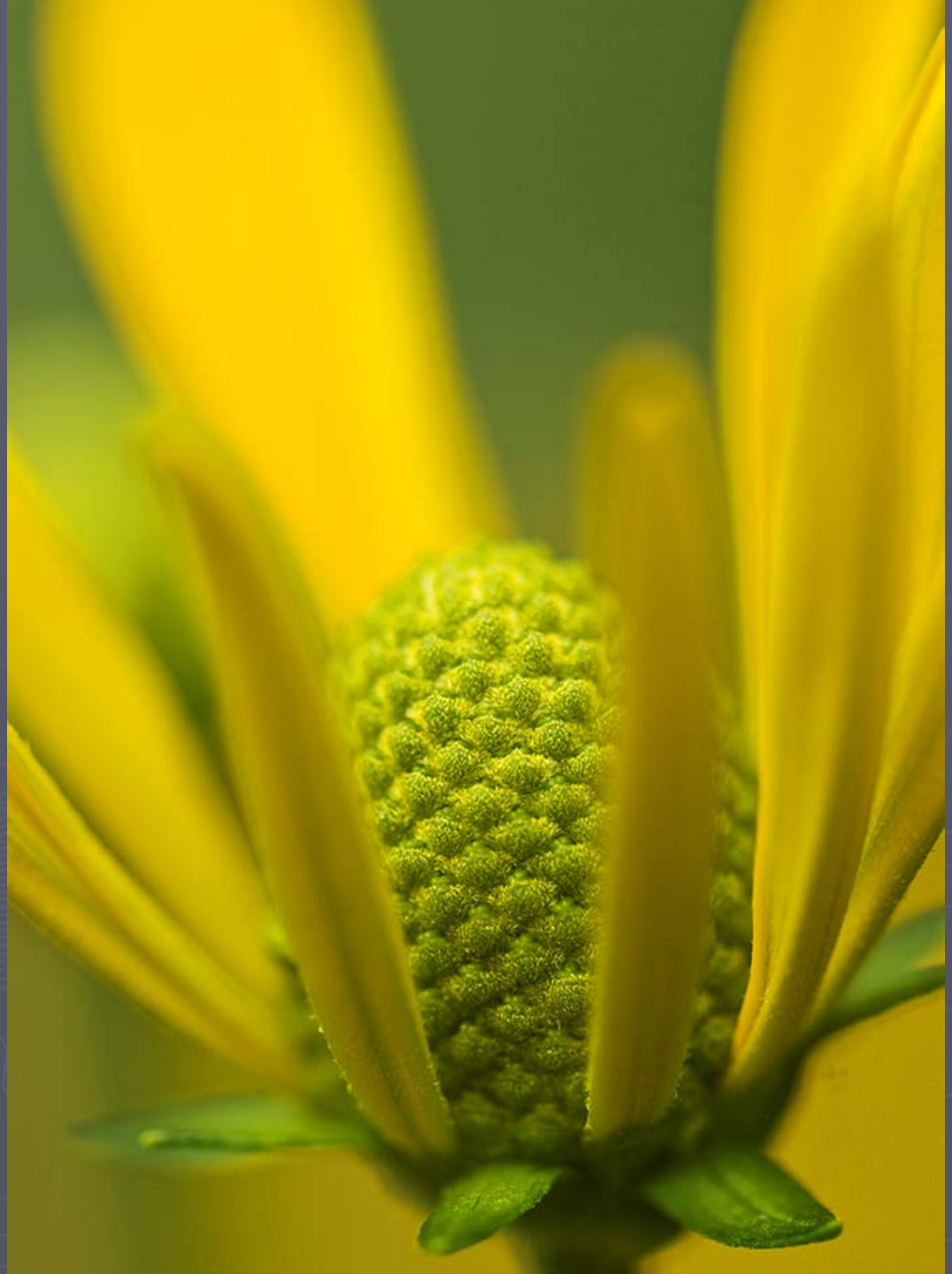
Controlling backgrounds

- Problem: Background too busy; too much distracting detail

- Solution: Open aperture or use longer focal length for less depth of field. (Limited ability with P&S.)

Finding focus—still another challenge

- Limited DoF requires more precise focusing.
- Must focus on most important part of the subject.
- Cannot use autofocus!



Finding focus

Get parallel to your subject.

Help is on the way!

- Technological improvements are making macro photography easier.
- High (and noise-free) ISO settings allow shooting at much faster shutter speeds than would otherwise be possible.

Up with ISO!

- f/22 @ ISO 400 = 1/15 second (subject blurred if moving)
- f/22 @ ISO 6400 = 1/250 second (subject sharp)
- Noise-control software getting better all the time.

Stack ’em up!

- For a stationary subject, many of the issues with DoF can be avoided with image stacking. (Also called focus stacking.)
- Rather than shooting one image at a very small aperture, you can shoot several images at wider apertures (and with faster shutter speeds to deal with the wind).
- Image-blending software can then consolidate multiple images into one image with great DoF and sharpness.

- f/14 to obtain sufficient depth of field = background too distracting.

- Small aperture = slow shutter speed = long wait for calm moment

f/4.5 = each flower sharp; background soft; faster shutter speed

Which one?

- Photoshop CS5:
  --“Focus stacking” comes with program
  --fast and easy, but deficient
- Helicon Focus:
  --fast and easy; high quality (?)
  --expensive ($115 to $250)
- Zerene Stacker:
  --slow and clunky; very high quality
  --inexpensive ($89)
- CombineZP:
  --user-unfriendly; high quality (?)
  --free!

To Learn More . . .

photo.net/learn/macro

digital-photography-school.com/macro-photography-tips-for-compact-digital-camera-users

cambridgeincolour.com/tutorials/macro-photography-intro.htm

macro-photography.eu

Digital Macro and Close-Up Photography for Dummies, by Thomas Clark

Understanding Close-Up Photography: Creative Close Encounters With or Without a Macro Lens, by Brian Peterson

Creative Close-Ups: Digital Photography Tips and Techniques, by Harold Davis