Photographic Depth of Field

Phillip Island Photographic Society

Monday, 3rd October 2022

Bert Hoveling Ph.D.

EFIAP FAPS EFIAP HonFAPS SSAPS SSVAPS

0419 118 610

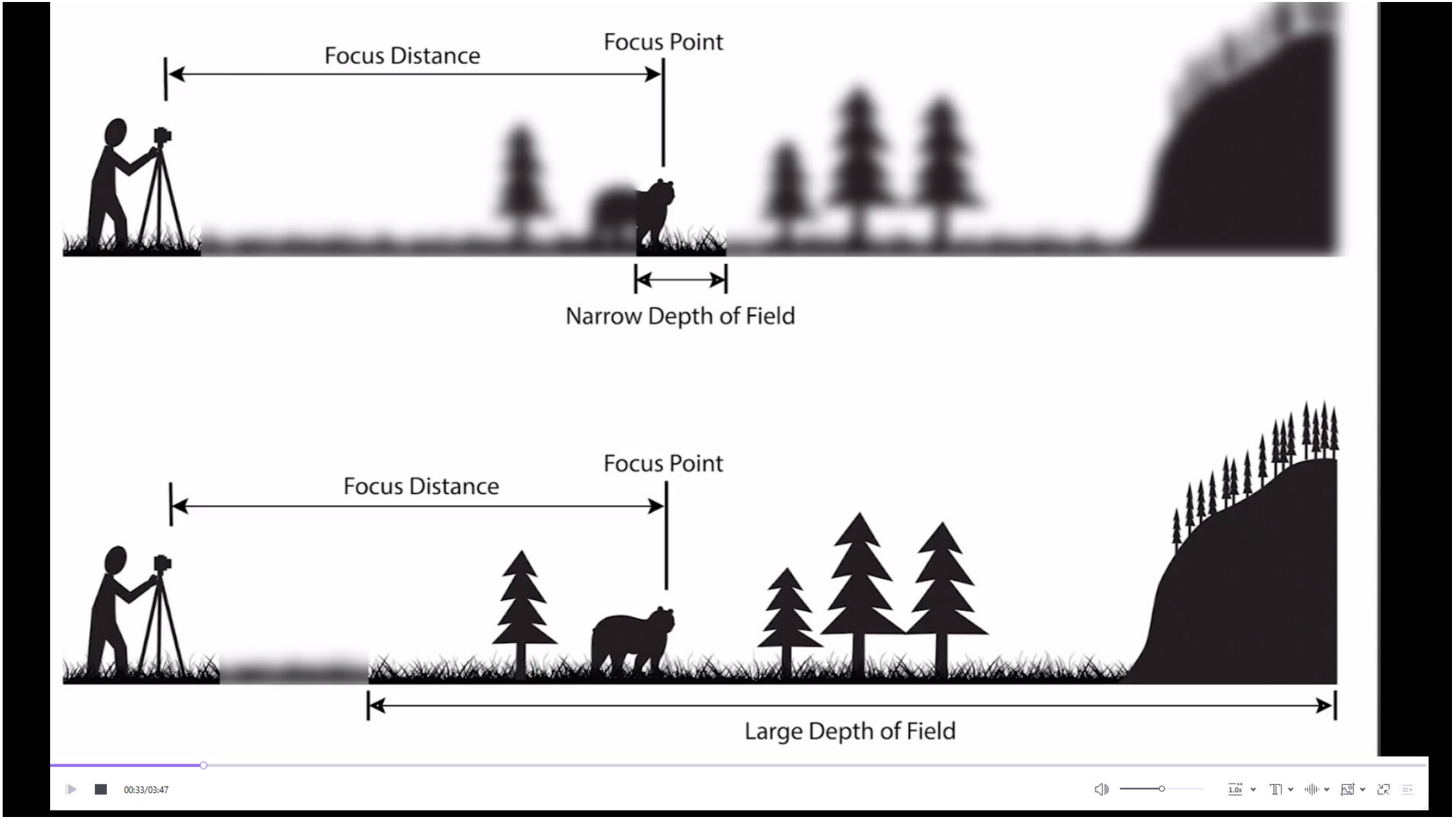
https://en.wikipedia.org/wiki/Depth_of_field#Factors_affecting_depth_of_field

Wikipedia Definition

The **depth of field** (**DOF**) is the distance between the nearest and the furthest objects that are in acceptably sharp focus in an image captured with a camera.

"Depth-of-field is determined by the distance from the nearest object plane in focus to that of the farthest plane also simultaneously in focus."

-Nikon


Focus Distance
Focus Point
Narrow Depth of Field
Focus Distance
Focus Point
Large Depth of Field
00:33/03:47

Key Words

- Lens
- Focus
- Pin Hole Lens
- Hyper Focal Distance Focussing
- View Camera Techniques
- Focus Stacking

Factors Effecting DOF

- Lens Selection: Focal Length of the Lens
- Lens Selection: Quality of the Lens
- Aperture Selected when taking the photographic image
- Distance closest and range to objects being photographed to be in focus
- Type of Camera used: Mobile; Compact; SLR; Large Format
- Use a Tilt/Shift Lens
- Exposure: Hand held?; Cable/Remote; Tripod;
- Photo Stacking: “in-Camera” or “Post Processing”

Lens Selection: Focal Length of the Lens

Standard Lens - 50 mm

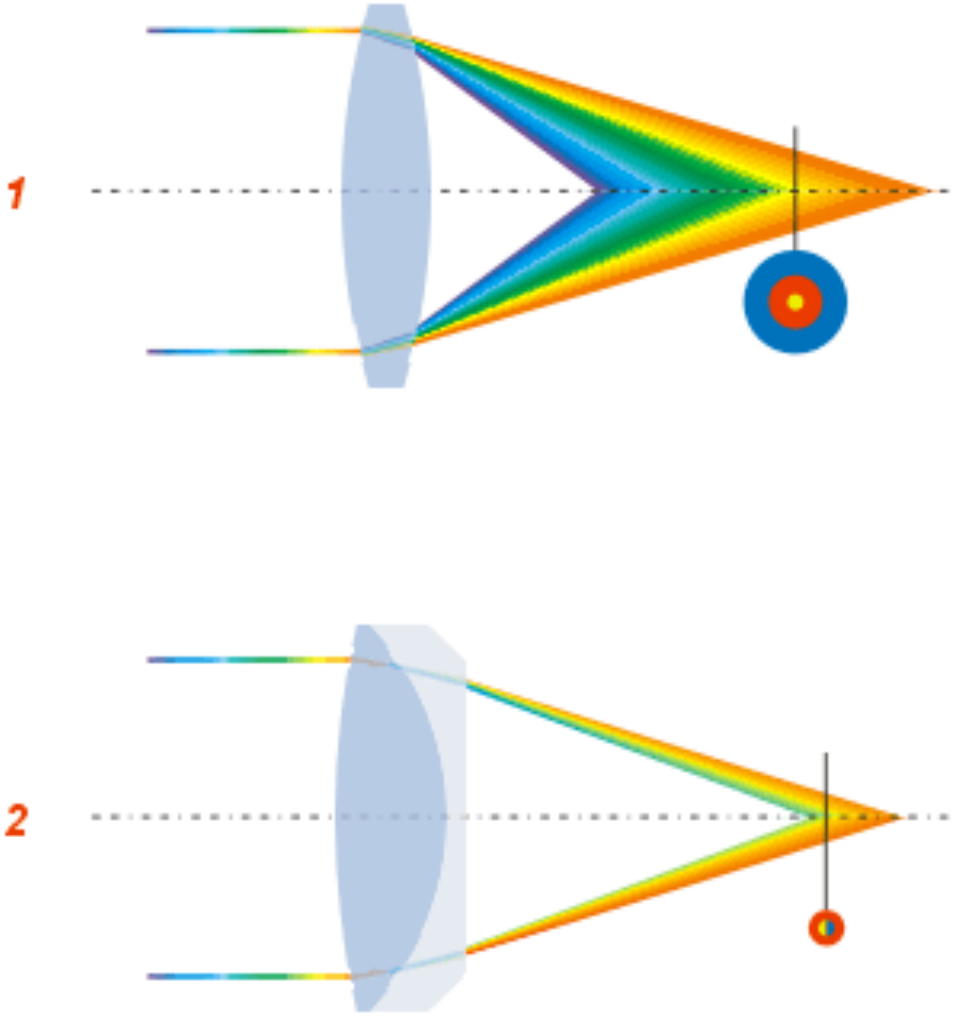
- Wide Angle Lens - 14 mm, 28 mm, …. – Higher DOF
- Telephoto Lens: - 200mm, 400 mm, 800 mm – Narrow DOF
- Macro Lenses – 50 mm. 100 mm, 180 mm
- Microscope Lenses ….

Lens Selection: Quality of the Lens

- Standard ‘Kit’ lenses – >> “Aberration” – low cost
- Multicoated High Quality lenses – Reduced “Aberration” - expensive
- Optical Aberration - “Distortion”/”Blurred”/”Soft Focus”
- Chromogenic Aberration – “Distortion”/”Blurred”/”Soft Focus”

Optical Aberration

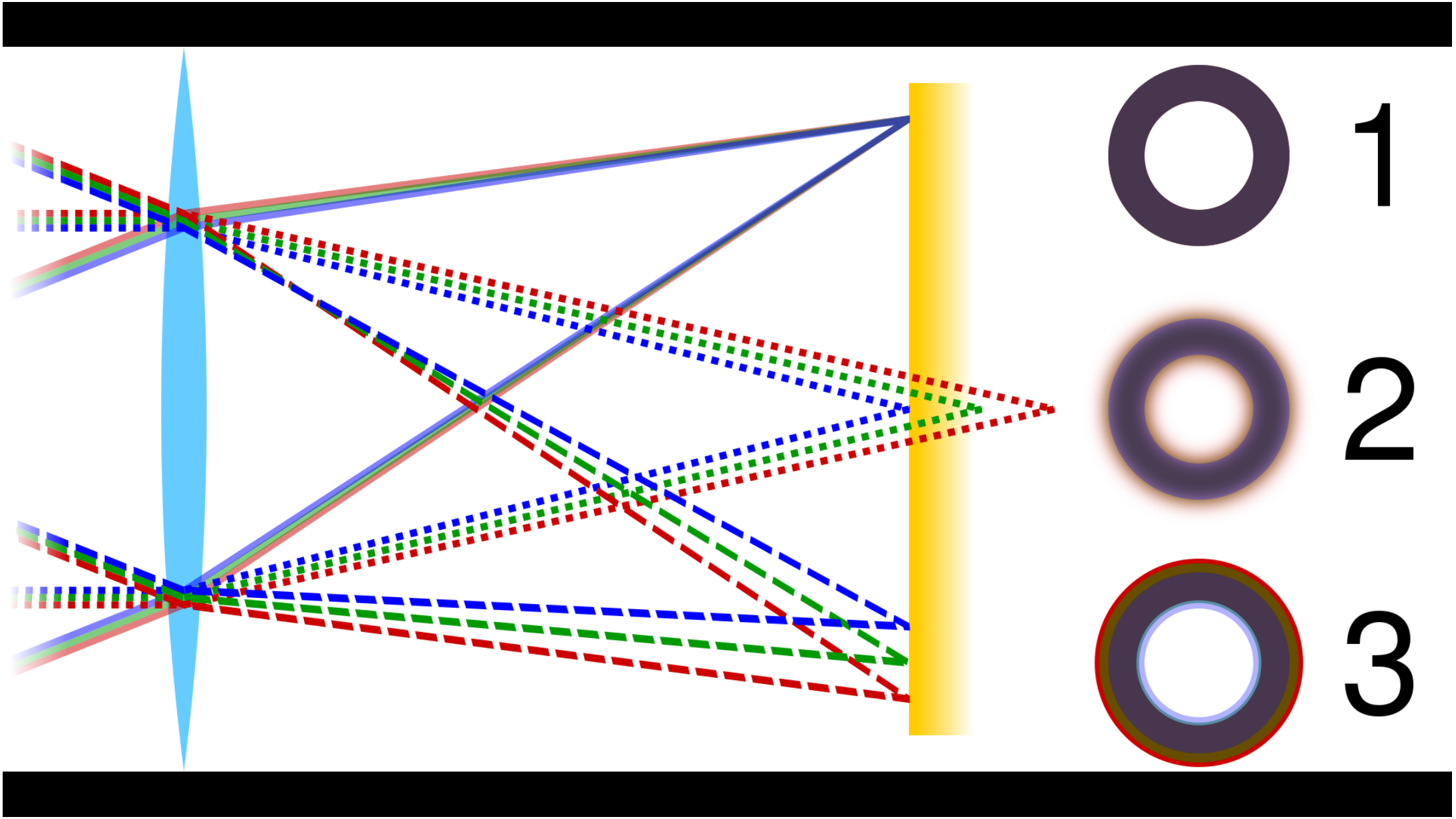
- In optics, **aberration** is a property of optical systems, such as lenses, that causes light to be spread out over some region of space rather than focused to a point.
- Aberrations cause the image formed by a lens to be blurred or distorted, with the nature of the distortion depending on the type of aberration.
- Aberration can be defined as a departure of the performance of an optical system from the predictions of paraxial optics.



Optical Aberration

Chromogenic Aberration

- In optics, **chromatic aberration** (**CA**), also called **chromatic distortion** and **spherochromatism**, is a failure of a lens to focus all colors to the same point.
- It is caused by dispersion: the refractive index of the lens elements varies with the wavelength of light.
- The refractive index of most transparent materials decreases with increasing wavelength.[2] Since the focal length of a lens depends on the refractive index, this variation in refractive index affects focusing.
- Chromatic aberration manifests itself as "fringes" of colour along boundaries that separate dark and bright parts of the image.


1
2
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DOF: “Distance closest and range to objects”

- Select an **aperture** which will give you the focussing range –
- Check your **exposure** for the lighting conditions.
- If hand held, you **might need to increase the ISO** for the sensor.
- If using a **tripod**, use a **cable release or remote release** for long exposures

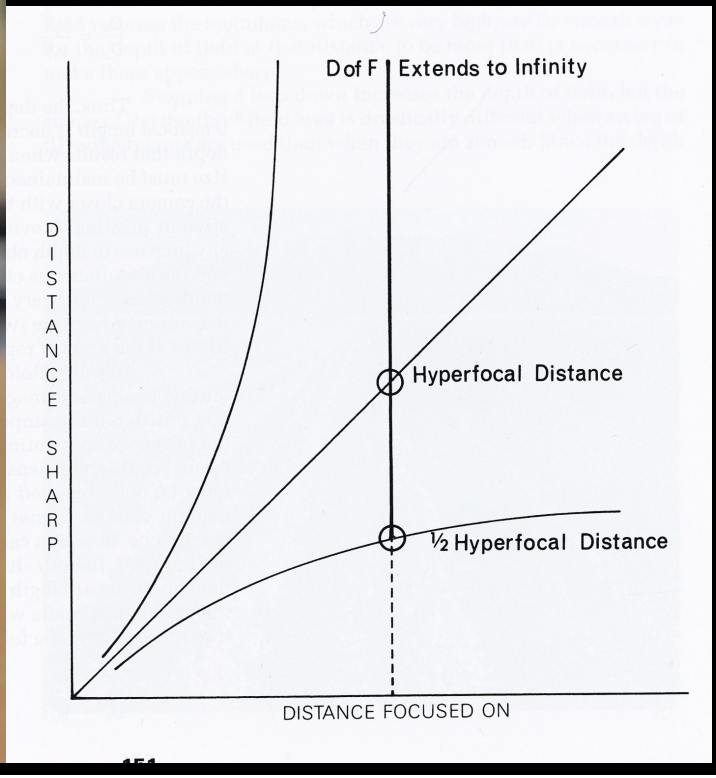
Aperture Selected when taking the photographic image


11 1.4 2 2.8 4 5.6 8 11 16
4 5 8 10 15 25 ft
1.2 1.5 2 3 5 10 ∞ m
16 11 8 4 2 0.95 2 4 8 11 16

Hyper Focal Distance

- In optics and photography, **hyperfocal distance** is a distance beyond which all objects can be brought into an "acceptable" focus.
- As the hyperfocal distance is the focus distance giving the maximum depth of field, it is the most desirable distance to set the focus of a fixed-focus camera.
- The hyperfocal distance is entirely dependent upon what level of sharpness is considered to be acceptable.

Hyper Focal Distance Focussing

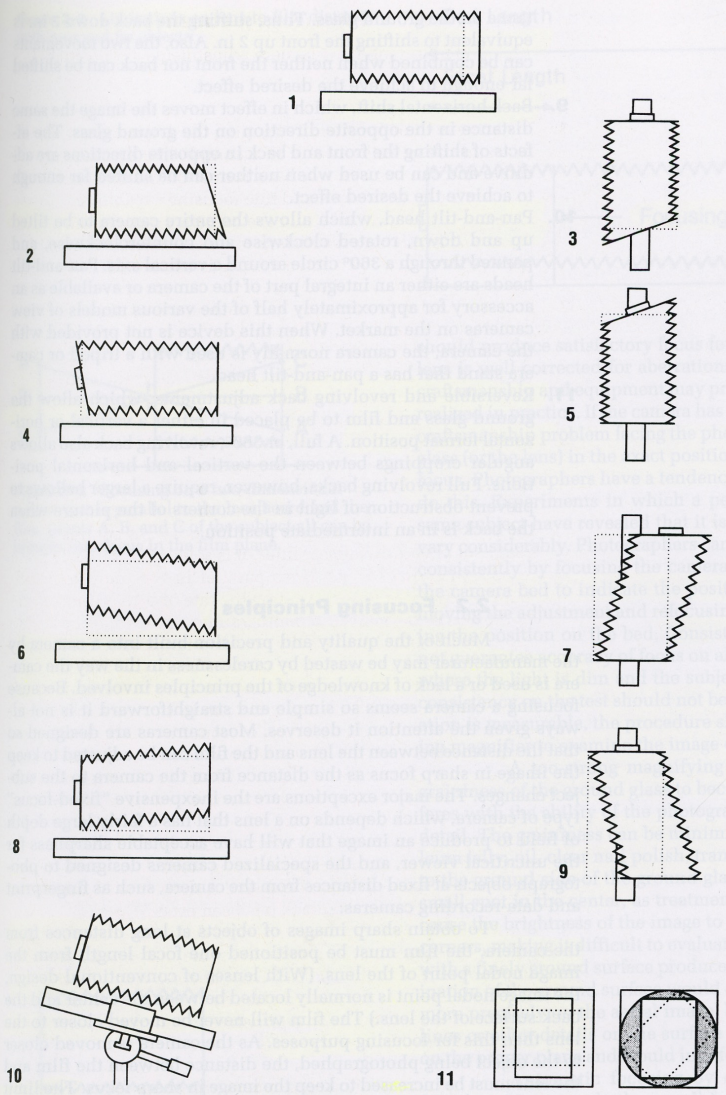



ft
15 5 3 2 1.5 1.25 1
m
∞ 2 1 0.7 0.5 0.4 0.35 0.3
22 16 11 8 5.6 4 2.8
22 16 11 8 5.6 4 2.8

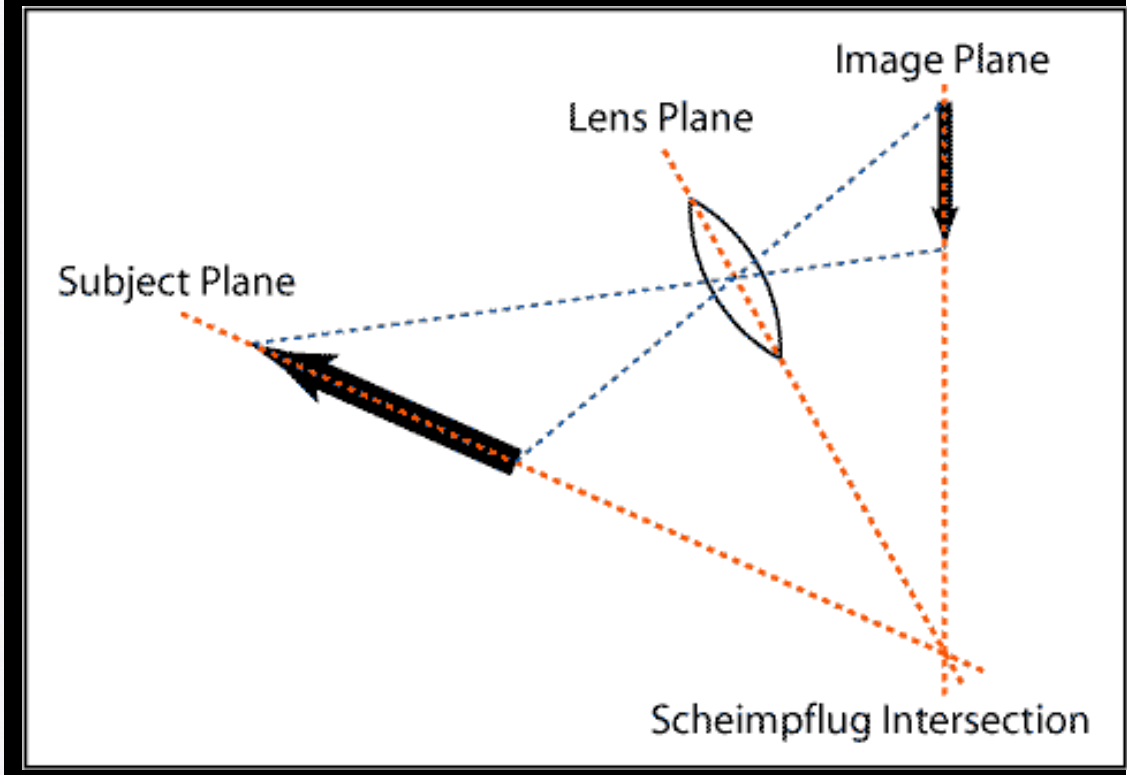

10 12 15 20 30 50 ∞
3 4 5 7 10 15 30
ft
m
PASSE
100
135
200
8
16
1: 3.9
32
f 300 mm
100 - 300
5.6 8 11 16 22 32

Type of Camera used

- **Compact Cameras** – *Lens – Aperture Control/Limited for DOF*
- **SLR Cameras** - *Lens – Aperture Control/Limited for DOF*
- **View/ Large Format Cameras** – *Tilt/Shift/Rotate Advantages for DOF and Perspective Correction*
- *Pin-Hole Camera – SLR/Medium Format/Large Format*



View Camera Controls



Tilt Shift Lens – Samyang:$1,172; CANON:$3,044

Fotodiox Pro TLT ROKR - Tilt / Sh

fotodioxpro.com/products/hbv-ef-tr

Apple | Disney | Apple (2) | ESPN | Twoo - Meet New P... | Gmail | Bing | Google | MalwareTips Blog | Squash Vic | Knox Park Squash | Favourites | Favourites (2) | EXOTIC BLACK BEA... | Getting Started | Other bookmarks

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FotodioX®
www.fotodioxpro.com

Lens Adapters | Lighting/Grip | Light Modifiers | WonderPana Filter System | GoTough GoPro Accessories | Other Gear

Fotodiox Pro TLT ROKR - Tilt / Shift Lens Mount Adapter for Hasselblad V-Mount SLR Lenses to Canon EOS (EF, EF-S) Mount SLR Camera Body




Sku: HBV-EF-TR

UPC: 847372043415

− 1 + $219.95 Add to Cart

or 4 interest-free payments of $54.99 with ZIP

Product Highlights:

- Adapter allows lens to 20mm total shift and 10 degrees of tilt
- 360 degrees of rotation built in
- Bring new life to vintage work horse lenses
- Enhanced craftsmanship and high-tolerance construction for demanding professionals
- Limited 2-Year Manufacturer Warranty

Canon EOS (EF & EF-S) Mount D/SLR Camera Compatibility List for Most Adapter Types

Canon EOS (EF, EF-S) Mount SLR Cameras - Popular models include:

- EOS 10D, 20D, 20Da, 30D, 40D, 50D, 60D, 60Da, 70D, 80D, 90D
- EOS 5D/II/III/IV, 5DS/R, 6D/II, 7D/II
- EOS 1D/II/IIN/III/IV, 1Ds/II/III, 1D C, 1D X/II
- EOS Rebel, XT, XS, T1i-T7i, SL1, SL2, SL3

Hide

Please be aware that shipments may be delayed to the ongoing COVID-19 pandemic. Please visit usps.com or ups.com to see if your delivery may be impacted.

9:00 PM
Thursday
29/09/2022

Pin Hole Cameras

- Camera Body “Adapter” + 1.0 cm Drilled Hole + “Pin Hole in Alfoil”
- Large DOF
- Disadvantage – “Soft Focus – compared to Qauality Lens
- Applications: “Art Images – Cyanotype, VanDyke Brown – Alternative Emulsions”

Focus Stacking - Technique

- *Exposure of MULTIPLE IMAGES of the object/scene – without moving the camera – Use a Focussing Rail fine adjustment*
- *MERGING the photos - either manually or with automated software – such as Photoshop…..*
- *EVALUATIING the final "stacked image" – for further "post processing"*

Photo Stacking: “in-Camera” or “Post Processing”

- Which cameras can create focus stacked images?
- 1 OM-D E-M1 Mark II. The replacement to the Olympus OM-D E-M1, the E-M1 Mark II brings a higher resolution (20.4Mp) sensor, significantly improved ... 2 OM-D E-M1 (firmware version 4.0) 3 Olympus OM-D E-M5 Mark III. 4 OM-D E-M5 Mark II (firmware version 4.0) 5 OM-D E-M1X. More items

Focus Stacking – for DOF

- Macro Photography - Focus Stacking – improved DOF
- Landscape – Focus Stacking – improved DOF

Tilt/Shift Lenses
Perspective and DOF Assistance

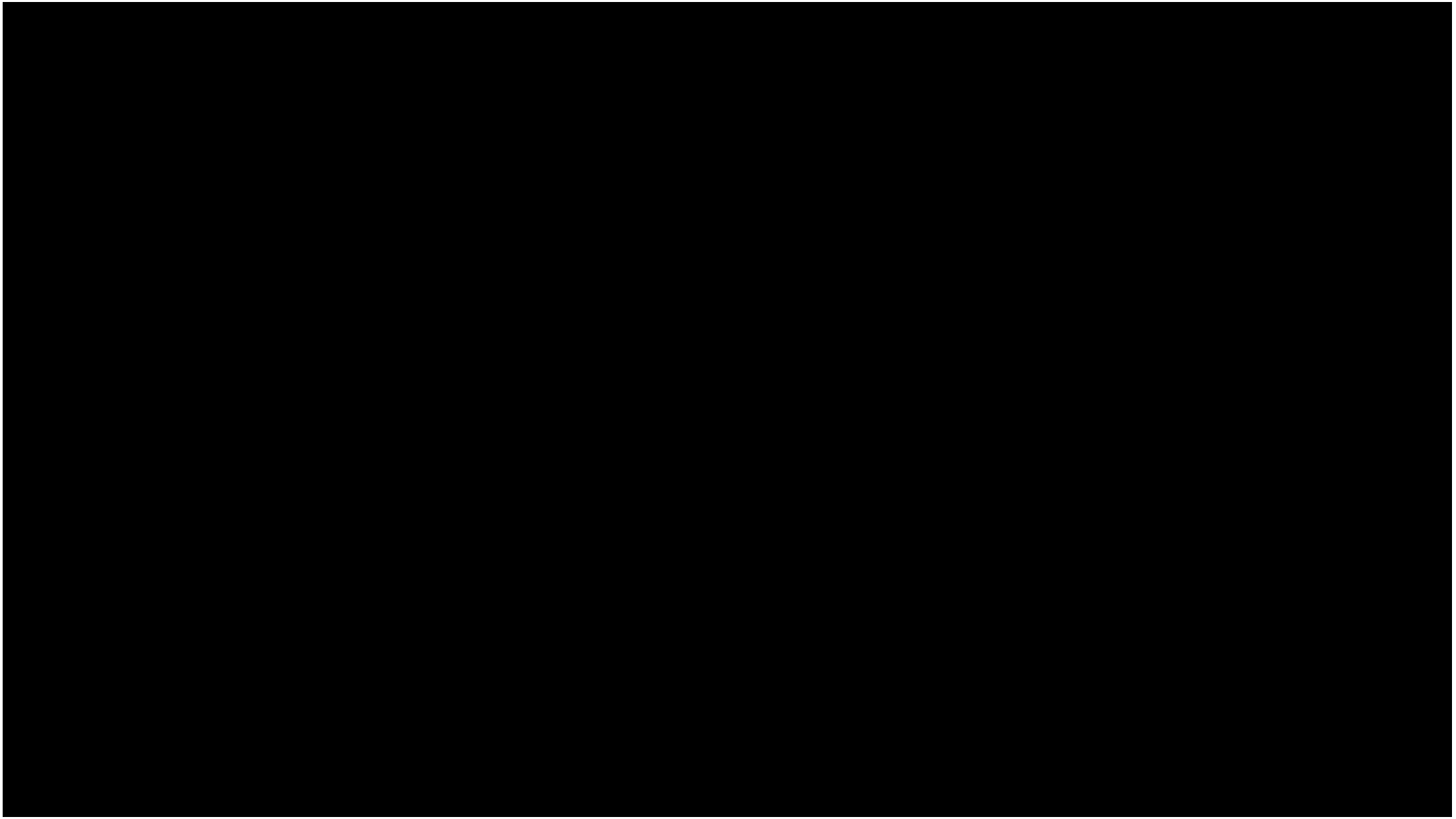
- Similar advantages to View Camera Techniques
- Better Perspective Control – “Converging Buildings” – Architecture
- Better DOF Control (with Aperture Control) – “Landscapes”

Macro Photography DOF

- Use a Tripod
- Use a Focussing Rail
- Use Small Apertures – f/16; f/32..

British Museum Insects
Extreme DOF Technique

MICRO PHOTOGOGRAPHY –INSECTS – BRITISH MUSEUM



Check List

- Power Point Presentation
- Laser Pointers
- Catalogues
- “Pin Hole Camera”
- Large Format – 5 x 4
- Tilt/Shift Lens
- Lenses
- Cameras