

# Mirrorless Cameras 101

Heard Nature Photographers

Saturday Morning Class, March 9, 2019

**Peter Gilbert**



*"For God's sake, Edwards. Put the laser pointer away."*

# Agenda

1. Mirrorless Defined
2. Differences – Advantages – Disadvantages Vs. DSLRs
3. Choosing a Camera/System - Considerations
4. Accessories
5. Lens Choices – Considerations
6. Learn **Your** Sweet Spot
7. Resources
8. Questions (and hopefully, Answers)

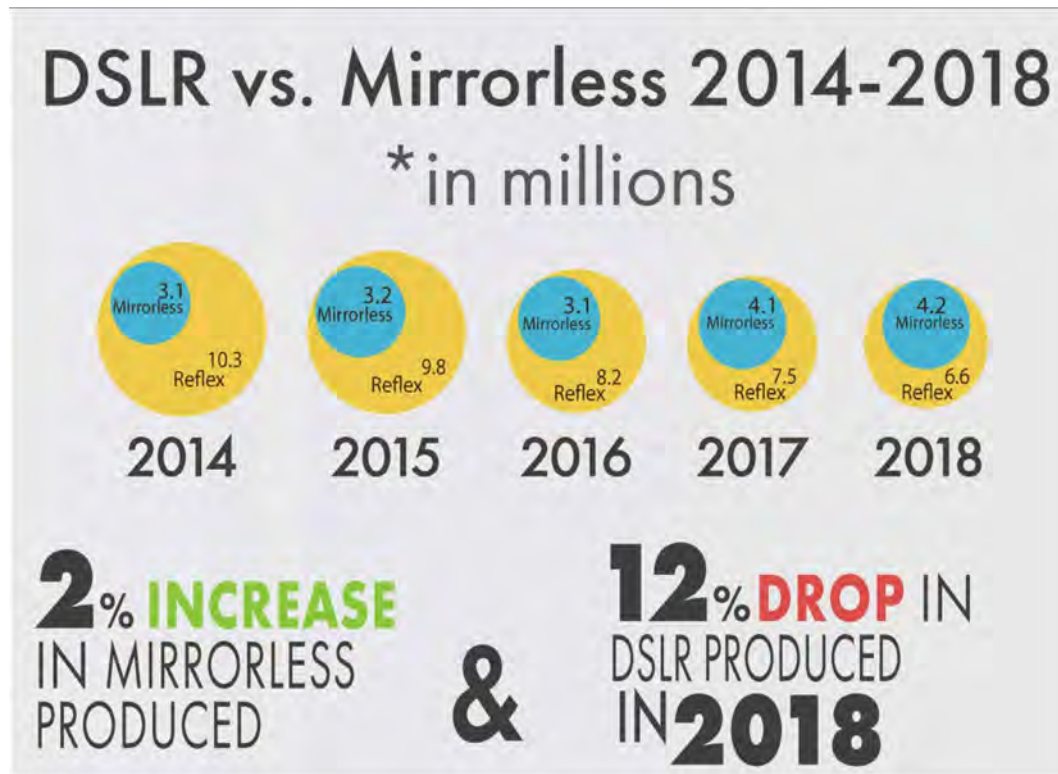
# Definition of “Mirrorless”

- Concept started in 2004 (Epson), became more popular in 2008 with  $\mu$ 43 (Panasonic)
  - Originally called EVIL cameras (!) “Electronic Viewfinder Interchangeable Lens”
  - EVIL morphed into “CSC” – Compact System Camera
  - Generally now called MILC (Mirrorless Interchangeable Lens Camera); or just “Mirrorless”
- Not rangefinder (think: Leica); or P&S; or LF (think: View Cameras); or cell phones
- Not normally including GoPro or Drones, or (dedicated) Video Cameras
- 2013 saw Sony introduce first full-frame mirrorless models

# What's Different?

- Well – No big swinging mirror!
  - Quieter, less vibration
- No optical viewfinder – the EVF (electronic viewfinder) is in essence a small TV monitor
  - So – no mirror lock-up feature; not needed
- Focusing and metering made **directly off the sensor**
- Body can be made smaller and lighter than DSLR, fewer moving parts
  - Lens flange back distance much shorter than DSLR, so thinner body possible

# Mirrorless is Growing...



...even as total ILC market is shrinking

# Advantages of Mirrorless

- **Smaller and lighter** body
- **Quieter** (with electronic shutter)
  - **Less vibration** (especially using electronic shutter option)
  - Focusing more accurate and fast (with newer sensors)
  - **“WYSIWYG”** – metering, white balance, focus can all be seen in real time in EVF or rear LCD
- Better, more convenient for video

# Advantages (Continued)

- Short flange distance means off-brand lenses can be used with adapters (some with AF and EXIF features)
- Faster burst rates (frames/second) possible ~ up to 20
- **Manual focusing made easy** with Focus Peaking feature
- Electronic Lens Contacts enable new features
  - Special features such as **Eye Focus**; Film Simulation; Pixel Shift



# Advantages Shooting Video

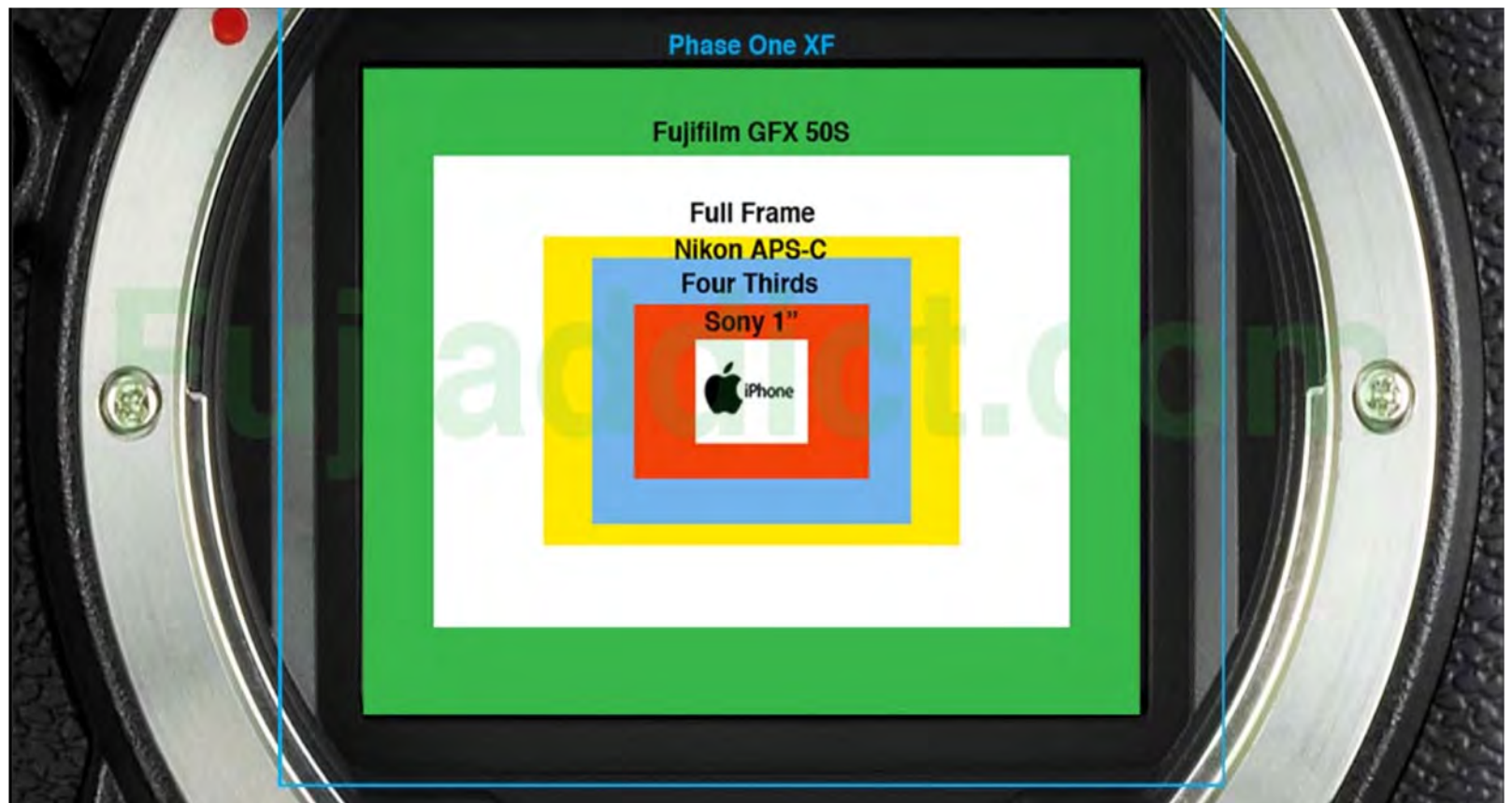


- Many affordable dedicated “Cine” lenses becoming available
- Light and portable rigs
- EVF is real time view
- Use LCD for touch focus
- Manual focus aids
- “Picture Style”/grading effects in camera

# Disadvantages

- Some people prefer optical viewfinder: **EVF is harder to use in low light**
- **Shorter battery life** (smaller battery; EVF/LCD fulltime)
- Size and weight advantage of mirrorless largely vanishes with longer lenses
- DSLR “Pro” cameras are more rugged and weatherproof
- Smaller bodies are hard to hold for some; and buttons are smaller and closely spaced
- AF-C (or, tracking) in DSLRs is more developed and reliable for the most part for fast-moving subjects
- Newer Mirrorless brands have **fewer native lenses available** at present (Canon R, Nikon Z, Panasonic-S/SL)

# Sensor Sizes Compared



1"

$\mu 4/3$

APS-C

FF

FF

MF

Order cameras by: [Height] [Width] [Depth] [Weight]

Nikon 1 V2

Olympus OM-D E-M1

FujiFilm X-T2

Sony A7R

Canon EOS 5D Mark IV

Pentax 645D



2.7x

2x

1.5x

1x

1x

0.8x

Crop Factor

# Olympus $\mu$ 43 Mirrorless



Professional Sports

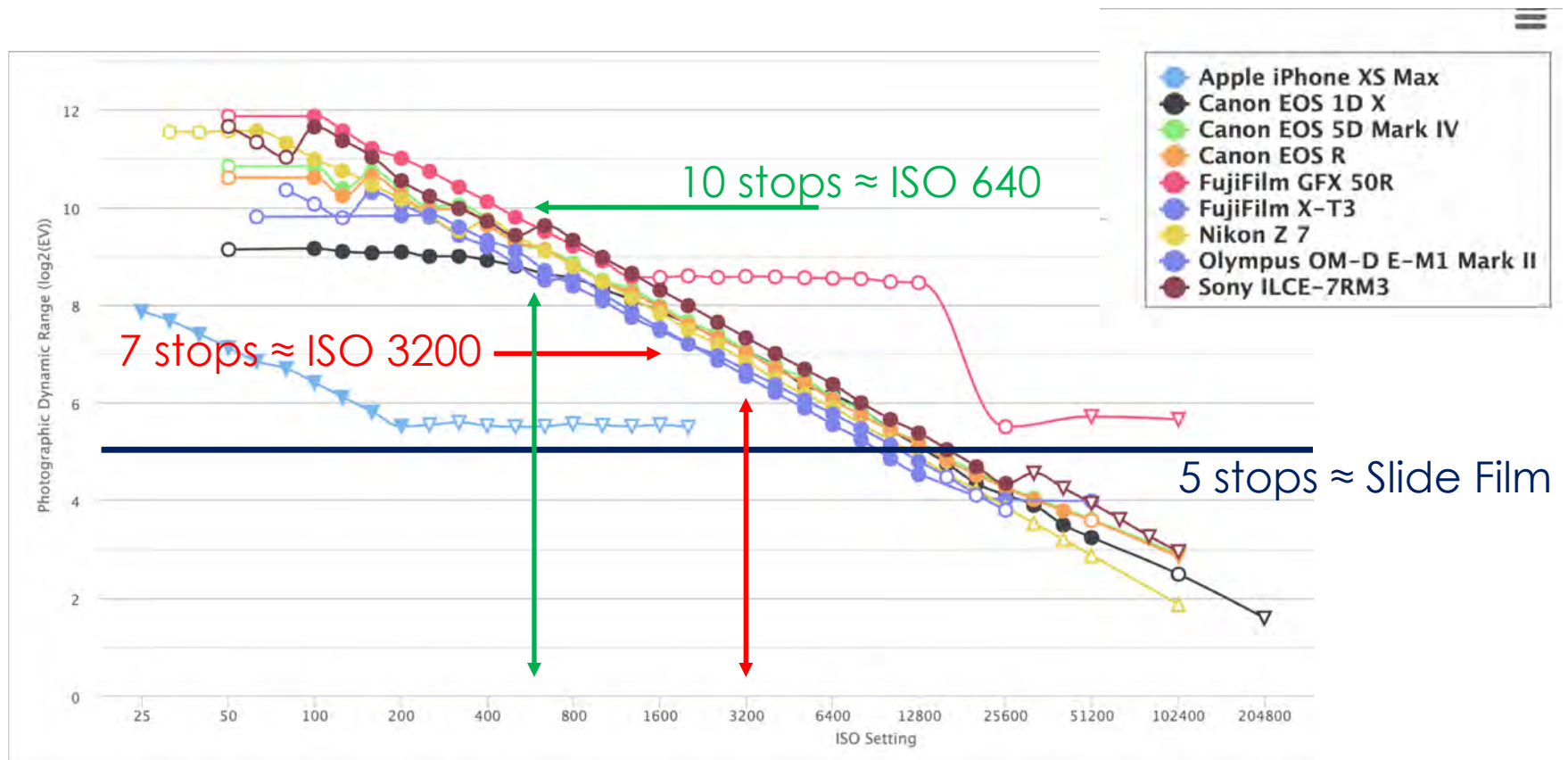
Everything Else

# What Size Sensor Do I Need

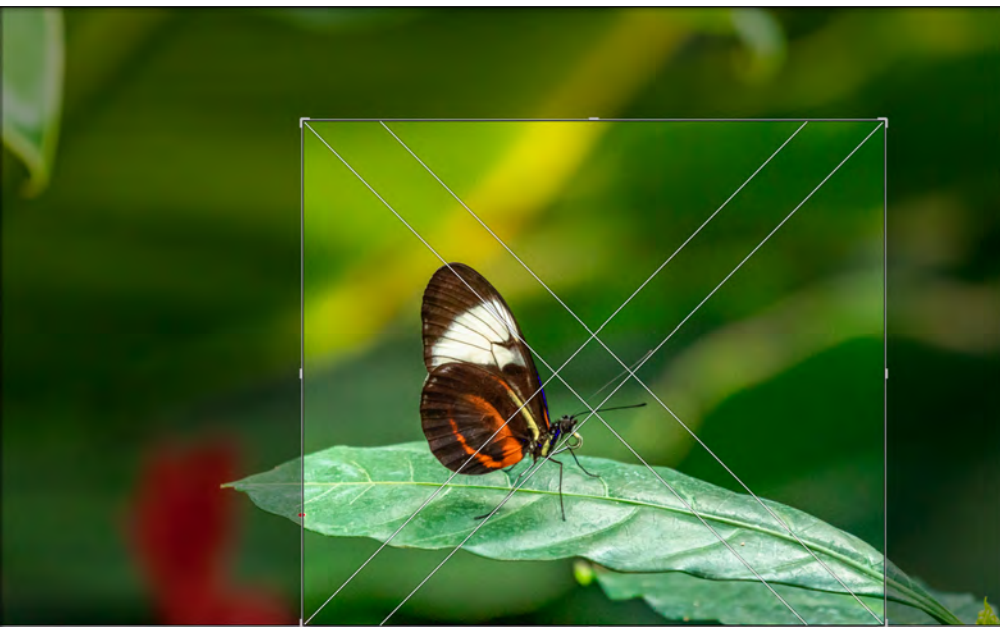
- Compare dynamic range
- Ability to crop
- Noise levels/fine details
- MPixels vs sensor size
- Image Stabilization
- Special tricks – pixel shifting, internal HDR processing etc.



# Dynamic Range V<sup>s</sup> Sensor Size



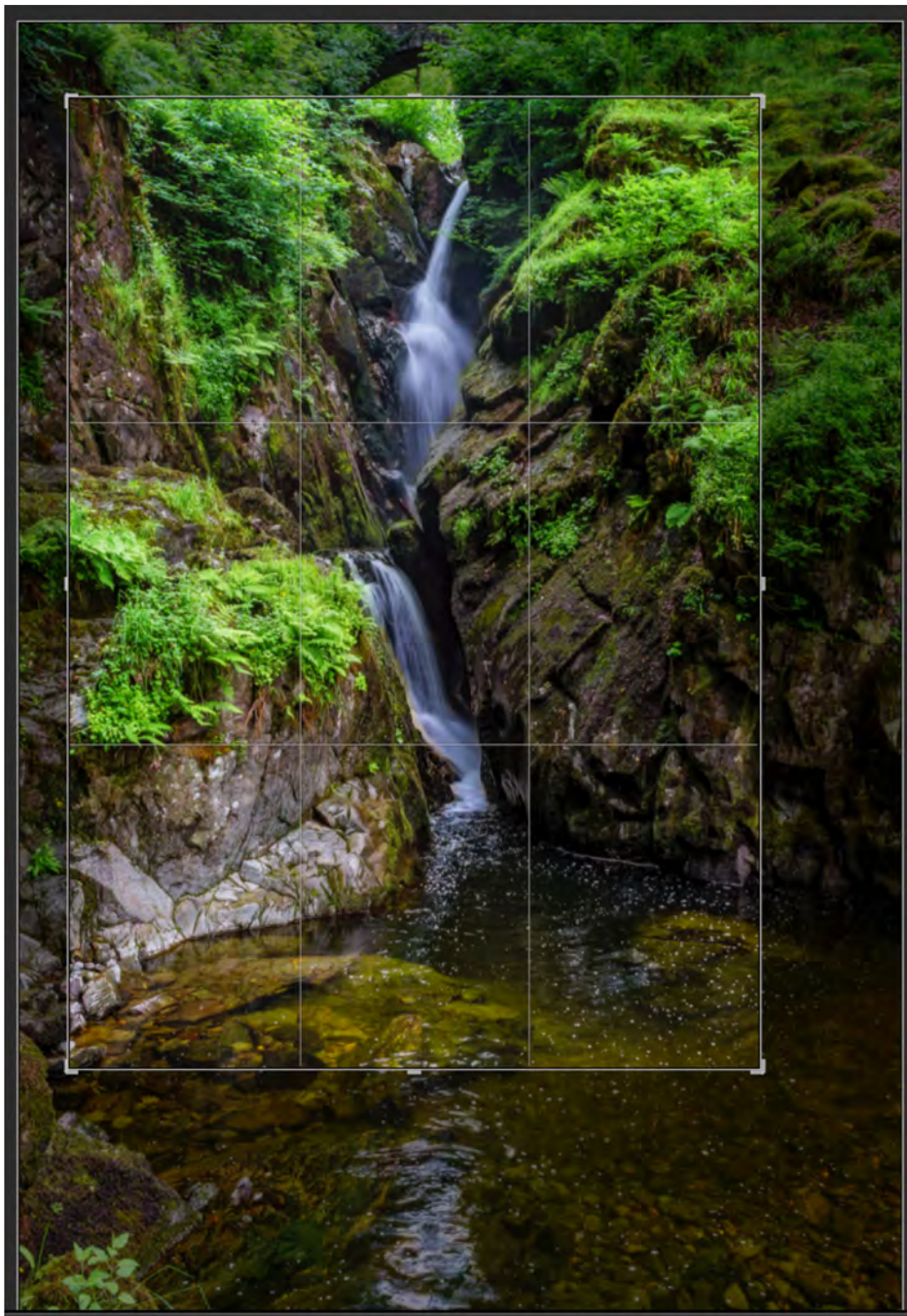
“Useful” DR = print or project without losing information or having excess noise



High MP and larger Sensor  
Provides plenty of scope for  
Cropping even shooting at  
High ISO (this handheld 300mm  
Shot at ISO 12800 with OIS active)







Shot with 85mm Prime lens  
From a viewpoint. Full Frame  
Gives you added flexibility when  
it's impossible to move closer

# Newest Canon and Nikon Models (The Empire Strikes Back....)

	
<b>Canon RP</b>	<b>Nikon Z6</b>
Mirrorless system camera	Mirrorless system camera
Canon RF mount lenses	Nikon Z mount lenses
26.2 MP, Full Frame Sensor	24.3 MP, Full Frame Sensor
4K/30p Video	4K/30p Video
ISO 100-40000 (50-102400)	ISO 100-51200 (50-204800)
Electronic viewfinder (2360k dots)	Electronic viewfinder (3690k dots)
3.0" LCD, 1040k dots	3.2" LCD, 2100k dots
Swivel touchscreen	Tilting touchscreen
5 shutter flaps per second	12 shutter flaps per second
<del>In-body stabilization</del>	In-body stabilization
Not weather sealed	Weathersealed body
133 x 85 x 70 mm, 485 g	134 x 101 x 67 mm, 675 g

\$1299 body

\$1995 body

# Canon & Nikon Mirrorless Lenses

**2018**

RF 24-105mm F4L IS USM

RF 50mm F1.2L USM

RF 35mm F1.8 MACRO IS STM

RF 28-70mm F2L USM

Mount Adapter EF-EOS R

Control Ring Mount Adapter EF-EOS R

**2019**

Drop-in Filter Mount Adapter EF-EOS R

RF 15-35mm F2.8L IS USM

RF 24-70mm F2.8L IS USM

RF 70-200mm F2.8L IS USM

RF 24-240mm F4-6.3 IS USM

RF 85mm F1.2L USM

RF 85mm F1.2L USM DS

**2019**

S-Line NIKKOR Z 58mm f/0.95 S Noct

S-Line 20mm f/1.8

S-Line 85mm f/1.8

S-Line 24-70mm f/2.8

S-Line 70-200mm f/2.8

S-Line 14-30mm f/4

**2020**

S-Line 50mm f/1.2

S-Line 24mm f/1.8

S-Line 14-24mm f/2.8

NikonRumors



# Canon RP Compared With Sony A7iii



## Canon RP

Mirrorless system camera  
Canon RF mount lenses  
26.2 MP, Full Frame Sensor  
4K/30p Video  
ISO 100-40000 (50-102400)  
Electronic viewfinder (2360k dots)  
3.0" LCD, 1040k dots  
Swivel touchscreen  
5 shutter flaps per second  
~~In-body stabilization~~  
Not weather sealed  
133 x 85 x 70 mm, 485 g

\$1299 body



## Sony A7 III

Mirrorless system camera  
Sony E mount lenses  
24 MP, Full Frame Sensor  
4K/30p Video  
ISO 100-51200 (50-204800)  
Electronic viewfinder (2359k dots)  
3.0" LCD, 922k dots  
Tilting touchscreen  
10 shutter flaps per second  
In-body stabilization  
Weathersealed body  
127 x 96 x 74 mm, 650 g

\$1799 body

# FF Mirrorless with 24~105mm Lenses (Nikon Z7 with 28~70)



# Mirrorless Vs. DSLR with standard zoom (24~70mm eq.)



Fuji: 1.9 lbs

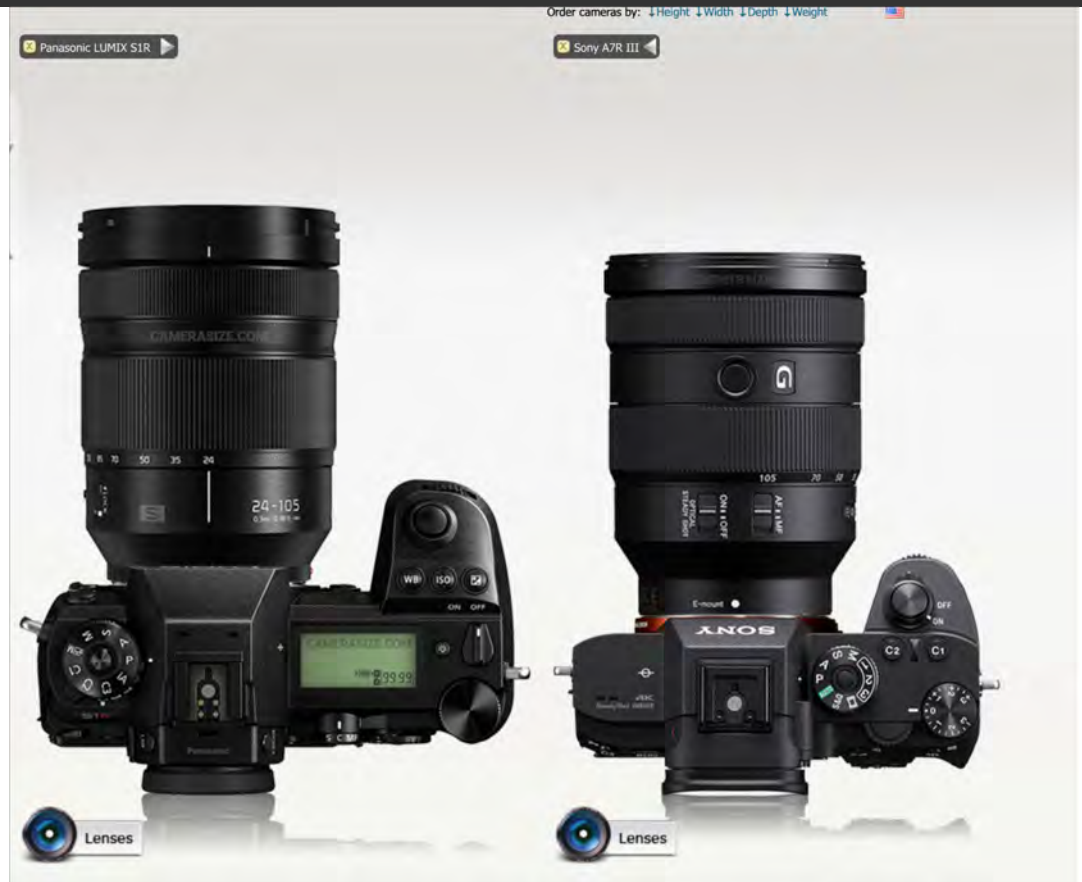
Sony: 2.7 lbs

Canon: 3.5 lbs

# New Panasonic FF Mirrorless



Authorized Dealer



3.75 lbs

2.90 lbs

# Mirrorless Vs. DSLR with 100~400mm Lenses



Fuji: 4.2 lbs

Sony: 4.5 lbs


Canon: 5.3 lbs



# Accessories

- ▣ Adapters (for off-brand or same-brand legacy lenses)
- ▣ Flashes
- ▣ Tripods
- ▣ Remote Controllers
- ▣ Camera Bags
- ▣ 3rd-Party Lenses
- ▣ Others
- ▣ “Backwards” Compatibility of Brand Accessories

# Most Popular Smart Adapter for Sony



The image shows a Metabones EF-E mount T adapter, a black and silver ring that connects Canon EF/EF-S lenses to Sony E-mount camera bodies. The adapter is shown from a three-quarter perspective, highlighting its internal electronic contacts and the mounting flange. The Metabones logo is visible on the top and bottom of the adapter. To the right of the adapter is a yellow badge that reads '#1 SELLER' with a trophy icon.

**metabones**

**#1 SELLER**

**In Stock**  
Order **now** to ship **Mon Feb 11**  
**Free Expedited Shipping**


**Product Highlights**

- Canon EF/EF-S Lens to Sony E-Mount Body
- Works with Full-Frame and APS-C Cameras
- Switch for In-Body Image Stabilization
- Support for Phase- & Contrast-Detect AF

[Show more](#)

★★★★★ Reviews 69    60 Questions, 114 Answers

Style: Standard



# Canon & Nikon Mount Adapters

## Canon Control Ring Mount Adapter EF-EOS R

B&H # CAMAEFRFCR

**Canon**  
Authorized Dealer



### In Stock

Order in the next **1:45:57** to ship **today**

**Free Expedited Shipping**

### Product Highlights

- Canon EF/EF-S Lens to EOS R Camera
- Maintains AF and Image Stabilization
- Configurable Control Ring
- Dust- and Water-Resistant

★★★★★ Reviews 16 10 Questions, 18 Answers

### Style: With Control Ring

☐ Standard ☒ With Control Ring

☐ With Drop-In Circular Polarizer Filter

☐ With Drop-In Neutral Density Filter

## Nikon FTZ Mount Adapter

B&H # NIFTZ • MFR # 4185



### In Stock

Order in the next **1:44:30** to ship **today**

**Free Next Day Delivery (USA)**

### Product Highlights

- Nikon F Lens to Nikon Z-Mount Camera
- Maintains AF/AE with E, G, D Lenses
- Retains Infinity Focus
- Integrated 1/4"-20 Mount

★★★★★ Reviews 4 16 Questions

..and just announced – this...

**KIPON®**

CP+2019 YOKOHAMA  
Feb28-Mar3  
Booth No. G-19



Zマウント-カメラ

EFレンズ

世界初 **CANIKON** オートフォーカス アダプター 誕生！！

The image is a promotional graphic for the KIPON CANIKON autofocus adapter. It features three main components: a Nikon Z-mount camera body on the left, a central KIPON CANIKON adapter with the brand name in Cyrillic, and a Canon EF lens on the right. The adapter is shown with a blue and white color scheme. The text '世界初 CANIKON オートフォーカス アダプター 誕生！！' (World's first CANIKON autofocus adapter born!!) is prominently displayed at the bottom. The event information 'CP+2019 YOKOHAMA Feb28-Mar3 Booth No. G-19' is in the top right corner.

Mount Canon EF lenses on Nikon Z mirrorless body

# Canon Lens Mounted on Nikon Z 7



# Godox Flashes

Godox

KIT



**In Stock**

Order **now** to ship **Mon Feb 11**

**Free Expedited Shipping**

## Product Highlights

- Built-In 2.4 GHz X Wireless Radio System
- Compatible with Sony ADI / P-TTL
- Guide Number: 197' at ISO 100 and 200mm
- Zoom Range: 20-200mm (14mm with Panel)

[Show more](#)

★★★★★ Reviews 8

8 Questions, 17 Answers

Configuration: With X1T Trigger

Flash Only

With X1T Trigger

With XPro Trigger

TTL System: Sony

Canon

Fujifilm

Nikon

Olympus/Panasonic

Sony



# Nissin Flashes

## Nissin i400 TTL Flash for Fujifilm Cameras B&H # NIND400FJ • MFR # ND400-FJ

**Nissin**

Authorized Dealer



### In Stock

Order **now** to ship **today**

**Free Expedited Shipping**

### Product Highlights

- Compatible with Fujifilm TTL
- Guide Number: 131' at ISO 100 and 105mm
- Zoom Range: 24-105mm (16mm with Panel)
- Tilts Upward 90°

[Show more](#)

★★★★★ [Reviews 2](#) [Q&A](#)

Compatibility: **Fujifilm**

Canon

**Fujifilm**

Micro Four Thirds

Nikon

Sony

# Manfrotto BeFree CF Travel Tripod


MFR # MKBFRTC4-BHUS




[https://www.bhphotovideo.com/c/product/1408034-REG/manfrotto\\_mkbfrtc4\\_bhus\\_befree\\_advanced\\_carbon\\_fiber.html](https://www.bhphotovideo.com/c/product/1408034-REG/manfrotto_mkbfrtc4_bhus_befree_advanced_carbon_fiber.html)



# Popular 3<sup>rd</sup> Party Mirrorless Lenses



Alternate View



**In Stock**  
Order **now** to ship **today**  
**Free Expedited Shipping**

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**Product Highlights**



- Fujifilm X-Mount Lens
- 18mm (35mm Equivalent)
- Aperture Range: f/2.0 to f/22
- One Aspherical & One Hybrid Element

[Show more](#)

★★★★★ [Reviews 42](#) | [3 Questions, 10 Answers](#)

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Color: **Black**



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Mount: **Fujifilm-X**

Sony-E **Fujifilm-X** Micro Four Thirds

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Configuration: **Lens Only**

**Lens Only**

# Prime V<sup>s</sup> Zooms

- Primes are generally cheaper, smaller, lighter and faster than zooms
  - Inexpensive primes can be as good or better than expensive zooms
  - Better in low light situations
  - Better for shallow DOF (e.g. portraits)
- Zooms are more flexible – several focal lengths in one package
  - But generally larger, heavier and slower (smaller maximum aperture)
  - Many 4x or higher zoom ratio lenses are weaker at the longer end

# Primes V<sup>s</sup> Zooms

- With 42MP FF and higher sensors now available, you can easily crop from a wide shot made with a good prime.
  - But zooms are still desirable when
    - You can't move physically to recompose a shot
    - You don't want to be changing lenses in dusty/wet conditions
    - You value convenience over ultimate image quality
- Some “Premium” zooms e.g. Sony's “GM” line are as good if not better than corresponding “normal” Prime lenses
  - But they are heavy and expensive

# Zoom Versus Prime Lenses



24~70mm/f2.8

25mm/f2

55mm/f1.8

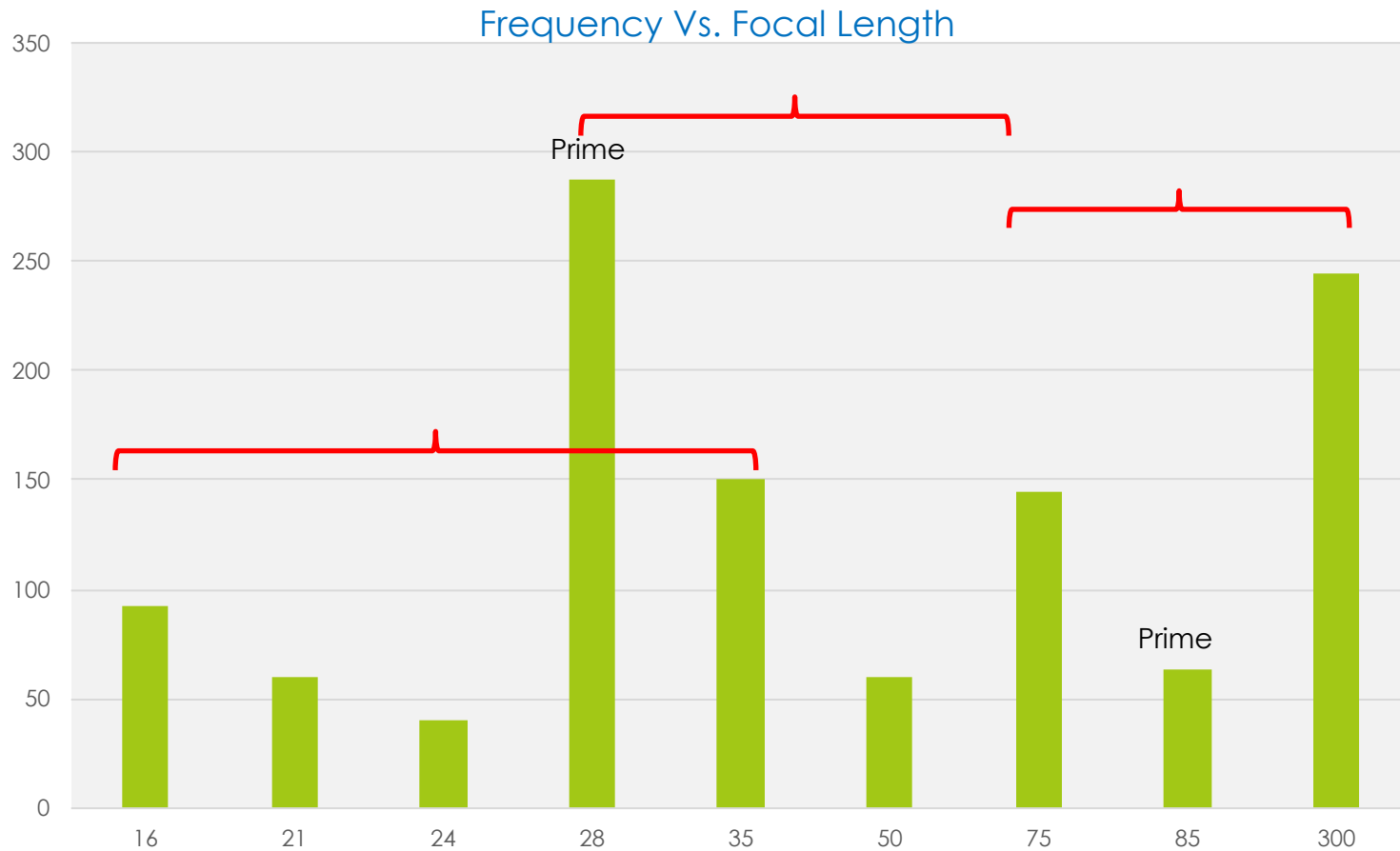
85mm/f1.8

# Choosing Lenses



Pick any two

# What Focal Lengths do You Prefer?



# All-in-One Lens Solution (approx. 28~200mm equivalent)



2.5 lbs

2.3 lbs

3.1 lbs

# Camera Vs. Camera System

- Canon & Nikon offering “smart” adapters so existing DSLR lenses can be used (more weight and bulk though)
  - Specialty lenses and older Nikon F lenses might have only limited compatibility
- Existing Canon & Nikon flashes can be used (*iTTL Nikon flashes work with Z6 and Z7 – SB800 and newer*)
- Sony E (FE) has a large number of lenses available now both branded and 3<sup>rd</sup> Party
  - B&H lists 162 FE (full-frame) and 95 E (APS-C crop) lenses for Sony
- Fuji has a well-developed and excellent lens line
  - B&H lists 142 Fuji X (and some 3<sup>rd</sup> Party) lenses
- μ43 system (Olympus & Panasonic) lenses interchangeable but not all lens features always available
  - B&H lists 170 μ43 lenses in total



# Your Camera & Lens Choice(s)

- The best camera is the one **you** carry with you
  - Do **you** normally drive or hike to each shooting location? How far can **you** hike?
- The best lenses are the ones **you** take with you
  - How much are **you** willing/capable of carrying, and for how long?
- The latest technology is nice but not always needed.
  - Will **you** use all the bells & whistles?
  - How important to **you** are AF features like fast AF-C (Tracking) & Eye-AF?
- Do **you** like to shoot at night or low light?
  - What is **your** tolerance for image noise at higher ISO settings?
- What do **you** intend to do with your images?
  - Print them? What size?
  - Web only?

# What is Your Sweet Spot?

■ For **you** there is a right combination of –

- Sensor Size
- Size/Weight (body, lenses, accessories)
- Cost (body, lenses, accessories)
- AF (and MF too!) Features & Performance
- Noise/Dynamic Range

Prioritize these items

■ ***“Never give up something without getting a commensurate benefit”*** – Thom Hogan ([sansmirror.com](http://sansmirror.com))

# OK... So What's the Answer?

■ You value small size/light weight →  $\mu$ 4/3 **Oly/Pana**

■ You value highest IQ & low light capabilities → FF - \*\*

■ You want



→ APS-C **Fuji**

**\*\*** *Go with your existing brand if you want to use your lenses*

# New AF Features.... “Real-Time Tracking”

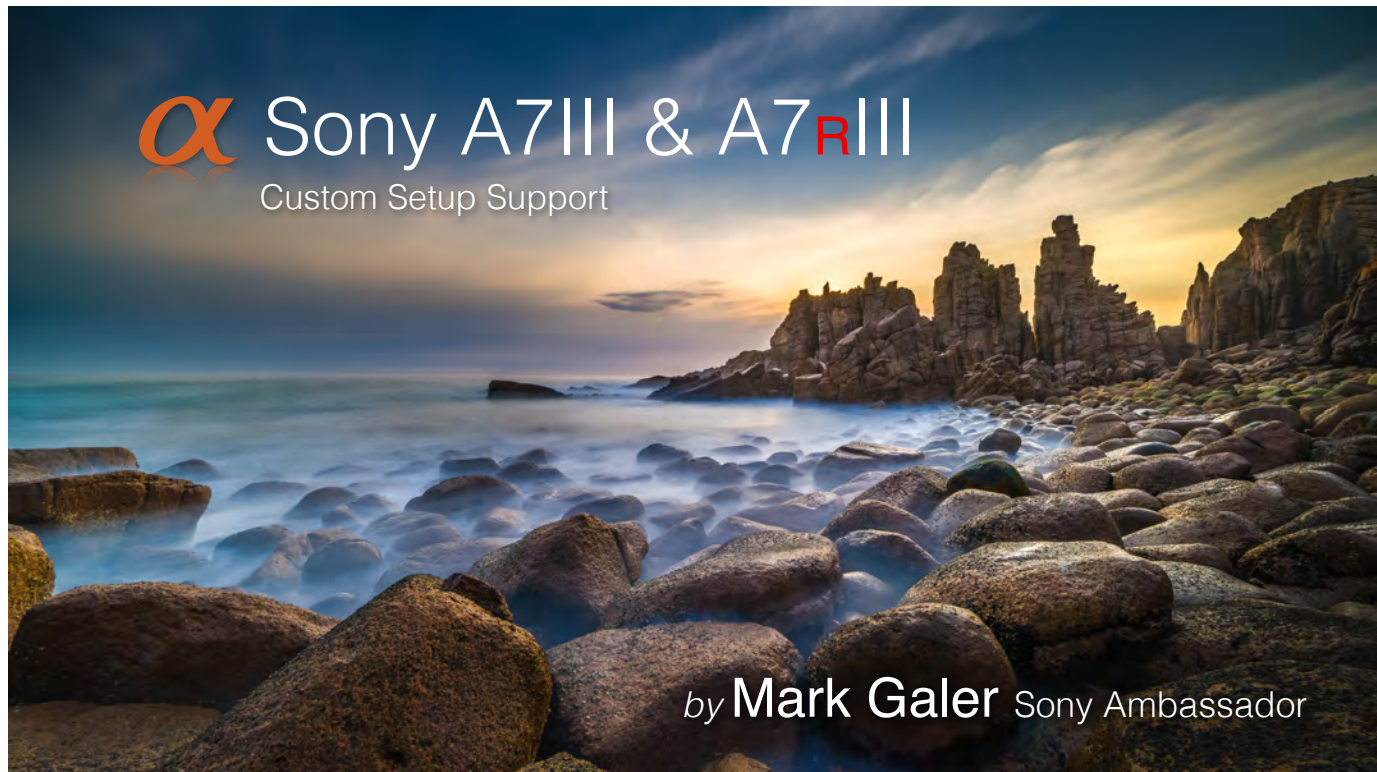


“Automatic” Auto Focus

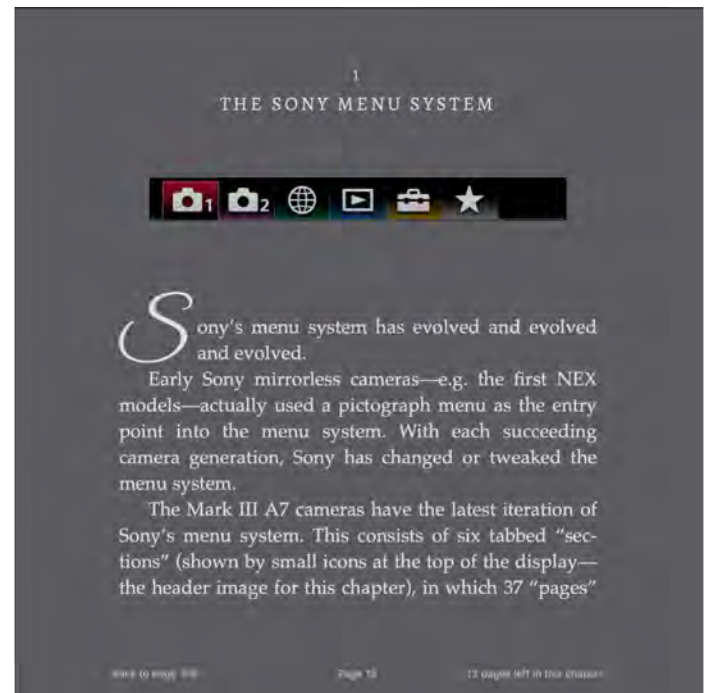
# Resources Available

- ▣ YouTube Tutorials
- ▣ Printed Books
- ▣ E-Books
- ▣ Friends and Fellow Photographers
- ▣ And failing all else – the Camera Manual!

# Free YouTube (or Author Website) Tutorials – Sony Example



# Thom Hogan Books (Print & e-Book)





## Questions & Answers



# Process Fuji X RAW Files (.RAF)





*That's all Folks!*