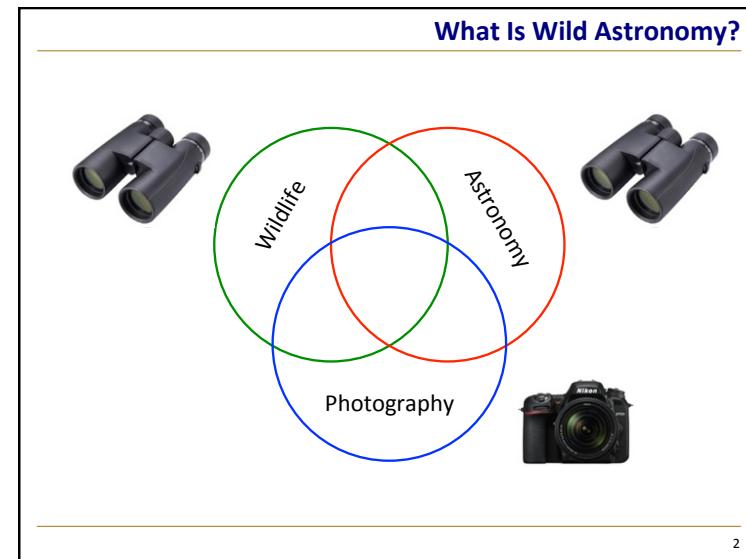


Wild Astronomy

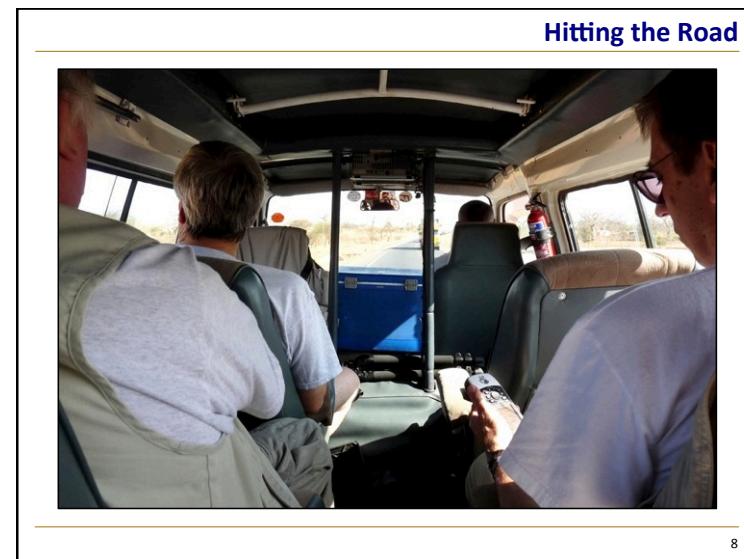
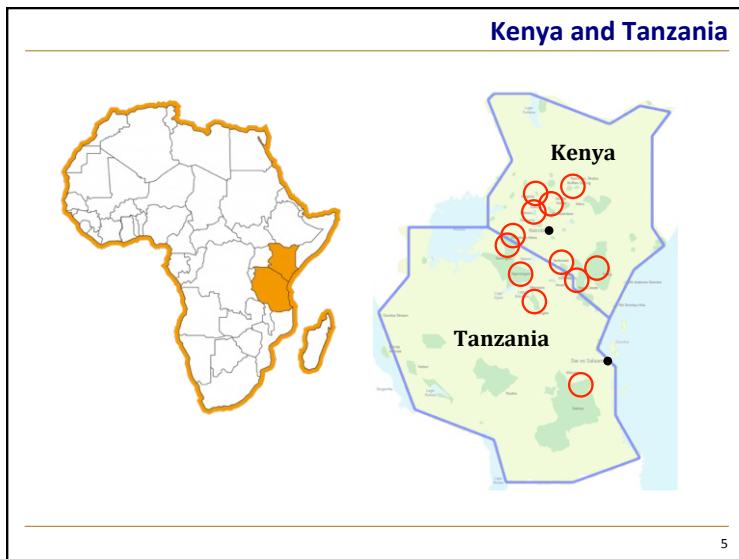


What Are We Talking About	
Going on Safari	Where to go, what to take
Lodges and Camps	Where to stay
Game Drives	How to see all the wildlife
Wildlife Photography	Capturing it all
Astrophotography	Under the darkest skies

3



Wild Astronomy



Wild Astronomy

Quintessential Africa



Lots of zebras, elephants and giraffes ...

... and a watering hole

9

Flying To Rufiji



Flying by bush aircraft – faster and more expensive than by road

10

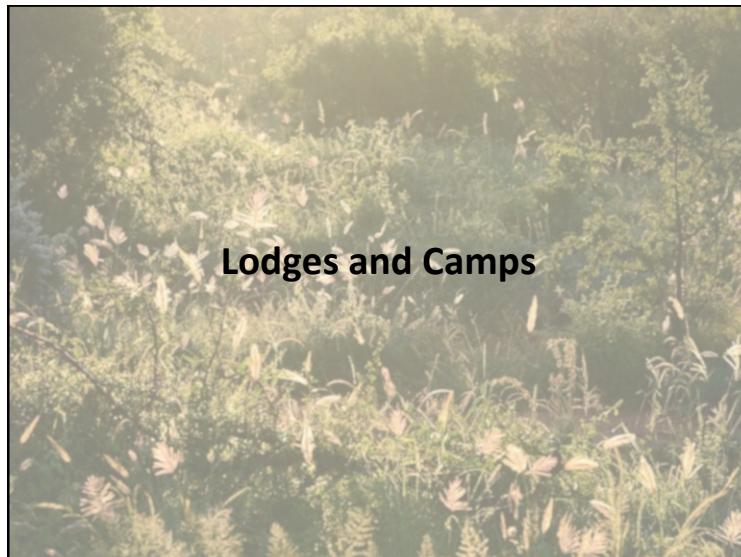
Rufiji International Airport



Mtemere Airstrip, Rufiji River Camp

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Lodges and Camps



Wild Astronomy

Sunbird Lodge



View from terrace of Sunbird Lodge, Lake Elementaita

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Sunbird Lodge



Inside Sunbird Lodge room, Lake Elementaita

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Mara Serena Lodge



View from terrace of Mara Serena Lodge, Maasai Mara

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Kilaguni Serena Lodge



Terrace of Kilaguni Serena Lodge, Tsavo West National Park

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Wild Astronomy

Overlooking the Watering Hole



Terrace of Kilaguni Serena Lodge, Tsavo West National Park

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Eland at Sunrise



Watering hole of Kilaguni Serena Lodge, Tsavo West National Park

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Floodlit Watering Hole



Watering hole of Kilaguni Serena Lodge, Tsavo West National Park

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Star Trails Over Kilaguni



2003 First attempts at astrophotography, Kilaguni Serena Lodge, Tsavo West National Park

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Wild Astronomy

Rooms On Stilts



Sunrise at Salt Lick Lodge, Taita Hills

21

Crater View



View from Ngorongoro Lodge room, Ngorongoro Crater

22

Keekorok Lodge



Boardwalk in grounds of Keekorok Lodge, Maasai Mara

23

Ol Tukai Lodge



Ol Tukai Lodge, Amboseli National Park

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Wild Astronomy

Ol Tukai Lodge



Grounds of Ol Tukai Lodge, Amboseli National Park

25

Ol Tukai Lodge



Electric fence of Ol Tukai Lodge, Amboseli National Park

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Star Trails Over Ol Tukai



2003 First attempts at astrophotography, Ol Tukai Lodge, Amboseli National Park

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Tented Camps



Mara Sarova Game Camp, Maasai Mara

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Wild Astronomy

Tents by the River



Governors' Camp, Maasai Mara

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Tents by the River



Signs of a nocturnal visitor – maybe astrophotography is not such a good idea

30

Rufiji River Camp



Rufiji River Camp, Selous Game Reserve, Tanzania

31

Star Trails Over Rufiji River Camp



Nikon D70 + 18-70mm lens
Static tripod (no tracking)
120s exposures

2005 Early attempts at astrophotography, Rufiji River Camp, Selous Game Reserve, Tanzania

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Wild Astronomy



Our Safari 'Team'



The Syzygy Society with David – our driver, guide and friend

34



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Wild Astronomy

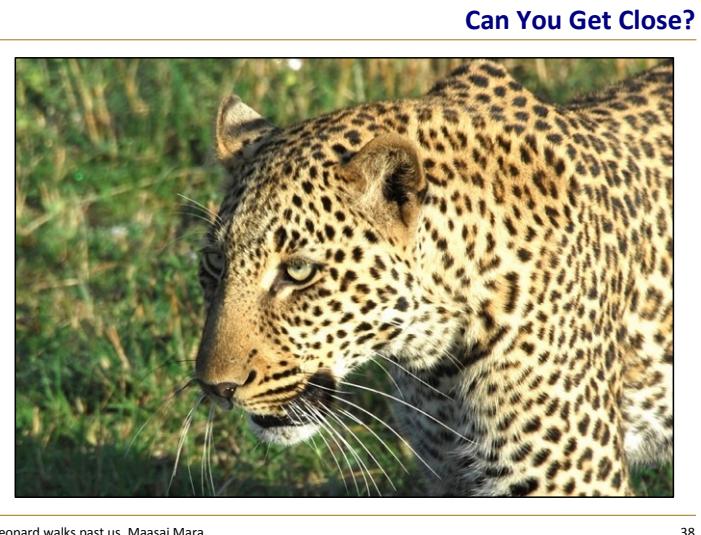


Can You Get Close?



Governors' Camp, Maasai Mara

37



Can You Get Close?

Leopard walks past us, Maasai Mara

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Ready For a Game Drive



Waiting for a game drive at Ashnil Mara Camp, Maasai Mara

39

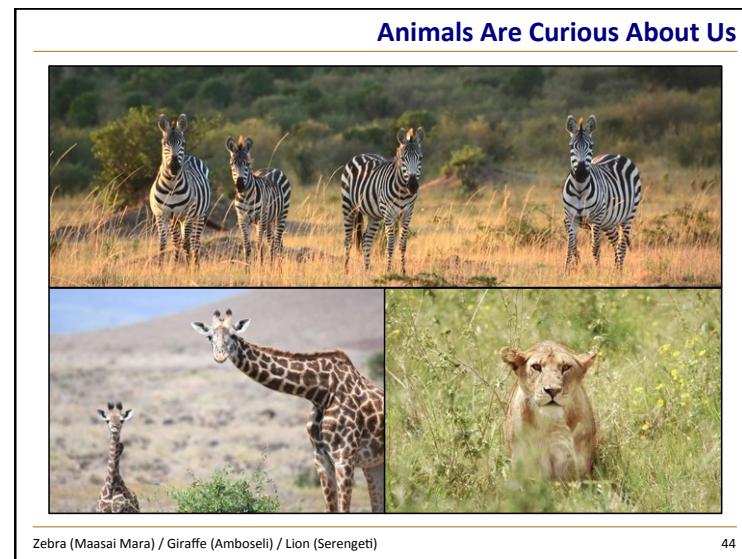
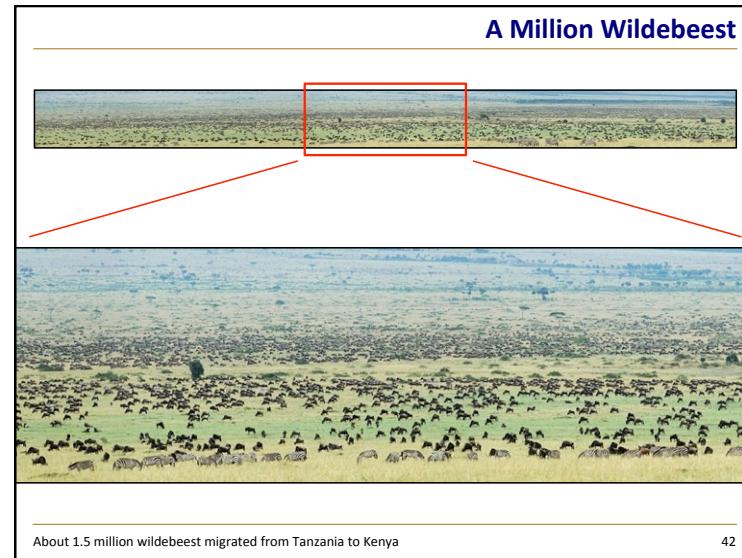


Chimping

Chimping after a game drive, Sweetwaters Serena Camp, Ol Pejeta Conservancy

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Wild Astronomy



Wild Astronomy

Animals in the Grass



Lioness watching over her cubs in the grass, Serengeti National Park, Tanzania

45

Animals in the Grass



Elephant in the swamp, Amboseli National Park

46

Animals in the Grass



Giraffe in the long grass, Maasai Mara

47

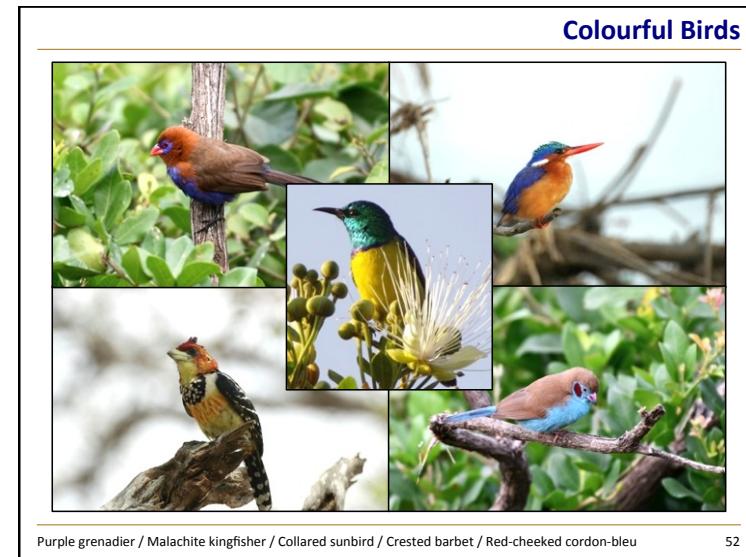
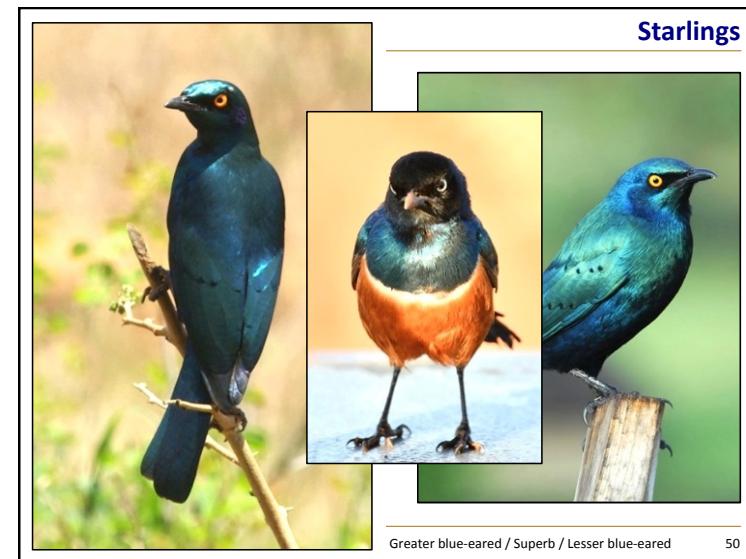
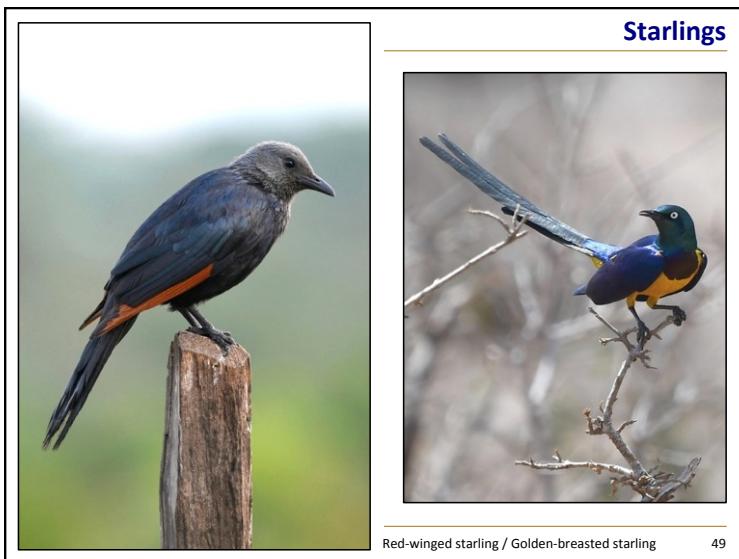
Zebras Grazing



Zebras grazing at sunrise, Maasai Mara

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Wild Astronomy



Wild Astronomy

White-fronted Bee-eaters



White-fronted bee-eaters, Rufiji River Camp

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Lilac-breasted Roller



Lilac-breasted roller, Taita Hills

54

Big Birds



Ostrich / Ground hornbill / Saddle-billed stork / Greater egret / Black-headed heron

55

Odd Birds



Hammerkop

Secretary birds

Kori bustard

56

Wild Astronomy

Raptors



Lappet-faced vulture / Augur buzzard

57

Raptors



Black-cheested snake-eagle / African fish eagle / Pale chanting goshawk / Grey kestrel / African fish eagle

58

Patience



Tawny eagle, Tsavo West National Park

59

Bad Hair Day?



Tawny eagle, Tsavo West National Park

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Wild Astronomy

Water Birds



Black-winged stilt / Greater painted-snipe / African jacana

61

Lesser Flamingo



Lesser flamingo, Ol Tukai Lodge, Amboseli National Park

62

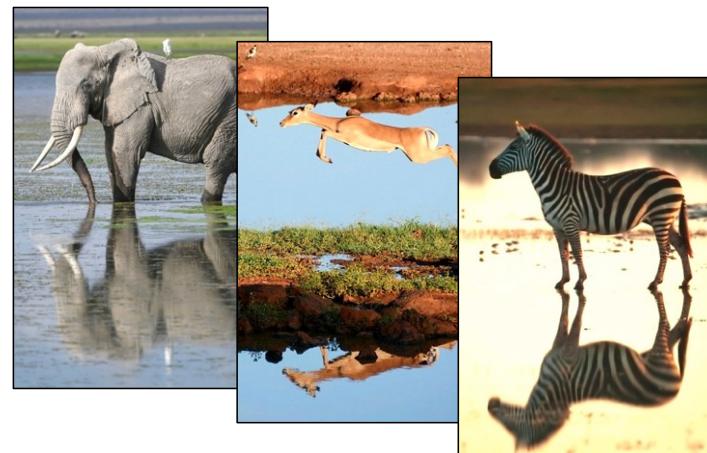
Reflections



Great white pelican / Lesser flamingo / Black-headed heron / Great cormorant / Lesser flamingo

63

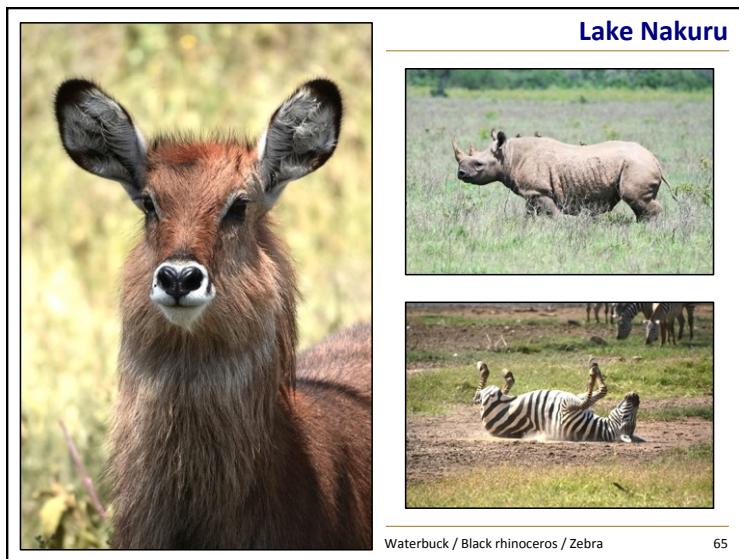
Reflections



Elephant (Amboseli NP) / Impala (Tsavo West NP) / Zebra (Tsavo West NP)

64

Wild Astronomy



Wild Astronomy

Zebra Crossing



Zebras crossing flooded plain, Ol Tukai Lodge, Amboseli National Park

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Yawns



Olive baboon / Leopard / Cheetah / Hippopotamus

70

Astrophotography



Star Trackers



DIY star tracker 'K2' designed and built by Steve
Used 2007–2013



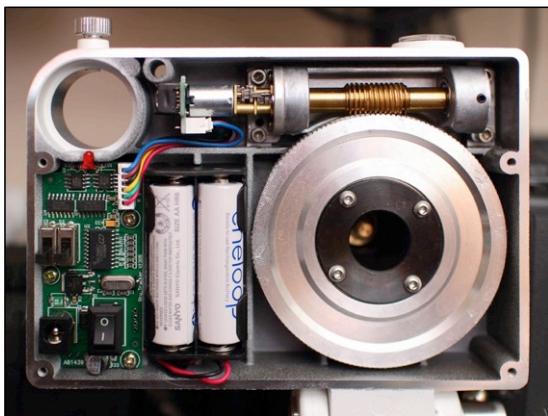
iOptron SkyTracker™
Used since 2013

K2 and iOptron star trackers

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Wild Astronomy

Inside a Star Tracker



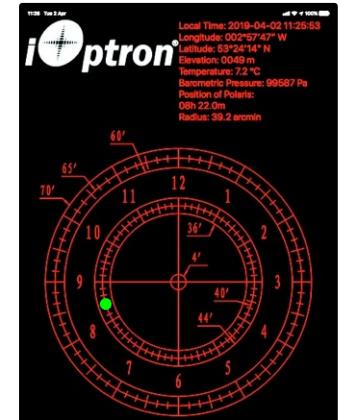
Inside the iOptron SkyTracker™

73

With Polaris visible, aligning a star tracker is easy in the UK.



But ...



iOptron SkyTracker™ alignment using Polaris

74

Aligning a Star Tracker

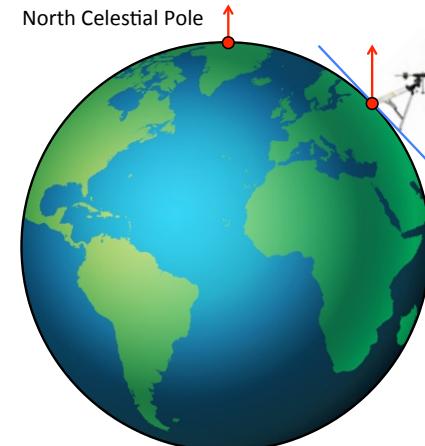
... when in Kenya, on the equator, things are more tricky.



Kenya straddles the equator

75

Aligning a Star Tracker



In East Africa the NCP and Polaris are very close to the horizon, and hence are hidden behind distant hills or elephants.

Aligning a star tracker near the equator

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Wild Astronomy

Alternative Ways To Align

To align a tracker with the North Celestial Pole, even if you can't see it, you can use a compass to find North and a spirit level to set the tracker's axis to the correct altitude (= your latitude on the Earth's surface).



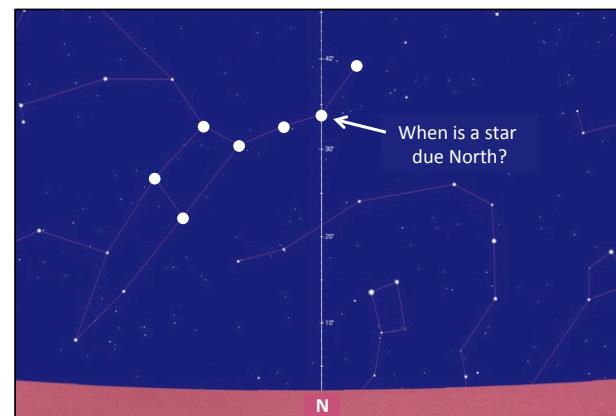
But beware...

Magnetic North is not the same as True North, and a compass needle can be affected by nearby metal and motors found in, for instance, a motorised star tracker!

Aligning a star tracker using magnetic North and the latitude

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Alternative Ways To Align



Aligning a star tracker using star transit times

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Milky Way



Taken by Rob / Nikon D7500 / 50mm lens @ f/2 / single 20s

79

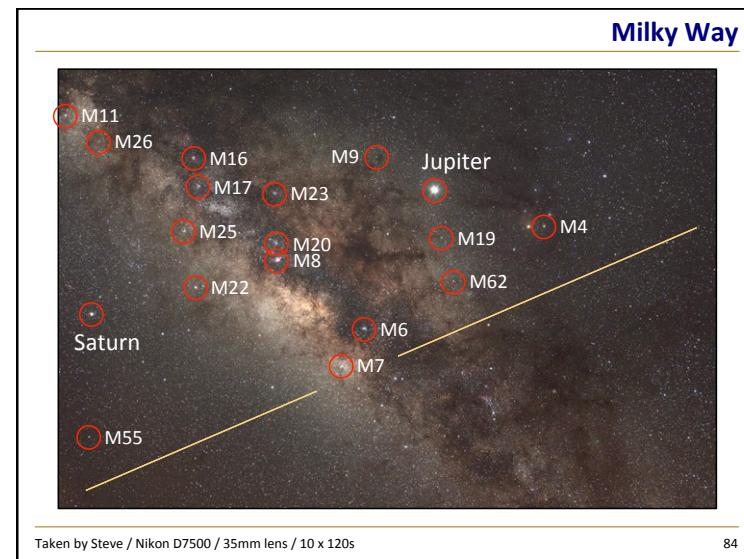
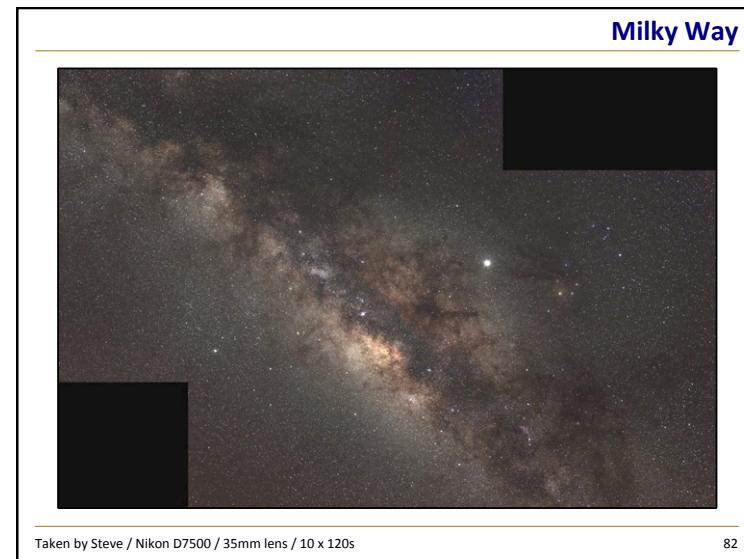
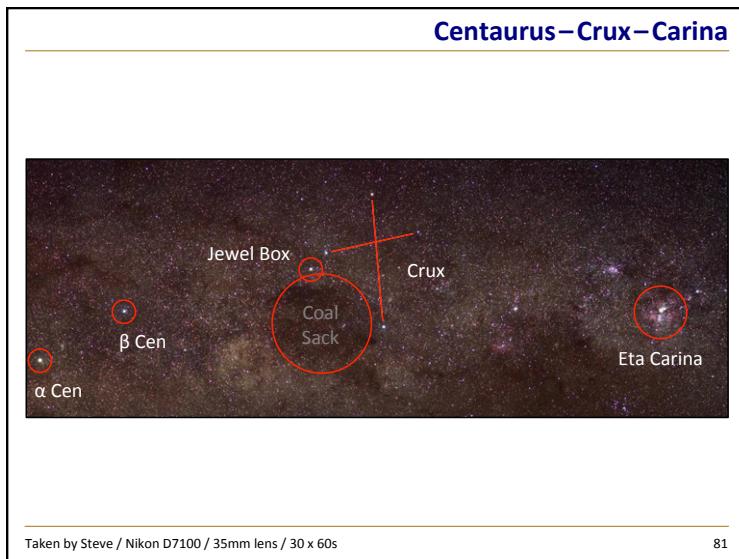
Large Magellanic Cloud



Taken by Steve / Nikon D7100 / 85mm lens / 30 x 60s

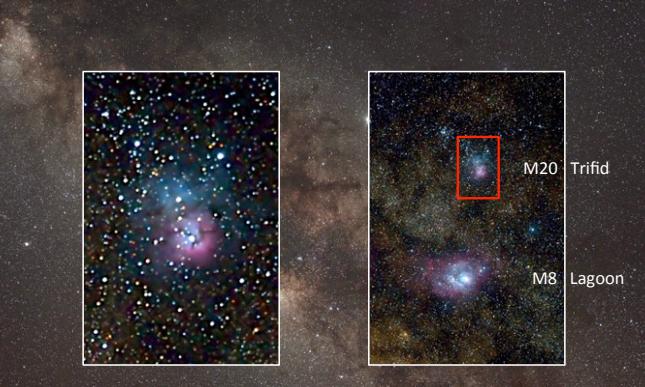
80

Wild Astronomy



Wild Astronomy

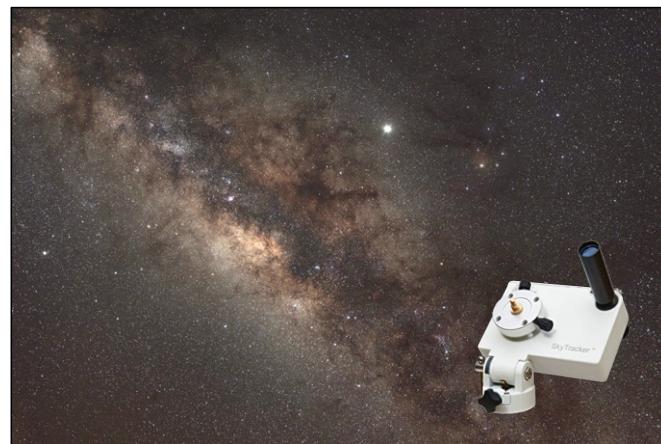
Lagoon and Trifid Nebulae



Taken by Steve / Nikon D7500 / 300mm lens / 1 x 30s

85

Milky Way



Taken by Steve / Nikon D7500 / 35mm lens / 10 x 120s

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The End(s)



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Wildlife by day ...

... stars by night

Wild
Astronomy

Dr Steve Barrett

MSAS 26 Apr 2022