Tony Wright

March 2021

DETAIL IN CONTEXT
HIGH RESOLUTION IMAGES

LIFE STOPPED PLAY

- Shame about the lockdown
- And the snow
- But Zoom destroys the demos anyway

HIGH RESOLUTION... WHY AND HOW EVENTUALLY...

- The Quest for Resolution
- Resolution and Image Quality Parameters
- High Resolution Photography
- DIY High Resolution Photography
- DIY Examples

THE QUEST FOR RESOLUTION

- Resolution has been prized throughout history
- Limited by the Human Eye and Hand
- Limited by the Available Optics and Tools
- Technological Advances

IN ALL THEIR FINERY

BIG IMAGE....

....ALLOWS LOW RESOLUTION

DETAIL AT A DISTANCE - PETROGLYPHS

DEATIL, SCALE AND MEANING

SCALE AND MEANING

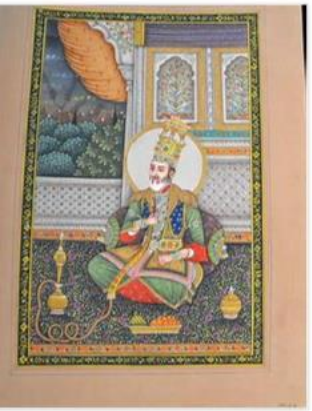
ORNAMENTAION

MANUSCRIPTS











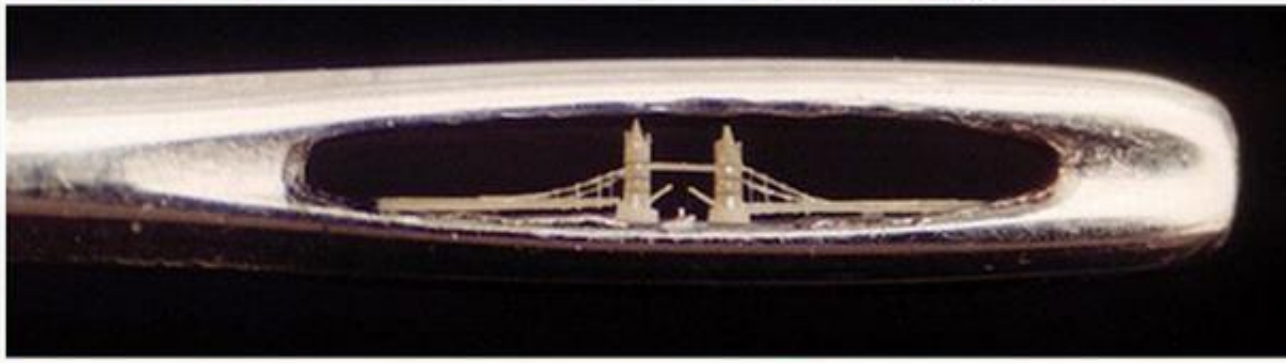








MINIATURES



MICROSCOPIC ART

A BRUSH WITH RESOLUTION

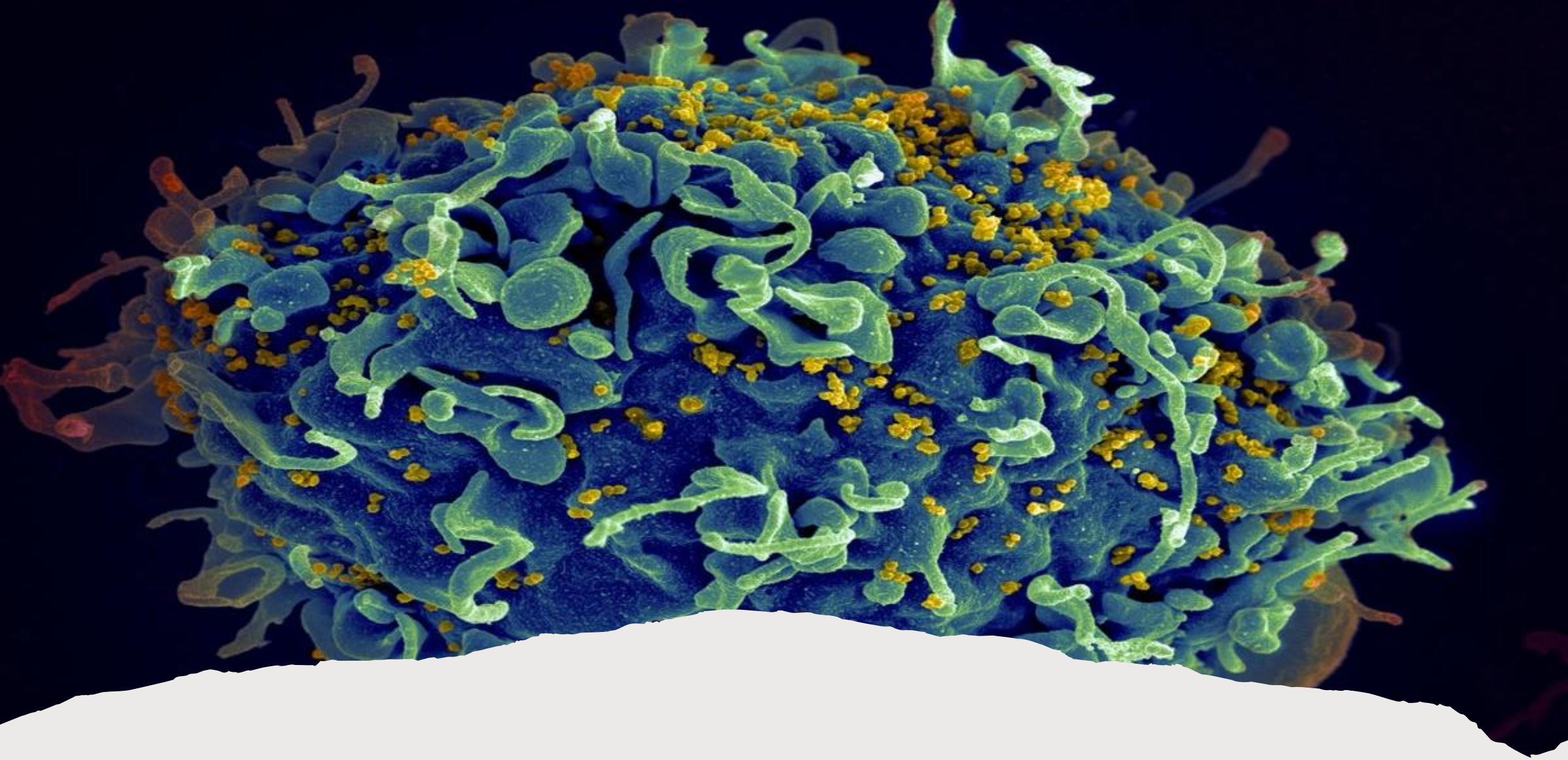
WOOD CUT PRINTS

ENGRAVINGS

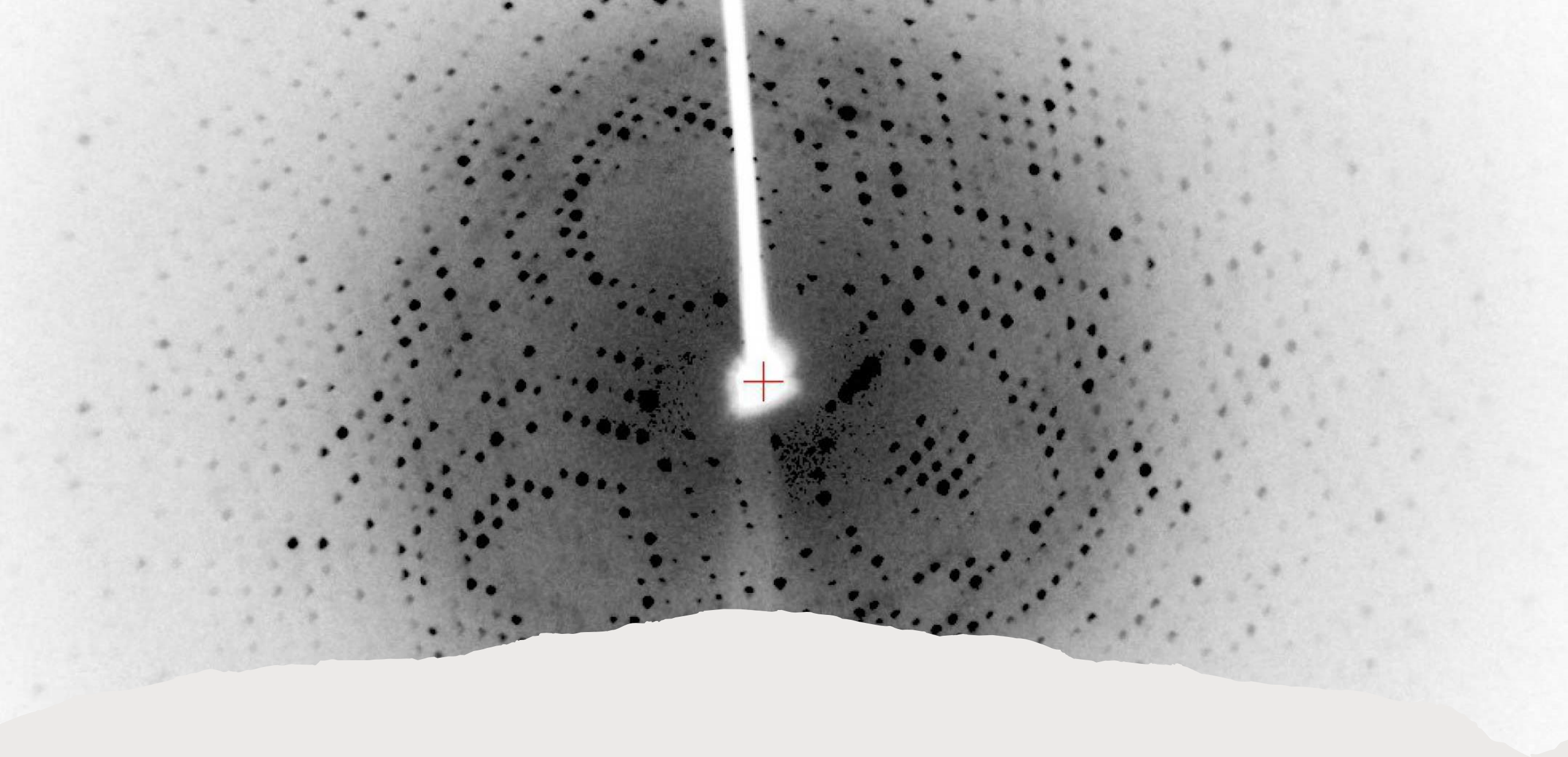
HALFTONE PRINTING

LARGE FORMAT OR TECHNICAL WIZARDRY

MACRO IMAGES



MICROSCOPE IMAGES

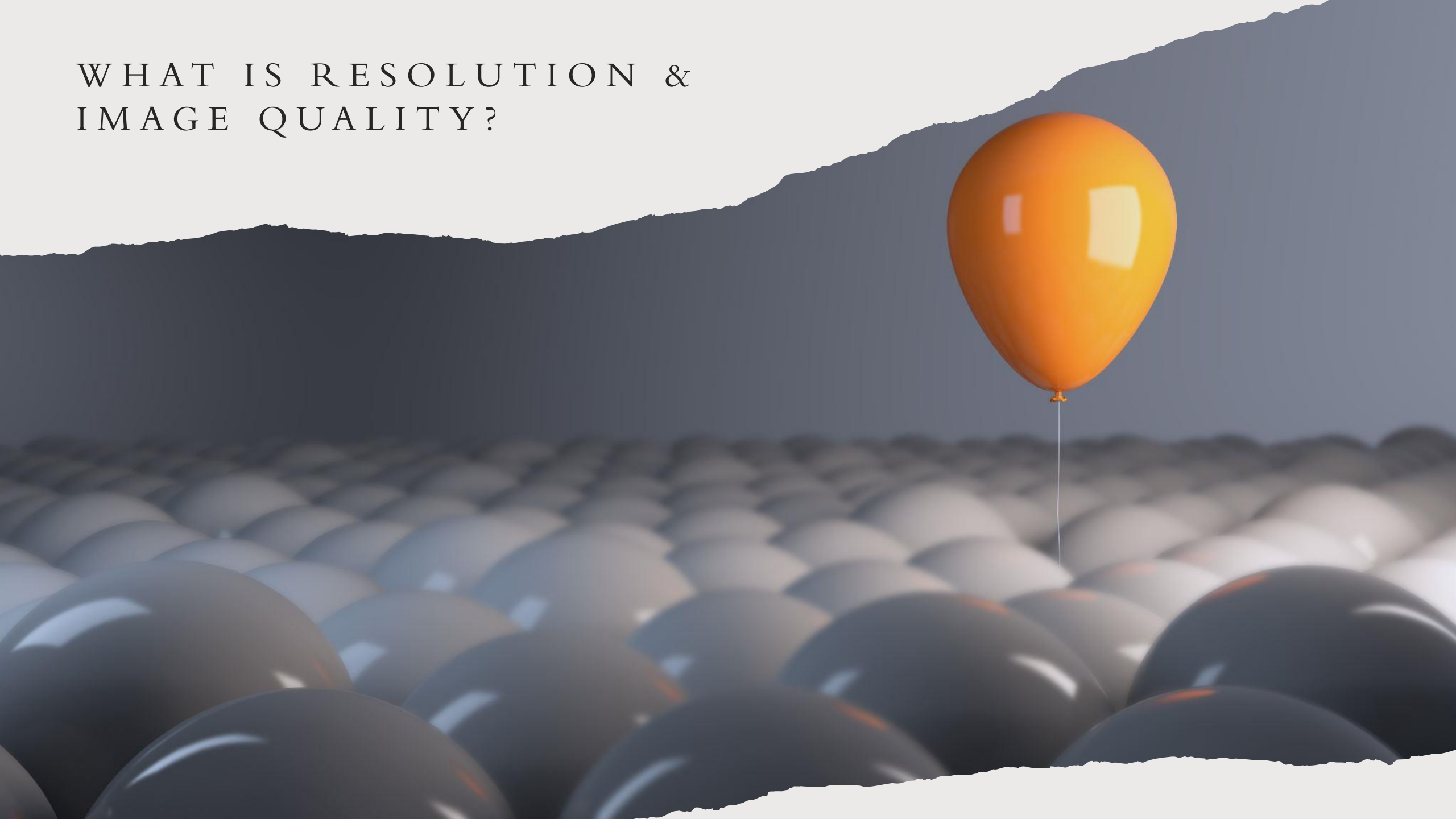


XRAY CRYSTALOGRAPHY

ASTRONOMICAL IMAGING

THE UNIVERSE

WHAT IS RESOLUTION & IMAGE QUALITY?



UNAIDED VIEWER

- Eyesight
- Viewing Distance
- Lighting
- Physiological Aspects

LENS

- Focal Length
- Lines per millimetre
- Modular Transfer Function
- Curvature of Field
- Focal Distance
- Depth of Focus
- Flare

CAMERA

- Inertia
- Stability
- Shutter Shock
- Release Mechanism
- Subject Distance
- Subject Motion

FILM

Grain

Graininess

Granularity

Acutance

Substrate

SENSORS

- Sensor Size
- Pixel Numbers
- Pixel Density
- Pixel Layout

DIGITAL IMAGE PROCESSING

- RAW File Conversion
- Camera and Lens Profiles
- Sharpening and Masking
- Pixel “Pushing”
- Output Engine
- JPG Settings
- Neural Super Zoom Filter
- Computational Photography

VIEWING MEDIA

- Printer Settings
- Printing Media
- Print Size
- Screen Resolution
- Pixel Pitch
- Projector Resolution
- Screen Size and Viewing Distance

HIGH RESOLUTION PHOTOGRAPHY

Reverse Engineering the Masters to **Create Detail in Context**

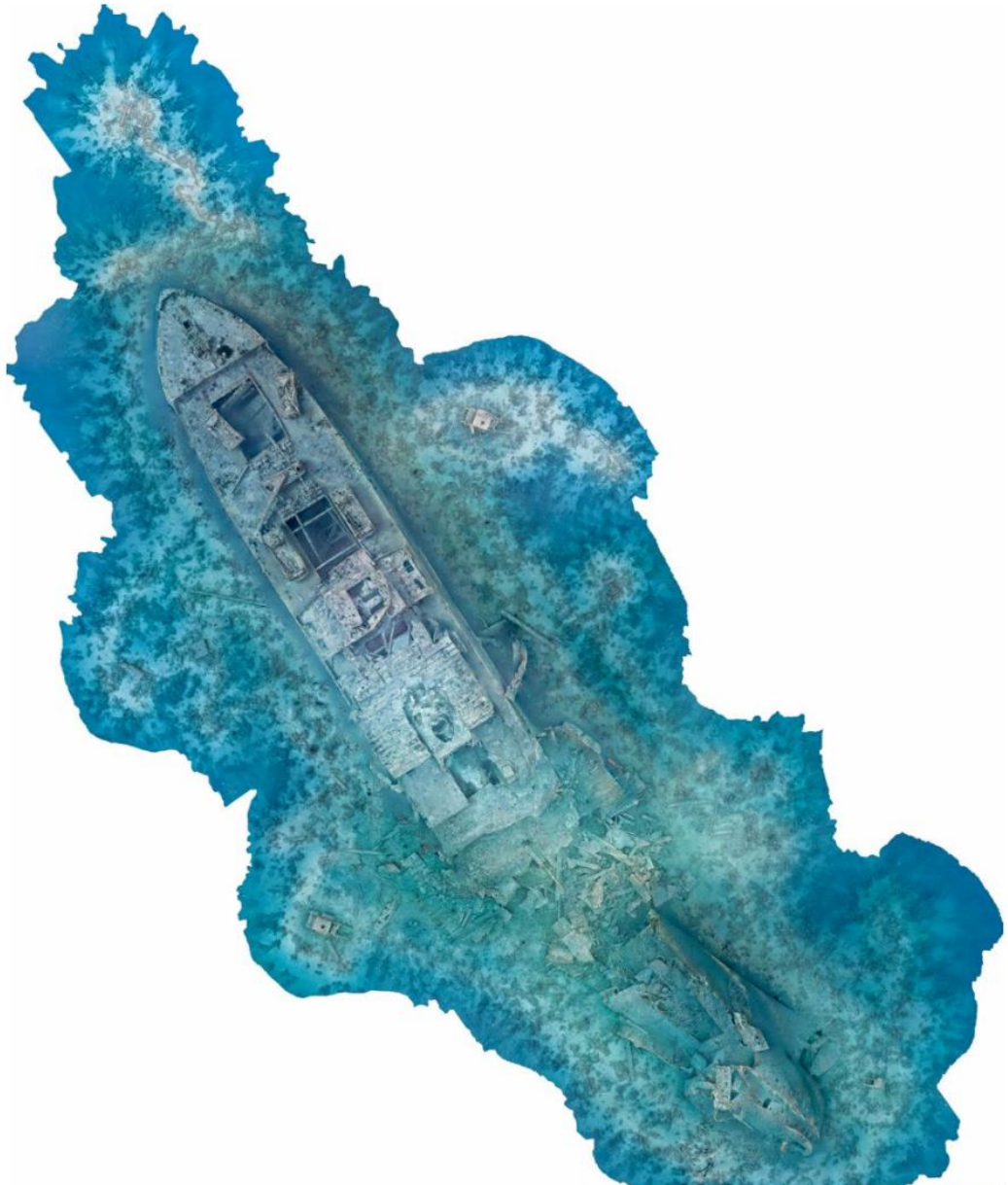
WHAT THEY/WE NEED

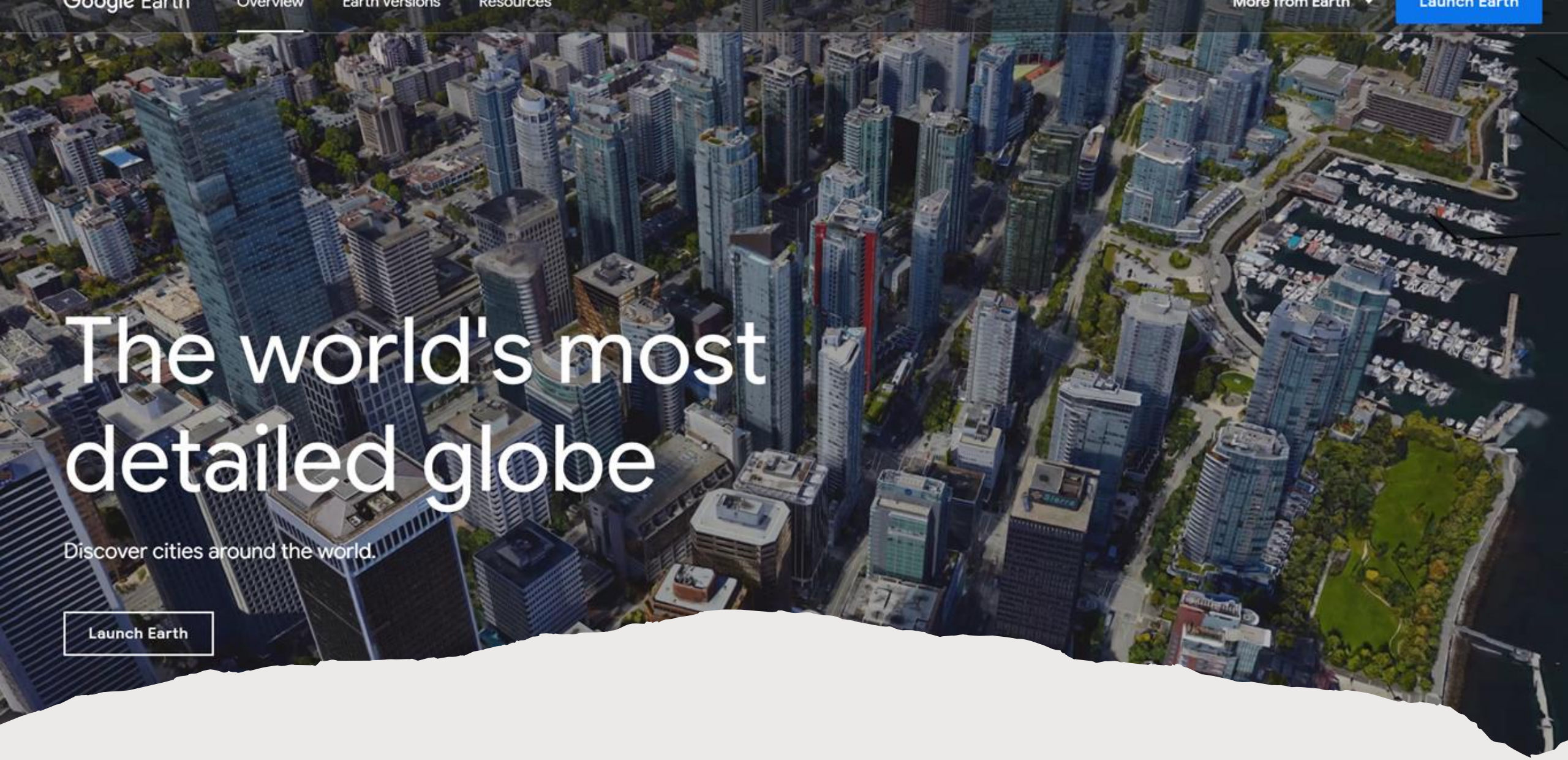
- Lots of Pixels
- Combining Software
- Storage
- Viewing Interface

ARIAL PHOTOGRAPHY

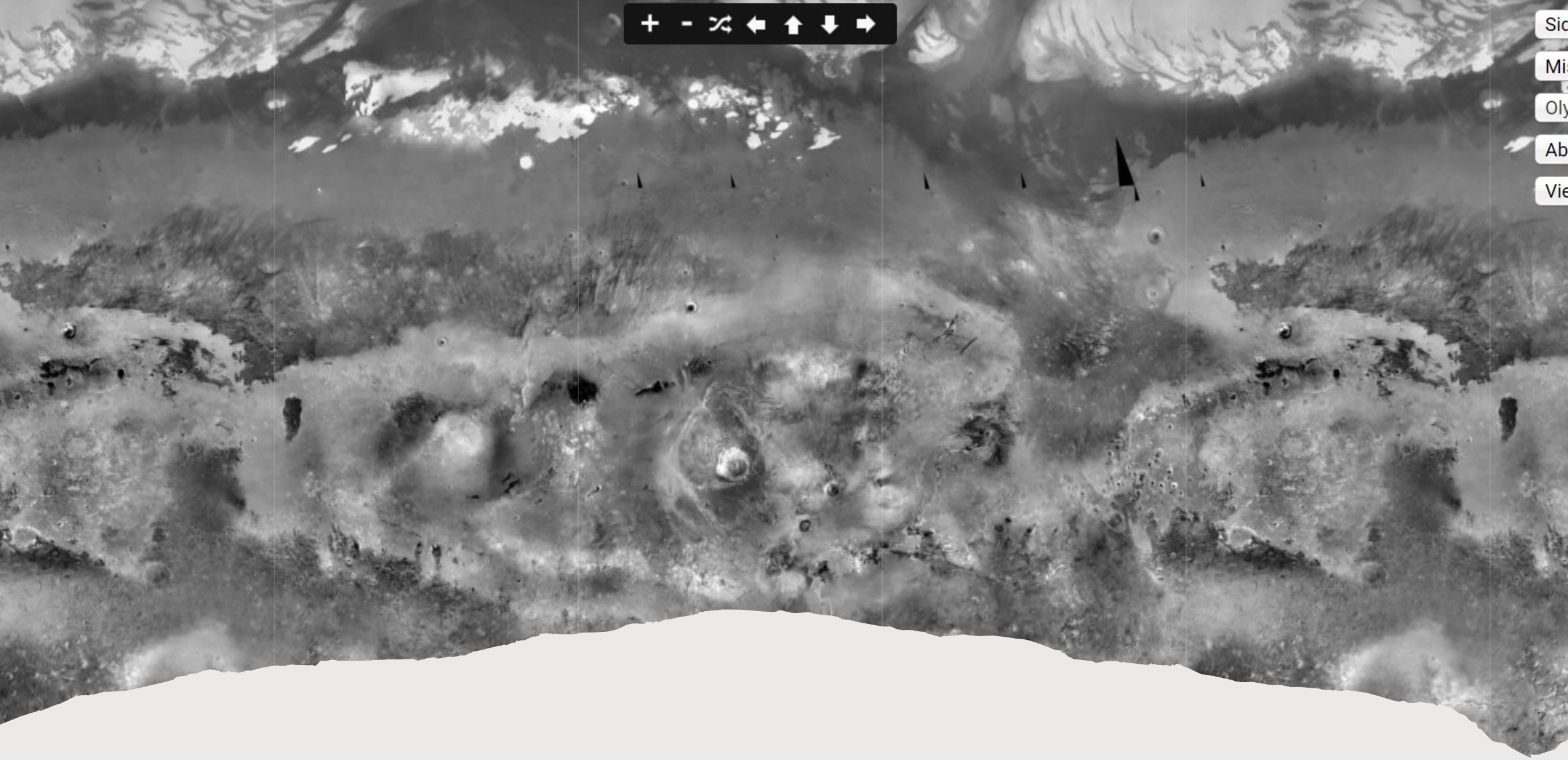
- The wreck of SS Thistlegorm, a ship sunk in the Red Sea in 1941.
- The image was made from 15,005 frames that were tagged with GPS data and merged together.
- Unlike an uncorrected aerial photograph, an orthophoto can be used to measure true distances, because it is an accurate representation of the Earth's surface, having been adjusted for topographic relief, lens distortion, and camera tilt.

Science Photographer of the Year (General Science category): Orthophoto of SS Thistlegorm by Simon Brown





GOOGLE EARTH



GOOGLE MARS

SHANGHAI PANORAMA

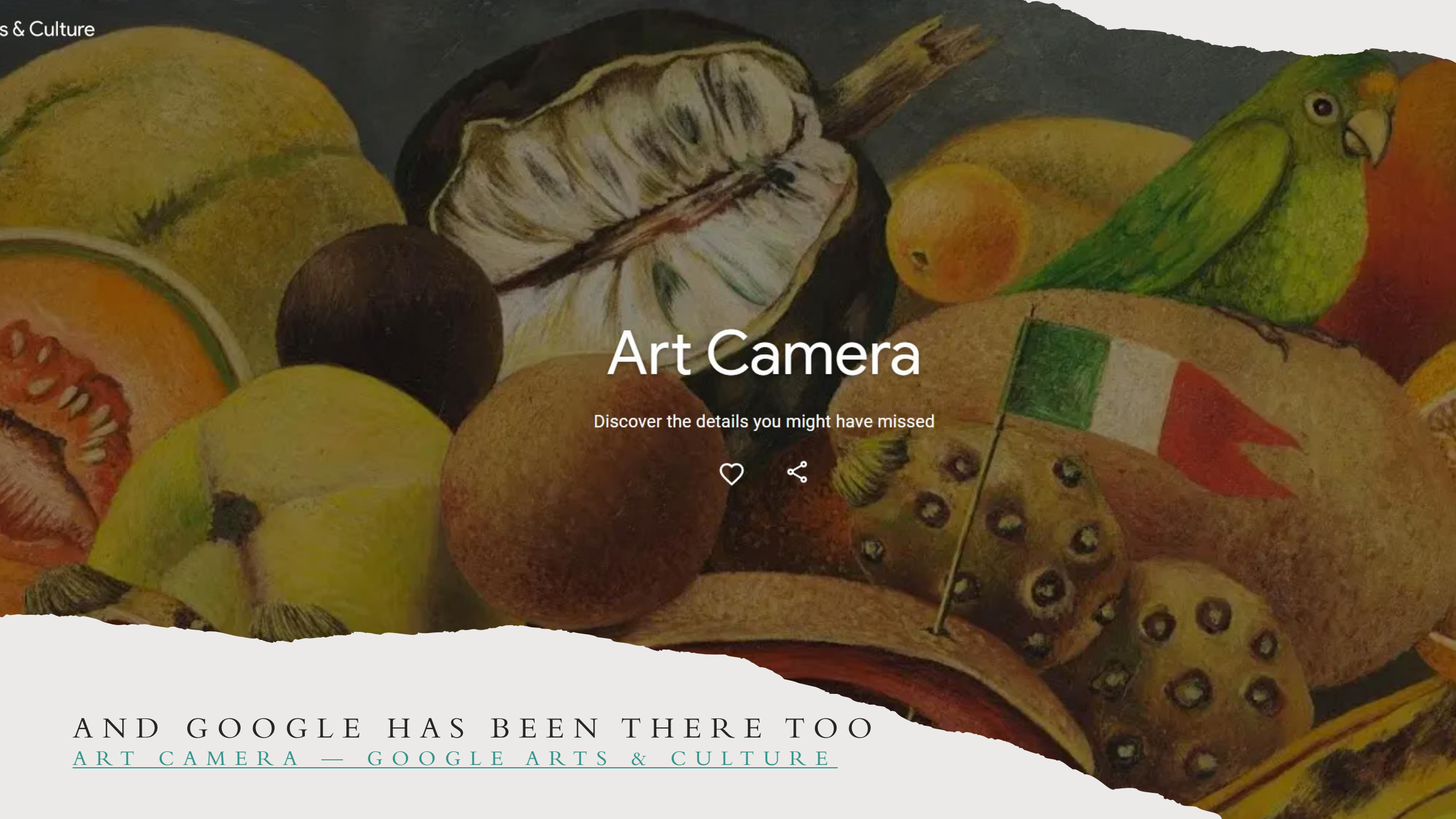
- BigPixel Studio, has been creating super high-resolution panorama images of cities
- Its latest image is captured from the top of the Oriental Pearl Tower in Shanghai and has a 195-gigapixel resolution.
- Built using many images shot using a traditional camera with precise control.
- The thousands of images are then processed and merged using the company's in-house technology.

THE NIGHT WATCH

- “Ultra Resolution Image”
- First, separate photos are taken, which are subsequently digitally assembled to form a single image.
- In total the robot will take more than 8400 400 mega pixel photos at an extremely high resolution of 5 micrometres
- Most detailed ever photograph of The Night Watch online (rijksmuseum.nl)

GIRL WITH A PEARL EARING

- The panorama was made possible using the Hirox 3D Digital Microscope RH-2000, which features a CMOS sensor capable of capturing up to 50 frames per second at 1920 x 1200 resolution.
- This technology, scanned the full painting and transformed it into a panorama with a resolution greater than 10,000MP.
- One pixel in the new panorama is equal to 4.4 microns



AND GOOGLE HAS BEEN THERE TOO

ART CAMERA — GOOGLE ARTS & CULTURE

DIY HIGH RESOLUTION PHOTOGRAPHY

- Subject
- Viewpoint
- Camera
- Lens
- Hardware
- Software
- Viewing

SUBJECT
"DETAIL IN CONTEXT"

VIEWPOINT
PERSPECTIVE
SUBJECT MOVEMENT
LIGHTING

CAMERA

- More is More
- Take more images
- Use RAW if possible
- Highish shutter speed
- Camera mount

LENS

- Resolution and Quality to Match the Sensor
- Focal length to obtain the final pixel count
- Optimum Aperture
- Lens hood

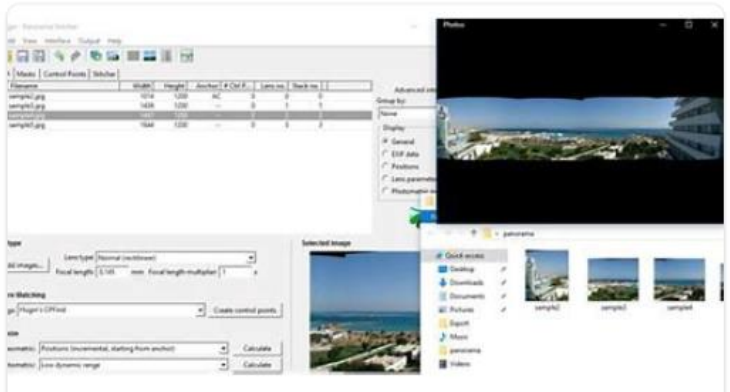
HARDWARE

- Fast Processor
- Lots of RAM
- Lots of Storage and back up
- Dedicated Graphics Card
- Decent Monitor
- Fast Broadband

SOFTWARE

- Lightroom
- Photoshop
- Other Editing Software
- Dedicated Software
- Save/Export as TIFF
- 4Gb TIFF file size limit in PS

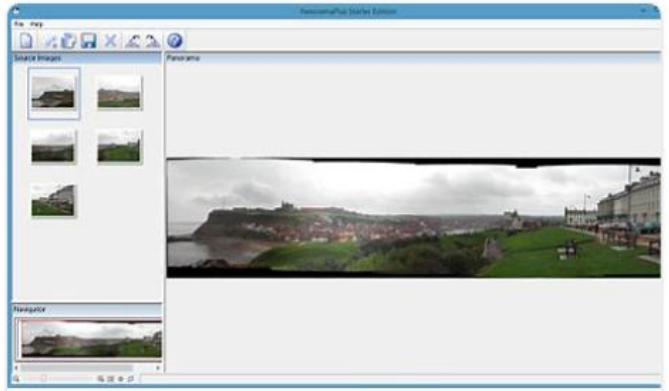
Windows 10



4 Free Panorama Creator Software For Windows 10

Panorama Maker 5 Pro Get for Free download ...

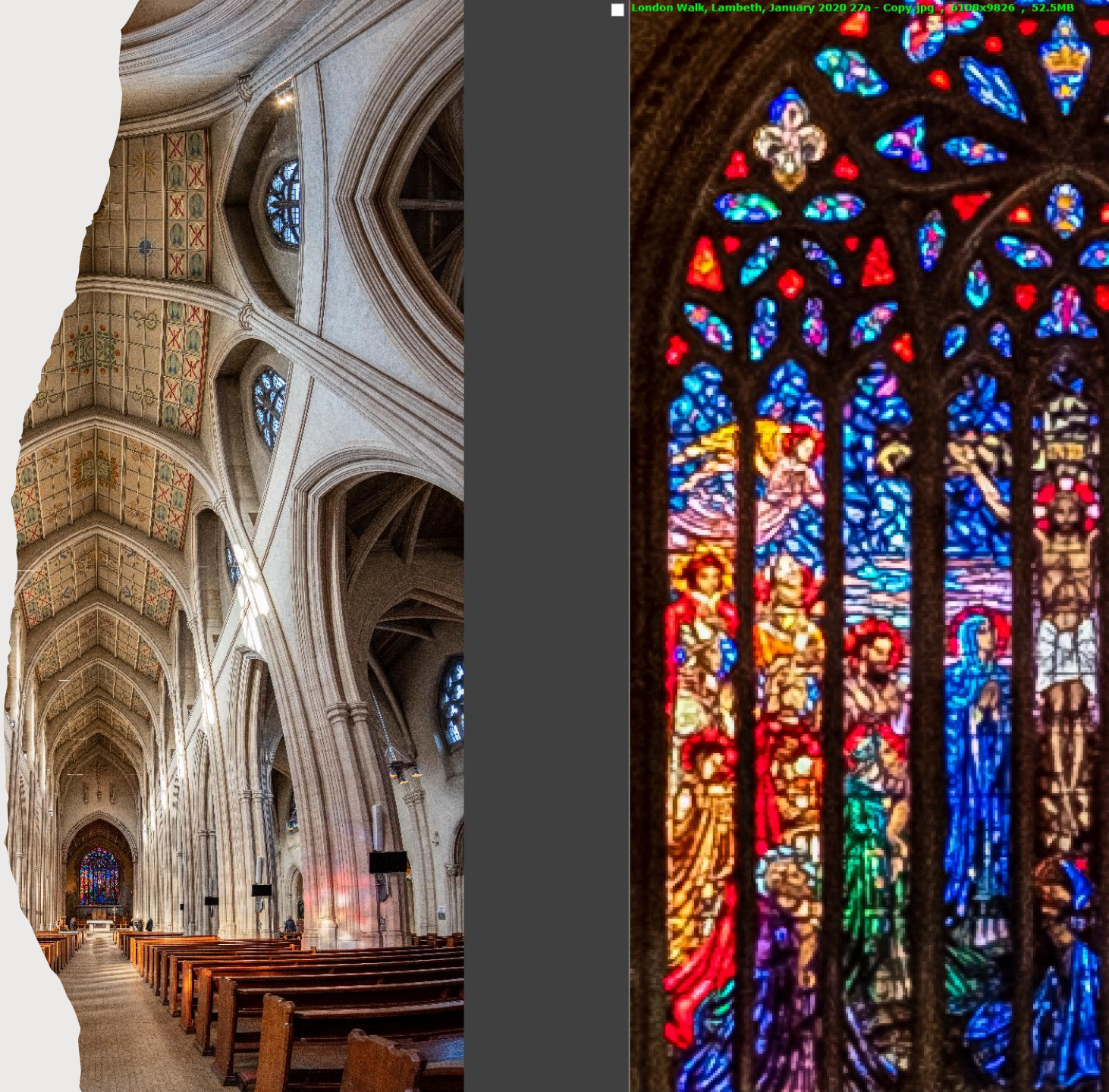
Top 10 Best Photo Stitching Software for Panorama Photography



9 Best Photo Stitching Software To Create Panorama Images

VIEWING

- Access via Cloud link
- OS Viewers
- Faststone and other desktop viewers
- Photoshop etc
- Web viewers?



LOW RESOLUTION EXAMPLE

AI SUPER ZOOM

(PLUS A BIT MORE)

HIGHT RESOLUTION EXAMPLES