

Theia[®]

TECHNOLOGIES



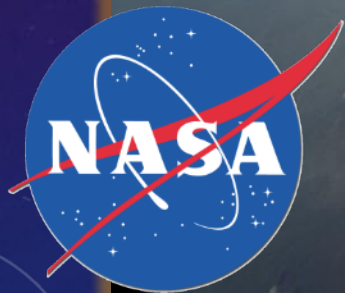
Theia[®] Technologies

THEIA TECHNOLOGIES

- Founded 2006
- Custom lens design and manufacturing
- Japanese manufacturing partner
- Lenses for machine vision and security applications
- Patented Linear Optical Technology®
- ISO 9001:2015



SOME OF THEIA'S CUSTOMERS

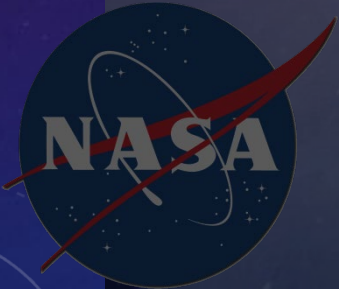


SOME OF THEIA'S CUSTOMERS

HDV15/StarDot PI-Apr 02 16:55:52 2010 Flight -
Exposure: 9 MAC: D00F-FD11278
Frame number: 136929
Internal Temperature: 16.0°C

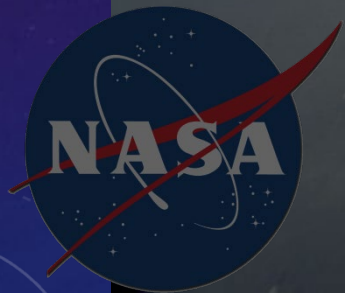


SHOT 100% USING THE
HERO3+
BLACK EDITION



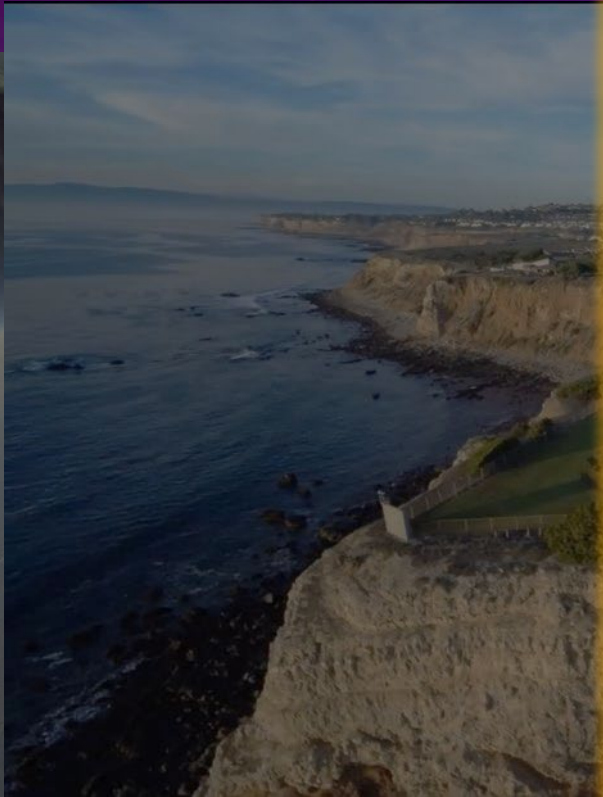
SOME OF THEIA'S CUSTOMERS

HDV15/StarDot PH Apr 02 16:55:52 2010 Flight
Exposure: 9 MAC 0000F-FD11278
Frame number: 136929
Internal Temperature: 16.0°C

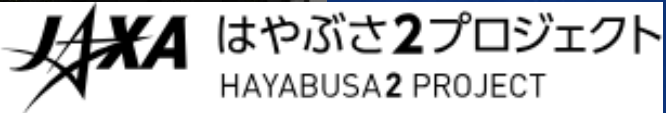


SOME OF THEIA'S CUSTOMERS

HDV15/StarDot PI-Apr 02 16:55:52 2010 Flight -
Exposure: 9 MAC: 0000F-D-11278
Plane number: 138629
Internal Temperature: 16.0°C



©JAXA: September 23, 2018 at 10:10 JST surface image from Rover-1B after landing



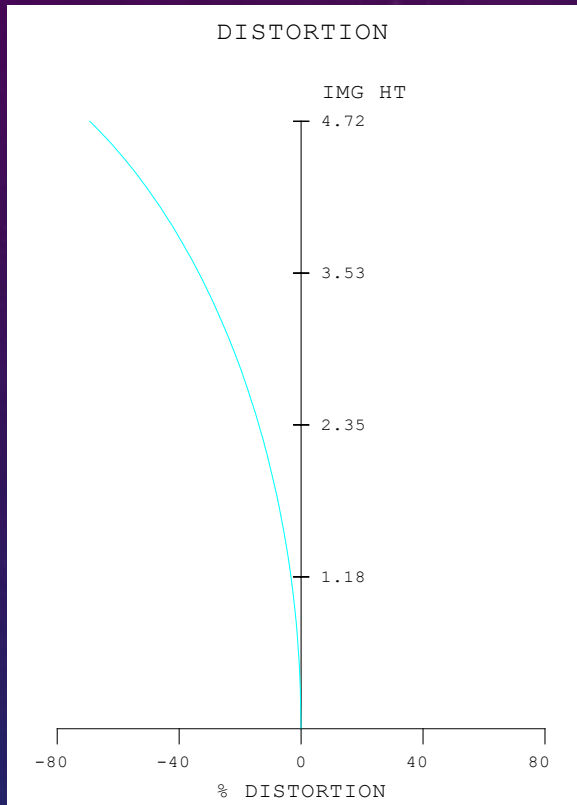
BARREL DISTORTION



© Theia Technologies, SY125 lens



BARREL DISTORTION



SY125 lens



BARREL DISTORTION



© Theia Technologies, SY125 lens



BARREL DISTORTION



© Theia Technologies, SY125 lens



BARREL DISTORTION

Whole sky survey: barrel distortion acceptable



Regional Meteoroid Environment Office of NASA
Alabama, Aug 17th, 2018

Aerial mapping: barrel distortion undesirable



Theia Technologies: SY125M flown over Newberg, Oregon

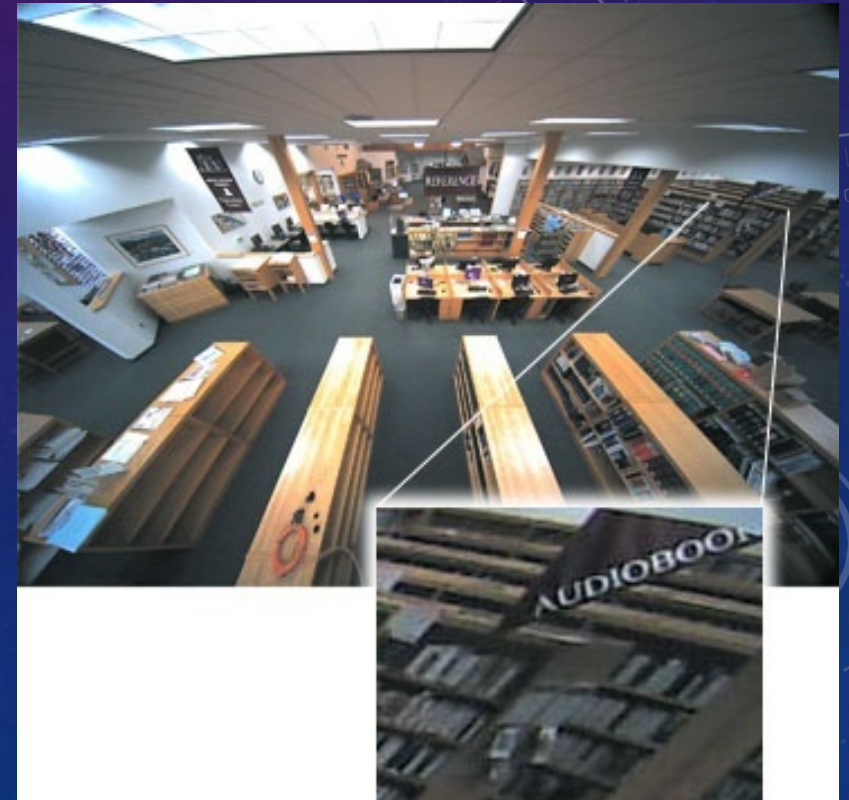
DISTORTION CORRECTION

- Fisheye lens with barrel distortion doesn't capture as much detail at the edge as a rectilinear lens

Typical fisheye lens with barrel distortion



Theia SY125 rectilinear lens with Patented Linear Optical Technology®



DISTORTION CORRECTION

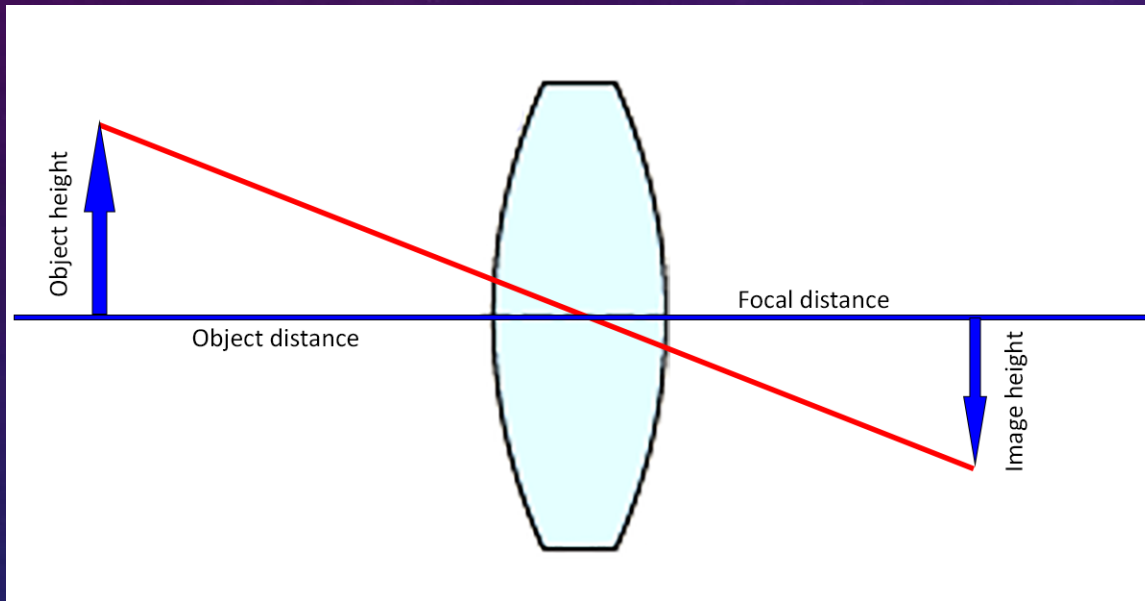
Lens with barrel distortion



Rectilinear lens with distortion correction



RECTILINEAR LENSES



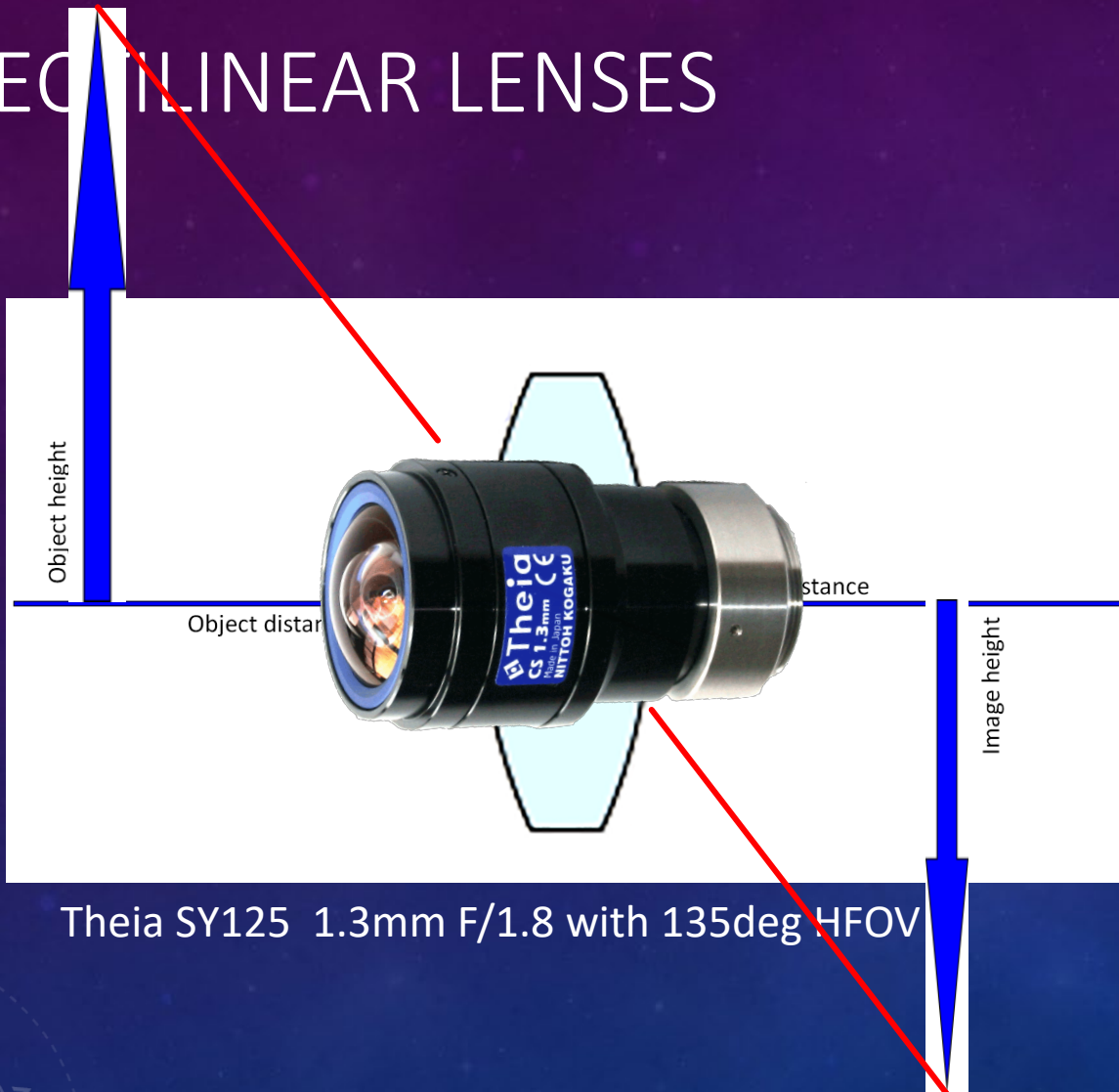
$$\text{Image height} = \text{focal distance} * \frac{\text{Object height}}{\text{Object distance}}$$

RECTILINEAR LENSES



$$\text{Image height} = \text{focal distance} * \frac{\text{Object height}}{\text{Object distance}}$$

RECTILINEAR LENSES



Theia SY125 1.3mm F/1.8 with 135deg HFOV

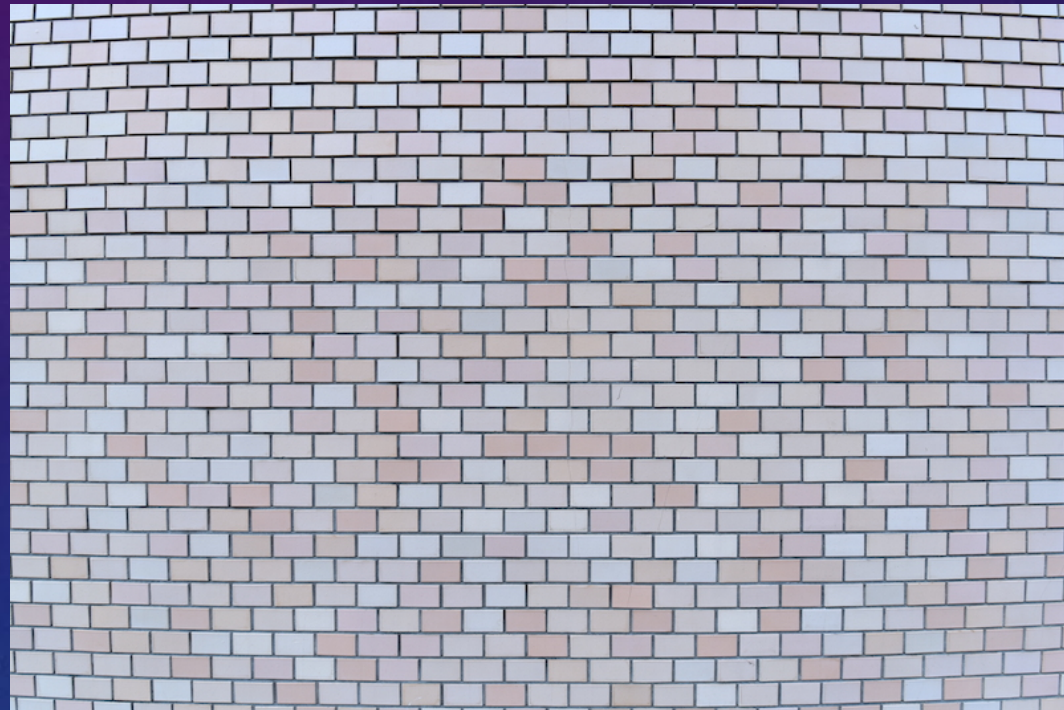
$$\text{Image height} = \text{focal distance} * \frac{\text{Object height}}{\text{Object distance}}$$

3D STRETCHING



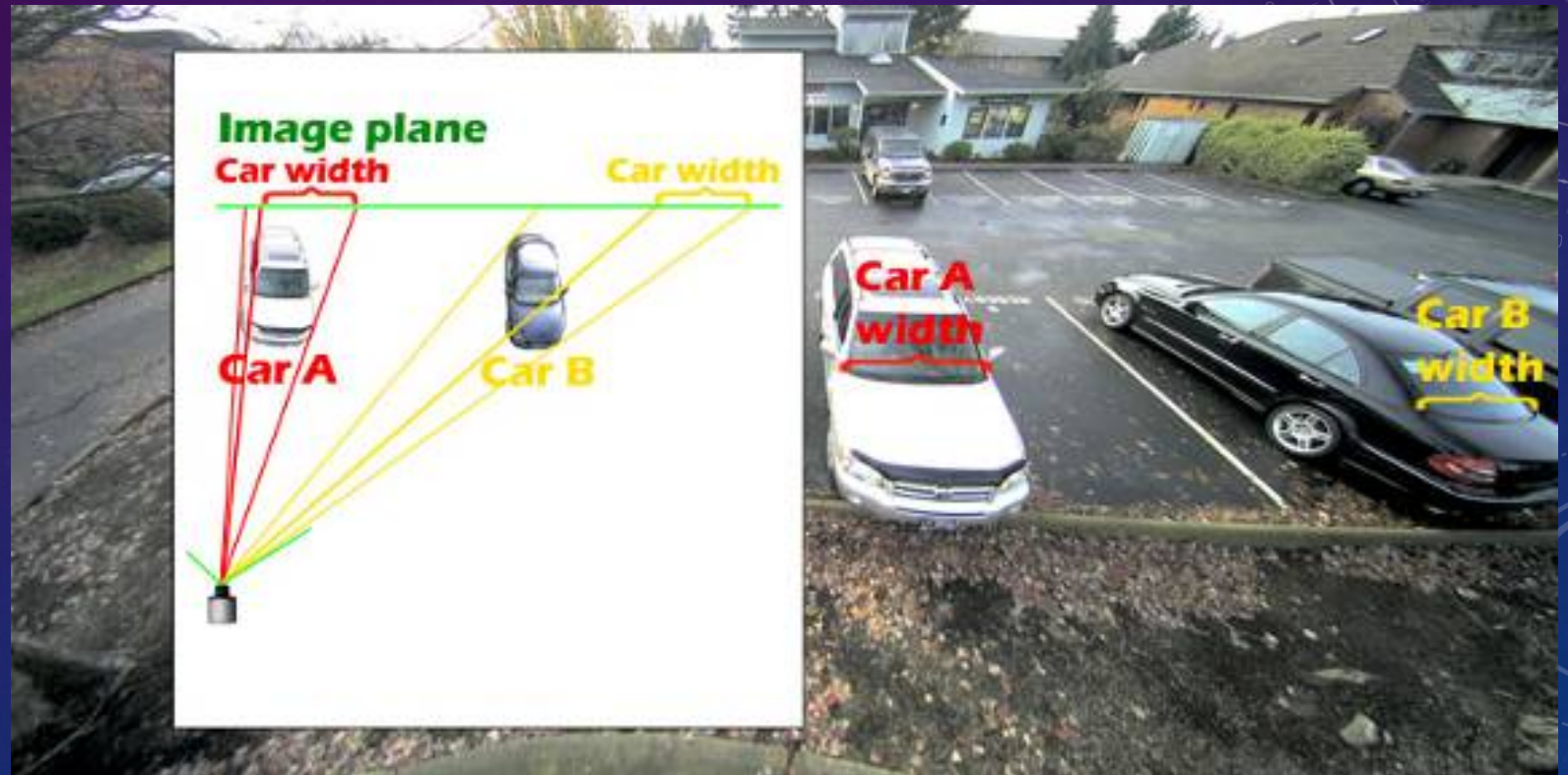
3D STRETCHING

- Wide angle rectilinear lens image of a flat surface doesn't show 3D stretching



3D STRETCHING

- Ultra wide distortion correction introduces 3D stretching for objects at the image edges

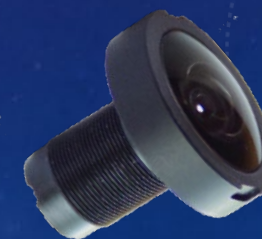


THEIA LENSES — ULTRA WIDE WITH LINEAR OPTICAL TECHNOLOGY®



SY125 & MY125	SY110 & MY110	SL183 & ML183
1.3mm fixed FL	1.7mm fixed FL	1.8 – 3.0mm varifocal
135° HFOV	120° HFOV	120° to 92° HFOV
7% corner distortion	2% corner distortion	0% corner distortion
Visible or IR only	Vis-IR corrected	Vis-IR corrected
5MP 1/2.5" sensor	3MP 1/3" sensor	5MP (4K resolution) 1/2.3" sensor

THEIA LENSES



THEIA LENSES – ULTRA WIDE REDEFINED



CONTACT INFORMATION



- Mark Peterson
 - VP Advanced Technology
 - 29765 SW Town Center Loop W, Suite 4, Wilsonville, OR 97070, USA
 - +1-503-570-3296
 - mpeterson@TheiaTech.com or info@TheiaTech.com
- Website www.TheiaTech.com

Request a sample at www.TheiaTech.com/request-a-sample and evaluate Linear Optical Technology® for yourself.