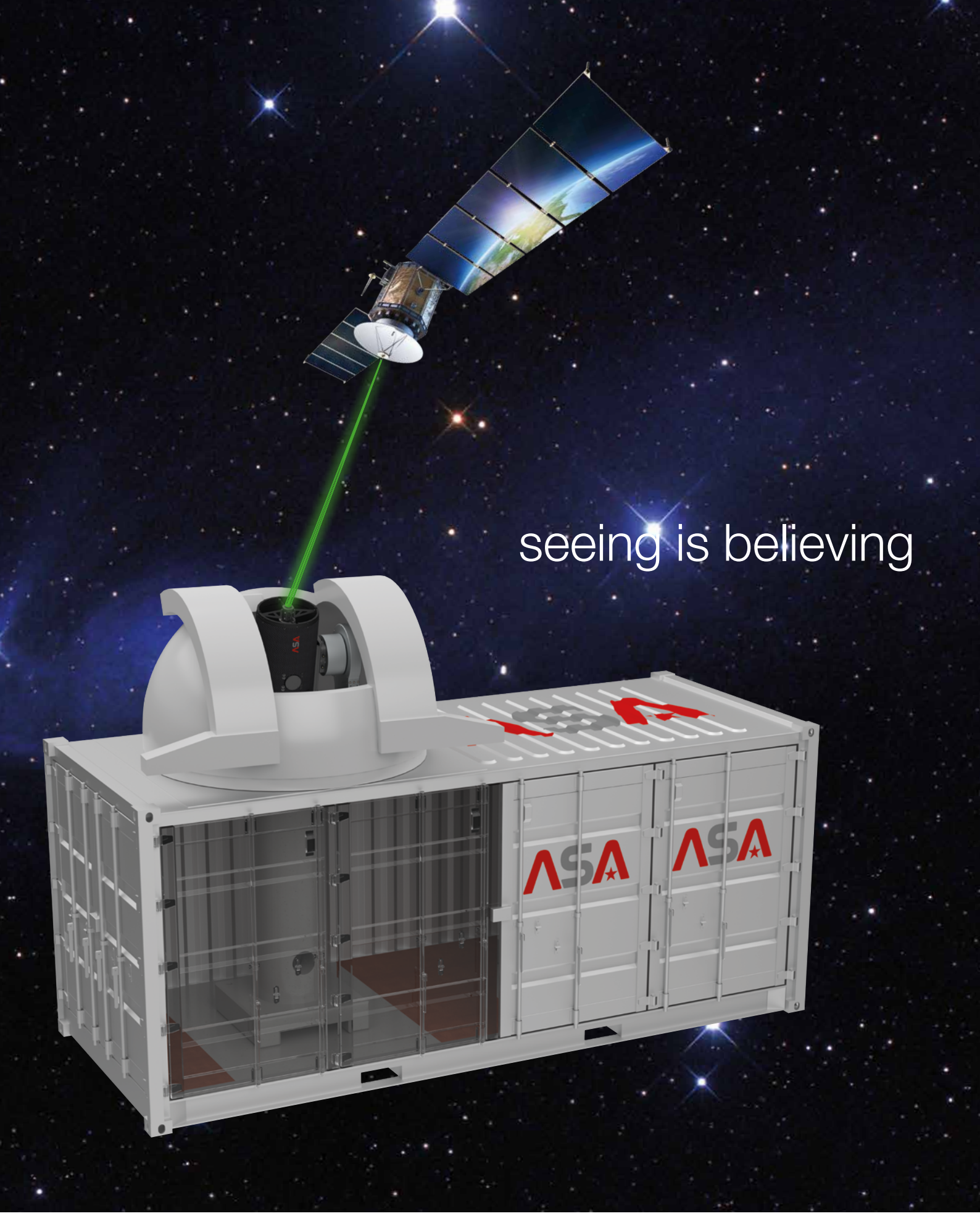

seeing is believing

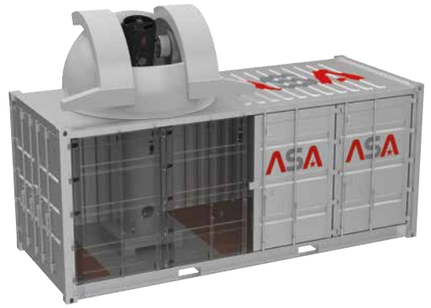
Based in the middle of Europe.

All in-house
ASA – Your partner for “turnkey” solutions

Egon Döberl CEO
ASA Astrosysteme GmbH

“TURNKEY” SOLUTIONS?

"ASA Astrosysteme GmbH covers all areas in design and manufacturing of astronomical instruments. We guarantee custom solutions with highest quality and fast delivery times at an unbeatable price performance ratio made in Austria.
Our systems are used in all areas of astronomy and sky observations and are considered as reference class on the world market. I am very proud that my long-lasting Vision pursued by me and my team came to life."



CUSTOM SOLUTIONS

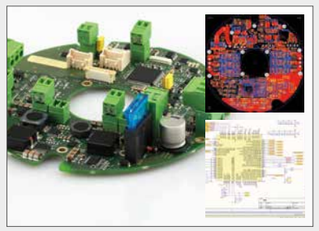
Telescopes
Tracking systems
Observatories

CUSTOM SERVICE

World wide installation
Remote support
Customer trainings
Maintenance contract

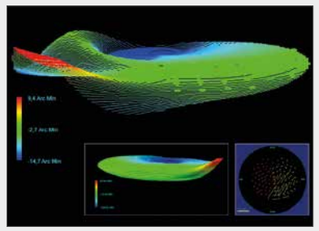
ELECTRONIC

Design
Closed loop direct drive systems
Sensors technology
Weather stations



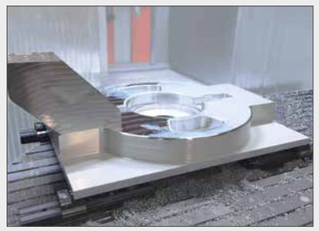
SOFTWARE

Satellite tracking SW
Direct Drive control
SDK packages for robotic use



IN HOUSE MANUFACTURING

Domes
Telescopes
Optics

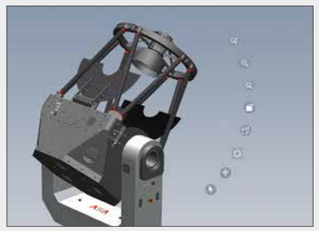


RESEARCH DEVELOPMENT

Satellite tracking platforms
Turnkey ground stations
Direct Drive technology
Fully robotic observatory technology

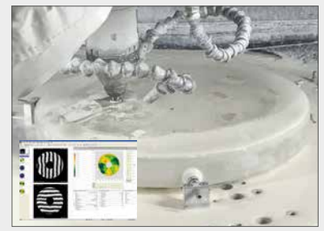
ENGINEERING

CAD design 3D
Finite element simulation
CNC machining, Carbon fiber technology
Observatory safety



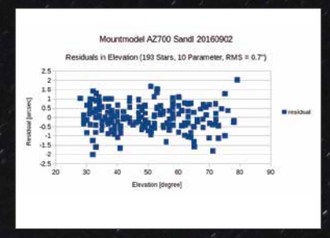
OPTICS

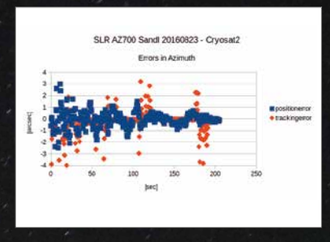
Optics design
Light weight mirrors
CNC greening and polishing
Metrology

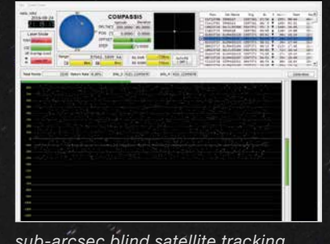


ASA **OGS** ALLOWS **FSO** COMMUNICATION

OGS - **O**PTICAL **G**ROUND **S**TATION
FSO - **F**REE **S**PACE **O**PTICAL







sub-arcsec blind satellite tracking

BLIND SATELLITE TRACKING

SUB-ARCSEC

SSA

FULL ROBOTIC
SPACE SITUATIONAL AWARENESS

SLR

FULL ROBOTIC
LASER RANGING STATIONS

LASER

QUANTUM KEY DISTRIBUTION (QKD)
LASER COMMUNICATION OPTICAL GROUND STATION (OGS)

reference organizations

Space debris includes all human-made, non-functioning objects in orbit around Earth, some of which regularly re-enter the atmosphere. As of the end of 2017, it was determined that 19894 bits of space junk were circling our planet, with a combined mass of at least 8135 tons – that's more mass than the entire metal structure of the Eiffel Tower.

Space debris is a hazard to our satellites and spacecraft as well as a contributor to near-Earth space pollution.

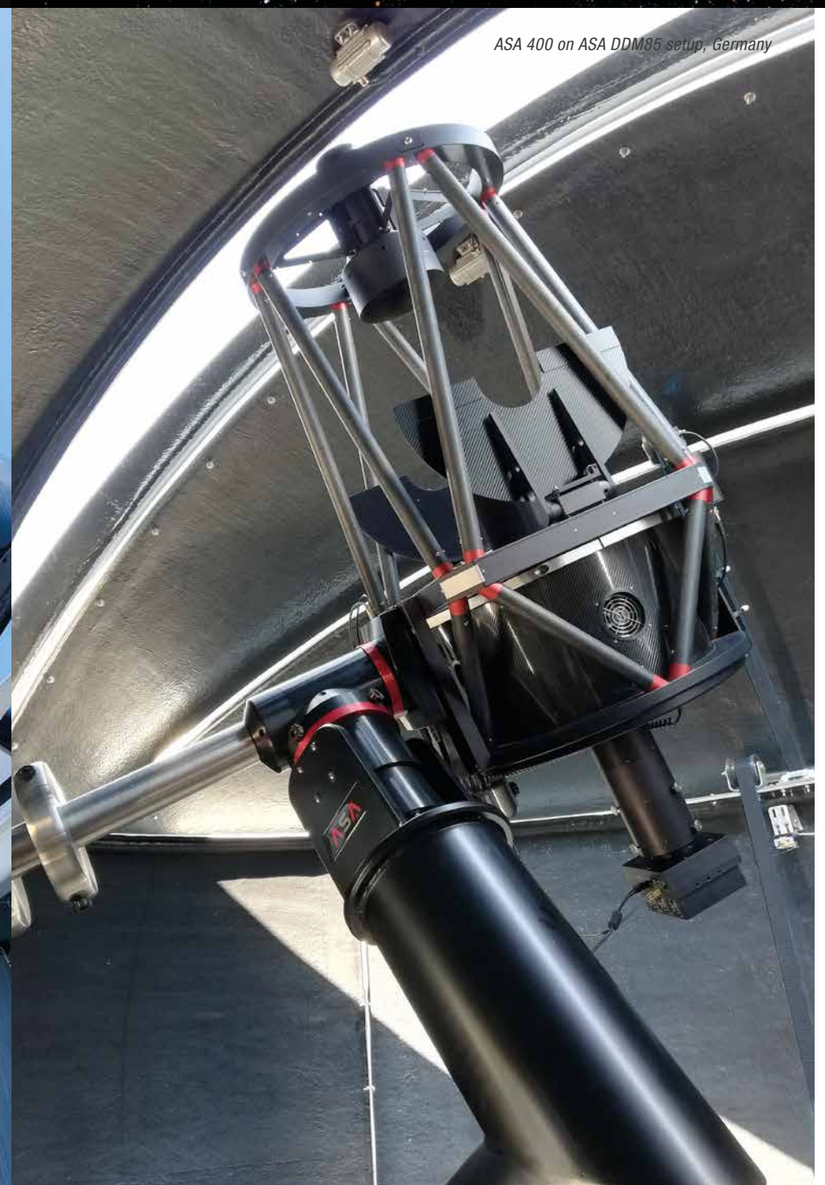
ASA H400 on DDM85

TUBE – OPTIC H400
- 400 mm main mirror – hyperbolic
- Focal ratio f2.4
- Corrected field of view: 70 mm diagonal
- 52 kg weight

MOUNT – DDM85
- Direct Drive
- Absolute encoder
- Pointing accuracy <12" RMS with pointing file
- Tracking accuracy* 0,35" RMS in 5 minutes

*at optimal ambient and sky conditions

ASA H400 on DDM85 setup, Spain



ASA 400 on ASA DDM85 setup, Germany

ASA 400 on DDM85

OPTIC – ASA400
- 400 mm main mirror – Ritchey Chrétien design
- Focal ratio f8
- Field of view 70 mm diagonal
- 72 kg weight

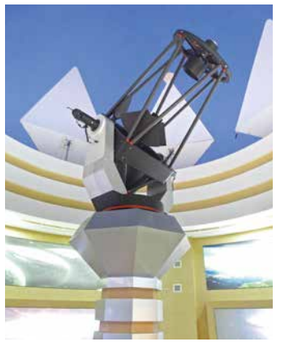
MOUNT – DDM85
- Direct drive
- Absolute encoder
- Pointing accuracy <12" RMS with pointing file
- Tracking accuracy* 0,35" RMS in 5 minutes

*at optimal ambient and sky conditions

ASA AZ800 observatory, Switzerland

ASA AZ800 in Hungary

ASA AZ800 in Austria



ASA AZ800 in Turkmenistan

ASA AZ800 in Spain

ASA AZ800 f6.85 f2.5

Ritchey-Chrétien Alt-Az telescope f6.85 f2.5 with Nasmyth focus
Direct Drive motors with absolute encoders on all axis

MAIN DATA

Focal length	5600 mm
F-number	6.85
Optical diameter	≥ 800 mm
Image scale	37" per mm
Mirror material	Fused Silica (quartz), ultra low thermal expansion 0.55e-6/°C
Software	

SYSTEM PERFORMANCE

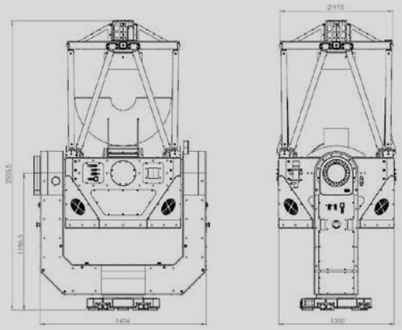
Pointing accuracy	< 8" RMS with pointing model (for altitude 20° to 85°)
Tracking accuracy	< 0,25" RMS within 5 minutes (at optimal ambient and sky conditions) over 5 min 0,05" RMS/min
Slewing speed	6°/sec (up to 10°/sec optional)

BASIC EQUIPMENT

- ASA AZ800 telescope including fork mount und telescope with ASA optics
- Telescope electronics rack including all power supplies for telescope, IP-remote power switch, Ethernet switch
- All tools necessary for telescope installation
- Laser for optical collimation

OPTIONAL ACCESSORIES

- ASA ADR 160 – Derotators
- ASA filter wheel for 4x 100 x 100 mm filters
- Customer specific camera adapter
- Correctors: Field Flattener, Reducers
- ASA-UPS (uninterruptable power supply)
- Main mirror cover



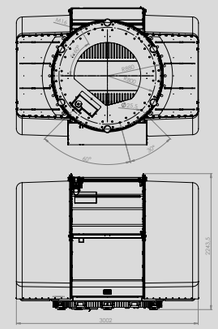
ASA OGS – ASA AZ800 in Austria

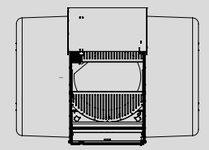
ASA OGS installation

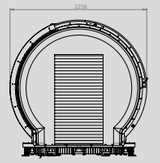
ASA AZ800 inside of ASA OGS

ASA OGS

Ritchey-Chrétien Alt-Az telescope f6 with Nasmyth focus
Direct Drive motors with absolute encoders on all axis







MAIN DATA

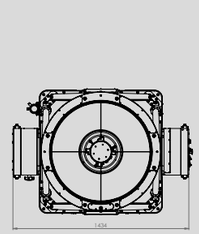
Focal length	4800 mm
F-number	6
Optical diameter	≥ 800 mm
Image scale	37" per mm
Mirror material	Fused Silica (quartz), ultra low thermal expansion 0.55e-6/°C
Software	

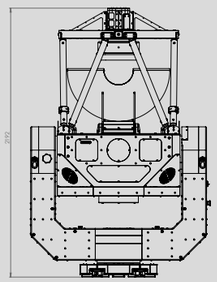
SYSTEM PERFORMANCE

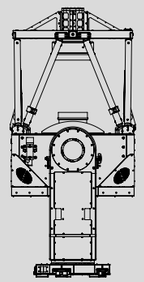
Pointing accuracy	< 8" RMS with pointing model (for altitude 20° to 85°)
Tracking accuracy	< 0,25" RMS within 5 minutes (at optimal ambient and sky conditions) over 5 min 0,05" RMS/min
Slewing speed	6°/sec (up to 10°/sec optional)

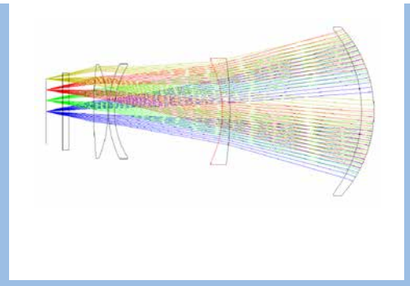
BASIC EQUIPMENT

- ASA AZ800 telescope including fork mount and telescope with ASA optics
- Telescope electronics rack including all power supplies for telescope, IP-remote power switch, Ethernet switch
- All tools necessary for telescope installation
- Laser for optical collimation

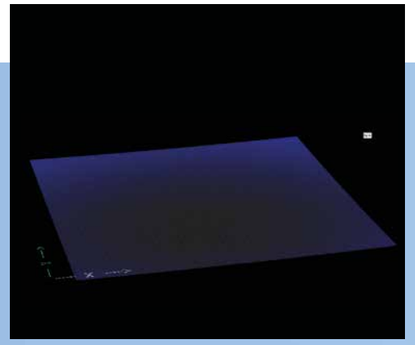




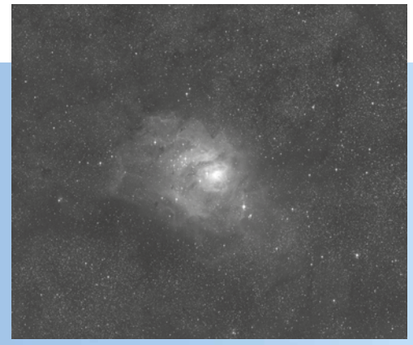




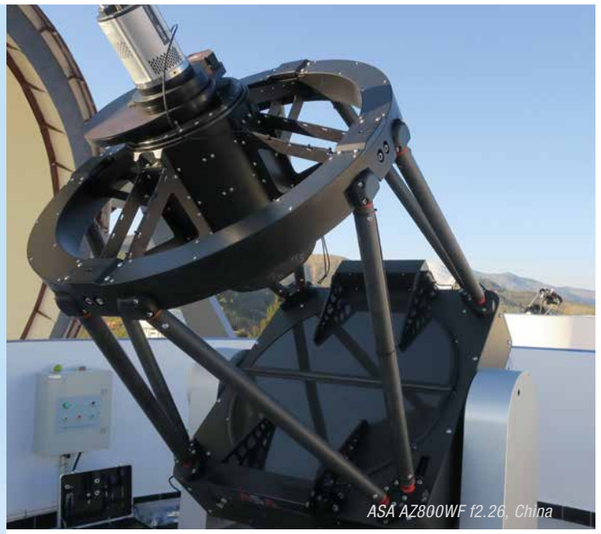
Optical Layout ASA AZ800WF



Field Curvature 80 mm diagonal



First light M8 5 sec with ASA AZ800WF f2.2



ASA AZ800WF f2.26, China

ASA AZ800WF f2.26, China

ASA AZ800WF f2.26

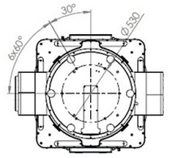
800 mm Widefield telescope

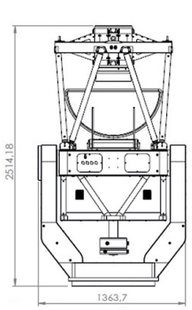
OPTIC

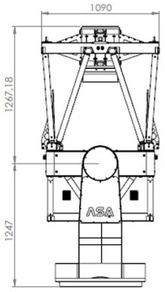
- Main mirror 800 mm
- Prime focus design
- Field of view linear diameter 104 mm

DIMENSIONS

- 2800 mm height
- 900 kg weight





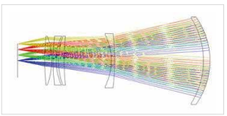


ASA EQ1000WF f1.3

1000 mm Widefield telescope

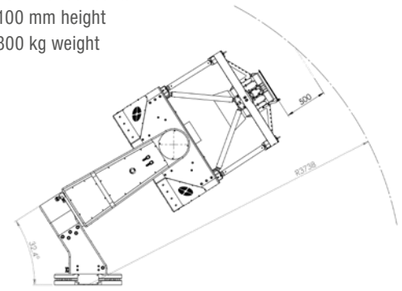
OPTIC

Optical diameter	1000 mm
Corrected field of view	130 mm linear
Back focal length	100 mm
Spectral range	400-700 nm
D80 integral light	8-15 um
RMS diameter integral light	4-9 um



DIMENSIONS

- Fits in 20 feet container
- 3100 mm height
- 1800 kg weight



First Light M27 with ASA EQ1000

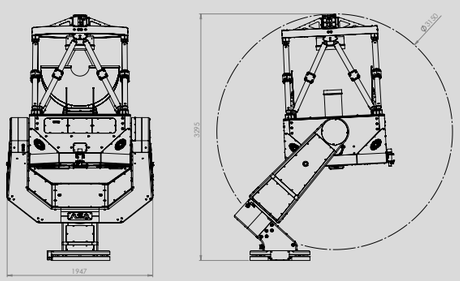
ASA EQ1000 f6.76 f2

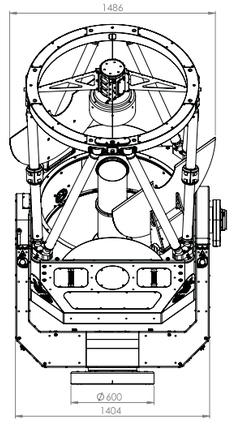
1000 mm Ritchey Chrétien telescope

OPTIC
- 1000 mm main mirror
- Ritchey Chrétien design
- Custom field corrector

DIMENSIONS
- 3295 mm height
- 2100 kg weight

TECHNICAL DETAILS
- Direct Drive motors
- All axis with absolute encoder
- Unguided blind tracking performance
- Derotator with encoder system





ASA AZ1000 Dimensions

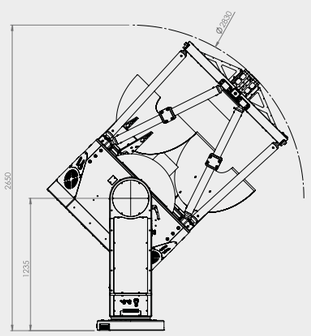
ASA AZ1000 f7 f2

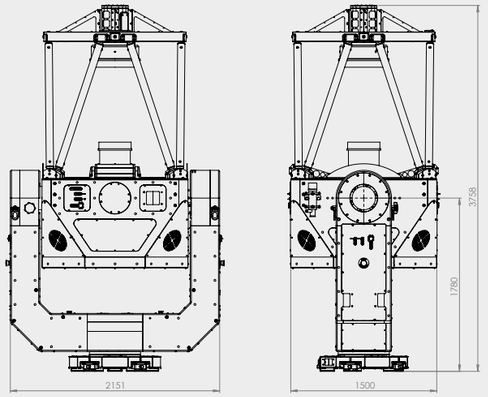
1000 mm Ritchey Chrétien telescope

OPTIC
- Optical diameter 1000 mm
- Ritchey Chrétien design

DIMENSIONS
- 2650 mm height
- 1150 kg weight

TECHNICAL DETAILS
- Direct Drive motors
- All axis with absolute encoder
- Unguided blind tracking performance
- Derotator with encoder system





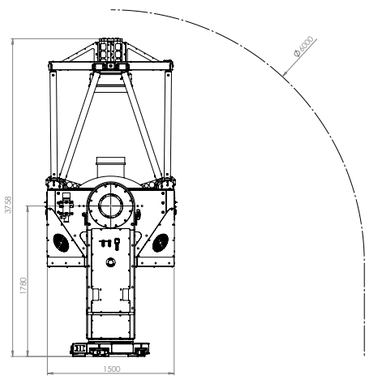
ASA AZ1200 Dimensions

ASA AZ1200 f6 f2

1200 mm Ritchey Chrétien telescope

OPTIC
- Optical diameter 1200 mm
- Ritchey Chrétien design

DIMENSIONS
- 3300 mm height
- 2500 kg weight



The world's largest full CNC manufactured telescope

ASA AZ1750

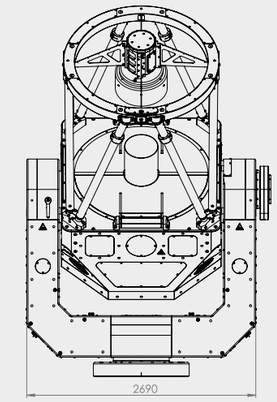
The world's largest full CNC manufactured telescope

OPTIC
- 1750 mm main mirror
- Ritchey Chrétien design
- Custom field corrector

DIMENSIONS
- 4889 mm height
- 6600 kg weight

TECHNICAL DETAILS
- Direct Drive motors
- All axis with absolute encoder
- Unguided blind tracking performance
- Derotator with encoder system
- Four automatic exchange Nasmyth-Foci
- Remote mirror covers M1, M2 and M3

ASA AZ1750 in Empfingen, DE



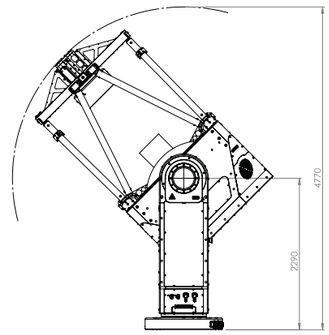
ASA AZ1500 Dimensions

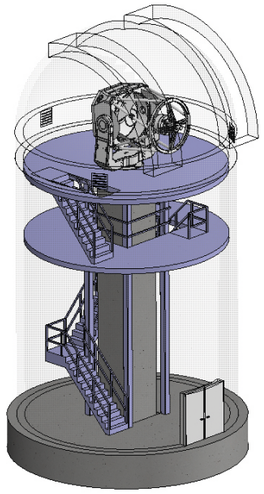
ASA AZ1500 f6 f2

1500 mm Ritchey-Chrétien telescope

OPTIC
- Optical diameter 1500 mm
- Ritchey Chrétien design

DIMENSIONS
- 4.800 mm height
- 7.500 kg weight





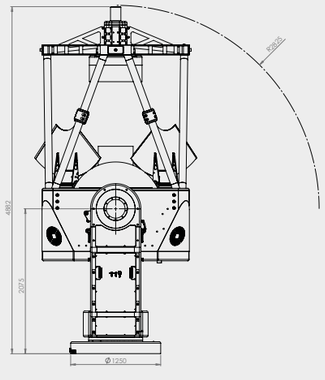
ASA AZ1750

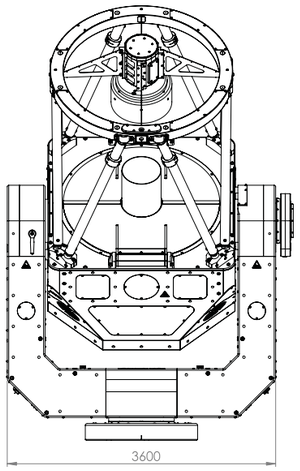
ASA AZ1750 f6 f2

1750 mm Ritchey Chrétien telescope

OPTIC
- Optical diameter 1750 mm
- Ritchey Chrétien design

DIMENSIONS
- 4.882 mm height
- 6.500 kg weight





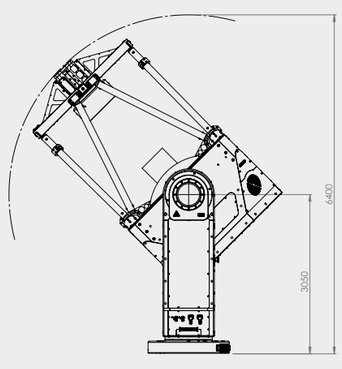
ASA AZ2000 Dimensions

ASA AZ2000 f6 f2

2000 mm Ritchey Chrétien telescope

OPTIC
- Optical diameter 2000 mm
- Ritchey Chrétien design

DIMENSIONS
- 6.400 mm height
- 12.000 kg weight



ASA H400 f2.4

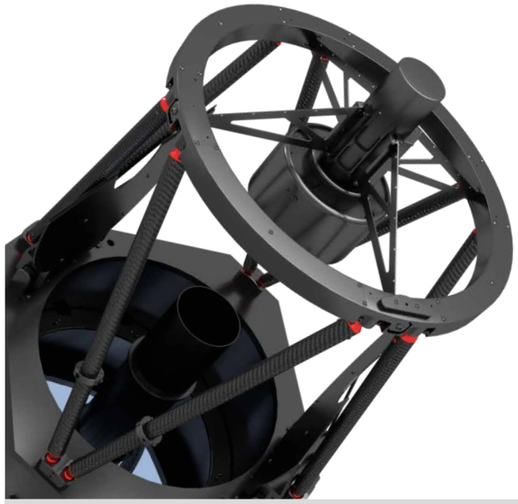
400 mm Hyperbolic ASA telescope

TUBE – OPTIC H400

Main mirror	400 mm hyperbolic
Corrected field of view	70 mm diagonal
Focal ratio	f2.4
Weight	52 kg

ASA TRACKING MOUNT
- Direct drive
- Absolute encoder on each axis
- Pointing accuracy <12" RMS with pointing file
- Tracking accuracy* 0,35" RMS in 5 minutes

*at optimal ambient and sky conditions



ASA600 f7 f2.5

600 mm Ritchey-Chrétien telescope

OPTIC

Main mirror	600 mm hyperbolic
Field of view	70 mm diagonal
Focal ratio	f7
Weight	97 kg

MOUNT – DDM200
- Direct drive
- Absolute encoder
- Pointing accuracy <12" RMS with pointing file
- Tracking accuracy* 0,35" RMS in 5 minutes

*at optimal ambient and sky conditions

ASA DDM100

ASA DDM200 with polar wedge

DDM500 with pier

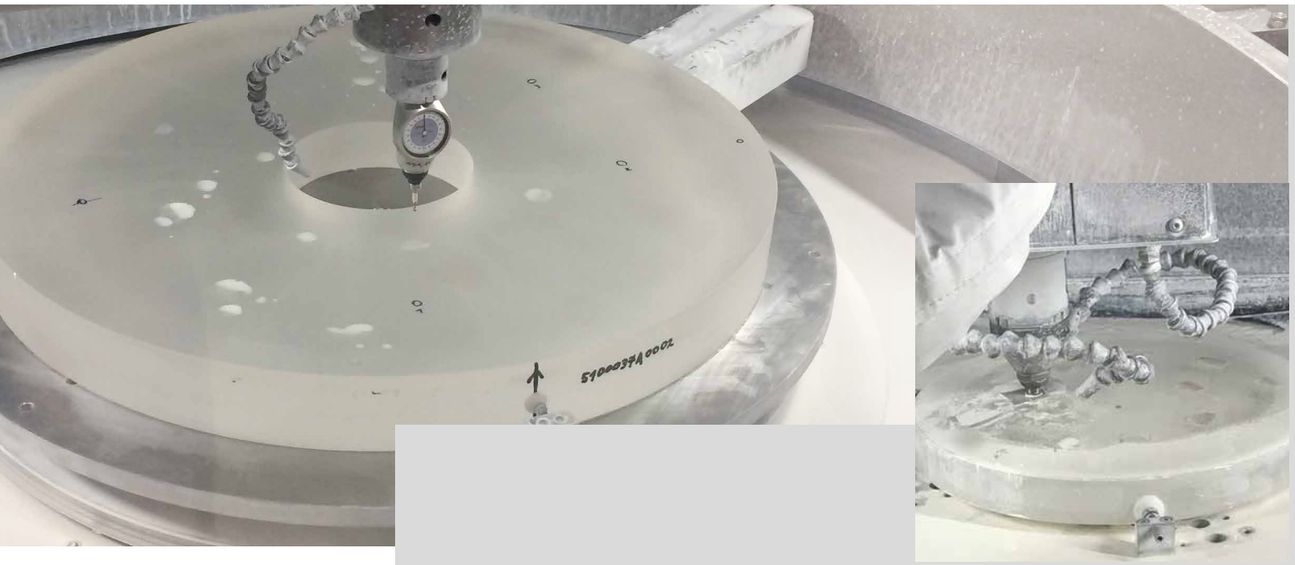
FROM SMALL TO BIG

THE RIGHT MOUNT FOR EVERY TELESCOPE.

THE NEW GENERATION

Three new DDM mounts cover the payload range from 0 to 500 kg/1100 lbs. All DDM mounts are equipped with ABSOLUTE encoders on each axis. Best performance with ASA telescopes.

The ASA DDM mounts are the entry into all kinds of research work, including astronomy, satellite tracking and laser communication applications.



We believe that **the most important part in producing optics is the testing**. So ASA decided that we invest in the best test equipment available, remove any measuring error as good as possible and use real values in our specifications.

ASA decided to invest in our own optical production and the optics we produced are far better than anything we have obtained so far.

Our CNC machines work in the state of art polishing technique and it allows us to correct even surface errors like astigmatism to perfection. We are also able to produce any free form surfaces like off-axis parabola and even more complicated shapes.

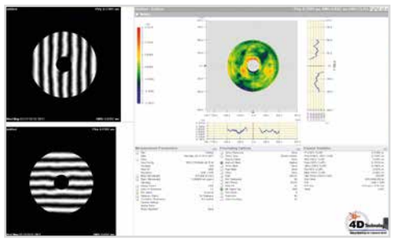
Our optical production unit makes it possible for us to produce optics with a diameter of up to 2000 mm in house.
1000 mm optics can be produced in less than 3 months from order to delivery, we welcome your inquiry.
Lenses can be made from all materials available in the Schott or CDGM glass catalogue.

FACTS

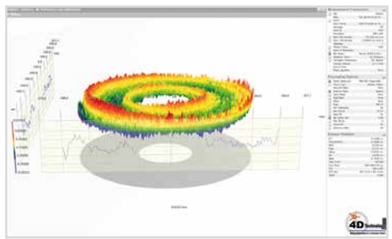
- The 1000 mm f1.8 mirror was produced on the UPG2000 and measured with a CGH.
- Pixel sampling was 1.67 mm.
- Wavefront RMS is 23 nm, PV is 113 nm. This was appr. 2x better than demanded by the customer.
- The mirror is a D = 800 mm parabolic mirror with f2.5. It has been produced at the ASA optical factory and measured with a CGH and our 4D Phasecam 4020. We have currently running a serial production here with an output of one mirror every 3 weeks.

WE HAVE SPECIALIZED IN ASPHERICAL OPTICS IN SIZES > 300 MM FOR

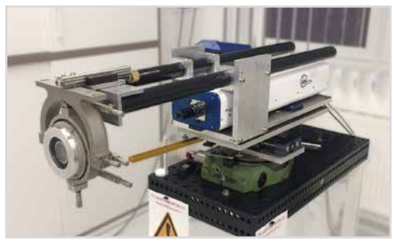
- Astronomical telescopes
- Lidar System
- Telescopes for Laser Communication
- Widefield Telescopes for Space Surveillance
- Off-Axis mirrors (Laser Beam Focusing, Spectroscopy, Beam Expanders)
- Collimators
- On-Axis Parabolic mirrors (convex and concave)
- On-Axis Hyperbolic mirrors (convex and concave)
- Ellipsoids
- Flats



1000 mm f1.8 mirror

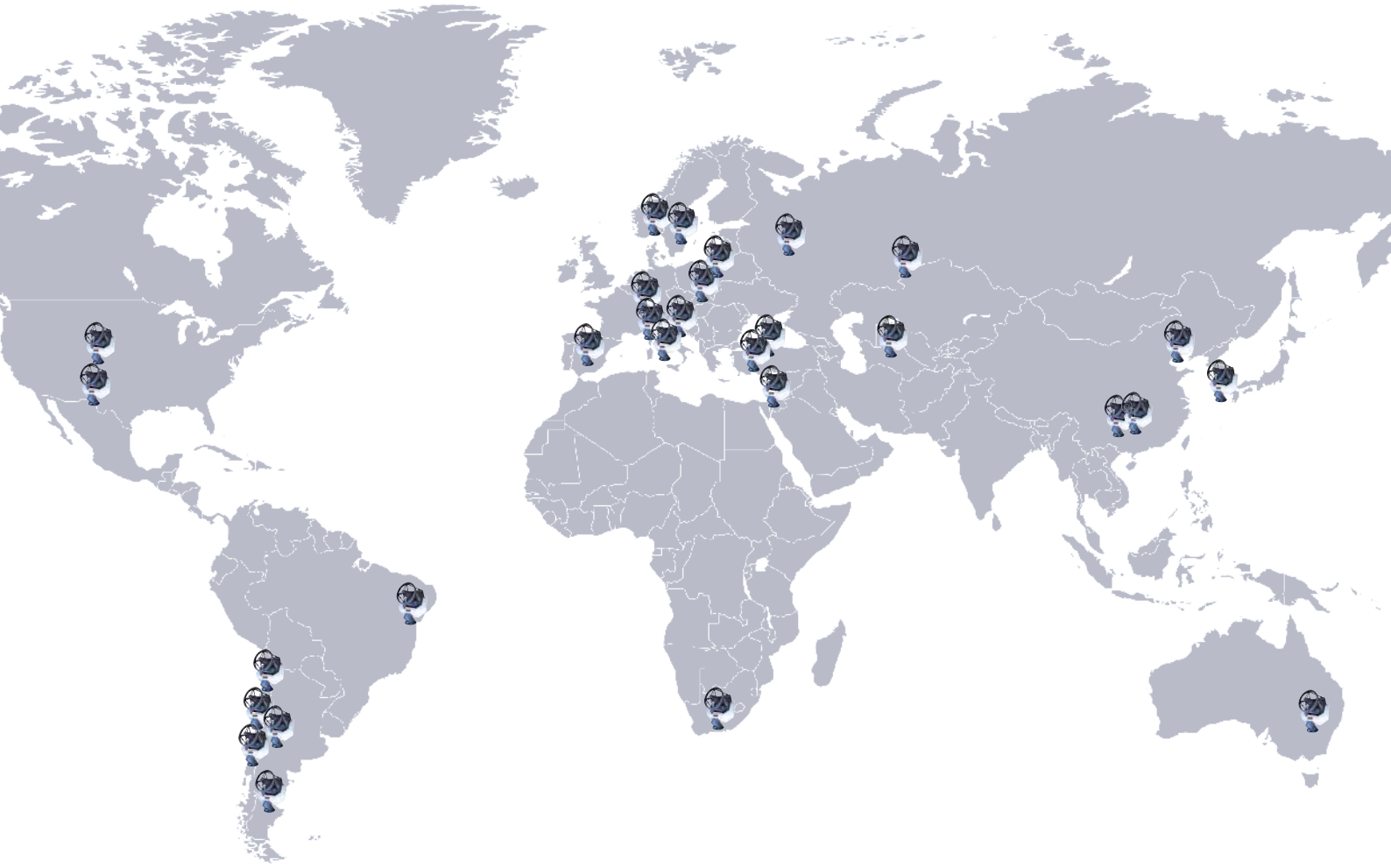


800 mm f2.5 mirror



Aligning CGH in front of phasecam

UPG 2000 for production of up to 2000 mm diameter



WHERE WILL THE NEXT ASA
TELESCOPE BE IN OPERATION?

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