








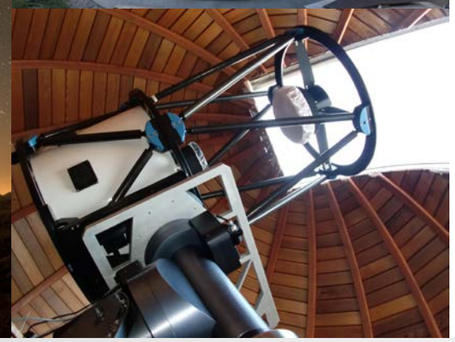


Founded in 2006, ***PlaneWave Instruments*** *is committed to providing observatory-class products for serious astronomers at an unprecedented value. Developed by PlaneWave, the CDK (Corrected Dall-Kirkham) is a revolutionary telescope, its optical system was designed to excel at imaging on large format CCD cameras while remaining an excellent instrument for visual use.*

Created to meet the demands of both the serious imager and visual observer, the CDK is offered at an unprecedented price/performance ratio for a telescope of this quality and aperture. One advantage of the CDK design is its ease of collimation and achievable centering tolerance for a telescope of this class. This assures that the user will get the best possible performance out of the telescope. The end result is a telescope which is free from off-axis coma, off-axis astigmatism, and curvature of field, yielding a perfectly flat field all the way out to the edge of the largest CCD sensors available today. Today PlaneWave makes a full line of CDK and Ritchey-Chrétien (RC) telescopes as well as imaging and observatory class mounts to provide complete imaging systems for both individuals and industry.

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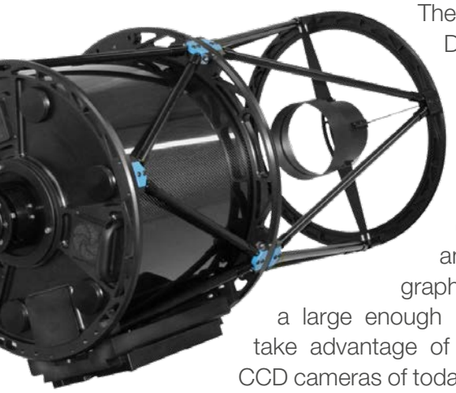
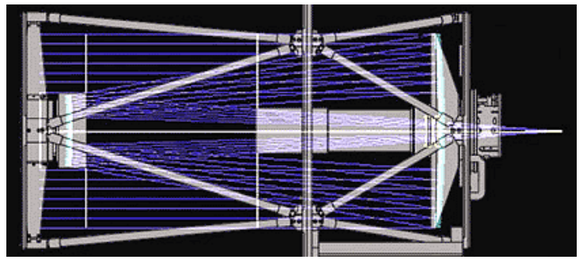
THE OPTICAL DESIGN OF CDK ASTROGRAPHS

Shown on the example of CDK20 Astrograph



The CDK [Corrected Dall-Kirkham] telescope is based on an optical design developed by Dave Rowe. The goal of the design is to make an affordable astrographic telescope with a large enough imaging plane to take advantage of the large format CCD cameras of today. Most telescope images degrade as you move off-axis from either coma, off-axis astigmatism, or field curvature. The CDK design suffers from none of these problems. The end result is a telescope which is free from off-axis coma, off-axis astigmatism, and curvature of field, yielding a perfectly flat field all the way out to the edge of a 52mm (respectively 70mm on most other CDK-optics) image circle. This means pinpoint stars from the center out to the corner of the field of view.



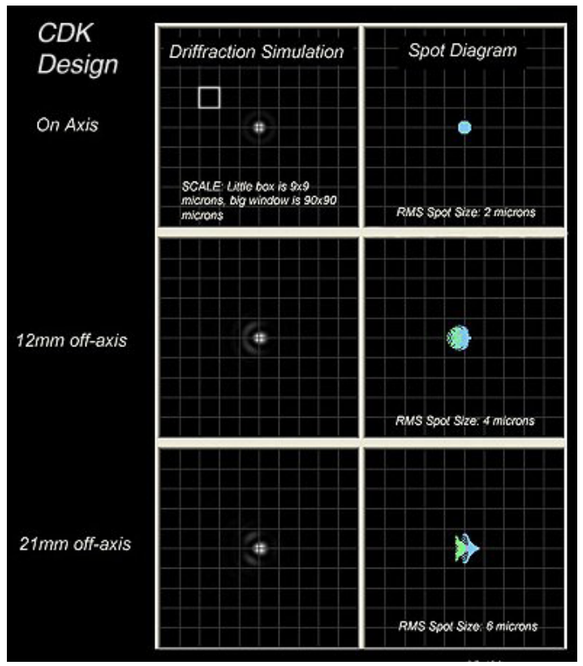
The design is a simple and elegant solution to the problems posed above. The CDK consists of three components:

- an ellipsoidal primary mirror,
- a spherical secondary mirror
- and a lens group.

All these components are optimized to work in concert in order to create superb pinpoint stars across the entire 52 to 70mm image plane.

OPTICAL PERFORMANCE

The following graphic shows two simulations showing the CDK's stunning performance. The first is a **diffraction simulation** and the second is a spot diagram. In the diffraction simulation the star images on axis and off-axis are nearly identical. In the spot diagram 21mm off-axis the spot size is an incredible 6 microns RMS diameter. For 26mm off-axis, a 52mm image circle, the RMS spot size is 11 microns. This means the stars across the entire focal plane are going to be pinpoints as small as atmospheric seeing will allow. Both of the simulations take into consideration a flat field, which is a more accurate representation of how the optics would perform on a flat CCD camera chip.



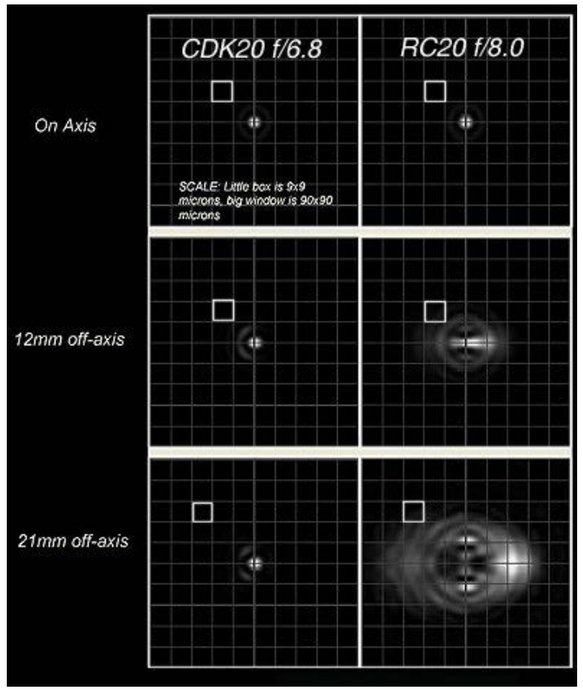
For visual use some amount of field curvature would be allowed since the eye is able to compensate for a curved field. The diffraction simulation was calculated at 585nm. The spot diagram was calculated at the RGB wavelength, repectively at 720-, 555- und 430nm. Many companies show spot diagrams in only one wavelength, however to evaluate chromatic performance multiple wavelengths are required.

COMPARISON: CDK VS. RITCHEY CHRÉTIEN

The simulation below compares the optical performance of the CDK design to the Ritchey Chrétien (RC) design. The RC design was popularized as an astroimaging telescope due to its use in many professional observatories. Although very difficult and expensive to manufacture and align, the RC is successful in eliminating many of the problems that plague many other designs, namely off-axis coma. However the RC does nothing to eliminate the damaging effects of off-axis astigmatism and field curvature.

The CDK design tackles the off-axis coma problem by integrating a pair of correcting lenses into a two mirror design. The beauty is that this design also corrects for astigmatism and field curvature. Because the lenses are relatively close to the focal plane, and because these lenses work together as a doublet, there is no chromatic aberration. The CDK offers a wide aberration-free, flat field of view that allows the user to take full advantage of the very large imaging chip cameras in the market place today.

Having an aberration free telescope design means nothing if the optics cannot be aligned properly. Many RC owners never get to take full advantage of their instrument's performance because the RC is very difficult to collimate. Aligning the hyperbolic secondary mirror's optical axis to the optical axis of the primary mirror is critical in the RC design, and the tolerances are unforgiving. The secondary mirror of the CDK design is spherical. It has no optical axis and so the centering tolerance of the CDK secondary mirror is comparatively huge. With the help of some very simple tools, the CDK user will be able to set the secondary spacing, collimate the optics and begin enjoying the full performance potential the instrument has to offer within a few minutes.



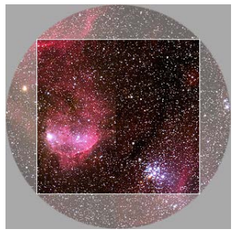
The drastic difference in performance between the CDK and the RC is apparent. The biggest component that degrades the off-axis performance of the RC is the defocus due to field curvature. In many diagrams shown by RC manufacturers, the diagrams look better than this because they are showing a curved field. This is fine for visual use because the eye can compensate for some amount of curvature of field. But CCD arrays are flat and so in order to evaluate the performance a spot diagrams and/or diffraction simulations requires a flat field as shown.

The small squares are 9x9 microns wide, the individual comparative images are 90 micrometers wide. The spot diagrams were calculated for a wavelength of 585 nanometers.

Furthermore, please note: the CDK design is f / 6.8, the RC design is f / 8. This is not important for stars, but it can easily reduce the exposure time when photographing extended objects like nebulae.

52mm flat field

30mm flat field in comparison



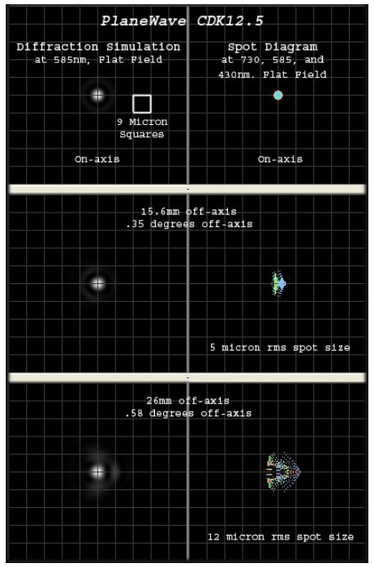
Usable field size of SBIG STX 16803 at 50mm flat field

Usable field size of SBIG STX 16803 at 30mm flat field

CDK 12,5

OPTICAL SYSTEM

Aperture	12.5 inch (318 mm)
Focal Length	2541 mm(100.04 inch)
Focal ratio	f/8
Central Obstruction	17,64% by surface area; 42% of the Primary Mirror Diameter
Back Focus from Mounting Surface	10.445 inch (265 mm)
Back Focus from racked-in Focuser	7.2 inch (183 mm)
Weight	48.5 lbs (22kg)
OTA Length	31 inch (787 mm)
Optical Performance	3.8 micron RMS at 13mm off-axis; 12.0 micron RMS at 26mm off-axis
UpperCage	Carbon Optical Tube
Lower Cage	Carbon Optical Tube
Optimal Field of View	52mm Image Circle



PRIMARY MIRROR

Optical Diameter	12.5 inch (318 mm)
Outer Diameter	13 inch (330 mm)
Shape	Prolate Ellipsoid
Material	Fused Silica
Coating	Enhanced Aluminum - 96%

SECONDARY MIRROR

Diameter	4.65 inch (118 mm)
Material	Fused Silica
Shape	Spherical
Coating	Enhanced Aluminum - 96%

Prices, further images and technical information in English and German on:
www.baader-planetarium.com/cdk12

PLANEWAVE *CDK 12,5* IS AVAILABLE IN THE FOLLOWING VERSIONS

WITH
FUSED SILICA
OPTICS
#1323212Q

AS DALL-KIRKHAM
IRDK
INFRARED-OPTIMIZED
#1323212I

CDK 14

OPTICAL SYSTEM

Aperture	14 inch (356 mm)
Focal Length	2563 mm(101 inch)
Focal ratio	f/7.2
Central Obstruction	23.5% by surface area; 48.5% by diameter
Back Focus from Mounting Surface	11.09 inch (282 mm)
Back Focus from racked-in Focuser	8,09 inch (206mm)
Weight	48 lbs (22 kg)
OTA Length	35 inch (889 mm)
Optical Performance	3.1 micron RMS at 13mm off-axis; 6.0 micron RMS at 35mm off-axis
UpperCage	Carbon Fiber Truss
Lower Cage	Carbon Fiber Truss with Light Shroud
Optimal Field of View	70mm Image Circle

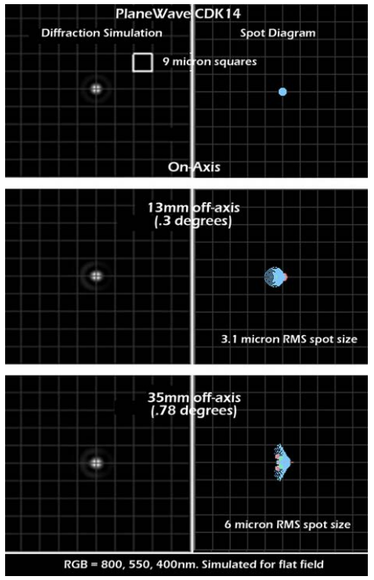
PRIMARY MIRROR

Optical Diameter	14 inches (355.6)
Outer Diameter	14.5 inches (368.3mm)
Shape	Prolate Ellipsoid
Material	Fused Silica
Coating	Enhanced Aluminum - 96%

SECONDARY MIRROR

Diameter	6.5 inch (165 mm)
Material	Fused Silica
Shape	Spherical
Coating	Enhanced Aluminum - 96%

Prices, further images and technical information in English and German on:
www.baader-planetarium.com/cdk14



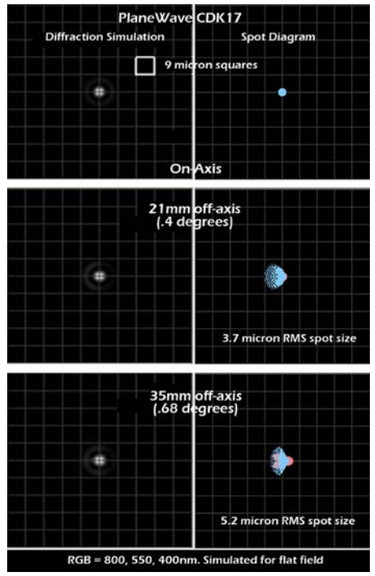
PLANEWAVE *CDK 14* IS AVAILABLE IN THE FOLLOWING VERSION

WITH
FUSED SILICA
OPTICS
#1323214Q

CDK 17

OPTICAL SYSTEM

Aperture	17 inch (432 mm)
Focal Length	2939 mm (115.71 inch)
Focal ratio	f/6.8
Central Obstruction	23.7% by surface area; 48.6% of the Primary Mirror Diameter
Back Focus from Mounting Surface	10.24 inch (260 mm)
Back Focus from racked-in Focuser	7.24 inch (184 mm)
Weight	106 lbs (48 kg)
OTA Length	42 inch (1067 mm)
Optical Performance	3.1 micron RMS at 13mm off-axis; 6.0 micron RMS at 35mm off-axis
UpperCage	Carbon Fiber Truss
Lower Cage	Carbon Fiber Truss and Light Shroud
Optimal Field of View	70mm Image Circle



PRIMARY MIRROR

Optical Diameter	17 inch (432 mm)
Outer Diameter	17.5 inch (445 mm)
Shape	Prolate Ellipsoid
Material	Fused Silica
Coating	Enhanced Aluminum - 96%

SECONDARY MIRROR

Diameter	7.48 inch (190 mm)
Material	Fused Silica
Shape	Spherical
Coating	Enhanced Aluminum - 96%

Prices, further images and technical information in English and German on:
www.baader-planetarium.com/cdk17

PLANEWAVE *CDK 17* IS AVAILABLE IN THE FOLLOWING VERSIONS

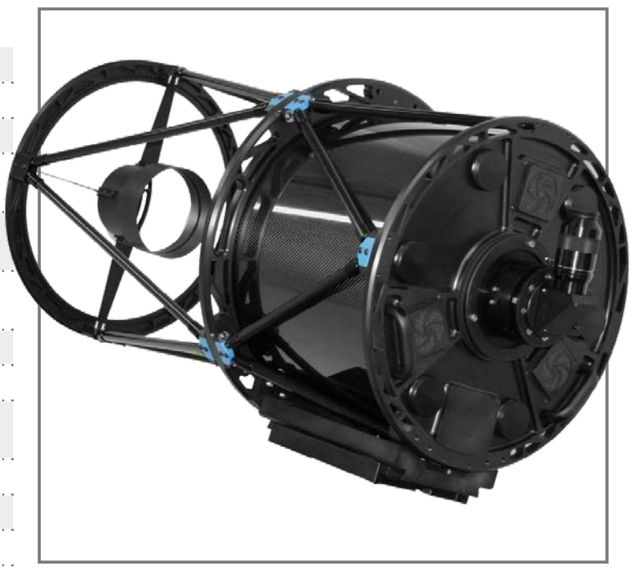
WITH
FUSED SILICA
OPTICS
#1323217Q

WITH
FUSED SILICA
AND 8" PLATES FOR FORK MOUNTS
#1323217FQ

CDK 20

OPTICAL SYSTEM

Aperture	20 inch (508 mm)
Focal Length	3454 mm(135.98 inch)
Focal ratio	f/6.8
Central Obstruction	15.21% by surface area; 39% of the Primary Mirror Diameter
Back Focus from Mounting Surface	8.8 inch (223mm)
Back Focus from racked-in Focuser	5.8 inch (147 mm)
Weight	140 lbs (63.5 kg)
OTA Length	47 inch (1,194 mm)
Optical Performance	4.0 micron RMS at 13mm off-axis; 11.8 micron RMS at 26mm off-axis
UpperCage	Carbon Fiber Truss
Lower Cage	Carbon Fiber Truss with Light Shroud
Optimal Field of View	52mm Image Circle



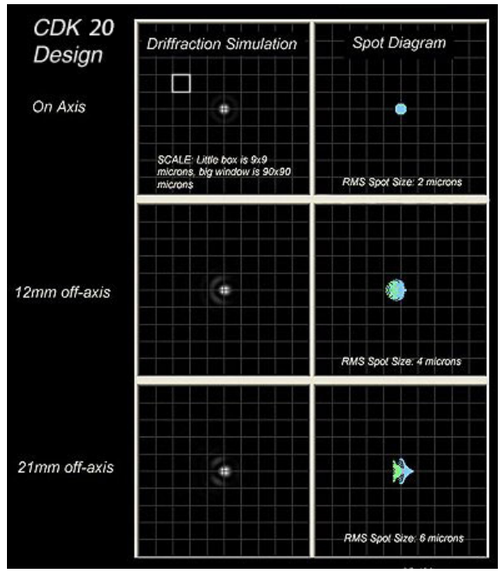
PRIMARY MIRROR

Optical Diameter	20 inch (508 mm)
Outer Diameter	20.5 inch (521 mm)
Shape	Prolate Ellipsoid
Material	Fused Silica
Coating	Enhanced Aluminum - 96%

SECONDARY MIRROR

Diameter	7.5 inch (191mm)
Material	Fused Silica
Shape	Spherical
Coating	Enhanced Aluminum - 96%

Prices, further images and technical information in English and German on:
www.baader-planetarium.com/cdk20



PLANEWAVE *CDK/RC 20* IS AVAILABLE IN THE FOLLOWING VERSIONS

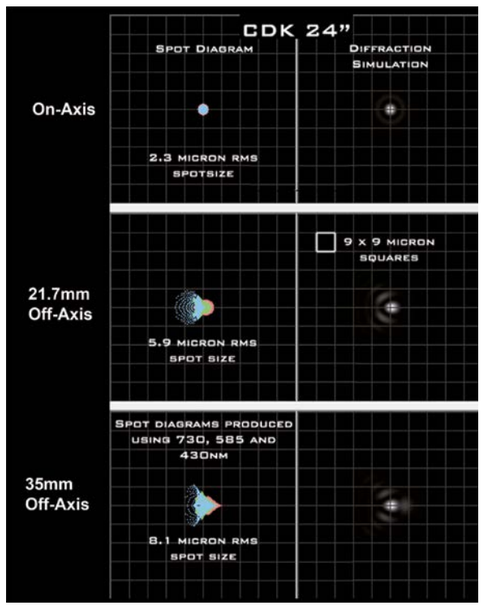
WITH
FUSED SILICA
OPTICS
#1323220Q

WITH
FUSED SILICA
AND 8" PLATES FOR FORK MOUNTS
#1323220FQ

AS DALL-KIRKHAM
IRDK: IR-OPTIMIZED
W. FUSED SILICA
#1323270IQ

FUSED SILICA RC
OPTICS
#1323221Q

FUSED SILICA RC
AND 8" PLATES FOR FORK MOUNTS
#1323221Q



OPTICAL SYSTEM

Aperture	24 inch (610 mm)
Focal Length	3962 mm (155.98 inch)
Focal ratio	f/6.5
Central Obstruction	22,09% by surface area; 47% of the Primary Mirror Diameter
Back Focus from Mounting Surface	14.1 inch (358 mm)
Back Focus from racked-in Focuser	5.81 inch (148 mm)
Weight	240 lbs (108.9 kg)
OTA Length	56 inch (1,422 mm)
Optical Performance	3.1 micron RMS at 13mm off-axis; 7.0 micron RMS at 42mm off-axis
UpperCage	Carbon Fiber Truss
Lower Cage	Carbon Fiber Truss with Aluminum Light Shroud
Optimal Field of View	70mm Image Circle

PRIMARY MIRROR

Optical Diameter	24 inch (610 mm)
Outer Diameter	24.5 inch (622 mm)
Shape	Prolate Ellipsoid
Material	Fused Silica
Coating	Enhanced Aluminum - 96%

SECONDARY MIRROR

Diameter	9.45 inch (240 mm)
Material	Fused Silica
Shape	Spherical
Coating	Enhanced Aluminum - 96%

Prices, further images and technical information in English and German on:
www.baader-planetarium.com/cdk24

PLANEWAVE *CDK/RC 24* IS AVAILABLE IN THE FOLLOWING VERSIONS

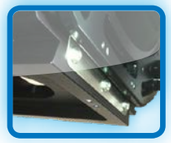
- WITH **FUSED SILICA OPTICS** *#1323224Q*
- WITH **FUSED SILICA AND 8" PLATES FOR FORK MOUNTS** *#1323224FQ*
- AS DALL-KIRKHAM **IRDK: IR-OPTIMIZED W. FUSED SILICA** *#1323224IQ*
- **FUSED SILICA OPTICS** RC *#1323225Q*

STANDARD FEATURES FOR ALL CDK TELESCOPES

COOLING FANS – Three cooling fans blow air inside the back of the telescope. Internal diverting fans circulate air flow behind the mirror for even cooling to help the telescope reach thermal equilibrium quickly. The fans are controlled with PWI PC software with the optional *Electronic Focus Accessory (EFA Kit).*

CARBON FIBER TRUSS DESIGN – Rigid and lightweight. Minimizes thermal expansion which causes focus shift with changes in temperature.

DELTA-T READY – for added dew prevention, the CDK's are internally wired with polyimide film pads and temperature sensors, ready to be controlled with the optional *Delta-T controller.*



DOVETAIL EXPANSION JOINT – allows for the difference in thermal expansion between carbon fiber and aluminum. The expansion joint allows the aluminum dovetail to expand and contract without stressing the carbon fiber lower truss.

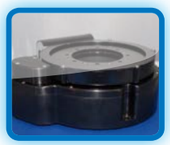
RECOMMENDED ACCESSORIES

DELTA-T HEATER *(CDK 12,5: #1329112 / 14: #1329110 / 17: #1329117 / 20: #1329120 / 24: #1329124)*

- have Full Control of Primary and Secondary Heater using PlaneWave Interface (PWI 3) Software
- Monitor current temperature of primary mirror, secondary mirror and surrounding ambient temperature
- Automatically maintains mirror temperature set point as outside temperature changes
- Displays real time graph of all temperature sensors

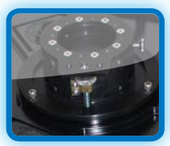
IRF 90 – INTEGRATED ROTATING FOCUSER *(#1329070)*

Large capacity Integrated Focuser and Rotator. The Focuser is capable of lifting 40 lbs (18 kg) with a range 30 mm (30000 microns). It has a 90mm aperture with a range of 365 degrees with hardstops to elliminate any chance of cord wrap. The IRF90 is compatable with CDK14 – CDK700. It requires a standard Electronic Focuser Assembly (EFA-Kit) and the software PlaneWave Interface and ASCOM drivers.



3.5" HEDRICK FOCUSER *(#1329050)*

Heavy duty no-slip focuser capable of handling an imaging payload of up to 20lbs (9,1 kg). The focus tube runs on 5 bearings and is driven by a leadscrew so there is no chance of slipping. Focus may be automated through a computer using PlaneWave's EFA Kit add-on. The focuser comes with pre-installed motor that can be controlled with the EFA hand control or PWI PC software. The draw tube travel is 1.3 inch.



EFA KIT (ELECTRONIC FOCUS ACCESSORY)

(CDK 12,5: #1329020 / 14: #1329020 / 17: #1329024 / 20: #1329020 / 24: #1329024)

The EFA Kit automates focusing (on optional Hedrick focuser), monitors temperature (on optional Delta T Dew Heater), and controls fans built-in to CDK telescopes. The EFA control box can be mounted to the back plate of any CDK telescope. The EFA Kit plugs into the temperature sensors and fan control wires that come standard with each telescope. A Hand Control is provided to control a optional Focuser or Rotator when standing at the eyepiece. The EFA kit comes with PlaneWave Interface (PWI), a software package that controls all external devices from a PC. All the cables are provided to attach the EFA kit to a PC. The EFA kit is ASCOM compatible.

L-Mount

MOUNT SYSTEM

Mount type	Alt-Az or Equatorial configuration
Mount weight	**L-350:** 110 lbs (50 kg) **L-500:** 257 lbs (100 kg) **L-600:** 338 lbs (153 kg)
Payload Capacity (kg)	**L-350:** 100 lbs (45 kg) **L-500:** 200 lbs (91 kg) **L-600:** 300 lbs (136 kg)
Latitude range	0 to 90 degrees, Northern and Southern hemispheres
Cable management	Equipment cables can be wired through mount

MOTION CONTROL

Motor Control	Industrial grade brushless motor control system and built in electronics
Motor	Azimuth and Altitude: Direct Drive 3 Phase Axial-Flux Torque Motors)
Encoder	152mm disk built into the azimuth and altitude axes with stainless steel encoder on the circumference with reader yields 18,880,000 counts per revolution of the telescope. This translates to about 0.069 arcsecond resolution.
Motor Torque	Approximately 20 ft-lbs continuous; 50 ft-lbs peak

CONTROL SYSTEM

Control System Electronics	PlaneWave Interface dual axis telescope control
Software	PlaneWave Interface (PWI4). Incorporates PointXP mount modeling software by Dave Rowe All ASCOM compatible.
Homing Sensors	Home position sensors are included allowing the mount can find its home position on power up. (L-500)
Slew speeds	20 degrees per second (standard); 50 degrees per second (maximum), both axes
Power requirements	Accepts 120 VAC. Supplied with 12VDC 15A Regulated Power Adapter (L-500)

SYSTEM PERFORMANCE

Pointing accuracy	<10 arcseconds RMS with PointXP Model
Pointing precision	2 arcsecond
Tracking accuracy	< .3 arcsecond error over 5 minute period
System natural frequency	10 Hz or greater

Prices, further images and technical information in English and German on:
www.baader-planetarium.com/l-mount

PLANEWAVE *L-MOUNT* IS AVAILABLE IN THE FOLLOWING VERSIONS

L-350
DIRECT DRIVE MOUNT
PAYLOAD: 100 LBS (45 KG)
#1321102

L-500
DIRECT DRIVE MOUNT
PAYLOAD: 200 LBS (91 KG)
#1321100

L-600
DIRECT DRIVE MOUNT
PAYLOAD: 300 LBS (136 KG)
#1321101

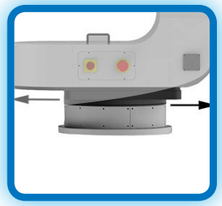
PLANEWAVE L-SERIES DIRECT DRIVE MOUNT

The L-Series combines versatility, simplicity and affordability by combining all the technology of our Observatory class telescopes into a compact stand-alone mount. In its Alt/Az configuration it is considerably more compact than its equatorial counterpart, allowing a larger telescope to fit in a smaller enclosure. The mass it takes to make a rigid alt/az mount is substantially less, leading to cost savings. Unlike German Equatorial mounts, there are no meridian flips to deal with, and no large protruding counterweights to create a dangerous hazard in a public observatory. Alt/Az is more intuitive to use and no polar alignment is needed. Besides, it is the way the pros do it!

L-SERIES SPECIAL FEATURES

INCREDIBLE SLEW SPEED – The direct drive motors can move the telescope at speeds up to 50 degrees per second for tracking satellites or just to minimize target acquisition time.

DUAL MOUNTING BRACKET – PlaneWave style mounting bracket to hold CDK17/20 onto inside of fork arm with additional option of mounting a scope on the outside of the fork arm. Optional dovetail clamp required.



AZIMUTH DOVETAIL BALANCE SYSTEM – For precise center of gravity balance whether in Alt-Az or Equatorial configuration.

THROUGH THE MOUNT CABLING – Access panels in the fork arm and azimuth axis allow for camera equipment cabling through the inside of the mount.

DIRECT DRIVE MOTORS AND ENCODERS – Direct Drive motors mean there are no gears to cause backlash and periodic error. With high-resolution encoders providing the feedback for the direct drive motors, not only will the telescope track without periodic error or have any backlash at all, but the mount will be able to counter against wind gusts. The direct drive motors can move the telescope at incredible speeds for tracking satellites or just to minimize target acquisition time.

CDK 350

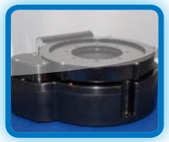
OBSERVATORY TELESCOPE (MOUNT & OPTICS)

Set consisting of:

- **CDK14**, 14 inch (0.35 m) f/7.2 Corrected Dall-Kirkham Astrograph. The telescope features 3 cooling fans ejecting air from the back of the telescope. *More Information on page 7*

- **L-350 Direct Drive Mount**, with 100 lbs (45 kg) loading capacity. Incredible slew speed, dual-mounting options, Azimuth dovetail balance system, through the mount cabeling, Direct-Drive motors/encoders and much more. *More Information on pages 12/13*

- ***Optional:*** **IRF 90** – Integrated rotating focuser. Large capacity Integrated Focuser and Rotator. The Focuser is capable of lifting 40 lbs (18 kg) with a range 30 mm (30000 microns) *More Information on page 11*



- ***Optional:*** **EFA Kit** (Electronic Focus Accessory). This Kit automates focusing (on optional Hedrick focuser), monitors temperature (on optional Delta T Dew Heater), and controls fans built-in to CDK telescopes. *More Information on page 11*

CDK FEATURES:
see CDK 14 (p. 7) and Standard Features for all CDK's (p. 11)

MOUNT FEATURES:
see L-Mount Special Features (p. 13)

Prices, further images and technical information in English and German on:
www.baader-planetarium.com/cdk350

PLANEWAVE *CDK 350* IS AVAILABLE IN THE FOLLOWING VERSION

WITH
FUSED SILICA
OPTICS
#1323235Q

CDK 400

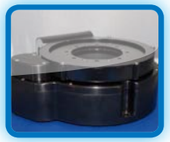
OBSERVATORY TELESCOPE (MOUNT & OPTICS)

Set consisting of:

- **CDK17**, 17" (0.43 m) f/6.5 Corrected Dall-Kirkham Astrograph. The telescopehas a dual carbon-fiber truss design, with 3 cooling fans ejecting air from the back of the telescope, and 4 fans blowing across the boundary layer of the mirror's surface *More Information on page 8*

- **L-500 Direct Drive Mount**, with 200 lbs (91 kg) loading capacity. Incredible slew speed, dual-mounting options, Azimuth dovetail balance system, through the mount cabeling, Direct-Drive motors/encoders and much more. *More Information on pages 12/13*

- ***Optional:*** **IRF 90** – Integrated rotating focuser. Large capacity Integrated Focuser and Rotator. The Focuser is capable of lifting 40 lbs (18 kg) with a range 30 mm (30000 microns) *More Information on page 11*



- ***Optional:*** **EFA Kit** (Electronic Focus Accessory). This Kit automates focusing (on optional Hedrick focuser), monitors temperature (on optional Delta T Dew Heater), and controls fans built-in to CDK telescopes. *More Information on page 11*

CDK FEATURES:
see CDK 17 (p. 8) and Standard Features for all CDK's (p. 11)

MOUNT FEATURES:
see L-Mount Special Features (p. 13)

Prices, further images and technical information in English and German on:
www.baader-planetarium.com/cdk400

PLANEWAVE *CDK 400* IS AVAILABLE IN THE FOLLOWING VERSION

WITH
FUSED SILICA
OPTICS
#1323240Q

CDK 500

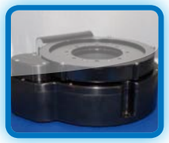
OBSERVATORY TELESCOPE (MOUNT & OPTICS)

Set consisting of:

- **CDK20**, 20 inch (0.51 m) f/6.8 Corrected Dall-Kirkham Astrograph. has a dual carbon-fiber truss design, with 3 cooling fans ejecting air from the back of the telescope. *More Information on page 9*

- **L-500 Direct Drive Mount**, with 200 lbs (91 kg) loading capacity. Incredible slew speed, dual-mounting options, Azimuth dovetail balance system, through the mount cabeling, Direct-Drive motors/encoders and much more. *More Information on pages 12/13*

- ***Optional:* IRF 90** – Integrated rotating focuser. Large capacity Integrated Focuser and Rotator. The Focuser is capable of lifting 40 lbs (18 kg) with a range 30 mm (30000 microns) *More Information on page 11*



- ***Optional:* EFA Kit** (Electronic Focus Accessory). This Kit automates focusing (on optional Hedrick focuser), monitors temperature (on optional Delta T Dew Heater), and controls fans built-in to CDK telescopes. *More Information on page 11*

CDK FEATURES:
see CDK 20 (p. 9) and Standard Features for all CDK's (p. 11)

MOUNT FEATURES:
see L-Mount Special Features (p. 13)

Prices, further images and technical information in English and German on:
www.baader-planetarium.com/cdk500

PLANEWAVE *CDK 500* IS AVAILABLE IN THE FOLLOWING VERSIONS

WITH **FUSED SILICA OPTICS**
#1323250Q

WITH **FUSED SILICA OPTICS** RC
#1323251Q

CDK 600

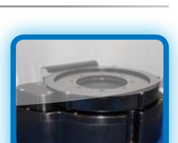
OBSERVATORY TELESCOPE (MOUNT & OPTICS)

Set consisting of:

- **CDK24**, 24" (0.61 m) f/6.5 Corrected Dall-Kirkham Astrograph. The telescope has a dual truss design, with 3 cooling fans for the back of the primary mirror and 4 fans for the front surface of the primary mirror. *More Information on page 10*

- **L-600 Direct Drive Mount**, with 300 lbs (136 kg) loading capacity. Incredible slew speed, dual-mounting options, Azimuth dovetail balance system, through the mount cabeling, Direct-Drive motors/encoders and much more. *More Information on pages 12/13*

- ***Optional:* IRF 90** – Integrated rotating focuser. Large capacity Integrated Focuser and Rotator. The Focuser is capable of lifting 40 lbs (18 kg) with a range 30 mm (30000 microns) *More Information on page 11*



- ***Optional:* EFA Kit** (Electronic Focus Accessory). This Kit automates focusing (on optional Hedrick focuser), monitors temperature (on optional Delta T Dew Heater), and controls fans built-in to CDK telescopes. *More Information on page 11*

CDK FEATURES:
see CDK 24 (p. 10) and Standard Features for all CDK's (p. 11)

MOUNT FEATURES:
see L-Mount Special Features (p. 13)

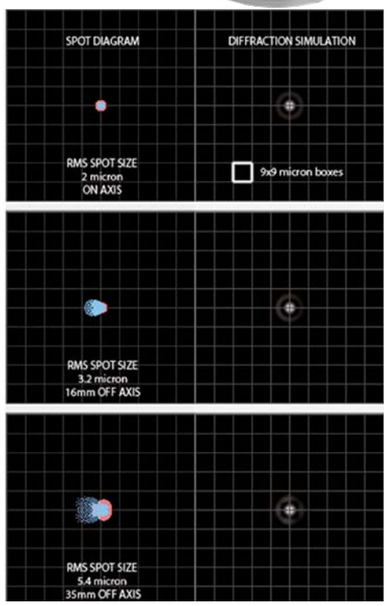
Prices, further images and technical information in English and German on:
www.baader-planetarium.com/cdk600

PLANEWAVE *CDK 600* IS AVAILABLE IN THE FOLLOWING VERSIONS

WITH **FUSED SILICA OPTICS**
#1323260Q

WITH **FUSED SILICA OPTICS** RC
#1323261Q

CDK 700



OPTICAL SYSTEM

Aperture	27.56 inch (700 mm)
Focal Length	4540 mm
Focal ratio	6.5
Central Obstruction	47% of the Primary Mirror Diameter
Back Focus from Mounting Surface	309 mm (12.2 inch)
Weight	1,200 lbs (544 kg)
OTA Tube	Dual truss structure with Nasmyth focus
Dimensions	93.73" H x 43.25" W x 39" D
Focus Position	Nasmyth Focus
Fully Baffled Field	60 mm
Image Scale	22 microns per arcsecond
Optimal Field of View	70 mm (0.86 degrees)

MECHANICAL STRUCTURE

Fork Assembly	Single piece U shaped fork arm assembly for maximum stiffness
Azimuth Bearing	20 inch diameter thrust bearing
Altitude Bearing	2 x 8.5 inch OD ball bearings
Optical Tube	Dual truss structure with Nasmyth focus

SYSTEM PERFORMANCE

Pointing Accuracy	10 arcsecond RMS with PointXP Model
Pointing Precision	2 arcsecond
Tracking Accuracy	<1 arcsecond error over 10 minute period
System Natural Frequency	10 Hz or greater
Field De-Rotator Accuracy	3 microns of peak to peak error at 35 mm off-axis over 1 hour of tracking (18 arc sec)

Prices, further images and technical information in English and German on:
www.baader-planetarium.com/cdk700

PLANEWAVE *CDK 700* IS AVAILABLE IN THE FOLLOWING VERSIONS

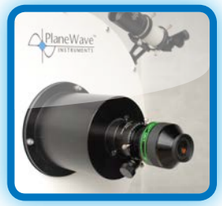
WITH
FUSED SILICA
OPTICS
#1323270Q

AS DALL-KIRKHAM
IRDK: IR-OPTIMIZED
W. FUSED SILICA
#1323270IQ

0.7 METER OBSERVATORY TELESCOPE-SYSTEM

The CDK700 is a complete observatory class telescope and direct drive alt-azimuth mounting system, designed and engineered by PlaneWave. With a 70mm image circle, the CDK700 is designed to excel at imaging on large format CCD cameras. The optical system utilizes a Nasmyth focus through both altitude bearings allowing your camera or eyepiece to remain at a fixed height while holding heavy instruments without needing to rebalance the optical tube assembly. Instrumentation can be installed on both sides of the fork mount and easily accessed using the included rotating tertiary mirror system. With direct drive motors, high resolution encoders and zero backlash or periodic error the CDK700 sets a new standard for small observatory telescopes.

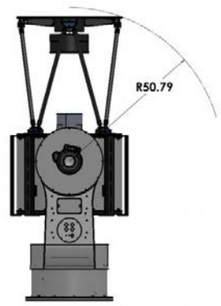
CDK 700 SPECIAL FEATURES

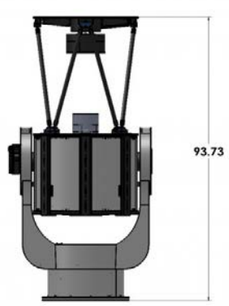


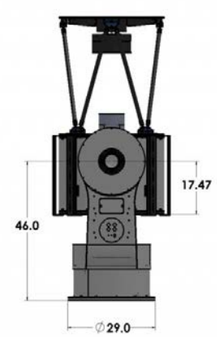
NASMYTH FOCUS – Dual Nasmyth Focus along the altitude axis eliminates balancing issues as you change out equipment. Eyepieces remain at a constant wheelchair-accessible height, greatly simplifying access to the telescope for public observatories. Includes the IRF90 field de-rotator/focuser which de-rotates the field and allows for long expousure Alt-Az tracking.

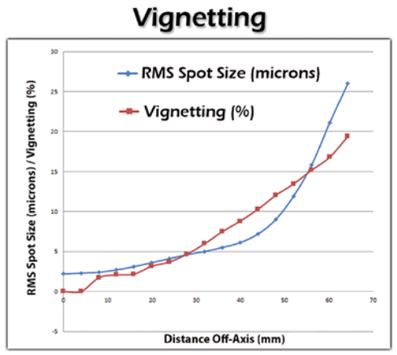
ROTATING TERTIARY MIRROR – The CDK700 includes an integrated rotator for the tertiary mirror, with magnetic locks to position the mirror precisely for either Nasmyth focus position. The rotator can move from one port to the other in under 10 seconds, allowing observers to easily transition between imaging and visual use.

DIRECT DRIVE MOTORS AND ENCODERS – Direct Drive motors mean there are no gears to cause backlash and periodic error. With high-resolution encoders providing the feedback for the direct drive motors, not only will the telescope track without periodic error or have any backlash at all, but the mount will be able to counter against wind gusts. The direct drive motors can move the telescope at incredible speeds for tracking satellites or just to minimize target acquisition time.

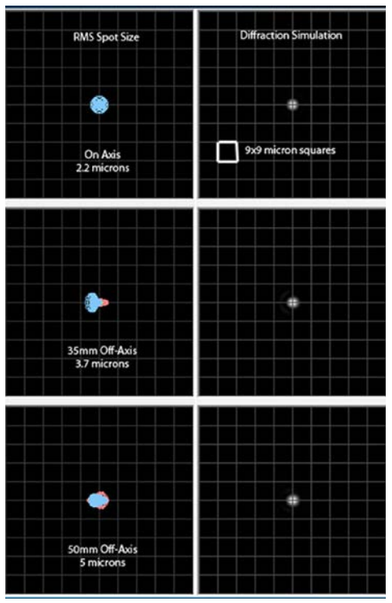








PW1000



OPTICAL SYSTEM

Aperture	1000 mm (39.37inch)
Focal Length	6000 mm
Focal ratio	f/6
Central Obstruction	47% of the Primary Mirror Diameter
Back Focus from de-rotator	373 mm (14.7 inches)
Weight	2600 lbs lbs (1180 kg)
OTA Tube	Dual truss structure with Nasmyth focus
Dimensions	135" H x 72" W x 45"
Focus Position	Dual Nasmyth Focus Ports
Image Scale	29 microns per arcsecond at F/6
Optimal Field of View	100 mm (1.0 degrees)
Optimal Field of View	70 mm (0.86 degrees)

MECHANICAL STRUCTURE

Fork Assembly	Space Frame Steel Truss
Fork Base	Welded stainless steel torsion box
Azimuth Bearing	Dual 11.125 inch tapered roller bearings
Altitude Bearing	Three 9.5 inch 4 way loaded ball bearings (two pre-loaded on motor side and one on non motor side)
Optical Tube	Dual truss structure with Nasmyth focus
Instrument Payload	300 lbs (150 ft-lbs) - mounted on the field de-rotator plate

SYSTEM PERFORMANCE

Pointing Accuracy	Better than 10 arcsecond RMS with PointXP Model
Pointing Precision	2 arcsecond
Tracking Accuracy	<1 arcsecond error over 10 minute period
Natural Frequency	10 Hz or greater
Field De-Rotator Accuracy	<3 microns of peak to peak error at 35mm off-axis over 1 hour of tracking (18 arc sec)

Prices, further images and technical information in English and German on:
www.baader-planetarium.com/pw1000

PLANEWAVE *PW1000* IS AVAILABLE IN THE FOLLOWING VERSIONS

w. **FUSED SILICA**
OPTICS *#1323300Q*

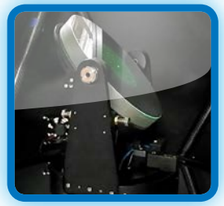
w. **FUSED SILICA**
OPTICS *#1323301*
RC

1 METER OBSERVATORY TELESCOPE-SYSTEM

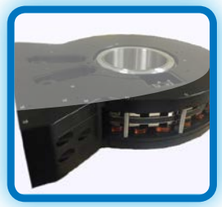
The PW1000 is a complete 1-meter observatory class telescope and direct drive alt-azimuth mounting system, designed and engineered by PlaneWave. With a diffraction limited 100mm image circle, the PW1000 is designed to excel at imaging on the largest format CCD cameras available today. Light-weighted optics are made of zero expansion fused silica materials for excellent thermal stability and maximum throughput. The optical system utilizes a Nasmyth focus through both altitude bearings allowing instrumentation to be installed on both sides of the fork mount that is easily accessed using the included rotating tertiary mirror system. With direct drive motors, high resolution encoders and zero backlash or periodic error the PW1000 sets a new standard in 1-meter class observatory telescopes.

PW1000 SPECIAL FEATURES

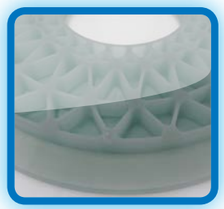
DUAL NASMYTH FOCUS PORTS – Dual Nasmyth Focus along the altitude axis eliminates balancing issues when you change equipment. Eyepieces remain at a constant wheelchair-accessible height, greatly simplifying access to the telescope for public observatories. The computer-controlled tertiary mirror allows either Nasmyth port to be selected in just a few seconds, allowing observers to easily transition between imaging and visual use, or other instrumentation.



ROTATING TERTIARY MIRROR – The CDK1000 includes an integrated rotator for the tertiary mirror, with magnetic locks to position the mirror precisely for either Nasmyth focus position. The rotator can move from one port to the other in less than 10 seconds, allowing observers to easily transition between imaging and visual use.



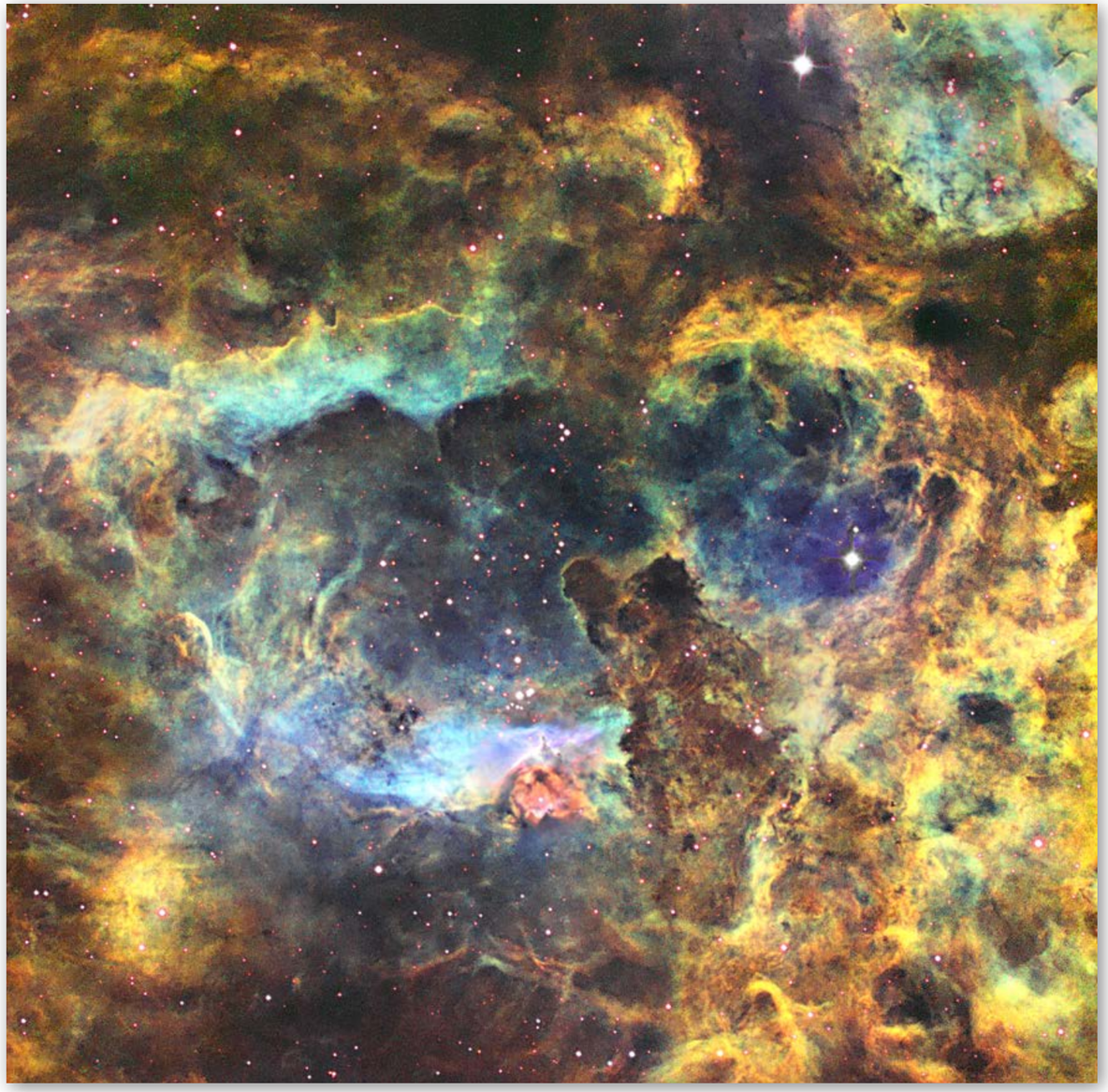
DIRECT DRIVE MOTORS AND ENCODERS – Direct Drive motors and absolute on-axis encoders eliminate the need for reduction gears, thereby eliminating backlash and periodic error. With high-resolution encoders providing the feedback for the direct drive motors, not only will the telescope track without periodic error and backlash, the mount will also counter wind gusts with precise servo feedback. The direct drive motors can move the telescope at incredible speeds for tracking satellites or just to minimize target acquisition time



LIGHT-WEIGHT FUSED SILICA OPTICS – Fused Silica has a coefficient of thermal expansion six times lower than Borosilicate (Pyrex) glass, which means that while it cools down, fused silica preserves its shape to a high degree of accuracy. This translates into consistent optical performance and unchanging focus over temperature changes.

AUTOMATED PRIMARY MIRROR SHUTTER – Protects the primary mirror from unwanted dust and moisture with this integrated four shutter automated system, fully controllable with PlaneWave's PWI software.

Author	© W. Paech, F. Hofmann
Object	Sculptor Galaxy (NGC 253)
Telescope	PlaneWave CDK17 w. Televue 0.8x reducer
Location	Namibia, Africa
CCD	ALCCD 12
Exposures	15 x 600s



Author	© John Ebersole
Object	Lobster Nebula (NGC 6357) in HST Narrowband Palette
Telescope	PlaneWave CDK700
Location	iTelescope, Siding Spring, Australia
CCD	FLI PLO 9000
Filters	Astrodon 6nm Ha, OIII, SII
Exposures	Ha – 100 min 1x1, OIII – 120 min 2x2, SII – 80 min 2x2

Images

Author	© Christoph Kaltseis
Object	Crescent Nebula (NGC 6888)
Telescope	PlaneWave CDK14
Location	Sarleinsbach, Upper Austria, 562mm
CCD	Nikon D810A, 0.39" resolution per Pixel
Exposures	16x480s @ ISO800 in RGB

Author	© Bill Snyder
Object	Wizard Nebula (NGC 7380)
Telescope	PlaneWave CDK17
Location	SRO Sierra Remote Observatories
CCD	SBIG STXL 11002 with AO-X
Filters	Astrodon 3nm Ha, OIII, SII
Exposures	Ha – 10 hrs, OIII – 5.5 hrs, SII – 7.5 hrs. 30 min subs

Author	© W. Paech, F. Hofmann
Object	Lagoon Nebula (M8)
Telescope	PlaneWave CDK12,5 w. Televue 0.8x reducer
Location	Namibia, Africa
CCD	ALCCD 12
Exposures	12 x 600s

Author	© Sebastian Voltmer
Object	Iris Nebula (NGC 7023)
Telescope	PlaneWave CDK12,5
Location	Spicheren, France
CCD	ST-2000XM
Filters	Baader RGB

PlaneWave INSTRUMENTS

baader planetarium

PRODUCTS

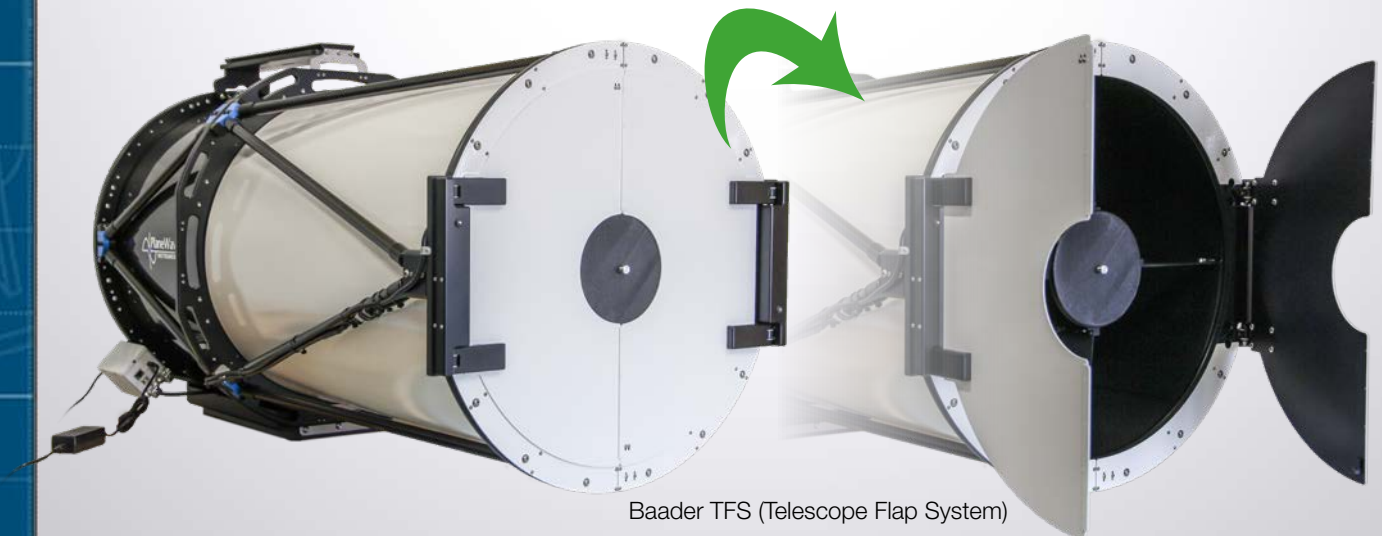
PlaneWave CDK 20 in Khazan, Russia

Comparison CDK700 / PW-1000

PlaneWave CDK 17 in Sharjah, UAE

PlaneWave CDK 24 at Astro-Show, Germany

Baader Planetarium specializes in erecting turnkey observatories utilizing mainly PlaneWave astrographic and infrared telescopes with professional CCD-camera equipment.



Baader TFS (Telescope Flap System)

OFFICIAL PLANEWAVE EU-DISTRIBUTOR:

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