10 MICRON
astro • technology
by COMEC-TECHNOLOGY

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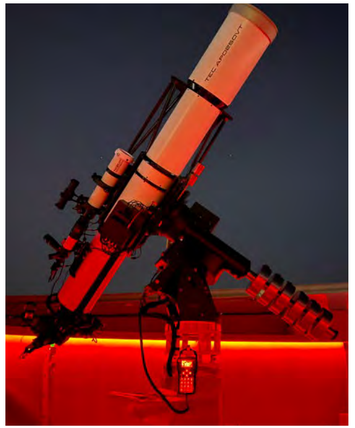
baader planetarium
OFFICIAL EU-DISTRIBUTOR

1. *Test Operation of AZ1000 HPS Silver – Solar Edition*
2. *Installation of GM3000 HPS in 3.5m Baader AllSky Dome*
3. *GM4000 HPS with multiple tescopes at Sharjah, UAE*
4. *GM3000 HPS for AG Orion in Hochtaunus, Germany*
5. *AZ2000 HPS in dual-use operation*



INTRODUCTION

THE IOMICRON HPS TECHNOLOGY

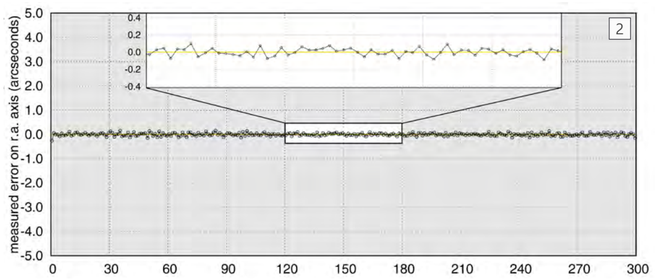
HPS stands for High Precision and Speed, representing the essence of 10Micron mounts. High precision, thanks to an innovative and exclusive absolute encoder paired with 10Micron manufacturing. High speed, thanks to high performance electronics and AC servo motors

The HPS-series mounts are equipped with a pair of ultra-high resolution absolute encoders, directly mounted at the right ascension and declination axis.

This technology has already been used in professional observatories, where high costs and complexity is not an issue. Measuring the rotation angles of the axes directly allows to compensate for most of the mechanical errors, such as periodic errors and transmission backlash. However, this requires systems with very high resolution.

In the past few years this technology could also be found in amateur astronomers' instruments, often paired with the use of direct drive technology where motors are mounted directly on the mount's axes – without any mechanical reduction gear.

10Micron GM mounts continue to feature the traditional worm to worm-wheel drive solution, while pairing it with state of the art encoder technology. The encoders do their job with 1/10 arcsecond resolution. This enables GM mounts to perform at the same level of precision as professional direct-drive mounts (without any mechanical drive) but without all the downsides of a mount only controlled by electronically manipulating magnetic fields.



1. *NGC 6960, GM2000 HPS II, CDK 14 • 43x480 sec • UNGUIDED • © Christoph Kaltseis*
2. *300 seconds unguided tracking with GM4000 HPS II, error curve measured by high resolution encoder*

IOMICRON FIRMWARE

UNGUIDED IMAGING

The described extremely high precision makes 10Micron mounts stand out and allows unguided imaging already on the first night!

Every 10Micron mount delivered by Baader Planetarium comes with a Quickstart Manual (along with the detailed ~80 page instruction manual), that explains you the first necessary steps to take your first guided or unguided image. If you follow the described proven and tested procedure you should be able to take

- images w/o autoguider (UNGUIDED) for several minutes of exposure, dependig on your equipment (stability, sampling etc): 10 minutes with 1000mm focal length are very usual*
- images with autoguider (GUIDED), with telescope setups not yet optimized for unguided imaging: longer exposures, also with long focal lenghts*

* This is an easy and fast method to take your first shoots on your first nights; once you will gain more experience with your mount you will soon be able to achieve much longer guided and unguided images.For example, some skilled customers regulary take **single UNGUIDED exposures of 50min**. with more than 2000mm focal lenght! GUIDED imaging is possible with virtually unlimited exposure time.

IOMICRON FIRMWARE

Firmware Features	User defined mount parking positions, 2stars and 3stars alignment function, up to 100 alignment stars for modeling, correction of polar alignment and orthogonality errors, estimate of average pointing error, storage of multiple pointing models, sidereal, solar and lunar tracking speed adjustable on both axes, declination-based autoguide speed correction, adjustable horizon height limit, pointing and tracking past meridian, assisted electronic balance adjustment, automatic (ClockSync proprietary software) manual or GPS time & site coordinates synchronization, leap seconds support and full accounting for the UT1-UTC timescale, configurable atmospheric refraction, direct Baader dome control via RS-232, network settings, comets and asteroids filter, multi-language interface. Remote Assist via Internet connection with dedicated server.
Keypad control	Rugged keypad with metal housing and reliable professional micro switches, Large graphic display – heated for operation under lowest temperatures, dimmable display and keyboard with back-lit keys, five information menu lines for coordinates, object information and symbols showing mount status and active external connections and accessories. All the functionality of the mount is available through the keypad without requiring an external PC
Database	Stars: by Common Names, Bayer designation, Flamsteed designation, Bright Star Catalogue, SAO, HIP, HD, PPM, ADS, GCVS. Deep-sky: M, NGC, IC, PGC ,UGC limited up to mV = 16. Solar system: Sun, Moon, planets, asteroids, comets, artificial satellites. Equatorial and altazimuth coordinates. User defined objects. Quick slewing positions recalls for frequent focusing or useful operation.

IOMICRON HPS MOUNTS

SPECS AND FEATURES

The object database contains many star catalogs and furthermore deep-sky objects up to 16th magnitude. Solar system objects can be tracked with non-sidereal speed. Orbital elements of comets, asteroids and artificial satellites can be loaded into the mount, so that these objects can be tracked directly using the keypad.

The usage of a model containing up to 100 stars makes the pointing accurate. Modeling allows correction of classical polar alignment and conic errors, and also of the most important flexure terms of the optical tube. This way it is possible to obtain pointing accuracies in the order of 15 arcseconds RMS. The same model can be used in order to obtain the maximum tracking accuracy, compensating also for the atmospheric refraction (depending on local atmospheric pressure and temperature).

A series of auxiliary functions provide automated align procedures for precisely aligning the mount to the celestial pole. You may save and recover the alignment data of different observing sessions. This function is very useful if you have many instruments in different setups, each one requiring different flexure corrections.

The resulting tracking accuracy makes autoguiding unnecessary for most projects. The absolute encoders on both axes allow to obtain a typical tracking error below 1 arcsecond. However it is still possible to autoguide using the ST4-compatible port or through the serial/Ethernet connection, with a guide rate configurable from 0.1x to 1x. The guide rate can be automatically corrected for the target declination, there is no need of recalibrating the autoguiding parameters when observing at different declination.

All HPS mounts can also be controlled with common software packages by connecting it to a PC with RS-232 serial port, Ethernet or WiFi, via the proprietary 10Micron ASCOM driver or conventional compatible command protocols. Furthermore, a dedicated software (included) can be used to create a „virtual keypad", replicating exactly the functions of the physical keypad. The RS-232 port also allows the direct control of Baader Domes without PC. Once configured with your instrument parameters, the firmware is able to make all the calculations required for positioning the dome slit in front of your optical tube for almost all instrument configurations

EQUATORIAL GM MOUNTS

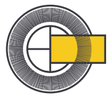
Applications:
- Astronomy
- Astrophotography

Sizes:
- GM1000 - 4000

ALT-AZIMUTHAL AZ MOUNTS

Applications:
- Astrophotography
- Satellite Laser Ranging

Sizes:
- AZ1000 - 4000



ABSOLUTE ENCODERS

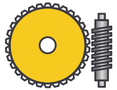
On-axis in RA & Dec, featuring more than 10 million increments (interpolated), fully encapsulated and calibrated.

BUILT-IN INTELLIGENCE

Onboard industrial-grade Linux computer for standalone control, analysis of the absolute encoders and controlling motors – this mount „knows" that it is a mount.

AC SERVO MOTORS

High torque brushless servo motors, maintanence free, allowing a pointing speed of up to 20°/s (GM 2000).



WORM GEAR

High-precision traditional worm-wheel drives and clutches for the best reliability – made with B14 bronze.

CNC-MILLED

No casted parts, complete mechanical structure is CNC-milled, premium materials for high quality and durability.

REMOTE OPERATION

Fully remote controlled via your observatory PC through 10/100/1000 LAN or WiFi, ASCOM-compatible, mount PC also controls Baader Domes.

HIGHLIGHTS

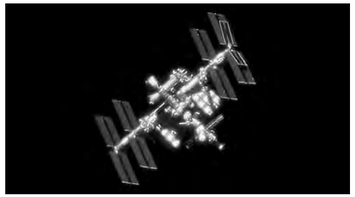
IOMICRON HPS MOUNTS

UNGUIDED TRACKING (UP TO 0.6" RMS)

Powerful firmware featuring advanced mount modeling, with several parameters computation and special functions: the only way for perfect unguided tracking during long exposures.

STAND-ALONE OPERATION

Control unit includes all necessary functions for field use – no PC required. Large, dimmable graphic display with up to five text lines / status icons, heated for low temp operation.

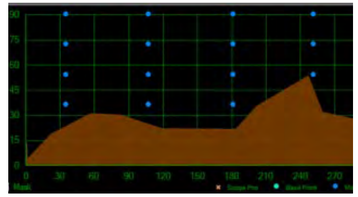


HIGH SPEED - SATELLITE/ISS

Precise multistar pointing model, suitable e.g. for high precision spectroscopy, TLE manager for satellite tracking, orbital parameters management for ISS, minor planets and comets.

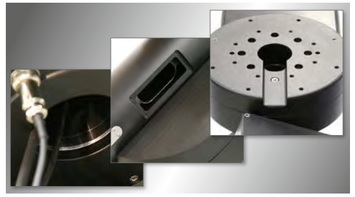
VERSATILE PLATFORM

They are a reliable basis for one or several telescopes and all astronomical purposes; but they can also track satellites, space debris and carry laser emitters and -receivers for communication, data transfer, and distance measurements.



PRECISE MULTISTAR POINTING MODEL

With third party software it is possible to automatically create sky models with plate solving technology with up to 100 data points. It's possible to store different models for different telescopes and switch between the models.



GM/AZ 3000/4000: INTERNAL WIRING

To prevent the tangling, knotting, and tearing of cables from auxillary equipment (such as cameras) mounted on the telescopes, cable harnesses can be placed through the large 10Micron observatory-class mounts.

GM 1000 – GM 4000

EQUATORIAL HPS MOUNTS

The classic astronomical mount offers a decisive advantage: By aligning the RA axis to the celestial pole, the earth's rotation is compensated with only one motor, a rotation of the field of view of eyepiece or camera is compensated. The object remains stably centered. For many decades, amateur astronomers have been working with this proven design, especially when it comes to photography with longer exposure times or observation with high magnifications.

GM4000 HPS in 4.5m Baader AllSky Dome for Open University, Tenerife

1451000

GM1000 *HPS*

Loading Capacity	25 kg
Mount weight	19.5 kg (w/o accessories)
Working Temperature	-15°C to +35°C
GoTo Speed	adjustable from 2°/s to 15°/s
Power Parameters	~ 0,5 A guiding ~ 3 A max. speed ~ 4 A Peak

Check out all GM1000 Included items, Features & Related Accessories:

10micron.eu/gm1000

AMATEUR ASTRONOMER

The GM 1000 HPS is an excellent mount for astrophotography that is also perfectly suited for mobile use. The mechanics, stability and accuracy set new standards. (...) It makes Astrophotography a lot easier and ensures precise tracking.

Michael Deger

1452030

GM2000 *HPS II*

Loading Capacity	50 kg
Mount weight	18.5 kg + 15 kg
Working Temperature	Standard: -15°C to +35°C ❄Upgrade: -30°C to +35°C
GoTo Speed	adjustable from 2°/s to 20°/s
Power Parameters	~ 0,7 A guiding ~ 3 A max. speed ~ 5 A Peak

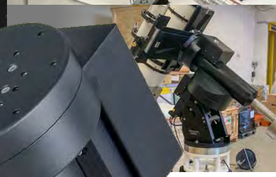
Check out all GM2000 Included items, Features & Related Accessories:

10micron.eu/gm2000

AMATEUR ASTRONOMER

The GM2000 HPS currently carries two telescopes. Due to the fixed setup of the mount I will now usually take my deep sky images unguided, which I have done occasionally so far. But now this will become the normal case and has proven itself very well.

Helmut Heinicke



#1453000

GM3000 *HPS*

Loading Capacity	100 kg
Mount weight	65 kg (w/o accessories)
Working Temperature	Standard: -15°C to +35°C ❄Upgrade: -30°C to +35°C
GoTo Speed	adjustable from 2°/s to 12°/s
Power Parameters	~ 1 A guiding ~ 3 A max. speed ~ 5 A Peak

Check out all GM3000 Included items, Features & Related Accessories:

10micron.eu/gm3000

PRIVATE OBSERVATORY

My mount from 10Micron has been extremely successful in use. (...) Mechanically a gem: extremely fast, very quiet, very accurate and very stiff. This mount is a real "final solution". You can "forget" it, as it always works reliably.

Dr. Claus Possberg

#1454010

GM4000 *HPS II*

Loading Capacity	150 kg
Mount weight	125 kg
Working Temperature	Standard: -15°C to +35°C ❄Upgrade: -30°C to +35°C
GoTo Speed	adjustable from 2°/s to 8°/s
Power Parameters	~ 1,5 A guiding ~ 5 A max. speed ~ 6 A Peak

Check out all GM4000 Included items, Features & Related Accessories:

10micron.eu/gm4000

HANS-HAFFNER OBSERVATORY

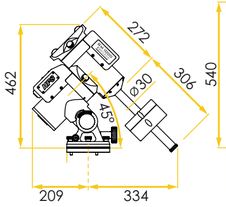
Already the first test images with the new mount showed the extraordinary high quality of the new system with additionally simplified handling. In addition to the high-precision tracking, the HPS II also impresses with its extremely accurate pointing.

Martin Feige

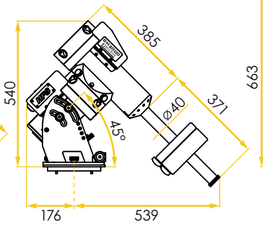
GM HPS MOUNT

DIMENSIONS

all given measurements in Millimeter (mm)



GM 1000 *HPS*



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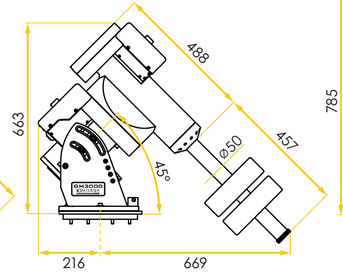
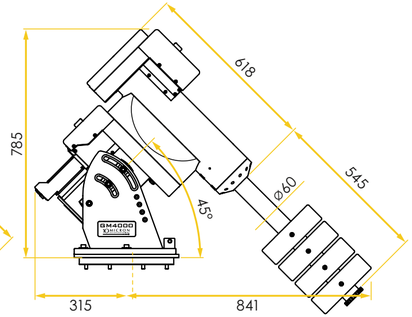
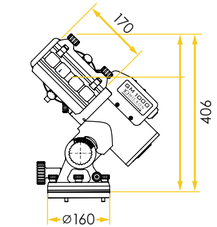
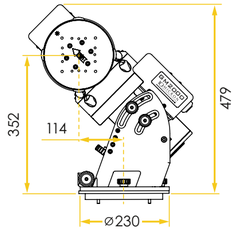


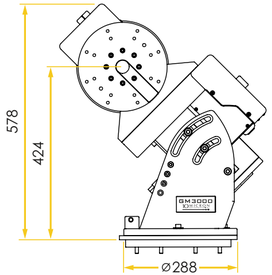
GM3000 *HPS*

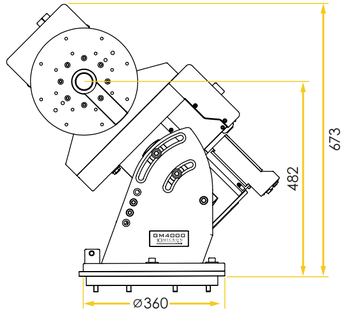


GM4000 *HPS*









GM HPS MOUNTS

TECHNICAL DATA

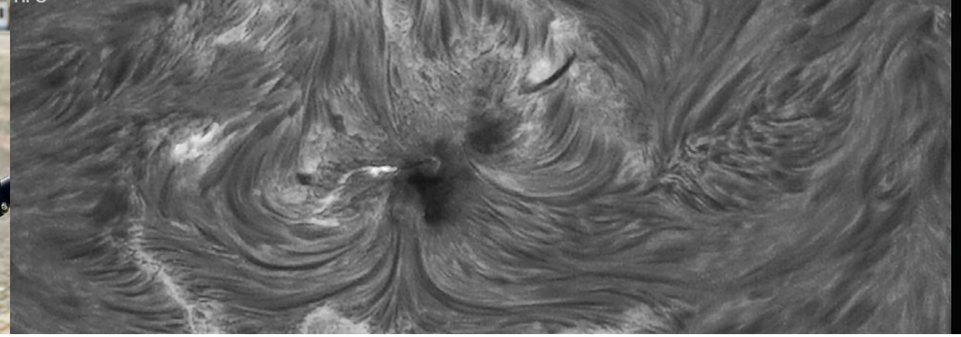
SPECIFICATIONS	GM1000 *HPS*	GM2000 *HPS II*	GM3000 *HPS*	GM4000 *HPS II*
Mount Type	German Equatorial Mount			
Weight (mount w/o acc.)	19,5 kg *(43 lbs)*	18,5 kg + 15 kg = 33,5 kg *(73 lbs)*	65 kg *(143 lbs)*	125 kg *(276 lbs)*
Instrument payload capacity	25 kg *(55 lbs)*	50 kg *(110 lbs)*	100 kg *(220 lbs)*	150 kg *(330 lbs)*
Latitude range	0° – 82° *(90° optional)*	20° – 70°	20° – 70°	20° – 70°
Azimuth fine adjustment range	+/– 7.5°	+/– 10°	+/– 10°	+/– 10°
Counterweight shaft	30 mm diameter, stainless steel, weight 1.7 kg – 3.7 lbs	40 mm diameter, stainless steel, weight 4 kg – 9 lbs	50 mm diameter, stainless steel, weight 8 kg – 18 lbs	60 mm diameter, stainless steel, weight 13 kg – 29 lbs
Axes	30 mm diameter, alloy steel	50 mm diameter, alloy steel	a.r. 80mm / dec. 50mm diameter, alloy steel	a.r. 85mm / dec. 80mm diameter, alloy steel
Bearings	Pre-loaded tapered roller bearings			
Worm wheels	250 teeth, 125 mm diameter, B14 bronze	215 teeth, 172 mm diameter, B14 bronze	a.r. 315 teeth, 244 mm diameter, B14 bronze dec. 250 teeth, 192 mm diameter, B14 bronze	a.r. 430 teeth, 330 mm diameter, B14 bronze dec. 315 teeth, 244 mm diameter, B14 bronze
Worms	20mm diameter, tempered alloy steel, grinded and lapped	24mm diameter, tempered alloy steel, grinded and lapped	32mm / 24mm diameter, tempered alloy steel, grinded and lapped	32mm diameter, tempered alloy steel, grinded and lapped
Motors	2 axes AC servo brushless			
Power supply	24 V DC			
Power consumption	~ 0,5 A while tracking ~ 3 A at maximum speed ~ 4 A peak	~ 0,7 A while tracking ~ 3 A at maximum speed ~ 5 A peak	~ 1 A while tracking ~ 3 A at maximum speed ~ 5 A peak	~ 1.5 A while tracking ~ 5 A at maximum speed ~ 6 A peak
Go-to speed	Adjustable from 2°/s to 15°/s	Adjustable from 2°/s to 20°/s	Adjustable from 2°/s to 12°/s	Adjustable from 2°/s to 8°/s
Working Temperature	-15°C to +35°C	Standard: -15°C to +35°C Low-Temp (❄) Upgrade: -30°C to +35°C		
Pointing accuracy (typical)	<20" with internal 25-stars software mapping (max 100 stars). Modeling software "Model Maker" available for automatic alignment			
Average tracking accuracy	~ 1" typical for 15 minutes / ~ 0,6" RMS with internal 25-stars software mapping and compensation of system flexures and polar alignment errors			
Safety Stop	+/– 30° past meridian in r.a. (software) +/– 45° past meridian in r.a. (mechanical)			

AZ 1000 – AZ 4000

ALT-AZIMUTHAL HPS MOUNTS

Their advantage lies in their compactness; larger telescopes can be accommodated in smaller domes. The complete payload can be used for instrument weight, no counterweight axis is needed in double configuration. ALT AZ mounts, however, have to track in three axes (ALT, AZ and derotator at camera/eyepiece) which is technically more demanding but no longer a problem due to modern computer technology. The smaller ALT-AZ mounts are often used by amateurs and public observatories for visual observation. The larger ones are used for satellite tracking, where the alignment of the mount to the earth axis is not necessary or even disadvantageous.

AZ2000 HPS for Rodewisch Observatory, Germany

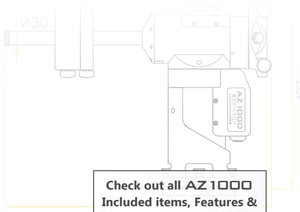


Counterweights not included

#1451900

AZ 1000 *HPS*

Loading Capacity	25 kg
Mount weight	19.5 kg (w/o accessories)
Working Temperature	-15°C to +35°C
GoTo Speed	adjustable from 2°/s to 15°/s
Power Parameters	~ 0,5 A guiding ~ 3 A max. speed ~ 4 A Peak



Check out all AZ1000 Included items, Features & Related Accessories:

10micron.eu/az1000

MIRATLAS, WORLDWIDE NETWORK

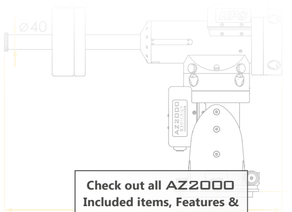
We were looking for a reliable mount that could operate 24/7, always knowing were it stands whatever could happen: power loss, unexpected movement... And a mount easily controlled from a Linux machine. The AZ1000 makes it all, and even more!

CTO of Miratlas

#1452901

AZ 2000 *HPS*

Loading Capacity	50 kg (+40 kg for optional dual-telescope configuration)
Mount weight	33 kg
Working Temperature	Standard: -15°C to +35°C ❄Upgrade: -30°C to +35°C
GoTo Speed	adjustable from 2°/s to 20°/s
Power Parameters	~ 0,7 A guiding ~ 3 A max. speed ~ 5 A Peak



Check out all AZ2000 Included items, Features & Related Accessories:

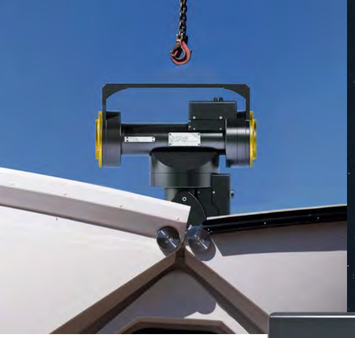
10micron.eu/az2000

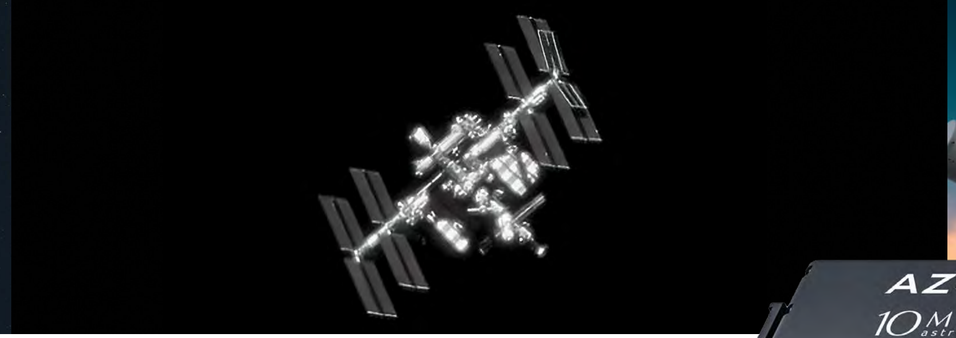
RODEWISCH OBSERVATORY, GERMANY

On the one hand, the mount is very easy to use and, on the other hand, very precise. A real enrichment for our public observation evenings thanks to the dual option. The mount also delivers excellent results when tracking satellites live.

Olaf Graf

Counterweights not included





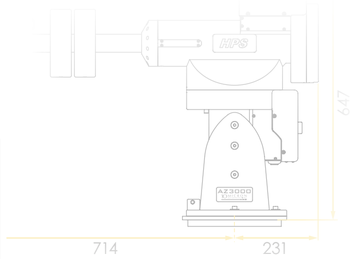
Counterweights not included

1453900

AZ 3000 *HPS*

Loading Capacity	100 kg (+65 kg for optional dual-telescope configuration)
Mount weight	65 kg (w/o accessories)
Working Temperature	Standard: -15°C to +35°C ❄Upgrade: -30°C to +35°C
GoTo Speed	adjustable from 2°/s to 12°/s
Power Parameters	~ 1 A guiding ~ 3 A max. speed ~ 5 A Peak

Check out all AZ3000 Included items, Features & Related Accessories:
10micron.eu/az3000



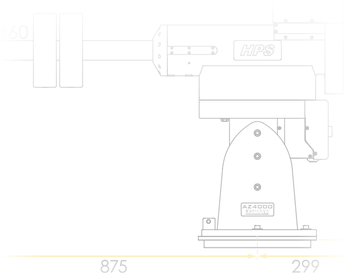
Optional: DT-set for dual telescope configuration

1454900

AZ 4000 *HPS*

Loading Capacity	150 kg (+100 kg for optional dual-telescope configuration)
Mount weight	125 kg
Working Temperature	Standard: -15°C to +35°C ❄Upgrade: -30°C to +35°C
GoTo Speed	adjustable from 2°/s to 8°/s
Power Parameters	~ 1,5 A guiding ~ 5 A max. speed ~ 6 A Peak

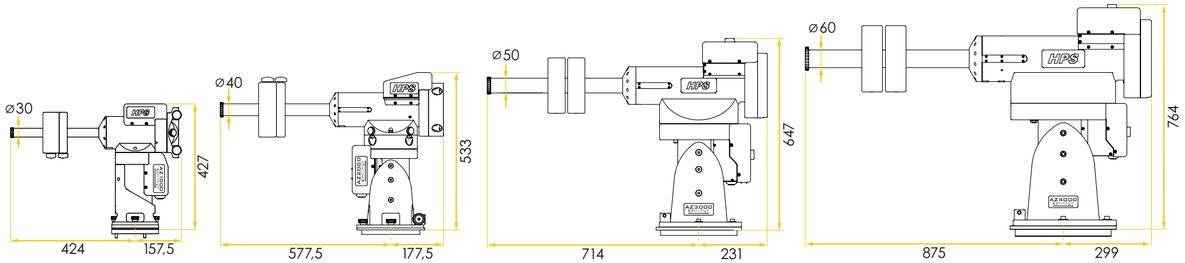
Check out all AZ4000 Included items, Features & Related Accessories:
10micron.eu/az4000



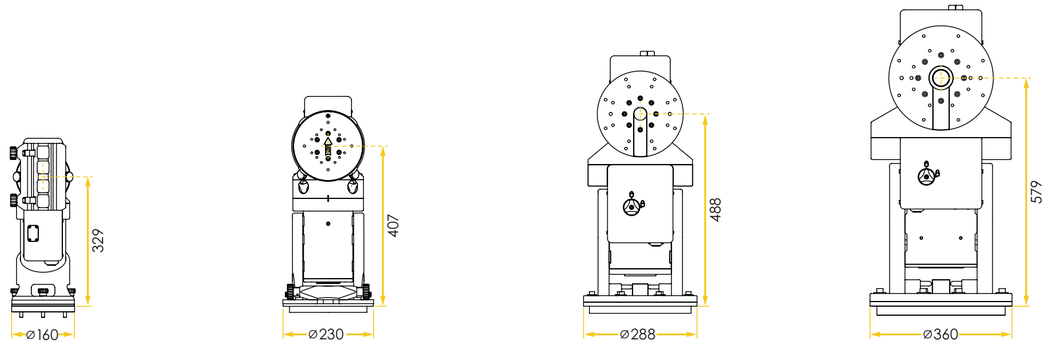
AZ HPS MOUNT

DIMENSIONS

all given measurements in Millimeter (mm)



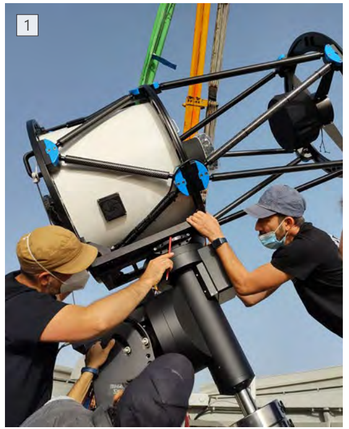
AZ1000 *HPS* AZ2000 *HPS* AZ3000 *HPS* AZ4000 *HPS*

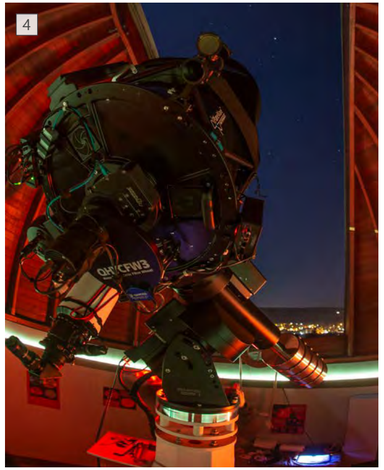


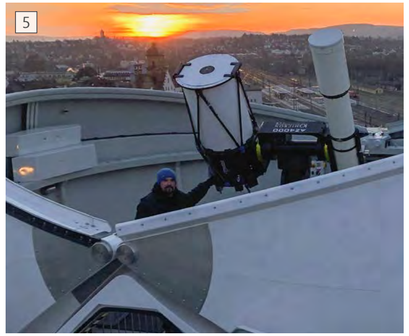
AZ HPS MOUNTS

TECHNICAL DATA

SPECIFICATIONS	AZ1000 *HPS*	AZ2000 *HPS*	AZ3000 *HPS*	AZ4000 *HPS*
Mount Type	Altazimuth German Mount			
Weight (mount w/o acc.)	19,5 kg *(43 lbs)*	33 kg *(73 lbs)*	65 kg *(143 lbs)*	125 kg *(276 lbs)*
Instrument payload capacity	25 kg *(55 lbs)*	50 kg *(110 lbs)* standard configuration 50 + 40 kg *(110 + 90 lbs)* for optional dual telescope configuration	100 kg *(220 lbs)* standard configuration 100 + 65 kg *(220 + 143 lbs)* for optional dual telescope configuration	150 kg *(330 lbs)* standard configuration 150 + 100 kg *(330 + 220 lbs)* for optional dual telescope configuration
Azimuth fine adjustment range	+/− 10° (for initial orientation)			
Counterweight shaft	30 mm diameter, stainless steel, weight 1.7 kg (3.7 lbs)	40 mm diameter, stainless steel, weight 4 kg (9 lbs)	50 mm diameter, stainless steel, weight 8 kg (18 lbs)	60 mm diameter, stainless steel, weight 13 kg (29 lbs)
Axes	30 mm diameter, alloy steel	50 mm diameter, alloy steel	a.r. 80mm / dec. 50mm diameter, alloy steel	a.r. 85mm / dec. 80mm diameter, alloy steel
Bearings	Pre-loaded tapered roller bearings			
Worm wheels	250 teeth, 125 mm diameter, B14 bronze	215 teeth, 172 mm diameter, B14 bronze	a.r. 315 teeth, 244 mm diameter, B14 bronze dec. 250 teeth, 192 mm diameter, B14 bronze	a.r. 430 teeth, 330 mm diameter, B14 bronze dec. 315 teeth, 244 mm diameter, B14 bronze
Worms	20mm diameter, tempered alloy steel, grinded and lapped	24mm diameter, tempered alloy steel, grinded and lapped	32mm / 24mm diameter, tempered alloy steel, grinded and lapped	32mm diameter, tempered alloy steel, grinded and lapped
Transmission	Backlash-free system with timing belt and automatic backlash recovery – traditional worm gear mechanics			
Motors	2 axes AC servo brushless			
Power supply	24 V DC			
Power consumption	~ 0,5 A while tracking ~ 3 A at maximum speed ~ 4 A peak	~ 0,7 A while tracking ~ 3 A at maximum speed ~ 5 A peak	~ 1 A while tracking ~ 3 A at maximum speed ~ 5 A peak	~ 1.5 A while tracking ~ 5 A at maximum speed ~ 6 A peak
Go-to speed	Adjustable from 2°/s to 15°/s	Adjustable from 2°/s to 20°/s	Adjustable from 2°/s to 12°/s	Adjustable from 2°/s to 8°/s
Working Temperature	-15°C to +35°C	Standard: -15°C to +35°C Low-Temp (❄) Upgrade: -30°C to +35°C		
Pointing accuracy (typical)	<20" with internal 25-stars software mapping (max 100 stars). Modeling software "Model Maker" available for automatic alignment			
Average tracking accuracy	~ 1" typical for 15 minutes / ~ 0,6" RMS with internal 25-stars software mapping and compensation of system flexures and polar alignment errors			
Safety Stop	**AZ**: +/- 150° (software) and +/- 155° (mechanical) | **ALT**: +/- 95° (software) and +/- 100° (mechanical)			







1. *GM 4000 HPS for the Open University, Tenerife*
2. *GM 3000 HPS at Private Observatory, Germany*
3. *GM 1000 HPS at Amateur Astronomer, Romania*
4. *GM 4000 HPS at Rodewisch Observatory, Germany*
5. *AZ 4000 HPS at experimenta Science Center, Germany*

6. *GM 3000 HPS for University of Kent, UK*
7. *GM 4000 HPS at Rodewisch Observatory, Germany*
8. *GM 3000 HPS at Staernwarte Gersbach, Germany*
9. *GM 4000 HPS at Kazan Federal University, Russia*
10. *GM 2000 HPS (older model) at Private Observatory, Germany*

AZ 5000 – AZ 8000

DIRECT-DRIVE DDS MOUNTS

10MICRON AZ DDS MOUNTS

SPECS AND FEATURES

The AZ DDS (Direct Drive System) is a new generation of professional robotic mounts, in altazimuthal fork configuration with software integrated focuser/derotator. They are specially developed for professional and research applications such as SLR / SSA and LaserCom, which need a really demanding grade of quality and affordability.

The AZ DDS mounts integrate all the latest technologies and technical acquirements in mechanical, electrical, electronics, software and design fields: any single feature and component has been accurately studied in order to reach the highest level of efficiency that has always characterized 10Micron products; likewise 10Micron has integrated many new features in order to ensure the safety of both the instrument and the operator.

DDS HIGHLIGHTS

- Direct Drive System with torque motors specially designed for astronomical application
- On-axis high resolution, industrial grade absolute encoders
- High precision, high quality large diameter bearings from precision machinery industry
- Very stiff and compact fork to minimize vibrations and higher the "natural system frequencies"
- Integrated, industrial grade electronics and onboard microserver with internal sky model capability
- Integrated interface for focuser/derotator with direct control
- Minimum base height for improved stability and use with small domes
- Nasmyth focus with 100mm, 110mm or 160 mm bores
- Very fast pointing speed up to 40°/sec. and accurate positioning in a few arc/seconds
- Very accurate tracking for long exposure unguided imaging, optimized for LEO satellite tracking
- Two Line Elements tracking data interface manager available

DDS *Direct Drive System*

1456500

AZ 5000 DDS

Loading Capacity	250 kg – 650 mm (26") diameter
Mount weight	300 kg
GoTo speed	40°/s

Check out all AZ5000 Included items, Features & Related Accessories:
10micron.eu/az5000

1456600

AZ 6000 DDS

Loading Capacity	300 kg – 800 mm (31") diameter
Mount weight	360 kg
GoTo speed	30°/s

Check out all AZ6000 Included items, Features & Related Accessories:
10micron.eu/az6000

1456800

AZ 8000 DDS

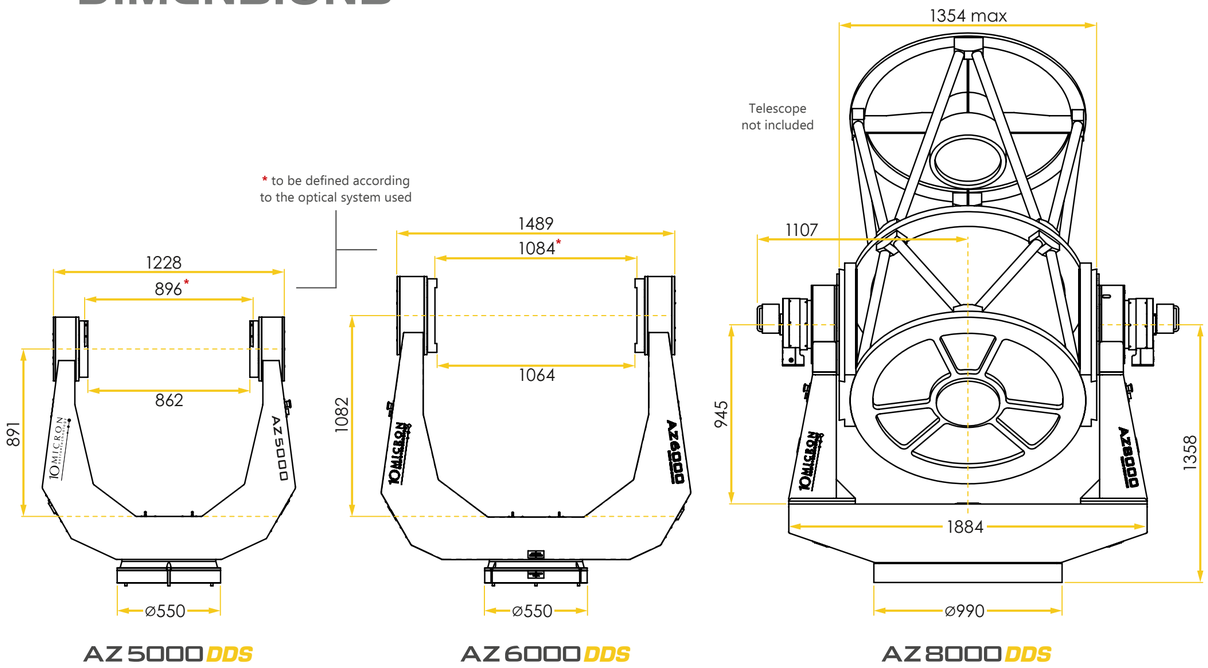
Loading Capacity	700 kg – 1000 mm (40") diameter
Mount weight	950 kg
GoTo speed	20°/s

Check out all AZ8000 Included items, Features & Related Accessories:
10micron.eu/az8000

AZ DDS MOUNTS

DIMENSIONS

all given measurements in Millimeter (mm)



AZ 5000 DDS

AZ 6000 DDS

AZ 8000 DDS

AZ DDS MOUNTS

TECHNICAL DATA

SPECIFICATIONS	AZ 5000 DDS	AZ 6000 DDS	AZ 8000 DDS
Mount Type	Alt-azimuth direct drive mount with on-axis high resolution absolute encoders		
Weight (mount w/o acc.)	300 kg *(661 lbs)*	360 kg *(793 lbs)*	950 kg *(2094 lbs)*
Instrument payload capacity	up to 250 kg, 650 mm (26") diameter	up to 300 kg, 800 mm (31") diameter	up to700 kg, 1000 mm (40") diameter
Axes bearing	Premium quality large diameter, high precision bearings		
Motors	Professional grade direct drive motors; no worm gears or transmission systems, zero backlash		
Encoders	High Resolution absolute encoders, industrial grade		
Power supply	48 V DC		
Power consumption	5 A peak	7 A peak	20 A peak
Go-to speed	40 °/s	30 °/s	20 °/s
Pointing accuracy	<10" RMS with internal 25 stars software mapping, max 100 stars. Modeling software "Model Maker" available for automatic alignment		
Average tracking accuracy	1" typical for 15 minutes / 0.6" RMS with internal 25-stars model (real sky observation). < 0.01" encoder readout error		
Nasmyth holes diameters	1 standard on the motor side – 100mm diameter	2 standard on both sides – 110mm diameter	2 standard on both sides – 160mm diameter
Nasmyth focus payload capacity	30 kg	35 kg	50 kg
Safety features	Mechanical stops in both axis, Anti-wrap logic, On board and remotable Emergency stop button with safety relay, Aural warning system, Unbalance/collision protection system		
Security stops	Mechanical Off-Travel stops at AZ +/- 300° (~2 turns) and Alt: 100° (-5° / +95°)		
Security brakes	Electromechanical brake & stops for unbalance safety in altitude		
Dimensions (mount with fork)	1350 x 550 x 1350 mm	1660 x 550 x 1520 mm	1900 x 1000 x 1500 mm
Focuser/DeRotator dedicated (optional)	**GO1 by 10Micron**. 10Micron specific, software integrated control. 25 kg payload capacity, internal temperature probe		**GO2 by 10Micron.** 10Micron specific, software integrated control. 50 kg payload capacity, internal temperature probe

BAADER PLANETARIUM

YOUR RELIABLE PARTNER

FROM ONE SOURCE

TURN-KEY OBSERVATORY SOLUTIONS

With 50+ years of experience, Baader Planetarium provides turn-key observatory solutions that include services from conceptualization up to installation and training. Depending on your application and mission parameters, we can also guide you through the process, including selection of the optimal equipment and software that is controlled by our Observatory Management System (OMS).

SPECIFICATIONS

- **Turn-key observatories** utilizing Classic Slit or AllSky domes that range from 2.1 - 8.5m
- **Various electronic equipment configurations**, that allow you to setup a classic observatory or one with remote access that can be fully autonomous
- **Tailored to your requirements,** suitable for amateur astronomers as well as for schools, universities, research institutes and commercial customers.

"The whole is greater than the sum of its parts"

Aristotle

INDIVIDUALLY TAILORED TO YOU

We would be pleased if you contact us regarding your observatory project at **www.baader-planetarium.com/dome-requests**

YOUR RELIABLE PARTNER

BAADER PLANETARIUM

Baader Planetarium has been the official 10Micron distributor for Europe since 2004. We provide the tools to teach and enable people to explore the universe we live in.

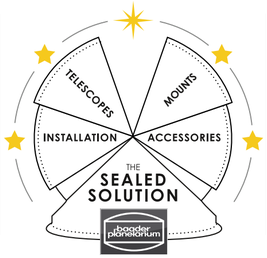
OUR VALUE PROPOSITION

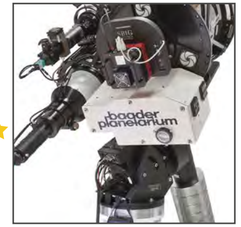
- We provide **Turn-Key Observatory Solutions** by integrating observatory equipment to function as a system utilizing in-house developed and customized products and software.
- We offer the most **reliable Domes** in the market which survive the harshest environmental conditions.
- Customers can rely on fast shipment of requested Astronomical Consumer Products along with support.

HISTORY

Our company started in 1966 with the first product being the Baader Planetarium which also became our name. Since then, we continued to expand by offering domes that would protect telescopes for astronomers in different environments around the world. We also realized the need of further educating and providing the right equipment for our customers needs, hence, we developed a variety of accessories to adapt all the components required to install complete observatories.

The observatory domes we produce and the high end telescopes and mounts from the brands we sell are also in demand from the space industry. We combine these devices to fully integrated turn-key ground stations for satellite tracking, lasercommunication and space debris tracking and install them everywhere in the world.





>600
OBSERVATORIES

50+
YEARS EXPERIENCE

3.560 m
TALLEST MOUNTAIN

300 km/h
HIGHEST WIND LOAD

-86°
COLDEST TEMPERATURE

DISCOVER

BAADER OBSERVATORIES

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Please let us know how we can help you within your desired application by contacting us at:

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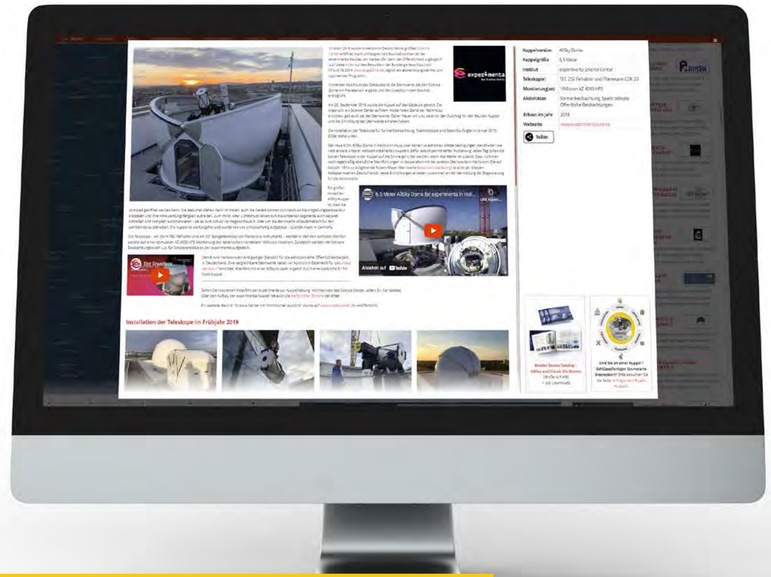


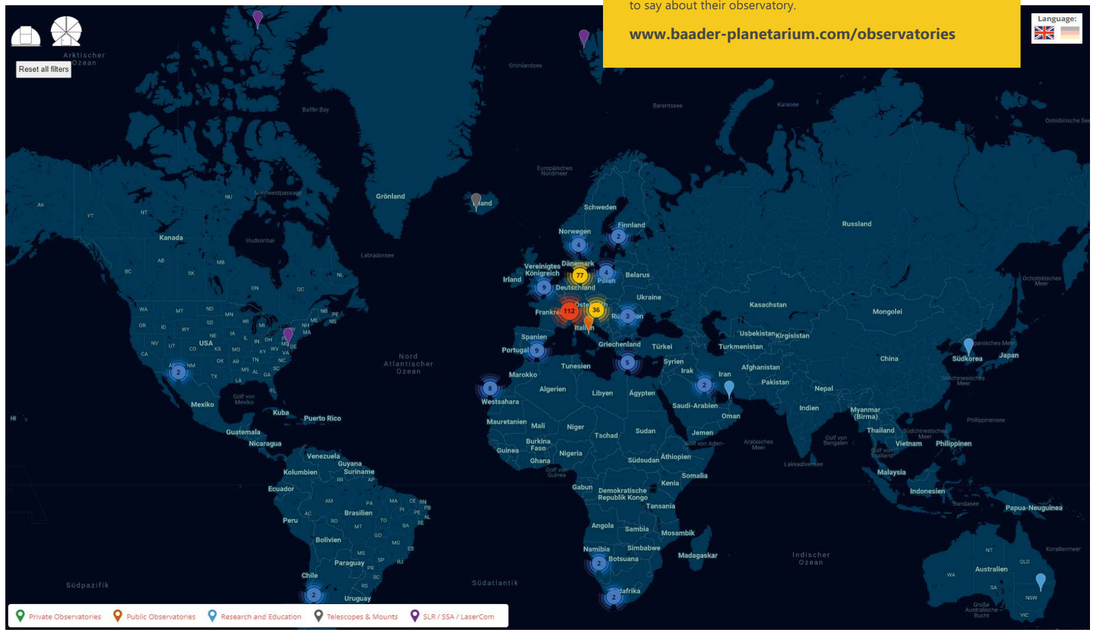
www.baader-planetarium.com/dome-requests

BAADER OBSERVATORIES

AROUND THE WORLD

On our observatory world map you can see all the installations we are allowed to present with a multitude of pictures and information. Discover what the owners of our domes (even after decades) have to say about their observatory.

www.baader-planetarium.com/observatories



REFERENCES

RESEARCH

NASA, Airbus Defence and Space, The Open University, KIT-Campus Alpin – IMK-IFU: Atmosphärische Umweltforschung, AWI – Alfred Wegener Institut, ESO – Europäische Südsternwarte Instituto Astrofisicas Canarias, MPE – Max-Planck-Institut für extraterrestrische Physik, DLR – Deutsches Zentrum für Luft- und Raumfahrt, RIKEN Center for Advanced Photonics (RAP), FORTH – Foundation of research and technology Hellas, MPI – Max Planck Institut, ZEISS, ÖAW – Österreichische Akademie der Wissenschaften, KIS – Kiepenheuer-Institut für Sonnenphysik, BKG – Bundesamt für Kartographie und Geodäsie, GFZ – Helmholtz-Zentrum Potsdam, IAC – Instituto Astrofisica Canarias, MeteoSwiss, NLS – Finnish Geospatial Research Institut FGI, Solaris – Nicolaus Copernicus Astronomical Center, Institut für Astrophysik Göttingen

EDUCATION

Kazan Federal University, Dalhousie University, LMU – Ludwig-Maximilians- Universität München, University of Kent, Universität Hamburg, Eberhard Karls Universität Tübingen, Lund University, EGN – Einstein Gymnasium Neuenhagen, Gymnasium Balingen, Leonardo DaVinci Campus, FSG Friedrich Schiller Gymnasium Fellbach, Kopernikusschule Freigericht, Bischöfliches Gymnasium Petrinum, Arnoldschule Gotha – Staatliches Gymnasium, Frobenius Gymnasium Hammelburg, SGM – Staffelsee Gymnasium Murnau, Universität Bern, Kepler Gymnasium, vhsrt – Volkshochschule Reutlingen, RGL BGL, phaenovum – Staernwarte Gersbach, Universitat of Barcelona, JSG, Rheinische Friedrich Wilhelms Universität Bonn, JKG, Gymnasium Penzberg, Alpinhotel Pacheiner, Schul- und Volkssternwarte Dahlewitz, Sternwarte Schaffhausen

PUBLIC

experimenta – Das Science Center, Haus der Natur – VEGA Sternwarte, ATHOS – Centro Astronomico Isla de la Palma Canarias, Galileum Solingen, Sternwarte Drebach, Sternwarte Zollern-Alb, Volkssternwarte München, SWRT – Sternwarte und Planetarium Reutlingen, TLS – Thüringer Landessternwarte, Sharjah Center for Astronomy and Space Sciences

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