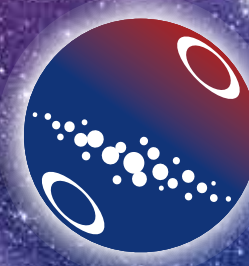


Ohira Tech

www.megastar.jp/en/



MEGASTAR



Surrounded by the beauty of the skies... Touching the infinity of the universe...

MEGASTAR reminds us of our belonging to the Milky Way Galaxy.

MEGASTAR is a new-generation planetarium system created by Takayuki Ohira at a time when the existing planetariums were able to project stars only up to the 6th and 7th magnitude, or around six to thirty thousand stars. In 1998, during the London IPS Conference, MEGASTAR-I made its debut, showing 100 times more stars than conventional planetariums, showing those stars up to the 11th magnitude – a staggering one million – plus stars. It was a revolution in the planetarium world. Although indistinguishable to the human eye, the small stars are there, shining in deep space. MEGASTAR's close-to-real projections allow you to view the faint stars like tiny grains of sand, as they form the depth and breadth of the galaxy. People watching MEGASTAR shows are so touched by the beauty of the skies that they often shed silent tears. Possibly the stars in the vast universe make us instinctively appreciate the fragile life on our planet, as we are awed by the mysteries of our universe.

Reality in the Starry Skies

True to its name, MEGASTAR will unfold the constellations made up of millions of stars. The Milky Way will be viewed, for the first time in the world as huge clusters of stars, not just a hazy band. Using binoculars, as Galileo Galilei did about 400 years ago, you will be able to see not only the individual stars of the Milky Way, but you will also discover all of the Messier objects. There are over 170 clusters and nebulae you can view with the help of MEGASTAR.

Hybrid Solution

The MEGASTAR is designed to work along with digital planetarium systems. The optical MEGASTAR star projector creates the beautiful realistic star field, along with the bright naked eye visible planets, Sun and Moon, while description images (labels, figures, guide lines, etc.) are projected digitally. Such features like the geometry tools on the starball, Solid-State Shutter for star masking concept, independent bright star control, open control interface enable the MEGASTAR to be easily integrated with the digital planetarium.

Compact

Our star projectors are surprisingly small, lightweight and of simple design. The projector body might be installed not to block any visitor's view nor cast a shadow when used alongside a digital planetarium system. Besides all this, its installation space requirement is small. Some portable models are available for planetarium shows not only in stationary domes, but also in mobile planetarium domes.

Easy Maintenance and Low Running Cost

The entire MEGASTAR series use ultra-bright LED lamps as light sources, a first in the planetarium industry. There is nearly no need to replace the lamps (lamp life time 30,000 hours). It is a notably safer and environmentally-friendly device with lower power consumption. All of the rotational electrical components are sealed with precious metallic slip rings, thus eliminating the need to clean or exchange the hard-to-access parts. The Solid-State Shutter provides projection masking without using movable parts, keeping the mechanism reliable and long-serving.



Flagship projector for installations

MEGASTAR-III

[for domes 15m-30m]

MEGASTAR-III is the current and optical planetarium projector development for larger domes, with increased number of independent bright stars projectors (135 projectors). A similar to MEGASTAR-IIA in its core architecture, it is facilitated with three layers surrounding twilight projectors (optional), automatically synchronize with Sunset and Sunrise. The high number of bright stars projectors makes MEGASTAR-III a master of realistic star projection, and perfect for MEGASTAR-FUSION (see details on page 7) based shows.

The magnificent starry skies for mid-large domes for installations

MEGASTAR-IIA

[for domes 10m-23m]

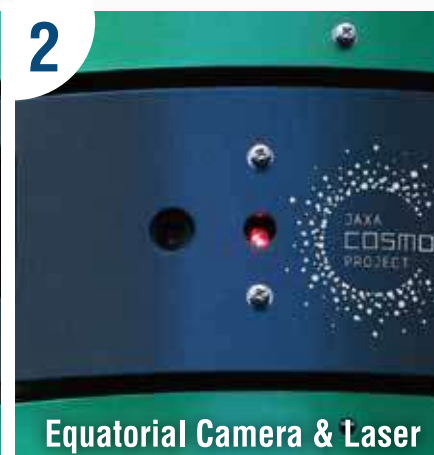
MEGASTAR-IIA is the current and active optical planetarium projector development, fits for domes from 10 up to 23 meters in diameter. The projector system is divided into 32 lenses. Also, the brightest 40 stars (optionally can be increased to 62) are projected independently each with its own color and magnitude. MEGASTAR-IIA is the first planetarium in the world to implement LED lamp as light source for large domes. This eliminates the need of lamp replacement.

4 Mutual Functions



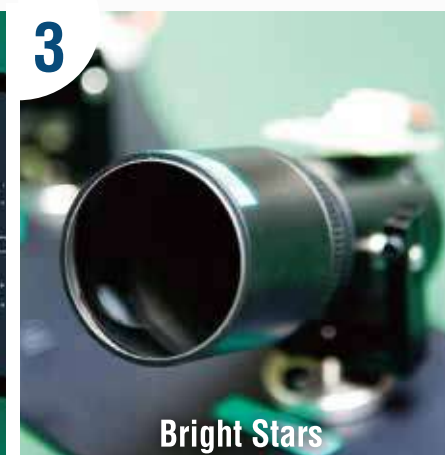
MEGASTAR-FUSION Support

The projectors support Fusion projection (see details on page 7) with digital projection system. This opens new horizon of hybrid projection with stars been projected using both digital system and the Megastar.



Equatorial Camera & Laser

The camera and laser device are used for starfield alignment as well as calibration with the digital planetarium system.



Bright Stars

MEGASTAR is facilitated with individual projectors for the brightest stars. Each projector reproduces one star with its color and apparent magnitude as well as adjustable twinkle. Bright stars can be controlled independently allowing smooth fade on/off and variable stars simulations.



Solid-State Shutter

The electronically controlled shutter allows custom masking of the stars over the dome surface. It functions without any movable parts, making it life lasting feature. The Solid-State Shutter is an original feature of the MEGASTAR, and enables it to function in flat and tilted domes, as well as opening new possibilities in hybrid projection.

Three layers surrounding twilight projectors (optional)



Digital age star projector **for installations**

MEGASTAR-Neo

[for domes 5m-15m]

MEGASTAR-Neo is an optomechanical planetarium star projector designed for small to mid-range flat domes of 5m-15m in diameter. It is a new development of Ohira Tech with a concept of a simple, low-cost, long-life, affordable device for planetariums. The projection hemisphere diameter is just 320mm, and a total weight of 33kg (the projection hemispheres unit weighs 19kg). MEGASTAR-Neo can be carried by one person, transported by post. Its replaceable, easy to ship, projection hemispheres concept provides smooth and reliable site support. It is easy to setup, integrate, and maintain. Gravitational shutters offer horizontal star masking for flat domes. Projection hemispheres unit can function as two axis star projector*. The separable azimuth base unit adds the azimuth axis (default configuration).



Digital System Integration

Optimized for integration with digital planetarium systems.



Laser

Alignment laser for calibration with digital planetarium systems.



Small and Light

Smallest of its kind, lightweight star projector-just 19kg (320mm projection hemisphere diameter). Can be carried by one person, and easy to install.



*A separate power unit required.



TECHNOLOGY



A next-generation to the hybrid solution

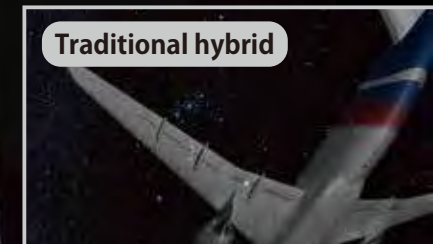
MEGASTAR FUSION

[Patented]

This is a new projection concept, and a next generation to the hybrid solution. The Fusion is about projecting starfield using: an optomechanical system for projecting brightest stars sharply, and a digital system for projecting fainter stars as well as digital images. This concept, when high contrast and high resolution digital projector used, provides not only realistic and impressive starfield, but also beautiful graphical sceneries where stars no longer overlap the digital images, as MEGASTAR has individual control over each star. Such effects as shiny stars blinking from behind fast moving clouds become possible. With Fusion different sceneries with stars can be created.

MEGASTAR-IIA with increased bright stars number and MEGASTAR-III are optimal projectors for Fusion shows.

Traditional hybrid



FUSION



Original star plate data & manufacturing

MEGASTAR is associated with its rich and deep starfield, with stars of the milky way projected separately in a realistic manner. This is achieved thanks to the advanced laser in-house production technology of the star plates. In 2015, in cooperation with Sony DADC Japan, it became possible to engrave holes as small as 200 nanometer "GIGAMASK". With the deep space star data become available, MEGASTAR is able to project a starfield with over one billion individual stars. Ohira Tech also, in cooperation with Sega Toys, provides original star data for their popular series of home planetariums "HOMESTAR".

Home planetarium with star data provided by Takayuki Ohira HOMESTAR from Sega Toys.



World first single star plate with the GIGAMASK technology





Full System

The Star Projector installed in the center of the dome, surrounded by the Planets as well as the Sun and Moon Projectors. Their operation is fully computer-controlled, providing accurate system synchronization. The coordinates of the planets, the Sun and the Moon are calibrated exactly according to time (past, present, future) and location (Earth location or arbitrary location within the solar system).

photograph : Copernicus Science Museum, Warsaw, Poland



photograph : Kazan Federal University Planetarium, Kazan, Russia



Large type

Planet Projector (large/small)

Planet projectors are computer controlled independent projectors. Using ultrabright LED lamps for vivid images, you are not encumbered by lamp replacements. The entire projector is given a stylish design and housed in a transparent cover, thus no movable parts are exposed. Planet Projectors are characterized by their reliable long-life designs.



Small type



Sun and Moon Projectors (large/small)

The state-of-the-art Sun and Moon Projectors, the Eclipse System, have adopted a completely new concept in digital imaging. A dynamic visible diameter, red Sun, planet transition, Moon surface features and phase can be demonstrated.



Image Projection with Eclipse System

The Eclipse System allows you to view a highly realistic depiction of the luminous Moon with all of its surface features. Visitors can see the total solar eclipse with the corona, the breathtaking diamond ring, the bronzed Moon during a lunar eclipse and much more. Enjoy the elaborate and beautiful views and performances of the Sun and the Moon. It's an ideal tool for projecting realistic eclipses accompanied by music and/or narrations.



Blue Sky and Twilight Projectors

In addition to planet projectors, Ohira Tech offers LED separate projectors to reproduce Blue sky and twilight colors. These projectors are controlled by the same system, and work in synchronization with the Star and Sun projectors. It adds beautiful effects to your planetarium, uses little space and consumes little power with no need for maintenance.



Related
product

NanoDimmer

[Patented]

NanoDimmer is LED lighting system for dark theater environment. Its main advantage is the extremely high contrast (1 to 10 million) and its smooth dimming.

Often in planetariums, bright cove lighting is used, however, when it comes to really dark environment, ordinary cove light fails to perform smooth transitions, and below a certain level of brightness it completely turns off.

NanoDimmer addresses this issue, providing smooth transition down to barely visible brightness.

This is ideal for planetarium and twilight environments.



4 Features of the Nano Dimmer

1 Ultra-wide contrast range
(the world's highest range)
Enables a full-range smooth transition from faintest to brightest light

2 Full color
Supports RGB 3 colors

3 Computer and DMX control
Can be controlled using a computer or DMX512 controller

4 Use of LED strips
Can function with various types of LED strips of 24 V

■ Planetariums and theaters

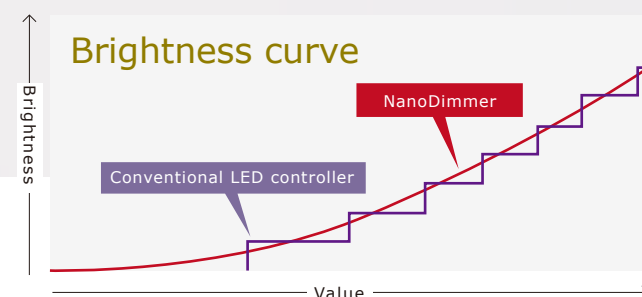
Smooth and extremely low brightness become possible.



NanoDimmer in Bangkok planetarium

■ Interior lights

Cove lights, and smooth variation in the reproduction of natural lights



As mobile planetarium



Stars in a family atmosphere



In a restaurant or bar



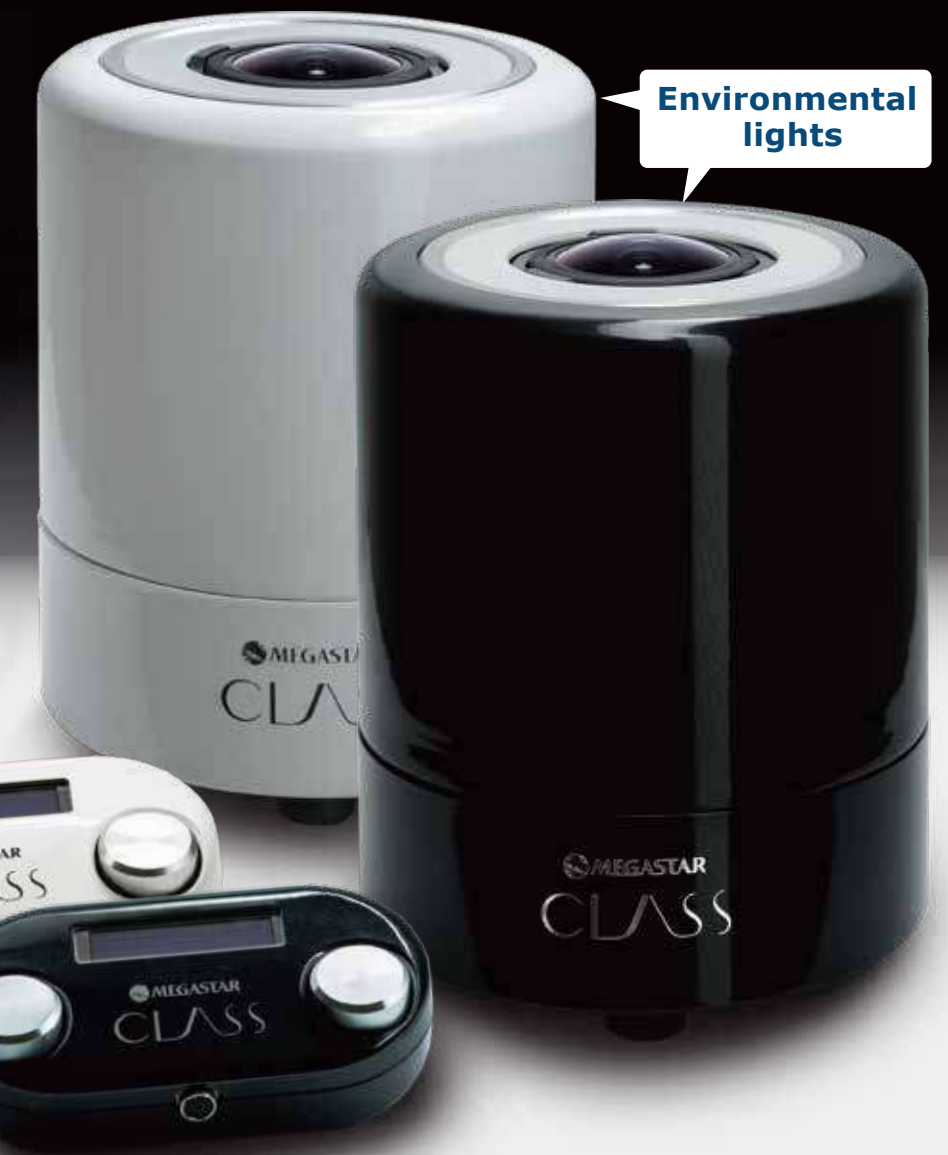
▲Smartphone app

for personal use Your personal planetarium projector

MEGASTAR CLASS

[for domes up to 7m, and can be used in smaller rooms]

MEGASTAR CLASS is our planetarium product for personal use. Its name is an acronym for C (Compact), L (Light), A (Accurate), S (Simple) and S (Silent). The device is easy to set, easy to move. It has one wide lens (180 deg projection) projecting stars from latitude 35 Northern Hemisphere and provides daily motion. It projects Million stars and has environmental lights. It can be controlled via handy controller or using an app from your android phone. This new simple concept for planetarium projection suits small domes as well as individual customers.



Achievements in Japan

(As of June 2018)

Nishimino Planetarium in Fujihashi Castle

Ibi, Gifu

MEGASTAR-IIB
Diameter:9.2m Flat
April, 2012



Nara City Education Center

Nara city, Nara

MEGASTAR-ZERO
Diameter:6m Flat
October, 2011



Itami City Culture and Science Museum for Children

Itami, Hyogo

MEGASTAR-IIB
Planets, Sun, Moon and
twilight projectors
Diameter:14m Flat
March, 2013



Mitsubishi Motors Nagoya Plant
Okazaki, Aichi

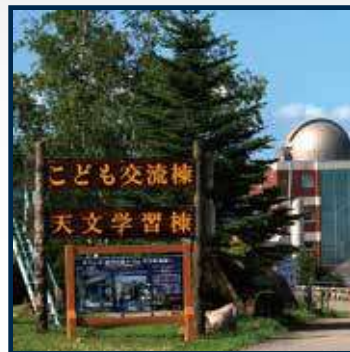
MEGASTAR CLASS prototype
Diameter: 6m Flat
October, 2015



Kigoyama Communication & Training Center

Kanazawa, Ishikawa

MEGASTAR-Neo
Diameter:10m Flat
March, 2018



Yamanashi Prefectural Science Center

Kofu, Yamanashi

MEGASTAR-IIA
Planets, Sun, Moon
and twilight projectors
Diameter:20m Tilt
March, 2010



Ohira Tech Ltd.

Yokohama, Kanagawa



[Road Station]
Fujikawa-Rakuza
Fuji, Shizuoka

MEGASTAR-IIB
Diameter:14m Tilt
July, 2010

※MEGASTAR-IIA and NanoDimmer
to be installed in July, 2018.

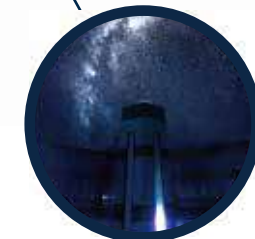
Kanagawa Institute of Technology
Atsugi City Children's Science Center
Atsugi, Kanagawa



MEGASTAR-IIB
Diameter:12m Flat
July, 2009

RAKU SPA TSURUMI

Yokohama, Kanagawa



MEGASTAR-Jr.
Inside stone spa
August, 2014

Kawasaki Municipal Science Museum

Kawasaki, Kanagawa



MEGASTAR-III FUSION
Planets, Laser Venus, Sun,
Moon and twilight projectors
Diameter:18m Flat
April, 2012

Planetarium BAR

Minato-ku, Tokyo



MEGASTAR-ZERO
Diameter:4m Flat
(inside the Bar)
June, 2008

National Museum of Emerging Science and Innovation

Koto-ku, Tokyo



MEGASTAR-II cosmos
MEGASTAR-ZERO
Planets, Sun and Moon projectors
Diameter:15.24m Tilt
July, 2004

Moiwayama Observatory

Sapporo, Hokkaido



Dome theater:MEGASTAR-IIB
Diameter:6m Flat
Restaurant:Full dome Digital System
December, 2011

Hitachi Civic Center

Hitachi, Ibaraki



MEGASTAR-IIA
Planets, Sun, Moon and
twilight projectors
Diameter:22m Tilt
July, 2011

Higashiyamato City Folk Museum

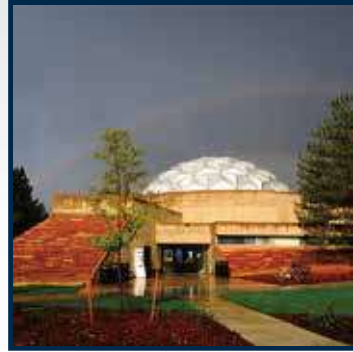
Higashiyamato, Tokyo



MEGASTAR-IIB
Sun and Moon projectors
Diameter:14m Flat
March, 2014

Achievements in the World

(As of June 2018)



Fiske Planetarium
Boulder, USA

MEGASTAR-IIA
Sun and Moon Projectors
Diameter: 20m Flat
September, 2013



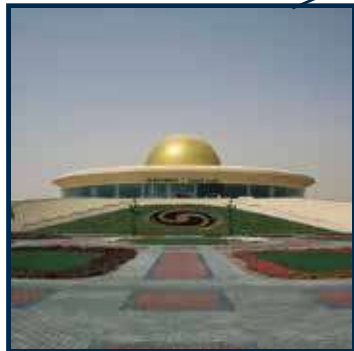
Hudson River Museum
Yonkers, USA

MEGASTAR-IIA
Diameter: 12m Flat
February, 2014



Galileo Galilei Planetarium
Buenos Aires, Argentina

MEGASTAR-IIA
Diameter: 20m Flat
January, 2012



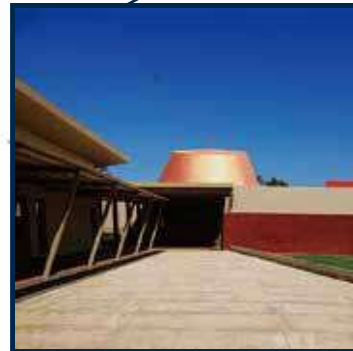
Sharjah Centre for Astronomy & Space Sciences
Sharjah, UAE

MEGASTAR-IIA
Planets, Sun and Moon projectors
Diameter: 18m Tilt
May, 2015



Kavaratti Science Museum & Planetarium
Kavaratti, India

MEGASTAR-IIB
Diameter: 10m Flat
January, 2011



Swami Vivekananda Planetarium
Mangalore, India

MEGASTAR-IIA
Planets, Sun and Moon projectors
Diameter: 18m Tilt
February, 2018



Madrid Planetarium
Madrid, Spain

MEGASTAR-IIA
Diameter: 17.5m Flat
October, 2017



Konya Science Center
Konya, Turkey

MEGASTAR-IIA
Diameter: 14m Tilt
February, 2015



Copernicus Science Center
Warsaw, Poland

MEGASTAR-IIA
Planets, Sun and Moon projectors
Diameter: 16m Flat
June, 2011



AHHA Science Center
Tartu, Estonia

MEGASTAR-IIA
MEGASTAR-ZERO
Diameter: 9.3m Full sphere
May, 2011



Kazan Federal University Planetarium
Kazan, Russia

MEGASTAR-IIA
Planets, Sun and Moon projectors
Diameter: 15m Tilt
June, 2013

Ohira Tech Ltd.

Daejeon Observatory

Daejeon, Korea

MEGASTAR-Neo
Diameter: 9.5m Flat
May, 2018



Nehru Planetarium
Delhi, India

MEGASTAR-IIB
Diameter: 15m Flat
October, 2010



Nakhon Ratchasima Planetarium
Korat, Thailand

MEGASTAR-IIA
Diameter: 20m Flat
June, 2012



Sir Thomas Brisbane Planetarium
Brisbane, Australia

MEGASTAR-IIB
Diameter: 12.5m Flat
March, 2013



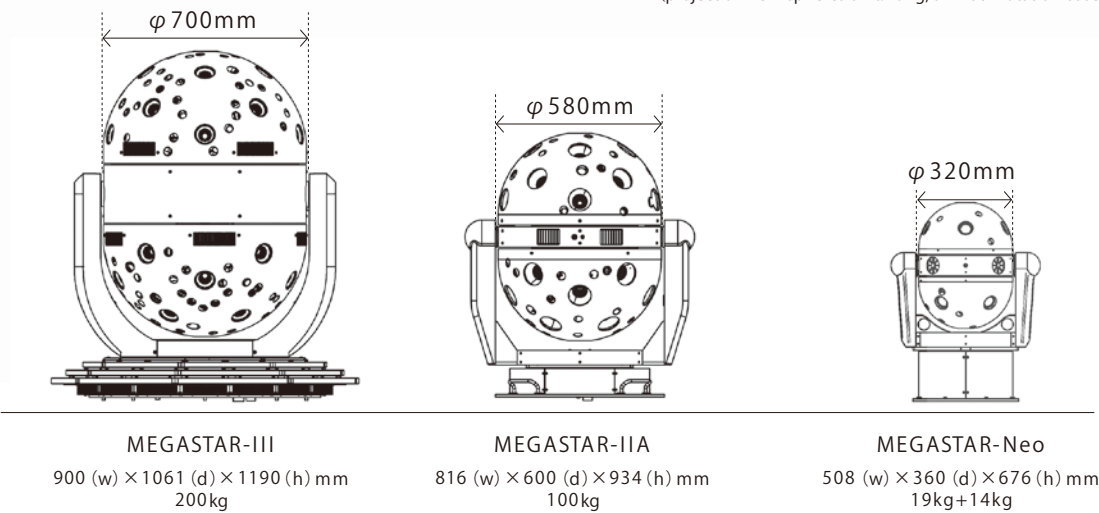
Geumnyeonsan Youth Training Institute
Busan, Korea

MEGASTAR-IIB
Diameter: 9m Flat
February, 2017

Technical Specifications

Star Projector	MEGASTAR-III	MEGASTAR-IIA	MEGASTAR-Neo
Dome diameter range	15-30m flat/tilt dome	10-23m flat/tilt dome	5-15m flat dome
Number of stars	1 million - 20 million		1 million (default configuration)
Deep Space Objects	over 170, including all Messier objects		
Projection type	32 optical projection units		12 optical projection units
Light source	Ultra bright LED light source (lamp life expectancy 30,000 hours)		
Dimming	Electronic control 0-100%		
Star masking	Solid-State shutter		Gravity shutter
Twilight projectors	Optional: Integrated (for flat dome)	Optional: Independent projectors	
Motion	Time motion : Diurnal, Annual, Precession Geographical motion : Longitude, Latitude (Full sphere) , Azimuth		
Physical axes	Three axes, speed 0 - 20deg/sec	Three axes, speed 0 - 40deg/sec	
Cooling	8 built-in controllable fans	4 built-in controllable fans	
Bright Stars with twinkle	135	21 - 62	16
Calibration	Equatorial camera and laser		Equatorial laser
Dimensions	900(w)×1061(d)×1190(h)mm	816(w)×600(d)×934(h)mm	508(w)×360(d)×676(h)mm
Weight	200kg	100kg	33kg [※]
Power consumption (max)	2.4kW	1.4kW	600W

※ (projection hemispheres unit: 19kg, azimuth rotation base: 14kg)



Planet Projector	Large	Small
Shape	Independent XY computer controlled projectors	
Light source	Ultra bright LED	
Cooling	Natural (Fanless)	
Dimensions	443(w)×443(d)×312(h)	200(w)×200(d)×216(h)

Sun, Moon Projector	Large	Small
Shape	Independent XY computer controlled projectors	
Light source	Ultra-high pressure mercury lamp	LED
Projected images	Brightness variation, visible diameter variation, surface features, eclipses, Moon phases, planet transitions	
Dimensions	900 (w) × 556 (d) × 626 (h)	453 (w) × 164 (d) × 410 (h)

Control	
Console PC	WINDOWS-OS
Manual operation	Dials or faders independent parameters control/Time(diurnal, annula, precession)/Location(longitude, latitude)/Axes control(diurnal axis, latitude axis, azimuth axis)/Individual object brightness/Dome Illuminations control
Control interface	GUI, DMX-512, LAN
Operation modes	Manual mode, Auto mode, SMPTE input voice time code

Other	
Power supply	100V-240V AC 50/60Hz
Safety features	Emergency safety switch (optional)

Nano Dimmer	Control Unit
Power	+5 V DC 2 A (provided with AC adapter 100~240 V)
Front indicators	Power, input control, state, and output control
Control interface	RS232C or DMX512 (switching)
Driver unit connections	Dual RJ45 (two sets)
Dimensions	250 (w) × 102 (d) × 44 (h)
Weight	820g
Other	●Optional light-on button ●Optional 19 in. rack mounting ears

Nano Dimmer	Driver Unit
Power	+24V DC maximum 12 A
Control unit/Driver unit connections	two sets: input & output
LED strip connection	PHOENIX CONTACT MSTB2.5-4-GF-5.08 (MSTB 2.5-4-STF-5.08 on LED side)
Dimensions	Maximum 4 A per channel
LED power output	130 (w) × 82 (d) × 30 (h)
Weight	160g
Used LED strips	ColorBright RGB Color Changing 300LED Strip Light CB-RGB2-24V-REEL
Used AC adapters	Mean Well HLG-320H-24A (power up to two aforementioned LED stripes) Mean Well HLG-240H-24A (power up to one aforementioned LED stripe)

MEGASTAR CLASS	
Price in Japan	1,300,000 JPY (Excl. Tax)
Available colors	Black and white
Number of stars	More than 1 million
Light Source	Ultra-bright LED
Environmental lights	Ultra-wide-range RGB colors: Blue sky, twilight effects, candle and other effects
Maximum room dimension	3.5 m from the device (7m dome)
Motion	Diurnal star motion for 35° from the Northern Hemisphere
Projection environment	Total darkness
Temperature/humidity	5~35°, up to 80% humidity
Bluetooth	Version2.1+Enhanced Data Rate (EDR) Class2
Dimensions	190 (φ) × 240mm (h)
Weight	4kg (without controller)
Power consumption	35 W maximum (100 V)
Accessories	Handy controller, AC adapter (100-240 V), cables, lens covers, and user manual
Warranty	1 Year (within Japan)

Technologies for Science & Art & Entertainment

Megastar is an accurate simulator for the night sky.
It is an educational tool.
However...
Why are we so moved when we look up at the magnificent star-filled skies?
Something really happens in our hearts.
Why do the stars have such power over us?
It seems as if something transcendental is trying to deliver his message to us through the stars...
Megastar might be the tool to deliver this message!



Nov, 1991

Takayuki Ohira developed a lens projection type planetarium "Astroliner", a project which was said to be impossible to accomplish by an individual person.

Jun, 1998

"MEGASTAR" achieved more than 1 million stars for the first time in the world. It was announced at the IPS in London.

Apr, 2004

MEGASTAR-II Phoenix was installed in Kawasaki Municipal Science Museum.

Jul, 2004

MEGASTAR-II cosmos developed jointly with the National Museum of Emerging Science and Innovation (Miraikan).

Nov, 2004

MEGASTAR-II cosmos certified by Guinness World Records as the world's most advanced planetarium projector.

Oct, 2006

MEGASTAR-II selected for the "New Japan Style" best 100 (by Ministry of Economy, Trade, and Industry).

Jun, 2008

2008 At the IPS in Chicago, SUPER MEGASTAR-II shows the world's largest number of 22 million projected stars.

Dec, 2008

Developed the world's first LED optical star projector MEGASTAR-IIB for permanent installations in medium size domes.

Dec, 2009

Developed the world's first LED optical star projector MEGASTAR-IIA for permanent installations in large domes.

Feb, 2005

Established Ohira Tech Ltd.

Aug, 2005

The world's first home optical planetarium HOMESTAR released jointly with SEGA TOYS CO., LTD.

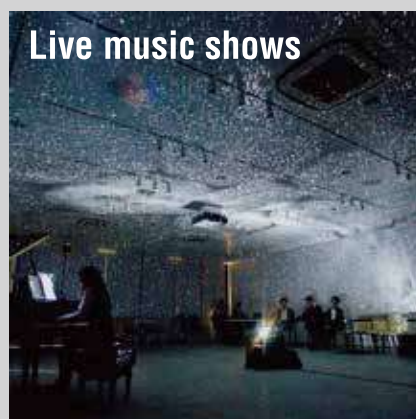
Sep, 2005

The Science for Adults: Vol.9 Ultimate pinhole planetarium (magazine) was released jointly with Gakken Education Publishing Co., Ltd.



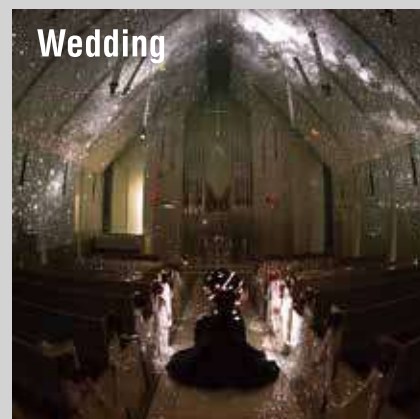
Event

We deliver stars to any desired place.



Live music shows

MEGASTAR appears at concerts of numerous artists.



Wedding

Reproduce at the wedding ceremony a starry sky of important days.

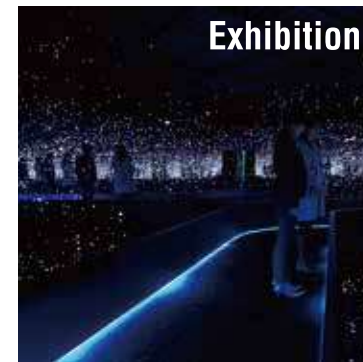


Hospital

We deliver a starry sky to hospitals. It brings relief from the fear and tension and gives an opportunity to think about the significance of one's existence in the universe.

"3D SKY WALK"

Illumination of the starry sky (Mori Arts Center Gallery)



Exhibition

Nov, 2010

An exhibition "Sky Planetarium" was held at the Mori Arts Center Gallery (Roppongi Hills Mori Tower 52F).

Apr, 2012

Developed a revolutionary new projection method MEGASTAR-III FUSION that combines optical and digital methods.

May, 2011

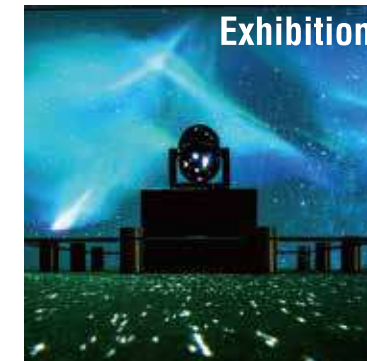
MEGASTAR used as an optomechanical unit of the world's first 360-degree all-sky ball planetarium installed in the AHHA Science Center (Tartu, Estonia)

Jul, 2011

MEGASTAR-IIB at Roadside Rest Area FUJIKAWA-RAKUZA certified by Guinness World Records as the world's most advanced planetarium projector.

Aug, 2011

Moved the office to Yokohama from Kawasaki.



Exhibition

Jun, 2014

The art installation "Imaginary Cosmos" by MEGASTAR-II exhibited at the Museum of Contemporary Art Tokyo.

"Imaginary Cosmos" mission [SPACE x ART] - beyond cosmologies (Museum of Contemporary Art Tokyo)

Mar, 2016

Developed full-dome personal ultra-small planetarium projector MEGASTAR CLASS.

Oct, 2015

Jointly with Sony DADC Japan Inc. developed the super precision star plate GIGAMASK capable of projecting the largest number of stars in the world (more than one billion stars).

Nov, 2015

Projected MEGASTAR-II in the cave on the seaside as a part of an exhibition "Space Art Tanegashima".



Exhibition

"Star Cave" Space Art Tanegashima (Cavern at the Tanegashima seaside)

COMPANY PRIFILE

Company Name	Ohira Tech Ltd.
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Tel	+81-(0)45-507-3531
Fax	+81-(0)45-507-3532
Established	February 2005
Capital	10,000,000 JPY
URL	https://www.megastar.jp/en/
E-mail	sales@megastar.jp

