IO – October 2004

Issue # 2004-10

www.eugeneastro.org

Eugene Astronomical Society, Annual Club Dues $25, President: Tracy Stephensen tracystephensen@comcast.net or 541-338-6647,
Secretary & Treasurer: Richard Boyd; IO editor, Sam Pitts, sampitts@comcast.net:
Io *(EYE-oh) is nearest to Jupiter and fastest orbiting of the four Galilean moons*
EAS is a Proud Member of:
The Astronomical League
The World's Largest Federation of Amateur Astronomers

Monday- October 4th MEETING

EUGENE ASTRONOMICAL SOCIETY

At The Science Factory Planetarium

Elections for BOD will be held

The meeting will begin at **7:00 PM** in the Planetarium. Alicia McGraw will have a program on the Genesis project. Also, We will be holding elections for next years Board. EAS encourages any interested parties to volunteer for consideration as a board member. (See BOD Message page # 2) Come early and help others learn about their scopes. Those of you, who are new or not sure about your equipment, show up early and some of our members will assist you in understanding your equipment better. If you are planning on getting a scope please come out and ask questions, we're glad to assist you in making a good solid choice to maximize your viewing pleasure.

The Science Factory is at 2300 Leo Harris Parkway, behind Autzen Stadium.

Pisgah Star Party

Postponed do to clouds, tentatively reset for Friday, October 1st, 7:00 PM, show up at 6:00 PM for setup, dependent on weather. Look for conformation on Web Site and User List. Contact Roscoe or Tracy for further information and updates. Events will include viewing through scopes, slide show of night sky vistas and sharing astronomy with the public. This is a great chance to assist the public in locating constellations, deep sky objects, cosmology, etc. Come on out and have some fun.

This has been a poor year for Dark Sky outings in Oregon, especially in the Eugene area. Even the Oregon Star Party was Clouded/Rained out.

Magazine subscriptions go to **Rocasyd@aol.com**

Join the user List! **Keep in-touch with Members and Events!**

http://lists.cmc.net/cgi-bin/mailman/listinfo/eugeneastro

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EAS Board of Directors

The Board of Directors of the Eugene Astronomical Society continues the tradition of positive forward progress in the growth and operations of the society (club). The following information will assist members in keeping up to date of club activities.

Guy Prouty has stepped forward and offered to run for Board of Directors, and Jerry Oltion has decided he needs to step down from these responsibilities. The rest of the current EAS Board of Directors, Tracy Stephensen, A.C. Illig, Richard Boyd, and Rossco Wright, has decided that they would like to run for re-election, and proceed with the continuity as begun when they were elected 3 months ago.

The following are accomplishments of this BOD.

The meeting place was secured at the Science Factory Planetarium.

EAS telescopes have been moved from expensive commercial storage into donated space.

Income from T-shirt sales, book sales, magazine renewals, new and renewing club memberships, and star party donations have been deposited and properly recorded.

Tax deductible contributions have been acknowledged, thank you notes written, and funds deposited.

Bills have all been paid and properly recorded.

Magazine renewal requests from members have been processed and renewed.

The club membership in the Astronomy League has been renewed and fee paid.

The roster has been kept current.

There have been five Board meetings and minutes have been recorded.

Two General Meetings were planned and held with speakers and activities. The October meeting is also planned with a speaker.

Four public Star Parties were held including the John Dobson event.

The EAS picnic was planned, prizes collected, a site reserved, (and rained out).

The membership was invited to a telescope workshop party for collimation and adjustment at Rossco's shop.

The membership was invited to an evening of Moon study with the Rob Adams Scope at Rossco's shop.

Insurance for the Rob Adams Scope was procured, and it was present at the Springfield High School Star Party September 24th.

Telrad finders were purchased for the Rob Adams scope and the 12-inch white Dobsonian. All club-lending scopes have been collimated and aligned and offered to the membership.

The website has been completely redone and updated by Board member Richard Boyd with the expert assistance from previous webmaster Dave Cole.

The IO Newsletter has been edited and presented on time by Sam Pitts.

An official office room for the EAS records, files, and supplies has been procured.

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What's Out This Month

October begins with Cygnus directly over head and offers great viewing and imaging opportunities. Lyra and the Ring Nebula are to the West and still high enough for good viewing. The great square of Pegasus is to the East, Cassiopeia the Northeast. The great Andromeda & Pinwheel Galaxies are now in a great location for deep viewing.

To the South, Sagittarius is nice right after sunset but Scopius is fading from view fast. Capricornus and Aquarius are to the South around midnight. Neptune will reach +7.9 magnitude in Capricornus (RA 21h .5m Dec –17º 06'), while Uranus is visible to the naked eye at +5.8 in Aquarius (22h 21.6m Dec. 17º 05').

Saturn is starting to climb higher in the east and should be visible after midnight, while Venus is still high in the East way before sunrise. Jupiter will be visible towards the middle of the month an hour or so before sunrise with mars following. A nice lineup of Venus, Jupiter and Mars will take place during the early morning hours of October 25, before sunrise. This will be a good time to photograph the event with 400-800 asa film and a 50mm lens for 20 seconds, 35mm lens for 35 seconds, with a tripod and cable release

This is the time to finish logging in all the Messier objects around the central core of the Milky Way or wait till Spring of 2005.

Transits of Jupiter's Moons

10/11	06:42	Ganymede	Shadow Begins
	07:20	Ganymede	Transit Begins
10/12	06:21	Io	Transit Begins
	08:36	Io	Transit Ends
	03:43	Io	Transit Ends
10/19	07:55	Io	Shadow Begins
	08:22	Io	Transit Begins
10/28	04:53	Io	Transit Begins
	06:32	Io	Transit Ends

Shadows cast on Jupiter's disk by Transit of its moons may Begin and end after transit times. Begin observing before Times listed. Actual times of events will vary depending on your precise location within time zones. Shadows start before transits and usually end before transits are over.

Don't forget the time change last Saturday in October.

Be careful of the sun if you plan on viewing Jupiter after Sunrise.

Don't forget to view Saturn and try to identify it's many moons. Titan, Rhea, Dione & Tethys are visible in 4" scopes while Enceladus will require a 10-12" scope. Get that Web Cam going and submit some shots of Saturn, Uranus and Neptune for next months IO.

Jupiter's Red Spot Centered PST

10/01	05:12	17:08		10/16	02:41	12:37
10/02	00:00	10:59		10/17	08:28	00:00
10/03	00:00	06:51		10/18	04:20	14:16
10/04	02:42	12:38		10/19	00:12	10:07
10/05	00:00	08:30		10/20	05:59	15:55
10/06	04:22	14:17		10/21	01:50	11:46
10/07	00:13	10:09		10/22	07:38	00:00
10/08	06:01	15:56		10/23	03:29	13:25
10/09	07:52	11:48		10/24	09:17	00:00
10/10	07:40	00:00		10/25	05:08	15:04
10/11	08:31	13:27		10/26	01:00	10:56
10/12	09:19	00:00		10/27	06:47	16:43
10/13	05:10	15:06		10/28	02:39	11:35
10/14	07:02	10:58		10/29	08:26	00:00
10/15	06:49			10/30	04:18	10:05

EAS Membership Dues October

Please fill out new membership forms and submit your dues in October to EAS. See Roscoe at the next meeting. Applications are on the Web site:

www.eugeneastro.org

Scientists Discover First of a New Class of Extrasolar

In addition, one of the new planets joins three others around the nearby star 55 Cancri to form the first known four-planet system.

The discoveries consist of two new planets. They were discovered by the world renowned planet-hunting team of Drs. Paul Butler and Geoffrey Marcy of the Carnegie Institute of Washington and University of California, Berkeley, respectively; and Barbara McArthur of the University of Texas, Austin. Both findings were peer- reviewed and accepted for future publication in the Astrophysical Journal. NASA and the National Science Foundation funded the research.

"NASA, along with our partner NSF, is extremely proud of this significant planetary discovery," said Al Diaz, Associate Administrator of NASA's Science Mission Directorate. "The outcome of the tremendous work of the project scientists is a shining example of the value of space exploration."

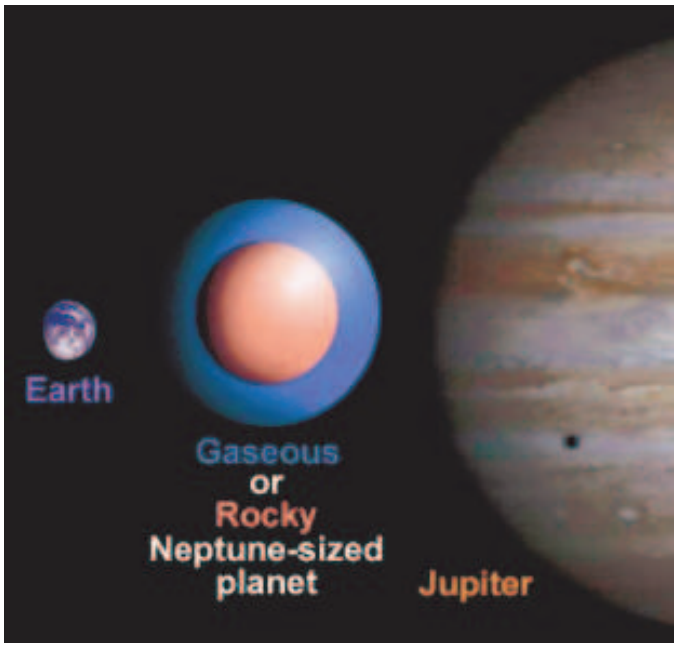
"These Neptune-sized planets prove that Jupiter-sized, gas giants aren't the only planets out there," Marcy said. Butler added, "We are beginning to see smaller and smaller planets. Earth-like planets are the next destination."

Future NASA planet-hunting missions, including Kepler, the Space Interferometry Mission and the Terrestrial Planet Finder, will seek such Earth-like planets. Nearly 140 extrasolar planets have been discovered.

Both of the new planets stick very close to their parent stars, whipping around them in a matter of days. The first planet, discovered by Marcy and Butler, circles a small star called Gliese 436 about every two-and-one-half days at just a small fraction of the distance between Earth and the Sun, or 4.1 million kilometers (2.6 million miles). This planet is only the second known to orbit an M dwarf, a type of low-mass star four-tenths the size of our own sun. Gliese 436 is located in our galactic backyard, 30 light-years away in the constellation Leo.

The second planet, found by McArthur, speeds around 55 Cancri in just under three days, also at a fraction of the distance between Earth and the sun, at approximately 5.6 million kilometers (3.5 million miles). Three larger planets also revolve around the star every 15, 44 and 4,520 days, respectively. Marcy and Butler discovered the outermost of these in 2002. It is still the only known Jupiter-like gas giant to reside as far away from its star as our own Jupiter. The 55 Cancri is about 5 billion years old, a bit lighter than the sun, and is located 41 light-years away in the constellation Cancer. "55 Cancri is a premier laboratory for the study of planetary system formation and evolution," McArthur said.

Because the new planets are smaller than Jupiter, it is possible they are made of rock, or rock and ice, rather than gas. According to the scientists, the planets may have, like Earth formed through gradual accumulation of rocky bodies. "A planet of Neptune's size may not have enough mass to hold onto gas, but at this point we don't know," Butler said.



This illustration compares the size of the newfound Neptune-sized planets beyond our solar system to the sizes of Earth and Jupiter.(NASA)

Both discoveries were made using the "radial velocity" technique, in which a planet's gravitational tug is detected by the wobble it produces in the parent star. Butler, Marcy and collaborators, including Dr. Deborah Fischer of San Francisco State University and Dr. Steven Vogt of the University of California, Santa Cruz, discovered their "Neptune" after careful observation of 950 nearby stars with the W.M. Keck Observatory in Mauna Kea, Hawaii. They were able to spot such a relatively small planet, because the star it tugs on is small and more susceptible to wobbling.

McArthur and collaborators Drs. Michael Endl, William Cochran and Fritz Benedict of the University of Texas discovered their "Neptune" after obtaining over 100 observations of 55 Cancri from the Hobby- Eberly Telescope at McDonald Observatory in West Texas. Combining this data with past data from Marcy, Fischer and Butler from the Lick Observatory in California, and archival data from NASA's Hubble Space Telescope, the team was able to model the orbit of 55 Cancri's outer planet. This, in turn, allowed them to clearly see the orbits of the other three inner planets, including the new Neptune-sized one.

For visuals depicting the new planets and information about NASA's planet-hunting missions on the Internet, visit:

http://planetquest.jpl.nasa.gov/news/ssu_images.html

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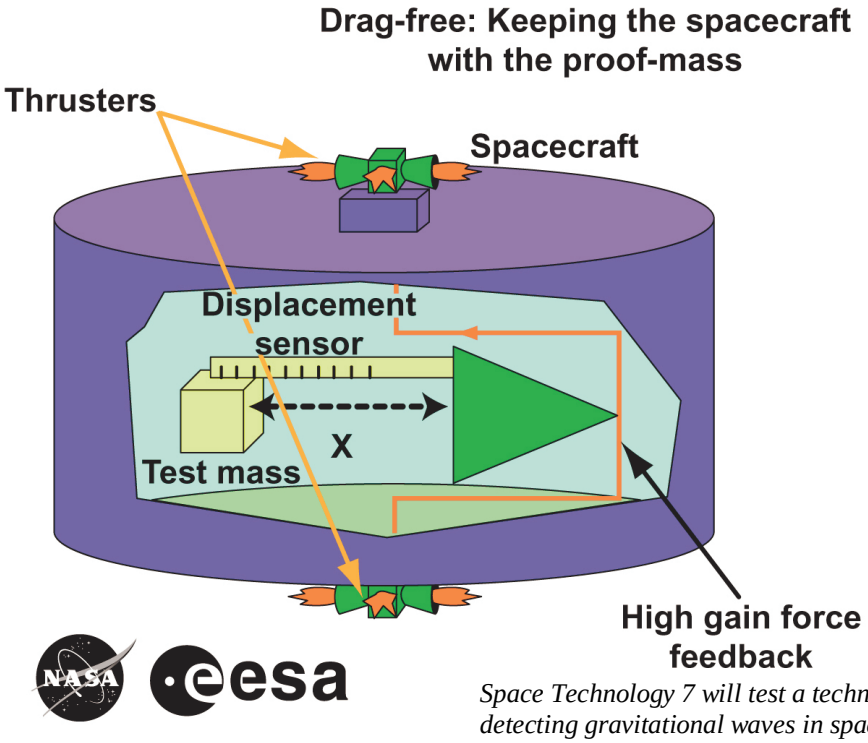
Hunting Gravitational Waves: Space Technology 7

by Patrick L. Barry and Dr. Tony Phillips



Space Technology 7 will test a technology to be used in detecting gravitational waves in space.

Among the mind-blowing implications of Einstein's general theory of relativity, direct verification is still missing for at least one: gravitational waves. When massive objects like black holes move, they ought to create distortions in space-time, and these distortions should spread and propagate as waves--waves in the Fabric of space-time itself.

If these waves do exist, they would offer astronomers a penetrating view of events such as the birth of the Universe and the spiraling collisions of giant black holes. The trick is building a gravitational wave detector, and that's not easy.

Ironically, the gravitational waves spawned by these exceedingly violent events are vanishingly feeble. Gravitational waves exert a varying tug on objects, but this tug is so weak that detecting it requires a device of extraordinary sensitivity and a way to shield that device from all other disturbances.

Enter Space Technology 7 (ST-7). This mission, a partnership between NASA's New Millennium Program and the European Space Agency (ESA), will place a satellite into a special orbit around the Sun where the pull of the Earth's and Sun's gravities balance. But even the minute outside forces that remain -- such as pressure from sunlight -- could interfere with a search for gravitational waves.

To make the satellite virtually disturbance-free, ST-7 will test an experimental technology that counteracts outside forces. This system, called the Disturbance Reduction System (DRS), is so exquisitely sensitive that it can maintain the satellite's path within about a nanometer (millionth of a millimeter) of an undisturbed elliptical orbit.

DRS works by letting two small (4 cm) cubes float freely in the belly of the satellite. The satellite itself shields the cubes from outside forces, so the cubes will naturally follow an undisturbed orbit. The satellite can then adjust its own flight path to match that of the cubes using high-precision ion thrusters. Making the masses cube-shaped lets DRS sense deviations in all 6 directions (3 linear, 3 angular).

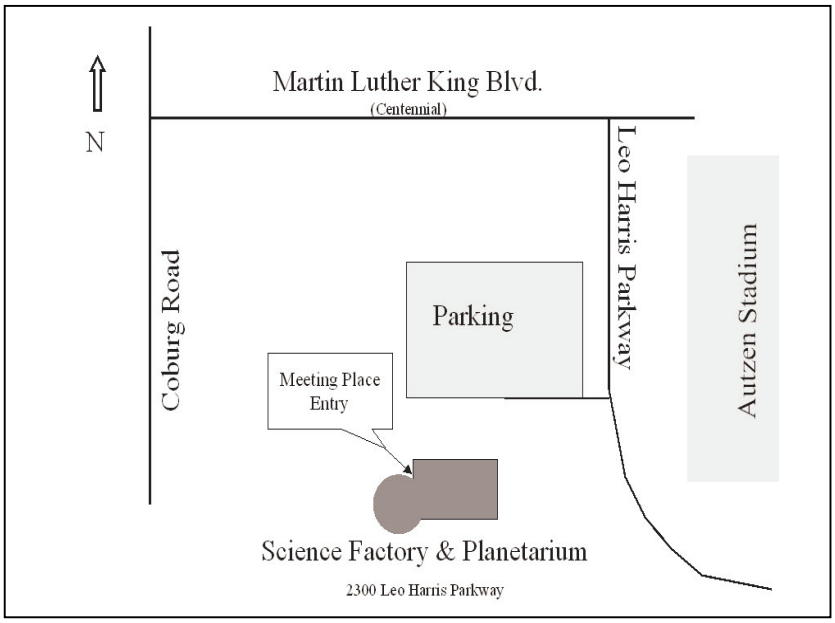
ST-7 is scheduled to fly in 2008, but it's a test mission; it won't search for gravitational waves. That final goal will be achieved by the NASA/ESA LISA mission (Laser Interferometer Space Antenna), which is expected to launch in 2011. LISA will use the DRS technology tested by ST-7 to create the ultra-stable satellite platforms it needs to successfully detect gravitational waves.

If ST-7 and LISA succeed, they'll confirm Einstein (again) and delight astronomers with a new tool for exploring the Universe.

Read more about ST-7 at http://nmp.jpl.nasa.gov/st7 . For kids in a classroom setting, check out the “Dampen that Drift!” article at http://spaceplace.nasa.gov/en/educators/teachers_page2.shtml .

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the

The elections will be held at the October 4th General Membership meeting at the Science Factory.



Q: How far can you see on a clear day?
A: 93 Million miles...From here to the Sun.
From: Rob Z., rzhome@ANTISPAMdallas.net

Living on Earth may be expensive, but it includes an annual free trip around the Sun.
From: "alohacyberian", alohacyberian@att.net*)*

Astro Bloopers

hereby nominate an unnamed fellow meteor observer, who watched the Leonid peak this year, carefully tape recording his scientific observations so as not to take his eyes off the sky..... with the pause button depressed all night long.

From: Wayne Hally (wayne.t.hally@tek.com)

Mars Rover Breakdown Revealed!

NASA just disclosed details why the Rover wouldn't accept any commands. They took a picture of the Rover's built-in display, which showed a Windows screen and the text, "press any key to continue". *From: gudath@ezinfo.vmsmail.ethz.ch (henrik 'boris grishenko' gudat)*

The 5 Laws of Astronomical Observing

1st Law: The skies are never clear within 3 days of new moon, since there is not enough solar energy reflected off the moon to dissipate the clouds.

2nd Law: Rare astronomical events usually occur within 3 days of full moon and/or within 30 apparent degrees from the sun (gravitational interpretation of Murphy's law*).

3rd Law: When observing, the object you want to see will always be below the horizon or less than 10 degrees from the horizon with the most light pollution (since frustration is related to entropy, it must always increase).

4th Law: Supernovae, comets, and asteroids are always discovered by someone else (because no matter where you are, the sun will always set earlier somewhere else, and therefore someone else will find it first).

5th Law: 90 percent of meteors occur behind you when everyone else is facing you (so they can all say, "ooh!... You missed a good one!)

From: *Stephen Tonkin (astro@aegis1.demon.co.uk)*

IO Image Gallery

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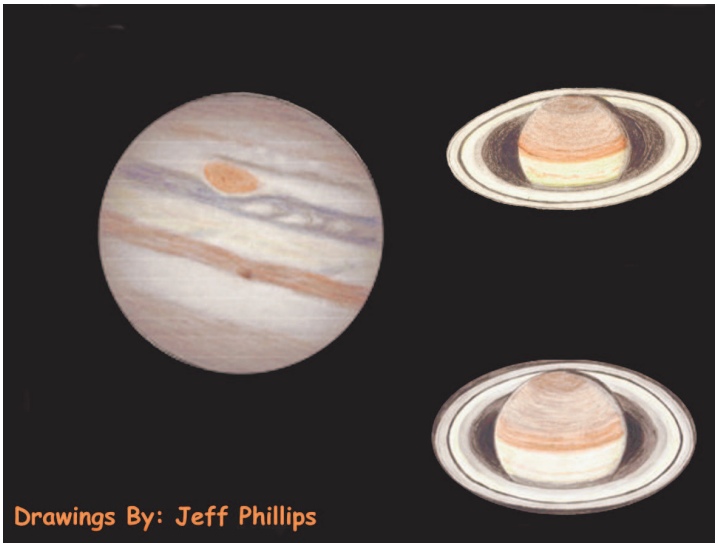
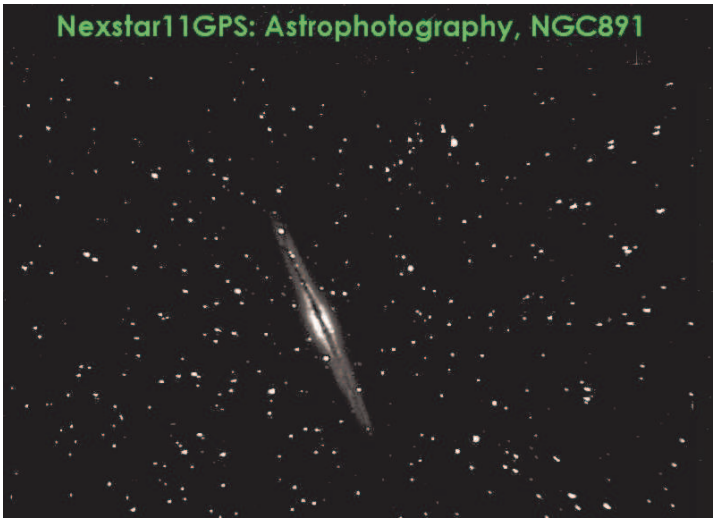


Observations & Diagrams By : Jeff Phillips

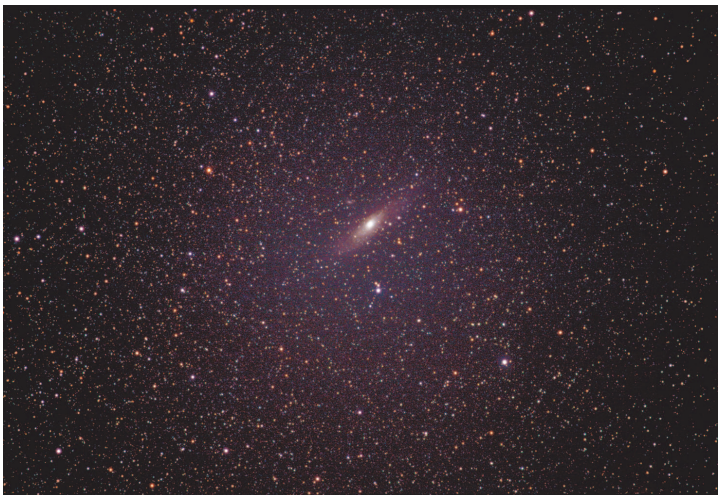
Horsehead in Orion CCD By: Dave Cole



CCD By: Dave Cole

Pleiades M45 Image By: Sam Pitts

Aquila By: Richard Boyd



Andromeda Galaxy M31 By: Richard Boyd

High-Tech Telescopes

Defining Terms Used in Marketing

YEARS OF DEVELOPMENT - We finally got one to work.

With the advent of CCDs and the new computer-controlled telescope drives, this may be your first brush with the arcane world of really high-tech. For anyone who may be considering some of the advanced products now on the market, this page will provide an interpretation of a few terms that you've no doubt seen widely used in advertisements.

ALL NEW - The power supply, connectors, and software are not compatible with previous versions. Even the screw threads are different.
ADVANCED DESIGN - Salespeople don't understand it.
BREAKTHROUGH - It nearly worked on the first try.
DESIGN SIMPLICITY - It was developed on a shoestring budget.
EXCLUSIVE - We're the only ones who have the directions telling how to use it.
FIELD TESTED - The manufacturer has no way to test it.
FOOLPROOF OPERATION - It's unrepairable, short of sending it back to the factory (which can't fix it either).
FUTURISTIC - It only runs with the help of a next-generation computer, which isn't available yet.
HIGH ACCURACY - The screw threads match the threads of the holes they're supposed to mate with.
IT'S HERE AT LAST - We've released a 26-week project in 48 weeks.
MAINTENANCE FREE - see Foolproof Operation.
MEETS OR EXCEEDS OPTICAL STANDARDS - We haven't the foggiest idea about the total wavefront accuracy.
NEW - It comes in a different color than the first version.
PERFORMANCE PROVEN - It worked through beta test.
QUALITY STANDARDS - It works most of the time.
REVOLUTIONARY - Everything that's supposed to go round and round actually goes round and round.
SATISFACTION GUARANTEED - We'll send you another manual if this one fails to work.
STOCK ITEM - We shipped it once before and we can do it again, probably.
UNMATCHED - No one else wants to copy our design.
UNPRECEDENTED PERFORMANCE - May mean two different things:
1. Actually worked the first time right out of the box.
2. Nothing before ever ran so erratically.

YEARS OF DEVELOPMENT - We finally got one to work.

Premium TELSCOPE AND Mount ORDER LIST DEFINTIONS:

ON ORDER-After being on the list for 5 years we are ready to take your money and put you on a Confirmed Order List
CONFIRMED ORDER LIST: You are guaranteed the item! We will let you know in the next year or so when it will be available for shipping.

Culled off the newsgroup sci.astro.amateur (Author Unknown)