The Spectrum

Newsletter of the Western Colorado Astronomy Club

Members of the Astronomical League, MARS Region

Members of the International Dark-Sky Association

Only Twelve Months in a Year

The last newsletter of the year is printed and finally in the mail. I must apologize for its late arrival as work and the holidays conspired to foil all my attempts to finish it in December. What we need is a 13th month to catch up on all the odds and ends and get ready for the new year, right?. Believe it or not, a 13-month calendar actually was proposed in the early 1900s. Based on the work of two 19th Century priests, Auguste Comte and Abbé Mastrofini, each of its 13 months had 28 days and exactly four weeks. The system was perpetual with the days of the week always occurring on the same dates each year. One or two "blank" days were allowed during the year to keep the calendar synchronized with celestial events. The 13th month was named "Sol" and fell in the middle of the year. This was a big problem for the U.S. because our 4th of July holiday would have to be renamed Sol 17! Even with all its advantages and simplicity, the 13-month calendar failed to gain enough support with standards organizations here and in Europe. After 25 years of debate, the official World Calendar was finalized in 1937 with our current system of twelve months and extra days added in leap years.

Club News and Events

November General Meeting

The upcoming elections for club officers were discussed. Jeff Dershem presented an overview of NASA's Gravity Probe-B mission that concluded in November 2005. The accompanying video detailed the forty year history of the project from its inception to the launch of the satellite last year. In addition to the basic physics, the Gravity Probe-B satellite represents a phenomenal engineering achievement with components and systems operating reliably at the very limits of our current manufacturing technology. Data from the mission are being analyzed now and the results should quantify and provide a critical test for some of the predictions made by Einstein's theory of General Relativity.

Mars Public Viewing

Jim Maddox - WCAC

Mars and Earth were at their closest approach in their orbits in late October and early November 2005. The red planet won't be this close again to Earth until 2018. At the 2005 closest approach, Mars was at a distance of 43 million miles. At these times when the distance is smallest between the two planets, Mars appears brighter in the sky and larger in telescopes. Members of the Western Colorado Astronomy Club held two public viewings of the event on Oct. 29th and Nov. 4th at Sherwood Park (and assisted at a concurrent viewing at West Middle School for the younger set). Sky conditions were finally fair enough for several dozen at both locations to enjoy the opportunity of seeing the ruddy planet eyes on. Club V. P. Ricky Smith felt he got a good enough moment or two between the scattered clouds and humidity to be able to just make out the south polar ice cap. Club stalwarts Dave Bertram, Jim McSheehy and Charlie Liggett assisted James Stryder at the middle school and President Dave Copley, V.P. Ricky Smith, Jeff Dershem and James Maddox were at the Sherwood location.

December General Meeting

The final lecture in 2005 was given by Professor Gordon Gilbert of Mesa State College and highlighted the 100th anniversary of Albert Einstein's *annus mirabilis* (miracle year). In this single year, the young Austrian patent clerk published three fundamental scientific

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WESTERN COLORADO ASTRONOMY CLUB

The Western Colorado Astronomy Club formed in 1989 as a non-profit organization for the purpose of astronomy education. Members have a wide range of skill levels from beginner to advanced. Club activities include observing, astrophotography, telescope making, and discussion and lectures related to astronomy. Meetings are held at 7:00 PM on the first Tuesday every month at Mesa State College in the Weldon room of the Horace Wubben science building. Monthly observing sessions are held throughout the Western Slope, including an annual star party atop of the Grand Mesa lasting several days and nights including camping and observing. Club members visit schools in District #51 at various times to give telescope viewing time to the students, and to lecture on astronomy-related science and current events. Several times a year we visit the Colorado National Monument for observing with the general public in mind. The club also presents an annual program at Mesa Mall for the community astronomy day.

Membership is open to anyone interested in astronomy and the night sky -- no telescope is required! Several loaner telescopes are available for members who complete the requisite training in their use. We are members of the IDA (International Dark-Sky Association) and the AL (Astronomical League). Membership benefits include discounted astronomical publications, AL services, and newsletters. Also an annual national event takes place in various areas of the United States. For current events log onto the internet and visit the WCAC's exclusive web site, at:

www.wcacastronomy.org

WCAC OFFICERS 2005

President Pro Tem	Dave Copley	242-1721
Vice President	Ricky Smith	858-9936
Treasurer	Blanche Godel	242-1721
Secretary	Teresa Bartlett	523-7247
Community Liaison	Jeff Dershem	243-1351
Newsletter Editor	James McSheehy	243-2887
ALCOR Representative	Aaron Reid	216-5744
WCAC Historian	Vicki Foster	434-8456

(the local area code is 970, and local zip codes are 81501-81506)

Did you know?

Like the light from a laser, starlight is nearly coherent and this partly explains why stars twinkle. Look at the reflection of a laser pointer on a wall a to see a similar effect.

ASTRO-ADS

Place your ad here -- free to club members,
a $3.00 charge to non-members.
Only astronomy-related items please!

* Vixen Super Polaris (SP) German equatorial mount with adjustable height, rigid wood tripod. Has good vibration dampening characteristics for imaging and can handle scopes up to ten pounds. Includes polar alignment scope, single axis (RA) drive w/controller, manual slo-mo controls, and counterweight. $250 - contact Jim McSheehy 243-2887.

UPCOMING EVENTS

Please note that all event dates and times are subject to change. Check our web site at:
www.wcacastronomy.org
for the latest information

January 3rd — Monthly club meeting at 7 PM
Topic:Dave Copley rails at the cosmos (not really, but whatever the topic is, Dave will do a superb job!)

February 7th — Monthly club meeting at 7 PM
Topic: TBA

March 7th — Monthly club meeting at 7 PM
Topic: TBA

papers that changed the course of physics in the 20th Century. With his usual grace and good humor, Dr. Gilbert tied together topics ranging from quantum physics to cosmology, and showed some of Einstein's human foibles as a young man looking for work and dealing with sudden celebrity.

Mesa State Physics Professor Gordon Gilbert Lectures on Einstein's "Miracle Year", 1905.

Goodbye Teresa

WCAC Secretary Teresa Bartlett and her family are leaving Grand Junction, and we all express our thanks for her exceptional service on behalf of the club. Teresa was instrumental in planning and organizing many club activities including the annual star party, and in cajoling the dozens of vendors who generously donated door prizes for club raffles. Good luck Teresa, we hope you'll stay in touch..

Krazy Kosmology

Observing the Fringe Element

What gives particles of matter their mass? Is this mass also responsible for the observed effects we call inertia? At the start of the 21st Century, 100 years after Einstein and 325 years after Newton, these fundamental questions are still unanswered. Consult a typical physics text and you will find that mass is inferred from inertia, and inertia is defined in terms of mass -- a circular argument. Most quantum physicists believe that mass is caused by an undiscovered particle, the Higgs boson, and they are now spending large sums of money attempting to isolate it in experiments at the huge CERN laboratory in Switzerland.

In the quantum theory, Higgs particles form a kind of glue that congregates around and "sticks" to other particles like quarks and electrons. Massive particles like quarks have more of these sticking to them than lighter particles like electrons, and heavier particles cannot move as quickly through the "glue" These quantum effects explain the properties we observe as rest mass and inertia. While these quantum theories are good at explaining the rest mass of individual particles, they fail to account for all of the subtle effects seen in inertial acceleration on larger scales, and they cannot be linked to Einstein's theory of General Relativity.

Astrophysicists Bernard Haisch and Alfonso Rueda reject this explanation and offer instead a theory that relies on the sea of virtual particles that exist in the vacuum of what we consider "empty" space. These virtual particles were postulated as early as 1930 by Dirac, and other physicists like Andrei Sakharov and John Wheeler developed theories for the corresponding zero-point energy field (ZPF). In these theories our universe of normal matter coexists within a sea of virtually infinite energy. Haisch and Rueda believe that matter gets its property of mass from interaction with fluctuations in the zero point field, and the inertia we observe when lifting a sack of potatoes is due to simple electromagnetic effects -- no undiscovered quantum particles need apply! In their theory, heavy particles have more mass because they get jostled more by the zero point field, and inertia applies equally well to one single electron or an entire galaxy of stars because both are moving through and experiencing the same zero point field. Haisch, Rueda, and Harold Puthoff are currently working to incorporate General Relativity and further extend their theories.

Scientists at CERN expect to know sometime in 2007 whether the postulated Higgs boson is a real particle. Should they fail to show its existence, then theories less favored like the ZPF of Haisch and Rueda may become the front runners in our attempts to explain mass and inertia.

A New View of the Andromeda Galaxy

By Dr. Tony Phillips and Patrick L. Barry

This is a good time of year to see the Andromeda galaxy. When the sun sets and the sky fades to black, Andromeda materializes high in the eastern sky. You can find it with your unaided eye. At first glance, it looks like a very dim, fuzzy comet, wider than the full moon. Upon closer inspection through a backyard telescope—wow! It's a beautiful spiral galaxy.

At a distance of "only" 2 million light-years, Andromeda is the nearest big galaxy to the Milky Way, and astronomers know it better than any other. The swirling shape of Andromeda is utterly familiar.

Not anymore. A space telescope named GALEX has captured a new and different view of Andromeda. According to GALEX, Andromeda is not a spiral but a ring.

GALEX is the "Galaxy Evolution Explorer," an ultraviolet telescope launched by NASA in 2003. Its mission is to learn how galaxies are born and how they change with age. GALEX's ability to see ultraviolet (UV) light is crucial; UV radiation comes from newborn stars, so UV images of galaxies reveal star birth—the central process of galaxy evolution.

GALEX's sensitivity to UV is why Andromeda looks different. To the human eye (or to an ordinary visible-light telescope), Andromeda remains its usual self: a vast whirlpool of stars, all ages and all sizes. To GALEX, Andromeda is defined by its youngest, hottest stars. They are concentrated in the galaxy's core and scattered around a vast ring some 150,000 light years in diameter. It's utterly unfamiliar.

"Looking at familiar galaxies with a new wavelength, UV, allows us to get a better understanding of the processes affecting their evolution," says Samuel Boissier, a member of the GALEX team at the Observatories of the Carnegie Institution of Washington.

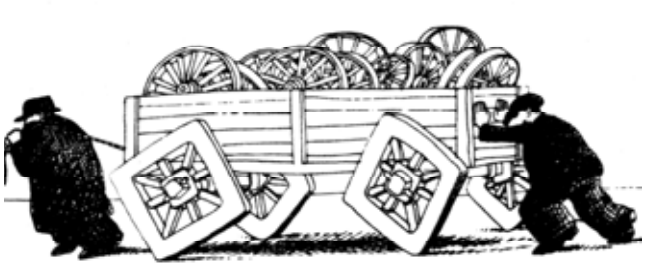
Beyond Andromeda lies a whole universe of galaxies—spirals, ellipticals and irregulars, giants and dwarfs, each with its own surprising patterns of star formation. To discover those patterns, GALEX has imaged hundreds of nearby galaxies. Only a few, such as Andromeda, have been analyzed in complete detail. "We still have a lot of work to do," says Boissier, enthusiastically.

GALEX has photographed an even greater number of distant galaxies—"some as far away as 10 billion light-years," Boissier adds—to measure how the rate of new star formation has changed over the universe's long history. Contained in those terabytes of data is our universe's "life story." Unraveling it will keep scientists busy for years to come.

For more about GALEX, visit
http://www.galex.caltech.edu

GALEX Reveals and Unfamiliar Andromeda Galaxy.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.



Anyone got a SIG?

Although WCAC is a relatively small organization, perhaps it's time to consider forming some Special Interest Groups or SIGs. SIGs are informal groups of club members who want to meet and concentrate on a specific discussion topic or work on a common project. By pooling time and resouces, SIGs allow members to advance in the hobby more quickly and get more done in less time. Possible charters for SIGs might involve:

1) Telescope making - mirrors, lenses, mounts

2) Back yard observatories - design, construction

3) Imaging and processing - CCD, film, software

4) Observing sites - Serach for new locations

5) Cosmology - Discuss the latest theories and physics

6) Light Pollution - Action at the city and county level

There are many other possibilities and if you are interested, lets talk about them at the next club meeting or through emails.

Astro-Humor

"God could cause us considerable embarrassment by revealing all the secrets of nature to us: we should not know what to do for sheer apathy and boredom."
— Goethe

"Crash programs fail because they are based on the theory that, with nine women pregnant, you can get a baby in a month."
— Werner von Braun.

http://astro.wsu.edu/worthey/astro/html/

"Sometimes I think we're alone in the universe, and sometimes I think we're not. In either case the idea is quite staggering."
— Arthur C. Clarke.

"If you think there are no new frontiers, watch a boy ring the front doorbell on his first date."
— Olin Miller.

"During the heat of the space race in the 1960's, the U.S. National Aeronautics and Space Administration decided it needed a ball point pen to write in the zero gravity confines of its space capsules. After considerable research and development, the Astronaut Pen was developed at a cost of about $1 million U.S. The pen worked and also enjoyed some modest success as a novelty item back here on Earth. The Soviet Union, faced with the same problem, used a pencil."

Application for Membership in the Western Colorado Astronomy Club

New _____ Renewal _____
Name: _____
Address: _____
City, State, Zip: _____
TEL: Home ( )_____ Work ( )_____
E-mail: _____
Occupation: _____
Other Interests: _____
_____
How did you hear about the club? _____
_____

Please Circle all that apply:

Regular Membership: $35	$ _____
Associate: $15 (age 22 and younger)	$ _____
Astronomy Magazine $34	$ _____
Sky and telescope Magazine $34	$ _____
Donation to Colorado Astronomy Day events at Lincoln Park	$ _____
TOTAL	$ _____

Please make checks payable to Western Colorado Astronomy Club and mail with form to: WCAC Treasurer, PO Box 55032 Grand Junction CO 81505

Western Colorado Astronomy Club
PO Box 55032
Grand Junction CO 81505

Address Correction Requested

Don't miss our monthly meetings!

The Western Colorado Astronomy Club meets on the first Tuesday of every month at 7 PM, and all members, invited guests, and vistitors are welcome. Meetings are held at Wubben lecture hall on the Mesa State College downtown campus (1175 Texas Ave.). For additional information and directions, please visit our web site at:

http://www.wcacastronomy.org/