



AU AstroNews

The Newsletter of the Astronomical Unit

February 2004

Sponsored by the Santa Barbara Museum of Natural History

February Meeting – “On Movement”

The next meeting, on Friday, February 6, will be presented by Thomas P. Bún. Tom will take us on a striking progression of velocities, from the modest speed of rotation of our planet Earth, to the relativistic velocities on the surface of a pulsar – AND BEYOND. Make sure to come *early* to the meeting for a free planetarium show between 7:00 to 7:15 PM. featuring the current night's sky.

At our last meeting, Dr. Alex Filippenko entertained us with his wonderful lecture on the Big Bang. Thanks to Dr. Alex Filippenko for another wonderful evening.

Ask Dr. Nebulous

Anya, 4th grade asked:

Is Pluto a terrestrial planet or is it a gas giant?

Neither. The terrestrial planets are Mercury, Venus, Earth, and Mars. The Gas Giants are Jupiter, Saturn, Uranus, and Neptune.

Pluto is the largest known Kuiper Belt object. Most astronomers consider it a planet, although there was a proposal a few years ago to reclassify it to a minor planet. This was generally rejected, mostly for historical reasons; we all learned that Pluto was a planet in grade school and would be reluctant to lose a planet.

If Pluto were discovered today, few would call it a planet. As a Kuiper Belt object it is a big dirty snow ball. That is, it is mostly ice and dust, just like a comet, in fact many comets start out as Kuiper Belt objects. See

<http://www.solarviews.com/eng/kuiper.htm>
for more about the Kuiper Belt

My Newtonian telescope tube has a balance problem. I have adjusted the weight at the ends so that it balances, but when it is pointed up

or down, [the] balance is off again. What is the problem?

Your scope tube is well balanced to the right and left sides but not top to bottom. The mass of the finder, focuser, and eyepieces are above the centerline. Picture a 5 x 10 board with 2 holes 5 inches from the ends. Put a rod through the hole in the middle and the board balances well. Put the rod through a hole near the bottom and most of the mass is above the hole and while the side to side mass is balanced, any bump will make it turn 180 degrees so the mass is below the pivot point. Try to move some of the mass of your scope so that it is lower on the tube.

Ask Dr. Nebulous your questions about the cosmos, observing deep sky objects, or about telescopes, send them care of the newsletter editor at shadess@umail.ucsb.edu

Astronomy Trivia

- A day takes 23hrs 56min 4.091 seconds
- There are 13 lunar months in a year, each of 28 days. This gives 364 days a year, short of the 365.2422 days of the tropical year.
- The last “Blue Moon” occurred in November of 2001
- One Mercury day is 176 Earth days, while one Mercury year is only 88 Earth days!

January Outreach Volunteers

AU outreach volunteers Warren Bitters, John Boyd, Joe Brown, Bill Clausen, Tim Crawford, Art Harris, June Kelley, Dale Lowdermilk, Pat & Chuck McPartlin, Edgar Ocampo, Craig & Kenyon Prater, John West, Tom Whittemore, and Tim Wittenburg showed the astronomical sights to 154 customers at outreach events. The new Coronado hydrogen alpha solar scope was a big success!

AU Events for February

Tuesday, February 3, setup 6:30 PM

Telescopes for La Patera School second grade classes, night 2.

Thursday, February 5, 7:30 PM

Dr. Andrew Lange of CalTech and a Goldberg Professor, will give a lecture in Fleischmann Auditorium, on Observational Cosmology results from the BOOMERANG project. AU members who bring telescopes for the public to look through (after the lecture) can attend the lecture for free. FYI: Chuck and Pat will stay outside to watch over the telescopes during the lecture.

Friday, February 6, 7:30 PM

AU monthly meeting in Farrand Hall. AU member Tom Bún will give a presentation on the range of rotational velocities in the Universe.

Sunday, February 8, setup 7:30 PM

Telescopes for Elderhostel in Ojai.

Saturday, February 14, 5:30 PM

Valentines Day, and AU planning meeting at SBMNH. Come help plan your club's activities for the coming year! All members welcome.

Saturday, February 14, 7 PM

Monthly Star Party at SBMNH. Saturn will still be spectacular, and Jupiter will make an appearance at the end.

Wednesday, February 18, setup 6:30 PM

Telescopes for La Colina Junior High School, with emphasis on Messier Catalog Objects.

Friday, February 20, 7 PM

Monthly public observation at Westmont. Venus, Mars, Saturn, and Jupiter.

Saturday, February 21, all night

Dark Sky. Contact Paul Winn or Joe Doyle for details.

Thursday, February 26, setup 6:30 PM

Telescopes for Harding School - Moon and planets.

Sunday, February 29, all day

It's Leap Day! Keep up with the stars!

Scheduled events are subject to change, and additions with little notice! For the latest and greatest contact Chuck McPartlin at (macpuzl@west.net) for the latest developments.

An Evening with Dr. Alex Filippenko

By Dean Mars

The Big Bang: Truth or Nonsense, was a discussion of the many theories about the expanding universe and its beginnings. Dr. Filippenko states, "Extrapolating backwards in time, one can conclude that the universe has a definite beginning in time, when it existed in a very hot and compressed state. This sweltering dense beginning is known as the Big Bang." However, there is another possibility. Fred Hoyle, in 1948 brought to light his steady-state theory; the expanding universe had no distinct beginning, and it expands because of the ongoing creation of matter. The steady-state theory finally lost support in 1965 when Arno Penzias and Robert Wilson discovered cosmic microwave background radiation, which is a thumbprint of the faint afterglow from the now popular explanation of the very beginnings of the universe, The Big Bang Theory.

Our speaker states, "Although almost all scientists now believe the steady-state theory to be incorrect, this alternative hypothesis served science well because it forces cosmologists to question critically their assumptions and conclusions." In the scientific world this is how the game is played. To be a scientist one must constantly question anything and everything. Each expert in his or her field is relentlessly looking for a better way to explain the unknown, and if that explanation it is good enough, a Nobel Prize could be the reward. However, many have gone down as absolute crackpots, and this is not a satisfying way to end a career.

Problems with the Original Big-Bang Model

Dr. Filippenko explains, "The first problem is the universe's incredible uniformity. The temperature indicated by the cosmic background radiation is an identical in all directions. How can the universe be so uniform? Widely separated regions of the universe could never have been in thermal equilibrium with each other (that is, at the same temperature). No signals, not even those traveling at

the speed of light, could have crossed such vast distances over the age of the universe. Thus, they had no way of “telling” each other which temperatures to choose—they are beyond each other’s horizon.”

The second problem with the original big-bang theory is that it has no way to explain why the overall geometry of the universe is so “flat.” Cosmologists call this the “flatness problem.”

Inflation to the rescue

Dr. Filippenko gives details, “In 1979, Alan Guth came up with a brilliant solution to these problems. His idea, known as “inflation,” is a modification of the original big-bang theory. Suppose the universe started out much smaller than the size implied by an extrapolation of the equations of the original big-bang theory. Guth proposed that it might have subsequently “inflated”—expanded extremely fast and by an immense factor, perhaps 10^{50} or more. This huge expansion was achieved by the universe doubling in size every tiny fraction of a second for a significant amount of time, contrary to the constant or decelerating expansion predicted in the original big-bang theory. In his book *The Inflationary Universe*, Guth provides an intuitive feel for such exponential growth by envisioning a chessboard. If there is one grain of wheat on the first square, and the number of grains on each successive square is doubled, the wheat on the 64th square (2^{63} grains) would be the size of a mountain that covers Manhattan.”

Call for Newsletter Submissions

Anyone interested in submitting an astronomy article or column for the *AU AstroNews* should send an e-mail to the editor at shadess@umail.ucsb.edu. Submissions are asked to be sent no later than the 15th for it to be considered in the next month’s issue. Submitted works after that date will be considered for the following month. Remember, space is limited so keep articles short.

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