Focal Point

February, 2012

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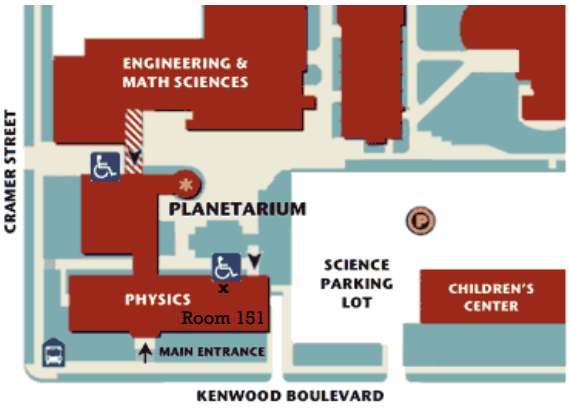
The February Membership Meeting

The upcoming General Membership Meeting of the MAS is going to be held on February 17th, at 8:00PM at the UW Milwaukee Physics Building, Room 151, which is located at 1900 E Kenwood Bld. Parking available in the Science Parking Lot. David Kaplan, an Assistant Professor at UWM, Physics Department will give a talk entitled: **The Murchison Widefield Array** .



The Murchison Widefield Array

David Kaplan will describe the motivation for and development of the Murchison Widefield Array (MWA), a new radio telescope under construction in Western Australia. Using new techniques to image an unprecedented field of view, MWA will help make significant advances in our studies of the Sun, the Early Universe, and cosmic explosions.

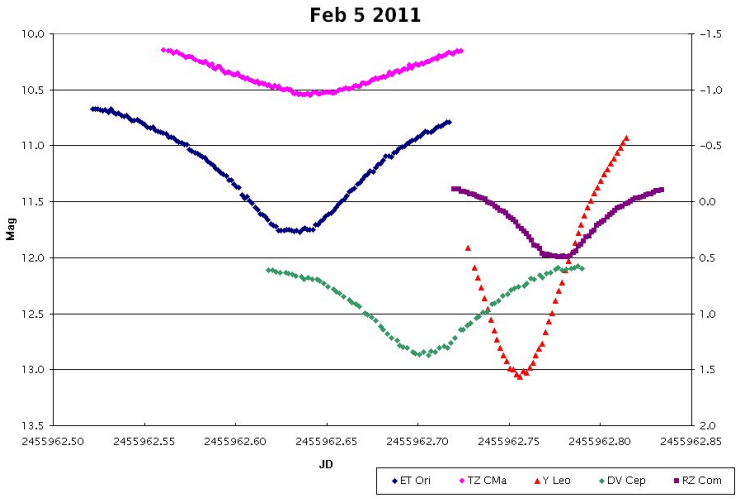
The MWA will consist of 2048 dual-polarization dipole antennas optimized for the 80-300 MHz frequency range, arranged as 128 "tiles", each a 4x4 array of dipoles. An illustration of the planned array deployment is shown above together with a photograph of one of the tiles. The array will have no moving parts, and all telescope functions including pointing will be performed by electronic manipulation of dipole signals, each of which contains information from ~4 steradians of sky centered on the zenith. Each tile will perform an analog beamforming operation, narrowing the field of view to a fully steerable ~25 degrees at 150 MHz.

Observatory News

Member's (Keyholder) Night

On Saturday, February 4th, we had a good turnout for member's night. Despite the bright Moon, ten people were at the observatory, observing a variety of things including Jupiter and some of the brighter deep sky objects. Almost all of the scopes were open. The temperature was mild for a February night and we all had a lot of fun.

For some, it was the first chance to see how I make time series observations of eclipsing stars. The attached graph shows the light curves of the five eclipses that I observed that night. Each point represents one CCD image. By collecting this data, we are able to keep track of the orbital period of these stars (these periods change more often than you might think). We have been following a few hundred stars like this for the past few decades. (As I mentioned, I'm probably the most fanatical member of the club).



Also on Saturday night (actually Sunday morning) I imaged the supernova in M101. I used four different filters (B, V, R, and I). Attached are the images is V (visual), and R (red). The supernova continues to fade and is now at 14.3 magnitude in the visual. The star is now fading more rapidly in R and I (infrared).

This supernova was first discovered back in August (at magnitude 18 if I remember correctly). It rose to 10th magnitude the first week of September and has been slowly fading since then.

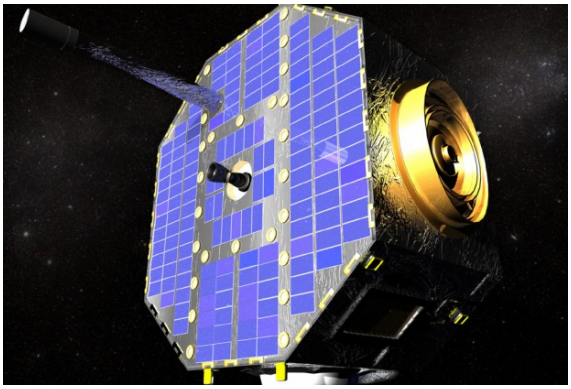
by Gerry Samolyk

In the Astronomical News

New "Alien" Particles Have Entered Our Solar System

Researchers have measured neutral "alien" particles that have entered our solar system from interstellar space. The team used NASA's Interstellar Boundary Explorer (IBEX) spacecraft to find the neutral particles, which make up about half the material outside the heliosphere. The heliosphere is the bubble in which our Sun and planets reside and is formed by the interaction between the solar wind and the interstellar medium. Electrically charged particles cannot penetrate the boundary between these two bodies, but neutral particles are able to flow freely through it.

Ulysses is the only other spacecraft that has been able to directly detect these neutral particles. IBEX's low-energy energetic neutral atom camera has measured interstellar neutral particles that Ulysses was unable to detect. The spacecraft's data reveals that interstellar neutrals enter the heliosphere at a speed of about 52,000 miles per hour. IBEX discovered that the solar wind is about 7,000 miles per hour slower than previously thought, which indicates that our solar system is in the "local interstellar cloud." The scientists have performed the first detailed analyses of samples of captured interstellar neutral atoms. The team said the findings are important because the interstellar gas surrounding us can affect the strength of the Sun's heliosphere.



NASA's Interstellar Boundary Explorer (IBEX) studies the outer boundaries of the solar system where particles from the solar wind collide with particles from the galactic wind. Credit: NASA

The astronomers say that we will transition into a different region at any time within a few thousand years where conditions will change and affect the heliosphere's protective capability for better or for worse. As the solar system travels around the Milky Way through cosmic time, the nature of the heliosphere has likely had implications on the evolution of life on Earth, as varying levels of radiation spurred genetic mutations, and extinctions. A deeper understanding of our heliosphere could help scientists explore astrospheres that surround other stars through the Milky Way.

IBEX found neutral atoms in 2009 and 2010, but the new discovery is the most complete glimpse of the material. "We've directly measured four separate types of atoms from interstellar space and the composition just doesn't match up with what we see in the solar system," Eric Christian, mission scientist for IBEX at NASA's Goddard Space Flight Center in Greenbelt, MD, said in a press release.

These new measurements help give clues about how and where our solar system formed, the forces that physically shape our solar system, and even the history of other stars in the Milky Way. The scientists wrote in The Astrophysical Journal that for every 20 neon atoms in the galactic wind, there are 74 oxygen atoms. However, in our own solar system, for every 20 neon atoms there are 111 oxygen atoms. This translates to more oxygen in any given part of the solar system than in the local interstellar space.

"Our solar system is different than the space right outside it and that suggests two possibilities," David McComas, the principal investigator for IBEX at the Southwest Research Institute in San Antonio, Texas, said in a statement. "Either the solar system evolved in a separate, more oxygen-rich part of the galaxy than where we currently reside or a great deal of critical, life-giving oxygen lies trapped in interstellar dust grains or ices, unable to move freely throughout space."

The new results also hold information about the history of the material in the universe. Knowing the amounts of elements in space can help map out how the galaxy evolved and changed over time.

by RedOrbit

Adopt a Telescope Program - Signup Sheet

	Adoptee	Scope	Location
1	Sue Timlin	18" F/4.5 Obsession	Wiesen Observatory
2	Neil Simmons	12.5" F/7.4 Buckstaff	B Dome
3	Russell Chabot	12.5" F/9 Armfield	A Dome
4	Dan Yanko	10" F/6 Newtonian	Albrecht Observatory
5	Tamas Kriska	25" F/15 Zemlock	Z Dome
6	Henry Gerner	12" LX 200	Tagney Observatory
7	Jeffrey Fillian	14" Z-Two scope	Ray Zit Observatory
8	Kevin & John McCarthy	10" LX 200	Jim Toeller Observatory

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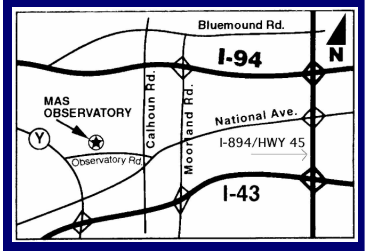
2/25	Lee Keith	414-425-2331
3/3	Scott Laskowski	414-421-3517
3/10	Jill Roberts	414-582-9422
3/17	Tim Hoff	262-662-2212



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