Science in the Media:
Bringing Cutting-Edge Astronomy from Scientists to Students

Handouts

NSTA Meeting
Baltimore, November 2010

Presented by:
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A new discovery: E-mail between scientists

Date: Thu, 19 Jul 2007 16:07:22
From: Edwin Hubble <edwin.p.hubble.1@nasa.gov>
To: Arthur Clarke <arthur.c.clarke.1@nasa.gov>
Subject: Swift and Suzaku discover something new about AGN

Hi Art,

Late last night, the Suzaku and Swift astronomers released some preliminary findings that I think you will find very interesting. I have copied what they sent out. Let me know what you think.

> Consensus is emerging that almost all large galaxies have a supermassive black hole at its center, a fraction of which are accreting, making them active galactic nuclei (AGN). AGN are broadly classified into Type I (AGN direct viewed with little absorption) and Type II (heavy line-of-sight absorption, AGN seen predominantly via scattered light).
>
> Suzaku observations show that two galaxies detected in the Swift/ BAT (hard X-ray, >keV, survey) to be neither. These are highly absorbed AGN, like traditional Type IIs, but show little sign of scattered light (hence missed by pervious surveys). This discovery may force a re-evaluation of the number of AGN in the local universe.
>
> Suzaku follow-up observations of newly discovered (with INTEGRAL or Swift/ BAT) hard X-ray sources are a highly effective method to evaluate the population of such highly absorbed AGN with little scattering.

—Ed

A new discovery: Brainstorm questions for scientists

Question:

Question:

Question:

Question:

Question:

Question:

A new discovery: Planning an article

Audience:	Media Source:

Headline:

Lead Paragraph:

Who:	What:	When:	Where:	Why:

Detail Paragraphs:

How is the discovery important?

Quote:

Last Paragraph:

Catchy phrase that will serve to round off story:

Example of how a topic is handled for different audiences

Snippet from Article 1: Using the Hubble Space Telescope and the Very Large Telescope (VLT), astronomers have looked back to find the most distant galaxy so far. “We are observing a galaxy that existed essentially when the Universe was only about 600 million years old, and we are looking at this galaxy – and the Universe – 13.1 billion years ago,” said Dr. Matt Lehnert from the Observatoire de Paris, who is the lead author of a new paper in Nature. “Conditions were quite different back then. The basic picture in which this discovery is embedded is that this is the epoch in which the Universe went from largely neutral to basically ionized.”	Snippet from Article 2: Galaxies had their most significant impact on the Universe when they assembled their first generations of stars. Energetic photons emitted by young, massive stars in primeval galaxies ionized the intergalactic medium surrounding their host galaxies, cleared sightlines along which the light of the young galaxies could escape, and fundamentally altered the physical state of the intergalactic gas in the Universe continuously until the present day. Observations of the cosmic microwave background, and of galaxies and quasars at the highest redshifts, suggest that the Universe was reionized through a complex process that was completed about a billion years after the Big Bang, by redshift $z \approx 6$.
Snippet from Article 3: Astronomers believe they've found the oldest thing they've ever seen in the universe: It's a galaxy far, far away from a time long, long ago. Hidden in a Hubble Space Telescope photo released earlier this year is a small smudge of light that European astronomers now calculate is a galaxy from 13.1 billion years ago. That's a time when the universe was very young, just shy of 600 million years old. That would make it the earliest and most distant galaxy seen so far.	

Sources for the example of how a topic is handled for different audiences

Snippet from Article 1: Using the Hubble Space Telescope and the Very Large Telescope (VLT), astronomers have looked back to find the most distant galaxy so far. “We are observing a galaxy that existed essentially when the Universe was only about 600 million years old, and we are looking at this galaxy – and the Universe – 13.1 billion years ago,” said Dr. Matt Lehnert from the Observatoire de Paris, who is the lead author of a new paper in Nature. “Conditions were quite different back then. The basic picture in which this discovery is embedded is that this is the epoch in which the Universe went from largely neutral to basically ionized.” This is from an article by Nancy Atkinson on Universe Today, an astronomy news service online. URL: http://www.universetoday.com/76258/vlt-hubble-smash-record-for-eyeing-most-distant-galaxy/	Snippet from Article 2: Galaxies had their most significant impact on the Universe when they assembled their first generations of stars. Energetic photons emitted by young, massive stars in primeval galaxies ionized the intergalactic medium surrounding their host galaxies, cleared sightlines along which the light of the young galaxies could escape, and fundamentally altered the physical state of the intergalactic gas in the Universe continuously until the present day. Observations of the cosmic microwave background, and of galaxies and quasars at the highest redshifts, suggest that the Universe was reionized through a complex process that was completed about a billion years after the Big Bang, by redshift $z \approx 6$. This is an article by M. D. Lehnert, N. P. H. Nesvadba, J.-G. Cuby, A. M. Swinbank, S. Morris, B. Clément, C. J. Evans, M. N. Bremer andS. Basa in Nature, a publication aimed at scientists. URL: http://www.nature.com/nature/journal/v467/n7318/full/nature09462.html
Snippet from Article 3: Astronomers believe they've found the oldest thing they've ever seen in the universe: It's a galaxy far, far away from a time long, long ago. Hidden in a Hubble Space Telescope photo released earlier this year is a small smudge of light that European astronomers now calculate is a galaxy from 13.1 billion years ago. That's a time when the universe was very young, just shy of 600 million years old. That would make it the earliest and most distant galaxy seen so far. This is from an article by Seth Borenstein in the Washington Post (actually Associated Press article), a general news newspaper. URL: http://www.washingtonpost.com/wp-dyn/content/article/2010/10/20/AR2010102003597.html	

Multiwavelength Astronomy and Active Galactic Nuclei Resources

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Multiwavelength Astronomy

Readings

- Measuring the electromagnetic spectrum: http://imagine.gsfc.nasa.gov/docs/science/know_l1/emspectrum.html
- Welcome to the World of Multiwavelength Astronomy: http://imagine.gsfc.nasa.gov/docs/science/know_l1/multiwavelength.html

Activities

- A great list of activities from Cool Cosmos: http://coolcosmos.ipac.caltech.edu/cosmic_classroom/multiwavelength_astronomy/multiwavelength_astronomy/activities.html

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Active Galaxies

Readings

- Active Galaxies and Quasars: http://imagine.gsfc.nasa.gov/docs/science/know_l1/active_galaxies.html

Activities

- Active Galaxy Education Unit from Fermi (includes lesson on modeling an AGN with paper): http://fermi.sonoma.edu/teachers/agn/
- Activities associated with an AGN pop-up book (includes a lesson on modeling an AGN with food): http://fermi.sonoma.edu/teachers/popup.php