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'Dark Energy' Lecture at LLLC Illuminates World of Cosmology

By Lou Fancher

At a Jan. 22 Science Café in the Lafayette Library and Learning Center's Community Hall, 130 people lined up to see one of cosmology's stars. University of California, Berkeley, Astronomy Professor Alex Filippenko packed the house, drawing a novice-to-expert audience for his "Dark Energy and the Runaway Universe" presentation.

As a member of not one, but two, Nobel Prize-winning teams credited with discovering the accelerating expansion of the universe, Filippenko has heft in the field. His nine-time position as "Best Professor" and multiple "Best Course" recognitions from students on the Cal campus adds the younger set's stamp of approval. Tack on his hundreds of public lectures, newscast and contributions to publications and television documentaries and you have the human equivalent of a supernova.

Or maybe, a superstar, which would please the pun-loving Filippenko, who began his lecture discussing a recent attempt to vomit.

Invited to fly with the Bay Area's Blue Angels, Filippenko recalled the experience. "Most people ask me, 'Did I throw up?' I tried to. Twice. I figured, if I throw up in a controlled way, then I won't throw up suddenly, unexpectedly," he laughed.

Shifting to more serious matters, Filippenko explained why his name was not on the 2007 and 2011 Nobel Prizes. "Only three people can share the prizes," he said. "There were 51 people on the two teams."

To counter what he said is a misperception-that science is an asocial activity-he told the audience how the three winners spent much of their prize money to fly all of the team to attend Nobel Week 2011. "Science is one of the most interactive things I know of. It's a wonderful exchange of ideas that allows progress to be made much more quickly than when you pursue it alone," he said.

Cosmology, he emphasized, is the study of the structure and evolution of the universe as a whole-and not to be confused with another, nearly identically-named field.

"Among the general public, there's confusion between cosmology and cosmetology, the study of hairdos and facials," he joked, displaying an image of an ad promoting hair and skin care education at an erroneously copy-written "cosmology" class.

Seeking to answer questions such as, Is the universe infinite? What is its age? and What are its fundamental building blocks? Filippenko rattled through an initial list of facts.

"It began 13.7 billion years ago," he said. "It's built out of enormous galaxies, and not just a few of them. There's something like 100 billion galaxies ... and that's just in the parts we can see."

Showing images taken by the Hubble Space Telescope after it "stared" at one spot in the sky for ten days and nights, the thousands of galaxies drew gasps and raised eyebrows from some in the audience. "They pay us to sit around and count galaxies," Filippenko joked. "Pretty cushy job, huh?"

Any impression of astronomers free-floating was quickly dispelled as he described Edwin Hubble's methodology for measuring distances between galaxies and research leading to the confirmation of "redshift" in beams of light. "(The discoveries) meant nearby galaxies are moving away at some speed, but the more distant galaxies are moving away at even faster rates," Filippenko said. "Anything that's not tied down, stretches. Space is actually getting bigger."

Science Café presenters often have one foot in a vaudevillian, entertaining land of miracles, and the other, in a densely-informative, scientific maze. Filippenko spread his subject across both as he riffed on Cal-Stanford rivalry one moment, then spoke at length on the deep physics of the universe. Audience questions focused on boundaries: alternate universes; forces known and unknown. Did the universe begin with a bang? What will happen if it re-collapses?

Filippenko said it's up to the young people to find those answers. Top among their studies should be defining the "dark energy" scientists now believe constitutes 73 percent of the universe. "We really don't know what (it) is. What we thought was empty space is dark energy."

A century after Albert Einstein came up with - and ultimately abandoned - his idea that an anti-gravitational force kept the universe from expanding at an infinitely accelerating rate, and without it would either explode in a hot, cataclysmic event or collapse into a cold, black void, Filippenko left much to be discovered by future generations.

Upcoming Lectures at LLLC

Alta Bates Summit Medical Center - What Has Happened to My Good Night's Sleep?
Tuesday, Feb. 5, 6:30 to 8 p.m., Community Hall
Neurologist and sleep medicine specialist Joanna Cooper, MD, will explain why sleep is so important, how sleep patterns change over time, what disorders might be affecting your sleep and how to get the help you need to maximize your chances of a good night's sleep. Free. To reserve your space, call (510) 869-6737.

"The Race for Space: International Law and Protocol in the Final Frontier"
Wednesday, Feb. 6, 7 to 8 p.m., Community Hall
SETI Institute Senior Research Scientist Dr. Margaret Race will discuss how international policies for planetary protection and responsible exploration have guided activities in outer space since the earliest years of the Space Age. She'll also share her perspective and involvement in current international efforts to update protocols for future

space activities, including those applicable to commercial ventures and long term human outposts. Cost: $8 members, $10 non-members, students free. For reservations visit the World Affairs Council of the East Bay website at www.ItsYourWorld.org or call (415) 293-4600.

Science Café - Plants, Perfumes and Poisons
Tuesday, Feb. 19, 7 to 8 p.m., Community Hall
Dr. Margareta (Greti) Sequin, author, plant enthusiast and lecturer emerita at San Francisco State University, comes to the LLLC to share her vast knowledge of California native flora and their pleasing and poisonous properties. On a virtual walk, Sequin will lead the group to look at plants that contain defensive substances and examine their molecular structures, and explore the connections with human uses of these plant substances, such as commercial fragrances or medicines. Admission: $5/person. For info, call (925) 283-6513, ext. 101 or email reserve@LLLCF.org.

For information about additional events, visit www.lafayettelib.org.

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