Well-known astronomer visits campus

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The time was 7:00 p.m. on March 15 and the place was Hamrick Auditorium. The subject was " Extra-solar Planets and the Potential for Other Life On the Universe." After a brief introduction by Tom English, Dr. Charles R. Tolbert started his lecture, a " hybrid of the potential of life elsewhere in the universe and the new extra-solar planets." He had intended to give a lecture on only the possibility of other life, but had been asked to discuss the extra-solar planets as well.

Tolbert attended the University of Richmond, and has a Doctorate from Vanderbilt University. His father grew up outside of Lenore, and Tolbert lived " in the shadow" of Grandfather Mountain for several years. He came to GWU through the Harlow Shapley Visiting Lectureship program of the American Astronomical Society. He currently teaches at UVA.

Until about eight years ago, our sun (sol) was the only star with known planets, explained Tolbert. This was the first time that technology was advanced enough to speculate the existence of planets. Astronomers cannot directly experiment on stars -they have to rely on light. The color, spectrum, and Doppler shift depend on, respectively, temperature, composition, and motion. The Doppler shift effect gives stars the Red shift (going further from us) and Blue shift (coming closer to us). It is also the Doppler shift that allows us to speculate about the existence of extra-solar planets. Dr. Tolbert said that planets were discovered, but they were strange. They were orbiting pulsars, which is the after -effect of a Super Nova. No one knows how the planets survived that close to the star. Then, about 5 years ago, newer technology led to the discovery of planets around sun-like stars. Tolbert held up a list of stars with planets that was six pages long. All of these planets were three to five times the mass of Jupiter (which is 300 times the mass of the earth) and had orbits of as low as three days. Eighty-four days was the highest period he gave (Mercury's orbit is eighty-eight days). The planets were big, close to the stars, and fast; no one understands how they exist.

Tolbert moved on to the possibility of other life in the universe. He said we do not know of any life without some sort of liquid, so we look for liquid before life. He also mentioned that "the one way to find out if something is alive is to kill it." He explained why the moon is a " bad" place for life, although it is the easiest place to look. Mars is second best, but we have not been there yet, and probably will not find anything when we go. "We must go to other solar systems," said Tolbert. However, planets do not equal life. We would first have to receive a signal of some sort--we have not so far. There is absolutely no shred of evidence, so why do most scientists say there is other life in the universe? Tolbert was going to prove there was other life. Using statistics and a rather simple formula, you arrive at either--optimistically - 10 million forms of life in our galaxy, or--pessimistically--one in a billion chances of life in this galaxy. Taking into consideration 100 billion stars in our galaxy, and even more galaxies in the universe, there is a lot of life out there. However, Tolbert quickly added it would take four and a half years for a one- way communication to the nearest star. (One light-year equals one year for radio communication and our closest neighbor is 4.5 light years away.)

In conclusion, Tolbert stated that extra-solar planets are not what we expected; they are not planets like earth. Our solar system seems to be the oddity. There is no life, according to the evidence, but there is life according to the statistics. Tolbert said that-due to the length of time for communication to take place-it does not matter. He also said we should wait 5 years or so to have a better idea about the extra-solar planets.

Tolbert fielded questions from the audience after he finished his presentation. He answered questions about Mars rocks on earth, saying we are not sure they come from Mars (they just have the right composition) and that the "bacteria" found in some Mars rocks is almost too small to ever have been alive. He also said that meteoric material is very common and can be found in nearly all gutters and in dust, because most meteorites burn up in the atmosphere. Tolbert also fielded a question about Pluto being a planet. He said, "Yes. There are nine planets: Mercury, Venus, Earth, Mars Jupiter, Saturn, Uranus, Neptune, and Pluto. Therefore, Pluto is a planet."

During the lunch on March 16, Dr. Charles R. Tolbert gave a speech entitled " Science and Religion: One Scientist's Opinion." Tolbert began his speech saying there were potential conflicts, and he was going to give his take on why. In his lecture, Tolbert used what scholars would term an Independence position. He separated the "realms" of science and religion totally, in some cases having them almost come into conflict.

Tolbert began with the story of Harlow Shapley who engaged Hubert Curtis in a debate about whether the spiral nebulas (and distant objects in general) were clusters of stars on the edge of the Milky Way, or other galaxies. Shapley, defending the cluster position, won based on the data he presented. Three years later, a paper was published with the distances to various galaxies. In 1920, clusters prevailed; in 1923, galaxies won. Tolbert said it was a great example of the flexibility of science. He also gave an example concerning the Earth's crust and how it was once thought that the Earth was shrinking and that led to mountains. Within 10 years, plate tectonics had taken over. New data or reinterpretations of old data change the status quo. There are no discovered truths. "Science tries to understand nature; better understanding leads to better theories." Science, according to Tolbert, corrects itself from human misunderstanding.

Tolbert then focused on religion. He stated that religion is generally based on "ancient and revealed truth." It becomes tradition and helps to bolster the converted and to recruit new members. Religion, according to Tolbert, often incorporates science because its leaders are educated and usually know science. This is a "time bomb" because religion is left behind when science changes. He gave the example of Galileo. In his time, everyone thought the earth stood still ("you could not feel it moving, could you"?) and that everything else moved ("well, something had to move!") Tolbert said that Galileo found stars fainter than the naked eye could see, which contradicted the scripture about the stars being put in the sky as a sign to man ("why were they there as signs to man if man couldn't see them"?). The church did three things: they quoted Joshua 10:12, 13, where the sun stands still, they tried to ban and suppress him and they had other scientists counter him.

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When the issue of evolution came up, Tolbert remarked that Catholics were okay with it because they separated science and religion and relied on the church to interpret scripture. Protestants, relying on individual readings with less room for interpretation, tried the previous three methods on the theory of evolution. The scientists merely quoted other famous scientists who said the earth was created by the second law of thermodynamics, which stated you cannot [naturally] get order from chaos. Since no experiments could be performed, they said evolution was not a real science. They were wrong, because the universe is expanding constantly, which negates the second law of thermodynamics; you can also perform experiments in evolution. "If," said Tolbert, "you look at Australia," you will see an example of isolated groups changing with still "every niche habitable" filled by a creature.

At the beginning of his conclusion, Tolbert asked two questions: did Adam have a navel and did trees have growth rings. His conclusion was that God "created earth in a way that looks fifteen billion -years-old." But, he did not have time to defend his position on this point. Tolbert added that while science ignores religion, religion fights science. "You can always hear preaching against modern science," he said. As a conclusion, he remarked, " religion and science stand side by side if religion does not rely on science, because science is fickle."