

Convocation Address

*University of Texas at Austin College of Natural Sciences
May 19, 2007*

By Bill Hobby

A generation ago a famous UT professor-to-be told a Howard University Commencement audience that she wasn't going to make the customary speech exhorting the graduates to go forth and do good works.

"Consider yourself exhorted," said Barbara Jordan, who then famously exhorted the nation about the erosion of civil liberties.

I am not going to exhort you either. But I am going to take a few minutes to talk about the recent achievements of the College of Natural Sciences—top to bottom, sky to Earth.

Last September your colleague, Robert Quimby, who gets his doctorate in astronomy today, found the brightest and most powerful stellar explosion ever recorded. Astronomers are known for their way with words, so Dr. Quimby gave his discovery a catchy name: SN2006gy.

His discovery has already caused astronomers to rethink a major astronomical premise—how massive stars die.

Dr. Quimby did not find this biggest, brightest explosion by scanning the skies night after night at the McDonald Observatory in the Davis Mountains. Instead, he was scanning his computer in a windowless office in RLM while software he developed scanned data from a small robotic telescope at McDonald. Quimby was searching for supernovas and found the biggest ever recorded.

A few weeks ago news of Dr. Quimby's discovery burst into the press right here on Earth.

David Lambert, the observatory director, tells me that Dr. Quimby has made an even bigger, still unannounced discovery: a supernova even brighter than SN2006gy. The analysis that led to this discovery was done on the Hobby-Eberly Telescope, or HET.

This very large telescope is now working on one of the great mysteries of the universe—dark energy. The project has another of those catchy astronomical names: HETDEX. HETDEX is mapping more than a million galaxies on the Hobby-Eberly telescope.

The McDonald Observatory is, of course, part of the College of Natural Sciences.

We don't know what dark energy and matter is. But whatever it is it's about 75 percent of the universe. Either we're missing something out there or we've got the arithmetic all wrong.

Dark energy and matter may be why the universe is expanding faster it was 13 billion years ago, right after the Big Bang.

Thinking big is nothing new in the College of Natural Sciences.

When the late Harlan Smith, director of McDonald Observatory for 26 years, first proposed building the Hobby-Eberly telescope, his idea was to construct a very large telescope at a fraction of the cost of other very large telescopes. It took many people, much faith and more money than he planned on for this gamble to succeed and there is still work to be done. But now the telescope is producing good science, and has a twin in South Africa.

Now let's get down to Earth.

The Lady Bird Johnson Wildflower Center, the newest member of the College of Natural Sciences family, is working on several projects that use native plants to combat climate change.

Global warming is caused by carbon dioxide. Plants inhale carbon dioxide and exhale oxygen. In urban areas, well-planned landscapes can not only pull CO₂ from the air, but store it in the soil for decades.

One Wildflower Center product, done in cooperation with the Seattle-based environmental company, Mithun, is an open-user, web-based carbon calculator which can aid developers in calculating the total carbon footprint of their projects.

It's one more tool to deal with perhaps the greatest challenge now facing the earth. It goes hand in hand with the Wildflower Center's work on green roofs, which reduce energy demand in the buildings beneath them, and standards for sustainable landscapes.

In other news, a biologist at this college, Camille Parmesan, conducted one of the most comprehensive studies on the effects of climate change on wild species worldwide, confirming that extinctions have already occurred in the most sensitive habitats. Three professors in computer science have designed TRIPS—a prototype for a computer process that could reach trillions of calculations per second. And university scientists worked on a team that developed a "superlens" that increases the capacity of microscopes used to scan nanostructures.

There are many more world-changing projects going on here. That's why they say that "What Starts Here Changes the World".

As graduates of the College of Natural Sciences, you have already opted to be someone who changes the world. Science has been pushing back frontiers and solving world problems for thousands of years.

We are grateful for your courage, your brainpower and your endurance. If this nation is going to remain globally competitive, we will need a lot more like you. And we are falling behind in the race to create tomorrow's scientists.

We will also need to pay attention to our education system. That starts with training teachers. The UTeach program, started right here, has doubled the number of students at this university who graduate with math and science teacher certification. Eighty percent of those who started teaching four years ago are still teaching.

But it also means stay tuned to the public debate about education.

When it comes time to pay for it, vote yes. Some things aren't free.

The past decade has been an experiment in privatizing higher education—most allegedly public universities, including this one, are funded more by tuition and private contributions than by public tax dollars. The state paid 44 percent of the cost of the university 22 years ago and only 16 percent today. Incidentally, that investment returns \$24 in economic activity for every dollar invested, but that's another story.

Public universities today are more state-assisted than state-supported.

As a Rice University graduate, I have no quarrel with private education. But public institutions educate most American students. We need a lot of smart people to have a prosperous, growing country.

So why is public support for higher education declining? There are many demands on tax dollars—health care, highways, wars—all these things are expensive.

Higher education is expensive, but it's cheap compared to ignorance.

As tuition and college costs go higher, many students graduate with debt that approaches a house mortgage—certainly with debt higher than a public school teacher's beginning salary.

We cannot stay competitive without the best universities in the world. So when your alumni association hits you up, write that check.

And keep an eye on how the state Legislature is treating public universities.

Research funding is also important. We went to the moon on American tax dollars. But again, there are many demands, and research funding requires investment in the future.

David Lambert says that science is based upon "wonder, adventure and hope." I wish you a career and a life based on wonder, adventure and hope.

This lecture was presented at the University of Texas at Austin, May 19, 2007.