Open House in Astronomy Wednesday

Oct. 20, 2010
7:00p.m.
180 REDC

Join Dr. Marc Imhoff of NASA Goddard Space Flight Center in Maryland for an astronomical presentation. Following the lecture, there will be a viewing of the stars at Mehalso Observatory.

Quote of the week:

"Equipped with his five senses, man explores the universe around him and calls the adventure Science."

~Edwin Powell Hubbard

Storms in the Tropics

Currently, there are two disturbances in the Carribean, both of which have the potential to become tropical storms.

System 1 consists of an area of thunderstorms near northern Honduras. The system has a 10 percent chance of tropical storm formation.

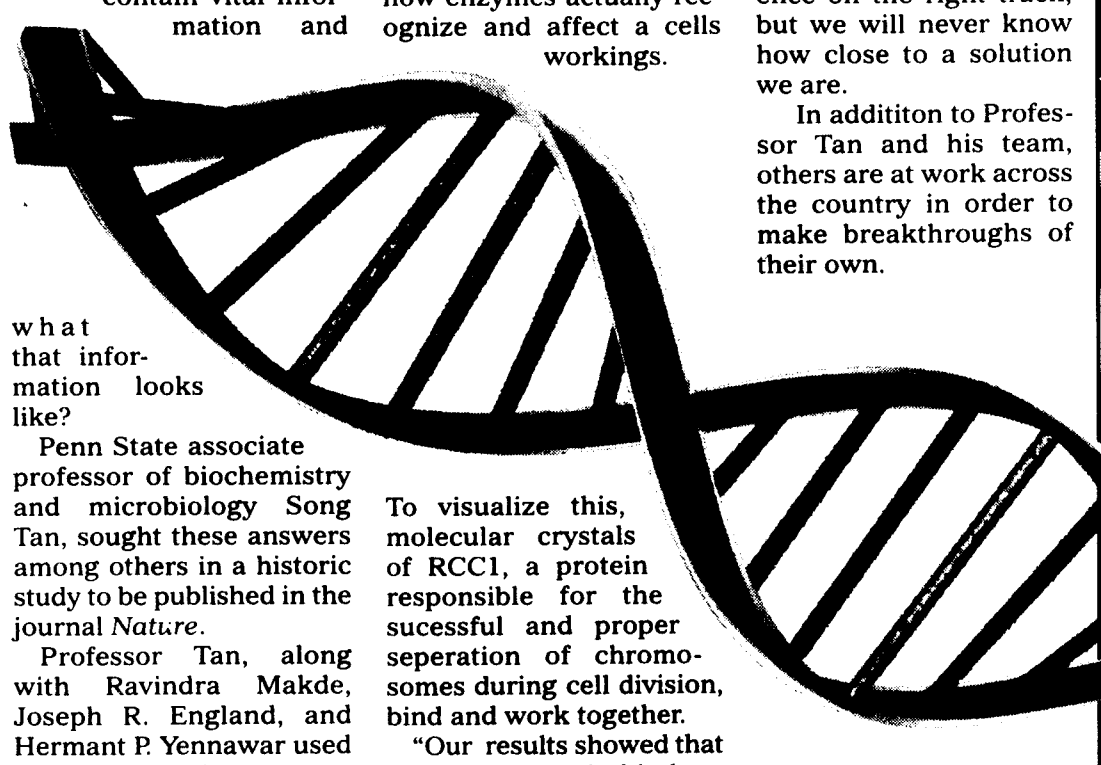
System 2 is situated farther to the east and is a huge tropical wave that has a 30 percent chance of becoming a tropical storm.

Other than these two systems, no other areas are showing signs of development.

UP Professor creates first DNA depiction

RYAN GULA
Science Editor

Ever wonder about the inner working of your body? How each cell works and carries out its function? How DNA can contain vital information and what that information looks like?



Penn State associate professor of biochemistry and microbiology Song Tan, sought these answers among others in a historic study to be published in the journal *Nature*.

Professor Tan, along with Ravindra Makde, Joseph R. England, and Hermant P. Yennawar used a process called X-ray crystallography to construct the first depiction of a nucleosome interacting with a protein.

A nucleosome is a unit of DNA packaging tightly compacted around protein.

DNA is found in nearly all known living organisms and contains genetic information specific to the development and function of that organism.

In order for an organism to operate based on the information contained in DNA, it must be deciphered. Because of how densely the DNA is packed onto a nucleosome, it has long been a target of research and study.

Science hopes that by studying nucleosomes, they will be able to observe the operational differences between healthy and deceased cells.

This knowledge could lead to the elimination or cure of many diseases and could potentially pioneer a cure for cancer.

Chromatin enzymes, a specific protein that functions to activate genes by binding to the nucleosome.

Although the actual structure of a nucleosome was determined 13 years ago, it was still unknown how enzymes actually recognize and affect a cells workings.

To visualize this, molecular crystals of RCC1, a protein responsible for the sucessful and proper seperation of chromosomes during cell division, bind and work together.

"Our results showed that the RCC1 protein binds to opposite sides of the nucleosome - similar to pedals positioned on a tricycle," said Tan.

The atomic view shows how enzymes are able to identify a protein core and DNA.

According to Tan, the findings will show us how chromatin enzymes interact with a person's DNA as it is packed into a cell's chromatin.

Findings took place at Penn State's Center for Eukaryotic Gene Regulation, where scientists work to gain a better understanding of how genes are turned on and off.

Tan's team has been working on this project for almost a decade, but he is already preparing to take his discovery even further.

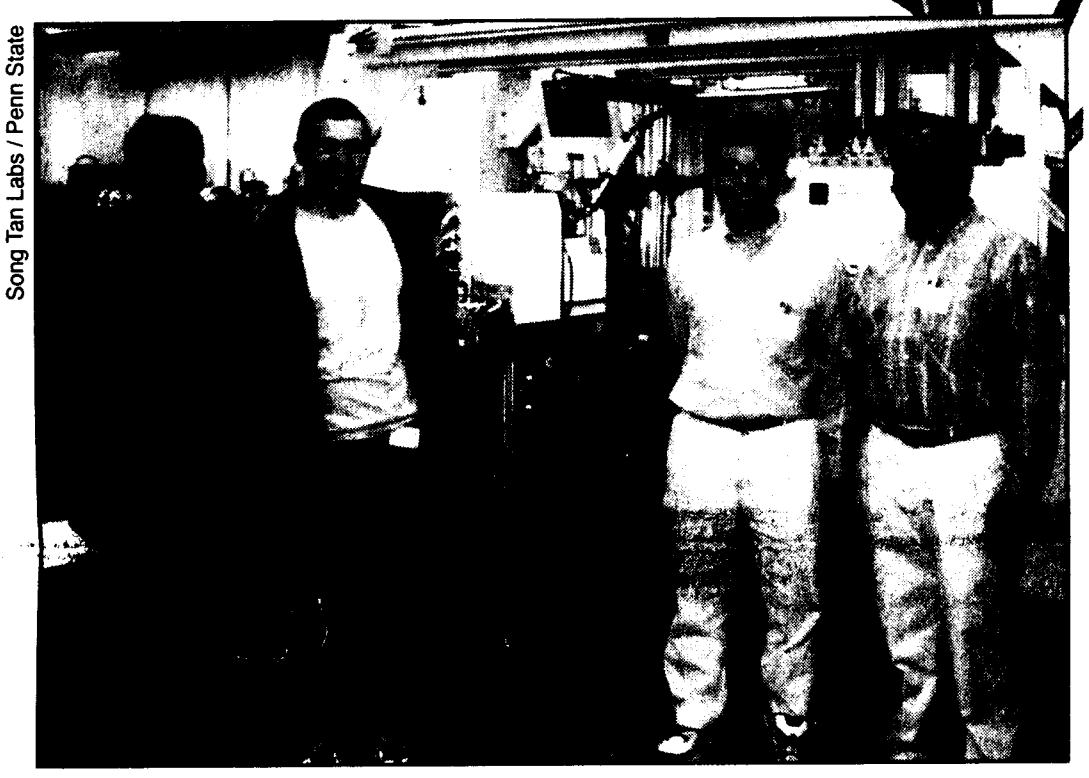
Future research could possibly lead to a cure for cancer along with other diseases which plague the body.

Although the findings are significant, still many questions remain about processes within the body and many additional doors still must be opened before cures are found.

This research is very significant to keep science on the right track, but we will never know how close to a solution we are.

In addititon to Professor Tan and his team, others are at work across the country in order to make breakthroughs of their own.

Professor Tan featured at right. Below he stands with his team that assisted him in designing the DNA model.



Song Tan Labs / Penn State

Open house enhances knowledge of Jupiter

RYAN GULA
Science Editor

It's the largest planet in our solar system, is currently visible in the night sky, and many don't know anything past it's giant spot.

A group of students and community members came to Behrend last week to find out more about the fifth planet in our solar system, Jupiter.

Dr. Darren Williams, an associate professor of physics and astronomy, captivated those present Wednesday evening with an array of facts, pictures, charts, and computer imaging of the huge planet.

Students received a good appreciation of the event and many were glad they attended.

"I was thrilled at the opportunity to fulfill course requirements and enhance my existing knowledge of Jupiter," said sophomore Rachael Tompkins.

Among the students were local residents who were also eager to satisfy their curiosity about other planets.

Since its discovery in 1610 by Galileo, scientists have been fascinated by the giant mass of gases.

First using telescopes to view the planet, and then with space craft performing fly-bys on their way out of the solar system.

More recently, NASA sent a craft that was intentionally directed into the planet, studying pressures and analyzing elements in the surroundings until it was destroyed by intense heat and pressures.

"Jupiter is actually a failed star," said Dr. Wiliams. "[It has] a core temperature several thousand degrees too cool."

That's good news for us here on Earth, as life would be completely different if we had another source of light so close.

Dr. Williams also described the complex and varying elements thought to give the planet its famous and distinctive color.

He also discussed one of Jupiter's most famous properties: its giant red spot. The spot is a hurricane several thousand years old and with wind speeds over 600 miles per hour.

Along with its four moons, Jupiter also has 65 'satellites' that orbit the planet, unable to escape because of Jupiter's gravitational pull.

Dr. Williams described each of the moons, focusing on the volcanic moon Io.

After an hour of presentation, the audience was allowed time for questions, with some focusing on the planet and others on different aspects of the universe as a whole.

Because of poor weather, the telescope observation was postponed. The next open house night in astronomy will take place Oct. 20, 2010.

Despite the delay, many came to the Observatory to catch a glimpse of Jupiter and three of the four moons.

Dr. Marc Imhoff, representing NASA, will give a presentation in REDC at 7:00 p.m. Immediately following the presentation, the observatory will be open for viewings.

> "I was thrilled at the opportunity to fulfill course requirements and enhance my knowledge of Jupiter."
>
> **Rachael Tompkins**
> sophomore accounting & finance major

Stephen Fyfitch / *The Behrend Beacon*
Dr. Williams speaks to the crowded lecture hall in OBS.

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