

ScienceWeek

Monday, July 10, 1995

Science Briefs

Butter side does tend to land down

A hand reaches. A plate slips. A slice of toast takes flight, slowly rotating as gravity steadily impels it toward an expensive Oriental carpet.

How will this tale end? With a relieved sigh? Or with a home tragically scarred by an ugly carpet stain?

Better call the Rug Doctor, says Robert Matthews. A few simple calculations demonstrate that falling toast really does tend to land butter-side down, he writes in the July issue of the European Journal of Physics.

The inevitability of a buttered carpet incident results from fundamental physical laws. Matthews found this by treating the falling toast problem like a simple high-school physics problem, accounting for all of the forces that act on a slice of bread as it slips off a plate or table and falls to the floor.

Leave some corn for bugs to eat

You're better off leaving some of your corn for bugs to eat, scientists say.

Using computers to model the evolution of insect resistance to pesticides, scientists from the University of Minnesota have developed a planting strategy that minimizes agricultural losses to insects over time.

The researchers based their model on genetically engineered corn, or maize, which produces a chemical that is tox-

help from ABOVE

Satellite helping researchers unlock mysteries of lightning

By **DIANNA SHERAM**
For the Times

Lightning is a key weather-shaper, according to climatology experts. Its charge is involved in the formation of tornados, precipitation and chemical changes in the atmosphere, among other things. It may even be a good indicator of a large-scale storm system's strength.

Yet, many of the in-depth facets of lightning's role in the nature of weather are only beginning to be understood by researchers — thanks to a unique technological innovation from Marshall Space Flight Center scientists.

On April 3, the Optical Transient Detector (OTD) was launched as part of a satellite payload. Circling the globe 14 times a day at about 457 miles into the atmosphere, it views virtually every place lightning normally occurs.

OTD's sensors pinpoint atmospheric lightning and thunderstorms taking place within its wide, 100-degree field of vision. Its high-speed telecentric telescopic lens records 500 images per second.

To extract lightning signals from bright backgrounds, the Real-Time Event Processor sees 10 million pixels per second from OTD's optics. RTEP is a dedicated analog and digital computer.

The new technology sees lightning and cloud formations in a way never before possible from ground or space, according to Dr. Hugh Christian of the Global Hydrology

"A lot of data comes to researchers in different forms, including mapping projections and resolutions," said Dr. Michael Botts, UAH senior research scientist.

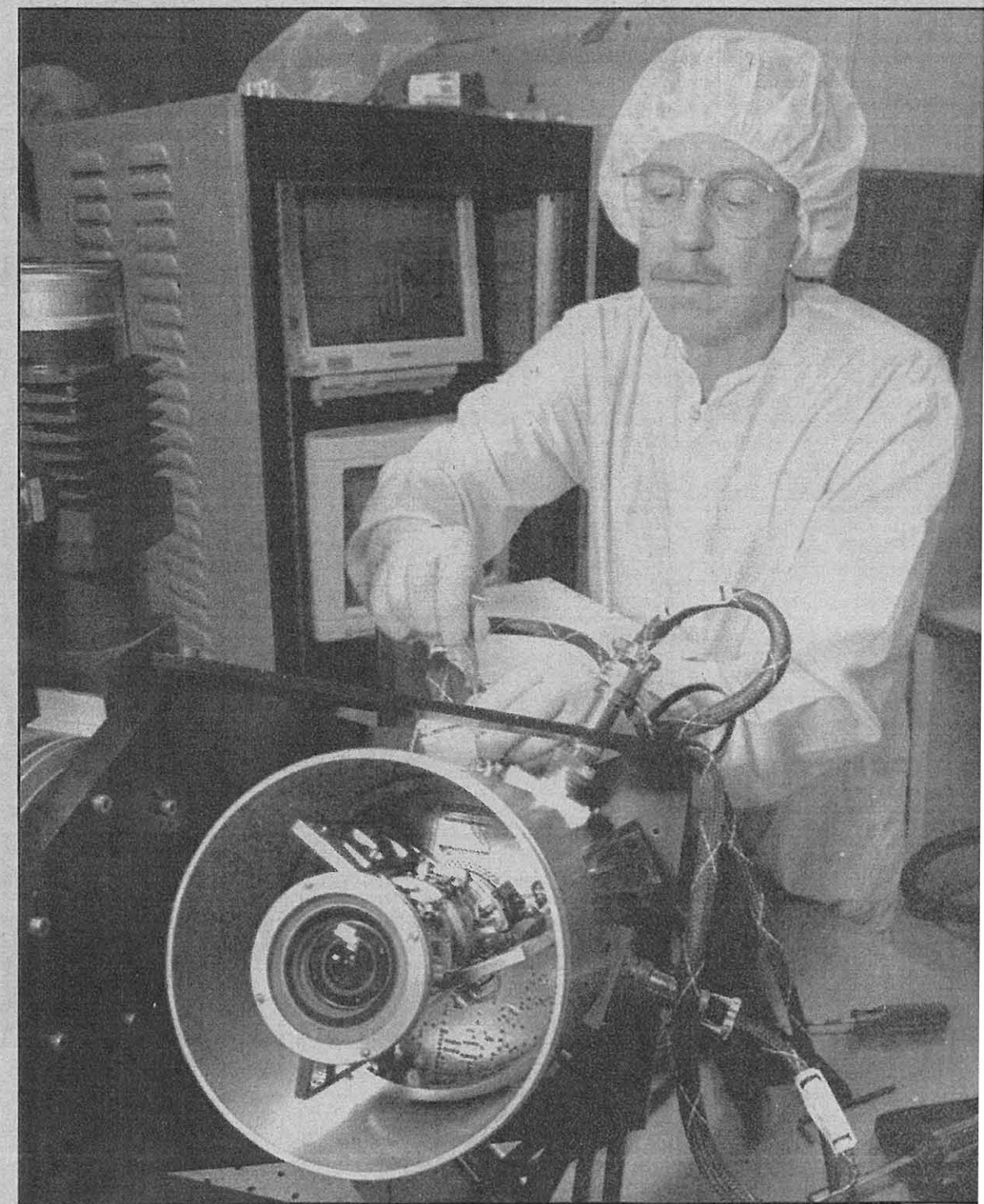
A team is developing software which "will enable the user to slide through time and see events updating together," Botts said. "Then, relationships can be seen between events in time and at a particular location. Tracing factors contributing to a storm's development will be easier."

OTD data is being integrated with sensors at ground weather stations and on other weather satellites, such as the GOES. A worldwide real-time lightning climatology database is being assembled. Meanwhile, the information is expanding scientists' understanding of how the Earth's weather and atmospheric systems are created and function. This achievement fits well with NASA's goal for Mission to Planet Earth projects, Christian pointed out.

Public access

The public can access some OTD data on the MSFC Internet World Wide Web Home Page, according to Paul Meyer of MSFC. That includes precipitation rates and climate data for Huntsville and the world. Much more information will be included soon, such as teacher resources, additional video loops, and more, up-to-date scientific information, he said. The Internet address is: <http://wwwghcc.msfc.nasa.gov:5678/otd.html>.

A specially devised narrowband, custom-made interference filter



Dr. Hugh Christian works on the Lightning Imaging Sensor, an improved version of the Optical Transient Detector, at the Marshall Space Flight Center.

Glenn Baeske/Huntsville

creases. So, the point when lightning flashes decrease, may indicate

Optical Transient Detector