

# science news

JUNE 5 & 12, 1976  
VOL. 109, NOS. 23 & 24, 353-384





# Conversation Pieces

## Question of the Century

Is there life on Mars? If there is, we hope this master-piece of miniaturization will prove it. Built by TRW, it packs into one cubic foot the equivalent of three organic chemistry labs full of equipment that's been designed to determine whether micro-organisms exist in the Martian soil. It also contains the complex electronics needed to gather the data for transmission to Earth. Several weeks after July 4th, 1976, when NASA's Viking (built by Martin Marietta) is scheduled to land on Mars, scientists hope to answer the question that has tantalized men for so long.

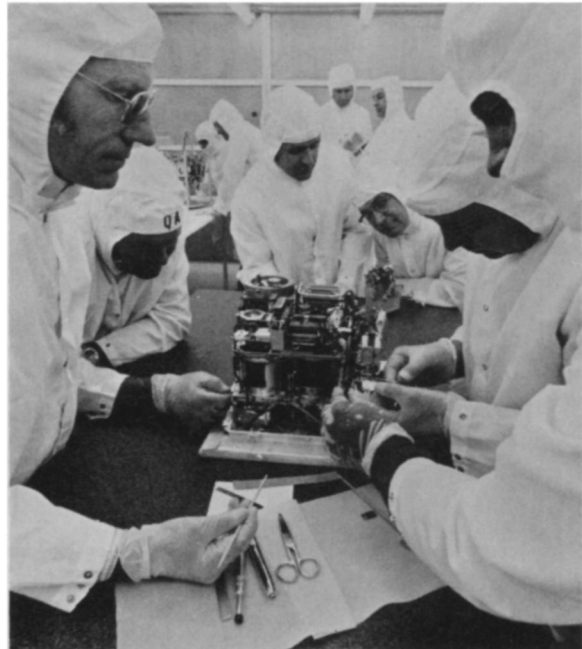
Another TRW-built experiment on Viking will measure the violent winds and cold temperatures of the red planet's tenuous atmosphere. Meanwhile, TRW engineers are working on further experiments designed to probe the hot, dense atmosphere of Venus, later this decade. With Earth's atmosphere "bracketed" by the opposite extremes of these two natural laboratories meteorologists may get new insights into our long-range climatic trends and weather processes.

These experiments are only the latest of many TRW projects designed to help NASA explore the solar system. In 1958, Pioneer 1 was the first spacecraft ever built by a private firm. It showed the shape of the Van Allen belts and measured interplanetary particles and fields. Later Pioneers observed solar disturbances and the solar wind from as far away as the other side of the sun. The most recent Pioneers have crossed the asteroid belt, made close-ups of Jupiter, and sent back more data on the interplanetary medium from record-breaking distances. One is now headed for Saturn and the other will become the first man-made object to leave the solar system.

During the nineteen sixties, TRW built NASA's series of Orbiting Geophysical Observatories, which mapped the Earth's magnetosphere and provided detailed data on phenomena that affect long-distance communications.

We've now started building three High Energy Astronomy Observatories for NASA. Designed to look far beyond our solar system, they'll map sources of X, gamma, and cosmic rays across the entire celestial sphere and then concentrate on the most interesting ones. The results should help answer key questions about quasars, pulsars, black holes, and galactic explosions. They may even throw new light on man's basic theories of energy and matter and on how the universe began.

In skimming the highlights of such projects, it's hard to avoid sounding boastful. But the engineers and scientists who actually do the work have no time for bragging. They're too busy applying the lessons they've learned to new and even more difficult problems. These hard-working people, in fact, are what TRW Systems is all



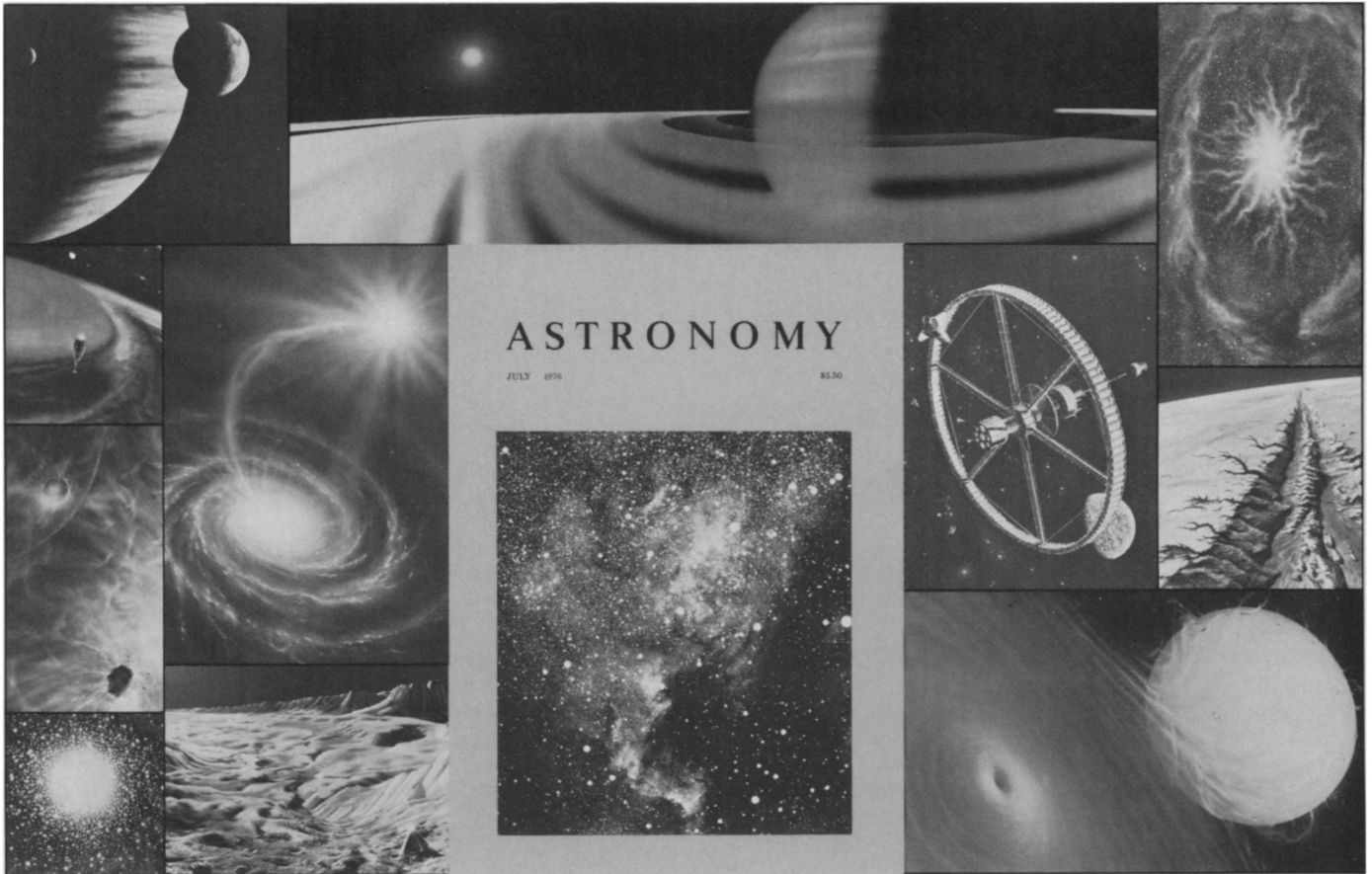
Building the Viking Lander Biology Instrument involved the use of more than thirty different types of advanced technology.

about. If you're interested, we'd like to send you a couple of booklets that give you an overview of our diverse capabilities and more information about the Mars instruments. Just write on your Company Letterhead to:

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# Man's Dream of Worlds Unseen



Carl Sagan and John Clark are a team.

A very unusual team indeed — scientist Sagan and artist Clark working together to open the complex vistas of the universe. Kip Thorne's black holes are mathematical concepts at best. But teamed with Adolf Schaller, artistic translation gives full color substance and form to formulae. The result? Cosmic portraits: man's dream of worlds unseen.

Three years ago **ASTRONOMY** magazine established a hallmark of beauty and readership intimacy seldom found today. And each month since then it has followed through with full color paintings and photographs, clear and pictorial writing, inviting layout and design, uncompromised printing quality... care and commitment to you the subscriber. **ASTRONOMY** makes the universe appealing. It transforms alienating theory to inviting, entertaining discovery.

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**ASTRONOMY's** monthly departments guide you to astrophotography with

cameras you probably already own — to the use of telescopic equipment — to location and observation of planets, constellations, asteroids, comets, galaxies, double stars, star clusters... to all the cosmic beauty awaiting your personal discovery.

Book reviews guide your astronomy reading and *Astro-News* keeps pace with the latest discoveries, research and findings... brought to you while they're still news.

## History of American Astronomy

And now, **ASTRONOMY** proudly presents a very special bicentennial celebration issue entirely devoted to the evolution of astronomy in the United States.

This exciting full color epic takes you from the prehistoric astronomy practiced by indigenous Americans, to the birth of astrophysics and development of astrophotography, through 20th century American astronomy — the discovery of quasars, pulsars, black holes — and the start of our nation's third century, "Toward Man's Dream of Worlds Unseen".

Noted authors — Von Del Chamberlain (Smithsonian Institution), Trudy E. Bell (Scientific American editor), Richard Berendzen (American University, Washington, D.C.), Michael Mendillo (Boston University), and David DeVorkin (Central Connecticut State College) — unfold the history of American astronomy with drama and refreshing writing style.

Full color reproductions of American astronomical art from the 1800s, antique brass telescopes and instruments, portraits of famous American astronomers and color sky photographs from leading observatories across the country, are interspersed with equally historic wood cuts and the first astrophotographs of the sun, moon and Milky Way.

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## ASTRONOMY

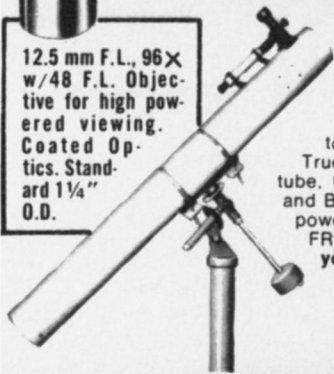
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Photograph by Nile Root. Unitron 4" telescope on an Equatorial mount.  
Taken with a Nikon F camera.

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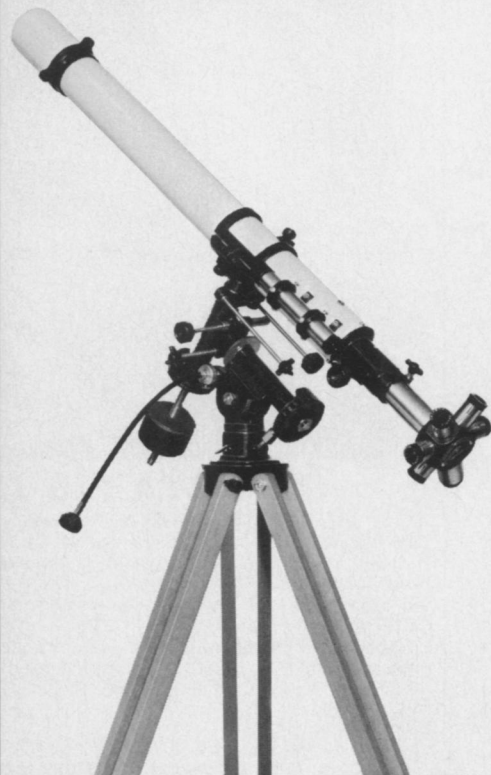
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