

Life on Venus? U-M prof speculates

Evidence that the hot, dry planet Venus may have once had an ocean has important implications for that planet's history and for the future of Earth, according to a University of Michigan space scientist.

"If Venus lost an ocean several billion years ago, could some form of life which might have developed earlier on that planet have been lost? Could Earth be heading toward the same fate, becoming like today's Venus, which has long been thought to be nearly Earth's identical twin when the planets were formed?"

So wonders Thomas Donahue, U-M professor of atmospheric and oceanic science. He is chairman-elect of the National Academy of Sciences' Space Science Board, which advises the National Aeronautics and Space Administration on space exploration. His concern for Earth's welfare and his interest in reconstructing the history of Venus have been heightened by new analysis of data from the U.S. Pioneer Venus mission in December 1978. Findings based on that data have been supported by measurements shared from Russia's landing probes on Venus in March.

THE POSSIBLE early existence on Venus of a 24-kilometer-deep ocean — as deep as those found on Earth — is reported in the May 7 issue of Science magazine by Donahue and his colleagues, John Hoffman and Richard Hodges Jr. of the University of Texas at Dallas, and Andrew Watson of the Marine Biological Association of the United Kingdom.

The investigators re-examined measurements taken during a malfunctioning of an instrument on the Pioneer spacecraft.

"Not until last autumn did we realize

that instead of atmospheric gases, the neutral mass spectrometer was sampling Venus water in the form of sulfuric acid solution in the clouds," explained Donahue.

"From these observations, we could determine that Venus once had 100 times as much water as it does now. The planet would have been covered with an ocean whose average depth would have been 30 feet. It is possible that the equivalent of a full terrestrial ocean had existed."

What happened to the water on Venus?

"Scientists suspect the forming of a phenomenon called the 'greenhouse effect,' where solar heat is trapped in the atmosphere," said Donahue.

"Then, water and carbon dioxide would have prevented heat from escaping the planet, causing it to grow still warmer. The result would have been a 'runaway greenhouse,' the evaporation of even more water and production of more carbon dioxide."

"The existence of an early ocean followed by the runaway greenhouse catastrophe and the consequent production of a hot, dense carbon dioxide atmosphere probably infers a history of plate tectonics on Venus."

PLATE TECTONICS is the process involving great slabs of rock that require water to enable them to slide over the planet's mantle, thereby shaping continents and the sea floor.

"It is possible," Donahue explained, "that during the period when Venus had an ocean, plate tectonics could have proceeded far enough to develop at least one continent that scientists have named Ishtar and perhaps another called Aphrodite."

"With the onset of the runaway greenhouse and the resulting disap-

pearance of an ocean, plate motion would have ceased. Subsequently, heat would have been transported from the interior through a multitude of large and small volcanoes distributed over the surface of the now-barren sea floor.

"Lava slowly flowing over that surface would have supplied the iron and other material required to dispose of the oxygen associated with the lost ocean."

Measurements from the recent Soviet missions, Venera 13 and 14, support this picture, noted Donahue. "The Russian spacecraft landed and took photographs of Venus' surface. Analyses of the surface rocks revealed basalt, the same rock found on the sea floor of Earth."

"Other supporting evidence are the measurements reported at the time of the Pioneer Venus mission that the amount of radiogenic argon and helium on Venus is much less than expected."

"But one way to tell if there really was an ocean would be to return to Venus," Donahue continued. "It still might be possible to detect traces of river channels, deltas and shorelines on the ancient continents."

"We can learn much more about Earth by taking a closer look at our sister planet, whose surface temperature is now 800 degrees Fahrenheit — so hot that metals melt."

Just for Dad & Grads!

Save up to

50%

on our entire collection of genuine stone rings & pendants, many accented with Diamond! Choose from our huge selection of brand name watches, pens & pencils sets and many other great gift ideas.

Choose from our entire inventory of 10K, 14K, 18K Gold Genuine Stone Rings & Pendants for Him and Her!

Including Emeralds, Rubies, Sapphires, Opals, Citrine, Jade, Garnets, Blue & Black Stones and many more!

A few examples of our hundreds of styles

Save on our huge selection of Chrome, 10K, 14K, 18K Gold Filled, Sterling and the newest Classic Black Selectip pen & pencil sets for men and women.

Reg. \$15.00 to \$75.00

Father's Day June 20th.

JEWELERS & SILVERSMITHS SINCE 1916

Discover CONNOLLY'S

FARMINGTON HILLS 428-2300 DOWNTOWN BIRMINGHAM 642-7157 FISHER BUILDING (DOWNTOWN) 872-3350 HEADQUARTERS VILLAGE HILL 375-9100

SEIKO

Save on our huge selection of the newest ladies and mens styles.

Reg. \$69.95 to \$2,500.00

by CROSS

Reg. \$15.00 to \$75.00

Father's Day June 20th.

JEWELERS & SILVERSMITHS SINCE 1916

Discover CONNOLLY'S

FARMINGTON HILLS 428-2300 DOWNTOWN BIRMINGHAM 642-7157 FISHER BUILDING (DOWNTOWN) 872-3350 HEADQUARTERS VILLAGE HILL 375-9100

CARPET CLEANING SPECIALS

ANY LIVING ROOM & HALL

Dual Process Shampoo and Steam Extraction

ONE ADDITIONAL ROOM

CLEANED FREE

150 Square Feet Limit

CARPET DYEING

Average Living Room, Dining Room - All Colors Cleaned and Re-Dyed

FURNITURE CLEANING

Sole Agent Lone Star Corp. Broomfield Hills

KLEEN BRITE SYSTEMS

540-6022

DON'T BE LEFT IN THE DARK!

ENERGY SAVING, LOW VOLTAGE AUTOMATIC GAS LAMPS ELECTRIFIED AND NEW YARDLIGHTS INSTALLED

No Lawn Damage

Duplicate the charm and security of your gas lamp.

OPERATES FOR ONLY 2+ A DAY!

Automatic shuts down on set control.

MICHIGAN YARDLIGHTING CO.

968-0487

BH BLOOMFIELD HILLS SCHOOLS

LEISURE & LEARNING SERVICES 1982 SUMMER DAY CAMPS

Campette
Huck Finn
Sports & Survival
Wind & Water
Gymnastics
Computer
Sports-O-Rama
Farm Living
Waterfront

CHILDREN ages 3 1/2 - 14

SPORT SCHOOL

Track & Field
Baseball
Football Conditioning
Basketball
Gymnastics
Softball
Swimming
Soccer
Detroit Express Soccer
Pom Pom

SPORT SCHOOLS

Track & Field
Baseball
Football Conditioning
Basketball
Gymnastics
Softball
Swimming
Soccer
Detroit Express Soccer
Pom Pom



SUMMER SCHOOL

Begins June 22, 1982 Ends July 29, 1982

Secondary Summer School located at Anderson High School. For information call 647-1224, Ext. 281 between the hours of 2:30-5:00 p.m. Hours Monday through Thursday 8:00 a.m.-1:00 p.m. Class selections for credit (transferable) or no credit including social studies, English, mathematics, science, foreign language, business, physical education, fine arts, and computer studies.

SUPER SUMMER

located at VVay Elementary School.

Hours Monday through Thursday 8:45 a.m.-11:45 a.m. Course selections offered in 2 week blocks include science, math, computers, language arts, fine arts, typing and foreign language. Call 334-3578 for further information.

SWIMMING & TENNIS LESSONS FOR ALL AGES - ALL SUMMER

CONTACT BLOOMFIELD HILLS RECREATION DEPARTMENT FOR DETAILS

334-3578

AGORAPHOBIA

- FEAR of driving alone
- FEAR of waiting in lines
- FEAR of going far from home
- FEAR of social situations
- FEAR of crowded public places (streets, stores, restaurants)
- FEAR of shopping malls or large stores
- FEAR of being trapped
- "FEAR OF FEAR"

PATHWAYS TO RECOVERY

An Individualized Treatment Program

- Methods to overcome avoidance of fearful situations
- Techniques to reduce, eliminate or cope more effectively with phobic situations
- Systematic gradual steps toward recovery
- Home visits (if necessary)

humanistic resources

PSYCHOLOGICAL SERVICES

Ron Rice, Ph.D., Psychologist
Program Director
626-2056

32910 W. 13 Mile
Farmington Hills, Michigan

THE EXCLUSIVITY OF WOODARD, EXCEPTIONALLY PRICED...\$599.

Thomas Furniture presents Woodard: the finest hand crafted outdoor furniture. Every step from shaping the highest grade iron, to welding the parts for double strength, to painting the finished piece is done by hand. That's what makes Woodard - the best!

TEQUILA. Luscious vanilla on vanilla. Werzall topped 48" table and 4 chairs with heavy gauge vinyl straps. Impossible to beat at...\$599

MARGARITA. The secret ingredient: the miracle weather-proof stretch fabric on the 4 sling chairs. A 48" tempered glass table, too. All in vanilla - only \$599.

SCULPTURA. This 48" table and 4 chairs are all mesh and fresh in pomp green. All for only...\$599. Ask about our special umbrella light. Umbrellas...from \$79. Patio shells...\$12.95.

Delivery, of course! But please - no phone orders. All items subject to prior sale, prior purchases excluded.

Since 1898
THOMAS furniture

4945 Dixie Hwy. Drayton Plains
674-C321 • Open Mon-Thurs-Fri. 9-9
Tue-Wed-Sat. 9-6, Sun. 12-5

USE OUR CONVENIENT CREDIT PLAN
VISA OR MASTER CHARGE