

# TARANTULA

*Tarantulas comprise a group of large and often hairy spiders of the family Theraphosidae.[2a]*

Water is an essential compound for all forms of life known to date on Earth,[1][2][3] but not on other planets.[4] The chemical formula is H<sub>2</sub>O, each molecule contains one oxygen and two hydrogen atoms connected by covalent bonds.

The human body consists of 55% to 78% water, depending on body size.[14] To function properly, the human body requires between one and seven liters of water every day to avoid dehydration; the exact amount depends on activity level, temperature, humidity, and several other factors. Apart from drinking water, humans get fluids from food and drinks other than water.

Most people believe that humans need 8–10 glasses (about two liters) per day,[15]

but the results of research published by the University of Pennsylvania in 2008 show that consuming 8 glasses is not proven to be of much help in making the body healthy.[16]

In fact, sometimes for some people, drinking more or excessive water than recommended can cause dependence. Other medical literature recommends consuming one liter of water per day, with additional when exercising or in hot weather.[17] Drinking water is healthy, but if you drink too much it can cause hyponatremia, which is when the sodium in the blood becomes too diluted.[18]

Hydrogen is also the most abundant element with a percentage of approximately 75% of the total elemental mass of the universe.[8][b] Most stars are formed by hydrogen in the plasma state.

Hydrogen compounds are relatively rare and rarely found naturally on Earth, and are usually produced industrially from various hydrocarbon compounds such as methane.

Hydrogen can also be produced from water through an electrolysis process, but this process is commercially more expensive than producing hydrogen from natural gas.[9]

One million dollars per day is the cost to supply water to the astronauts on the International Space Station (ISS). Four astronauts on the ISS require 12 gallons of water each day, and at \$83,000 per gallon to lift into space, the costs quickly add up. This prompted NASA to invest in a new, lower cost solution to biologically recycle and reuse water for both the ISS and other future manned space exploration efforts.[10]

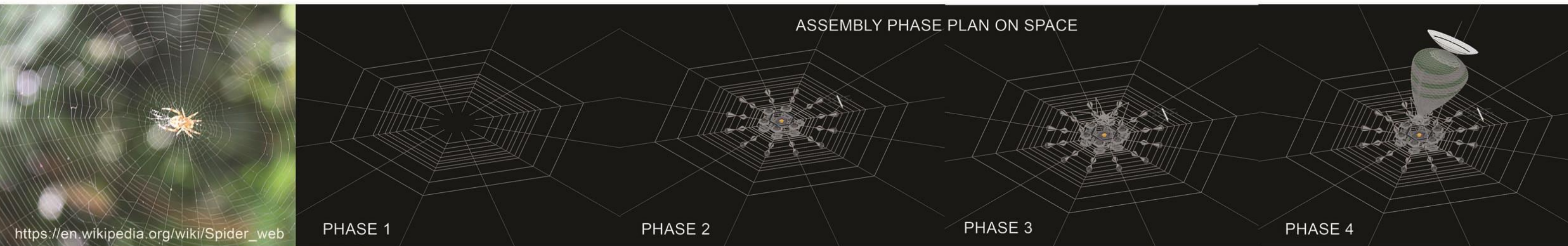
Scientists at the University of Illinois have discovered a new way to make water, and without the pop. Not only can they make water from unlikely starting materials, such as alcohols, their work could also lead to better catalysts and less expensive fuel cells. “We found that unconventional metal hydrides can be used for a chemical process called oxygen reduction, which is an essential part of the process of making water,” said Zachariah Heiden, a doctoral student and lead author of a paper accepted for publication in the Journal of the American Chemical Society, and posted on its Web site.

A water molecule (formally known as dihydrogen monoxide) is composed of two hydrogen atoms and one oxygen atom. But you can’t simply take two hydrogen atoms and stick them onto an oxygen atom.

The actual reaction to make water is a bit more complicated:  $2H_2 + O_2 = 2H_2O + \text{Energy}$ .

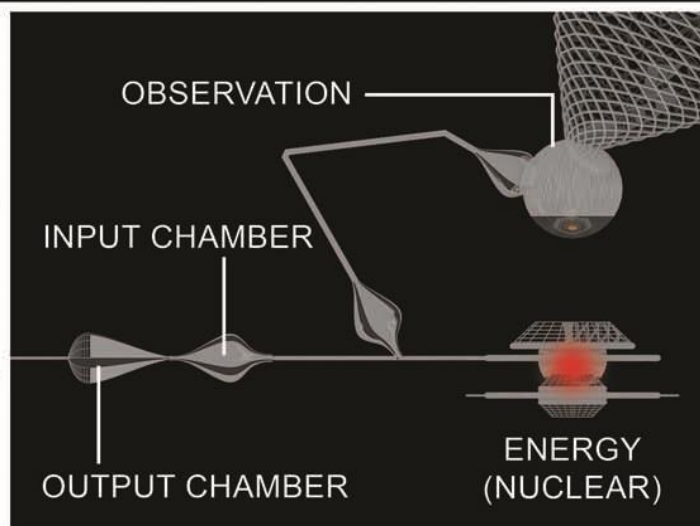
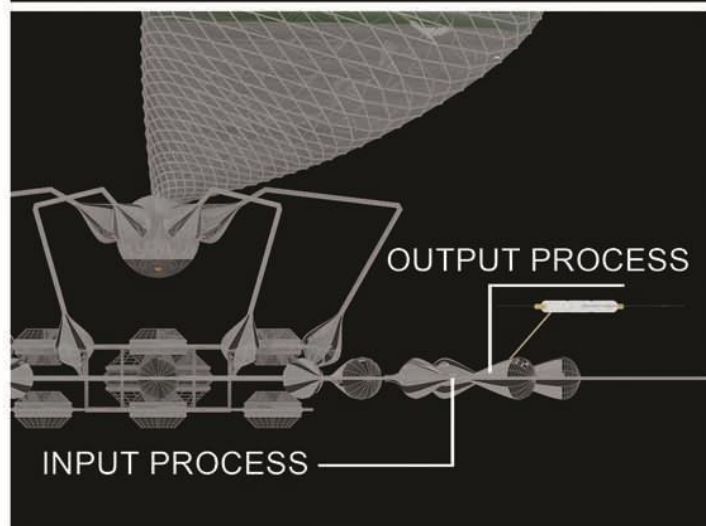
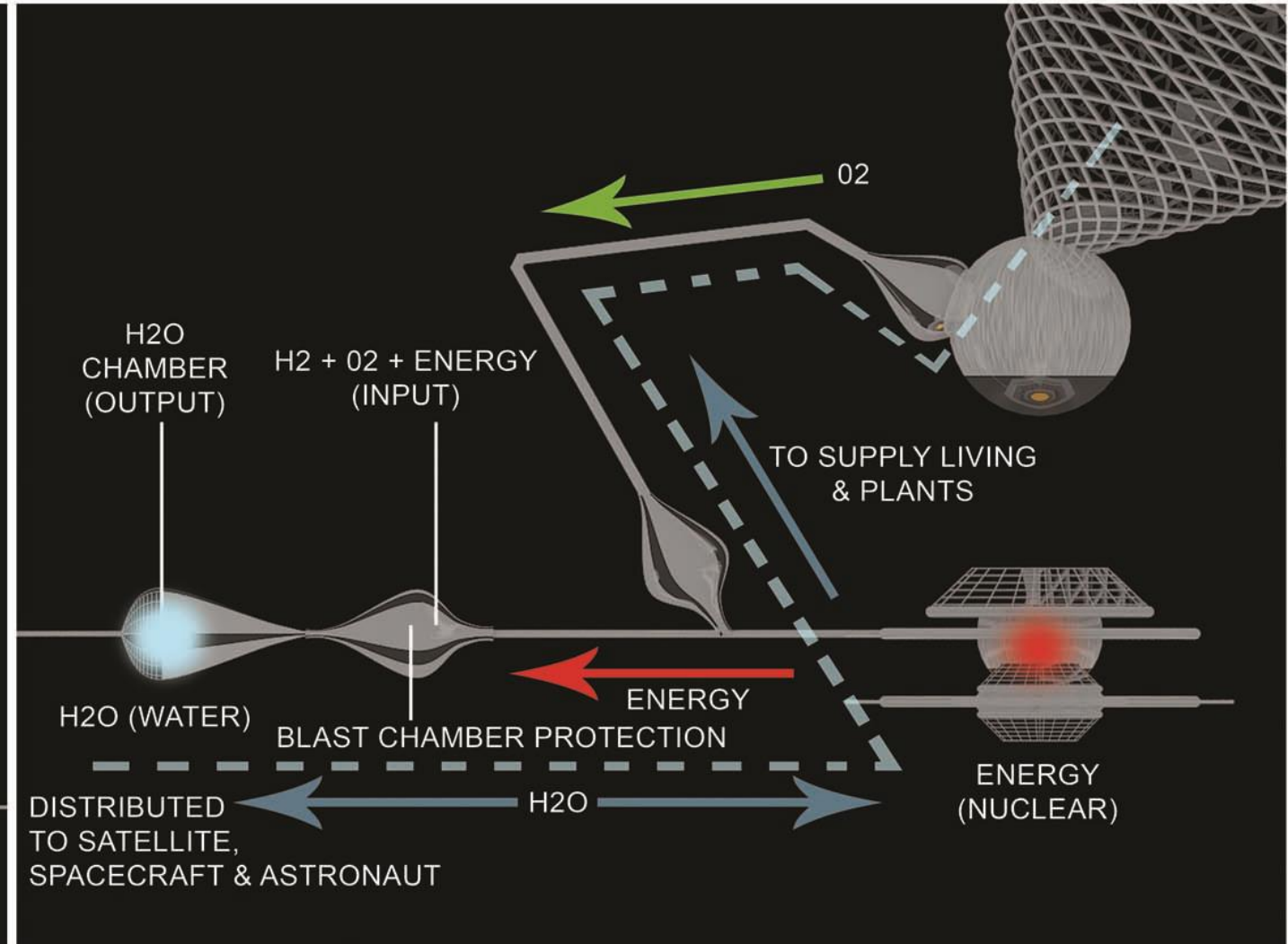
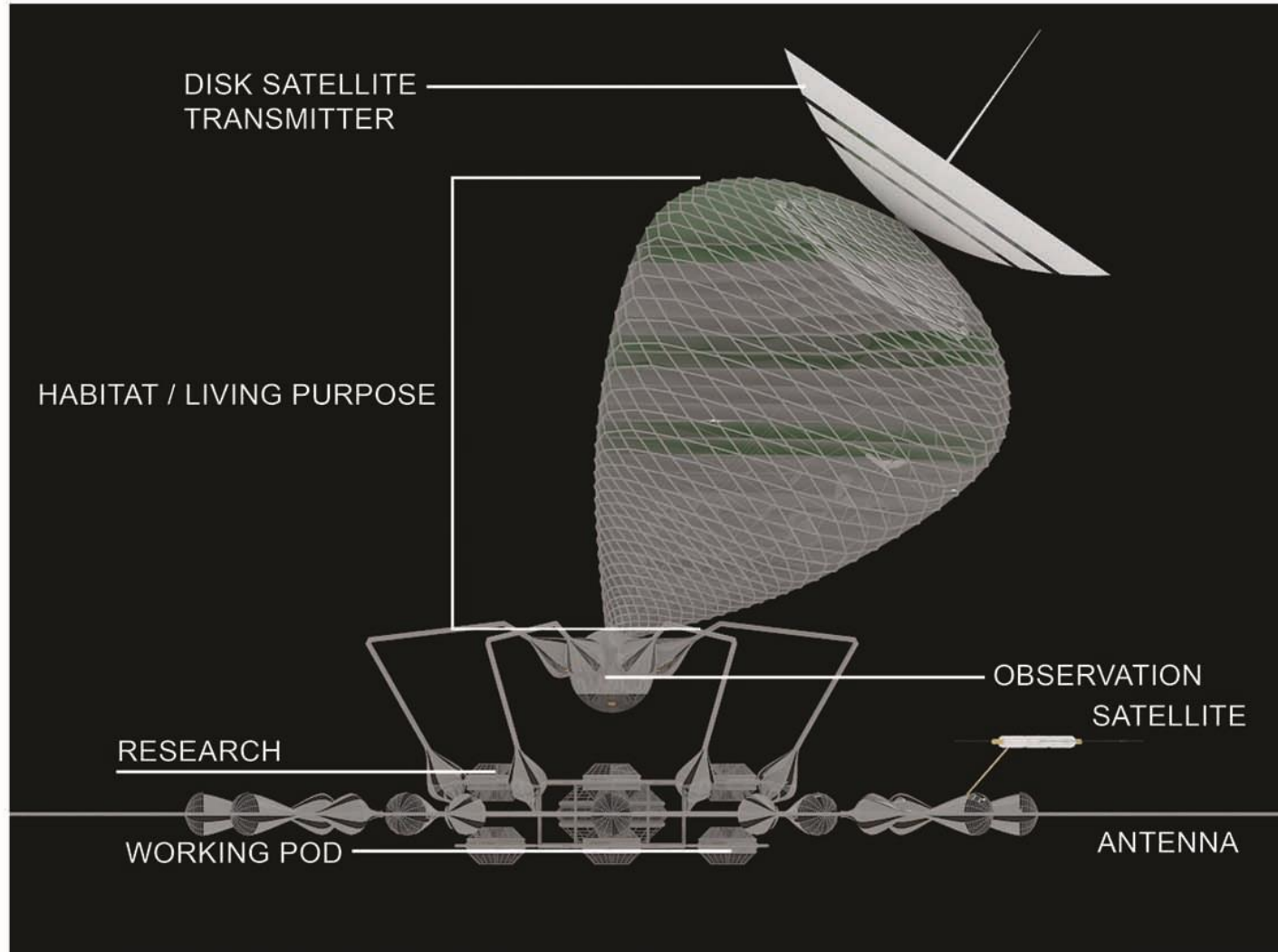
In English, the equation says: To produce two molecules of water (H<sub>2</sub>O), two molecules of diatomic hydrogen (H<sub>2</sub>) must be combined with one molecule of diatomic oxygen (O<sub>2</sub>). Energy will be released in the process.[11]

**The idea is to create a water station in space to supply the needs of astronauts as well as spacecraft and satellites. by combining the elements hydrogen and oxygen plus energy to produce water (H<sub>2</sub>O). The basic concept is inspired by Spider (Tarantula webs).**

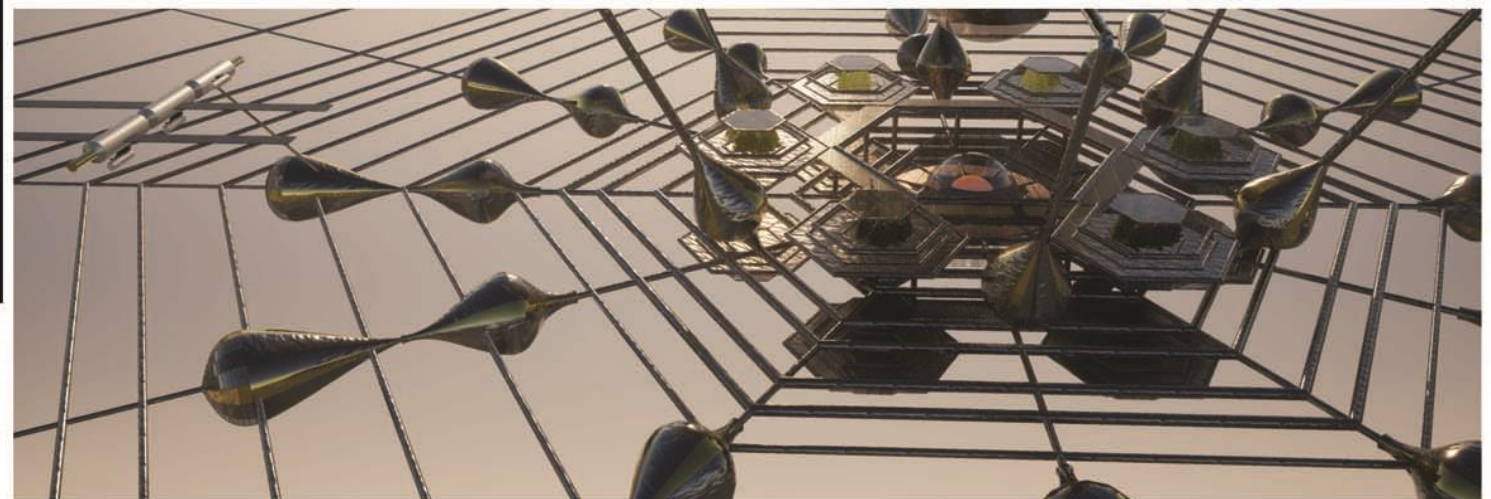




# TARANTULA SYSTEM



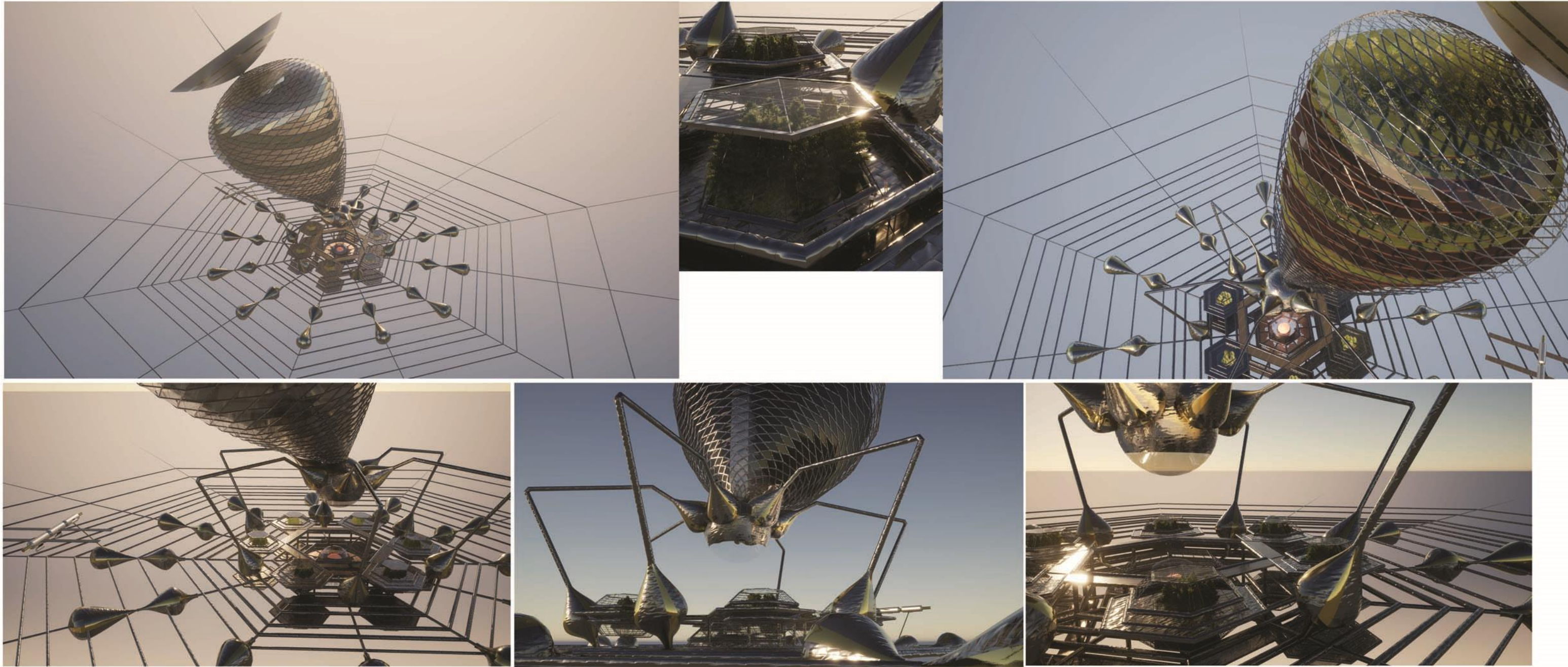
The process of hydrogen meeting oxygen and energy in an explosion-proof pod produces a small explosive reaction resulting in water vapor (H<sub>2</sub>O) which is stored in the pod. From the water pods will be distributed to satellites, astronauts and spacecraft. and distributed to human habitation areas and on plants. Plants grow and produce oxygen, and it is sent back to the pod for the water formation process. this process continues to go round.





# TARANTULA VISUALIZATION

Tarantulas orbit in space to serve as water supply stations for spacecraft, satellites and astronauts.



Water is useful for human life in space and for plants. With the water station, long-term travel in the future might be a solution for interstellar exploration.



## REFERENCE ARTICLES

1. (English) Philip Ball, Water and life: Seeking the solution, Nature 436, 1084–1085 (25 August 2005) | doi:10.1038/4361084a
2. (English) Water – The Essential Substance, Experimental Lakes Area, University of Manitoba
- 2a. Shultz, Stanley; Shultz, Marguerite (2009). The Tarantula Keeper's Guide. Hauppauge, New York: Barron's. p. 28. ISBN 978-0-7641-3885-0.
3. What are the Essential Ingredients of Life? Archived 06-06-2014 at the Wayback Machine., Natural History Museum, California Academy of Sciences
4. (English) Steven A Benner, Water is not an essential ingredient for Life, scientists now claim, SpaceRef.com[permanently disabled link], uplink.space.com Archived 11-09-2007
8. Palmer, David (November 13, 1997). "Hydrogen in the Universe". NASA. Retrieved 02-05-2008.
9. Staff (2007). "Hydrogen Basics — Production". Florida Solar Energy Center. Retrieved 02-05-2008.
10. (<https://www.ars.usda.gov/ARSTUserFiles/ott/New%20Website/Partnerships/SBIR%20-%20TT/Pancopia%20NASA%20Success%20Story.pdf>)
11. (<https://chemistry.illinois.edu/news/2007-12-31/scientists-discover-new-way-make-water>)
14. Re: What percentage of the human body is composed of water? Jeffrey Utz, M.D., The MadSci Network
15. "Healthy Water Living". Archived from the original on 2008-04-23. Retrieved 1 February.
16. "Lots of water 'is little benefit'". Retrieved April 6.
17. Rhoades RA, Tanner GA (2003). Medical Physiology (2nd ed.). Baltimore: Lippincott Williams & Wilkins. ISBN 0-7817-1936-4.
18. Are You Drinking Too Much Water? <https://health.detik.com/berita-detikhealth/d-1938409/apakah-anda-terlalu-banyak-minum-air>