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**NANO TECH**

## Tiny Computational Machine Fueled By DNA Wins Guinness Record

Tel Aviv - Feb 25, 2003

The device was awarded the Guinness World Record for "smallest biological computing device" Fifty years after the discovery of the structure of DNA, a new use has been found for this celebrated molecule: fuel for molecular computation systems.



life by the chip

The research, conducted by scientists at the Weizmann Institute of Science, will appear in this week's issue of Proceedings of the National Academy of Sciences USA (PNAS).

Whether plugged in or battery powered, computers need energy. Around a year ago, Prof. Ehud Shapiro of the Weizmann Institute made international headlines for devising a programmable molecular computing machine composed of enzymes and DNA molecules.

Now his team has made the device uniquely frugal: the single DNA molecule that provides the computer with the input data also provides all the necessary fuel.

The source of fuel of the earlier device was a molecule called ATP, the standard energy currency of all life forms. The redesigned device processes its DNA input molecule using only spontaneous, energy releasing operations. It breaks two bonds in the DNA input molecule, releasing the energy stored in these bonds as heat. This process generates sufficient energy to carry out computations to completion without any external source of energy.

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### Ariane 5 To Launch Space Tugs For Orbital Recovery Corp

Paris - Mar 3, 2003



Orbital Recovery Corporation has selected Ariane 5 as the primary launch vehicle for its Geosynch Spacecraft Life Extension System (SLESTM), signing an agreement with Arianespace to orbit at least four SLES space tugs beginning in 2005.

**COSMOLOGY**

### Researchers Conduct Most Sensitive Search For

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molecule, releasing the energy stored in these bonds as heat. This process generates sufficient energy to carry out computations to completion without any external source of energy.

A spoonful (5 milliliters) of "computer soup" can contain 15,000 trillion such computers, together performing 330 trillion operations per second with 99.9% accuracy per step. These computers need very little energy (all supplied, as mentioned, by the input molecule) and together release less than 25 millionths of a watt as heat.

The device was recently awarded the Guinness World Record for "smallest biological computing device."

### The study was carried out by Yaakov Benenson, Dr. Rivka Adar, Dr. Tamar Paz-Elizur, Prof. Zvi Livneh and Prof. Ehud Shapiro of the Institute's Biological Chemistry Department and the Computer Science and Applied Mathematics Department.

Prof. Ehud Shapiro's research is supported by the Dolfi and Lola Ebner Center for Biomedical Research, Yad Hanadiv, the Robert Rees Fund for Applied Research and the Samuel R. Dweck Foundation.

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**NANO TECH**  
**Sticky DNA Crystals Promise New Way To Process Information**  
 Minneapolis - Feb 12, 2003  
 Imagine information stored on something only a hundredth the size of the next generation computer chip--and made from nature's own storage molecule, DNA.



**Building Nano Sized DNA Structures**  
 Davis - Sep 19, 2002  
 A new method to make very small patterns of DNA molecules on surfaces has been developed by chemists at the University of California, Davis, and



**COSMOLOGY**  
**Researchers Conduct Most Sensitive Search For New Forces**  
 Boulder - Mar 03, 2003



University of Colorado at Boulder researchers have conducted the most sensitive search to date for gravitational-strength forces between masses separated by only twice the diameter of a human hair, but they have observed no new forces.

**EXO WORLDS**  
**Are There Earth-Like Planets Near Other Stars**  
 Heidelberg - Mar 03, 2003



The Max Planck Institute for Astronomy in Heidelberg has organized the first international conference with the emphasis on the space missions "DARWIN" and "Terrestrial Planet Finder"

**STATION NEWS**  
**ESA Takes It On The Chin As Euronauts Grounded**  
 Paris - Mar 03, 2003



The European Space Agency (ESA) has agreed to six-month post-ponements of the Soyuz flights by two members of its astronaut corps planned for April and October 2003.

**OPINION SPACE**  
**Is The Shuttle Fatally Flawed**  
 Prague - Mar 3, 2003



After the recent loss of the Space Shuttle



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**Process Information**  
Minneapolis - Feb 12, 2003  
Imagine information stored on something only a hundredth the size of the next generation computer chip--and made from nature's own storage molecule, DNA.



**Building Nano Sized DNA Structures**  
Davis - Sep 19, 2002  
A new method to make very small patterns of DNA molecules on surfaces has been developed by chemists at the University of California, Davis, and Wayne State University, Detroit. The technique could allow faster and more powerful devices for DNA sequencing, biological sensors and disease diagnosis.



**Using 'Nature's Toolbox,' A DNA Computer Solves a Complex Problem**  
Pasadena - Mar 18, 2002  
A DNA-based computer has solved a logic problem that no person could complete by hand, setting a new milestone for this infant technology that could someday surpass the electronic digital computer in certain areas.



**Is The Shuttle Fatally Flawed**  
Prague - Mar 3, 2003  
After the recent loss of the Space Shuttle Columbia, Americans and Israelis are mourning the tragic deaths of the seven-crew members. This is a tragedy not only for them but also for all of us, because the brave astronauts sacrificed their lives for the progress of all mankind.



The European Space Agency (ESA) has agreed to six-month postponements of the Soyuz flights by two members of its astronaut corps planned for April and October 2003.

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