HY YAHOO! 3 RSS RxPG NEWS news channels for medical professionals Medical Health World **Special Topics** Research shaadi.com **Find your 2** Chat Chat Chat perfect partner in 6 <u>ه</u>: <u>ه</u>: Andalucia Photos Register Free) <u>Home</u> Last Updated: Nov 5, 2008 - 10:31:59 AM RSS Health **Latest Research Channel** Aging Research Article Asian Health **Events** subscribe to Latest Research newsletter LATEST RESEARCH **Fitness** EMAIL | PRINT Food & Nutrition Very cold ice films in laboratory reveal mysteries of universe Happiness Ads by Google Lab Protocols PHD Institute PHD Biology Graduate Job Men's Health Nov 5, 2008 - 5:00:00 AM Mental Health It is clear that biology does use physics, said Cartwright. Indeed, how could it not do? So **Occupational Health** we shouldn't be surprised to see that sometimes biological structures clearly make use of Parenting simple physical principles. Then, going back in time, it seems reasonable to posit that when life **Public Health** first emerged, it would have been using as a container something much simpler than today's cell **Sleep Hygiene** membrane, probably some sort of simple vesicle of the sort found in soap bubbles. This sort of Women's Health vesicle can be found in abiotic systems today, both in hot conditions, in the chemistry associated with 'black smokers' on the sea floor, which is currently favoured as a possible origin of life, but RSS Healthcare also in the chemistry of sea ice. **Africa** <u>Australia</u> By European Science Foundation, [RxPG] The universe is full of water, **Canada Healthcare** Molecular Biology Article options Market leader in the field of genome analysis services! mostly in the form of very cold ice films **China Healthcare** www.eurofinsdna.com/home deposited on interstellar dust particles, Email to a Friend **India Healthcare Biomedical Science (Bsc)** but until recently little was known about New Zealand University of Bedfordshire Degree starting in September Printer friendly version the detailed small scale structure. Now South Africa 2008 the latest quick freezing techniques www.beds.ac.uk Latest Research channel RSS <u>UK</u> coupled with sophisticated scanning Molecular Biology Courses USA Effective Development Techniques Smaller Classes, More Latest Research news electron microscopy techniques, are World Healthcare **Better Instructors** allowing physicists to create ice films in www.cfpie.com cold conditions similar to outer space and observe the detailed molecular Latest Research Accredited DBA organisation, yielding clues to fundamental questions including possibly the Paris, New York, Tokyo, Shanghai Flexible schedules, E-Aging learning origin of life. Researchers have been surprised by some of the results, not **Alternative Medicine** www.ism.edu least by the sheer beauty of some of the images created, according to Julyan **Anaethesia** Ads by Google vv Cartwright, a specialist in ice structures at the Andalusian Institute for Earth **Biochemistry** Sciences (IACT) of the Spanish Research Council (CSIC) and the University **Biotechnology** of Granada in Spain. Cancer Express Interest >> 0 **Cardiology** Recent discoveries about the structure of ice films in astrophysical conditions . Contact Details >> **Clinical Trials** at the mesoscale, which is the size just above the molecular level, were Write to Her >> discussed at a recent workshop organised by the European Science Cytology Chat with Her >> Foundation (ESF) and co-chaired by Cartwright alongside C. Ignacio Sainz-Dental 🔄 View Horoscope >> Diaz, also from the IACT. As Cartwright noted, many of the discoveries about Dermatology ice structures at low temperatures were made possible by earlier research Embryology Payal, 23 into industrial applications involving deposits of thin films upon an underlying Spain Endocrinology More profiles in Spain substrate (ie the surface, such as a rock, to which the film is attached), such ENT as manufacture of ceramics and semiconductors. In turn the study of ice NRIs! Thousands of Indian profiles in Spain **Environment** films could lead to insights of value in such industrial applications. Epidemiology

Genetics temperatures far lower than even the coldest places on earth, between 3 and 90 degrees above absolute zero (3-90K). Most of the ice is on dust grains **Gynaecology** because there are so many of them, but some ice is on larger bodies such as asteroids, comets, cold moons or planets, and <u>Haematology</u> occasionally planets capable of supporting life such as Earth. At low temperatures, ice can form different structures at the **Immunology** mesoscale than under terrestrial conditions, and in some cases can be amorphous in form, that is like a glass with the molecules **Infectious Diseases** in effect frozen in space, rather than as crystals. For ice to be amorphous, water has to be cooled to its glass transition **Medicine** temperature of about 130 K without ice crystals having formed first. To do this in the laboratory requires rapid cooling, which **Metabolism** Cartwright and colleagues achieved in their work with a helium cold finger incorporated in a scanning electron microscope to take **Microbiology** the images. **Musculoskeletal** <u>Nephrology</u> As Cartwright observed, ice can exist in a combination of crystalline and amorphous forms, in other words as a mixture of order **Neurosciences** and disorder, with many variants depending on the temperature at which freezing actually occurred. In his latest work, Cartwright **Obstetrics** and colleagues have shown that ice at the mesoscale comprises all sorts of different characteristic shapes associated with the temperature and pressure of freezing, also depending on the surface properties of the substrate. For example when formed on a **Ophthalmology** titanium substrate at the very low temperature of 6K, ice has a characteristic cauliflower structure. **Orthopedics Paediatrics** Most intriguingly, ice under certain conditions produces biomimetic forms, meaning that they appear life like, with shapes like **Pathology** palm leaves or worms, or even at a smaller scale like bacteria. This led Cartwright to point out that researchers should not assume **Pharmacology** that lifelike forms in objects obtained from space, like Mars rock, is evidence that life actually existed there. If one goes to another **Physiology** planet and sees small wormlike or palm like structures, one should not immediately call a press conference announcing alien life

shaadi.com Register Free) Gastroenterology But the ESF workshop's main focus was on ice in space, usually formed at

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Psychiatry has been found, said Cartwright.

Radiology <u>Rheumatology</u> <u>Sports Medicine</u> <u>Surgery</u> <u>Toxicology</u> <u>Urology</u> <u>SMRSS</u> Medical News

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On the other hand the existence of lifelike biomimetic structures in ice suggests that nature may well have copied physics. It is
even possible that while ice is too cold to support most life as we know it, it may have provided a suitable internal environment for
prebiotic life to have emerged.

It is clear that biology does use physics, said Cartwright. Indeed, how could it not do? So we shouldn't be surprised to see that sometimes biological structures clearly make use of simple physical principles. Then, going back in time, it seems reasonable to posit that when life first emerged, it would have been using as a container something much simpler than today's cell membrane, probably some sort of simple vesicle of the sort found in soap bubbles. This sort of vesicle can be found in abiotic systems today, both in hot conditions, in the chemistry associated with 'black smokers' on the sea floor, which is currently favoured as a possible origin of life, but also in the chemistry of sea ice.

This is an intriguing idea that will be explored further in projects spawned by the ESF workshop. This may provide a new twist to the idea that life arrived from space. It may be that the precursors of life came from space, but that the actual carbon based biochemistry of all organisms on Earth evolved on this planet.

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