**GENERAL**

**EDUCATIFire and ice – a good place to searchON and OUTREACH**

**O for life?Jörn HelbertInstitute of PlN-GOING FLIGHT PROGRAM**

**FUTURE FLIGHT PROGRAM - ISSA PHASE I/II/III**

EXACT Investigatoanetary ResearchDLRRutherfordstrasse rs Present Results at LT-22

Two posters on the flight definition experiment Experiments Along Coexistence near Tricriticality (EXACT) were presented at the 22nd International Low Temperature Conference (LT-22) held in Helsinki in early August. Professor Norbert M2, 12489 BerlinGERMANYjoern.helbert@dulders of the University of Delaware, one of the co-investigators on Elr.de Creating a habitable environmenXACT, presented his work on deriving the equations for the propagation of heatt is a complex process involving a wi pulde variety of interacting processes. ses in miA prerequisite for any biological actxtures of helium-3 and helium-4. His poster was entivity is an energy source. The terresitled "A Nonlinear Wave Equation for Second-Sound Propagation in 3He-4He Mixtures". Also at LT-22, EXACT's work on developing a nano-Kelvin resolution thermometer for the temperatures below 1K was presented bytrial example of the black smokers sh Dr. John Panek of JPL. His poster was entitled "A High-Resolution Thermometer for the Temperature Range 0ows how efficient geothermal processe.75-1.0 K".

**ISSUES AND s are as an energy source.There is amCONCERNS**

**SCIENCE HIGHLIGHTS**

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Quantum tunneling across spin dople morphological evidence for continmains in a Bose-Einstein condensate.

**MIT Group uous and episodic volcanic activity oExplores Boundaryver the geological history of Mars. T between Domains in a Condensate**

Wolfganghe youngest ages determined by the cr Ketterle ofater size-frequency measurements are MIT reports about 2 Ma suggesting that the volcanthat a paper titled "Quantum tunneling across spin domains in a Bose-Einstein condeoes are potentially still active todansate" was recently published in Physical Review Letters (Phys. y. While there is no direct evidence Rev. Lett. **83**, 661-665 (1999)). The authors D.M. Stamper-Kurn, H.-J. Miesner, A.P. Chikkatur, S. Inouye, J. Stenger, for volcanic activity the likelihood and W. Ketterle dfor localized hot spot activity or hyescribe dynamics in a condensate condrothermal systems is very high.We hasisting of two immiscible components. In case of tve shown recently using thermo-physicwo immiscible fluids, gravity tries to localize the heavier fluid below thal modeling that a morphologically ide lighter one. When the entified glacial deposit on the northheavierwestern flanks of Hecates Tholus cont one is placed on top of the lighter one, a metastable situation arises. The analogous situation was prepared by the MIT group in a spinor Boains very likely still a stagnant icese-Einstein condensate, core. There are several units on Mar with a magnetic field gradient playing the role of gravity. For a sufficiently strong gradient, tunnels, especially on flanks of volcanic eing of one compondifices, which based on morphologicalent through the other was observed evidence may be glacial deposits and which are pand led to a stable equilibrium state. The observation of the tunneling rates provides a sensitive probe of the boundary existing between the two immiscible spin domains.

**UPCOMING EVENTS**