**GENERAL**

**EDUCATION and OUTREACH**

**ON-GOING FLIGHT PROGRAM**

**FUTURE FLIGHT PROGRAM - Fire and ice – a good plISSA PHASE I/II/III**

EXACT Investigators 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 Mulders of the University of Delaware, one of the co-investigators on EXACT, presented hace to search for life?Jis work on deriving the equations for the propagation of heat pulses in mixtures of helium-3 and helium-4. His poster was entitled "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 by Dr. John Panek of JPL. His poster was entitled "A High-Resolution Thermometer for the Temperature Range 0.75-1.0 K".

**ISSUES AND CONCERNS**

**SCIENCE HIGHLIGHTS**

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Quantum tunneling across spin domains in a Bose-Einstein örn HelbertInstitute of condensate.

**MIPlanetary ResearchDLRRutT Group Explores Boundary between Domains in a Condensate**

Wolfgang Ketterle of MIT reports that a paper titled "Quantum tunneling across spin domains in a Bose-Einstein condensate" was recently published in Physical Review Letters (Phys. Rev. Lett. **83**, 661-665 (1999)). The authors D.M. Stamper-Kurn, H.-J. Miesner, A.P. Chikkatur, S. Inouye, J. Stenger, and W. Ketterle describe dynamics in a condensate consisting of two immiscible componentsherfordstrasse 2, 12489 . In case of two immiscible fluids, gravity tries to localize the heavier fluid below the lighter one. When the heavier 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 Bose-Einstein condensate, with a magnetic field gradient playing the role of gravity. For a sufficiently strong gradient, tunneling of one component through the other was observed and led to a stable equilibrium state. The observation of the BerlinGERMANYjoern.helbetunneling ratert@dlr.de Creating a habs provides a sensitive probe of the bounditable environment is a complexary existing between the two immiscible spin domains.

**UPCOMING EVENTS**