**GENERAL**

**EDUCATIFire aON and OUTREACH**

**Ond iceN-GOING FLIGHT PROGRAM**

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

EXACT Investigato – a grs 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 Mood plulders of the University of Delaware, one of the co-investigators on Eace toXACT, presented his work on deriving the equations for the propagation of heat searc pulh for ses in milife?Jxtures of helium-3 and helium-4. His poster was entörn Heitled "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 bylbertI Dr. John Panek of JPL. His poster was entitled "A High-Resolution Thermometer for the Temperature Range 0nstitu.75-1.0 K".

**ISSUES AND te of CONCERNS**

**SCIENCE HIGHLIGHTS**

:

Quantum tunneling across spin doPlanetmains in a Bose-Einstein condensate.

**MIT Group ary ReExplores Boundarysearch between Domains in a Condensate**

WolfgangDLRRut Ketterle ofherfor MIT reports dstrasthat a paper titled "Quantum tunneling across spin domains in a Bose-Einstein condese 2, nsate" was recently published in Physical Review Letters (Phys. 12489 Rev. Lett. **83**, 661-665 (1999)). The authors D.M. Stamper-Kurn, H.-J. Miesner, A.P. Chikkatur, S. Inouye, J. Stenger, Berlinand W. Ketterle dGERMANescribe dynamics in a condensate conYjoernsisting of two immiscible components. In case of t.helbewo immiscible fluids, gravity tries to localize the heavier fluid below thrt@dlre lighter one. When the .de Crheaviereating 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 Bo a habse-Einstein condensate,itable with a magnetic field gradient playing the role of gravity. For a sufficiently strong gradient, tunnel enviring of one compononmentent through the other was observed is a complexand 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**