

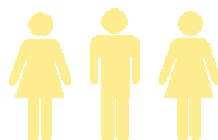
## SEMINAIRE SACM

20

Octobre 2006

11 H 00 Louis Salerno  
Cryogenics group  
NASA Ames Research Center  
Salle André Berthelot, Bât.141

# Cryogenics for Space Exploration



Cryogenic Fluid Management (CFM) is critical to NASA's Advanced Space Transportation programs. Current NASA concepts such as the Crew Exploration Vehicle (CEV), Orbital Transfer Vehicles (OTV), in-space cryogenic propellant depots, and planetary exploration all require sophisticated cryogenic propellant storage systems. Optimizing tankage and developing hybrid systems (passive and active cooling) reduces the initial mass to Low Earth Orbit (IMLEO), and thus allows a greater payload capacity for either scientific instruments or humans. Minimizing cryogenic propellant losses through zero boil-off (ZBO) is crucial to NASA's long duration exploration missions and on-orbit propellant storage in depots. As well, a long-term human presence in space requires In-Situ Resource Utilization (ISRU). Propellant production, liquefaction, and storage on planetary surfaces is critical for making NASA's planned exploration missions economically feasible. This paper will provide an overview of cryogenic activities ongoing within NASA to support the US vision for space exploration. Topics include Zero Boil-Off (ZBO) Cryogen Storage for long-term space missions, in-space cryogenic propellant depots, and lunar surface applications, Lightweight high efficiency cryocooler development, distributed cooling systems for an efficient interface between a cryocooler and propellant tanks, and liquefier technology for both lunar and planetary ISRU systems.



Le café sera servi 15 minutes avant

NB : La présentation d'une carte d'identité ou d'un passeport est exigée à l'entrée du centre .  
Tous les auditeurs extérieurs sont priés de prévenir à l'avance de leur visite : Geneviève  
VERON, Tél. : 01 69 08 69 49 (UE : délai de 24h, hors UE : délai de 4 jours) .

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