

NASA

Fundamental Physics at JPL

***Presented to the
Fundamental Physics Investigator Workshop
Dana Point, CA***

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- ***Program Activities***
 - *JPL Update*
 - *NASA HQ Update*
- ***Low Temperature and Condensed Matter Physics Status***
- ***Laser Cooling and Atomic Physics Status***
- ***Gravitational Physics Status***
- ***Biological Physics Status***
- ***Use of Guest Investigators***
- ***Conclusions***

JPL Update

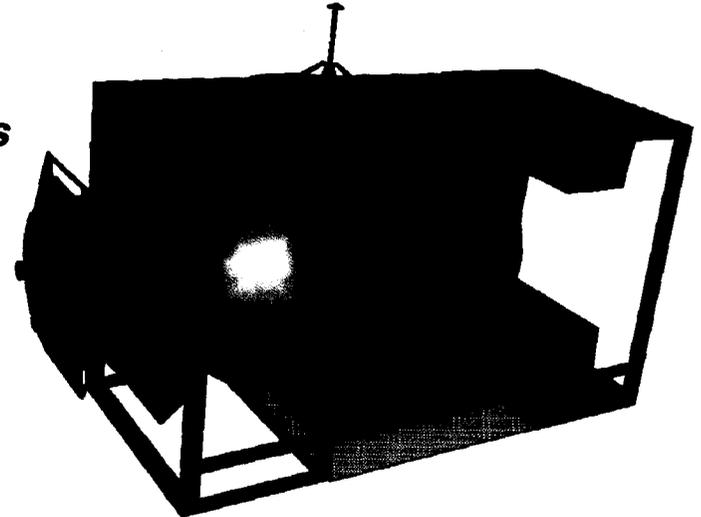
- Charles Elachi new Director
- Physicist Tom Prince new Chief Scientist
- Larry Simmons Assistant Lab Director for Astronomy and Physics
 - Fred O'Callaghan Program Manager for all Microgravity FP activities under Simmons

NASA HQ Update

- Mary Kicza new Associate Administrator for NASA's Office of Biological and Physical Research (OBPR) (Code U)
- ISS Payloads budget control transferred back to OBPR
 - Better protection from ISS vehicle problems
- Microgravity lead center role transferred back to HQ from MSFC
 - MSFC continue to support HQ in vital ISS and outreach functions
- NRA's now released annually.
 - 2001 NRA FP proposal deadline was April 12, 2002
- ISS Research Maximization and Prioritization Task force

Low Temperature and Condensed Matter Physics Status

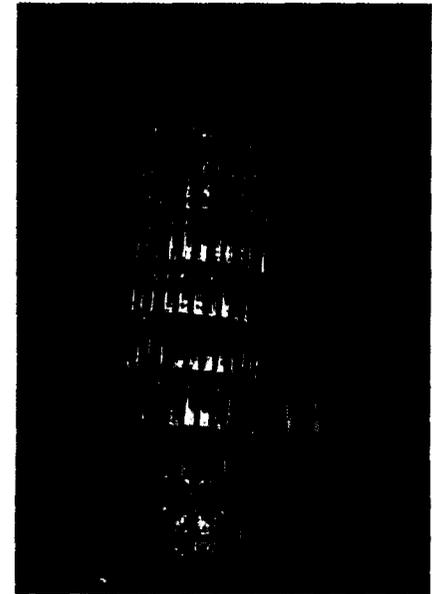
- **LTMPF has received budget authority for full flight development, following a Preliminary Design Review (PDR) last year**
- **Decision point for a second facility in 2003**
 - Will enable on-orbit swap-out every 16 months.
- **ISS slips has forced 7 month launch delay**
 - First LTMPF mission now 11/05
 - Additional delays very likely
- **Carrier for Shuttle transport to ISS remains unresolved**
- **Guest investigators for first mission selected from 00 NRA**
 - CQ (PI Goodstein) uses DYNAMX Instrument
 - COEX (PI Hahn) uses MISTE Instrument
 - Combined SCR/RDR held in May, 2002
- **NASA may select LTMPF-M3 candidate experiments from 01 NRA**
- **Critical Viscosity of Xenon (CVX-2) planned for Shuttle launch this summer**



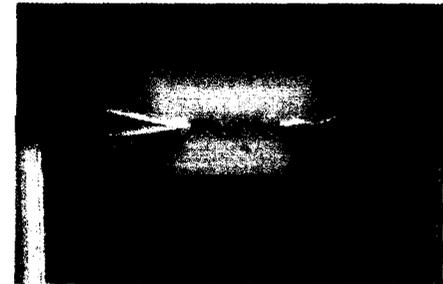
- **PARCS Requirements Definition Review (RDR) held last year**
 - Preliminary Design Review (PDR) scheduled in 2002
 - Authority for full flight development anticipated after PDR
- **RACE Science Concept Review (SCR) held last year**
 - RDR planned in 2003
- **ISS slips has forced further launch delay**
 - PARCS now targeted for 11/05
 - Additional delays very likely
- **Carrier for Shuttle transport to ISS remains unresolved**
- **New flight definition experiments selected from 00 NRA**
 - Condensate Laboratory Aboard the Space Station (CLASS) (PI Phillips)
 - Quantum Interferometer Test of Equivalence (QuITE) (PI Kasevich)
 - Combined SCR planned in 2003
 - Hardware development budget not yet in place
- **NASA may select additional flight definition experiments from 01 NRA**



- ***Satellite Test of the Equivalence Principle (STEP)***
 - One of the winners in the first phase SMEX selection
 - Phase 2 proposal submitted and site visit held at Stanford
 - Winners to be announced this summer
 - Continue making good progress on retiring technical risks
- ***Superconducting Microwave Oscillator (SUMO)***
 - Second flight of LTMPF delayed due to ISS slip
 - Continue instrument design activities
- ***New flight definition experiment selected from 00 NRA***
 - Test of the Principle of Equivalence using an Einstein Elevator (TPEEE) (PI Shapiro)
 - Balloon flight experiment
- ***NASA may select additional flight definition experiments from 01 NRA***
- ***JPL “thrust areas” under development***
 - ***Gravitational Physics (Code U)***
 - ***Gravitational Wave Astronomy (Code S)***



- *Seven ground investigations selected from the 2000 NRA*
- *NASA is asking the scientific community to justify need for experimentation in space*
- *If space justification can be documented, NASA is interested to select flight experiments from future NRAs*



- **Developing instruments for flight is a costly undertaking**
- **NASA and JPL want to ensure that instruments are utilized as efficiently as possible and that the investment in hardware is benefiting a wide scientific community**
- **One way is to allow guest investigations to use existing hardware**
 - **Similar to “observation time” on NASA telescopes**
 - **Will promote communication and collaboration with national and international scientists**
- **The requirements by a primary investigator determines the design of a new instrument**
- **A description of the instrument capability under development will be advertised in future NRAs, soliciting guest investigators to propose.**
- **Incorporation of guest investigations are not allowed to add any risk to the development of the primary investigator’s instrument**
- **Pilot program guest investigators have been selected to participate in the first LTMPF mission**
- **Interested in ideas on how to strengthen the guest investigator concept and how best to use in other sub-disciplines**
- **Discussion Session to be held Friday from 10:15 to 11:45**

- ***Need to maintain vitality in the research program - striving to simply maintain status quo is NOT adequate***
 - Explore new research directions in all sub-disciplines
 - Creative use of flight guest investigators
 - Pursue collaborations with Code S

- ***Need investigators advocacy support***
 - Outreach to public, NASA, and Congress
 - Relevance of science and technology
 - Weekly highlights and press releases are important

- ***Where we are currently pushing on the budget envelope***
 - STEP collaboration
 - Funding for CLASS and/or QUTE

- ***There is a bright future ahead for the discipline***

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