

ISS Research Status and Plans

European Space Agency Report

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- **Status Utilisation**
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 - ISS Increments 10,11,12
 - Longer Term: EML, IMPACT, MISS

Overall European Situation – ISS Related (1/2)

ISS Development Programme: Phasing out in 2004/05 with delivery of Columbus and ATV

ISS Exploitation Programme: - Period 1 (2002-2004): At ESA Council in May 2003 Ministers unblocked budget for time-critical activities: ATV + ARIANE Launches, ISS ground segment and User Support facilities
→ this demonstrates confidence of European politicians in stability of ISS programme

Overall European Situation – ISS Related (2/2)

- Period 2 (2005-2007) to be approved at next Ministerial Council in 2004/2005

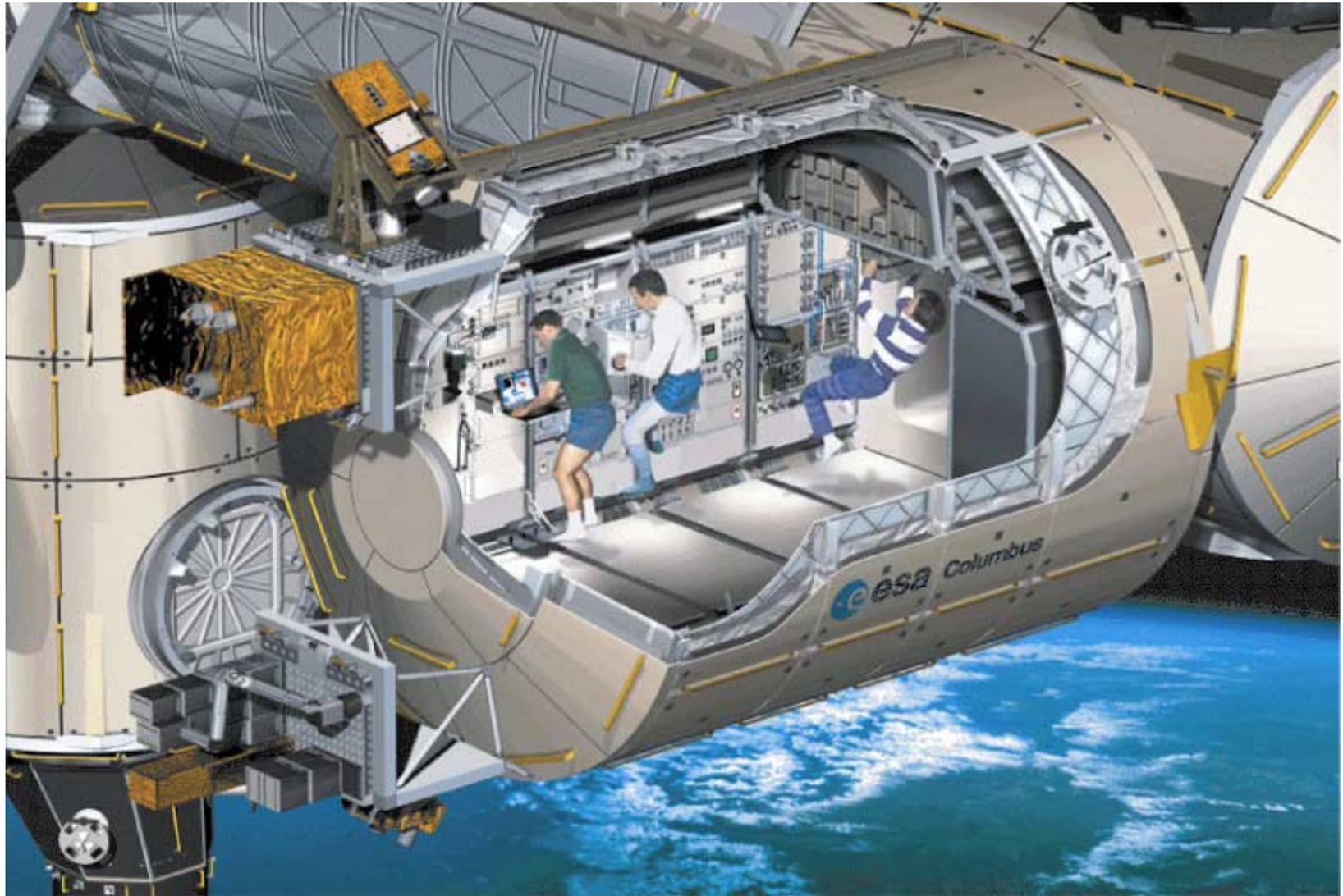
Elips Programme:
(Life & Physical Sciences)

- Implementation of approved programme (2002-2004)
- Preparation for ELIPS 2 (2005-2007) to be approved at next Ministerial Council 2004/2005



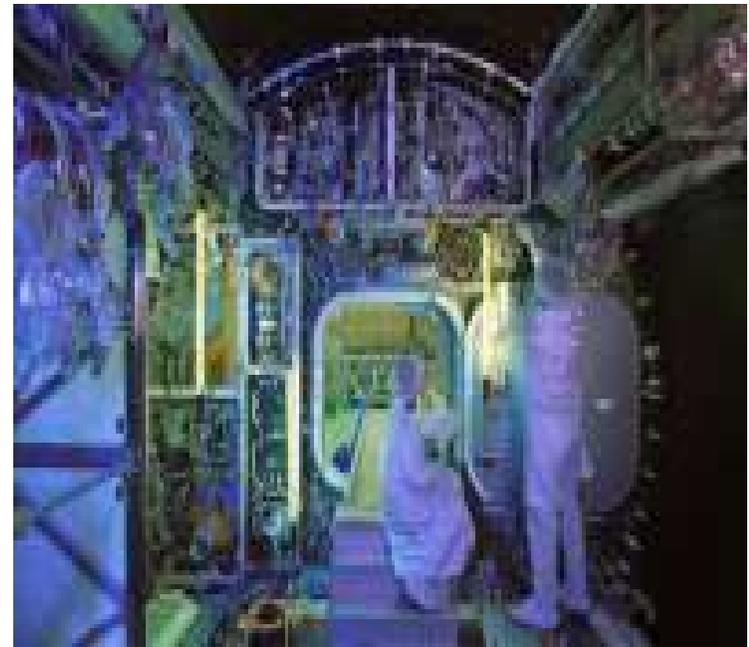
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Status Development (1/4)

Columbus Laboratory: FM Acceptance testing;
planned delivery to KSC
in March 2004
RLTF used for Biolab
testing.

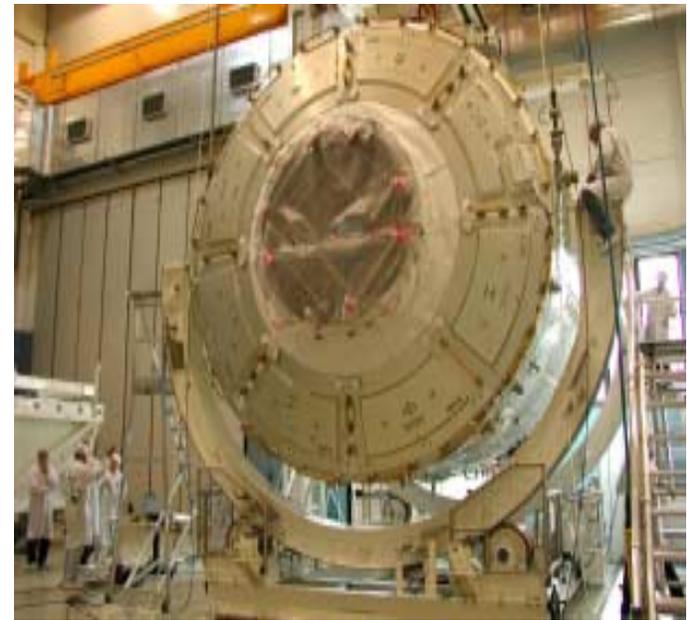


ATV (“Jules Verne”): FM Manufacturing and
integration is progressing
System CDR successfully
completed
Flight configuration for
ATV-1 on
Ariane 5: Vulcain 2 + EPS
upperstage
Launch date: 27 Sept. 2004



Nodes 2, 3:

Node 2 delivered to KSC on 1st June 2003; ongoing incoming inspection
Node 3 activities currently on hold



Cupola:

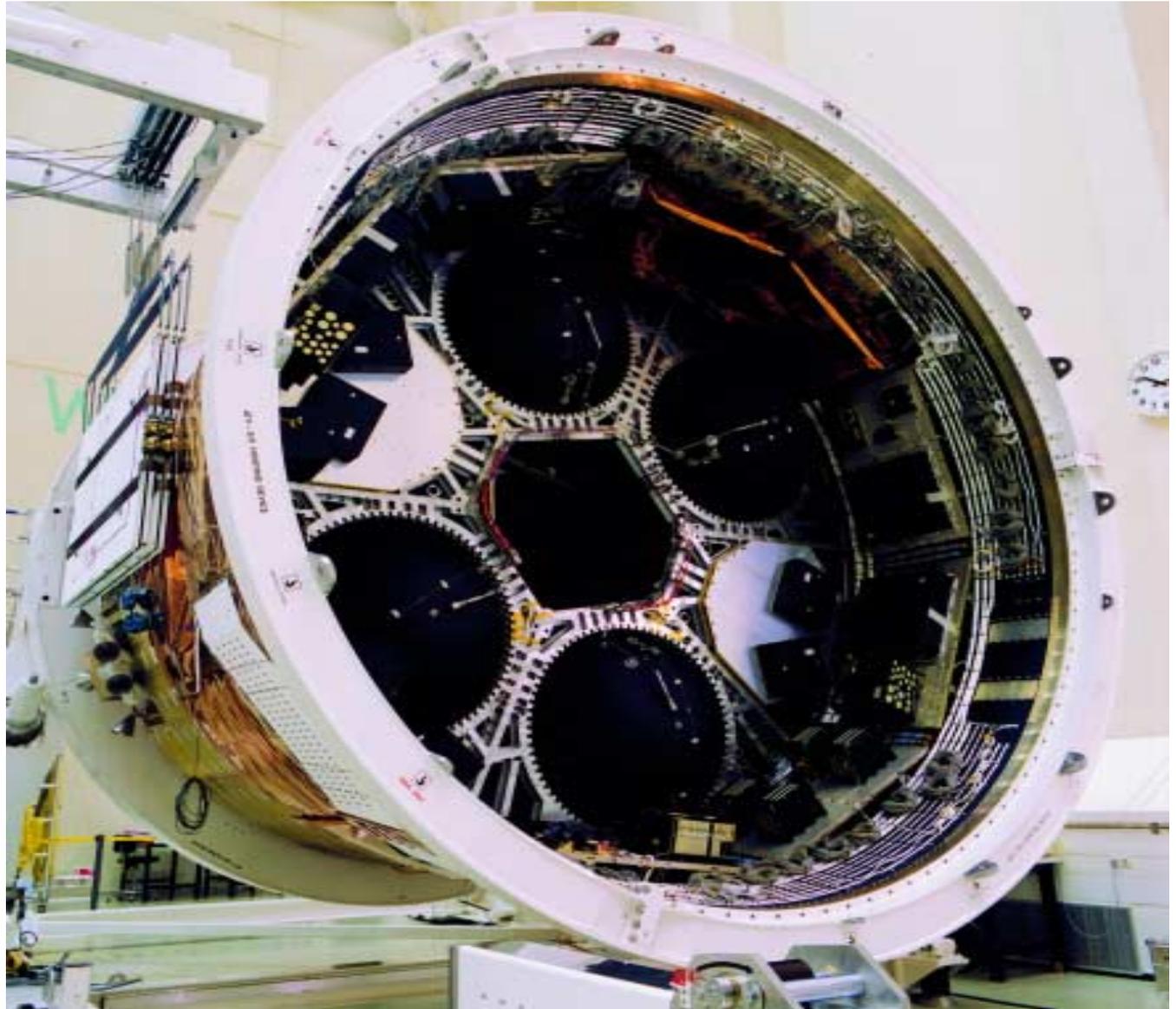
Primary structure proof test;
delivery of major subsystems for
out fitting; delivery to KSC
foreseen for November 2003

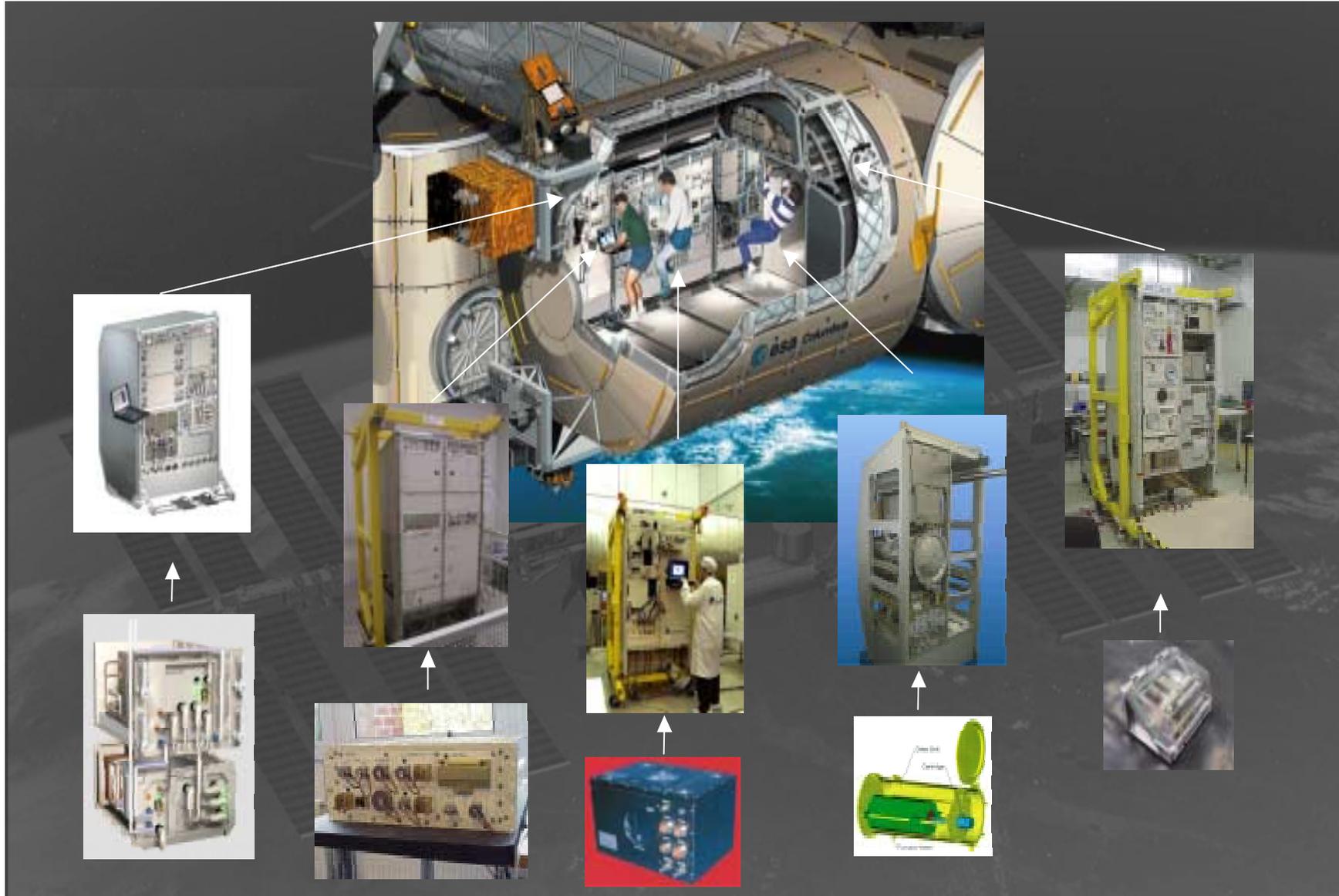




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Propulsion Module of ATV







Cryogenic Freezer

Phase B of CRYOS ongoing

EMCS and MSL:

Ready in 2003 for delivery to
NASA

Status Development (2/4)

MFCs and EDR: Biolab FM testing completed; FSL and EPM FM integration complete; EDR approaching finalisation; RLTF execution May-October 2003; subsequent COL integration and launch on 1E



Biolab Hardware Development



Centrifuge



Incubator (micro-vibrations test)



Optics

Electronics

Microscope



Automatic Handling Mechanism

Status Development (3/4)

MSG, MELFI, Freezer, Refrigerator



MSG back to nominal operations; MELFI to be de-integrated from MPLM and reinstalled 4,1/2 months before launch (ULF-1)
QM of Refrigerator/ Freezer completed



Status Development (4/4)

External Payloads:

First batch, on 1 E

EuTEF (CDR report finalised)

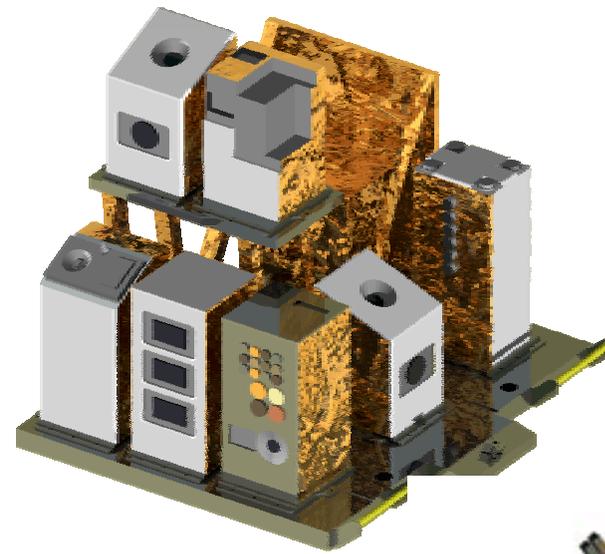
SOLAR (preparation for p/l
integrated design review)

Second batch, 2 years later

ACES (Pharao in phase C/D)

SPORT (phase B completed)

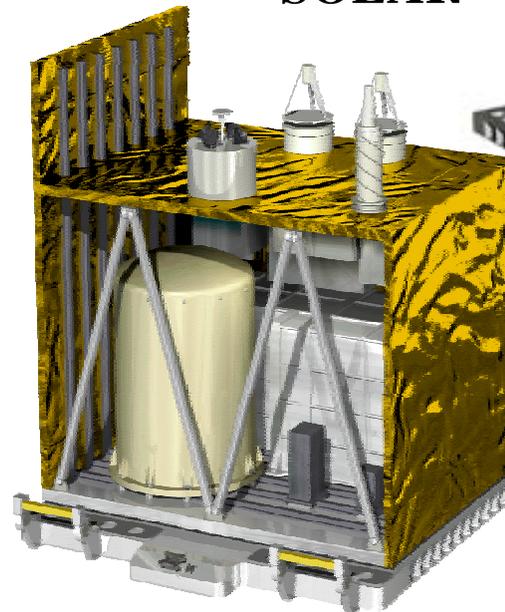
Call for 2005/06 external p/l
opportunities



EuTEF



SOLAR



ACES



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Expose and Matroshka
(on Russian ISS Segment):
Launch in 2004





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EUSO

Future external payloads

EUSO, Lobster, Rosita

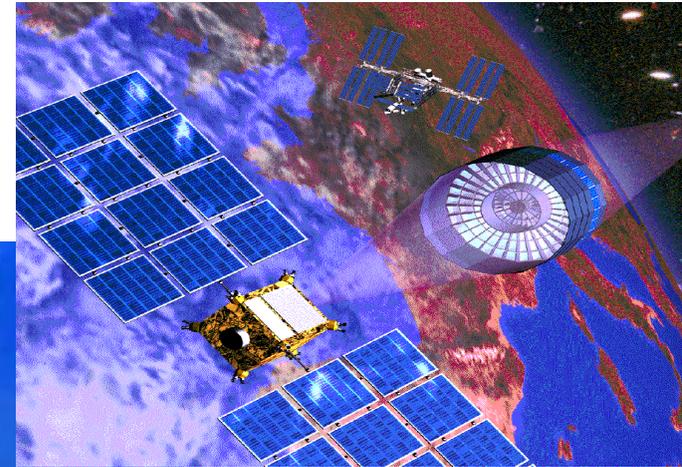
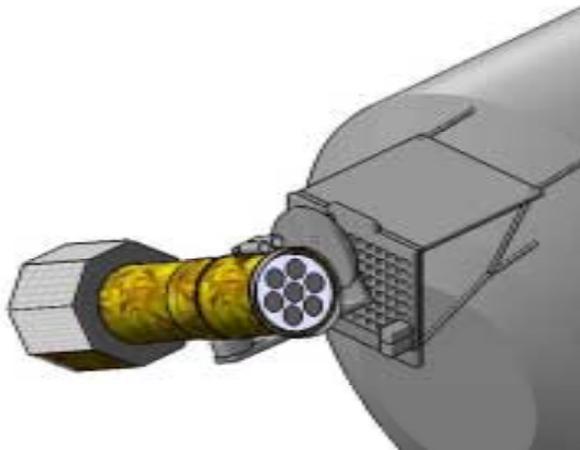
Xeus (long-term)



Lobster



Rosita



Xeus





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European Utilisation Platforms



Status Utilisation (1/4)

- Soyuz Missions

- Italien and Belgian missions in 4/2002 and 11/2002
- Spanish Soyuz Mission, October 2003
15 experiments in Life-, Physical Sciences, EO, Education
- Dutch Soyuz Mission, April 2004
18 experiments (composition still not finalised)

- Foton/Bion

- Foton M2 in 2005 reflight of Foton M1 experiments
- Foton M3 or Bion, in 2006
- Start of study on animal holding facility with Russia

Status Utilisation (2/4) ISS Utilisation Preparation / Planning

Planning still based on pre-Columbia assembly sequence

- EMCS (ULF 2): Phase A/B study for biology experiments underway; Phase C/D to start late 2003
- MSL (for MSRR1): Experiment cartridges development for delivery end 2004
- 1 E Launch: Preparation for Launch and commissioning launch readiness and mission management teams established;
5 ISPR payloads inside and 2 CEPA with external payloads

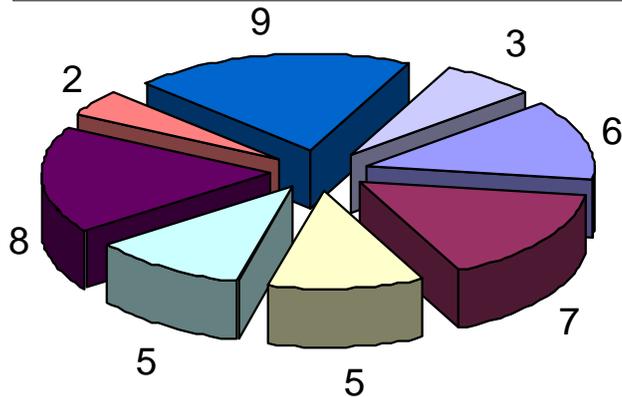


**European Modular
Cultivation System**

Status Utilisation (3/4)

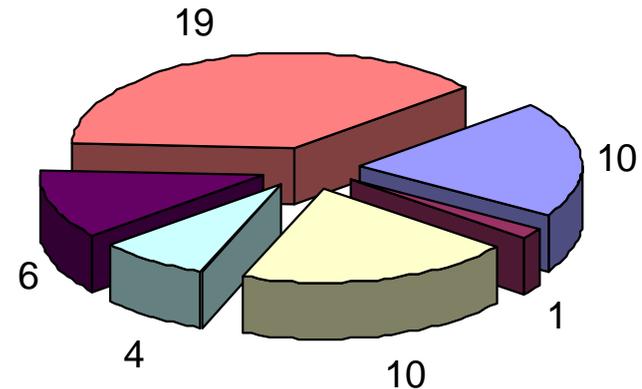
- Pressurized: experiments definition/ development for Biolab, FSL, EPM and EDR underway Phases A/B for first batches (increment 11) ongoing; C/D to start for delivery end 2004
 - Unpressurized: Solar, EUTEF instruments/ experiments development/ Integration underway
- Planning for increments 11, 12: experiments selected from existing data-base according to scientific priority, funding and readiness

- Plant Physiology
- Cell and Developmental Biology
- Biotechnology
- Integrated Physiology
- Bone and Muscle Physiology
- Neurosciences
- Origin, Evolution, and Distribution of Life
- Preparation of Human Planetary Exploration



**45 Life Sciences Projects
in Preparation for Initial
Columbus Utilisation
Phase (2004 - 2006)**

- Complex Plasmas and Dust Particle Physics
- Cold Atoms and and Quantum Fluids
- Fluids and Multiphase Systems
- Combustion
- Thermophysical Properties
- New Materials and Processes



**50 Physical Sciences Projects
in Preparation for Initial
Columbus Utilisation
Phase (2004 - 2006)**

Development of Experiment hardware for first batches of Experiments (about 30)
For EMCS, MSL, Biolab, FSL, EPM, EDR is underway

Status Utilisation (4/4)

Payloads for EDR or Facility Racks

- PCDF, FAST, Ferrofluids, Metallic Foams, BMTC
 - Payloads for Nasa CIR, CNES DECLIC
- Longer term: MSL-EML: Phase C/D to start end 2003
MISS (facility for animal research): Phase A/B underway
IMPACT (facility for complex plasma; dust aggregation - former IMPF/ICAPS): Phase B study released

Abbreviations

FM	- Flight Model
RLTF	- Rack Level Test Facility
ATV	- Automated Transfer Vehicle
EPS	- AR 5 Solid Booster (Etage de Propulsion Stockable)
MFC	- Microgravity Facilities for Columbus
FSL	- Fluid Science Laboratory
EDR	- European Drawer Rack
COL	- Columbus Laboratory
MSG	- Microgravity Science Glovebox
EMCS	- European Modular Cultivation System
MSL-EML	- Material Science Laboratory- Electro-Magnetic- evitator
EUTEF	- European Technology Exposure Facility

- ACES - Atomic Clock Ensemble in Space
- SPORT - Sky Polarisation Observatory
- ASIM - Atmosphere – Space Interaction Monitor
- PFS - Planetary Fourier Spectrometer
- EUSO - Extreme universe Space Observatory (high energy cosmic rays)
- LOBSTER - X-ray all sky monitor
- ROSITA - Roentgen – Survey with an Imaging Telescope Array
- ELIPS - European Life and Physical Sciences Programme
- EDR - European Drawer Rack
- MISS - Facility for Animal Research on ISS
- IMPACT - Facility for Complex Plasma and Dust Aggregation Experiments on ISS