



MELISSA

Waste Recycling with Plant Production

**Ch.Lasseur
(ESA)**

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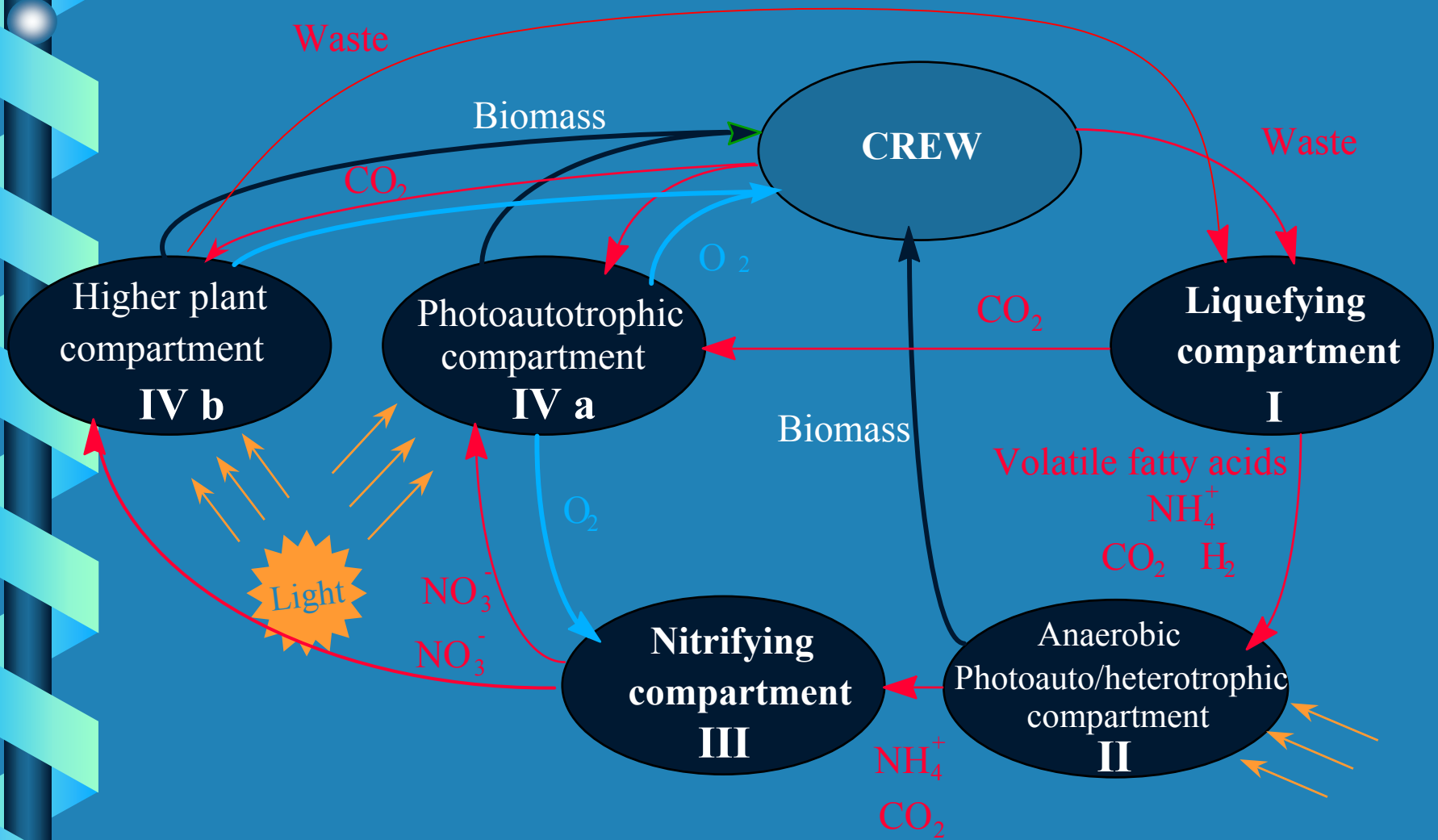


Introduction to MELISSA

The Concept:

- **MELISSA conceived as a micro-organisms and higher plant based Life Support system,**
- **Goals are the recovery of Food, Water and Oxygen from Waste and CO₂**
- **Global approach of the Life Support requirements**
- **Engineering approach of the Bio-processes,**

MELISSA Concept





Overview of MELISSA

History:

- **Project started in 1989 from the industry**
- **1991 creation of the ESA Laboratory,**
- **1993 signature a M.O.U. between partners,**
- **1995 Inauguration of the MELISSA Pilot Plant,**
- **1997 First Study for a space experiment**
- **1998 first continuous test with 3 linked compartments,**
- **2000 Two compartments connected at Pilot scale.**



Overview of MELISSA



The MELISSA partners:

- EPAS/University of Ghent (B),
- VITO/SCK, Mol (B),
- IBP/CNRS (F),
- ADERSA (F),
- University of Clermont Ferrand (F),
- Autonomie University of Barcelona (E),
- University of Guelph (CND),
- ESA.



Overview of MELISSA

Objectives of the Project:

- **Ground Demonstration of the Complete Loop,**
- **Preliminary Flight experiments,**
- **Preparation of an European Participation for future International manned space missions**
- **Integration of Associated Technology,**
- **Collaboration with terrestrial industry and technology transfer.**



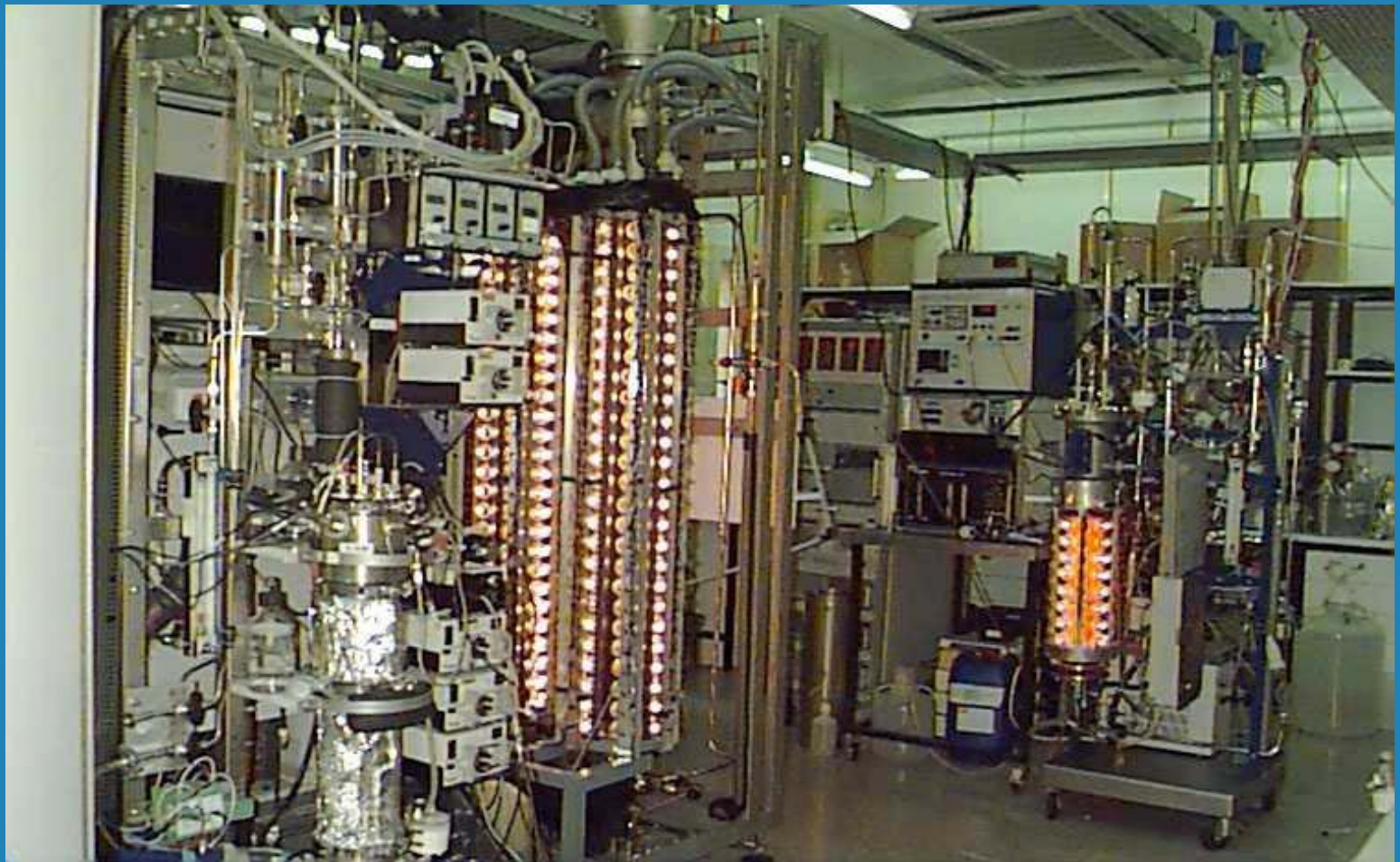
Overview of MELISSA

Future technical Milestones:

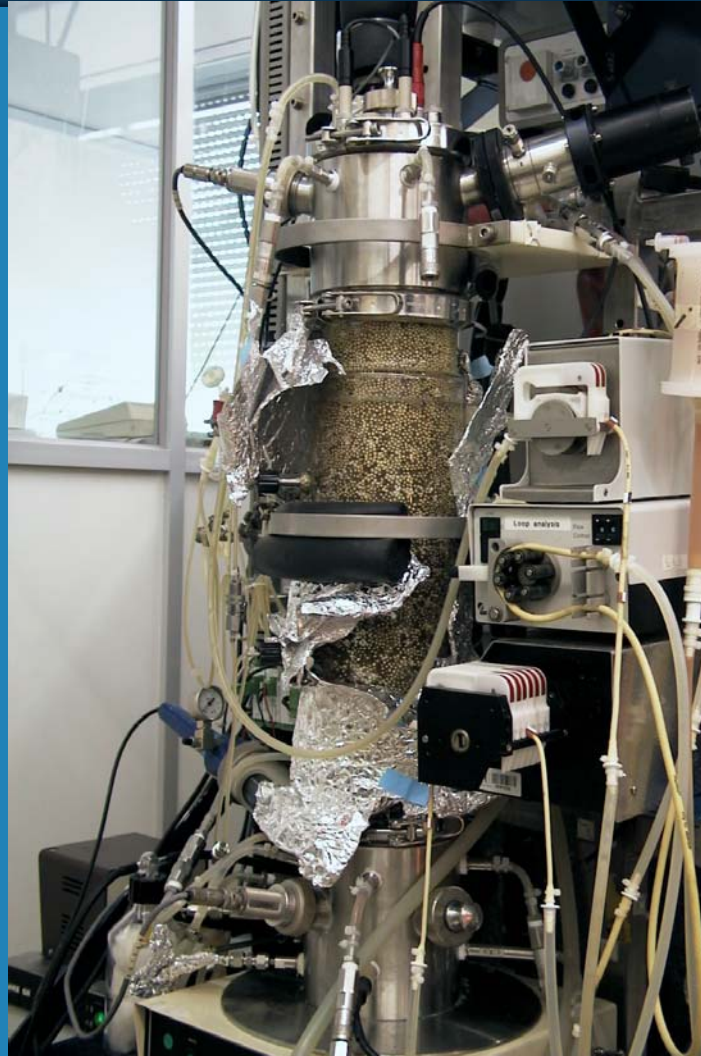
- **2000 Connection of 2 compartments at pilot scale,**
- **2002 Connection of 3 compartments,**
- **2004 Preliminary flight experiment,**
- **2005 Closure of the Loop with a consumer.**



The MELISSA Pilot plant



The nitrifying compartment





Overview of MELISSA

Conclusion

- **MELISSA Concept has been scientifically and technically demonstrated,**
- **Funds are partially identified for ground research and for preliminary flight experiments,**
- **There is a clear need to continue the ground research with the MELISSA partners and International collaborations.**



The MELISSA WEB page

<http://extids.estec.esa.nl/melissa/>