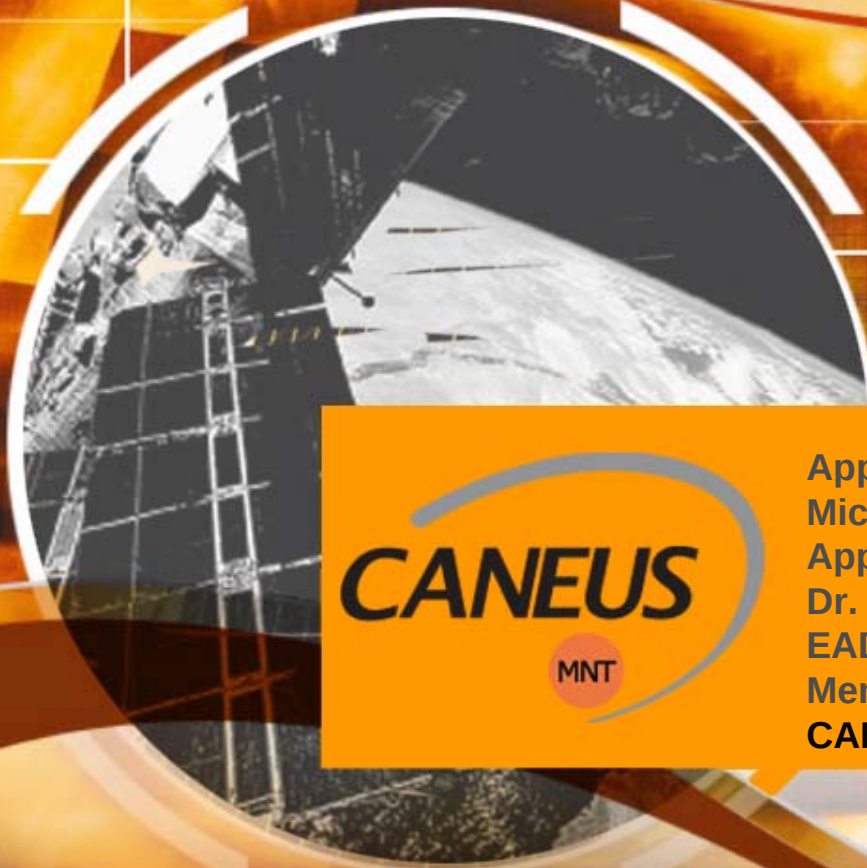
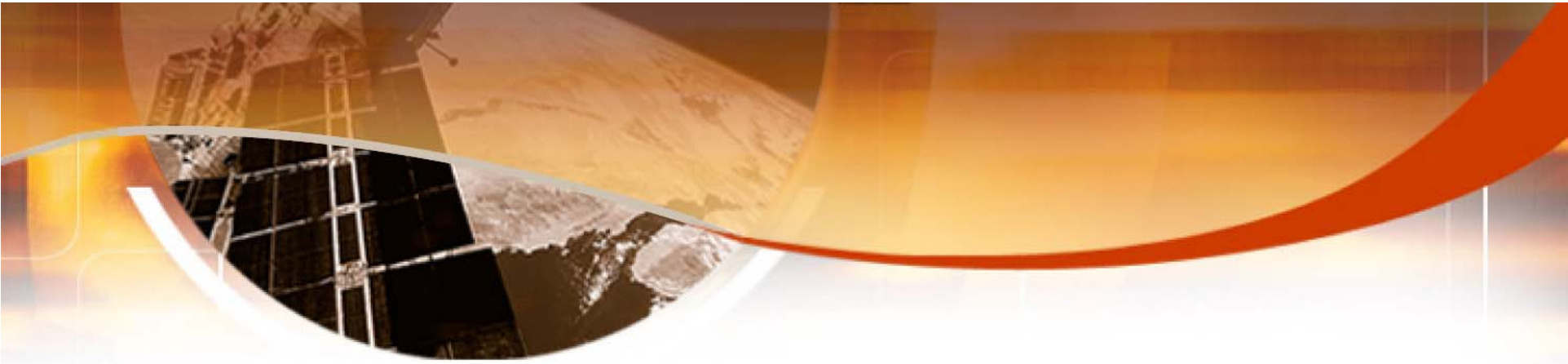




**Approach for Development and Commercialization of
Micro and NanoTechnologies for Aerospace
Applications
Dr. OUDEA Coumar
EADS-ST, and
Member of Board of Directors
CANEUS Organization**

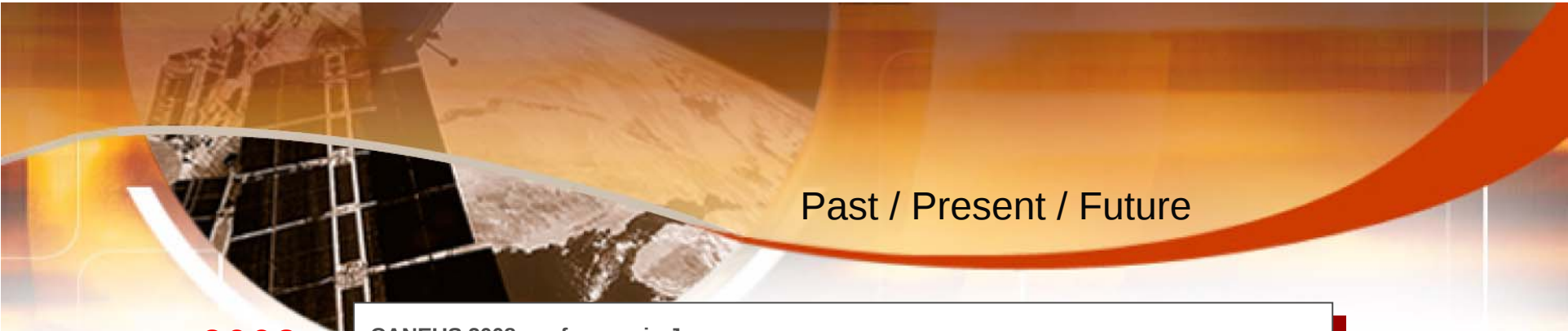


CANEUS

CANEUS began as a **CAN**adian, **EU**ropean and **USa** initiative
– it now includes Japan

- **Characteristics**

- An Existing and Functional International Network of Expertise in the Application of Micro and Nano Technologies to Aerospace Applications
- Commercialisation of Proven Concepts is the Objective
- **End Users Generate Market Pull at Identified Stages in the Process**



Past / Present / Future

2008

CANEUS 2008 conference in Japan.

2006

CANEUS 2006 conference in France.

2004

CANEUS Organization initiated a worldwide survey of potential MNT pilot project concept topics & 2004 conference was held on November 1-5 2004 in Monterrey, California.

2003

- CANEUS USA Inc. was founded and together with the AIAA and NASA,
- CANEUS developed the framework for MNT prototypes and programs.

2002

- Canada-CLS3 staged the historic CANEUS 2002 workshop in Montreal, Canada with the participation of 108 Speakers.
- International cooperation agreement covering Nano-Technology and Space was developed.

2001

Canada-CLS3 initiated and organized the First International Workshop on MEMS for Aerospace Applications with representation from NASA, DARPA and NEXUS-EU.

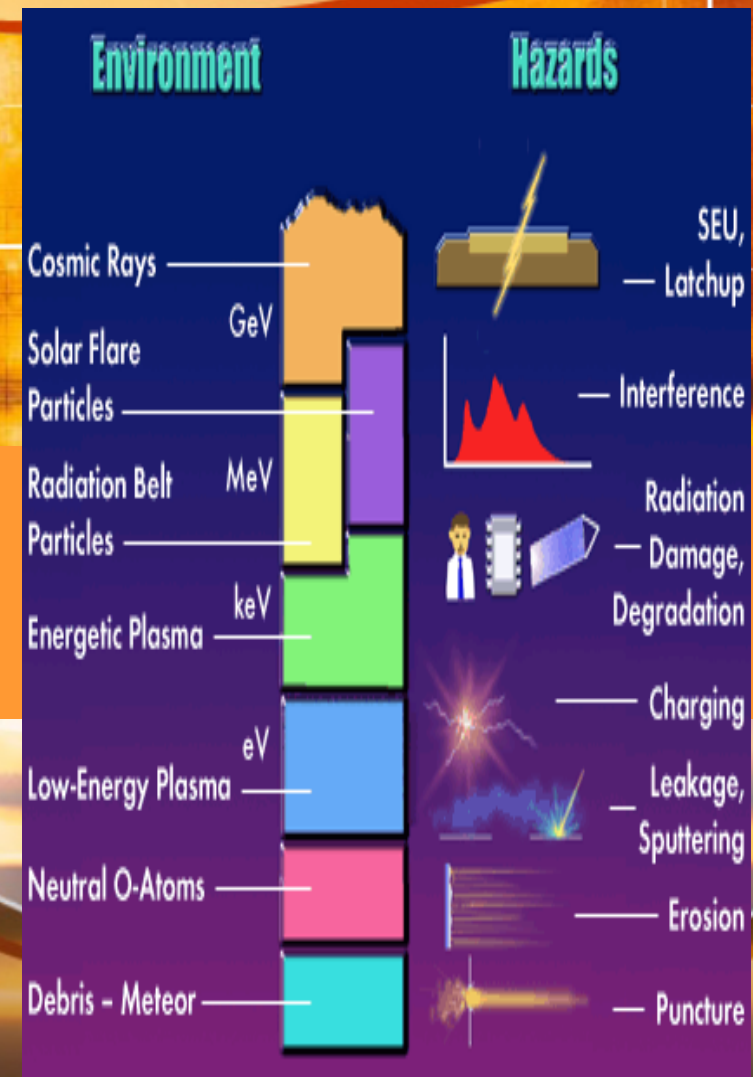
1999

Canada-CLS3 initiated and lead the international Consortium on MEMS/NEMS for Aerospace Applications.

Space specifications (1)

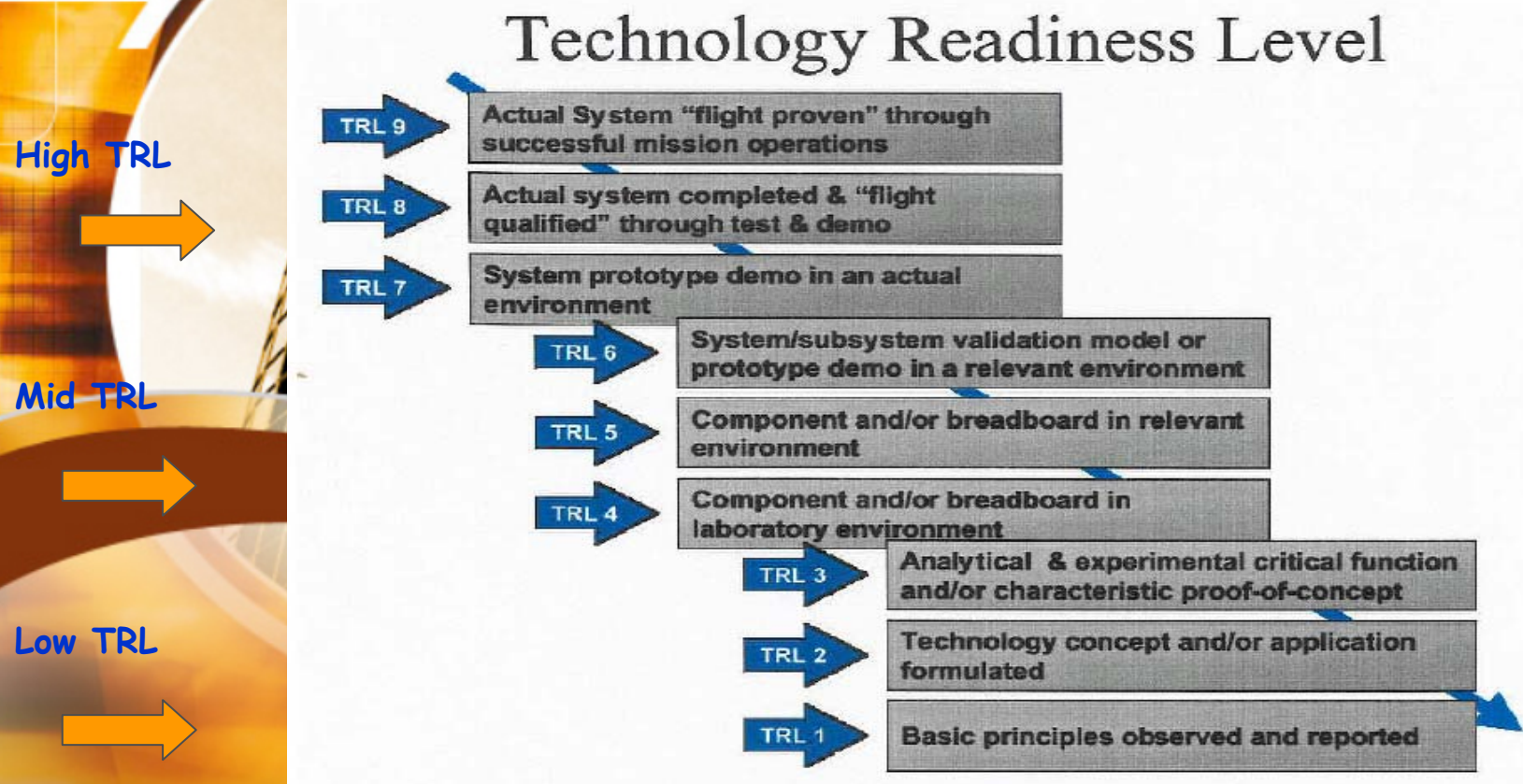
Launch and Space environments:

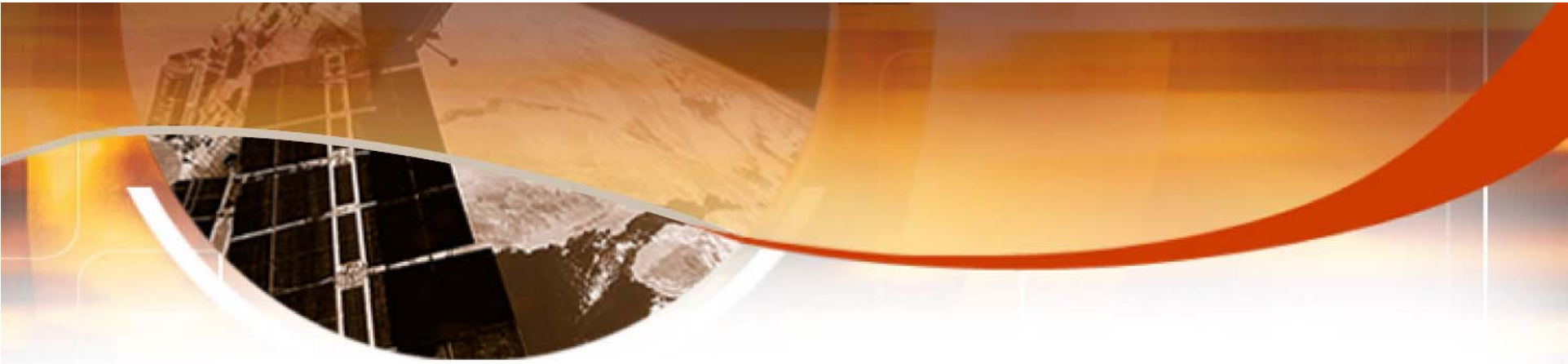
- Shock, vibrations, thermal
- Charged particle from electrons, protons, ...
- Lower orbits : erosion by atomic oxygen
- Irradiation from solar ultraviolet
- Contamination from out gassing
- Hypervelocity impacts
- Vacuum



Space specifications (2)

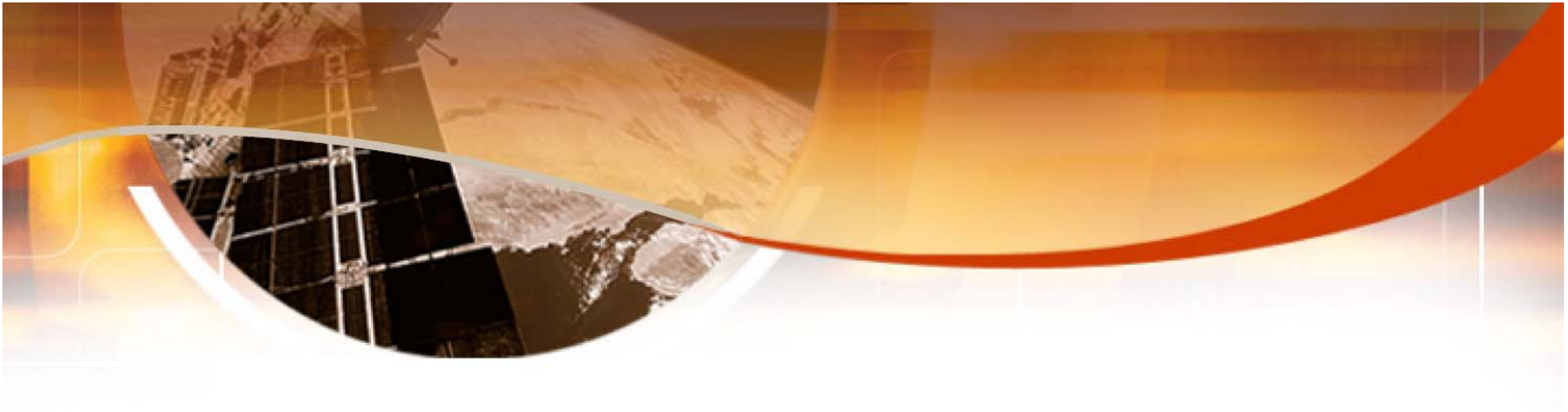
TRL (Technology Readiness Level) :





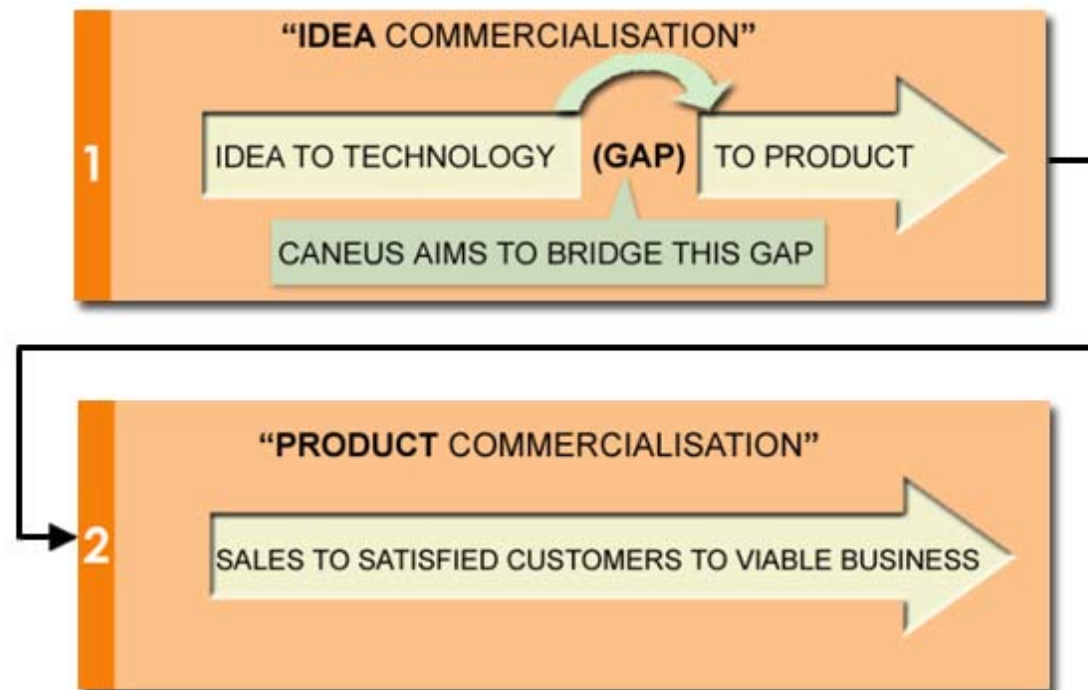
CANEUS History

- **CANEUS 2002 Montreal**
 - Developing the Nucleus of the CANEUS IDEA
- **CANEUS 2004 Monterrey**
 - Scan for Proven Concepts
 - Call for Commercialisation Frameworks
 - Review of First Commercialisation Frameworks from Proven Concepts
 - Selection of Priorities for Business Plans

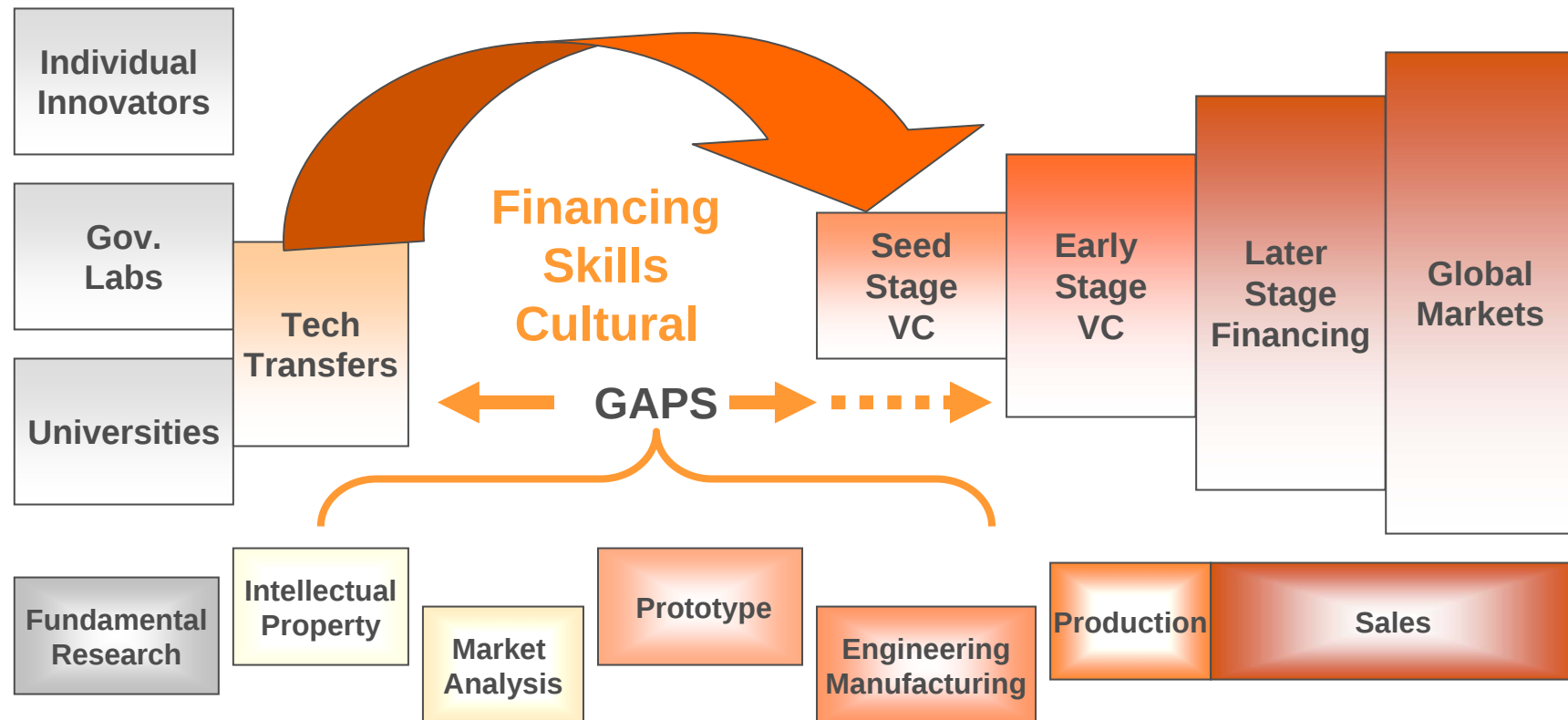


WHY CANEUS IS NEEDED

- The development model for MNT-based aerospace products and processes is currently a complex, inefficient process with a chasm at its centre.
- Promising MNT-based systems now emerge from a combination of Darwinian Evolution and Brownian Motion.
- This is an unsustainable model
- We propose its replacement as follows:

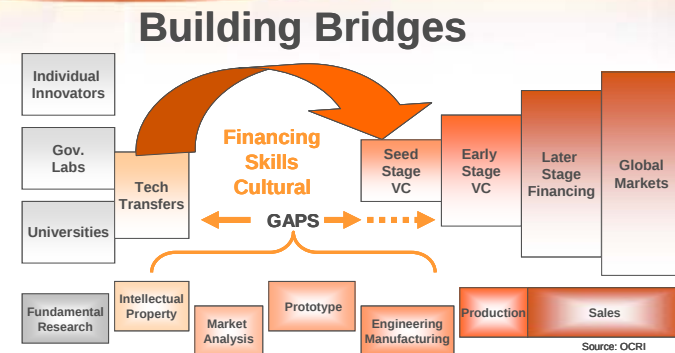


Building Bridges

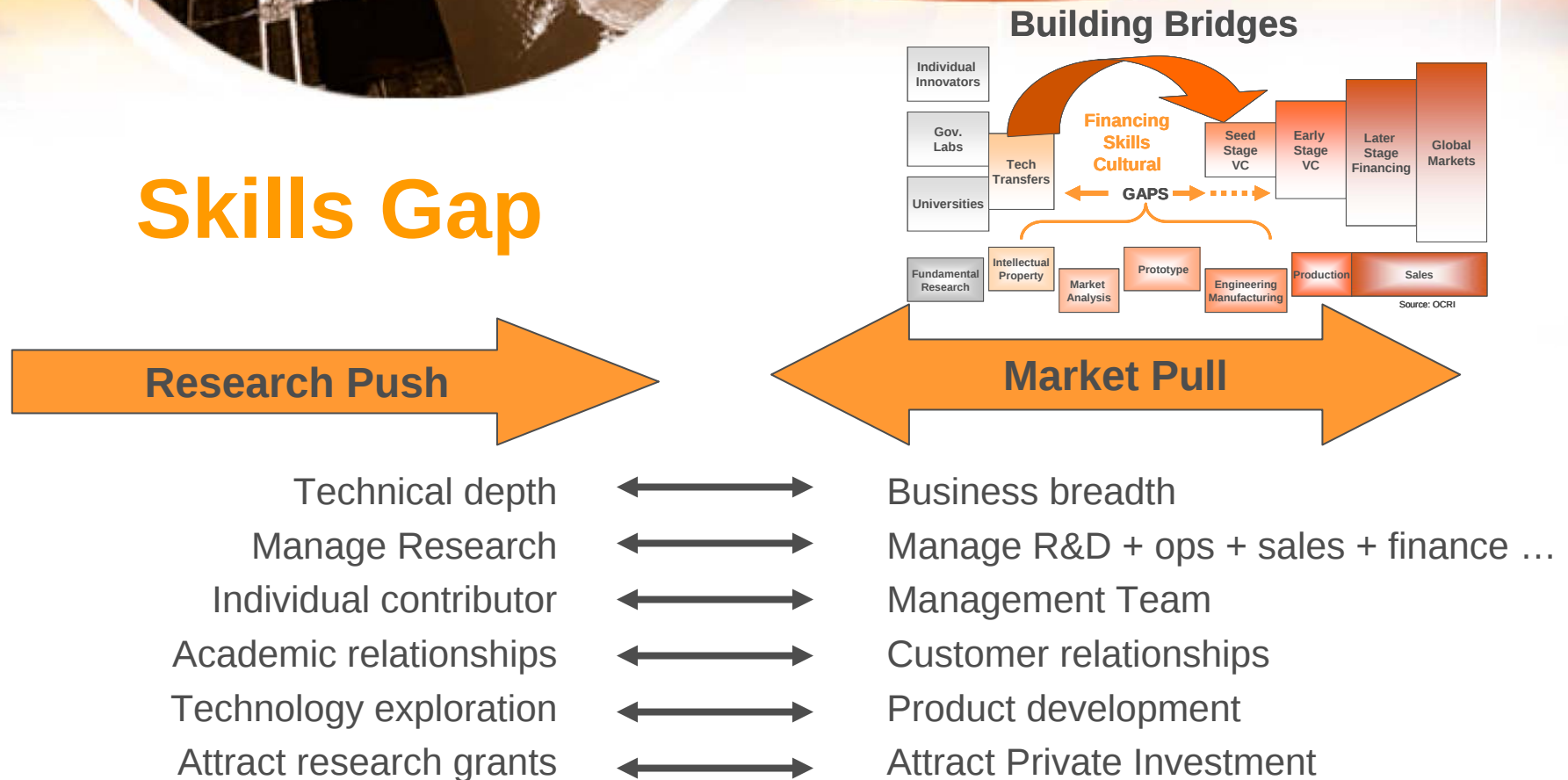


Financing Gap

- Very high opportunity management expenses
- Very long liquidity interval (8 – 10 years)
- Unattractive financial model, unacceptable VC returns
- VC's moving money to later stage deals
- Angels retreating



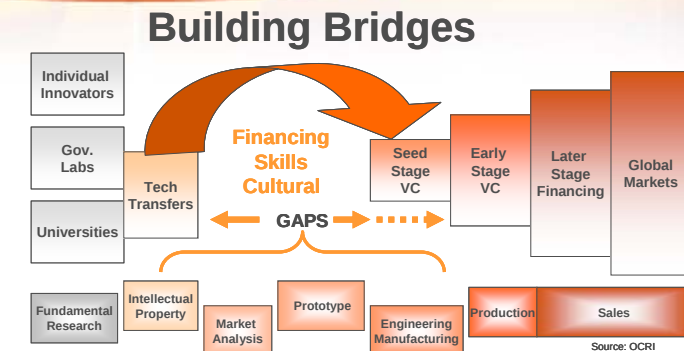
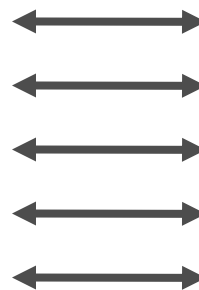
Skills Gap

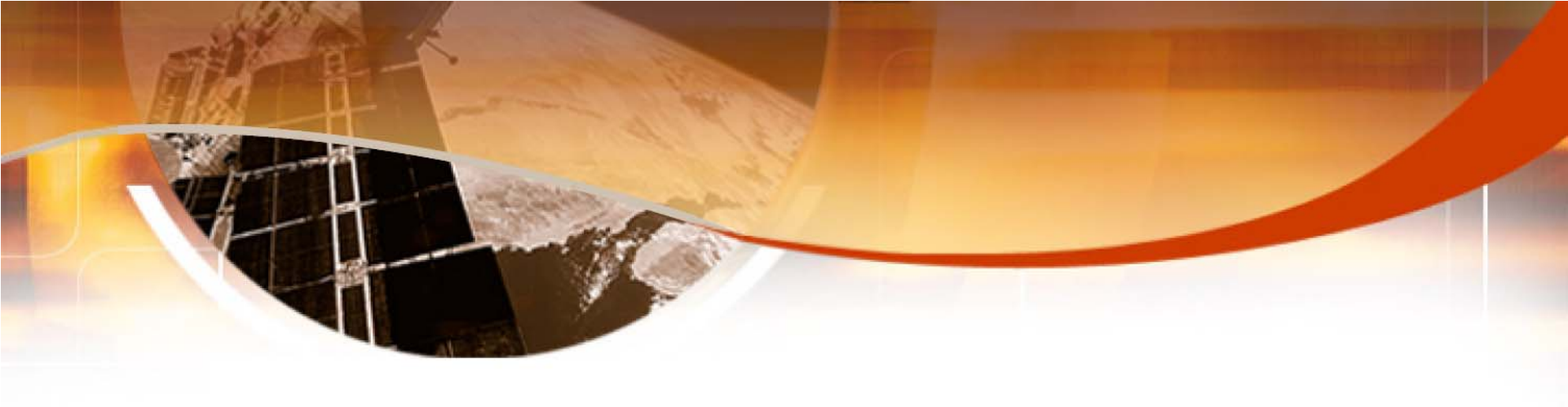


Cultural Gap



Idealism
Knowledge Discovery
Techno-centric
Sheltered environment
IP value perception

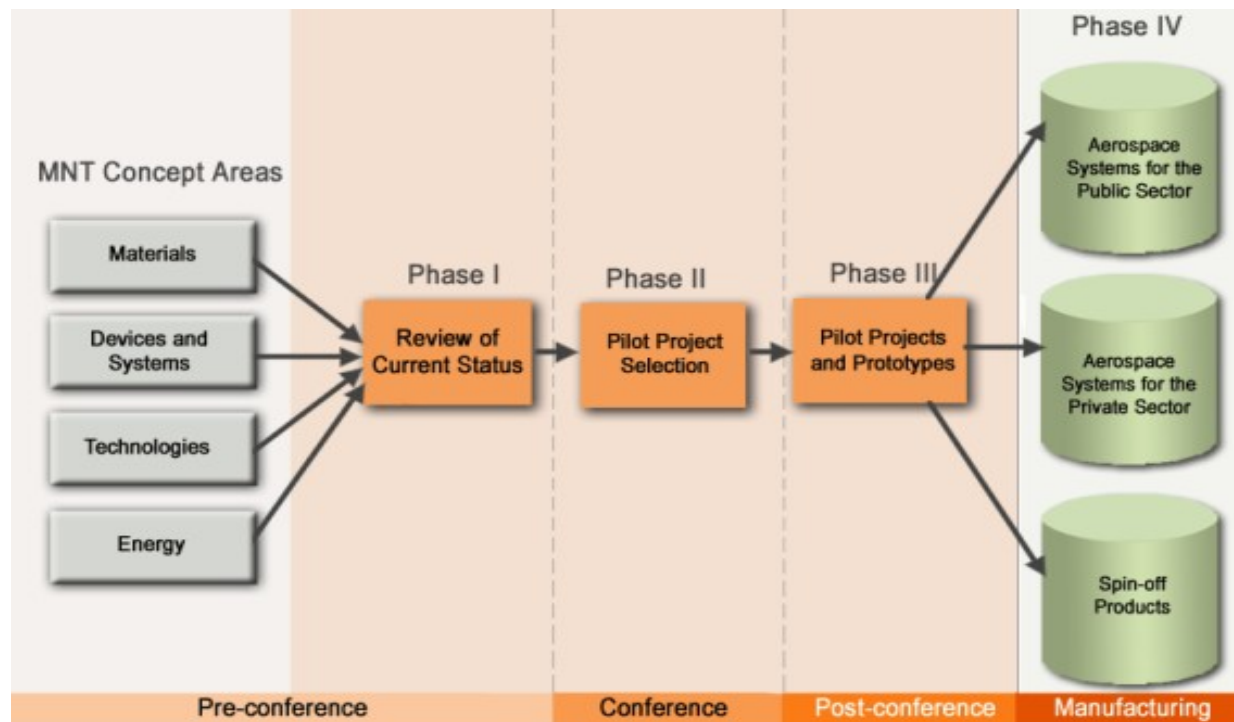




CANEUS Bridging Conferences

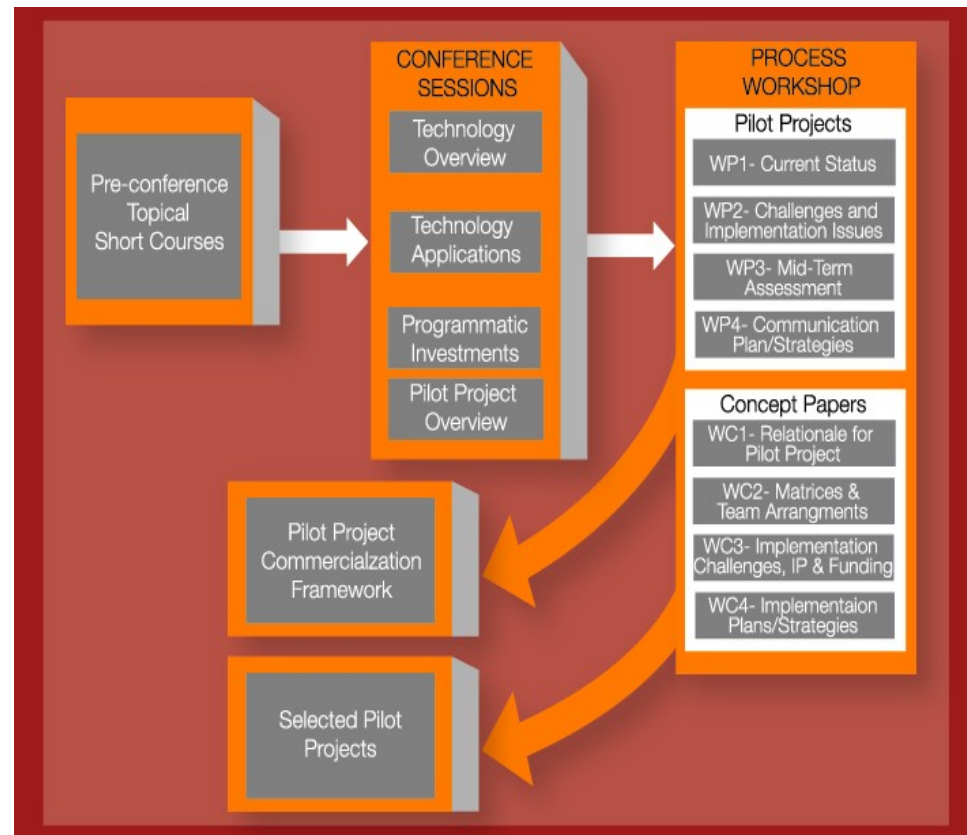
- Review Commercialisation Frameworks for Proven Concepts
- End User Feedback and Buy In
- Select Top Priorities for Business Plans
- Launch Business Plans as First Step to Creating New Firms

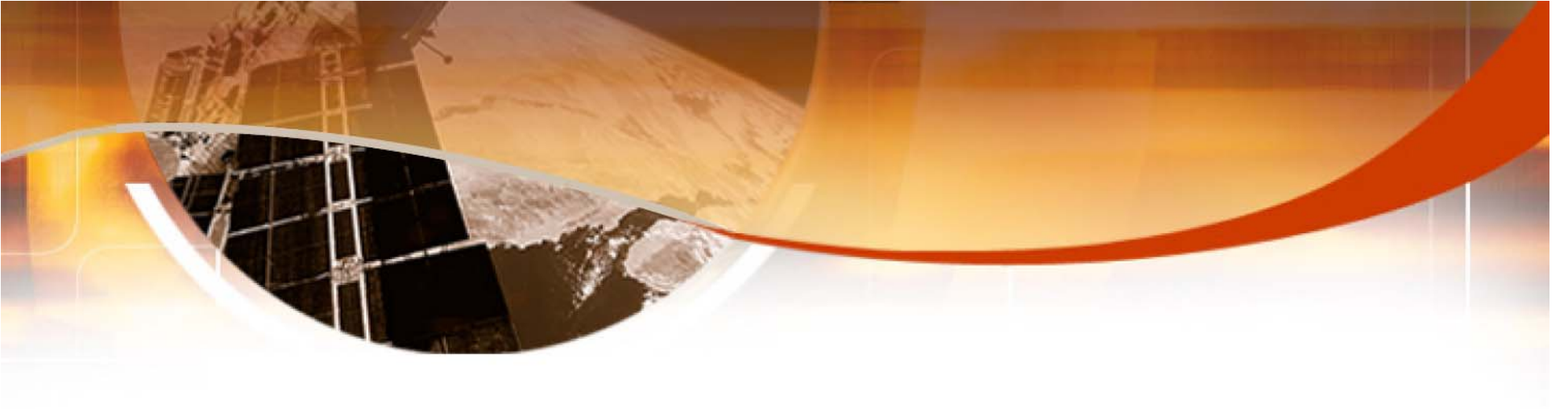
Concepts to Systems



CANEUS Conference Structure

CANEUS 2006:
Transition of MNT Concepts to systems
Toulouse, France.
Aug.27 – Sep.1, 2006

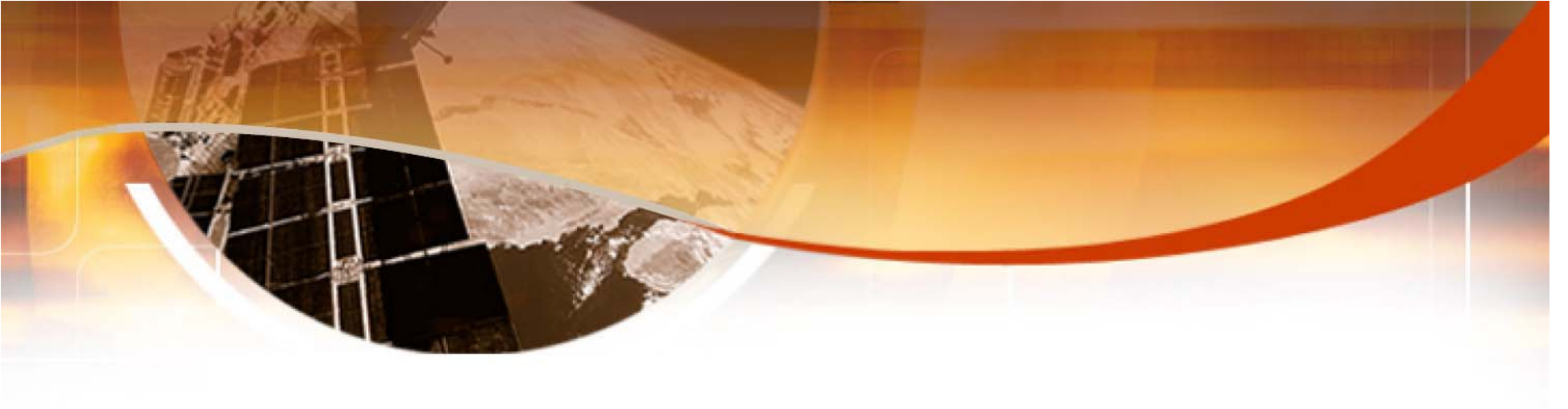




CANEUS 6-Step METHOD

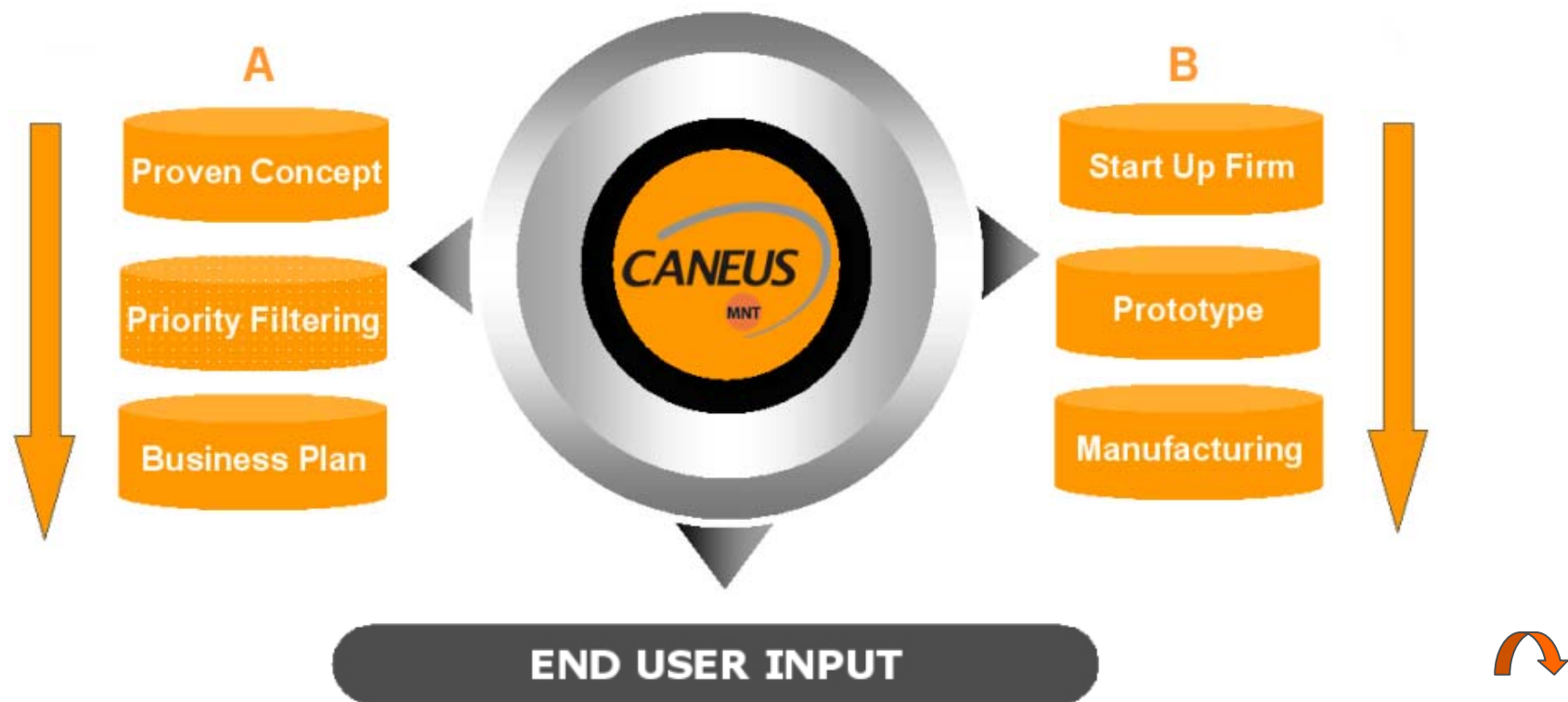
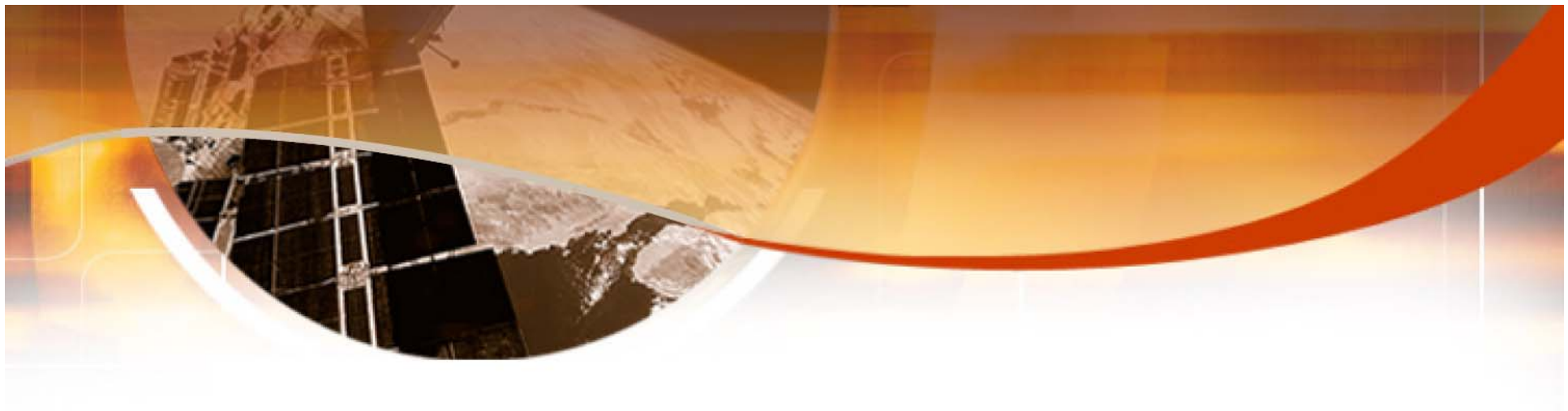
End Users an Integral Part of Process

1. Find and Recognise Proven Concepts
2. Develop Commercialization Frameworks
3. Develop Business Plans for “Winners”
4. Incubate Start-up Firms
5. Facilitate Prototype Development
6. Foster Move to Sustainable Manufacturing

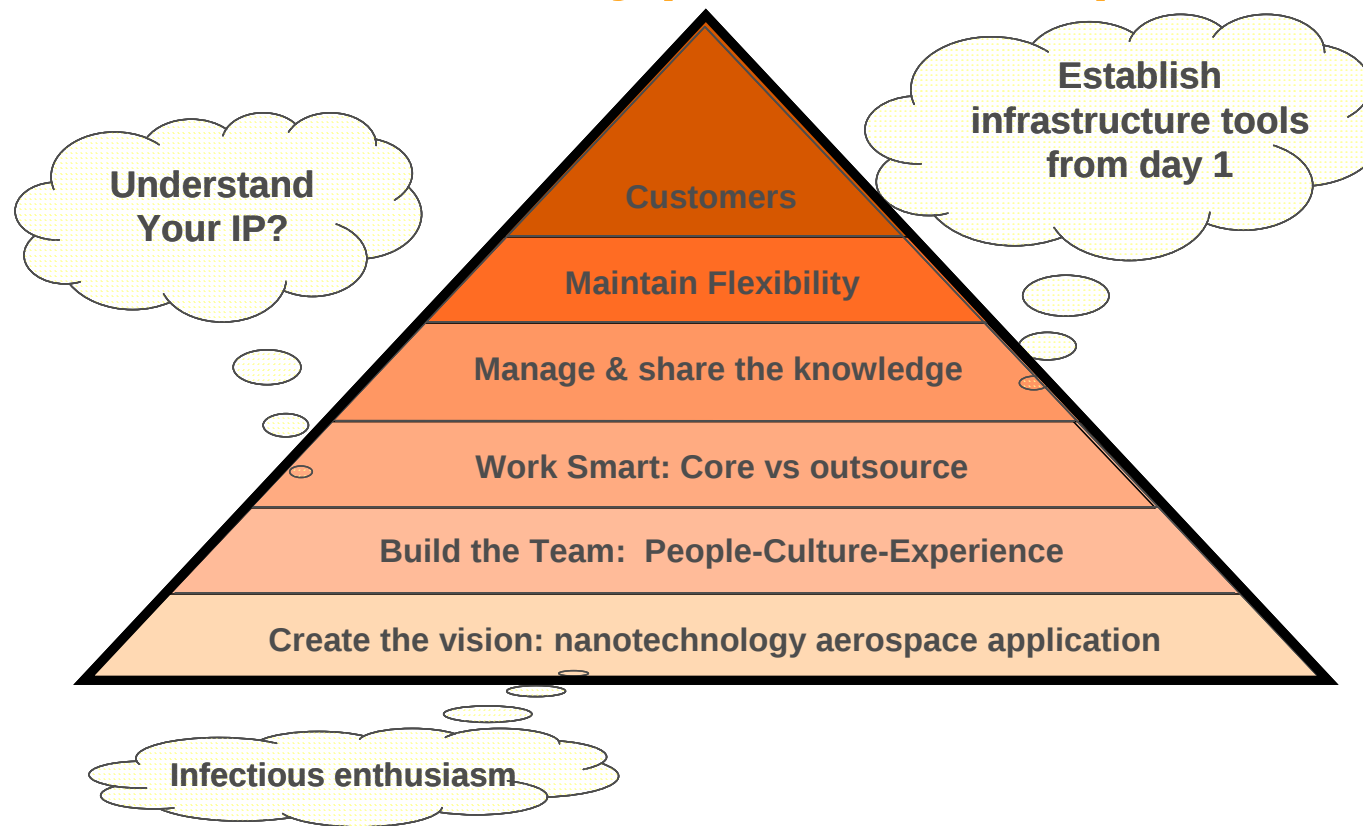


END Users Role

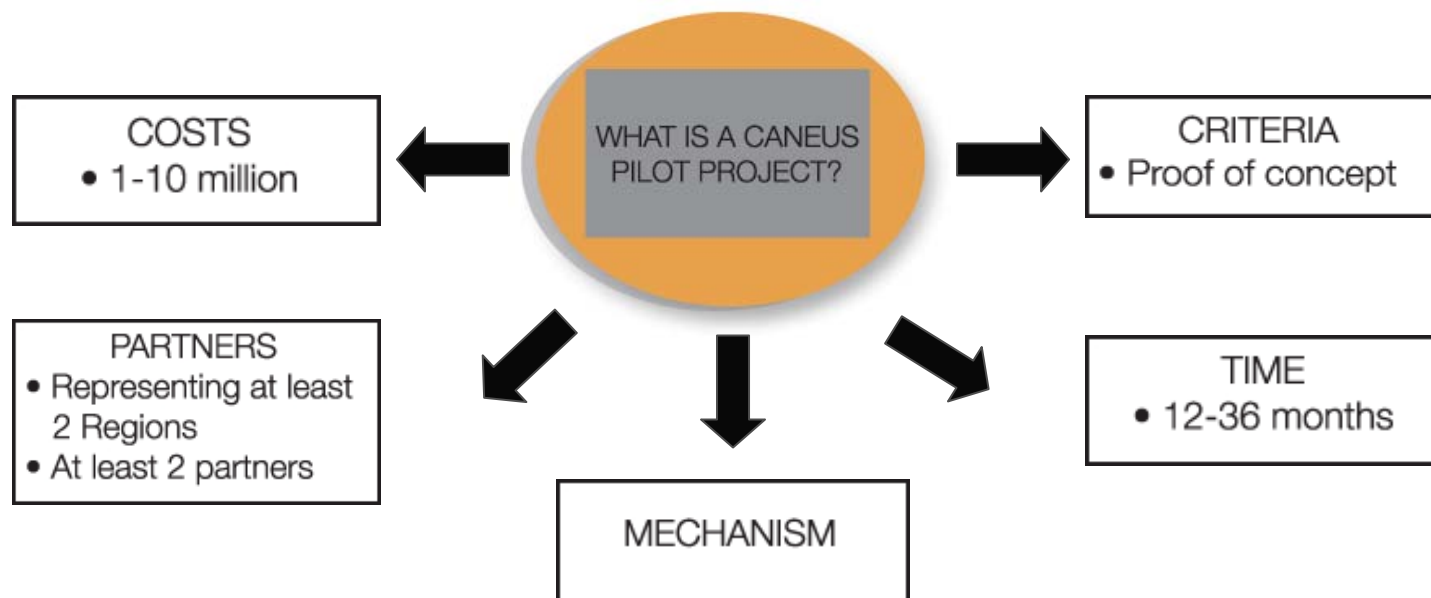
- Vet and Verify Proven Concepts
- Help Establish Real Priorities
- Provide Early Start-up Capital
- Mentor, Incubate and Nourish Start-Ups
- Assist in Obtaining Venture Capital
- Procure Early Orders for Products
- Provide Market Pull in all Phases

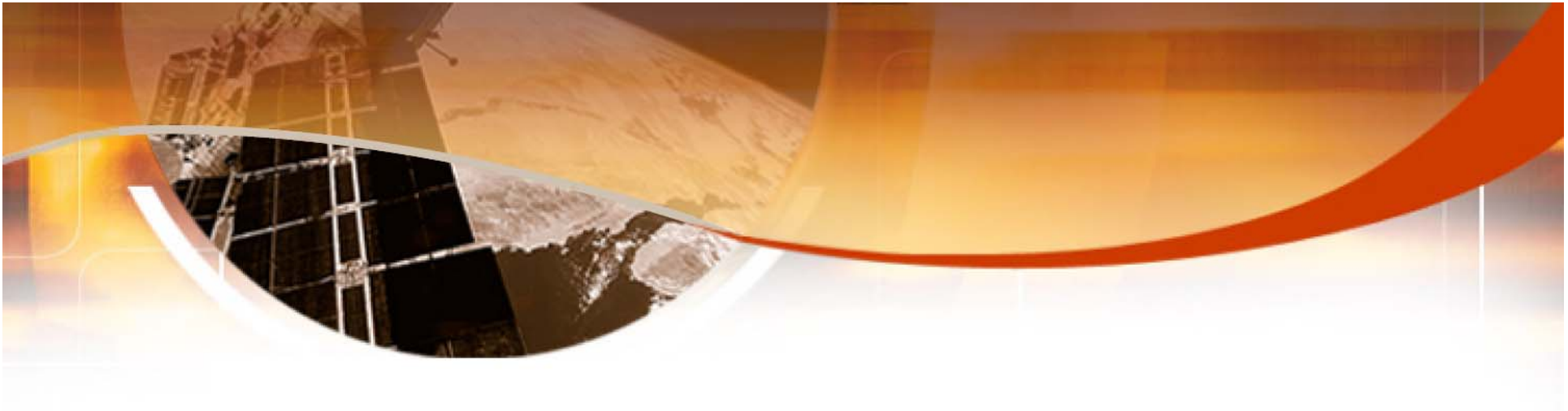


Towards Prototype Development



CANEUS Pilot Projects Definition

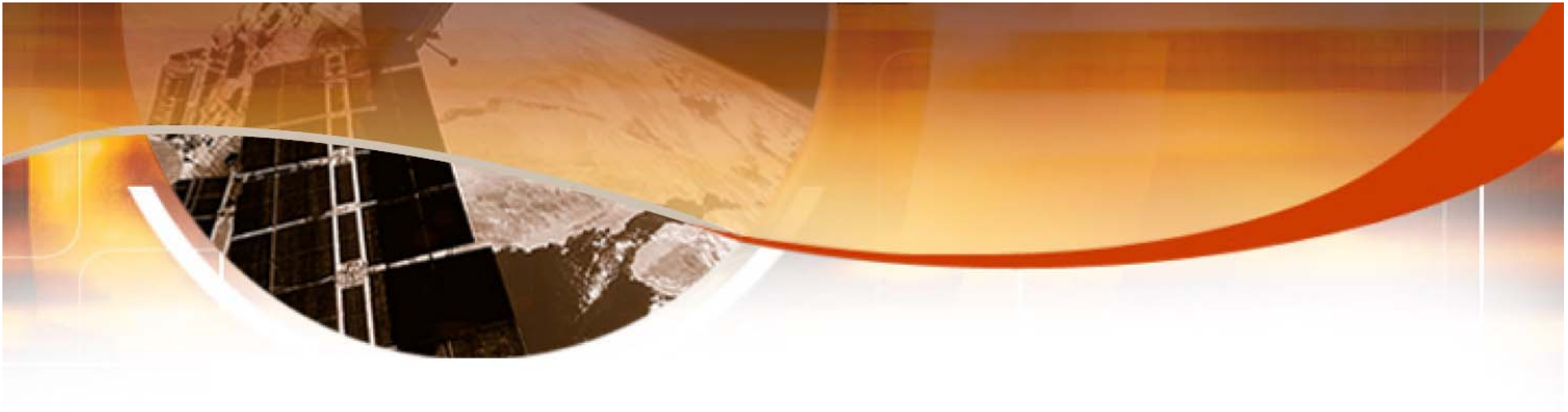




Pilot Projects Launch

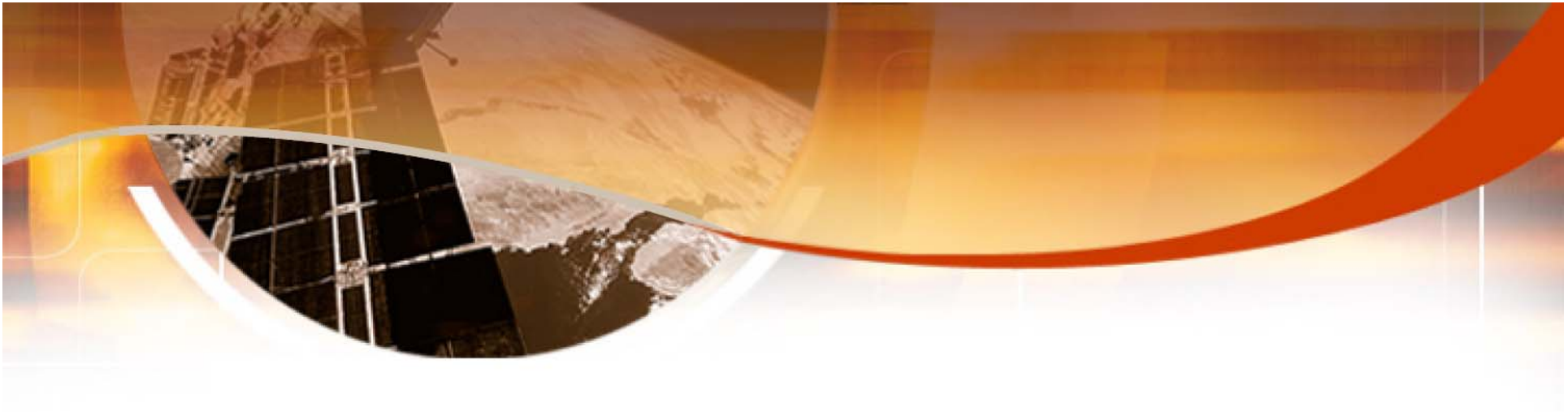
- Harsh Environment Sensors
- Reliability / Radiation
- Aircraft Sensing
- Nano Pico Satellites





History In The Making

- **CANEUS 2006 – Toulouse France**
 - New Round of Commercialisation Frameworks to be Reviewed
 - Review of Product Commercialisation Progress from 2004 Conference
 - Launch Network-Wide Scan of Proven Concepts
- **CANEUS 2008 – Japan**
 - Continuation of Commercialisation Processes



Summary

- CANEUS has been designed specifically to facilitate commercialisation of proven micro and nano technology concepts for aerospace applications
- CANEUS has built the international network required as the base condition for its operations
- CANEUS is now ready to help you succeed in realising your aerospace needs



Dr. OUDEA Coumar

EADS-ST and Board of Director of CANEUS

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Thank You!