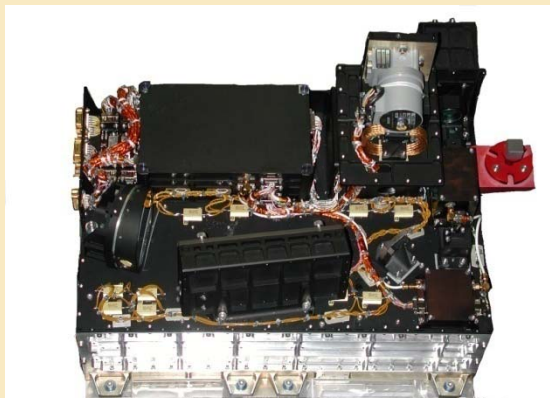
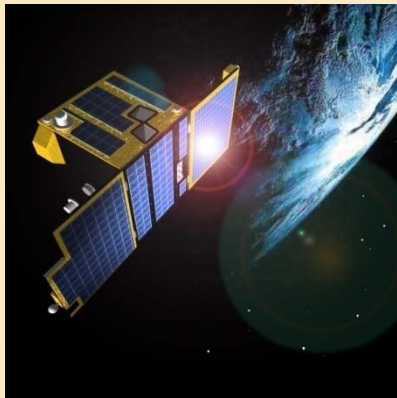


# Flemish Space Industries

Symposium

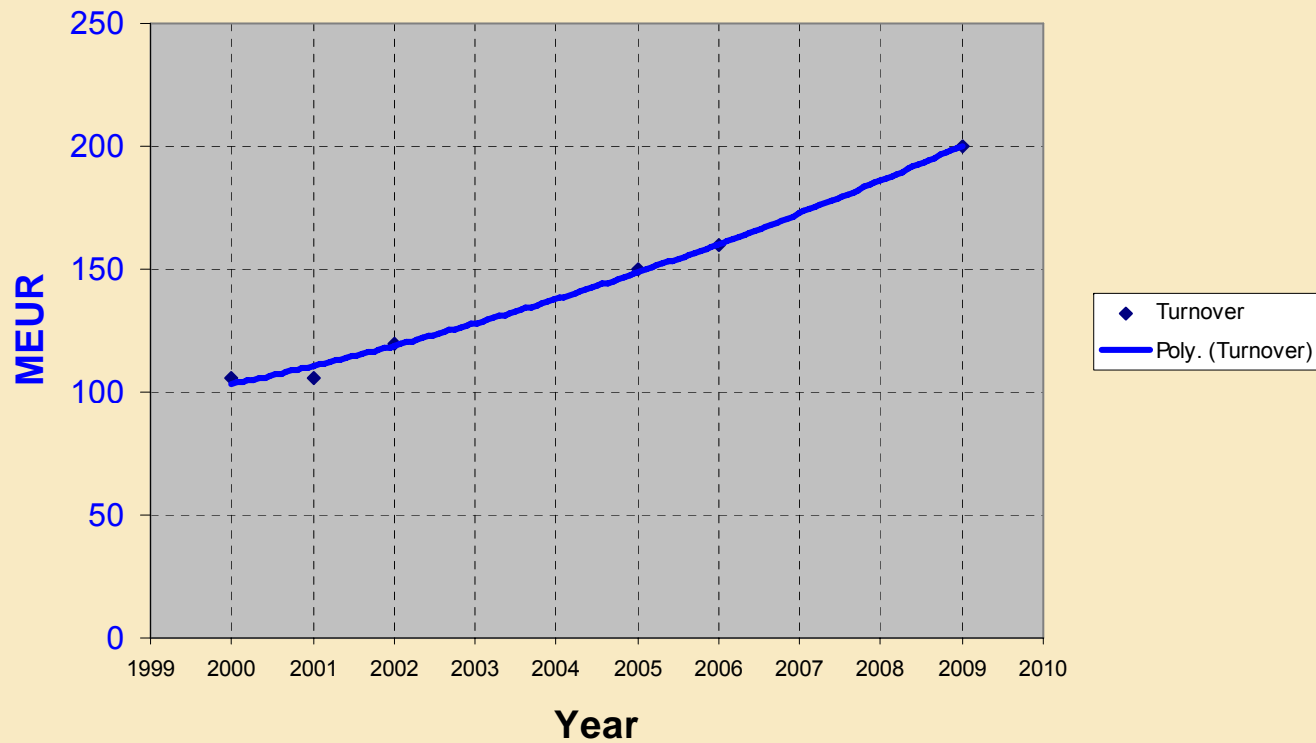
“Challenges for the next decennium“

8 May 2009



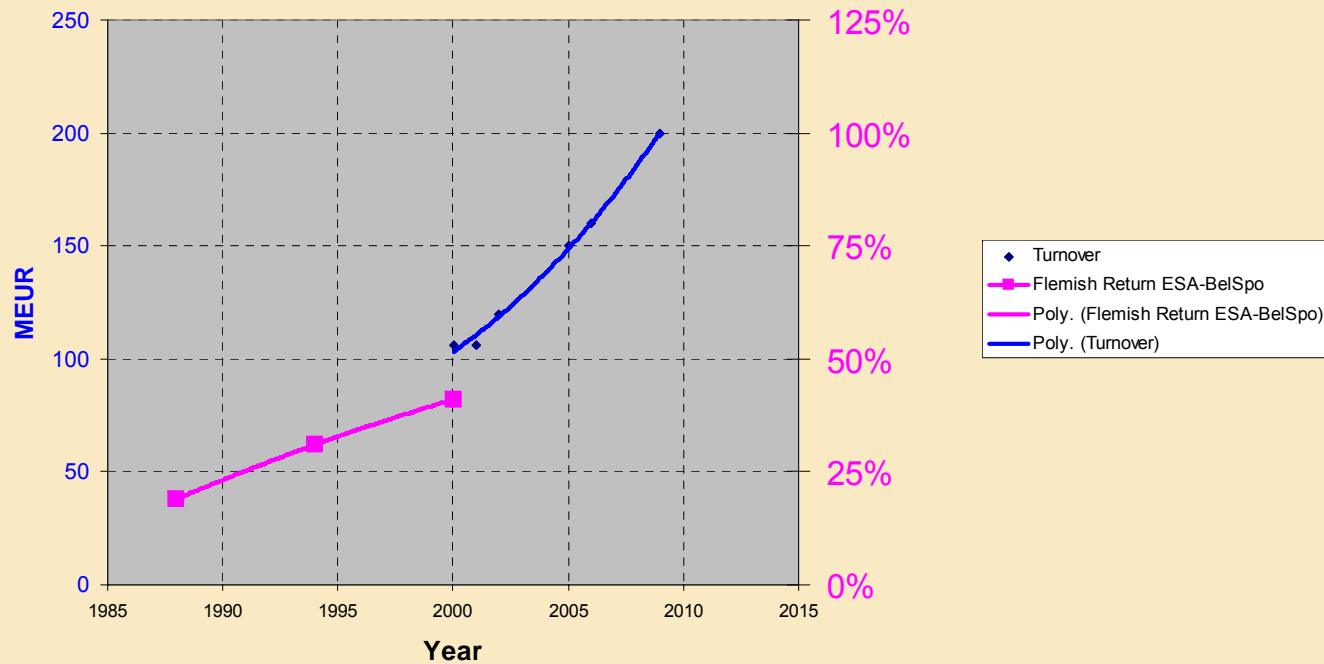
# TurnOver of VRI

## Turnover VRI Members



# Flemish Return ESA

Weighted Flemish Return of Belgian budget (ref.VRWB)



# K.U.Leuven

## LASA research centre

- Leuven research centre for **A**ero- & space **S**cience, technology and **A**pplications
- a new Research Centre in the Group of Science and Technology, with involvement from the humanities and biomedical sciences
- numerical simulations for space
- experimental techniques for space and aeronautics
- technology development for aeronautics
- technology development for science missions in space (and earth-bound)

# K.U.Leuven : technology development for science missions

- current involvement in science missions : CoRoT, Herschel, JWST (turnover in Prodex  $\approx$  1 Mio EUR/year), + Spitzer, Kepler (NASA missions, other funding paths)
- preparation of scientific and technological involvement in future missions (Plato, SPICA) and instruments for ground-based astronomy (ESO ELT)
- objective = to bring together expertise in science (asteroseismology, life sciences, microgravity, ...) and technology (micromechanics, robotics, materials, ...) to develop new cutting edge science missions

# VITO future plans

1. Further development of a world archive for global environmental monitoring
  - continue SPOT VEGETATION (1998 – 2012)
  - PROBA-V mission: development and implementation of the ground segment: operational at 2012
  - Preparation of the ESA Sentinel-3 “global land ground segment”: operational > 2012
2. Integration of earth observation in **Sensor Web systems**
  - Linked to unmanned platforms at low and high altitudes
  - R&D of an intelligent processing unit (GEODATA-platform)
3. R&D **hyperspectral image spectroscopy**
  - Deployment of the APEX (Airborn Prism EXperiment) instrument

# VITO future plans

4. Life support systems:
  - Study of microcompounds in closed loops for food production from waste

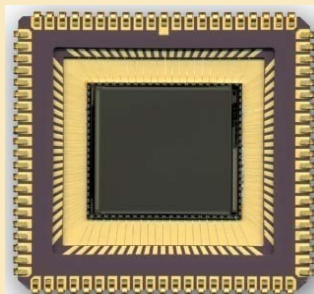
# Cypress Semiconductor Belgium

Formal FILLFACTORY

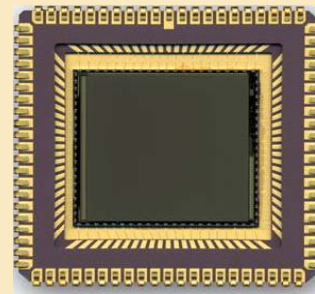
- Leading supplier of CMOS image sensors for various applications including industrial vision, high speed imaging, medical imaging, digital photography, security, military and **space applications**.
- CMOS image sensors for sun sensors, star trackers, observation cameras and scientific Instruments.



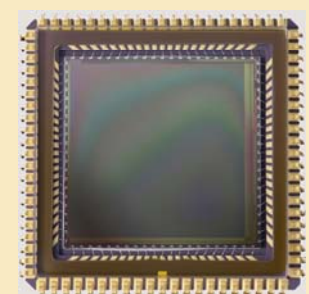
- **Qualified products**



STAR-250



STAR-1000



HAS

# Cypress Semiconductor Upcoming missions

- PROBA2 (payload)
- Alhabus (payload + star tracker)
- Lisa pathfinder (sun sensor)
- Sicral (sun sensor)
- Small Geo (star tracker)
- Prisma (star tracker)
- Bepi Colombo (star tracker)
- Astro-G (star tracker)
- Smart-Olev (star tracker)
- Sentinel-3 (star tracker)
- Exomars Rover (High resolution camera)

# Cypress Semiconductor Future Space activities

- Next generation CMOS image sensors for high end AOCS applications
- CMOS image sensors for low-end AOCS applications, monitoring cameras and rendez-vous systems
- CMOS image sensors for planetary observation and scientific missions
- State-of-the-Art package and glass lid design

# Umicore





# Evolution of 4inch to 6inch wafers for applications in terrestrial solar cells.

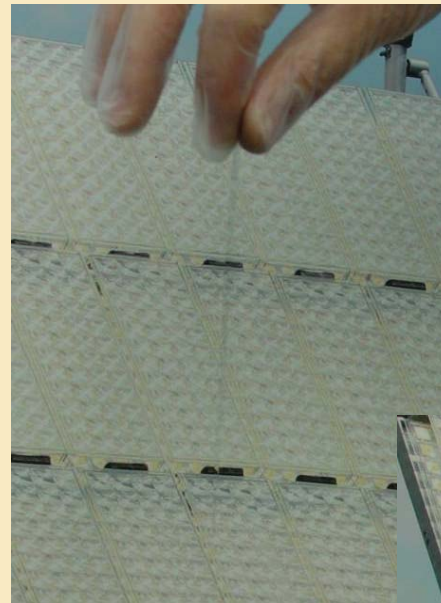
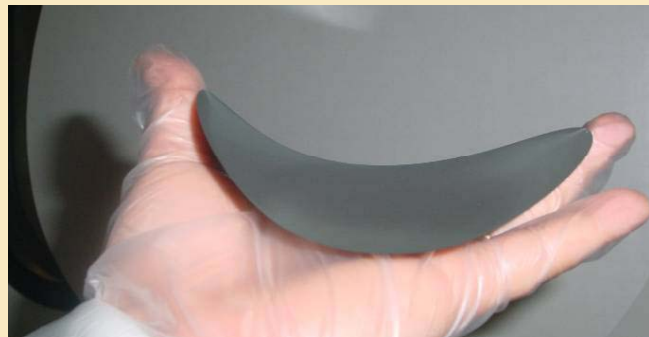
- 6 inch Crystal



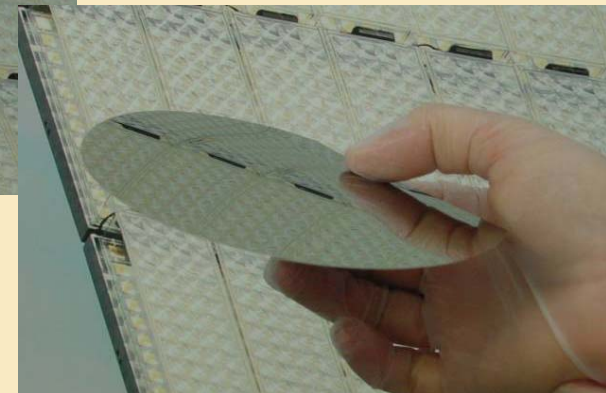
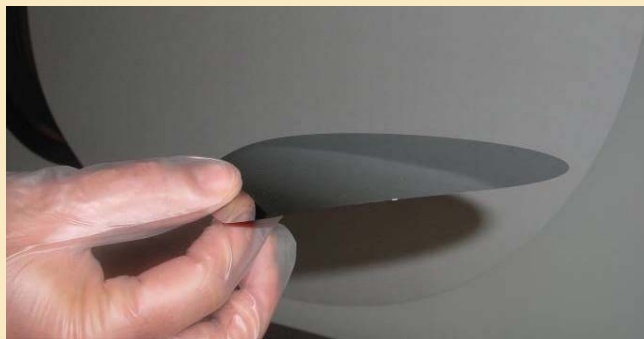
6 inch wafers with a thickness of  
300  $\mu\text{m}$ , 250  $\mu\text{m}$ , 200  $\mu\text{m}$  & 175  
 $\mu\text{m}$ :



# The future for wafers for solar cells in space: ultrathin 6 inch wafers (~62 $\mu\text{m}$ )



*Each gram weight savings helps to lower the costs of launching a new satellite*



# OIP Sensor Systems

- **OIP core competences:**
  - Optical units for **space** and **defence**
  
- **OIP main present space projects:**
  - PROBA-V Vegetation instrument
  - MIRI-IOC instrument (JWST mission)
  - Camera (ICAM)
  - Feasibility studies and demonstrators (ESPAIS and OC-GEO)

# OIP Sensor Systems

- **OIP main future space projects:**
  - Optical payloads:
    - For small LEO satellites
    - For small GEO satellites
    - For EO missions
    - For planet observation missions

# Satellite Telecom Plans

- Satellite-3-Play today (2009) :
  - Television broadcast
  - Telephone ( Voice-over-IP)
  - Broedband Internet Access
- Next SATCOM generation (2012-2014):
  - Speed Multiplied by factor 10
- Generation thereafter (2019):
  - Speed Multiplied by factor 3

# Satellite Telecom in 2009



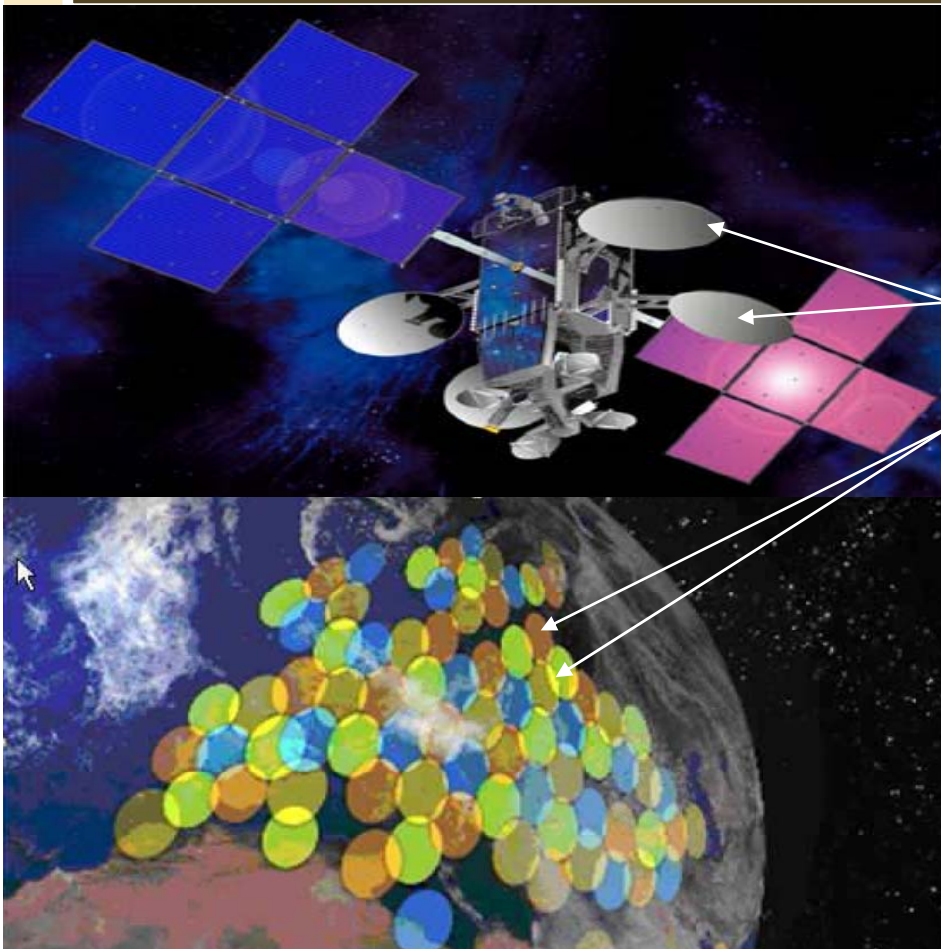
**Antenna Head  
( Tx/Rx)**

**Satellite  
Modem**

**Consumer terminal ( Newtec)**

- Broadband Internet Access terminals:
  - Down/Upload: till 2Mbps/256Kbps
  - Tariff: 20 to 40EUR/month
  - 75cm antenna diameter
- Satellite:
  - Via antenna of 1 meter diameter
  - Capacity: 3 Gbps
- Central Earthstation
  - Makes connection to the Internet
  - Max 250.000 consumers

# Satellite Telecom in 2012-14



- Broadband Internet Access terminals:
  - Down/Upload: till 20Mbps/2Mbps (\*10)
  - Tariff: 20 to 40EUR/month
  - 75cm antenna diameter
- Satellite:
  - Via 4 antenna's of 1 meter diameter
  - Has 80 spot beams over W.Europe
  - Capacity: 90 Gbps (\*30)
- Central Earthstation
  - Makes interconnection with the Internet
  - Max 1.250.000 consumers (\*5)

# Satellite Telecom in 2019

- Broadband Internet Access terminals:
  - Down/Upload: till 40Mbps/4Mbps (\*2)
  - Tariff: 20 to 40EUR/month
  - 75cm antenna diameter
- Satellite:
  - Via antenna's of 6 meter diameter
  - Has 600 spot beams over W.Europe
  - Must be very stable!!!!
  - Capacity: 600 Gbps (\*7)
- Central Earthstation
  - Makes connection to the Internet
  - Max 4.000.000 consumers (\*3)

# Institutional programs

- Be a key player on ground segments of major ESA/ EU Programs
  - Galileo
  - Musis
  - Athena-Fidus
  - GMES/ Kopernicus
  - Meteosat 3rd generation (MTG)
  
- TAS-A offers expertise in
  - Project management,
  - System engineering, Development and AIV
  - Deployment and support to operations
  - Customer support and services

# Product Line Strategy

- Enlarge present product portfolio to
  - Remote sensing market
    - OMNISAT G3 : “Technology jump” and provision of compatibility with new satellites
    - New product launch : integrated ground image reception station
  - Satellite control
    - IBB (integrated base band modem)
  - Telecom modem
- Diversification to Satellite on-board electronic equipment