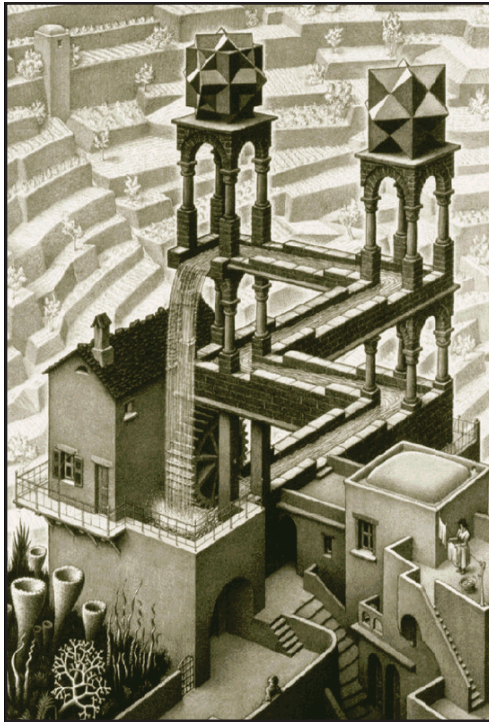




**GUIMARAES PORTUGAL**  
21 – 12 / 09 / 2011

### **SPACE FOR INNOVATION IN SPACE**

Dr. Knut Siercks  
Managing Director  
Hexagon Technology Center



## **AGENDA**

**01** Innovation in Space - P&N from Space to Earth

**02** Precision P&N Examples - Challenges

**03** Space for Innovation - Hexagon Technology Center



## A heritage of trust, a history of getting it right

Almost 200 years of Measurement Technology

- since 2006: Acquisition of more than 15 companies
- 2005 Merger with **Hexagon AB**
- 2004 Divestment **Swiss Optics** and **Escatec**  
Acquisition **Tritronics**
- 2002 Divestment **Vectronix (defense)**
- 2001 Acquisition **Cyra**, Acquisition **Laser Alignment**  
Acquisition **ERDAS**, Acquisition **LH Systems**
- 2000 IPO at Swiss Exchange (SWX)
- 1997 **Leica Geosystems**
- 1994 Acquisition **GPS-Magnavox (US)**
- 1990 Merger of Wild-Leitz and Cambridge Instr into **Leica**
- 1988 Acquisition **Kern, Aarau**
- 1986 Merger of Wild and Leitz into Wild-Leitz
- 1921 **Wild** founded in Heerbrugg, Switzerland
- 1819 **Kern** founded in Aarau, Switzerland



INTERGRAPH

**Leica**  
Geosystems

HEXAGON  
METROLOGY



Space- and Airborne



Ground-Based



Indoor



INTERGRAPH

Scanning



Leica  
Geosystems

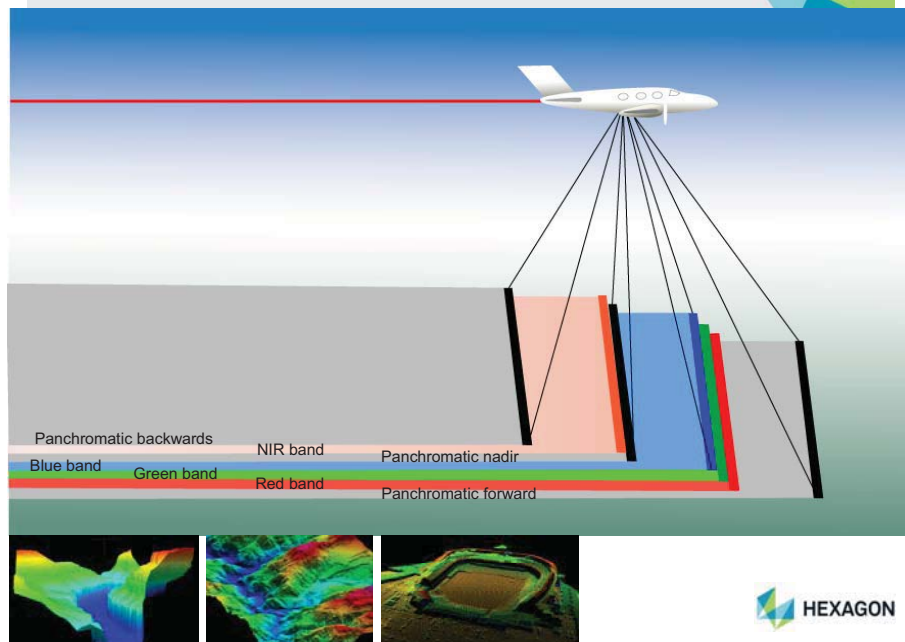
HEXAGON  
METROLOGY







## Digitale Luftbildkamera (Panchromatische und Spektrale Zeilenfilter)



Space- and Airborne



Ground-Based



Indoor



HEXAGON





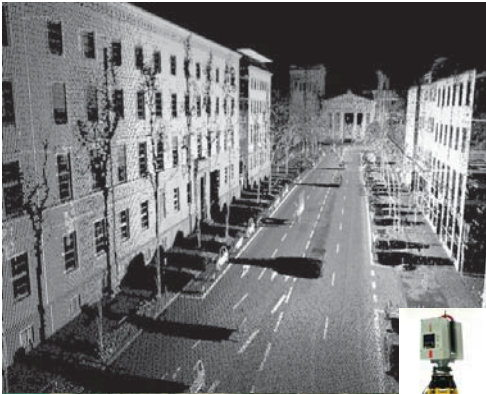




**HEXAGON**

**INTERGRAPH**

Scanning



**HEXAGON**  
METROLOGY



**HEXAGON**

**INTERGRAPH**

Scanning



**HEXAGON**  
METROLOGY









INTERGRAPH

Security



Leica  
Geosystems

HEXAGON  
METROLOGY



Space- and Airborne



Ground-Based



Indoor





Mechanics and Photonics

to achieve

- Flexibility
- Reliability
- Precision
- Productivity
- Cost Efficiency

Challenge: Cost, Shop floor environment

HEXAGON





Mechanics and Photonics

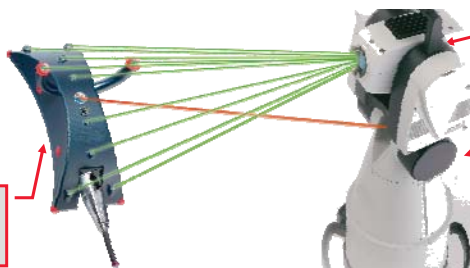
to achieve

Flexibility  
Reliability  
Precision  
Productivity  
Cost Efficiency

Challenge: Cost, Shop floor environment



3D-Artifact  
e.g. T-Probe



T-Cam  
→  $\omega, \varphi, \kappa$

Tracker  
→ X, Y, Z

Challenge: Cost, Shop floor environment





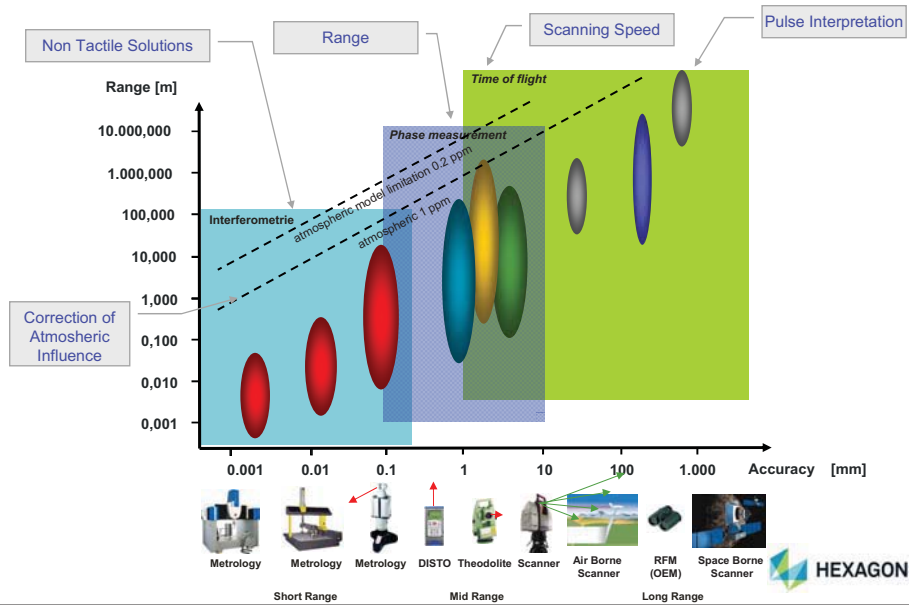
Challenge: Cost, Simple Use (MMI)



Challenge: Cost, Simple Use (MMI), Image processin



# Reflectorless – Electro-optical Distance Measurement Portfolio (run time) / Technology Cluster



INTERGRAPH

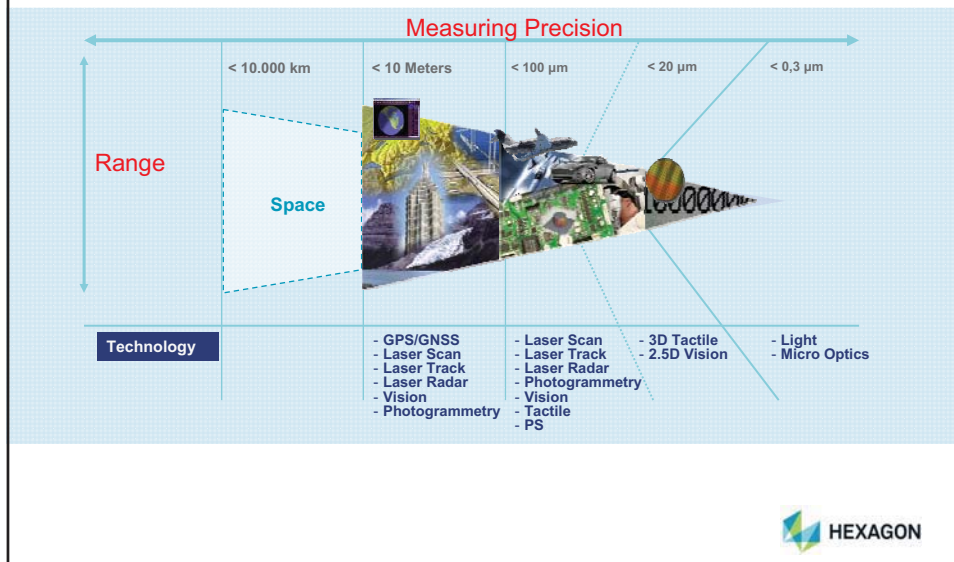
Leica  
Geosystems

HEXAGON  
METROLOGY



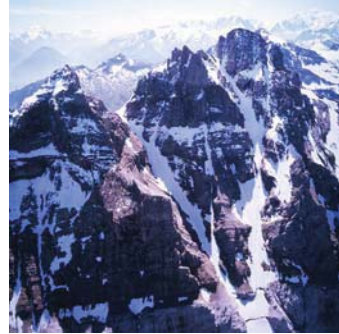
MIKROFYN AGATEC erdas Novus brown & sharpe

## From space to nano technology



Everything began in the mountains...!

## The Surveying Challenge in Switzerland ...



Dents du Midi – surveying point

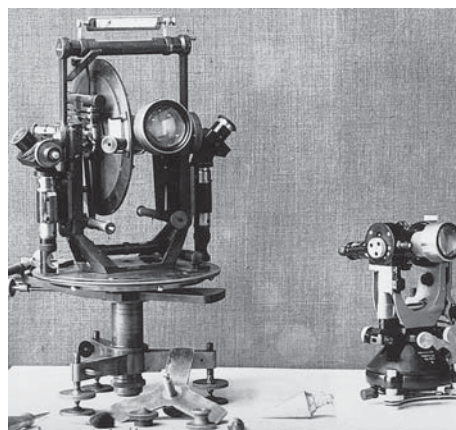
Heinrich Wild – August 1901



## Miniaturisation was the crucial step for the founding of Wild and Leica!



Heinrich Wild – co-founder

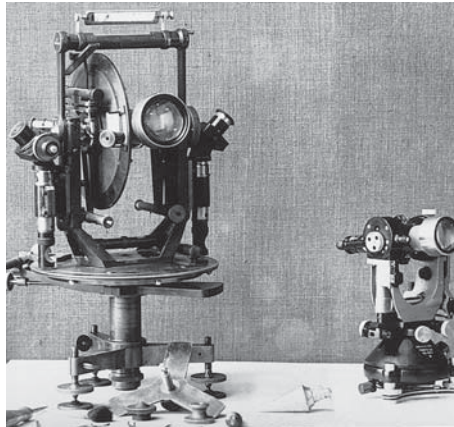


**“Miniaturization”** of surveying instruments  
(1921)





Miniaturisation was the crucial step for the founding of Wild and Leica!



**“Miniaturization”** of surveying instruments  
(1921)



**ASIA**  
**Mt. Everest**  
in 1992/93  
K2 1996,  
with a Leica  
GPS 300  
and TC2002  
(Intern. Ev-K2  
Team):  
**8846.10 m a.s.l.**



**WORLD'S  
FIRST GPS TOP  
MEASUREMENTS**

**AMERICAS**  
**Aconcagua** in  
January 2001  
with GPS500  
(Prof. G. Poretti):  
**6961,83 m a.s.l.**



**AFRICA**  
**Kilimanjaro** in 1999 with  
GPS500 (E. Messmer):  
**5893 m a.s.l.**



**EUROPE**  
**Matterhorn** in 2000  
with GPS500 and  
TCA2003  
**4477,55 m a.s.l.**  
**Mt. Blanc** in 2003  
with GPS500 by IGN:  
**4808,4 m a.s.l.**

**ALL PERFORMED  
WITH LEICA GPS SYSTEMS**

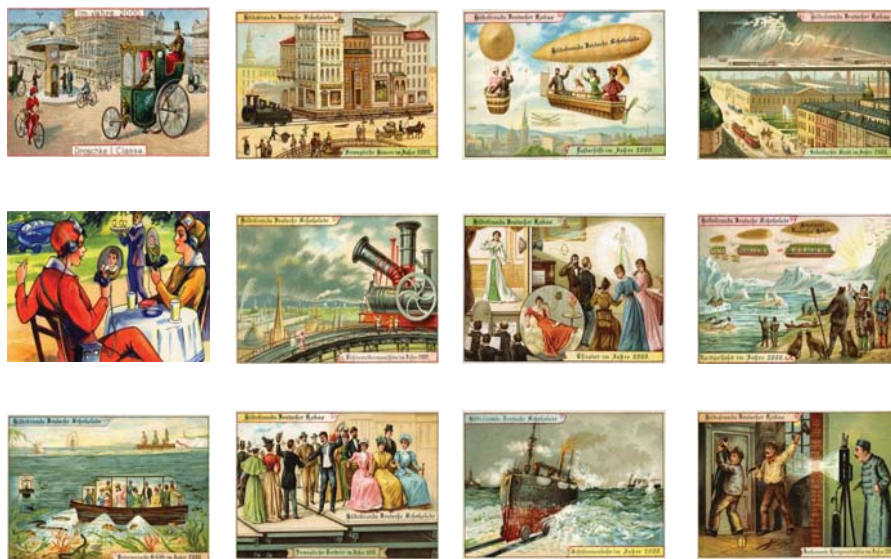


# Synergies



## Change the context ...

### The Future from yesterday ... 1900



Vision from 1900 about the society in 2000

## The Future from yesterday ...1950



Atom - Ship



Personal Rohrpost



Space Station



Assembly Hall



Floating Islands



Underwater City



Traffic



Town and Urbanisation



Flying Power Station



Discovery of the Space



Moon City



Magnetic Rail Way

Werke einiger Künstler des Weltraumzeitalters - der fortschrittsgläubigen 50er und 60er Jahre des vergangenen Jahrhunderts



# Zentral R&D

## Mission



## Hexagon Technology Center - Mission



**Generate and protect  
INNOVATION  
with and for the  
Hexagon Group**  
...  
**to strengthen our current  
business  
and generate new business**

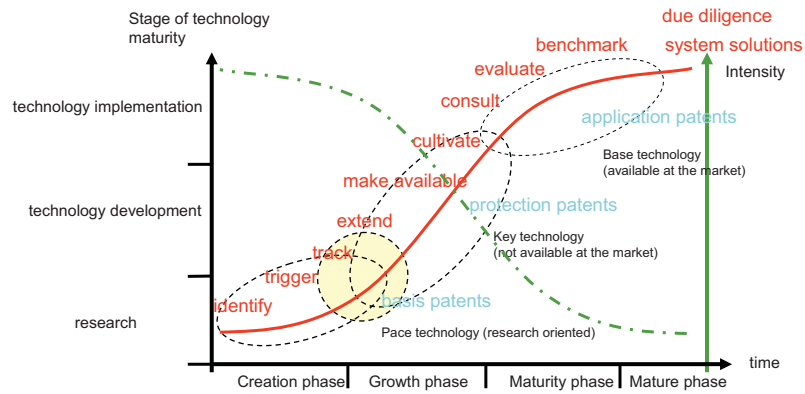


## Zentral R&D

## Task



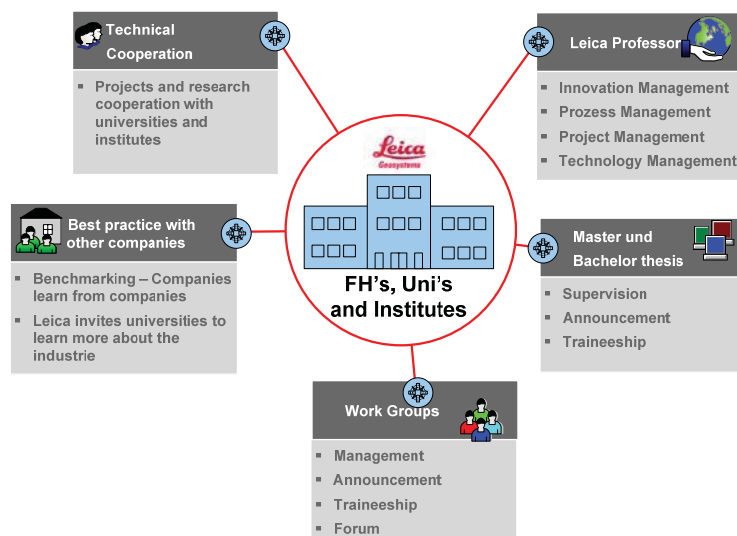
## Corporate Research and Innovation Management -> Tasks along the Technology S-Curve



The maturity of technologies is following a S-shaped curve over the time in most cases



## Research Cooperation





We have to think global!



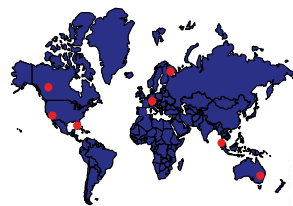
## Hexagon Research Network

WEF – The Global Competitiveness Report 2010

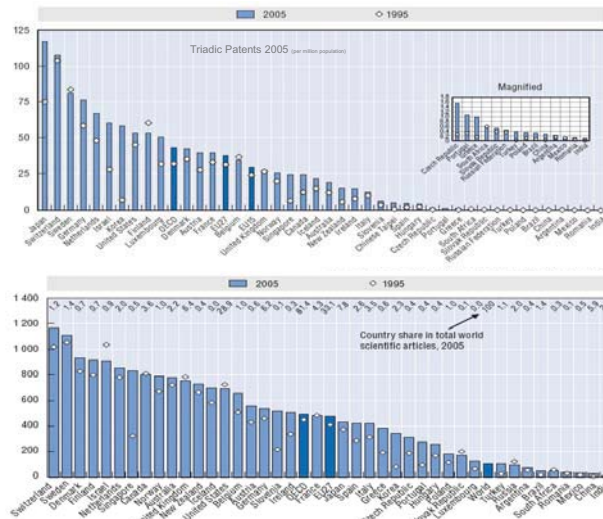
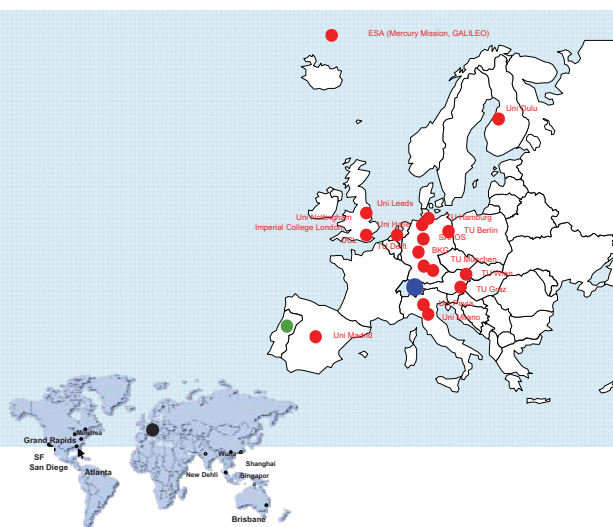


| Country/Economy  | GCI 2010–2011 |       | GCI 2010–2011 rank among 2009 countries | GCI 2009–2010 rank * |
|------------------|---------------|-------|-----------------------------------------|----------------------|
|                  | Rank          | Score |                                         |                      |
| ● Switzerland    | 1             | 5.63  | 1                                       | 1                    |
| ● Sweden         | 2             | 5.56  | 2                                       | 4                    |
| ● Singapore      | 3             | 5.48  | 3                                       | 3                    |
| ● United States  | 4             | 5.43  | 4                                       | 2                    |
| ● Germany        | 5             | 5.39  | 5                                       | 7                    |
| ● Japan          | 6             | 5.37  | 6                                       | 8                    |
| ● Finland        | 7             | 5.37  | 7                                       | 6                    |
| ● Netherlands    | 8             | 5.33  | 8                                       | 10                   |
| ● Denmark        | 9             | 5.32  | 9                                       | 5                    |
| ● Canada         | 10            | 5.30  | 10                                      | 9                    |
| ● Hong Kong SAR  | 11            | 5.30  | 11                                      | 11                   |
| ● United Kingdom | 12            | 5.25  | 12                                      | 13                   |
| ● Taiwan, China  | 13            | 5.21  | 13                                      | 12                   |
| ● Norway         | 14            | 5.14  | 14                                      | 14                   |
| ● France         | 15            | 5.13  | 15                                      | 16                   |
| ● Australia      | 16            | 5.11  | 16                                      | 15                   |
| ● Qatar          | 17            | 5.10  | 17                                      | 22                   |
| ● Austria        | 18            | 5.09  | 18                                      | 17                   |
| ● Belgium        | 19            | 5.07  | 19                                      | 18                   |
| ● Luxembourg     | 20            | 5.05  | 20                                      | 21                   |





■ 2005      ○ 1995



THANK YOU FOR YOUR ATTENTION!

