

**I don't have a degree in engineering...  
but physics lead me to an engineering  
career. How did it happen?**

**Marina Meliga**

**March 24<sup>th</sup>, 2006**



# Introducing myself: my professional career

- MS degree in Physics in 1981
- Internship at Turin University for 3 years, working on Solar Cells: theory and experiments
- I joined the Corporate research center of Telecom Italia in 1984, working on passive and active optical component designing
- In 1993 I became responsible of a Research Unit working on the development of Telecom Lasers
- In 2000 the division “Devices and Systems for Optical Communications” of Telecom Italia Lab was acquired by Agilent Technologies
- In 2005 all the semiconductor activity was spun off by Agilent and became a new entity: Avago Technologies
- Today I am the Device Manager, responsible for R&D and Manufacturing of 10 Gb devices, in Avago Technologies

# The information society:

The technologies which mostly changed our life

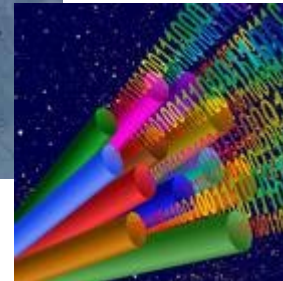
- **The computer**



- **INTERNET**



- **Telecommunications**



*This is my field of activity*

- **Life Science**



# In technology, real innovation comes from...



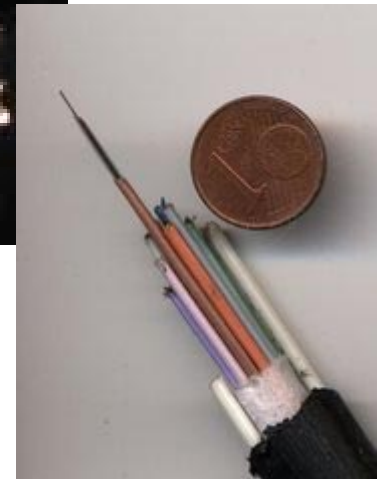
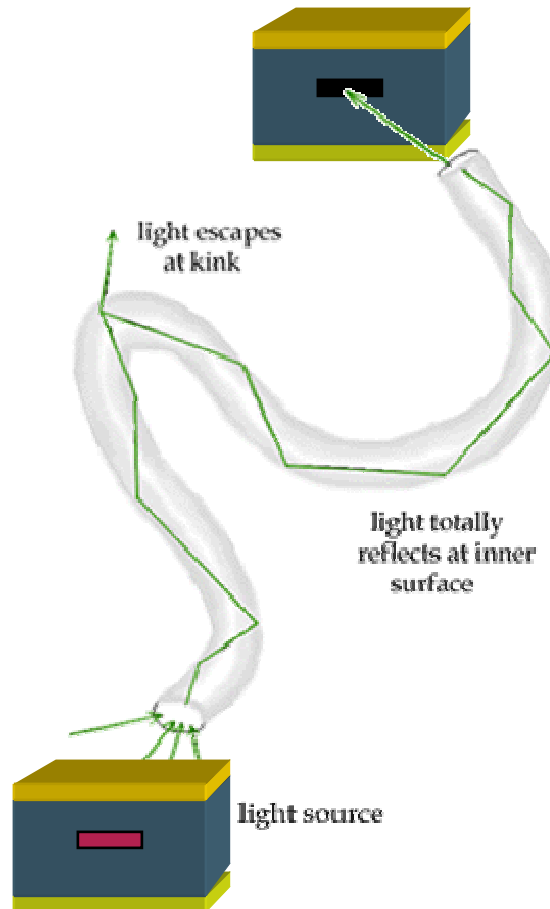
- work across the boundaries of physics, material science and engineering
- effective combination of theory and experiments
- revolutionary changes (= new inventions) followed by evolutionary changes

IT'S A REAL INTRIGUING JOURNEY!

# Technology revolutionary inventions which allowed the development of telecommunication systems

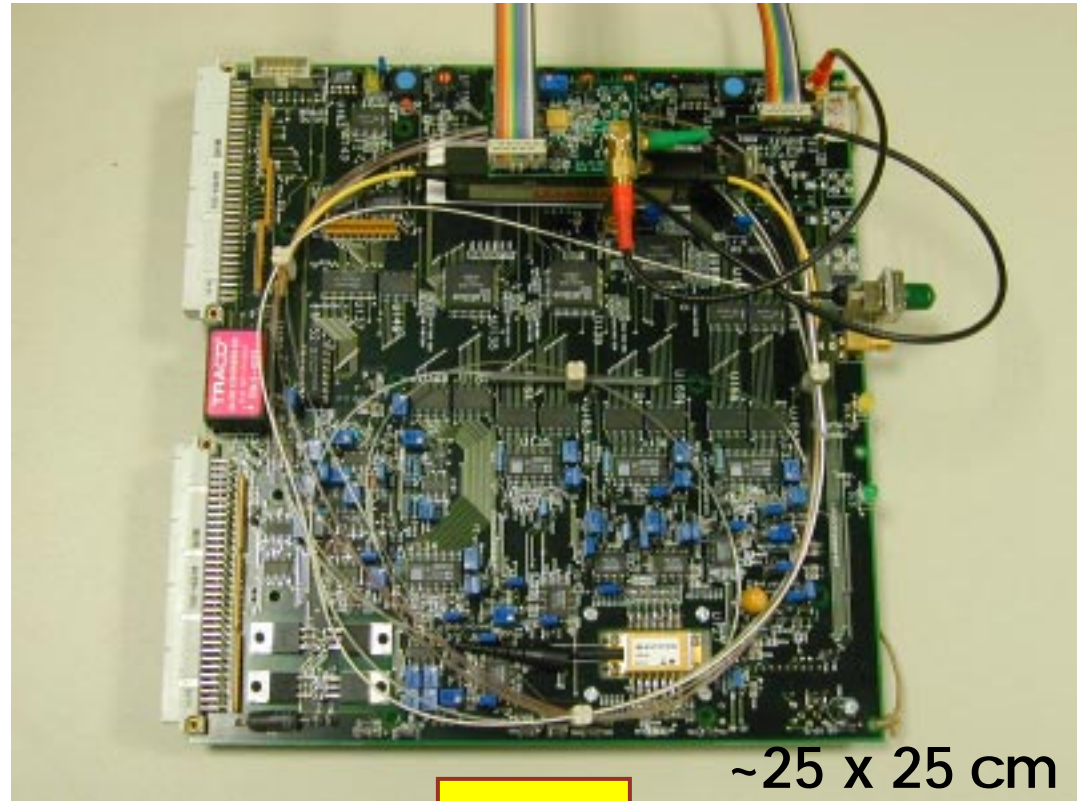
1962: Invention of the Laser and the Photodiode at Bell Labs

1970: Invention of the Optical Fibers at Corning



Technology evolutionary changes which allowed a widely adoption of the telecommunication systems

REDUCTION OF  
COSTS  
DIMENSIONS  
AND  
ELECTRICAL POWER  
OF  
LASERS



PLUGGABLE  
MODULES



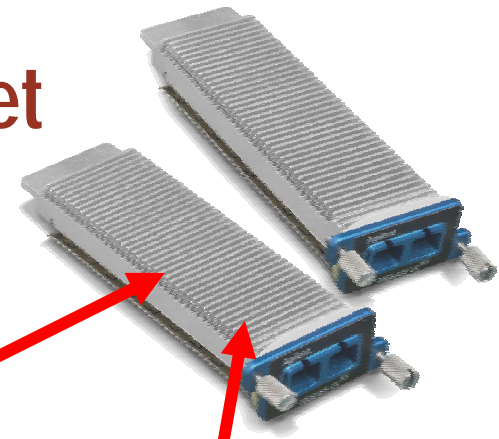
In 2002 Agilent was first to the market with a 10 Gb/s pluggable module

This is my job

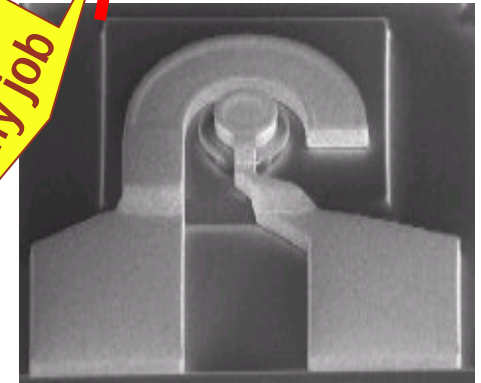


10 Gb/s Laser

*Delivered in September 2002*



This is my job



10 Gb/s Photodetector

*Delivered in April 2002*

**10 Gb/s = 10.000.000.000 bit/s**

# Clean room: where laser are fabricated

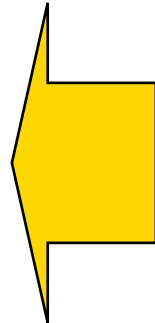
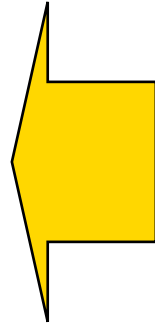


For the future revolutionary changes are needed: smaller and smaller components must be developed

**1 millimeter**  
0.001 m

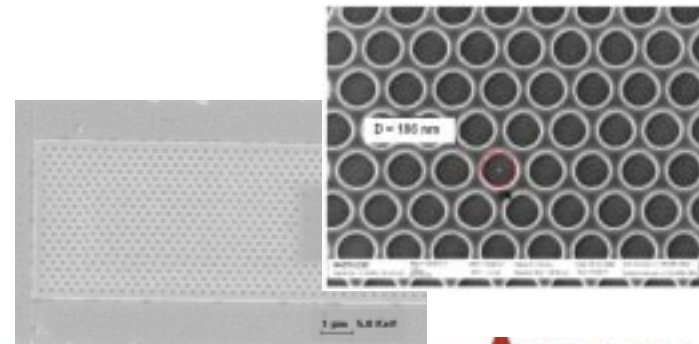
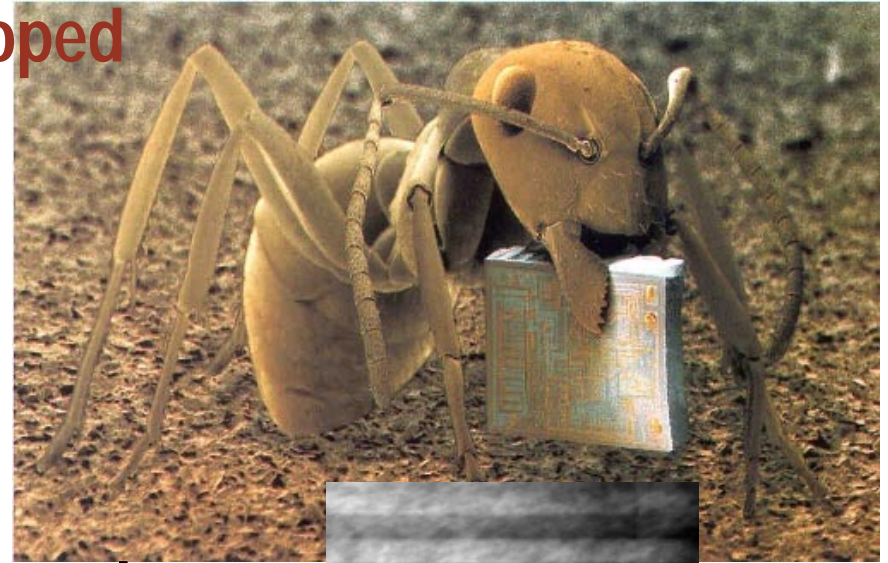
**1 micrometer**  
0.000001 m

**1 nanometer**  
0.000000001 m



**TODAY**  
Electronics and Photonics are  
Bases on  
microtechnology

And in 10 years?  
Nanotechnology  
Is arriving



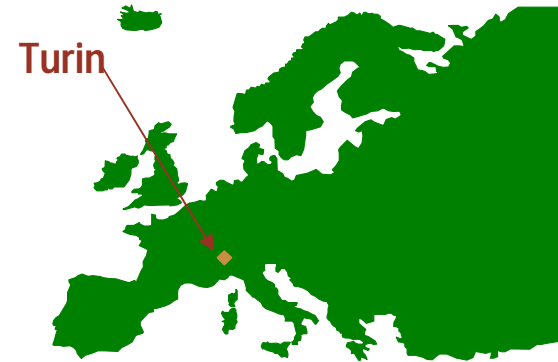


# Mission of my team: Avago Turin III-V devices team

**Design, fabricate, test, supply full specs  
reliable new lasers and photodetectors**

**Invest on few explorative and very promising  
technologies to ensure our long term  
competitive advantages**

## Turin III-V devices team



I am responsible of a unique group of ~ 40 engineers skilled and competent for device designing, epi, wafer fab, testing, reliability

We have full equipment capabilities

We are located in Turin – Italy (North-west)

## 2005 recognition : the IEEE/LEOS award



In 2004 I received the Engineering Achievement Award from the Institute of Electrical and Electronics Engineers (IEEE) / Laser and Electro-Optics Society (LEOS) during the LEOS annual meeting in Puerto Rico.

This award was: "for pioneering work on the development of semiconductor lasers and for the design and development of uncooled distributed feedback (DFB) lasers for datacom applications."

This was my statement: "I am very grateful to both Agilent and my team. Agilent has offered me the challenge and the opportunity of combining telecom performances with datacom costs in real devices for real customers. My team of 40 creative engineers met the challenge -- inventing, executing and delivering high-impact technologies and state-of-the-art devices. We have followed a very long path together. Device engineering and technology development require real teamwork. Mutual trust and respect among the team members as well as strong know-how are equally important. I share this award with my team."



## My personal life

**I am 49 years old, I am married and I have a 13 years old son**

**I like all the outdoor sports: skiing, cycling and hiking; every year I spend at least 7-10 days in a cycling tour with my family and some friends**

**Having had the opportunity to meet people from different countries and cultures, I do think that my professional career enriched my life very much. Today I try teaching all about this experience to my son; I do hope he will be a good citizen of the world.**