

Company Profile and Products

ESO Industry Day
Tommaso Occhipinti, General Manager
22, June, 2012

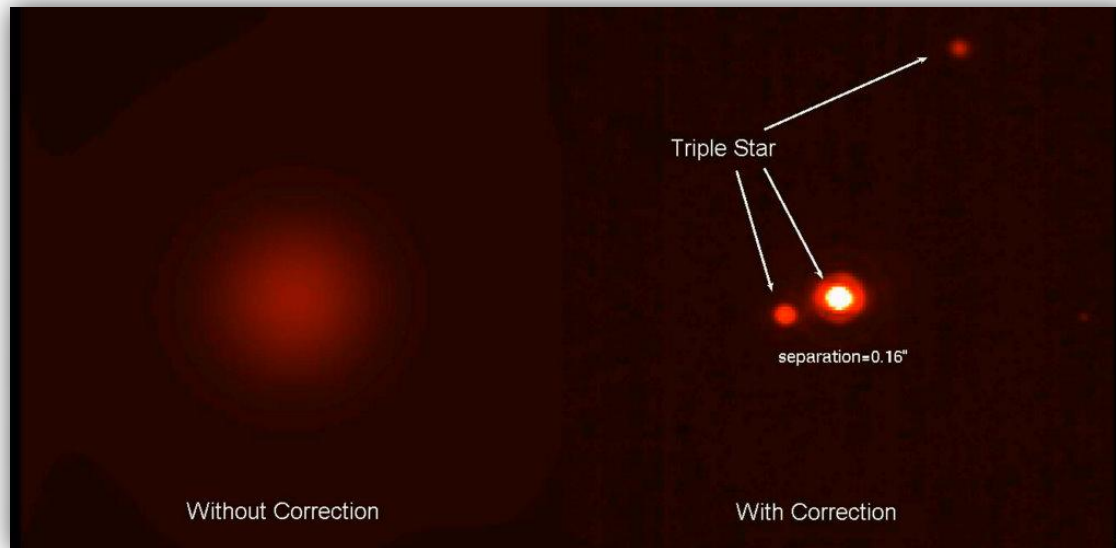




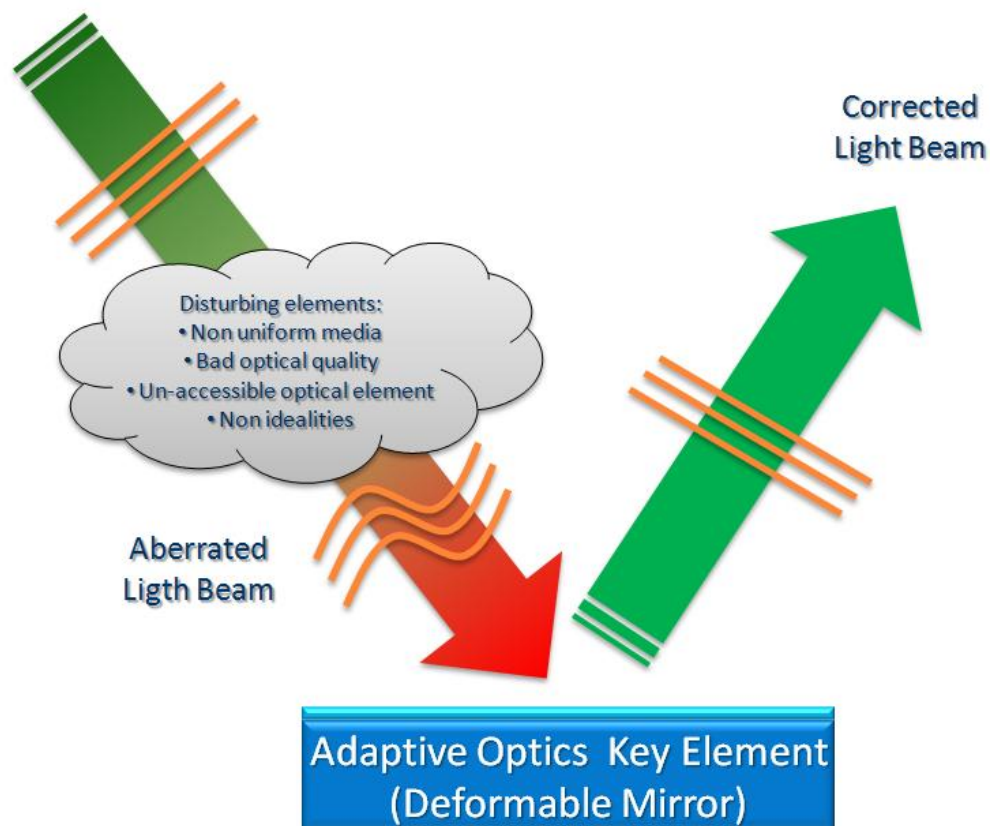
- Adaptive Optics
- Adaptica Company
- COTS products/Projects
- Adaptica & ESO

Adaptive Optics (AO) is a technology used to improve the performance of optical systems by reducing the effects of changing optical aberrations.

Created for astronomical applications AO is now a key technology for many different industries.



LBT first AO light, LBT press release, <http://www.physorg.com/news195838118.html>, Esposito, Ragazzoni et al.



Some Adaptive Optics applications:

- **Enviromental Video surveillance**
- **Biomedics**
- **Optical Coherence Tomography**
- **Industrial applications**

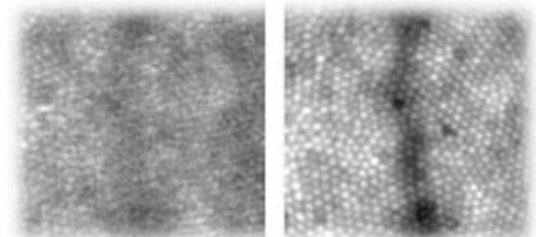
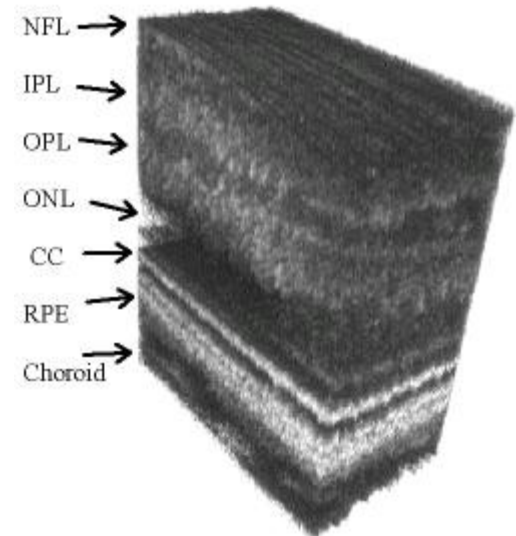


Video surveillance



Laser machining, cutting,
engraving

OCT, University of
California, Davis



Fundus without (SX) and
with (DX) Adaptive optics

- **Microscopy**, which can benefit of AO for static lens correction.
- **Wide Field Microscopy**, strong reduction of the cost of high quality optical objectives is achieved by the use of AO
- **Robotics Vision** AO allows real time optical accommodation for robotics vision
- **3D imaging** the use of AO allows to increase the instrumental depth range.



Microscopy



Scanner 3D



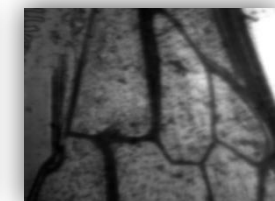
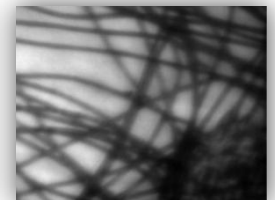
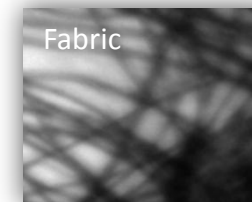
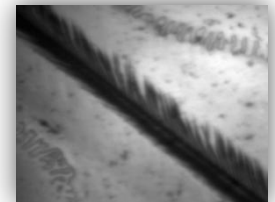
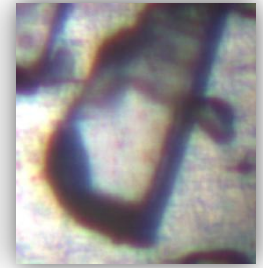
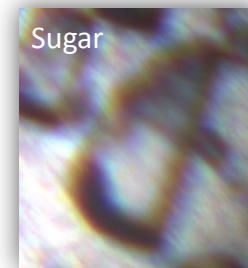
Robotic Vision

- Adaptica direct competitors are less than 10:
 - 3 in USA (e.g. Boston Micro Machines)
 - 3 in Europe (e.g. OKO tech, Alpao)
- All of them concentrate the business on scientific applications (labs, optical experiments)
- They usually produce very complex systems in few quantities
- Their STANDARD AO components in the market **COST TOO MUCH (20 – 30 K€)!**



Market opportunity

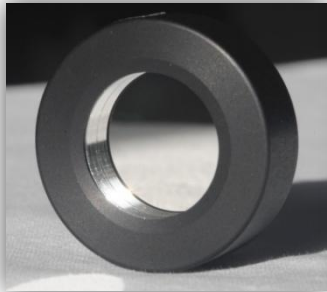
- Incorporated in February 2009
- A spin-off from the University of Padova (however the University does not own any shares)
- The Core Team is composed by 6 people: 4 PHD engineers, 2 PHD physicists
- We work inside a privately held company incubator called **M31** (they financed us and offered us infrastructures, labs, and top level consulting services on administration, management, finance)



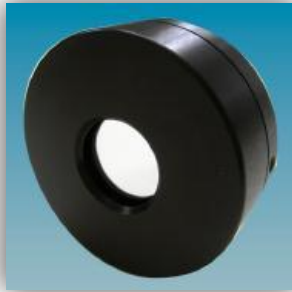
Adaptica, prototype microscope

- We started selling globally from the first year to Universities and research labs
- We signed an international distribution agreement with Edmund Optics for COTS products
- We placed a commercial office in Santa Clara (CA, USA) for the US market development (M31USA)
- Adaptica's CEO and Board of the Directors come from industry world: automation systems and ophthalmic diagnostic machines design and production





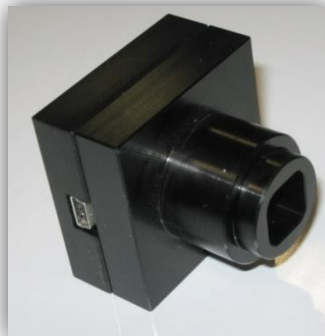
PAN



SATURN



EUROPA



MERCURY

- Deformable Mirrors (DM)
 - RHEA: Single Actuator Piezoelectric
 - PAN: Pull Membrane
 - SATURN: Push Pull Membrane
- Embedded Adaptive Optics Systems
 - EUROPA: Basic System
 - GANYMEDE: Closed Loop – Standard Applications
 - JUPITER: Closed Loop – High Frequency & Resolution
- Embedded High Voltage Driver
 - IO64/32: multichannel embedded control system
 - IO32A: multichannel analog control driver
- Wavefront Sensor
 - MERCURY: Shack Hartmann WFS
 - MMOS: SDK in Matlab
- LCD-based Products
 - CHARON: SLM - Spatial Light Modulator
- AO KITs & Demos
 - Didaptica: AO kit for universities and R&D division

Through the use of the most modern optical, mechanical and electronic technologies ADAPTICA develops embedded adaptive optics systems with characteristics of size and cost that makes them easily fit into existing optical systems or in course of design.

Adaptica brings the deformable mirror technology from scientific applications to the world of industry, biomedical applications and high demanding scientific applications.

Deformable mirrors history:
Astronomy ...



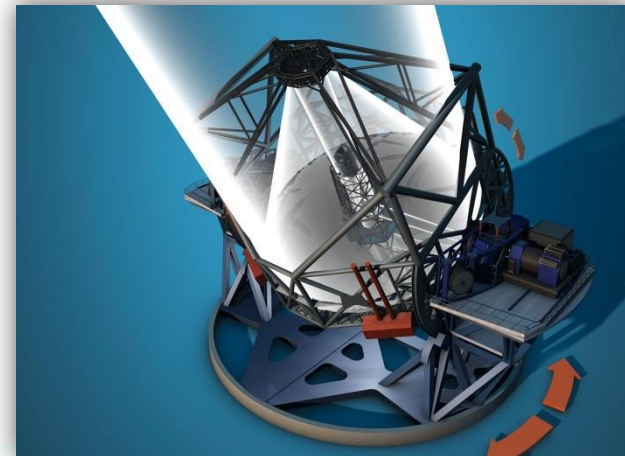
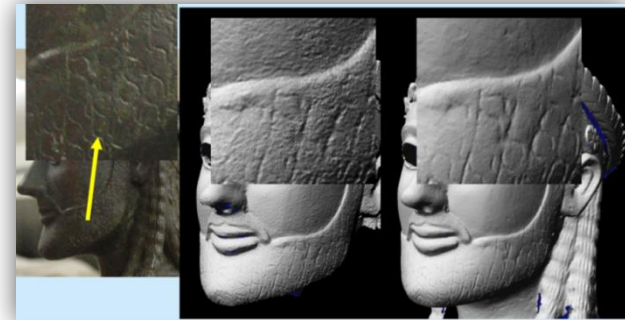
Adaptica's core
technologies



Innovate existing applications
Improve the performances
Create new applications



1. We will distribute our STANDARD AO products through international distributors (e.g. Edmund Optics)
2. We will address the industry markets with particular interest in:
 1. Microscopes
 2. LASER compression for the ultrafast market
 3. Ophthalmology: AO fundus camera
 4. Optical communications (innovative Adaptica technology)
 5. Cutting & Engraving lasers optimization
 6. 3D scanner for objects and lidar for very long distance
 7. Precision optical measurement in industry production line
3. **We will participate to national and international projects in Adaptive Optics**
4. **We will develop new DM technologies (for actuation and control)**



- Adaptica can work:
 - in deformable mirrors design and production
 - in control electronics for DMs
 - in the research and development of **new DM technologies**
 - In system integrations



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