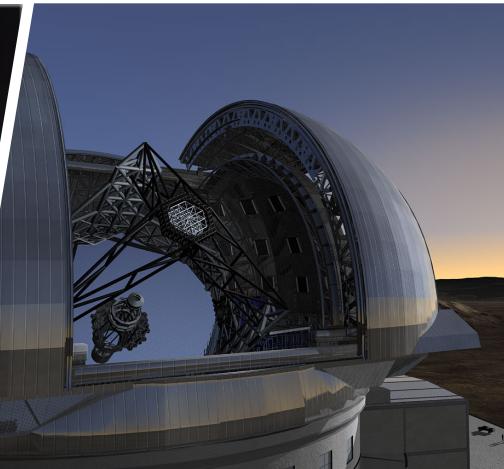
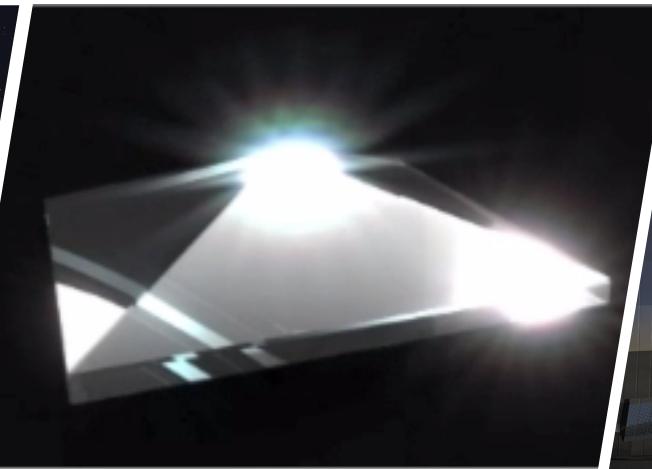
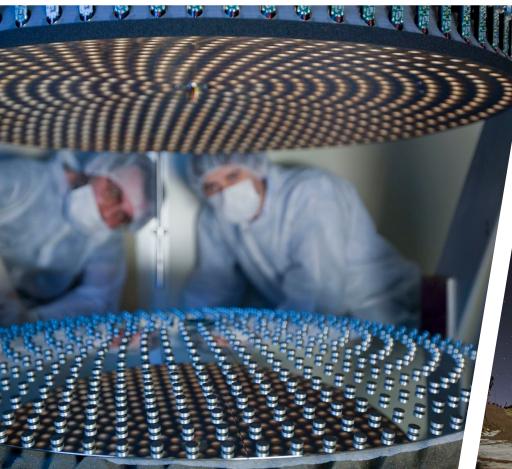




Giornate dell'INAF
27-28 Marzo 2019
Napoli – Osservatorio Astronomico di Capodimonte



Active & Adaptive Optics



Roberto Ragazzoni

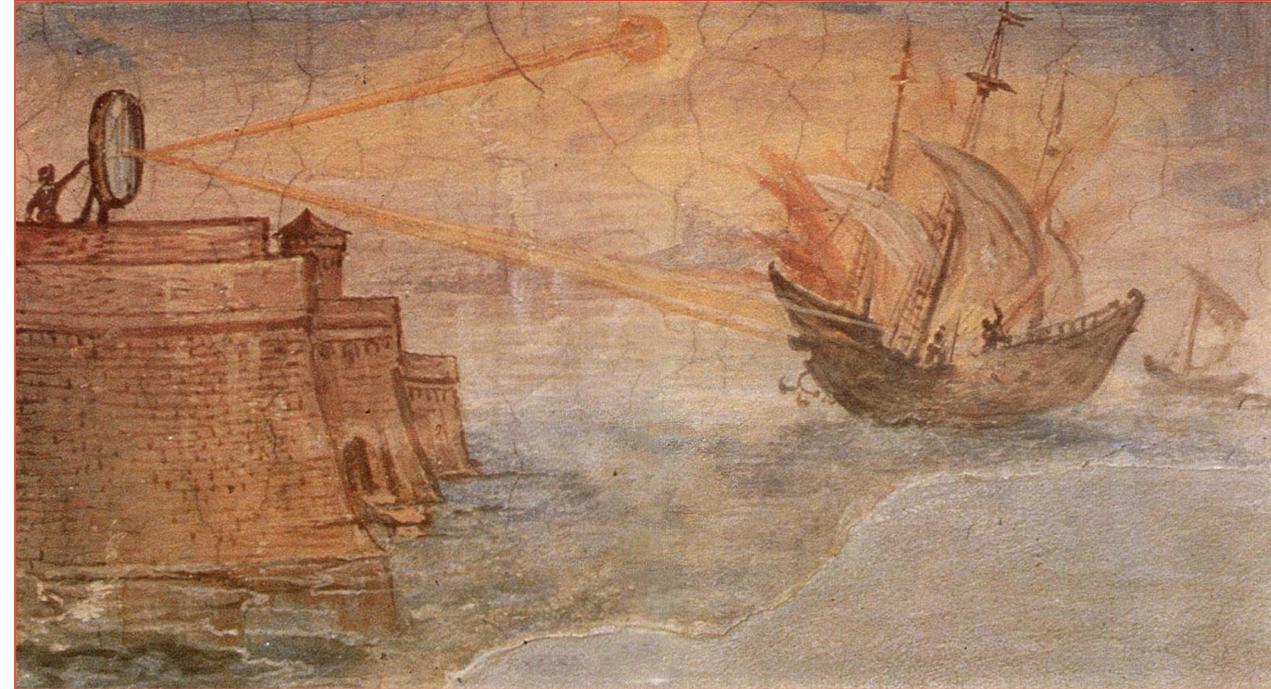
INAF – Osservatorio Astronomico di Padova

Active & Adaptive Optics

- Active Optics
- The MAORY Adaptive Optics system
- Optical turbulence characterization and forecast
- Active Optics for Radio Antennae
- Polarization-free AO system
- Space Applications

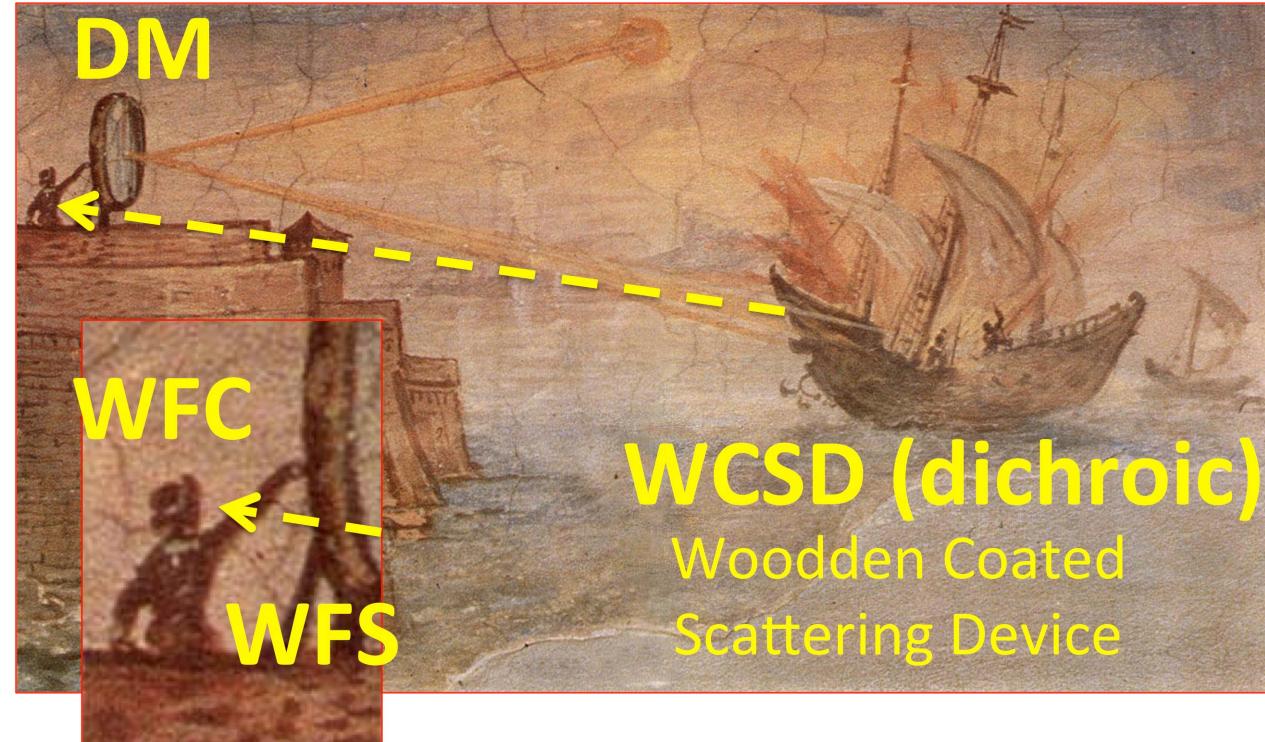


Syracuse – about 2215 years ago...



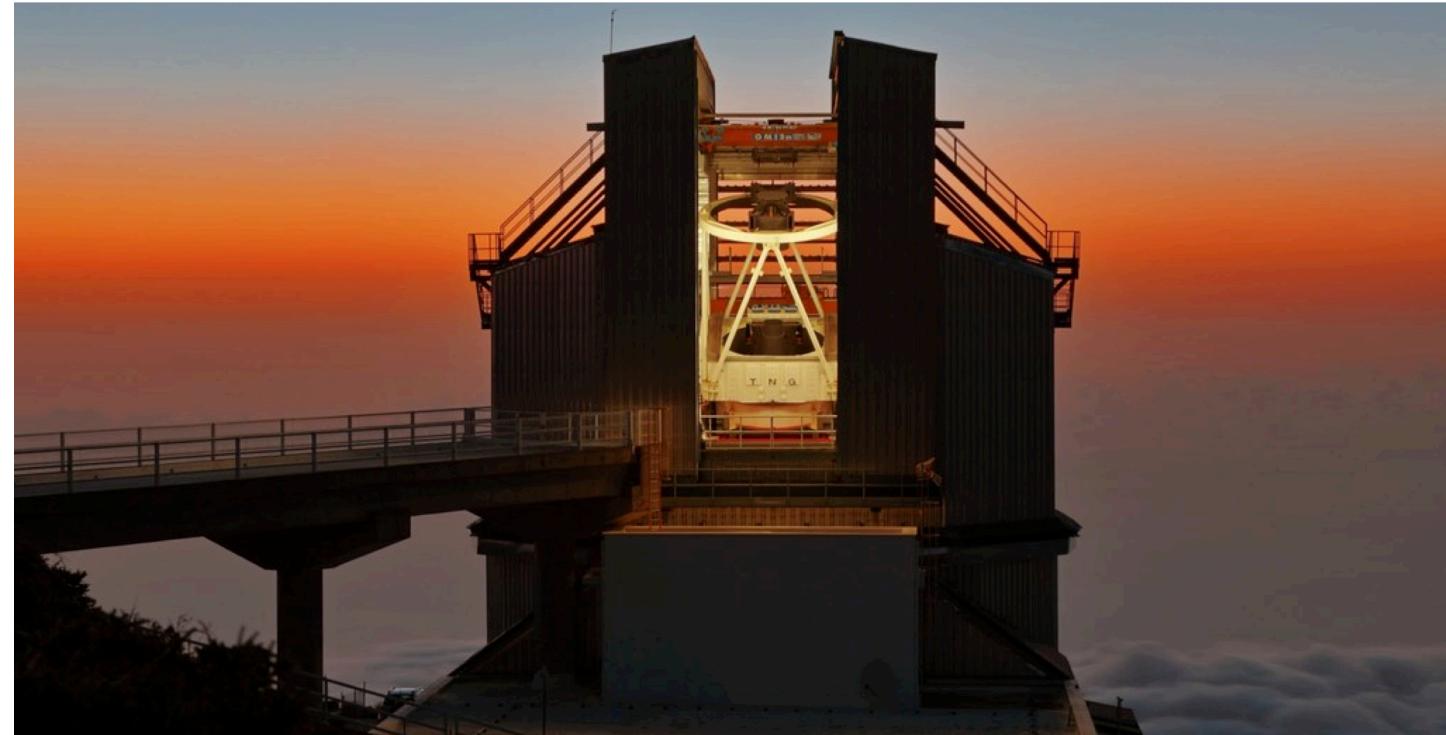


Syracuse – about 2215 years ago...





TNG





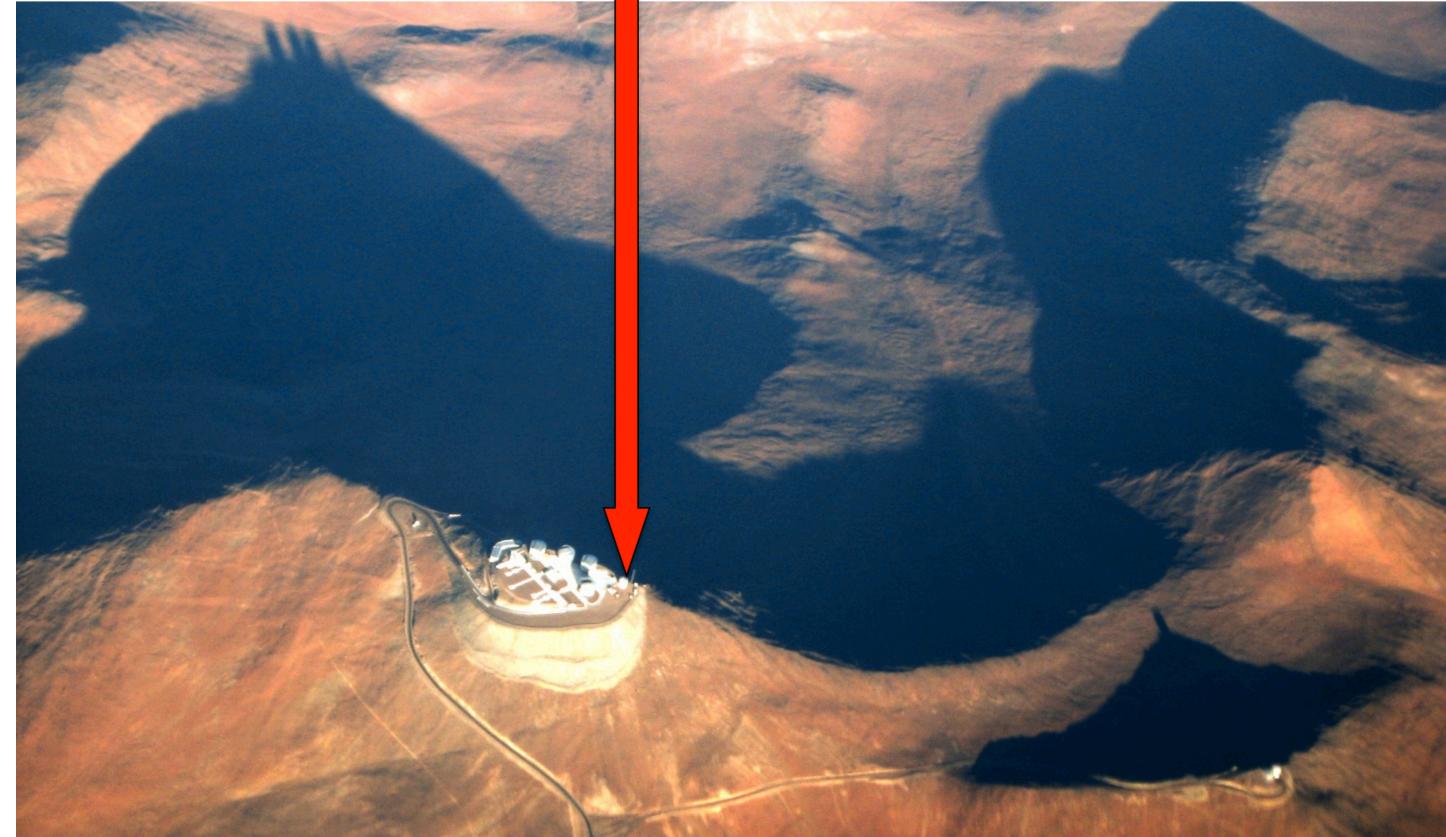
Valentina
Zitelli





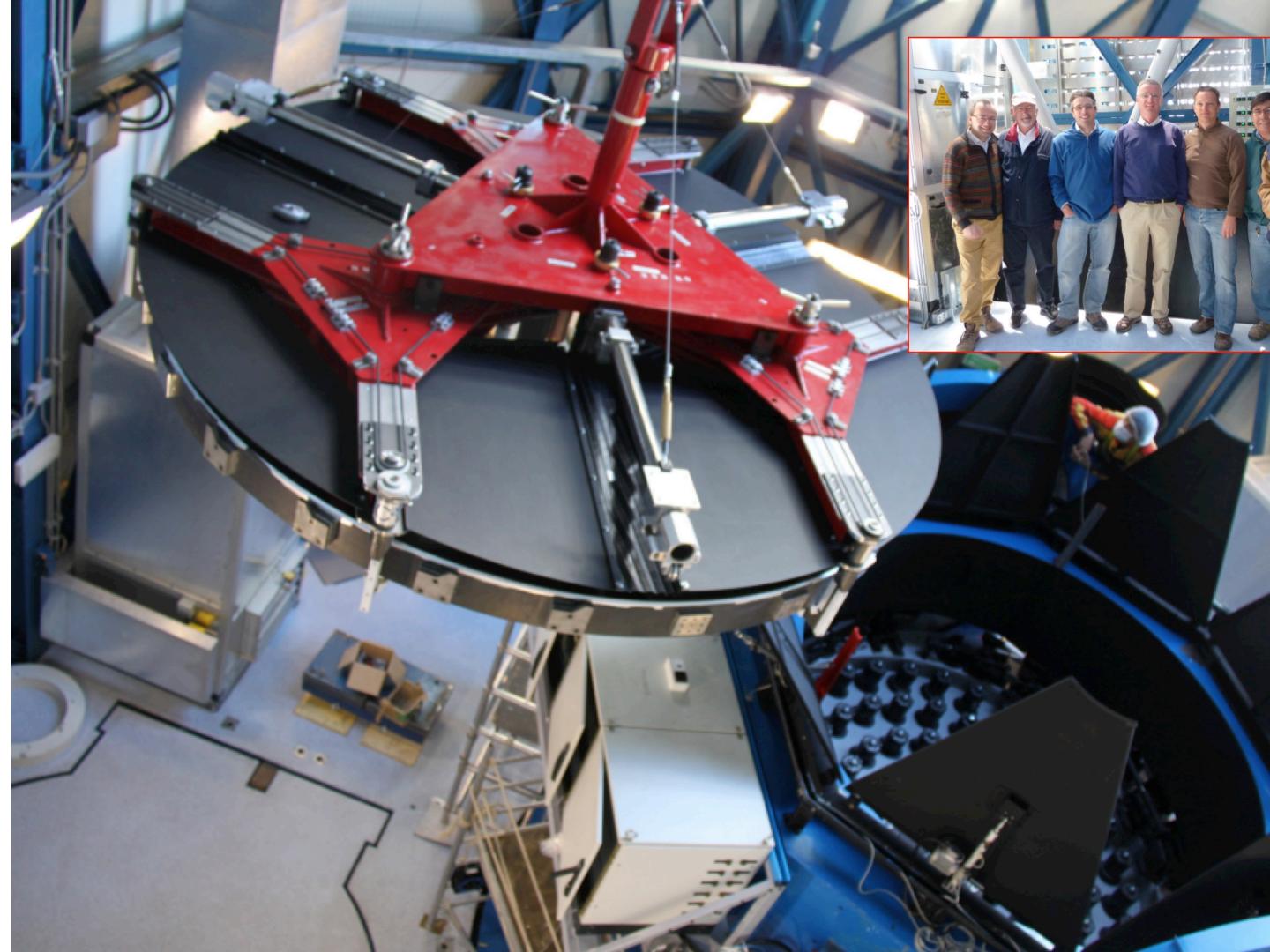
VST

Paranalcatraz









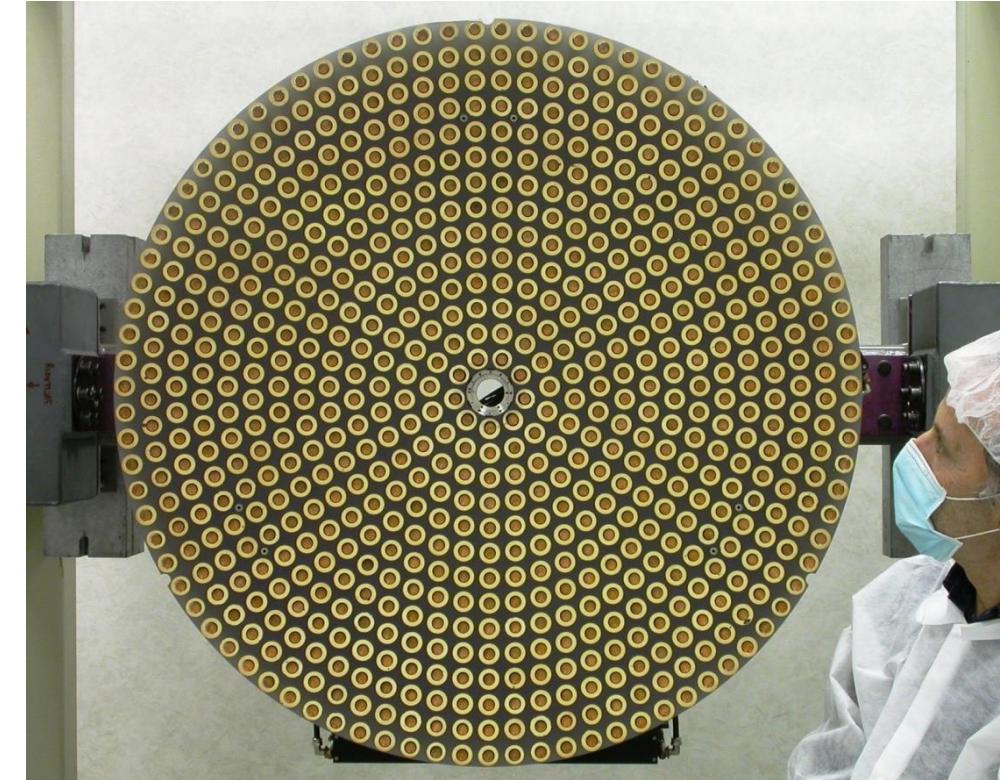


First...

- First Pyramid WFS in the sky
- First tomography in the sky
- First Multi Conjugated Adaptive Optics
- First Adaptive Secondary Mirrors
- First eXtreme AO system



Secondary Adaptive Mirrors



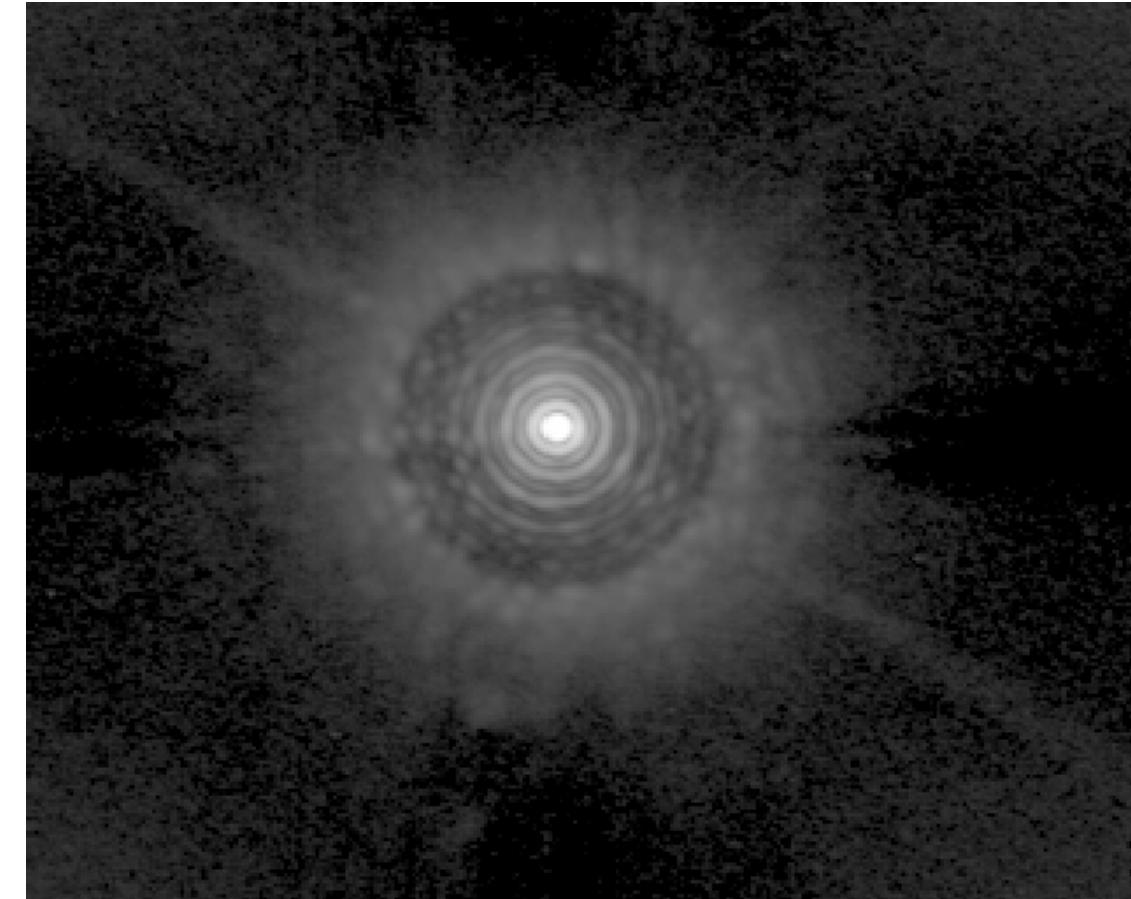


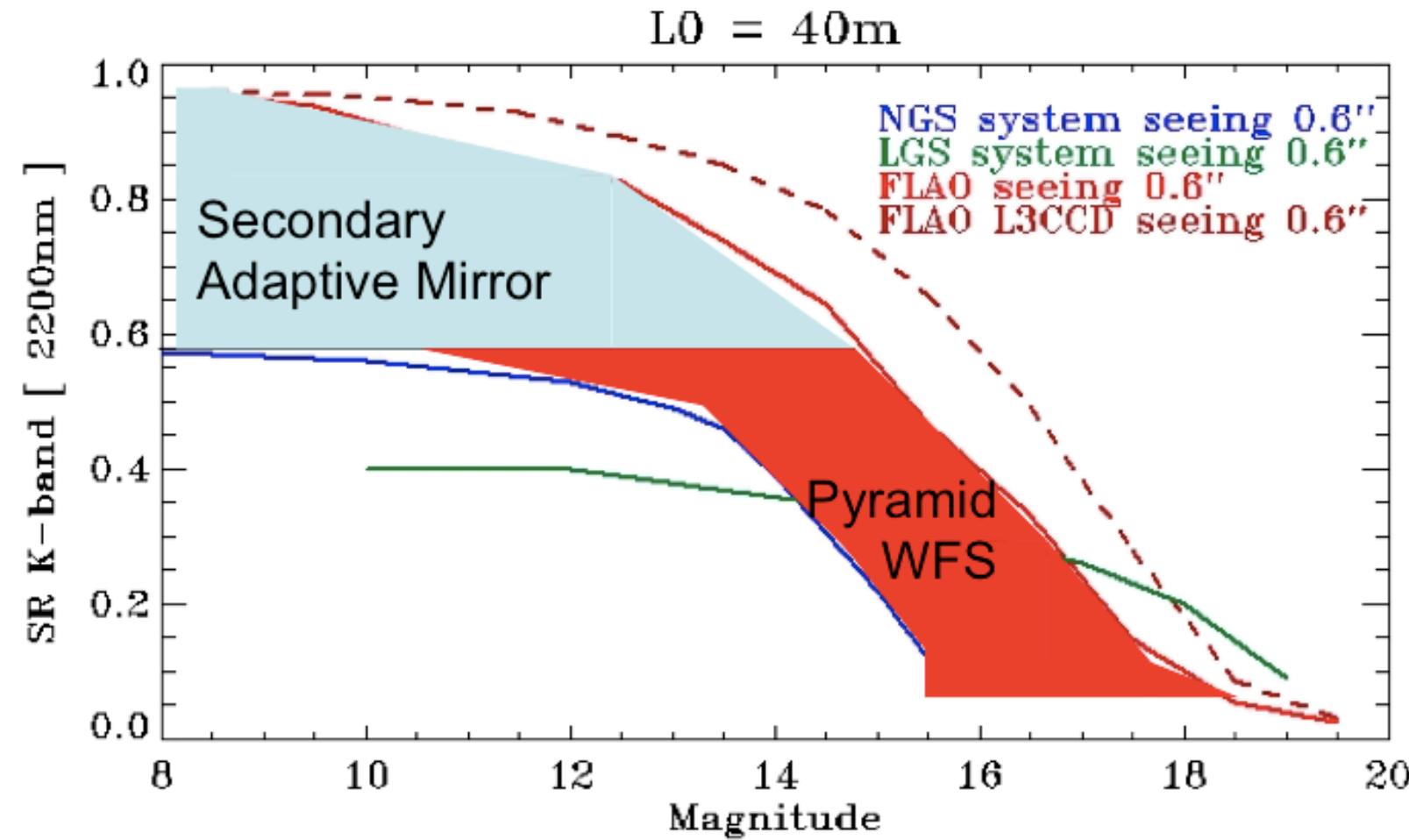
Secondary Adaptive Mirrors





eXtreme Adaptive Optics





Turbulence (forecast)



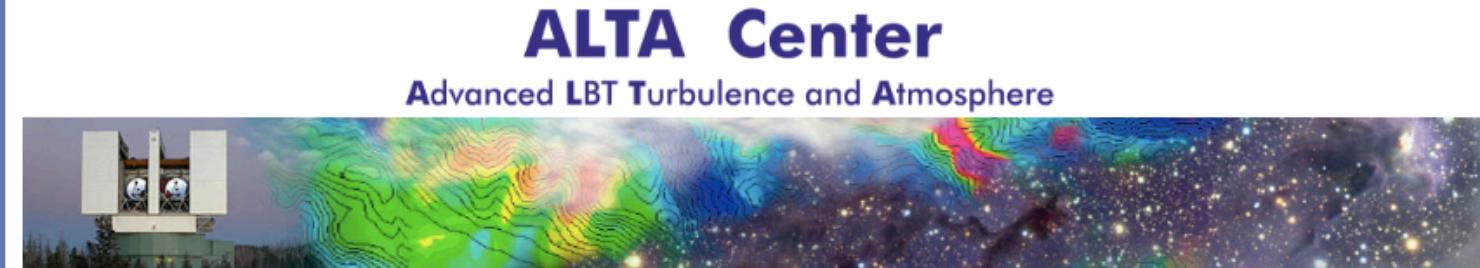
ALTA

Home

Optical Turbulence Tutorial

Forecasts Legend

Forecasts



Wind	Temperature	Relative Humidity	Water Vapor
C_N^2	Seeing - ϵ	Isoplanatic angle - θ_0	Wavefront coherence time - τ_0

Choose a date

First *light* chronology...

1993

A STUDY OF AN ADAPTIVE SECONDARY MIRROR

P. Salinari, C. Del Vecchio, V. Biliotti
Arcetri Astrophysical Observatory
Florence, Italy

Abstract

We report the study of an adaptive secondary mirror providing high order correction of the wave front perturbed by propagation through the atmosphere (up to approximately 1000 degrees of freedom). The device, based on electromagnetic actuators and capacitive position sensors, can also provide chopping with simultaneous correction of the induced coma, and can be used statically for correcting low order aberrations (active optics). We discuss the characteristics of the most important components, such as actuators, sensors, and the ultra thin mirror, and report the expected performances in the three above mentioned modes of operation (adaptive, chopping, and active).

3 August 1993

1994

1995

1996

1997

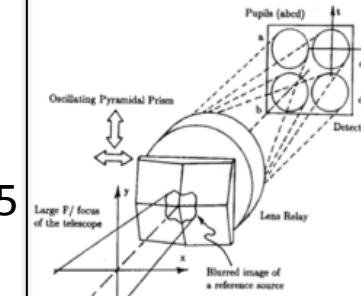
1998

JOURNAL OF MODERN OPTICS, 1996, VOL. 43, NO. 2, 289-293

Pupil plane wavefront sensing with an oscillating prism

ROBERTO RAGAZZONI
Astronomical Observatory of Padova, vicolo dell'Osservatorio 5,
I-35122 Padova, Italy

30 May 1995



First *light* chronology...

1999

2000

2001

2002

2003

2004

6 January 2000



First light AdOpt@TNG
5 September 2001

First *light* chronology...

2005



First light MAD at VLT
23 September 2007

2006

2007

2008

First light APE at VLT
13 September 2008



2009

2010

First light FLAO at LBT
May 25th, 2010



First *light* chronology...

2011



First Light MagAO at Magellan
November 24th, 2012

2012

2013



2014

First Light PathFinder at LBT
November 17th, 2013



2015

First Light ARGOS at LBT
March 22nd, 2014



2016

FLAO with LUCI2 at LBT
January 28th, 2015



First *light* chronology...

2016

2017

2018

2019

2020

SHARK...??

2021



21 September 2018

First Light SOUL on LUCI2 at LBT



4 April 2018

First Light Linc-NIRvana



11 October 2018

First Light Coude Foci
at Asiago 182cm



+ April 2018
First Light Linc-NIRVANA

2020 — SHARK...??
2021 —



11 October 2018
First Light Coude Foci
at Asiago 182cm

First *light* chronology...

2016
2017
2018
2019
2020
2021



10 December 2015
MAORY contract signature



14 April 2016
1st Workshop ADONI



11 April 2017
2nd Workshop ADONI



18 May 2018
3rd Workshop ADONI

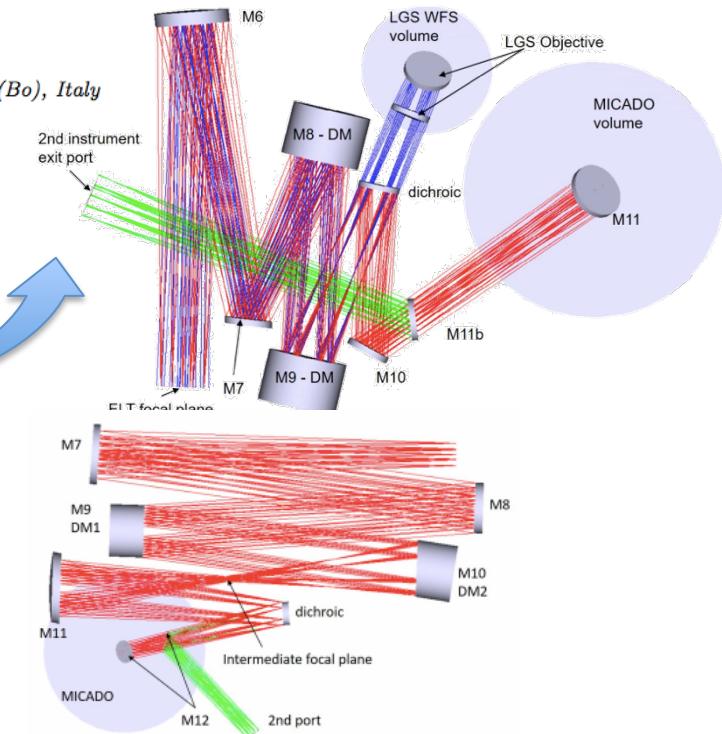
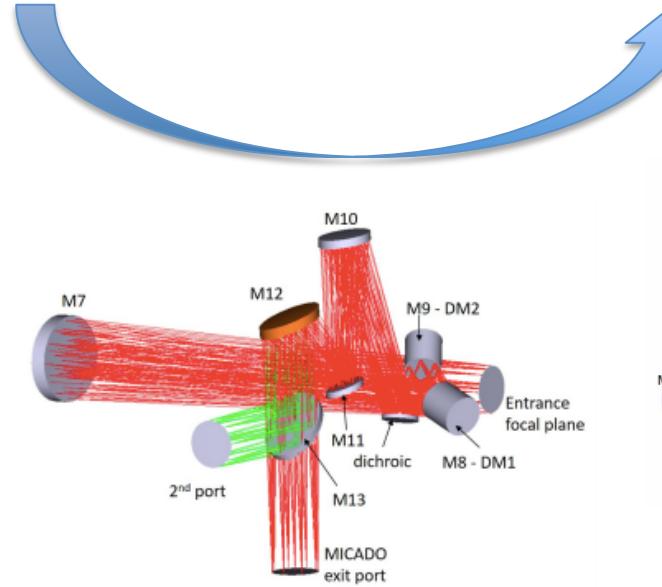
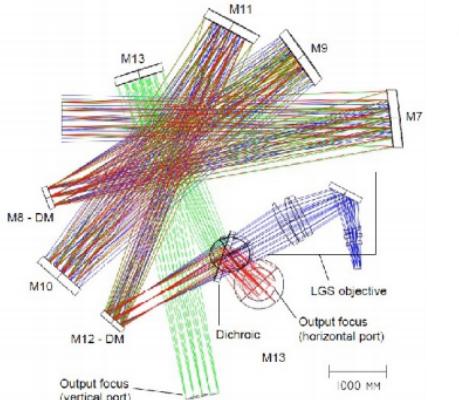
Historic evolution of the optical design of the Multi Conjugate Adaptive Optics Relay for the Extremely Large Telescope

MAORY

Matteo Lombini,^{1*} Emilianio Diolaiti,¹ Mauro Patti¹

¹INAF- Osservatorio di Astrofisica e Scienza dello Spazio di Bologna, via Gobetti 93/3, 40129 Bologna (Bo), Italy

Accepted 2019 March 15. Received 2019 March 04; in original form 2019 February 12





I miei 2 centesimi...



- Nel “*famolo strano*” abbiamo dimostrato di essere imbattibili...
- Quando si è lavorato in “*team at large*” alla fine le cose hanno funzionato molto bene...
- By-product inattesi... oftalmologia, comunicazione dati, Fly-Eye per space debris...



I miei 2 centesimi...



- Per evitare che la Vision sia una mera collezione di quello che facciamo o vorremmo fare oggi...
- Concentriamo le nostre sforze su alcune facility (MAVIS, MAORY, SHARK...) *caratterizzandole...*
- Lasciamo una frazione significativa “fissa” di risorse per inseguire le (nostre) idee nuove...
- Strategie per continuare a favorire “*dal basso*” dei team “*INAF*”...