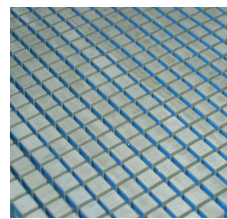
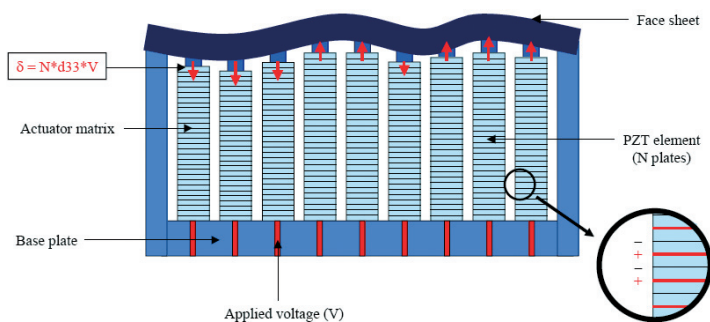


## Astronomy Applications

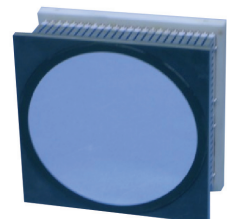
### A mirror to correct light distortion

Cilas invented the Stack Array Mirror technology which is the most widely used in adaptive optics systems.

An actuators matrix bonded to a thin Reflective Coated Substrate. The actuators are made of PZT stack. If an electric field is applied in the same direction than the polarization axis of the PZT material, then the thickness of the material will increase. If applied in the opposite direction, the thickness will decrease. This will lead to a modification of the optical plate shape.



Actuators structure



Stack Array Mirror

### Some Realizations

	SAM 52	SAM 185 (NAOS)	SAM 416 (Gemini DM4.5)	SAM 1377 (ESO-HODMAO)	SAM 4300 (TMT)
Max stroke (µm)	10	9,6	8,8	10	11,8
Individual Stroke (µm)	5	4	3,2	4	5,2
Interactuator Stroke (µm)	3	3	2,4	3	4,1
Matrix dimension	8	15	22	41	73
Number of actuators	52	185	416	1377	4200
Actuator spacing (mm)	8	8	5	4,5	5
Optical Aperture (mm)	80	112	106	180	360

Some Customers: ESO TMT, GEMINI, NSO, IAC, LAOG.

Quotation upon your specifications – Contact : [optics@cilas.com](mailto:optics@cilas.com)