Il Colle di Galileo

The Adaptive Optics National Workshop (ADONI) of the National Institute for Astrophysics (INAF)

April 12 to 14 at the Convitto della Calza (Florence)

Abstract. A national workshop dedicated to all INAF researchers and associates interested in the application of adaptive technologies to astronomy and other fields.

Keywords. Adaptive Optics, INAF, Galileo telescope.

Attention should first be drawn to the successful achievements of INAF in this field in recent years, making it a lead player on the world stage. Pyramid sensors[1] and adaptive secondary mirrors,[2] designed and developed entirely in Italy, first on the *Telescopio Nazionale Galileo* and the Multi-Mirror Telescope, then on the Very Large Telescope with MAD and finally on the Large Binocular Telescope with FLAO,[3] now represent the State of the Art[4] in adaptive optics for astronomical use. Corroborating their value, these technologies were adopted and used successfully on several other telescopes of the 8m class, such as Magellan[5] and the Very Large Telescope,[6] up to the Extremely Large Telescopes (40m class) currently under design, such as the Giant Magellan Telescope,[7] the Thirty Meter Telescope and the European Extremely Large Telescope.[8910] This situation is the result of the maturation of ideas, concepts and research projects developed over the years since 1994. This activity has led to the growth of various groups of INAF staff working in this field on national and international projects. The consolidation of these groups as an entity of excellence was one of the goals of ADONI, initiated in 2012 with coordination and development functions for the adaptive activities of INAF.

The goal of ADONI, in addition to supporting present or future project activities, is to continue to drive research in the field of adaptive optics. Common experience confirms that with the current funding model the commitment to pure research is difficult to manage. Nevertheless, sustaining this commitment is crucial to maintaining the leadership that Italy currently boasts in astronomical adaptive optics. This is the reason for the creation of ADONI as a unifying entity devoting a fraction of its commitment to research. Finally, ADONI also

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intends to follow up potential industrial developments in various fields, such as medicine, optical metrology and laser systems, where adaptive optics techniques are becoming increasingly popular.

Consistently with the above, the ADONI 2016 workshop provided an opportunity to meet the entire Italian community involved in adaptive optics, to take stock of the situation, exchange ideas, experiences, and projects, to share new, not yet established technologies and to map out possible future paths. ADONI 2016 gave young and emerging groups in this area the chance to meet the existing ones. The first positive result of the workshop was the large number of participants (86) together with the level of the contributions (43). The variety of the presentations, exploring all kinds of adaptive optics from X-rays, to deconvolution techniques for adaptive images from interferometric telescopes, through to the VIRGO adaptive optics, shows how active and varied this field is, with a huge future potential. Finally, 75% of the contributions were from young researchers under 40. It is obvious that the adoption of a national laboratory with a capacity for coordination, aggregation and thrust towards research is the best way to exploit the considerable existing assets. The workshop was also attended by Filippo Zerbi, the new Scientific Director of INAF. On several occasions, including a panel discussion concerning ADONI's mission, he has expressed a very positive opinion on the initiative; he also described the new organization of INAF and its possible relationship with the laboratory.

In conclusion, we believe that the ADONI 2016 workshop gave the adaptive community of INAF the chance to meet for three days of presentations, discussions and enrichment, made very effective by the informal quality of the event.

Figure 1 Workshop participants.

All the ADONI participants look forward with pleasure to the repetition of the appointment in the next few years.

Notes

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[2] Salinari, P *et al.* (1994), *Proceedings of the ICO-16*
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[4] Davis, R. and Kasper, M. (2012) *Annu. Rev. Astron. Astrophys.* 2012. 50:305–51
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[6] Arsenault, R. *et al.* (2008), *Proc. of SPIE* Vol. 7015 701524-1
[7] Pinna, E. et al. (2014), *Proc. of SPIE*, Vol. 9148, id. 91482M 15
[8] Diolaiti, E. et al. (2015), *Memorie della Societa Astronomica Italiana*, v.86, p.428
[9] Briguglio, R. (2015), *Fourth AO4ELT Conference*
[10] Esposito, S. (2015), *Memorie della Societa Astronomica Italiana*, v.86, p.446