Andrea Baruffolo   Curriculum Vitæ

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Personal Information

First/Family name:	Andrea Baruffolo	**Address:**	Istituto Nazionale di Astrofisica
Current Position:	First Technologist		Osservatorio di Padova
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Education

Graduated, in November 1991, in Astronomy at the University of Padova, with full marks and honors, with a Thesis on the "Kinematics of the Circumnuclear Regions of Seyfert Galaxies", supervisors: P. Rafanelli and M. Capaccioli.

Professional Experience

In 1990 (before graduating) work on assignment, at the Astronomical Observatory of Asiago (Italy), to **interface a plate–digitizing machine to a PC and to develop software for the determination of stellar radial velocities using the cross–correlation technique**.

January 1991—March 1993: under contract with the Galileo Italian National Telescope (TNG) Project, in Padova (Italy), to work on the **design and implementation of the control system software for the TNG**. This work involved the design and development of a common software environment (named GATE), in C under the PDOS real–time OS, where all the real time control software for the various Telescope Units and Instrument Controllers was to be realized.

First half 1992: **development of a graphical User Interface for the Asiago Fast Photometer**, of the Asiago Astronomical Observatory (Italy), and development of a procedure for the reduction of optical light curves of the Crab Pulsar obtained with this instrument.

3rd quarter 1992—March 1993: **development of a data acquisition system for all the instruments available at at the 1.8m Copernico Telescope** of the Astrophysical Observatory of Asiago (Italy). This system, still in use at the Asiago Mt. Ekar Observatory, provides for CCD setup and monitoring, data acquisition and quick–look/quick–analysis, data storage and management on magnetic disk in FITS format, automatic transfer of acquired frames to a data analysis workstation.

June 1993–May 1994: successful applicant for a **Fellowship from the Italian National Council for Research (CNR)**, to work at the Astronomical Observatory of Padova (supervisor: L. Benacchio), on the definition of a model for data archiving for the new generation of ground–based astronomical telescopes, and study of technical problems connected with the practical implementation of this model.

From October 1993 to April 1994: under contract with the Astrophysical Observatory of Catania (Italy), to work on the **optical design of the Spectrum–UV imaging camera and the development of simulation software for the computation of the position–dependent PSF in the focal plane**.

In 1993 some work on **deconvolution algorithms**, this experience was later applied to the deconvolution of images acquired with the Hubble Space Telescope.

Mid 1994–end 1994: **development of a statistical procedure and software** aimed at the study of the relevance of interaction to the presence of Seyfert or starburst activity in the nuclei of galaxies.

August 1994: successful applicant for a permanent position as **Astronomer at the Astronomical Observatory of Padova**.

September—December 1994: **consultant to the Working Group on TNG Archives**, appointed in mid 1994 by the Italian Council for Astronomical Research (CRA).

June 1995–end 2008: **responsible for the design, implementation and maintenance of the software for the Adaptive Optics module for the TNG (AdOpt@TNG)**. The work included: design and development of the coordination software and User Interfaces, integration in the TNG control system; participation in the definition of the requirements for the wavefront computer, supplied under contract by the ThermoTrex (San Diego, USA) company, and its integration in the module; design and development of the software for the Speckle facility for the real–time reduction of speckle images using different algorithms (AC via FFT, SAA,). Within this project, in 1997 I also partecipated to the development of a low cost seeing monitor able to measure the isokinetic patch size through imaging of the lunar edge and to the study of the sky coverage for one LGS tip–tilt retrieving technique.

January 1996—present: Development and maintenance of an **archiving system for the Asiago Astrophysical Observatory and of a web–based User Interface** to the Archive.

August 1996—July 1997: **Principal Investigator in a Pilot Project on the Management of Very Large Astronomical Databases using Object–Relational DBMSs**. This work comprised the development of an object–relational model of astronomical data, the extension of the DB engine with access methods based on multi–dimensional spatial data structures and of the query language with astronomical functions and query predicates.

August 1997—December 2001: working on a Project, funded by the Italian National Council for Astronomy and Astrophysics, for the **development of a system, based on an Object–Relational DBMS, for the on–line access to the Guide Star Catalogue II**.

September 1998–present: involved in the definition of the OmegaCAM project (a wide–field CCD imager for the VLT Survey Telescope – VST), and **responsible for the OmegaCAM Instrument Software**. In this project I coordinated a small group (up to four) of engineers and I'm responsible for the definition of requirements, the design, the development, test, installation and commissioning of the whole control software for the instrument. The OmegaCAM project has successfully passed all reviews (CDR, PDR, FDR) and is now at the Paranal Observatory ready for commissioning (expected in mid-2010).

June 2000—November 2001: **unpaid associate at ESO–Garching**, in the frameword of the OmegaCAM Project, to collaborate with ESO Optical Detector Team (ODT) on the definition of OmegaCAM–specific requirements towards the CCD control software and the design and implementation of the required modification of the ESO–standard CCD control software (FIERA).

October 2001—September 2007: collaboration with ESO Adaptive Optics Group for the realization of a technology demonstrator of Multi-Conjugated Adaptive Optics (MAD). In this project I'm **responsible for the development and integration of the instrument control software for MAD** MAD has been installed at the VLT (UT3) as a visitor instrument and has performed observations both in the "star–oriented" and in the "layer–oriented" modes during the course of 2007.

December 2001—today: **responsible for the instrumentation control software for SPHERE**, a second generation VLT instrument. Within this project I coordinate a group of six developers, distributed among France, Switzerland and Italy. The SPHERE Project has passed FDR in December 2008 and is now in the construction phase.

March 2002—today: responsible for the **design and implementation of the Image Analysis software for the Large Binocular Camera (LBC@LBT)**. This software derives the aberrations on the instrument focal plane from the analysis of de–focused star images and provide them to the telescope control software for correction.

March 2003—June 2006: participation to the **GRID.it project**, funded by the Italian Ministry for University and Research, and aiming at studying a Grid infrastructure for scientific research in Italy. Within this project I participated to the "Applications for Astrophysics" Work–Package with particular regard to the integration in the Grid of services for the access and consultation of astronomical databases.

October 2003—December 2005: **responsible of the Padova Research Unit of the "Draco" Project**. This project, funded by the Italian Ministry for University and Research, aimed at porting to the Grid of *computing–intensive* software applications for astrophysics. Within the project, our research unit ported to the Grid an application for consultation of large astronomical databases.

November 2007—today: participation to the Phase A study of the Multi–Conjugate Adaptive Optics for the E–ELT (MAORY), for the **definition of the top–level requirements on the MAORY control software and the preliminary definition of software interfaces** towards the telescope and client intrument.

June 2008—today: participation to the Assessment Phase of the PLATO project, aiming at the realization of a Class–M space mission for the discovery and characterization of exo–planets through the method of transits and asteroseismology. In the project I'm **responsible for the Instrument Control Unit (ICU)**, part of the on–board data processing system.

August 2009: successful applicant for a permanent position as **"Primo Tecnologo" (First Technologist) at the Astronomical Observatory of Padova**.

Teaching Experience

I've co-tutored 2 undergraduated students in Astronomy and 6 in Informatics Engineering, in the preparation of their graduation thesis dissertation.

Publications

About 120 publications listed in ADS.