

**Cesare Barbieri**  
Professor Emeritus of Astronomy  
University of Padova, Italy

**Curriculum Vitae**

Some representative publications are mentioned.

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e-mail: [cesare.barbieri@unipd.it](mailto:cesare.barbieri@unipd.it)

personal web page; <http://www.cesare-barbieri.it>

University Web page: <http://www.astro.unipd.it/barbieri/> (updated to end of 2013)

ORCID 0000-0002-6257-9076

Asteroid nr.13993 (Cesarebarbieri)

Mobile: +393482718731

Home address: via Livorno 12A, 35142 Padova, Italy

**Born:** San Giovanni in Persiceto (BO), 27/11/1942

**Education:**

Maturità Classica, liceo classico M. Minghetti, Bologna

Laurea in Physics, July 1965, University of Bologna, 110/110 summa cum laude.

**Career**

- Astronomer, Astronomical Observatory of Padova from Sept. 1, 1966 to sept. 30, 1971
- Libera Docenza in Astrophysics 1971
- Aggregate Professor from Oct. 1, 1973 to Oct. 31, 1976, University of Padova
- Full Professor of Astronomy, University of Padova from Nov. 1976 to Sept. 30, 2013
- Emeritus of Astronomy, University of Padova, since Oct. 1, 2013

Post-Doc Fellow at McDonald Observatory (Texas, USA) 1968-69 and Australian National University in Canberra 1973.

Visiting Professor at Boston University in several dates.

**University teaching:** (from 1971 to 2016)

- Analysis and Calculus, University of Mogadiscio (Somalia) ,1971
- Astronomy and Astrophysics for Graduate and Master Courses of Astronomy, Mathematics, Aerospace Engineering
- Astronomical Optics in PhD Schools of Astronomy and Ophthalmology

Invited lecturer in several Institutes in Europe and USA.

Invited lecturer 2016-2023) for the *Master in Science and Faith*, Pontificio Ateneo Regina Apostolorum, Rome

**Director:**

- Vice-director 1980-1985 and Director 1985-91 Padua and Asiago Astronomical Observatories
- 1987-98 Telescopio Nazionale Galileo TNG (La Palma, Canary Islands, Spain)
- 2008-10 PhD School of Sciences Technologies and Measures for Space, Univ. Padova
- 2010-13 Galilean School of Higher Education, Univ. Padova

**Committee Memberships:**

- 1974-75 Committee CNR Tecniche di Analisi di Immagini estese alla Geofisica e all'Astronomia
- 1976-87 Scientific Committee of the CNR Institute of Radioastronomy
- 1977-'79 ESA Study Team of the astrometric satellite Hipparcos
- 1979-82 consultant of the Piano Spaziale Nazionale for Physics, Astronomy and Space Geophysics
- 1980-85 Chairman of the Scientific Committee for the National Telescope OAN
- 1987-89 Scientific committee for the USA-Italy-Germany COLUMBUS telescope (now LBT)
- 1987-93 Scientific committee of the Bologna Astronomical Observatory
- 1985-87 European Space Agency (ESA) Astronomy Working Group
- 1991-94 ESA Space Science Advisory Committee and SC Horizon 2000+
- 1988-92 Scientific and Technical Committee of the European Southern Observatory (ESO)
- 1994-95 NASA Committee for the selection of the first space missions Discovery
- 2001 Evaluation committee of Estonian Universities
- 2002-07 Board European School NEON
- 2004-08 Board Master of Applied Optics, University of Padova
- 2013 and 2019 Evaluation Committee for Russian astrophysical programs
- 2013-21 Scientific Committee of the School of Higher Education 'G. Leopardi', University of Macerata

**Main Projects and contracts:**

- 1977-94 Member of the ESA Instrument Definition Team for the Faint Object Camera on board the NASA Hubble Space Telescope (HST)
- 1980-87 Scientific and managerial responsible to the Piano Spaziale Nazionale (ASI did not exist at the time) for the Italian hardware of the Halley Multicolor Camera on board the ESA cometary mission GIOTTO
- 1988 -1998 Responsible to the Ministry of Education and University MIUR (INAF did not exist at the time) for the design and construction of the 3,5m Telescopio Nazionale Galileo (TNG) on the Roque
- 1998 P.I. PRIN *Collisional, dynamical and physical evolution of bodies of the solar system*
- 2001 P.I. PRIN *Search and dynamical and physical studies of NEAs and other minor bodies of the solar system*

- 2002 P.I. PRIN *Digitization of photographic archives of the Italian Astronomical Observatories*
- 2006 P.I. PRIN *Astrophysics to the Quantum Limits*
- 2004-05 P.I. ESO contract for *Quanteye (Quantum Astronomy)*
- 2005-06 Member ESA contract *QIPS (Quantum Communications in Spaces)*
- 2007-09 P.I. of ESA/EC contact *Harrison (utilization of the time distributed by the GALILEO GNSS for Astronomy)*
- 2007-10 P.I. of the first Project of Excellence instituted by the Fondazione Cassa di Risparmio di Padova e Rovigo (Cariparo) *Quantum Properties of Light and Astronomy*
- 2009-13 Member of Strategic Program of the Padova University *Quantum Future (Quantum Astronomy and Quantum Communications)*
- 1995 - 2017 Responsible to ASI for the design, construction and operation of the Italian hardware and software of the OSIRIS imaging system on board the ESA cometary mission Rosetta and Lead Scientist of the Osiris International team

## Main Research Themes

- **Quasars, Radio Quiet Quasi-Stellar Objects, Seyfert galaxies and Active Galactic Nuclei:** astrometry, optical identification of radio-sources, discovery of non-radio emitting quasi-stellar objects through multicolor photometry on Asiago Schmidt plates; optical variability with innovative analysis of irregularly spaced data. **High-resolution imaging** with FOC/HST

Barbieri C; de Felice F (1966) *Properties of the QSS's*, Memorie della Società Astronomia Italiana, Vol. 37, p.763

Barbieri C; Bertola F (1972) *Identification of 5C 4 radio sources*, MNRAS. **156**, 399

Barbieri C; Romano G (1981), *Survey of the optical variability of compact extragalactic objects. IV Objects from 12H to 16H*, Astron&Astrophys. Suppl. 44, 159, and previous paper since 1974

Barbieri C; Benvenuti P (1974) *Studies of blue objects at high galactic latitudes. 3. Faint blue objects in the field of BD +15 2469*, Astron & Astrophys Suppl. **13**, 269

Barbieri C; Cristiani, S.; Romano, G., (1982), *A study of some compact extragalactic objects*, The Astron. Journal **87**, 616

Barbieri C; Omizzolo, S.; Romano, G.; Cristiani, S., (1985) *The variable extragalactic object 3C 446*, Astron&Astrophys. **142**, 316

Barbieri C; Barbon, R; De Bastiani, L.; Romano, G; Pesch, P. (1985), *Studies of faint blue objects at high galactic latitudes. IV Faint blue objects in the field of Chi UMa*, Astron&AstrophysSuppl. **61**, 163, and previous papers since 1971

Barbieri C; Cristiani, S., (1986), *Quasar candidates in the field of SA 94 (2h53m, + 0 deg 20 arcmin)*, Astron&Astrophys Suppl. **63**, 1

Barbieri C, Vio R, Cappellaro E, Turatto M (1990), *The Optical Variability of the Quasar 3C 446*, The Astrophysical Journal 359, pagg.63-66

La Franca F; Cristiani S; Barbieri C (1992), *The SA 94 QSO surveys. V - An UVx sample of 97 QSOs with B not greater than 19.9*, The Astronomical Journal **103**, 1062

Vio R; Turolla R; Cristiani S; Barbieri C (1993) *A Stochastic Model for the Variability of NGC 6814*, Astrophysical Journal v.405, p.163, DOI: 10.1086/172349

Barbieri C.; Rafanelli P; Schulz H and 18 more (1993) *Compact subarcsec structures of the double nucleus of NGC 6240 revealed with HST*, *Astronomy and Astrophysics*, Vol. 273, p. 1-5

Ragazzoni R; Barbieri (1994) *Cycle-Number Determination via Hough Transform: The Technique and an Application to GW CEP*, *Publications of the Astronomical Society of the Pacific*, v.106, p.683,

Deahrheng JM, Albrecht R, Barbieri C et al (1994) *The massive star content of the blue dwarf galaxy IZw 36 from Faint Object Camera observations*, *Astronomy and Astrophysics*, Vol. 288, p.413-42

Omizzolo A; Barbieri C; Rossi C (2005), *3C 345: the historical light curve (1967-1990) from the digitized plates of the Asiago Observatory*, *Monthly Notices of the Royal Astronomical Society* **356**, Issue 1, pp. 336-342.

- **Solar system planets and minor bodies:**

**Astrometry on Asiago Schmidt platers and high-resolution imaging from HST images of Pluto-Charon dwarf planet and moon**

Gemmo A; Barbieri C (1994), *Astrometry of Pluto from 1969 to 1989*, *Icarus* 108, 174, DOI: 10.1006/icar.1994.1051, with reference to previous papers

Albrecht R; Barbieri C; Adorf H M; Corrain G; Gemmo A; Greenfield P; Hainaut O; Hook R N; Tholen D J;Blades J C; Sparks W B (1994), *High-resolution imaging of the Pluto-Charon system with the Faint Object Camera of the Hubble Space Telescope*, *The Astrophysical Journal* **435**, L75-L78

**High-resolution images form Copernicus, TNG, HMC/GIOTTO and OSIRIS/ROSETTA and photometric and spectroscopic characterization of stars, comets, asteroids, moons of planets, Trans-Neptunian Objects. Transient Sodium atmospheres of Moon and Mercury**

Keller H U; Arpigny C; Barbieri C; Bonnet R M; Cazes S, Coradini M; Cosmovici C B et al. (1986), *First Halley multicolour camera imaging results from Giotto*, *Nature* **321**, 320

Keller HU, Delamere WAD, .... Barbieri C et al. (1988) *Comet Halley's Nucleus and its activity*, *Exploration of Halley's comet* pp 807-823, Eds. M. Grewing, F. Praderie, R. Reinhart, Springer

Parsce, F. ; Sartoretti, P. ; Albrecht, R. ; Barbieri, C. et al. (1992) *Near-ultraviolet imaging of Jupiter's satellite Io with the Hubble Space Telescope*, *Astronomy and Astrophysics* (ISSN 0004-6361), vol. 262, no. 2, p. 617-620.

Cremonese G, Thomas N, Barbieri C, Pernechele G (1992), *High Resolution Spectra of Io's neutral Sodium Cloud*, *Astronomy & Astrophysics* **256**, 286

Barbieri C; De Marchi G; Nota A; Corrain G; Hack W; Ragazzoni R; Macchetto D, (1996), *First HST/FOC images of the low mass companion of the astrometric binary Gliese 623*, *Astronomy & Astrophysics* 315, 418

Marchi S, Lazzarin M, Magrin S, Barbieri C (2003) *Visible spectroscopy of the two largest known trans-Neptunian objects: Ixion and Quaoar*. *Astronomy & Astrophysics* **408**, pp. L17-L19

Keller H U, Barbieri C, Koschny D, Lamy P, Rickman H, Rodrigo R; Sierks H; A'Hearn M F; Angrilli F. et al. (2010) *E-Type Asteroid (2867) Steins as Imaged by OSIRIS on Board Rosetta*, *Science* 327, p. 190

Marchi S; Barbieri C; Küppers M; Marzari F; Davidsson B; Keller H U; Besse S; Lamy P; Mottola S; Massironi M; Cremonese G (2010) *The cratering history of asteroid (2867) Steins*, *Planetary and Space Science*, Volume 58, Issue 9, p. 1116-1123

Sierks H; Barbieri C; Koschny D; Lamy P; Rickman H; Rodrigo R; OSIRIS Team (2010) *21 Lutetia: Overview of results from OSIRIS images*, "European Planetary Science Congress 2010, held 20-24 September in Rome, Italy. <http://meetings.copernicus.org/epsc2010>, p.664"

**Discovery of asteroids:** The automatic ADAS survey on Asiago Schmidt CCD images identified more than 1,000 asteroids of the Main Belt, and more are continuously confirmed (see the Minor Planets Circulars)

Barbieri, C.; Calvani, M.; Hoffmann, H. M.; Mottola, S.; Pignata, G.; Salvadori, L. (2002) *ADAS: Asiago-DLR Asteroid Survey*, *Memorie della Società Astronomica Italiana*, vol. 73, no. 3, p. 636

Hoffmann M; Pignata G; Barbieri C; Bertini I; Calvani M; Claudi R; Hahn G; Magrin S; Mottola S; Neukum G (2002) *The ADAS inner solar system project*, in: *Proceedings of Asteroids, Comets, Meteors - ACM 2002*. International Conference, 29 July - 2 August 2002, Berlin, Germany. Ed. Barbara Warmbein. ESA SP-500. Noordwijk, Netherlands: ESA Publications Division, ISBN 92-9092-810-7, 2002, p. 797 - 800

**High-resolution images and spatially-resolved -spectroscopy** of Moon, Mercury and Io (the innermost moon of Jupiter) transient Sodium atmospheres from ground and space. Diffuse Sodium in comets and other solar-system bodies. Aurorae and red arcs (SAR) in the upper terrestrial atmosphere. Terrestrial influence of Space Weather.

Contarini, G.; Barbieri, C.; Corrain, G. and 2 more (1996) *Spectroscopic observations of the sodium atmosphere of the Moon*, *Planetary and Space Science*, Volume 44, Issue 5, p. 417-420. DOI: 10.1016/0032-0633(95)00118-2

Barbieri C, Verani S, Cremonese G, Sprague A, Mendillo M, Cosentino R, Hunten D (2004), *First observations of the Na exosphere of Mercury with the high resolution spectrograph of the 3.5M Telescopio Nazionale Galileo*. *Planetary and Space Science* **52**, pp. 1169-1175

Mangano V; Borin P; Milillo A; Leblanc F; Massetti S; Orsini S; Mura A; Plainaki C; Rinaldi G; Barbieri C (2010) *Sodium exosphere morphology of Mercury*, EGU General Assembly 2010, held 2-7 May, 2010 in Vienna, Austria, p.11047

- **Digitization of the Italian and Vatican Astronomical Archives.** This PRIN project involved Asiago, Torino and Catania archives, and Vatican archive in Castelgandolfo. Many thousands of plates, some dating back to more than 100 years (e.g., Catania plates of Comet Halley passage in 1910) are available in digital form. The plates are used for studies of photometric variability, position and proper motions of stars and even nebulae; many solar-system moving objects have been discovered

Barbieri C; Blanco C; Bucciarelli B; Coluzzi R; di Paola A; Lanteri L; Li Causi, G; Marilli E; Massimino P; et al. (2003) *Digitization and Scientific Exploitation of the Italian and Vatican Astronomical Plate Archives*, *Experimental Astronomy*, v. 15, Issue 1, p. 29-43

Johnson J A; Winn J N; Rampazzi F; Barbieri C; Mito H; Tarusawa K; Tsvetkov M; Borisova A; Meusinger H (2005), *The History of the Mysterious Eclipses of KH 15D. II. Asiago, Kiso, Kitt Peak, Mount Wilson, Palomar, Tautenburg, and Rozhen Observatories, 1954-1997*, *The Astronomical Journal* **129**, Issue 4, pp. 1978-1984

Omizzolo A; Barbieri C; Rossi C (2005), *3C 345: the historical light curve (1967-1990) from the digitized plates of the Asiago Observatory*, *Monthly Notices of the Royal Astronomical Society* **356**, Issue 1, pp. 336-342.

- **Telescopes and Instrumentation for ground and space:**

## The 1.8m Copernicus in Asiago Cima Ekar

Barbieri C; Rosino L; Stagni R. (1974) *The 72-inch "Copernicus Telescope"*, Sky and Telescope, volume 47, page 298

Barbieri C (1973), *The Italian Project for a 3.5 m Telescope and the New 1.8 m Telescope of Asiago Observatory*, Solar Activity and Related Interplanetary and Terrestrial Phenomena. Proceedings of the First European Astronomical Meeting. Held under the Auspices of the International Astronomical Union in Athens, September 4 - 9, 1972 Vol. 1: XV, 195 pp. 78 figs.. Edited by J. Xanthakis. Springer-Verlag Berlin Heidelberg New York, 1973., p.183

Barbieri C; Di Serego A S (1979) *The RETICON Spectrophotometer at Cima Ekar Observatory*, Spectral Classification of the Future, Proceedings of the IAU Colloq. 47, Vatican City, July 11-15, 1978. Edited by M. F. McCarthy, A. G. D. Philip, and G. V. Coyne. Vatican Observatory, 1979., p.235

Barbieri C; Bortoletto, F.; di Serego Alighieri, S. (1980) *The Digicon system of Cima Ekar Observatory*, Astrophysics and Space Science, vol. 73, no. 1, Nov. 1980, p. 199-206

## The Faint Object Camera for the Hubble Space Telescope

NASA <https://nssdc.gsfc.nasa.gov/nmc/experiment/display.action?id=1990-037B-08>

ESA <https://sci.esa.int/web/hubble/-/17735-faint-object-camera>

## The 3.5m TNG On the Roque de los Muchachos in La Palma

Barbieri C (1997) *Galileo Italian National Telescope and its instrumentation*, Proc. SPIE Vol. 2871, p. 244-255, Optical Telescopes of Today and Tomorrow, DOI: 10.1117/12.26904

Barbieri C (1997) *The Galileo Italian National Telescope and its Instrumentation*, Experimental Astronomy 7, 257

## Halley Multicolour Camera for the ESA Giotto cometary mission

Keller H U; Arpigny C; Barbieri C; Bonnet R M; Cazes S, Coradini M; Cosmovici C B et al. (1986), *First Halley multicolour camera imaging results from Giotto*, Nature 321, 320

Barbieri, C, Brunello P. (1986) *The design of the baffling system of the Halley multicolour camera*. Accademia Peloritana dei Pericolanti - Classe di Scienze FF.MM.NN., LXIV (Supplement 1). pp. 131-155.

Barbieri C (1986) *halitealian contribution to the hardware of the HMC*. Accademia Peloritana dei Pericolanti - Classe di Scienze FF.MM.NN., LXIV (Supplement 1). pp. 125-130.

Keller, H. U.; Arpigny, C.; Barbieri C; Benvenuti, P.; Biermann, L.; Bonnet, R. M.; Cazes, S.; Colombo, G.; Cosmovici, C. B.; Delamere, W. A.; and 10 coauthors (1981) *A Halley Multicolour Camera*, Scientific And Experimental Aspects Of The Giotto Mission, (Batrick,B. + Mort,J. Editors) Esa-Sp-169. June 1981. Pp. 105-117.

Brunello, Pierfrancesco; Peron, Fabio; Barbieri, Cesare and 1 more (2000) *Baffling system for the Wide Angle Camera (WAC) of ROSETTA mission*, Proc. SPIE Vol. 4093, p. 79-88, Current Developments in Lens Design and Optical Systems Engineering, DOI: 10.1117/12.40524

## OSIRIS camera for the ESA cometary Rosetta mission

Ragazzoni R; Naletto G; Barbieri C; Tondello G (1995) *Optical design for the Rosetta wide-angle camera*, Proc. SPIE Vol. 2478, p. 257-268, Space Telescopes and Instruments, Pierre Y. Bely; James B. Breckinridge; Eds

Keller H U; Barbieri C; Lamy P; Rickman H; Rodrigo R; Wenzel K.-P; Sierks H; A'Hearn M F; Angrilli F; et al. (2007) *OSIRIS-The Scientific Camera System Onboard Rosetta*, Space Science Reviews, Volume 128, Issue 1-4, pp. 433-506

Debei, S.; Angrilli, F.; Barbieri, C. and 12 more (1999) *The Wide Angle Camera for the Rosetta Mission*, American Astronomical Society, DPS Meeting #3

## AquEye and IquEye quantum photometers for the Copernicus and 4m class telescopes

Barbieri C; Naletto G; Tamburini F; Occhipinti T; Giro E; D'Onofrio M (2008) *From QuantEYE to AquEYE—Instrumentation for Astrophysics on its Shortest Timescales*, High Time Resolution Astrophysics, Astrophysics and Space Science Library, Vol. 351. Edited by D. Phelan, O. Ryan, and A. Shearer. Berlin: Springer, 2008. ISBN 978-1-4020-6517-0, 2008, p.171

Barbieri C, Naletto G., Occhipinti T., Facchinetti C., Verroi E., Di Paola A., Billotta S., Zoccarato P., Bolli P., Tamburini F., Bonanno G., D'onofrio M., Marchi S., Anzolin G., Capraro I., Messina F., Belluso M., Pernechele C., Zaccariotto M., Zampieri L., Da Deppo V., Fornasier S. (2009) *AquEYE, a single photon counting photometer for astronomy*. Journal of Modern Optics Vol. 56-2, pp. 261-272

Naletto G; Barbieri C; Occhipinti T; Capraro I; Di Paola A; Facchinetti C; Verroi E; Zoccarato P; Anzolin G; Belluso M; and 13 coauthors, (2009) *Iqueye, a single photon-counting photometer applied to the ESO new technology telescope*, Astronomy & Astrophysics, Volume 508, Issue 1, 2009, pp.531-539

Barbieri C; Naletto G; Zampieri L; Verroi E; Gradari S; Collins S; Shearer A (2012) *Aqueye and Iqueye, Very-High-Time-Resolution Photon-Counting Photometers*, New Horizons in Time-Domain Astronomy, Proceedings of the International Astronomical Union, IAU Symposium, Volume 285, p. 280-282

Zampieri L; Naletto G; Barbieri C; Verroi E; Barbieri M; Ceribella G; D'Alessandro M; Farisato G; Di Paola A; Zoccarato P (2015) *Aqueye+: a new ultrafast single photon counter for optical high time resolution astrophysics* Proceedings of the SPIE Volume 9504 id 95040C 14 pp

- **Orbital Angular Momentum (OAM)**

Pioneering experiment of the application of OAM to astronomical images to obtain **high-angular resolutions** by removing the light from optical axis and send it to a surrounding ring.

Tamburini F, Anzolin G., Umbriaco G, Bianchini A, Barbieri C (2006) *Overcoming the Rayleigh criterion limit with optical vortices*, Physical review letters Vol 97m pp. 163903

Anzolin G, Tamburini F, Bianchini A, Umbriaco G, Barbieri C (2008) *Optical Vortices with starlight*, Astronomy and Astrophysics vol. 488-3

Anzolin G.; Tamburini F.; Bianchini A.; Barbieri C (2009) *Method to measure off-axis displacements based on the analysis of the intensity distribution of a vortex beam*, Physical Review A, vol. 79, Issue 3, id. 033845

Barbieri C; Tamburini, F.; Anzolin, G.; Bianchini, A.; Mari, E.; Sponselli, A.; Umbriaco, G.; Prasciolu M; Romanato F; Villorresi P (2009) *Light's Orbital Angular Momentum and Optical Vortices for Astronomical Coronagraphy from Ground and Space Telescopes*, Earth, Moon, and Planets, Volume 105, Issue 2-4, pp. 283-288

Mari E; Anzolin G; Tamburini F; Prasciolu M; Umbriaco G; Bianchini A; Barbieri C; Romanato F (2010) *Fabrication and Testing of  $l = 2$  Optical Vortex phase masks for Coronagraphy*, Optics Express Vol. 18 Issue 3, pp.2339-2344

Tamburini F, Mari E, Thidé B, Barbieri C, Romanato F (2011) *Experimental verification of photon angular momentum and vorticity with radio techniques*, Applied Physics Letters Volume 99, Issue 20, 14 November 2011, Article number 20410.

- **Optical Pulsars light curves**

The ultra-fast photometers AquEye and IquEye allow the determination of the light curves of optical pulsars, including one the Large Magellanic Cloud (with interesting comparison with XMM-Newton and Fermi Space telescopes data)

Gradari S, Barbieri M, Barbieri C, Naletto G, Verroi E, Occhipinti T, Zoccarato P, Germanà C, Zampieri L, Possenti A. (2011). *The optical light curve of the LMC pulsar B0540-69 in 2009*, Monthly Notices of The Royal Astronomical Society, Volume 412, Issue 4, pp. 2689-2694

Germanà C, Zampieri L.; Barbieri C and 12 more (2012) *Aqueye optical observations of the Crab Nebula pulsar*, Astronomy & Astrophysics, Volume 548, id.A47, 7 pp, DOI:10.1051/0004-6361/201118754

Zampieri L; Čadež A; Barbieri C; Naletto G; Calvani M; Barbieri M; Verroi E; Zoccarato P; Occhipinti T (2014) *Optical phase coherent timing of the Crab nebula pulsar with Iqueye at the ESO New Technology Telescope*, Monthly Notices of the Royal Astronomical Society, Volume 439, Issue 3, p.2813-2821,

**Fermi LAT Collaboration**; Ackermann M; Albert A; Baldini L; Ballet J; Barbiellini G; Barbieri C; Bastieri D; Bellazzini R; Bissaldi E; and 107 coauthors (2015) *An extremely bright gamma-ray pulsar in the Large Magellanic Cloud* Science Volume 350 Issue 6262 pp 801-805 (2015)

Spolon, A.; Zampieri, L.; Burtovoi, A. and 5 more (2019) *Timing analysis and pulse profile of the Vela pulsar in the optical band from Iqueye observations*, Monthly Notices of the Royal Astronomical Society, **482**, Issue 1, p.175-183, DOI: 10.1093/mnras/sty2605

Mignani R P; Shearer A; de Luca A; Marshall F E; Guillemot L; Smith D A; Rudak B; Zampieri L; Barbieri C; Naletto G; Gouiffes C; Kanbach G (2019) *The First Ultraviolet Detection of the Large Magellanic Cloud Pulsar PSR B0540-69 and Its Multi-wavelength Properties*, The Astrophysical Journal, **871**, Issue 2, article id. 246, 15 pp., DOI:10.3847/1538-4357/aafb04

Zampieri L; Burtovoi A; Fiori M and 5 more (2019) *Precise optical timing of PSR J1023+0038, the first millisecond pulsar detected with Aqueye+ in Asiago*, Monthly Notices of the Royal Astronomical Society: Letters, Volume 485, Issue 1, p.L109-L113, DOI:10.1093/mnras/slz043

Burtovoi A., Zampieri L., Fiori M., Naletto G., Spolon A., Barbieri C., Papitto A., Ambrosino A. (2020) *Spin-down rate of the transitional millisecond pulsar PSR J1023+0038 in the optical band with Aqueye+*, Monthly Notices of the Royal Astronomical Society : Vol. 498, Issue 1, p. L98

- **Lunar Occultations**

The ultra-fast photometers AquEye and IquEye allow precise measurements of lunar occultations, that provide **high-resolution data** on apparent diameter and disk illumination of bright stars.



Zampieri L; Richichi A; Naletto G; Barbieri C; Burtovoi, A; Fiori, M; Glindemann A; Umbriaco G; Ochner P; Dyachenko V V; Barbieri M (2019) *Lunar Occultations with Aqueye+ and Iqueye*, The Astronomical Journal, Volume 158, Issue 5, article id. 176, 7 pp., DOI: [10.3847/1538-3881/ab3979](https://doi.org/10.3847/1538-3881/ab3979)

- **Quantum Astronomy, Intensity Interferometry**

*QuantEye* document with the theoretical foundations of the application of quantum optics to astrophysics

Resurrection of Hanbury Brown – Twiss Intensity Interferometry, with the first demonstration with the two Asiago telescopes of very high-resolution data on the bright star Vega. The technique will be applied to other large telescopes, such as the ASTRI mini-array.

Dravins D; Barbieri C; Fosbury R A E; Naletto G; Nilsson R; Occhipinti T; Tamburini F; Uthas H; Zampieri L (2005) *QuantEYE: The Quantum Optics Instrument for OWL*, eprint arXiv:astro-ph/0511027

Barbieri C; Dravins D; Occhipinti T; Tamburini F; Naletto G; Da Deppo V; Fornasier S; D'Onofrio M; Fosbury R. A. E.; Nilsson R; Uthas H (2007) *Astronomical applications of quantum optics for extremely large telescopes*, Journal of Modern Optics, vol. 54, issue 2, pp. 191-197

Barbieri C; Daniel MK; de Wit WJ; Dravins D; Jensen H; Kervella P; Le Bohec S; Malbet F; Nunex P; Ralston JP; Ribak EN (2008) *New Astrophysical Opportunities Exploiting Spatio-Temporal Optical Correlations*, Astro2010: The Astronomy & Astrophysics Decadal Survey, Science White Papers, no. 61

Fiori M, Barbieri C, Zampieri L, Naletto G, Burtovoi A (2021) *Measurement of the second-order  $g^{(2)}$  correlation function of visible light from Vega in photon counting mode*, Proceedings of the SPIE, Volume 11835, id. 118350D 10 pp. (2021)., DOI: [10.1117/12.2593083](https://doi.org/10.1117/12.2593083)

Zampieri L, Naletto Gi, Burtovoi, A, IFiori M, Barbieri, C (2021) *Stellar intensity interferometry of Vega in photon counting mode*. Monthly Notices of the Royal Astronomical Society, Volume 506, Issue 2, pp.1585-1594 DOI: [10.1093/mnras/stab1387](https://doi.org/10.1093/mnras/stab1387)

- **Quantum Communications**

The collaboration with Anton Zeilinger and his group, started in 2001 has provided several important results about the implementation of Quantum sender/receiver for the ASI “Bepi Colombo” telescope in Matera and ESA OGS telescope in Tenerife. World-record transmission in free space of single and entangled photons and quantum keys between ground stations and satellites have been achieved.

Ursin R, Tiefenbacher F, Schmitt-Manderbach T, Weier H, Scheidl T, Lindenthal M, Blauensteiner B, Jennewein T, Perdigues J, Trojek P, Oemer B, Fuerst M, Meyenburg M, Rarity J, Sodnik Z, Barbieri C, Weinfurter H, Zeilinger A. (2007). *Free-Space Quantum Key Distribution Over 144 Km*, Nature Physics, Volume 3, Issue 7, pp. 481-486

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**Books:**

*Lezioni di Astronomia* (Zanichelli), two editions, 1999 and 2001

*La nascita dell'Astrofisica nel XIX secolo* (CLEUP), 2000

*Fundamentals of Astronomy* (Taylor and Francis), 2006, in English

*Astronomia Perché?* Editrice Compositori, 2009

*A brief Introduction to the Search Extra-terrestrial life*, (CRC Press), 2019, in English

*L'influenza del Cristianesimo sullo sviluppo dell'Astronomia'*, chapter in the volume "dopo 2000 anni di Cristianesimo" (CEI, Mondadori).

Chapters in several Italian Encyclopaediae (e.g. Treccani, EST Mondadori, etc.),

**Editor of Proceedings/Conferences:**

- European Satellite Astrometry (ESA 1970), the first European conference dedicated to Hipparcos
- The Three Galileo, the Men, the Spacecraft, the Telescope, proceeding of a conference held in Padova University, with audience in Vatican and address to scientists by Saint Paul John II (1997 Kluwer)
- Earth-Moon Relationships, conference held at the Accademia Galileiana in Padova (2000 Kluwer)
- 2nd ESA/COSPAR GALILEO GNSS, conference held in Padova University (2008 ESA publication)
- 400th Anniversary of the discovery of the Medicean Moons, IAU Symposium 269, held in Padova (2010 Cambridge University Press),
- From Giotto to Rosetta, 30 years of cometary science from ground and space (Accademia Galileiana di Padova)
- High Time Resolution Astrophysics, Marostica 27-28 November 2017 (see: <http://web.pd.astro.it/zampieri/htrameeting/HTRA.html> )
- 800 years of Space at the University of Padova, Sept. 7-9 2022, in the occasion of the 800th anniversary of the foundation of the University

**Outreach**

Organizers of scientific exhibits for the general public:

- 1986: Halley and Giotto (Padova and other Italian cities)
- 1993: *Galileo*, in the frame of the celebrations for the Anniversary of the Complutensis University (Madrid, Spain)
- 1996: *from Galileo to the Galileo Telescope*, in the frame of the events for the dedication of the TNG (La Palma, Canary Islands)
- 1997: *Viaggio nel Cosmo* (Padova and Rome, 1997)
- 2017: *Magister Giotto* (Venezia, Scuola Grande della Misericordia)
- 2022: *800 years of Space*, Galleria Cavour, Padova, 7-15 Sept. 2022

Speaker in many popular conferences in Italy and abroad.

2017 Prize Lacchini of the Italian Amateur Astronomer association for outreach activity

## **Memberships**

- Italian Astronomical Society SAIt
- International Astronomical Union IAU
- Cofounder of the European Astronomical Society EAS
- Accademia Galileiana Padova
- Istituto Veneto Scienze Lettere e Arti, Venezia

## **Prizes and Honours:**

- NASA Group Award for FOC/HST.
- ESA Certificate of Recognition for Osiris (Rosetta)
- Gold Medal of Italian Ministry for Education
- Commendatore of the Italian Republic
- Sigillum of the City of Padova