

CV Massimo Della Valle

1957-10-22. Born in Bari

1976. High School (Liceo) diploma, Brescia.

1983. Laurea in Astronomia, Università di Padova
(Summa cum Laude). Supervisor: Prof. L. Rosino.

1984. Fellow at the Asiago Astrophysical Observatory

1985. PhD student at the Byurakan Observatory (ex-URSS).
Supervisor: Prof. Ambartsumian.

1988. PhD in Astronomy Università di Padova. Supervisor:
Prof. L. Rosino.

1989. Post-Doc at SISSA, Trieste

1990-1993. Fellow at the European Southern Observatory, La Silla, Chile.

1994. Fellow at the European Southern Observatory, Munich,
Germany

1995-2000. Assistant Professor at the Astronomy Dept., Università di
Padova.

2001-2007. Associate Astronomer at the Arcetri Astrophysical
Observatory

2008. *Dirigente di Ricerca* at the Capodimonte Astronomical
Observatory, INAF-Naples.

2008-2009 Associate Astronomer at the ESO Telescope Division (on leave of INAF-Napoli)

April 2010 – January 2018 Director of the Capodimonte Astronomical Observatory, INAF-Naples

Feb 2018 – *Dirigente di Ricerca* at the Capodimonte Astronomical Observatory, INAF-Naples.

Scientific Work

The research activity covers several fields in the observational Astronomy: a) Supernovae (local and at high redshifts); b) measurement of the cosmological parameters; c) Novae (galactic and extragalactic); d) Distance Scale; e) Gamma-ray bursts and their afterglows; f) Supernova/GRB connection; g) Kilonovae (i.e. electromagnetic counterparts of gravitational wave sources).

He has authored about 600 publications, including about 40 invited and invited review papers and 240 papers that have appeared in major international refereed scientific journals. The set of publications has collected ~ 17,500 citations with h index 64 (source ADS at 3th October 2019).

Highlights

Supernovae

In the early '90s he was one of the first collaborators of Saul Perlmutter (Nobel laureate 2011) for the discovery of the accelerating expansion of the Universe through Supernovae¹. Later he also collaborates with Adam Riess and Brian Schmidt in the follow-up of SNe of particular interest² and with Piero Madau³ and Dani Maoz⁴ on the frequency of occurrence of SNe at high and low redshift respectively.

Novae

Between 1990 and 1998 in a series of works written in collaboration with Mario Livio^{5,6}, he has introduced the concept of novae populations, replacing the classical subdivision in morphological classes, with a physical classification. More recently with Bob Williams, Francesca Matteucci and others he used high-resolution spectroscopic observations to study the follow-up of classic Milky Way novae to identify for the first time the presence of Lithium in the Nova Cen spectrum 2013⁷. An observation that solves the problem of the existing discrepancy between the measurements of Lithium abundances observed in young stars with the value of the primordial abundance of Lithium recently measured by the Planck satellite.

Optical counterparts of high energy sources and Gamma-Ray Bursts

Since 1990 he was very active in the identification of the optical counterparts of X sources and their connection with black holes^{8,9,10}. In 1999, after the observations of the Peppo-Sax satellite, he was among the first to study the SN-GRB connection^{11,12}. This work is still in progress. As member of the Swift follow-up Team, he has coauthored about thirty papers with Neil Gehrels, Filippo Frontera, Guido Chincarini, Ken Nomoto and others^{13,14,15,16,17}. In 2006 he has identified a new explosive channel for massive stars associated with "long" GRBs¹⁸. More recently he has devoted many efforts to exploring the possibility of using GRBs as high-z probes of the early universe¹⁹ for measuring the cosmological parameters²⁰.

Electromagnetic counterparts of gravitational wave sources

As active member of the international collaborations ePESSTO (extended Public ESO Spectroscopic Survey for Transient Objects) and ENGRAVE (Electromagnetic counterparts of gravitational wave sources at the Very Large Telescope) and GRAWITA Italian team (GRAvitational Wave Inaf TeAm), he has collaborated at the identification and study of the first electromagnetic counterpart of a gravitational wave source, GW 170817^{21, 22}.

References

1. Perlmutter, S., Aldering, G., Della Valle, M. et al. 1998, *Nature*, 391, 51
2. Quinn, J., Garnavich, P., Li, W., Panagia, N., Riess, A., Schmidt, B., Della Valle, M. 2006, *ApJ*, 652, 512
3. Madau, P., Della Valle, M., Panagia, N. 1998, *MNRAS*, 297, L17
4. Maoz, D., Mannucci, F., Li, W., Filippenko, A., Della Valle, M., Panagia, N. 2011, *MNRAS*, 412, 1508
5. Della Valle, M., Livio, M. 1995, *ApJ*, 452, 704
6. Della Valle, M., Livio, M. 1998, *ApJ*, 506, 818
7. Izzo, L., Della Valle, M., Mason, E., Matteucci, F., Romano, D. Williams, R.E 2015, *ApJ*, 808,L14
8. Della Valle, M., Jarvis, B., West, R. 1991, *Nature*, 353, 50
9. Bailyn, C., Orosz, J., Girard, T., Joglee, S., Della Valle, M. et al. 1995, *Nature*, 374, 701
10. Middleton, M. et al. 2013, *Nature*, 493, 187
11. Della Valle, M., Malesani, D., Benetti, S. et al. 2003, *A&A*, 406, L33
12. Della Valle, M. 2006, GAMMA-RAY BURSTS IN THE SWIFT ERA: Sixteenth Maryland Astrophysics Conference. AIP Conference Proceedings, Volume 836, pp. 367-379
13. Campana, S. et al. 2006, *Nature*, 442, 1008
14. Racusin, J. et al. 2008, *Nature*, 455, 183
15. Campana, S. et al. 2011, *Nature*, 480, 69
16. Mazzali, P., Valenti, S., Della Valle, M. et al. 2008, *Science*, 321, 1185
17. Izzo, L., de Ugarte Postigo, A., Thoene, C. Kann, A. , Della Valle, M. et al. 2019, *Nature*, 565, 324
18. Della Valle, M., Chincarini, G., Panagia, N. et al. 2006, *Nature*, 444, 1050
19. Salvaterra, R., Della Valle, M., Campana, S. et al. 2009, *Nature*, 461, 1258
20. Amati, L. & Della Valle, M. 2013, *IJMPD*, 22, 14
21. Abbott et al. 2017, *ApJL*, 848, L12
22. Smartt et al. 2017, *Nature*, 551, 75

Coordinator of research projects and scientific-technological programs and participation in scientific and technological programs of great national and international importance

He has coordinated 39 and participated to 185 scientific proposals^a that were then carried out with the major ground-based telescopes (e.g. ESO-VLT and ESO-NTT, Gemini, LBT) and from Space (Swift, HST, XMM-Newton, Chandra). He is currently involved in the Euclid and THESEUS missions. THESEUS is an ESA satellite for sky exploration in domain X. This mission was selected in May 2018 as a finalist to become the fifth Medium-class mission (M5) of the Cosmic Vision programme by the European Space Agency (ESA). The winner will be selected in 2021 and it would launch in 2032. He is in the Science Board of SOXS (son of X-Shooter). This spectrograph + imaging were selected in 2015, out of 20 world wide proposals by ESO, to equip NTT and provide the community with a strategic follow-up tool up of the transients revealed by LSST, the large 8.4m surveys telescope that will start operating in the same years (2021 - 2022).

^a http://archive.eso.org/wdb/wdb/eso/sched_rep_arc/query

He coordinates and has coordinated several research programs funded by the Ministry of Education, University and Research (PRIN-MIUR and PRIN INAF).

PRIN INAF 2002: The physics of type Ia supernova explosions (MDV Local Coordinator – Arcetri; PI E. Cappellaro)

PRIN INAF 2005: Studio della Dark Energy attraverso strumenti cosmologici complementari (MDV Local Coordinator – Arcetri; PI G. Ghisellini)

PRIN INAF 2006: A study of the Supernova–Gamma-ray Bursts Connection in the Local Universe (PI M. Della Valle)

PRIN MIUR 2006: Fisica delle supernovae, fasi finali di evoluzione, nucleosintesi (MDV Local Coordinator – Arcetri, PI M. Busso)

PRIN MIUR 2009: Gamma Ray Bursts: from progenitors to the physics of the prompt emission process (MDV INAF Coordinator – PI F. Frontera)

PRIN INAF 2011: Transient Universe: from ESO Large to PESSTO (MDV Local Coordinator – Capodimonte; PI S. Benetti)

PRIN INAF 2014: "Transient Universe, unveiling new types of stellar explosions with PESSTO" (MDV Local Coordinator – Capodimonte; PI A. Pastorello)

PRIN INAF 2016: Astri/CTA Data Challenge (MDV Local Coordinator, Capodimonte, PI P. Caraveo)

PRIN INAF 2016: Towards the SKA and CTA era: discovery, localization, and physics of transient sources (MDV Local Coordinator, Capodimonte, PI M. Giroletti)

PRIN INAF 2017: "The origin of lithium: a key element in astronomy (MDV Local Coordinator, Capodimonte, PI P. Molaro)"

PRIN MIUR 2018: Electromagnetic follow-up of gravitational wave events (MDV Local Coordinator, Capodimonte, PI E. Cappellaro)

In 2013 he was appointed Italian representative in the Scientific Council of the International Center for Relativistic Astrophysics (see attachment 1).

Science leaves (months)

1996(1), 1997(1), 1999(2), 2003(2), 2005(2), 2019(2). Visiting Scientist, European Southern Observatory, Garching.

1995(1), 1997(2), 2000(2), 2002(1), 2004(2). Visiting Scientist, Space Telescope, Science Institute, Baltimore.

1998(2), 2001(2), 2003(2). Visiting Scientist, European Southern Observatory, Santiago and Paranal.

2006(1). Visiting Scientist, Department of Astronomy, Graduate School of Science, University of Tokyo, Japan

2006(2), 2007(2). Visiting Scientist, Kavli Institute, Santa Barbara, California University

2007(1). Visiting Scientist, Aspen Center for Physics

2007(1). Visiting Scientist, Dark Cosmology Center, Niels Bohr Institute, Copenhagen

2007(1). Visiting Scientist, Queen's University, Belfast, UK

2018(3). Visiting Scientist, at the IAA (Instituto de Astrofísica de Andalucía)

2018(1). Université de Savoie. Laboratoire d'Annecy-le-Vieux.

Teaching

1989. Lecturer at the SISSA (Trieste): "The Cosmological Distance Ladder".

1992. Visiting Professor, Centro de Astrofisica da Universidade do Porto, Portugal: "The Late Stages of the Stellar Evolution".

Assistant Professor "Esercitazioni di Astronomia I" (Padova, Astronomy Dept. a.a. 1994/95; 1995/96; 1996/97).

Assistant Professor "Laboratorio di Fisica II" (Padova Dip. Astronomia a.a. 1995/96).

Regular teacher of "Astronomia Generale" (Padova Dip. Fisica a.a. 1996/97; 1997/98).

Lecturer at the Physics Dept., Ferrara Università: "Tecniche Osservative in Astronomia" (a.a. 2002/03; 2003/04; 2005/06; 2006/2007) and PhD courses (a.a. 2009/2010)

Lecturer in PhD schools: *Nova Populations* 2003, Elba; *Novae and Supernovae* 2005, Sorrento; *The empirical grounds of SN-GRB connection* 2005, L'Aquila; *Supernovae* 2005, SISSA, Trieste; *SNe and GRBs: selected topics* 2006, Angra dos Reis, Brasil; *The Distance Ladder* 2007, Padova; *Supernovae and Gamma-ray Bursts* 2007, San Servolo, Venezia; *Gamma-ray Bursts as Cosmological Tools* 2009, Seoul; *Explosive phenomena in stars*, 2010, Université Sophia Antipolis, Nice; *GRB and SNe* 2011, Les Houches; *Supernovae and Gamma-ray Bursts*, 2011, Université Sophia Antipolis, Nice; *Gamma-ray Bursts* 2012, Napoli; *Cataclysmic Variables*, 2012, Teramo; *Nova and Supernova Explosions* 2014, Les Houches; *Supernovae and Cosmology*, 2017, Ajaccio; *Supernovae from an Observational perspectives*, 2019, INFN Catania,

Seminars in important Scientific Institutes (last ten years)

Astronomy Department Tokyo University; KAVLI Institute Santa Barbara, California University; Beijing KAVLI Institute; Hubble Space Telescope Institute, Baltimore; Munich Join Colloquium ESO Garching; Aspen Center for Physics; Niels Bohr Institute, Copenhagen; Institute for Advanced Study of Princeton; Queen's University in Belfast; University Sophia Antipolis, Nizza; CBPF Rio de Janeiro; University of Massachusetts Amherst; Instituto de Astrofisica de Andalucia; Annecy-le-Vieux, Université de Savoie.

Experience in the evaluation of the results of National and International research.

Member of the Time Allocation Committee for ESO, HST and Subaru telescopes.

Referee for A&A, ApJ, MNRAS, AJ, PASP, Nature, Science, Advances in Space Research.

In 2017, 18, and 19 he served as referee for proposals of the ERC 2018 Starting, Consolidator, Advanced and Synergy Grant Calls (see attachment 2).

He has been reviewer for both science proposals and “Appointments and Promotions” committees in the following Institutions:

- i) Chilean National Science and Technology Commission;
- ii) United States-Israel Binational Science Foundation;
- iii) Open University of Israel;
- iv) Italian Evaluation of Research Quality (VQR);
- v) PRIN-MIUR 2015;
- vi) Aerospace Engineering Department at Khalifa University, Abu Dhabi;
- vii) Liverpool John Moore University;
- viii) Weizmann Institute of Science, Tel Aviv
- ix) National Research Foundation, South Africa.

Other Activities

Coordinator of the Observing Service Mode at the European Southern Observatory (1990-1993).

Coordinator of the Target of Opportunity policy at the European Southern Observatory (1990-1993).

Member of the Target Opportunity committee of IUE (until the shut down, ~ 1996)

Coordinator of the Research Unity at the Padova/Asiago Observatory (1997-2000)

Member of IAU (since 1988)

Member of the IAU working group on SNe

Member of the SWIFT follow-up team

Member of the SWIFT Nova-CV team

Member of the Ligo/Virgo electromagnetic follow up team

Organizer of the first astronomical meeting Italia-Israele
<http://wise-obs.tau.ac.il/~dani/italy/>

Member of the Science Board of SOXS+NTT

Member of "Ateneo di Brescia - Accademia di Scienze Lettere ed Arti"

Member of the "Academic Board in Physics" (Collegio dei Docenti del Dottorato in Fisica), Federico II University, Napoli.

Lingue:

Italiano, Inglese e Spagnolo (fluent). Francese e Tedesco (basic knowledge)

Outreach:

- Author of dozens of papers published on Astronomy, Coelum, Le Stelle and national newspapers.

- On the occasion of the celebrations for the bicentennial of the foundation of the Capodimonte Observatory (1812-2012), he has promoted (taking advantage of a generous budget provided by

Campania region) the realization of the "Museum of Astronomical Instruments" (about 110 pieces distributed over an exhibition area of about 500m²) which is inaugurated on November 4, 2012 in the Capodimonte Observatory.

- He has promoted as chair or member of the scientific committee numerous exhibitions, such as:

i) *The Temple of Urania* realized at the State Archives of Naples, 24 May-29 September 2012;

ii) *The Factories of Heaven* in the framework of "Futuro Remoto" initiative: one of the most important and consolidated European scientific and technological dissemination events held in Naples since 1987.

iii) *Paleocontemporanea*: Fragments of transcendence in artistic representation from pre-Christian civilizations to contemporary, first edition of the art exhibition developed in the historical and cultural sites of the Collina di Capodimonte: National Archaeological Museum of Naples, Catacombs of Naples, Capodimonte National Museum and INAF-Capodimonte Astronomical Observatory, 2013.

iv) *Viaggiatori del Cosmo* from Giordano Bruno to the first trip to the Moon by Ernesto Capocci, Astronomical Observatory of Capodimonte, 13 March-30 April 2015, extended to 31 May 2015 (with patronage of Accademia dei Lincei). The exhibition was enriched by the anastatic reprint of selected works by Ernesto Capocci: *Report of the First Journey to the Moon made by a woman in the year of grace 2057* (typography Cottrau, Naples 1857) eight years ahead of Jules Verne's most famous novel *De la Terre à la Lune*; *Framework of the Solar Planetary System* (Printing House of Iride 1853); *Dialogues on Comets* (typography of Giornale del Regno delle due Sicilie, 1825).

- He has published the book: "*Che il Diavolo benedica i Pulcinella*" Scientific Chronicles "and non" of Naples in the years immediately after

the kingdom of Gioachino Murat. In collaboration with Mauro Gargano and Emilia Olostro-Cirella. Tullio Pironti publisher, Naples 2015.

- He has published the book *"Supernova"* in the Piero Angela series *Viaggio nell' Universo*, Agosto, 201