

Curriculum Vitae

ANDREA POSSENTI

Born at: Treviglio (Bg) on 9 Luglio 1963

citizenship: italiana

Student Titles:

- **High School Diploma** at the *Liceo Scientifico di Caravaggio* on July 1982, with marks: **60/60**.
- **Degree in Physics** at *Università degli Studi di Milano* on 24 March 1995, with marks: **110/110 cum laudem**.
- **PhD in Astronomy** at *Università degli Studi di Bologna* on 21 March 2000.

Research/Academic titles:

- **Fellowship from December 1999 to November 2003** at *INAF-Osservatorio Astronomico di Bologna* with the title: “EVOLUTION OF BINARY SYSTEM AND FORMATION OF MILLISECOND PULSARS”
- **Post-Doc contract from July 2004 to September 2004** at *INAF-Osservatorio Astronomico di Cagliari* with title: “REQUIREMENTS OF RECEIVERS AND BACK-ENDS FOR RADIO PULSAR OBSERVATIONS”
- **Staff Researcher since 15 October 2004** at *INAF-Osservatorio Astronomico di Cagliari*.
- Staff “First Researcher” (equivalent to **Associate Professor** at University) **since 02 November 2016** at *INAF-Osservatorio Astronomico di Cagliari*.

MANAGEMENT ACTIVITIES AND OTHER DUTIES

Management duties:

- **Director of INAF-Observatory of Cagliari** since 1 October 2010 until 31 July 2015 and from 26 March 2016 until 31 December 2017 (including a 7 months period as Vicar Director)
- **Member of the Board of the Sardinia Radio Telescope** from 1 October 2010 until completion of the activities of the Board at the end of 2013
- **Elected member of the Board of VESF (Virgo-Ego Science Forum)** since 9 November 2013 until end of 2015
- **Advisor of the INAF-Unit II for “enabling Radioastronomy”** since September 2017
- **Member of the SKA Science Team-Tier 1 ”Fundamental Physics with Pulsars”** since fall 2014

- **co-Chair of the SKA Science Team "Fundamental Physics with Pulsars"** since September 2015 until November 2017
- **Member of IPTA-board** since January 2018

TEACHING ACTIVITIES

Teaching Duties:

- **Course of 32 hours since March 2004 to June 2004** with title NEUTRON STAR PHYSICS, at *Dep. of Physics of the University of Cagliari*, nominated by the Council of the PhD course.
- **Course of 32 hours since March 2005 to May 2005** with title NEUTRON STAR PHYSICS, at *Dep. of Physics of the University of Cagliari*, nominated by the Council of the PhD course.
- **Regular course of 40 hours since November 2005 to January 2006** with title PHYSICS OF THE COMPACT OBJECTS, at *Dep. of Physics of the University of Bologna*, for the students of the II year of the Degree in Astrophysics and Cosmology.
- **Regular course of 48 hours since March 2007 to June 2007** at *Dep. of Physics of the University of Cagliari*, for the students of the II year of the Degree in Astrophysics . Title: RADIO ASTRONOMY.
- **Module of 10 hours since December 2007 to January 2008** for the students of the II years of the SSIS *University of Cagliari* Title: ASTROPHYSICS.
- **Module of 10 hours since December 2008 to January 2009** for the students of the II years of the SSIS *University of Cagliari* Title: ASTROPHYSICS.
- **Regular course of 48 hours since March 2010 to June 2010** at *Dep. of Physics of the University of Cagliari*, for the students of the II year of the Degree in Physics. Title: RADIO ASTRONOMY.
- **Regular course of 48 hours since March 2016 to June 2016** at *Dep. of Physics of the University of Cagliari*, for the students of the II year of the Degree in Physics. Title: ASTROPHYSICS.

Teaching at International Schools for PhD students:

- **On September 2007** course with title PULSARS AND COLLAPSED OBJECTS, at Radio Telescope of Medicina (Bologna), for the *II MCCT - SKADS International School*
- **On May 2009** course with title THE ROLE OF THE BINARY PULSARS IN TESTING GRAVITY THEORIES, at Centro Volta of Como, for the *VIII SIGRAV GRADUATE SCHOOL IN CONTEMPORARY RELATIVITY AND GRAVITATIONAL PHYSICS*
- **On May 2009** course with title ELECTROMAGNETIC OBSERVATION OF PULSARS AND BINARIES, at Virgo Site at Cascina (Pisa), for the *IV VESF school on Gravitational Waves*
- **On July 2010** course with title THE ROLE OF PULSARS TIMING IN GRAVITATIONAL WAVE DETECTION, at SCfA, Sesto Pusteria, for the *V VESF school on Gravitational Waves*

- **On October 2011** course with title RADIO TIMING: METHODOLOGIES AND... SOME RESULTS, at S.Margherita di Pula, for the *School on Principles of Multi-wavelength High Time Resolution Astrophysics*, organized by UCL-MSSL, NUI Galway, Opticom, MPE, Un. Zielone Gora and University of Cagliari
- **On April 2013** course with title COMPACT OBJECTS AS SOURCES OF GRAVITATIONAL WAVES, at INAF-Monteporzio Catone, for the *VESF school 2013 on Gravitational Waves, neutrino and multiwavelength observations: the new frontiers of astronomy*
- **On July 2014** course with title RELATIVISTIC BINARY PULSARS AND COALESCING BINARIES, at INAF-Monteporzio Catone, for the *AstroGR@Rome 2014: a Phd School on Gravitational Waves and electromagnetic observations of dense stellar systems*
- **On April 2015** course with title ASTROPHYSICAL SOURCES OF GWS, at the site of EGO-VIRGO at Cascina (Pisa) for the *1st GraWITon school*
- **On Nov 2015** course with title RADIO OBSERVATIONS AND THEORY OF PULSARS AND X-RAY BINARIES, at Instituto de Astrofisica de Canarias for the *XXVII Canary Islands Winter School about "High Time Resolution Astrophysics"*
- **On April 2016** course with title PULSAR ASTRONOMY, at the University La Sapienza in Rome for the *2nd GraWITon school*

Co-supervised Laurea Theses (since 2003):

- **Matteo Bachetti** - Subject: Search for pulsar in binary systems: the confirmation of the candidates (a.a. 2003-2004, 3yr laurea in Physics at Univ. Cagliari) Supervisors: Prof. N. D'Amico, Dr. A. Possenti
- **Fabio Schirru** - Subject: Timing of millisecond pulsars in NGC6441 and NGC 6266 (a.a. 2003-2004, 4yr laurea in Physics at Univ. Cagliari) - Supervisors: Prof. N. D'Amico, Dr. M. Burgay, Dr. A. Possenti
- **Maura Pilia** - Subject: Dedispersion and folding of radiopulsar data: the case of PSRJ1803-3002 in NGC6522 (a.a. 2004-2005, 3yr laurea in Physics at Univ. Cagliari) - Supervisors: Prof. N. D'Amico, Dr. A. Possenti, Dr. M. Burgay
- **Emanuela Sanna** - Subject: Ricerca di pulsar nel braccio di Perseo della Via Lattea a.a. 2004-2005, 4yr laurea in Physics at Univ. Cagliari) - Supervisors: Prof. L. Burderi, Dr. M. Burgay, Dr. A. Possenti
- **Noemi Iacolina** - Subject: Ricerca di pulsazioni radio coerenti dalla pulsar X al millisecondo J0929-314 (a.a. 2005-2006, 4yr laurea in Physics at Univ. Cagliari) - Supervisors: Prof. L. Burderi, Dr. M. Burgay, Dr. A. Possenti
- **Matteo Bachetti** - Subject: Software per la ricerca di pulsar in sistemi binari stretti (a.a. 2005-2006, 5yr laurea in Physics at Univ. Cagliari) - Supervisors: Prof. L. Burderi, Dr. A. Possenti, Dr. M. Burgay
- **Marco Pierbattista** - Subject: Implementazione di codici di ricerca di pulsar su sistemi multiprocessore (a.a. 2005-2006, 4yr laurea in Astronomy at Univ. Bologna) - Supervisors: Prof. G.C.C. Palumbo, Dr. M. Burgay, Dr. A. Possenti

- **Maura Pilia** - Subject: Timing di Pulsar Gamma Osservate da AGILE con i Radiotelescopi dell'EPTA (a.a. 2006-2007 5yr laurea in Astronomy at Univ. Bologna) - Supervisors: Prof. G.C.C. Palumbo, Dr. A. Possenti, Dr. M. Burgay
- **Manuel Floris** - Subject: Ricerca di Pulsar con la Perseus Arm Multibeam Survey (a.a. 2006-2007, 4yr laurea in Physics at Univ. Cagliari) - Supervisors: Prof. L. Burderi Dr. M. Burgay Dr. A. Possenti
- **Mario Cadelano** - Subject: Ricerca di pulsar all'interno del resto di supernova DA530 (a.a. 2011-2012, laurea in Physics at Univ. Cagliari) - Supervisors: Prof. N. D'Amico, Dr. M. Burgay, Dr. A. Possenti
- **Alessandro Ridolfi** - Subject: Probing eclipse mechanisms in Black Widow Pulsars and Redbacks: development of a code and its applications (a.a. 2011-2012, 5yr laurea in Physics at Univ. La Sapienza di Roma) - Supervisors: Prof. V. Ferrari, Dr. A. Possenti
- **Marco Marongiu** - Subject: Pianificazione di osservazioni di pulsar con il Sardinia Radio Telescope (a.a. 2012-2013, 5yr laurea in Physics at Univ. Cagliari) - Supervisors: Prof. N. D'Amico, Dr. A. Possenti, Dr. A. Pellizzoni, Dr. M. Burgay
- **Gemma Artizzu** - Subject: La pulsar ad eclisse PSR J1723-2837 (a.a. 2013-2014, 4yr laurea in Physics at Univ. Cagliari) - Supervisors: Prof. L. Burderi, Dr. M. Burgay, Dr. A. Possenti
- **Federico Loja** - Subject: Caratterizzazione di interferenze periodiche rilevabili in osservazioni di pulsar con il Sardinia Radio Telescope (a.a. 2013-2014, 3yr laurea in Physics at Univ. Cagliari) Supervisors: Prof. N. D'Amico, Dr. M. Burgay, Dr. A. Corongiu, Dr. A. Possenti

Co-Supervised PhD Theses (since 2003):

- **Marta Burgay** - Title: The Parkes High Latitude Pulsar Survey and the Discovery of the first Double Pulsar (a.a. 2000-2003, PhD in Astronomy at Univ. Bologna) - Supervisors: Prof. R. Fant, Prof. N. D'Amico, Dr. Andrea Possenti - Co-supervisor: Prof. A.G. Lyne
- **Alessandro Corongiu** - Title: Timing of Isolated and Binary Pulsars Discovered at Parkes (a.a. 2002-2005, PhD in Physics at Univ. Cagliari) - Supervisors: Prof. N. D'Amico, Dr. Andrea Possenti
- **Maria Noemi Iacolina** - Title: Accreting millisecond X-ray pulsars: a search for pulsed radio emission and constraints from the radio-ejection mechanism (a.a. 2006-2009, PhD in Physics at Univ. Cagliari) - Supervisors: Prof. L. Burderi, Dr. Andrea Possenti, Dr. Marta Burgay
- **Sabrina Milia** - Title: Search for Millisecond Pulsars for the Pulsar Timing Array project (a.a. 2008-2011, PhD in Physics at Univ. Cagliari) - Supervisors: Prof. L. Burderi, Dr. Andrea Possenti, Dr. Marta Burgay, Prof. N. D'Amico - Co-supervisor: Dr. W. van Straten
- **Caterina Tiburzi** - Title: Multidisciplinary studies of pulsar data and applications to Pulsar Timing Arrays (a.a. 2011-2014, PhD in Physics at Univ. Cagliari) - Supervisors: Prof. N. D'Amico, Dr. Andrea Possenti

EDUCATIONAL ACTIVITIES

Conferences:

- More than 300 *educational conferences*, three quarters of which devoted to the high school students
- **1993-2018**
- More than 110 *guided tours for visitors at sites and astronomical observatories* - **1993-2018**

Educational books:

- “COMETE: DIARIO DI VIAGGIO” [english title “COMETS: TRAVEL BOOK”] [ed. Mimesis-Milano, 124 pages, 40 pictures (+CD Rom), 2002, ISBN 88-8483-078-8]
- “ECLISSI” [english title “ECLIPSES”] [ed. MURSIA-Milano, 122 pages, 50 pictures (+CD Rom), 1999, ISBN 88-425-2603-7]

RESEARCH ACTIVITIES

Official qualifications:

- **Abilitazione Scientifica Nazionale** call 2012 (DD 222/2012). Qualification for **University Professor of II tier** obtained on 27 December 2013 and expiring on 27 December 2017, with the following marks in the 3 sectors of judgement of the Committee: **EXCELLENT, EXCELLENT, EXCELLENT**. Moreover, all the 3 required "median" values of the required publication parameters were largely overcome

Research projects which obtained competitive funds:

- **Coordinator and Principal Investigator TENDER 2011 LEGGE 7/2007 REGIONE SARDEGNA** - The high resolution sampling of the universe in the radio band - *PI: Andrea Possenti* (allocation: 500 keuro)
- **Coordinator and Principal Investigator PRIN INAF-SKA-CTA 2017** -Opening a new era in pulsars and compact objects science with MeerKat - *PI: Andrea Possenti* (allocation: 306 keuro)
- **Member of the Unit of Research PRIN MIUR 2001** - New frontiers in the pulsar studies - *PI: Nicolás D'Amico*
- **Member of the Unit of Research PRIN MIUR 2003** - Re-designing the frontiers of the pulsar research - *PI: Nicolás D'Amico*
- **Member of the Unit of Research PRIN MIUR 2005** - La double pulsar and beyond - *PI: Nicolás D'Amico*
- **Responsible of the Unit of Research PRIN INAF 2005** - Relativistic plasmas in astrophysical sources - *PI: Rino Bandiera*
- **Responsible of the Unit of Research PRIN INAF 2008** - Tracing Stellar cluster dynamics with blue straggler stars, binary millisecond pulsars and intermediate-mass black holes - *PI: Flavio Fusi-Pecci*
- **Responsible of the Unit of Research PRIN INAF 2010** - Unveiling the true nature of the stellar system Terzan 5 - *PI: Livia Origlia*
- **Member of the Unit of Research CALL RICERCA DI BASE 2010 LEGGE 7/2007 REGIONE SARDEGNA** - Fundamental Physics in the Double Pulsar system - *PI: Alberto Pellizzoni*
- **Member of the Unit of Research PRIN INAF 2014** - Getting to GUNS (Grand Unification of Neutron Stars) through X-ray variability studies of non-accreting neutron stars - *PI: Sandro Mereghetti*
- **Member of the Unit of Research PRIN INAF 2014** - Getting to GUNS (Grand Unification of Neutron Stars) through X-ray variability studies of non-accreting neutron stars - *PI: Sandro Mereghetti*

Member of Panels:

- **Since May 2017** chair of the Panel of the telescope **LOFAR**.
- **Since February 2012** member of the Panel of the telescope **LOFAR**.
- **From September 2012 to November 2013** member of the Panel of the telescopio **WSRT**.

Member of SOC:

- **On April 2007** member of the SOC of the international congress **PULSARS SEARCH AND THAI'MING**, hold at Krabi (Thailand)
- **On October 2010** member of the SOC of the international congress **RADIO PULSARS: AN ASTROPHYSICAL KEY TO UNLOCK THE SECRETS OF THE UNIVERSE**, hold at Chia-Domus de Maria (Italy)
- **On September 2011** member of the SOC of the International School **SINGLE-DISH RADIOASTRONOMY AND RADIO-SCIENCE**, hold at Parco Tecnologico di Sardegna Ricerche at Pula (Italy)
- **On September 2017** member of the SOC of international congress **PULSARS ASTROPHYSICS - THE NEXT 50 YEARS**

Working periods at other Institutes:

- *Swinburne University of Technology* - Melbourne - 1999 - 2001
- *Australia Telescope National Facility* - Sydney - 1999 - 2000
- *Astrophysikalisches Institut Potsdam* - Berlin - 1998
- *Swinburne University of Technology* - Melbourne - Jan-Mar 2010

Main Talks:

- Possenti: *Pulsar summary talk*, at **“SKA science for the SKA generation”** , Goa, Nov 2016
- Possenti: *The Italy-Australia pulsar connection*, at **“1st Baracchi conference”** , Perth, Nov 2016
- Possenti: *The power of radio astronomy in astrophysics*, at 102.a SIF Conference, Padua, Sept 2016
- Possenti: *The intriguing science of the Fast Radio Bursts*, at **“A Century of General Relativity”** , Sigrav XXII at Cefalú, Sept 2016
- Possenti: *Highlights and perspectives of binary pulsar timing*, at Ewass 2016, Athens, July 2016
- Possenti: *Pushing ahead the frontiers of pulsar science with SKA*, at Ewass 2016, Athens, July 2016
- Possenti: *The clock-like nature of the radio pulsars*, at **“IEEE International Workshop on Metrology for Aerospace”** , at Florence, June 2016

- Possenti: *Fast Radio Bursts (FRBs)*, at “**Perspectives on the Extragalactic Frontier**” , at ICTP - Trieste, May 2016
- Possenti: *The SKA project*, at LX Congress of SAIIt, Roma, May 2016
- Possenti: *The European Pulsar Timing Array*, at “**INAF after GW150914**”, Roma, Apr 2016
- Possenti: *Radio Observations of MSP in GCs with SKA and SRT*, at “**COSMIC-LAB: Star Clusters as Cosmic Laboratories for Astrophysics, Dynamics and Fundamental Physics (MODEST16)**”, Bologna, Apr 2016
- Possenti: *Shedding light onto the Fast Radio Bursts (FRBs)*, at CNOC 2015, Como, Sept 2015
- Possenti: *Concepts for the Pulsar SKA Working Group*, at “**SKA congress**”, Stockholm, Aug 2015
- Possenti: *A Meerkat look to pulsars in southern Globular Clusters*, at “**Pulsar science in the SKA era**”, Cape Town, Apr 2015
- Possenti: *The enigmatic origin of the Fast Radio Bursts*, at 100.a SIF Conference, Pisa, Sept 2014
- Possenti: *Searching Gravitational Waves in the nanoHz band: the role of SRT in the Pulsar Timing Array(s)*, at XXI SIGRAV Conference, Alessandria, Sept 2014
- Possenti: *Relativistic pulsar binaries*, at “The Unquiet Universe”, Cefalú, Jun 2014
- Possenti: *SKA and the next-generation multi-wavelength observatories*, at “**Advancing Astrophysics with the SKA**”, Giardini Naxos, Italy, Jun 2014
- Possenti: *Science with SRT and its role in the Pulsar Timing Array(s)*, INAF-Osservatorio Astronomico di Capodimonte, Napoli, May 2014
- Possenti: *Is there a breakdown of General Relativity in strong field regime? Addressing the issue with pulsar observations*, at University of Milan Bicocca, Department of Physics, Dec 2013
- Possenti: *Detecting Gravitational Waves with the new Sardinia Radio Telescope*, at “XCIX SIF congress”, Trieste, Oct 2013
- Possenti: *Pulsar Timing Perspectives with the New Sardinia Radio Telescope*, at GWADW13-Gravitational Wave Detectors for the Next Decade”, Isola d’Elba, May 2013
- Possenti: *Detecting gravitational waves from cosmological distances: the role of the Pulsar Timing Array(s)*, at SISSA, Trieste, Jan 2013
- Possenti: *SRT: the new large single dish in Sardinia*, at Astron, Dwingeloo, Nov 2012
- Possenti: *Probing and Measuring the Space-Time with the Radio Pulsars*, at “The Time Machine Factory”, Torino 2012
- Possenti: *Binary pulsar evolution: unveiled links and new species*, at “XXVIII general assembly of IAU”, Symposium 291, Pechino, 2012
- Possenti: *General Relativity Tests with Pulsars*, at “**Primo Congresso Nazionale della Scienza e Tecnologia di SKA**”, MIUR, Roma, Jun 2012

- Possenti: *Radio pulsars as probes of gravity theories* at “Bridging electromagnetic astrophysics and cosmology with gravitational waves”, Milano, 2011
- Possenti: *Radio pulsars in relativistic binaries: perspectives for SRT* at “XCVI SIF congress”, Bologna, 2010
- Possenti: *Gravitational Waves detection: the role of the pulsar timing array(s)* at “CERN: Theoretical Physics Center”, CERN-Ginevra, 2010
- Possenti: *Primordial Gravitational Waves detection: the role of the pulsar timing arrays* at “Primordial Gravitational Waves”, Cambridge, 2009
- Possenti: *Radio Millisecond pulsars* at “Ten Years of Accreting X-ray millisecond pulsars”, Amsterdam, 2008
- Possenti: *More and more radiopulsar: the status of present surveys and perspectives* at “The Modern Radio Universe”, Manchester, 2007
- Possenti: *The mystery of the RRATs*, at “SIGRAV 2006: 17th biennial Conference of the Italian Society for General Relativity and Gravitation”, Turin-Italy, 2006
- Possenti: *Secular and orbital changes in emission from the J0737–2029 system* at “The Multi-coloured Landscape of Compact Objects”, Cefalù-Italy, 2006
- Possenti: *Timing pulsars in Globular Cluster* at “The 2005 Lake Hanas International Pulsars Symposium”, Lake Hanas-China, 2005
- Possenti: *Two years of work in the Double Pulsar Laboratory*, at “Astrophysical Sources of High energy Particles and Radiation”, Torun-Poland, 2005
- Possenti: *Pulsar Observations*, at “Endpoints of stellar evolution”, Granada-Spain, 2005
- Possenti: *The Double Pulsar PSR J0737-3039: news and views*, at “Neutron Stars: Structure and Cooling”, ECT/Trento-Italy, 2004
- Possenti: *The Double Pulsar PSR J0737-3039: a two-clocks relativistic system*, at “SIGRAV 2004: 16th biennial Conference of the Italian Society for General Relativity and Gravitation”, Vietri sul Mare-Italy, 2004
- Possenti: *The Double Pulsar PSR J0737-3039 one year after*, at “GR 17: General Relativity congress”, Dublin-Ireland, 2004
- Possenti: *The Double Pulsar PSR J0737-3039*, at “Sait 2004”, Milan-Italy, 2004
- Possenti, Burgay, D’Amico: *The discovery of the Double Pulsar PSR J0737-3039A/B: implications*, at aula magna “Università di Roma La Sapienza”, Rome-Italy, 2004
- Possenti: *New peculiar millisecond pulsars in Globular Cluster*, at “Neutron Stars, Pulsars and Supernova Remnants”, Bad Honnef-Germany, 2002

Summary of the main research lines:

- *Discovery, timing and follow-up studies of the Double Pulsar in radio, optical, X-ray and γ -ray bands - from 2003 up to now*
- *Discovery and timing of millisecond pulsars in Globular Clusters - from 1999 up to now*
- *High resolution sampling of the Universe in the radio band - from 2012 up to now*
- *Design and involvement in the HTRU (High Time Resolution Universe) survey at Parkes - from 2008 up to now*
- *Discovery and follow-up studies of the Fast Radio Bursts - from 2013 up to now*
- *Design and involvement in the Superb (SURvey for Pulsars and Extragalactic Radio Bursts) experiment at Parkes - from April 2014 up to now*
- *Founder member of EPTA and involvement in the multi-telescope timing projects EPTA and LEAP. Search for gravitational waves - from 2006 up to now*
- *Studies of pulsars and magnetars from the radio to the X-ray and the γ -ray bands. Involvement in the Agile and Fermi projects - from 1997 up to now*
- *Study of the X-ray emission and search for pulsed radio emission in transiently accreting neutron stars - from 2001 up to now*
- *Involvement in 4 Multi-beam Pulsar Surveys with the 64m radio telescope at Parkes - from 1999 until 2007*
- *Evolutionary studies of (and search for) ultra rapidly rotating pulsars - from 1998 until 2001*
- *Study of the X-ray thermal emission from the neutron stars - from 1995 until 2001*

Summary of the publications at the end of January 2018 :

- 230 refereed papers
- 307 non refereed works
- 2 educational books
- 2 Theses (laurea thesis and PhD thesis)

Citations and other bibliometric indexes as at the end of January 2018:

- 12532 citations in refereed publications: ~ 54 citations for each paper
- H-index (from ADS astrophysics) = 58