

## PERSONAL INFORMATION

## Adriano Fontana



INAF Osservatorio Astronomico di Roma, Via di Frascati 33, 00078, Rome, Italy

+39 06 942 864 56 ask by e-mail

[adriano.fontana@inaf.it](mailto:adriano.fontana@inaf.it)

<http://www.oa-roma.inaf.it/fontana>

Skype: AdrianoFontana

Sex Male | Date of birth 29/11/1962 | Nationality Italian

## WORK EXPERIENCE

## Active positions

Aug 1, 2016 - now

Oct , 2013 - now

“Dirigente di Ricerca” (Research Director) at INAF – Osservatorio di Roma  
President of the LBT Corporation

## WORK EXPERIENCE

## PREVIOUS POSITIONS

Nov, 2010 – Nov 2019

Jan 2004 – Jul 2016

Apr 1998 – Jun 1998

Jun 1995- Jul 1995

Jan 1994 – Dec 2004

Nov 1993

Professor of “Astrofisica Extragalattica” at the Rome University La Sapienza  
“Astronomo Associato” (Associate Astronomer) at INAF – Osservatorio di Roma  
Visiting Astronomer at ESO- Garching  
Unpaid associate at ESO - Garching  
“Ricercatore Astronomo” (Researcher) at INAF – Osservatorio di Roma  
Visiting Astronomer at ESO - Garching

## EDUCATION AND TRAINING

2004

1994

1989

Training course on Project Management (Profingest, Bologna)  
PhD in Physics and Astrophysics – University of Rome La Sapienza  
Master Degree 110/110 *cum laude* in Physics – University of Rome La Sapienza

## PERSONAL SKILLS

Mother tongue

Other language(s)

Italian

English (Excellent, both written and oral)

## Digital competence

## SELF-ASSESSMENT

Information processing	Communication	Content creation	Safety	Problem solving
Proficient	Independent	Independent	Basic	Independent

- Programming languages: Fortran, C, python
- Astronomical software: Midas, IRAF, SM

**CURRENT MANAGEMENT RESPONSIBILITIES**

June, 2016 - now

**Head of the INAF Division for Optical-NIR astronomy**

This newly established INAF Division directly supervises and manages all the Italian participations to to Optical-NIR astronomical projects from ground (mainly ESO, LBT and TNG) and space (GAIA, Euclid, CHEOPS, PLATO among the others). In this capacity, I oversee *a)* all the institutional relations with the relevant governing bodies, *b)* the development of instrumentation for all these facilities; *c)* The execution of major scientific projects with a leading Italian role. The overall budget of the Division (that does not include the ESO yearly contribution) is about 10MEuro/yr.

Oct , 2013 - now

**President of the LBT Corporation**

The LBT Corp. is an independent legal entity, based in Tucson (AZ, USA) that manages all the activities related to the Large Binocular Telescope. In my capacity of President, I oversee the general management of the affairs of the Corporation, with the direct responsibility of signing all the financial transactions of the Corporation, and implement all the policies and directives of the Board, in particular overseeing the activity of the Telescope Director. The overall budget of the Corporation is about 13M\$/year.

Oct , 2012 - now

**Chair of LBT Board of Directors**

As a Chair of the Board of Directors of the LBT Corporation, (that is different from the President) I preside at all meetings of the Board and I am responsible that all policies of the Board are carried out. My main role is here is acting as an interface with all the Board Directors and Institutional Members from MPGs, INAF and several US universities.

Oct, 2009 - now

**Lead of the Italian LBT Coordination Centre**

The LBT-ITA Centre manages and oversees all the activities related to the Italian participation to LBT. In particular, it organizes the call for observing time under Italian share, the execution of all observing programs in a fully-fledged service mode and the analysis of all collected data. As such I supervise a team of ~15 astronomers and remote observers.

**Membership of International Project/Institution Boards**

MAORY Steering Committee (2018-now)

LSST Corporation Board (2018-now)

WEAVE Project Board (2016-now)

ASDC Board (2009-2014)

ASTRONET Executive Board (2005-2007)

## PREVIOUS MANAGEMENT RESPONSIBILITIES

2013 - 2016

**European Coordinator of the FP7 European project ASTRODEEP**

I led ASTRODEEP, a collaborative project among 4 institutes (INAF, CEA, UEdin, CDS) funded for a total of 2MEuro within the FP7-SPACE framework. It is a co-ordinated and comprehensive program of algorithm/software development and testing, data reduction/release, and scientific data validation/analysis aimed at making Europe the world leader in the exploitation of the deepest multi-frequency data from the major space and ground-based observatories.

2011 - 2017

**Lead of the Organization Unit "MER" of the Euclid mission**

The ESA mission Euclid is a major flagship of European astronomy. I have the responsibility of MER, a trans-national unit of the Ground Segment that is charged to design and develop the core of the data processing system, i.e. the part that collects data from Euclid and ground based surveys and prepares the final multiwavelength catalogue. The collaboration involves ~20 scientists and software engineers mainly from Italy, Germany and France.

2005-2007

**President of the INAF Science Council**

I have been President of the INAF Science Council, the first established soon after the constitution of INAF itself. I led the preparation of the first Long Term Plan of Italian Astronomy. This document presents a unified vision of the main topics in astronomy and astrophysics in the foreseeable future, and identifies the scientific and technological areas where INAF should focus its efforts during the next decade.

2005-2007

**Coordinator of INAF activities in the ASI Space Data Centre**

During the first period of the ASI-INAF agreement for the operations of ASDC I have acted as Coordinator of the INAF staff to perform scientific operations and to cooperate with INAF Institutes. I supervised the activities of INAF personnel, operating in support of space missions (mainly AGILE, GLAST, SWIFT, GAIA)

## MANAGEMENT OF MAJOR SCIENTIFIC PROJECTS

2014-now

Principal Investigator of the ESO-VLT Large Program, "*The formation and evolution of galaxies from cosmic dawn to high-noon under a magnifying GLASS*"

2014-now

Executive Board of the ESO public survey VANDELS

2012-now

European coordinator of the FP7-SPACE project ASTRODEEP

2010-now

Executive Board of the HST survey CANDELS

2010-2014

Principal Investigator of the HUGS survey, based on the ESO-VLT Large Program "*A complete view of the first 2 billion years of galaxy formation*"

2008-2010

Principal Investigator of the ESO-VLT Large Program ESO VLT, "*A deep infrared view of the early Universe: exploiting the unique capabilities of HAWK-I to explore the reionization epoch*"

2005-2008

Coordinator of the GOODS-MUSIC survey

2005-now

Coordinator of the research Group of Observational Cosmology and Galaxy Evolution at the INAF - Rome Observatory, which has several leading responsibilities in projects using ESO, LBT, ALMA HST, Spitzer and other world-class instrumentation.

## SCIENTIFIC ACHIEVEMENTS

## General description

My main research field is the study of Galaxies, AGNs, IGM and their co-evolution, primarily as as obtained from deep imaging and multiwavelength surveys with ground based and space telescopes.

I have been Principal Investigator of 3 Large Programs with ESO VLT instrumentation.

I am PI of many accepted proposals at TNG, LBT, NTT, VLT, ALMA, HST.

I led the HUGS survey, executed with HAWK-I@VLT, delivering the deepest view on IR-selected galaxies ever obtained.

I am a main participant to several extragalactic surveys (K20, GOODS, CANDELS, VUDS VANDELS, Frontier Fields, among the others) executed with VLT, HST, Spitzer and other world-class facility instruments.

I have been among the very first astronomers to use VLT, both as part of the Science Verification

Team and as one of the very first observer of the normal programs.

- Publications**
- I am author of about 350 scientific publications (based on ADS).
  - Of these, about 250 are published in peer-reviewed journals, for a total of more than 18700 citations.
  - I am first author in 13 of them, and among the first three authors in 52 of them.
  - 49 papers of mine have more than 100 citations; I am among the three first authors in 14 of them.
  - I am author of 3 letters to Nature, 1 to Science, and 18 to ApJL.
- Impact factor**
- As of 26 March 19, my impact factor ***h-index*** is 73 (based on ADS, computed on refereed papers).
  - Based on a survey conducted in 2013, I am leading author in 2 of the 25 most important papers produced by VLT in its first 15 years (<http://sciencewatch.com/articles/very-large-telescope-first-fifteen-years-discovery>)
- Main Results**
- My research activity tries to address as simple yet difficult question: how galaxies formed and evolved, especially in the first Gyrs of the Universe's life. Answering this question implies working on a number of inter-connected aspects, like:
- High redshift galaxies, stellar mass assembly, luminosity and mass functions, galaxy morphological evolution, clustering and large scale structures, obscured AGNs and their feedback on galaxy evolution.
  - Spectral evolution of galaxies and link with stellar astrophysics.
  - Wide field imaging and spectroscopic surveys.
  - Development of theoretical models of galaxy formation and evolution.
  - Intergalactic medium at high redshift, ionization and metal content of Lyman  $\alpha$  forest and metal systems, connection with high redshift galaxies.
  - Development of software for astronomical data processing, Data Grid.
  - Development of optical/IR instrumentation at large telescopes.

My main results, which characterized my scientific activity and for which I am most known are:

- **The assembly of massive galaxies at high redshift.** In a number of seminal and recent papers (e.g. Fontana+2003, 04, 06, Santini 2009, 2012, Grazian+2015) I have depicted the evolution of massive galaxies at  $z > 2$ ; I have shown that the growth of massive galaxies occurs at fast pace in the first 2-3 Gyrs of the Universe, such that about 50% of present-day mass of massive galaxies is already assembled at  $z \sim 1.5$ . I have also shown that red, quiescent and massive galaxies exist at all redshifts up to at least 4 (Grazian+07, Fontana+09, Grazian+15).
- **The search for the highest redshift galaxies.** Thanks to a combination of deep imaging surveys and spectroscopic follow-up I have progressively identified galaxies at the greatest distances ever recorded (e.g. Fontana+95, Vanzella+11 Finkelstein+15) and studied the general properties of high- $z$  galaxies in several aspects, including the comparison with theoretical models developed at the purpose (e.g. Fontana+1999, Grazian+2011).
- **Tracing the reionization of the Universe.** Using extended spectroscopic programs (based on VLT-FORS2 programs that I led) I have for the first time shown direct evidence of an increasingly neutral Inter Galactic Medium at  $z > 6.5$ , as shown by the decrease in the density of Ly emitting galaxies at  $z > 6.5$  (Fontana+10, Pentericci+11, 14). This sets a sharp constraint for the timing of reionization after the Dark Ages.
- **Advanced methods for data analysis.** During my whole career I have also developed and made public several new approaches to data analysis. Starting first with the FITLYMAN code originally installed in Midas (Fontana, Ballester 1995) I have developed methods for photometric redshifts since the early definition of the technique (Fontana+1998) and recently for de-blended photometry in deep extragalactic surveys (CONVPHOT, DeSantis+2007, T-PHOT and A-PHOT Merlin+2015-2018). Thanks to this experience I had been P.I of the FP7-SPACE project ASTRODEEP and of the Euclid Organizational Unit named MER.

#### MAIN PARTICIPATIONS TO SCIENTIFIC COMMITTEES AND APPROVED INSTRUMENT

TEAM	
2015	MOS@E-ELT
2012	Hubble Deep Fields Initiative 2012 Science Working Group (NASA/STScI)
2012	Project Scientist for the extragalactic case of MOONS (ESO)
2010	DIORAMAS@E-ELT
2008-2009	Member of the ESO OPC / Chair of Extragalactic panel
2008	Euclid
2006	DUNE

2004-2008	LBC Commissioning team
2005-2006	LBC Science Demonstration Time Committee (LBT)
2004-2007	Chairman of the Hawk-I Instrument Team (ESO)
2003	Italian Committee on Surveys
2002	Italian Committee on Databases in Astronomy
2001	LBC@LBT - Project Scientist of the Instrument SW
2001-2002	TAC for the Telescopio Nazionale Galileo
2000	UVES – SW development and characterization
1999	SUSI2@NTT - ESO. Responsible of science commissioning
1998	ESO VLT-UT1 Science Verification Team
2005-now	Coordinator of the research Group of Observational Cosmology and Galaxy Evolution at the INAF - Rome Observatory, which has several leading responsibilities in projects using ESO, LBT, ALMA HST, Spitzer and other world-class instrumentation.

## TEACHING

## University/PhD Courses

2010-now	Professor at Università La Sapienza di Roma, teaching “ <i>Astrofisica Extragalattica</i> ” (48hr course) for the Master Course on Astronomy and Astrophysics.
2006	Professor of <i>Database in astrophysics</i> for PhD students at l’Università di Tor Vergata - Roma
2002	Professor of <i>Cosmic structures at high redshifts</i> for PhD students at l’Università di Tor Vergata -
2001	Professor of “ <i>High redshift galaxies: theory and observations</i> ” at the Università di Roma 3

## Supervisor of master and PhD dissertation:

2018	Laurea magistrale in Astronomia e Astrofisica – <i>Università La Sapienza</i> – Flaminia Fortuni
2018	Laurea magistrale in Astronomia e Astrofisica – <i>Università La Sapienza</i> – Michael Romano
2015	Laurea magistrale in Astronomia e Astrofisica – <i>Università La Sapienza</i> – Antonello Calabro’
2015	Laurea Magistrale in Astronomia e Astrofisica – <i>Università La Sapienza</i> – Graziano Ucci
2013	Laurea Magistrale in Astronomia e Astrofisica – <i>Università La Sapienza</i> – Paola Di Mauro
2012	Laurea in Fisica – <i>Università La Sapienza</i> - Stefano Pilo
2009	Laurea Magistrale in Astronomia e Astrofisica – <i>Università La Sapienza</i> – Tiziana Trombetti
2009	PhD in Astronomia – <i>Università La Sapienza</i> – Paola Santini
2007	PhD in Astronomia – <i>Università di Tor Vergata</i> – Immacolata Donnarumma
2004	Laurea in Fisica – <i>Università La Sapienza</i> - Davide Ceccarelli

## Member of PhD Thesis Commissions:

2018	Université de Paris 7 – Stefania Amodeo
2017	Université de Paris 7 – Gael Noirot
2016	Università di Trieste – Emanuele Pomante
2016	SISSA - Emanuele Sobacchi
2010	Strasbourg University – Audrey Galametz
2010	SISSA – Pratika Dayal

## CONFERENCES

1998-2019	Invited speaker to many international conferences
1996-2019	Invited Seminars at International Institutes like ESO (Munich joint colloquim) Laboratoire d’Astrophysique de Marseille (LAM), Leiden Observatory, Heidelberg Steinwarte, Edinburgh Observatory, UCLA

- 2019 SOC Chair of the Conference "Euclid and Beyond: the many faces of modern cosmology"
- 2019 SOC member of the series of 3 International conferences "Extremely Big Eyes on the Early Universe", held in Los Angeles, Tokyo, Rome
- 2019 SOC Chair of the International conference "The early growth of galaxies V"
- 2018 SOC Member of the International conference "Birth, life and fate of massive galaxies and their central beating heart"
- 2018 SOC Chair of the International conference "The early growth of galaxies IV"
- 2017 SOC Chair of the International conference "The early growth of galaxies III"
- 2016 SOC Chair of the International conference "The HST, Spitzer and Herschel joint legacy"
- 2015 SOC Member of the international conference "Science with MOS: towards the E-ELT" – Cefalu'
- 2015 SOC Chair of the International conference "The Spectral Energy Distribution of high redshift galaxies: lessons learned and open questions" Sesto Val Pusteria
- 2014 Chair of Workshop Nazionale LBT - Padova
- 2013 SOC Member of the international conference "Star Formation Through Cosmic Time" Sexten
- 2012 Chair of Workshop Nazionale LBT - Padova
- 2011 SOC Member of the international conference "CANDELS in the high redshift Universe
- 2008 SOC Member of the international conference "Probing Stellar Populations out to the Distant Universe
- 2007 SOC Member of the international conference "Galaxy Growth in a Dark Universe", Heidelberg, lu

## PRIZES

---

- 2006 Premio "Tartufari" dell'Accademia Nazionale dei Lincei
- 2001 Premio Ing. Franco Pietrandrea from Rotary Club Roma Castelli Romani: "Nascita ed evoluzione delle galassie: quale scenario?"

## FUNDS

---

### International projects

- 2013-2016 Coordinator of FP7-SPACE "ASTRODEEP: unveiling the full power of deep extragalactic surveys" – 1,968,710 Euro
- 2011 Foreign Minister funds for LBT – ITA-USA collaboration. 30,000 Euro

### Large scale Italian projects

- 2013-2018 National Coordinator of the ASI funds for Euclid OU-MER. 600,000 Euro
- 2013 National Coordinator of the Project Premiale MIUR "Sensori Strategici per LBT: dal laser all'origine dell'Universo." 2,794,041.85Euro
- 2012 National Coordinator of the Project Premiale MIUR "Sensori Strategici per LBT: dal laser all'origine dell'Universo." 2,490,000 Euro
- 2007 WP Leader "Survey ed osservazioni multibanda:" of the contract ASI "Cosmologia e Fisica Fondamentale dallo Spazio" 800,000 Euro

### Small scale Italian projects (PRIN INAF e MIUR)

- 2012 National Coordinator of the PRIN INAF "A complete view of the first 2 billion years of galaxy formation" – Euro 154,000
- 2010 National Coordinator of the project "CANDELS: Tracing the history of the Universe with the largest HST program" 86,000 Euro
- 2008 Local Coordinator of the PRIN INAF "Feasibility and cost assessment of an extremely large Field of View spectrograph" (PI R. Ragazzoni). 82,000 Euro
- 2008 Local Coordinator of the PRIN MIUR "Survey infrarosse dell'Universo Primordiale: Galassie e AGN nel vicino IR." (PI Nazionale A. Franceschini) – Euro 48.131
- 2007 National Coordinator of the PRIN INAF "A deep VLT and LBT view of the early Universe: the physics of high redshift galaxies". 160,000 Euro
- 2006 Local Coordinator of the PRIN MIUR "Imaging Survey multicolore e ultraprofonde: galassie ed AGN fino all'epoca della reionizzazione" (PI B. Marano) 62,000 Euro
- 2003 Local Coordinator of the PRIN MIUR "Data Grid per la ricerca astrofisica in Italia: Strumenti per Analisi Dati LBC" – (PI F. Pasian) 55.200 euro

## OUTREACH

## Press releases

- 2015 ESO: "ALMA Witnesses Assembly of Galaxies in the Early Universe for the First Time", <http://www.eso.org/public/news/eso1530/>
- 2015 HST: "Hubble Sees Supernova Split into Four Images by Cosmic Lens", <http://hubblesite.org/newscenter/archive/releases/2015/08/image/a/>
- 2013 HST: "Galaxy Found in Hubble Survey Has Farthest Confirmed Distance.", <http://hubblesite.org/newscenter/archive/releases/2013/39/>
- 2011 ESO: "Distant Galaxies Reveal The Clearing of the Cosmic Fog", <http://www.eso.org/public/news/eso1138/>
- 2004 ESO: "Old Galaxies in the Young Universe", <http://www.eso.org/public/news/eso0422/>
- 2000 ESO: "Into the Epoch of Galaxy Formation": <http://www.eso.org/public/news/eso0006/>
- 1998 ESO: "First Results from the UT1 Science Verification Programme", <http://www.eso.org/public/news/eso9858/>
- 1998 ESO: "DEEP SKY DIVING WITH THE ESO NEW TECHNOLOGY TELESCOPE", <http://www.eso.org/public/news/eso9801/>
- 1995 ESO: "ESO Astronomers Detect a Galaxy at the Edge of the Universe", <http://www.eso.org/public/news/eso9526/>
- INAF I have appeared in many (28 at the moment) Press Releases in Italian media – full list available at <https://www.oa-roma.inaf.it/fontana/press-releases>

## Public lectures

I regularly perform public lectures and other outreach activities, both at the Observatory and in other Institutes – also abroad, in English. I also write articles on public outreach journals, like the Italian edition of Scientific American. I mention below only the most recent ones, held outside the normal activity at the Observatory or in high schools.

- 2017 Public Conference in Brugherio (Mi), entitled: "*Sistemi ordination e sistemi caotici nell'Universo di ieri e di oggi*"
- 2017 Public Conference at the Festival "ProMemoria", Mirandola, Bo., entitled "*Memoria del Cosmo e Nascita dell'Universo*"
- 2016 Public Conference at the Aerospace Faculty of the Rome University La Sapienza, entitled "*Astronomy toward 2020*"
- 2015 Public Conference at the "SpaceUp!" workshop – Rome
- 2014 Public conference at the Italian Embassy in Washington (USA), entitled "*From Galileo to giant telescopes: a journey through space and time*", to celebrate the 450 from Galileo's birth.
- 2014 Public conference at Scuola Normale di Pisa: "*La galassia più distante mai osservata (the farthest galaxy ever observed)*"