PAOLA SANTINI

PERSONAL INFORMATION

Date of birth:	30^{th} Dec 1981
Email:	paola.santini@inaf.it
Office address:	INAF - Osservatorio Astronomico di Roma Via di Frascati 33 00078 Monte Porzio Catone (Roma, Italy)
Office phone:	+39 06 94286469
Date of CV:	March 2022

CURRENT POSITION

Staff researcher at INAF - Astronomical Observatory of Rome (since 2018).

PREVIOUS POSITIONS

2014 - 2018	Fixed-term researcher, INAF - Astronomical Observatory of Rome.
2009 - 2014	Postdoctoral research fellowship, INAF - Astronomical Observatory of Rome.
2010 - 2011	Visiting scientist (6 months), Max Planck Institut für Extraterrestrische Physik, Garching (Germany).
2006 - 2009	Research fellowship, INAF - Astronomical Observatory of Rome.

Career breaks

2015	Maternity leave (5 months).
2017 - 2018	Maternity leave (5 months).

EDUCATION

2012	Post-graduate Master degree in Space Science and Technology, University of Rome "Tor Vergata". Final mark: 110/110 *cum laude*. Dissertation: *"Space debris: an observational point of view"*. Supervisor: Prof.ssa Alessandra Celletti. Internship report: *"Feasibility study: space-based observations of the space environment"* Thales Alenia Space.
2009	PhD in Astronomy, University of Rome "La Sapienza". Dissertation: *"The cosmic history of star formation and mass assembly: a mid-IR view of high redshift galaxies"*. Supervisors: Dr. Adriano Fontana and Prof. Paolo de Bernardis.
2006 - 2008	Participation to 4 national and international PhD schools.
2005	Degree in Physics, University of Rome "La Sapienza", final mark 110/110 *cum laude*. Dissertation: *"Controllo degli effetti strumentali sui dati di polarizzazione dell'esperimento BOOMERanG"* (*"Control of instrumental effects on polarization data of BOOMERanG experiment"*). Supervisor: Prof. Paolo de Bernardis.
2003	Erasmus project, Cambridge University, UK. Attended two astrophysical classes: Gravitational Astrophysics and Cosmology (Prof. Fabian, Prof. Lasenby and Prof. Rees) and Formation, Structure and Evolution of Stars (Prof. Tout).
2000	Secondary school diploma, Liceo Classico "T. Tasso". Final mark: 98/100.
1998	Cultural exchange (3 months), Shaftesbury Secondary School, Dorset, UK.

RESEARCH EXPERIENCE

Research interests

My research activity is mostly focused on understanding the complex physical processes driving galaxy evolution through cosmic time. This is achieved by analysing galaxy spectral, physical and statistical properties by means of a multiwavelength approach (from the X-rays to the millimetric regime). I took advantage of some of the deepest and most important extragalactic

surveys such as GOODS and CANDELS.
My main research interests are:

- star formation activity in galaxies: star formation rate tracers, star formation processes through cosmic time, star formation Main Sequence, optically obscured highly star-forming galaxies;
- passively evolving galaxies in the early Universe: selection and confirmation of the candidates, physical properties, mass growth;
- mass assembly, stellar mass functions and stellar mass density, estimate of galaxy stellar masses;
- evolution of dust and gas content in galaxies;
- star formation activity in AGN host galaxies, galaxy/AGN co-evolution;
- comparison between observations and theoretical predictions of models of galaxy formation and evolution.

Data reduction and analysis

Image analysis and source extraction: worked on MIPS (Spitzer) 24 μm image and on PACS (Herschel) images at 70, 100 and 160 μm; measured the photometry using the PSF-matching software ConvPhot for prior-based source deblending.

Reconstrunction of galaxy Spectral Energy Distribution (SED): fitting of observed SEDs with models of spectral synthesis of stellar population, dust emission models and AGN models; decomposition of various contributions; estimate of galaxy redshift and physical parameters.

Software development

Contributed to the development of the softwares ConvPhot (written in C language) and T-PHOT (written in Python language), both publicly released and aimed at measuring the photometry on low resolution astronomical images through PSF-matching.

Optimization of a proprietary code for SED fitting to perform galaxy SED decomposition into its stellar and nuclear components.

Scientific production

Author and co-author of 164 scientific publications, among which:

- 154 refereed publications on international scientific journals, of which 10 as first author and further 38 to which I significantly contributed to data analysis and interpretation
- 3 refereed conference proceedings (2 as first author)
- 7 non-refereed conference proceedings (1 as first author)

Citations:

- Total number of citations: 13213
- Total number of citations of first author papers: 1149 (115 on average per paper)
- Numbers of papers with ≥ 100 citations: 45 (6 as first author)

H-index: 71

(Source: NASA-ADS, as of March 2022)

Complete list of publications available at

https://ui.adsabs.harvard.edu/user/libraries/qkWQYlLYQ2Cysh6SKOLSpw

Peer review activity

Referee for ApJ, MNRAS, A&A, Physical Review & Research International.

Italian TAC for LBT-TNG-REM.

Proposal reviewer for HST, ALMA, CFHT.

Grant reviewer for FONDECYT-CHILE.

International collaborations

- PRIMER (JWST Cycle 1 Large Program, PI: J. Dunlop), from 2020;
- Rubin-LSST (participation through the INAF in-kind contribution Advanced tools for extragalactic photometry, PI: E. Merlin), from 2020;
- GLASS (JWST ERS program, PI: T. Treu), from 2017;
- CEERS (JWST ERS program, PI: S. Finkelstein), from 2017;
- VANDELS (ESO public spectroscopic survey, PIs: L. Pentericci and R. McLure), from 2016;
- SPICA (IR space observatory candidate for ESA Cosmic Vision M5 mission) Galaxy Evolution Working Group, 2016 - 2020;
- ASTRODEEP (FP7-SPACE project, PI: A. Fontana), from 2013;
- CANDELS (Cosmic Assembly Near-IR Deep Extragalactic Legacy Survey, PIs: S. Faber and H. Ferguson), from 2010;
- PEP (PACS Evolutionary Probe, PI: D. Lutz) from 2009;
- BOOMERanG (Balloon Observations of Millimetric Extragalactic Radiation and Geophysics, PI: P. de Bernardis e A. Lange), 2004 - 2009.

Visiting positions

- Visiting scientist (1 week), Cambridge University / Kavli Institute for Cosmology (collaboration with R. Maiolino), 2012
- Visiting scientist (6 months), Max Planck Institut für Extraterrestrische Physik, Garching (collaboration with D. Lutz), 2010-2011

Observational programs

- PI a successful proposal for MODS/LBT (8 hr)
- Co-I of several successful proposals for JWST, HST, ALMA, VLT, Herschel, Keck.

Observing skills

Observations with LBC and MODS at LBT Observatory (Italian time, Period 2011B).

AWARDS AND GRANTS

2016 Included in the online database 100esperte.it ("100 donne contro gli stereotipi"), collecting names and CVs of 100 women experts in the STEM (Science, Technology, Engineering and Mathematics) area.

2014 Awarded of the Prize Italian Young Researchers (organized by Gruppo 2003 per la Ricerca Scientifica).

2012 Scholarship from the Italian Space Agency (ASI) for attending the post-graduate Master degree in Space Science and Technology, University of Rome Tor Vergata (first classified in admission list).

TEACHING AND STUDENT SUPERVISION

2016 - 2019 Mentoring of Marianna Torelli, PhD in Astronomy, Astrophysics and Space Science.

2018 Invited lecturer for the course "Astrofisica extragalattica", University of Rome "La Sapienza", 4 hr.

2017 Invited lecturer for the course "Astrofisica extragalattica", University of Rome "La Sapienza", 8 hr.

2017 Master thesis co-supervision of Gaia Cipolletta, degree in Astronomy and Astrophysics, University of Rome "La Sapienza", dissertation "The Measure of the Star Formation Rate in high redshift Galaxies". Final mark: 110.

2016 Invited lecturer for the course "Astrofisica extragalattica", University of Rome "La Sapienza", 8 hr.

2015 Master thesis co-supervision of Graziano Ucci, degree in Astronomy and Astrophysics, University of Rome "La Sapienza", dissertation "The stellar masses of high redshift galaxies". Final mark: 110/110 *cum laude*.

2014 Lecturer for the course "Spectral Energy Distribution of galaxies", University of Rome "La Sapienza", PhD in Astronomy, Astrophysics and Space Science, 14 hr.

2013 Lecturer for the course "Spectral Energy Distribution of galaxies", University of Rome "La Sapienza", PhD in Astronomy, Astrophysics and Space Science, 12 hr.

2007 Professor assistant for the class "Laboratorio di meccanica" ("Mechanics laboratory") (Prof. Alessandro Nucara), Physics course of study, University of Rome "La Sapienza".

ORGANIZATION OF CONFERENCES, PHD SCHOOLS AND WORKSHOPS

2022 EAS 2022 Special Session "The Main Sequence: going beyond the scaling relation and investigating the complex galaxy evolutionary histories", Valentia (SOC).

2022 Conference "The growth of galaxies in the early Universe VII", Sesto (SOC).

2021 PhD School "Scientific Communication in Astronomy", Bertinoro (SOC and lecturer).

2020 Conference "The growth of galaxies in the early Universe VI", Sesto (SOC).

2019 LXIII Congresso Nazionale della Società Astronomica Italiana (Annual meeting of the Italian Astronomical Society) "20 anni di INAF: l'Astronomia Italiana tra presente e futuro", Rome (SOC).

2017 EWASS 2017 Special Session "Dust across the Universe", Prague (SOC).

2017 INAF JWST Info Day, Rome (SOC).

2015 "SpaceUp Rome 2015" (international space unconference, first Italian edition sponsored and patronized by ESA, ASI e some of the main Italian and international aerospace companies), Rome (SOC).

MEMBERSHIP OF SCIENTIFIC SOCIETIES

2018 - present Member of IAU (International Astronomical Union), Division J Galaxies and Cosmology.

SELECTED ORAL PRESENTATIONS

Institute seminars

2021 *"Passive galaxies at the dawn of the Universe"*
INAF Osservatorio Astronomico di Roma, Monte Porzio Catone.

2017 *"Unveiling the most elusive star-forming galaxies"*
INAF Osservatorio Astronomico di Roma, Monte Porzio Catone.

2016 *"Dust at high redshift: scaling relations through cosmic time & the search and characterization of obscured starforming galaxies"*
INAF Osservatorio Astrofisico di Arcetri.

2015 *"The evolution of the dust and gas content in galaxies"*
Stockholm University.

2014 *"The evolution of the dust and gas content in galaxies"*
INAF Osservatorio Astronomico di Roma, Monte Porzio Catone.

2012 *"Star formation activity in AGN host galaxies as seen by Herschel"*
Cavendish Laboratory, Cambridge University, Cambridge UK.

2012 *"Star formation activity in AGN host galaxies as seen by Herschel"*
INAF Osservatorio Astronomico di Roma, Monte Porzio Catone.

2009 *"How did galaxies accrete their mass? Star-forming and quiescent galaxies at high redshift"*
INAF Osservatorio Astronomico di Roma, Monte Porzio Catone.

Invited talks

2019 *"Search and confirmation of passive galaxies in the early Universe"*
Conference: Extremely Big Eyes on the Early Universe, Rome.

2019 *"ALMA confirmation of $z\sim$3-5 passive galaxy candidates"*
Conference: The growth of galaxies in the Early Universe - V, Sesto.

2017 *"Unveiling the most elusive star-forming galaxies "*
Conference: The growth of galaxies in the Early Universe - III, Sesto.

2016 *"Dust and gas in galaxies as seen by Herschel and what SPICA can do"*
Italian SPICA Workshop 2016, INAF Headquarters, Monte Mario, Rome.

2013 *"Star formation activity in AGN host galaxies as seen by Herschel"*
Seeking the Leading Actor on the Cosmic Stage: Galaxies vs Black Holes, Castellammare del Golfo.

2012 *"Star formation activity in AGN hosts as seen by Herschel"*
Ringberg AGN Workshop, Schloss Ringberg.

2012 *"The evolution of the dust content in galaxies"*
EWASS 2012, Rome.

2012 *"The evolution of the dust content in galaxies"*
Metals in Tuscany 2012, Abbazia di Spineto.

2011 *"Le survey fotometriche FIR di Herschel per lo studio dell'evoluzione di galassie e AGN"*
("Herschel FIR photometric surveys for studying galaxy and AGN evolution")
IV R.AGN.O meeting, Rome.

Contributed talks

2022 *"The assembly of star-forming and passive galaxies since cosmic dawn"*
Conference: The growth of galaxies in the Early Universe - VII, Sesto.

2020 *"Passive galaxies in the early Universe - Selection, confirmation and physical properties"*
Conference: The growth of galaxies in the Early Universe - VI, Sesto.

2020 *"Passive galaxies in the early Universe - The AO perspective"*
Conference: Astrofisica di frontiera con l'ottica adattiva italiana, Rome.

2019 *"Selection and confirmation of passive galaxy candidates in the early (z¿3) Universe"*
Conference: The Art of Measuring Galaxy Physical Properties, Milano.

2018 *"ALMA confirmation of z∼3-5 passive galaxy candidates"*
Conference: Birth, life and fate of massive galaxies and their central beating hearts, Favignana.

2017 *"Unveiling the most elusive star-forming galaxies "*
Conference: EWASS 2017, Special Session: Star formation, metals, and feedback in galaxies: Combining the latest observations and models, Prague.

2015 *"The evolution of the dust and gas content in galaxies"*
Conference: Back at the Edge of the Universe, Sintra.

2014 *"The evolution of the dust and gas content in galaxies"*
Conference: Star Formation Across Space and Time, ESTEC, Nordwijk.

2014 *"The evolution of the dust and gas content in galaxies"*
Conference: The Unquiet Universe, Cefalu.

2013 *"The evolution of the dust and gas content in galaxies"*
Conference: Star Formation Through Cosmic Time, Sesto.

2011 *"Enhanced SFR in AGN hosts with respect to inactive galaxies"*
PEP meeting, Garching.

2011 *"The faint end slope of the stellar mass function at 0.6<z<4.5 from deep ERS data"*
Conference: CANDELS in the high redshift Universe, Sesto.

2010 *"The dust content of high redshift galaxies"*
PEP meeting, Garching.

2009 *"How do galaxies accrete their mass? Star-forming and quiescent galaxies at high redshift"*
Conference: The Origin of Galaxies: Lessons from the Distant Universe, Obergurgl.

2009 *"How do galaxies accrete their mass? Star-forming and quiescent galaxies at high redshift"*
Conference: Open problems in galaxy formation, Potsdam.

2009 *"How do galaxies accrete their mass? Quiescent and star-forming massive galaxies at high redshift"*
Meeting: Roman Young Researchers Meeting 2009, Rome.

2009 *"How do galaxies accrete their mass? Quiescent and star-forming massive galaxies at high redshift"*
Conference: Harvesting the desert: the Universe between redshift 1 and 3, Marseille.

2008 *"The fraction of quiescent and active massive galaxies in the early Universe: observational constraints from the GOODS-MUSIC sample"*
Conference: When the Universe formed stars, Martinique.

2008 *"The SFR of high z galaxies: mid-IR vs SED fitting"*
Conference: Probing Stellar Populations Out to the Distant Universe, Cefalù.

PUBLIC OUTREACH

2022	Invited speaker at the Co.Scienza Festival, Trento (event will take place on apr 2022).
2021	Public conference, Simposio "Donne fra le stelle", Fiumefreddo Bruzio (CS).
2021	TEDx Talk.
2019	Public conference, high school F. Enriques, Rome.
2019 - 2021	Role model for the project Inspiringirls, aimed at encouraging young (11-13 years old) girls to studying STEM subjects.
2018 - 2019	Several outreach events at Astronomical Observatory of Rome.
2017	Speaker at "HiTalk WoW!" (public storytelling event focused on 12 Italian women excellences with the aim of inspiring, motivating and leading to reflection), Rome.
2008	Guide for schools visits to the Astrolab museum (Observatory of Rome).

LANGUAGE SKILLS

Italian: native speaker
English: excellent
French: elementary

COMPUTER SKILLS

Programming skills: IDL, Fortran, Shell, basics of Python, basics of C, basics of parallelization (MPI).
Scientific softwares: ConvPhot, SExtractor, T-PHOT, Swarp, Supermongo, Iraf, TOPCAT, DS9, SkyCat, CASA.
Operating systems: Windows, Linux, MacOS and major applications (Office package).
LaTeX.