

Prof. Roberto Maiolino FRS

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Curriculum Vitae

Qualifications

- 1996: PhD in Astronomy, University of Florence, on secondment to the Steward Observatory, University of Arizona
1992: MS in Physics (Laurea), *cum laude*, University of Florence

Academic Appointments

- 2021 - present: Royal Society Research Professor
2019 - present: Honorary Professor at University College London
2016 - 2021: Director, Kavli Institute for Cosmology,
University of Cambridge
2012 - present: Professor in Experimental Astrophysics,
Cavendish Laboratory, Department of Physics,
University of Cambridge
2006 - 2012: Senior Astronomer, Astronomical Observatory of Rome
2003 - 2006: Senior Astronomer, Arcetri Astrophysical Observatory
1997 - 2003: Astronomer, Arcetri Astrophysical Observatory
(Firenze, Italy)
1995 - 1997: Postdoctoral Fellow, Max-Planck Institut für Extraterrestrische
Physik (Garching, Germany)

Other Appointments

- 2022 – present: Editorial Board, Royal Society's Philosophical Transactions A
2020 - present: James Webb Space Telescope: Science Working Group
2020 - present: University of Rome, La Sapienza, Board for Graduate Studies
2019 - present: REACH project: Chair of the Board
2016 - present: ELT-HIRES: Chair of the Science Advisory Team
2016 - 2017: Japan Aerospace Exploration Agency (JAXA): SPICA
International Science Advisory Board
2015 - present: International Astronomical Union (IAU): Organizing Committee
of Cross Division D-J (Supermassive Black Holes, Feedback
and Galaxy Evolution)
2014 - present: Scientific Council, Italian Embassy in London
2014: European Southern Observatory (ESO): Committee for the
planning of the Very Large Telescope in 2020's
2014 - present: MOONS-VLT Board
2013 - 2016: SDSSIV-MANGA Strategic Composition Committee

2013 - 2016: HIRES Steering Committee
 2011 - 2012: European Astronomical Society (EAS): Working group on the Future of European Space Astronomy
 2009 - 2011: ASTRONET Wide Field Spectroscopy Working Group
 2009 - 2011: Large Binocular Telescope: Time Allocation Committee.
 2007 - 2011: European Science Advisory Committee (ESAC) for the Atacama Large Millimetre Array (ALMA)
 2007 - 2008: ASTRONET Roadmap Working Group
 2005 - 2010: Coordinator for the Italian Space Agency's grants in support of future space missions
 2005 - 2010: Large Binocular Telescope: Science and Technical Committee
 2004: Chandra X-ray Observatory: Time Allocation Committee
 2003 - 2006: Head of the Extragalactic Group, Arcetri Observatory
 2003 - 2006: Institut de Radioastronomie Millimétrique (IRAM): Program Committee
 2003 - 2005: European Southern Observatory (ESO): Observing Programmes Committee

Major projects with leading roles or heavy involvement

2021 - present: Steering Committee of the JADES collaboration
 2021 - present: JWST-NIRSpec: coordinator of the Multi-Object GTO survey
 2017 - present: JWST-NIRSpec: co-lead of the IFS GTO survey
 2016 - present: Project Scientist of HIRES (High Resolution Spectrometer for the Extremely Large Telescope)
 2016 - present: Co-PI of the ESO Large Programme "KLEVER"
 2014 - present: Co-PI of MOONS-VLT
 2013 - 2016: UK Co-PI of HIRES
 2011 - present: Project Scientist of MOONS (next generation ESO-VLT multi-object near-IR spectrograph)
 2008 - 2013: Project Scientist of SIMPLE (ELT high resolution near-IR spectrograph)
 2008 - 2009: PI of the ESO Large Programme "AMAZE"
 2005 - 2008: Project Scientist of GIANO (TNG high resolution near-IR spectrograph)
 2004 - present: JWST - NIRSpec Instrument Science Team

Awards, honors, fellowships, named lectures

2023: NASA Group Achievement Award (JWST Science Working Group)
 2023: Elizabeth Spreadbury Lecture
 2022: Kavli Frontiers Lecture
 2022: European Research Council (ERC) Advanced Grant (UKRI funded)
 2022: Elected Fellow of the Royal Society
 2021: Royal Society Research Professorship
 2019: Honorary Professor at University College London
 2018: Knighthood from the Italian President
 2016: Cavendish Physical Society Lecture (Cambridge, UK)
 2016: European Research Council (ERC) Advanced Grant
 2014: NOVA Lectures (The Netherlands)

1994: Scholar, Steward Observatory - University of Arizona (Tucson, USA)

1992: ASI Fellowship, Institute for Solid State Electronics (Roma, Italy)

Professional Societies

Since 2022: Fellow of the Royal Society

since 2018: Member of the European Astronomical Society

since 2001: Member of the International Astronomical Union

Publications

>470 refereed papers (about 200 non-refereed publications), cited more than 40,000 times; Hirsh (h) factor of 109.

Books edited

- *Issues in Unification of Active Galactic nuclei*, 2002
Astronomical Society of Pacific, Vol. 258
Editors: Roberto Maiolino, Alessandro Marconi, Neil Nagar
- *Multiwavelength AGN Surveys*, 2003
World Scientific Publishing
Editors: Raul Mujica & Roberto Maiolino
- *Texas in Tuscany: XXI Symposium on Relativistic Astrophysics*, 2003
World Scientific Publishing
Editors: Rino Bandiera, Roberto Maiolino, Filippo Mannucci

Lecturer at advanced schools (since 2007)

2021 *UKRI Introductory Course in Astronomy*, Armagh, UK

2014 *The complex physics of dusty star forming galaxies and AGNs*,
Bologna, Italy

2011 *Numerical and Observational Astrophysics: From the First
Structures to the Universe Today*, Buenos Aires, Argentina

2010 *The Infrared Universe: the Herschel and ALMA eras*, Asiago, Italy

2008 *High Energy Astrophysics Summer School*, Urbino, Italy

2007 *Science with ALMA*, Cagliari, Italy

2007 *Active Galactic Nuclei at the Highest Angular Resolution*,
Torun, Poland

Supervision of students, postdocs and research fellows

Supervised (or co-supervised) 50 PhD students, postdocs and research fellows, most of which currently are faculty at major research institutes, or have fellowships or postdoc positions at major research institutes and Universities.

University of Cambridge:

19 PhD students (8 of which visiting from abroad)

13 postdocs/fellows

University of Rome and Astronomical Observatory of Rome:

4 PhD students

3 postdocs/fellows

University of Florence and Arcetri Astrophysical Observatory:
7 PhD students
3 postdocs/fellows

Max-Planck-Institute für Extraterrestrische Physik:
1 PhD student

Teaching

2020: "Natural Sciences Tripos IA - Mathematics", Examiner,
University of Cambridge

2015-2018: "Astrophysical Fluid Dynamics", Examiner,
University of Cambridge

2014-present: "Formation of Structure in the Universe", University of Cambridge

2013-2018: "Waves and Oscillations Laboratory" Head of Class,
University of Cambridge

2012-2013: "Astrophysical Techniques" (postgraduate course),
University of Cambridge

2008: "Coevolution of galaxies and AGNs", International School for
Advanced Studies, S.I.S.S.A (2008)

2007-2008: "Extragalactic Astrophysics", University of Rome III, Italy

2006: "Active Galactic Nuclei", University of Florence

2005-2006: "Star formation in our galaxy and in the distant Universe" University
of Florence

2005: "Dust in the Universe", University of Rome III

2001-2002: "Extragalactic Astronomy and Cosmology", INAOE, Mexico

Research and highlights

I have been active in multiple areas of observational extragalactic astrophysics. The following are some of the main research areas, along with some of the associated highlights:

- Galaxy formation in the early universe
 - First detection of far-infrared fine structure lines in galaxies at high redshift (Maiolino et al. 2005, A&A 440, L51; Maiolino et al. 2009, A&A 500, L1).
 - Tracing the assembly of a primeval galaxy at $z > 7$ (Maiolino et al. 2015, MNRAS 452, 54, Carniani, Maiolino et al. 2017, arXiv:1701.03468).
 - Discovery of streams of molecular gas accreting onto a massive galaxy at the center of a protocluster at $z = 3.4$ (Ginolfi et al. 2017, MNRAS 468, 3468).
- Galactic outflows
 - Discovery massive quasar-driven molecular outflows (Feruglio, Maiolino et al. 2012, A&A 518, L155).
 - Systemic characterization of massive quasar-driven molecular outflows (Cicone, Maiolino et al. 2014, A&A 562, A21).

- First detection of massive quasar-driven outflows at high redshift (Maiolino et al. 2010, MNRAS, 425, L66; Cicone, Maiolino et al. 2015, A&A 574, A14).
 - First direct observational evidence of star formation quenching by quasar driven outflows (Cano-Diaz, Maiolino et al. 2012, A&A 537, L8).
 - First discovery of star formation in galactic outflows (Maiolino et al. 2017, Nature, 544, 202).
- Galaxy transformation and star formation quenching
 - "Starvation" (or "strangulation", i.e. halt of gas inflow from the intergalactic medium) identified as primary mechanism responsible for terminating star formation in most galaxies (Peng, Maiolino & Cochrane et al. 2015, Nature 521, 192).
- Metallicity evolution throughout the cosmic epochs
 - Determination of the evolution of the galaxy mass-metallicity relation at $z>3$ and finding of a steep metallicity evolution of galaxies at $z>3$ (Maiolino et al. 2008, A&A 488, 463; Troncoso, Maiolino et al. 2014, A&A 563, A58).
 - First measurements of metallicity gradients at $z>3$ and discovery of inverted gradients (Cresci, Mannucci, Maiolino et al. 2010, Nature 467, 811; Troncoso, Maiolino et al. 2014, A&A 563, A58).
 - Metallicity scaling relations with stellar mass, star formation rate, gas content, and environment (Mannucci, Cresci, Maiolino et al. 2010, MNRAS 408, 2115; Bothwell, Maiolino, et al. 2013, MNRAS 433, 1425; Bothwell, Maiolino et al. 2015, MNRAS 455, 1156; Peng & Maiolino 2014, MNRAS 438, 262; Nagao, Maiolino & Marconi 2006, A&A 459, 85).
 - Metallicity determination of distant quasar host galaxies (Maiolino et al. 2003, ApJ 596, L155; Juarez et al. 2009, A&A 494, L25; Nagao, Marconi, Maiolino, 2006, A&A 447, 157; Nagao, Maiolino, Marconi, 2006, A&A 447, 863).
- Formation and evolution of dust throughout the cosmic epochs
 - Discovery of a supernova origin of dust at high redshift (Maiolino et al. 2004, Nature 431, 533, Stratta et al. 2007, ApJ 661, L9; Gallerani et al. 2010, A&A 523, A85).
 - Cosmic evolution of the dust content in galaxies (Santini, Maiolino et al. 2014, A&A 562, A30).
- Unified model, circumnuclear medium and host galaxies of Active Galactic Nuclei
 - Revision of the Unified Model through the introduction of a dual absorber (Maiolino & Rieke 1995, ApJ 454, 95).
 - Discovery of a large population of heavily obscured AGNs (Maiolino et al. 1998, A&A 488, 463; Risaliti, Maiolino & Salvati 1999, ApJ 522, 157; Bassani, Dadina, Maiolino et al. 1999, ApJS 121, 473).
 - Dust absorption in AGNs and inconsistency with X-ray gas absorption (Maiolino et al. 2001, A&A 365, 28).
 - Discovery of "cometary"-like gas clouds orbiting supermassive black holes (Maiolino et al. 2010, A&A 517, A47).

- Analysis of the dust covering factor in AGNs (Maiolino et al. 2007, A&A 468, 979).
 - Identification of a population of "Elusive AGNs" (Maiolino et al. 2003, MNRAS 344, L59; Risaliti, Maiolino et al. 2006, MNRAS 365, 303; Imanishi, Dudley, Maiolino et al. 2007, ApJS 171, 72).
 - Star formation and stellar population in AGN host galaxies (Maiolino et al. 1995, Maiolino et al. 1998, Oliva, Origlia, Maiolino, Moorwood 1999, A&A 350, 9; Risaliti, Gilli, Maiolino, Salvati 2000, A&A 357, 13; Maiolino et al. 2005; Maiolino et al. 2007, A&A 468, 979; Santini et al. 2012, A&A 540, A109).
 - Gas content in AGN host galaxies (Maiolino et al. 1997, ApJ 446, 561; Maiolino et al. 2007, A&A 472, L33; Vito, Maiolino et al. 2014, MNRAS 441, 1059).
 - Evolution of the Black Hole-Galaxy scaling relations (Lamastra, Menci, Maiolino et al. 2010, MNRAS, 405, 29; Bongiorno, Maiolino, et al. 2014, MNRAS 443, 2077; Marconi, Axon, Maiolino et al. 2008, ApJ 678, 693).
- Obscured Supernovae
 - Discovery of the first near-infrared selected, obscured supernovae (Maiolino et al. 2002, A&A 389, 84).
 - Warm-Hot Intergalactic Medium
 - Detection of diffuse soft X-ray emission, associated with galaxy overdensities, tracing warm-hot baryons in the intergalactic medium (Zappacosta, Maiolino et al. 2005, MNRAS 357, 929; Zappacosta, Mannucci, Maiolino, et al. 2002, A&A 394, 7; Zappacosta, Maiolino et al. 2005, A&A 434, 801).