

PERSONAL INFORMATIONS

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PROFESSIONAL EXPERIENCE

09/2019 – ongoing: Post-doctoral Researcher, INAF-OAA (Firenze, IT)
 03/2018 – 08/2019: Post-doctoral Researcher, Kapteyn Institute (Groningen, NL)
 07/2016 – 07/2019: Post-doctoral Researcher, ASTRON (Dwingeloo, NL)
 03/2013 – 06/2016: Post-doctoral Researcher, Kapteyn Institute (Groningen, NL)

EDUCATIONS

25/02/2013: PhD in Astronomy, University of Bologna (IT)
 Thesis title: The gaseous halo of the Milky Way
 Supervisor: Prof. Filippo Fraternali
 10/2009: Master degree (*cum laude*) in Astrophysics and Cosmology, University of Bologna (IT)
 Thesis title: Cinematica del gas extra-planare nella Via Lattea (Kinematics of the extra-planar gas in the Milky Way). Supervisor: Prof. Filippo Fraternali
 11/2006: Bachelor degree (*cum laude*) in Astronomy, University of Bologna (IT)
 Thesis title: Soluzione numerica di equazioni di continuità in ambito astrofisico (Numerical solutions for continuity equations in astrophysics). Supervisor: Prof. Antonio Messina

SCIENTIFIC INTERESTS

Galaxy formation and evolution - Data modelling - Image processing - Numerical simulations

SUMMARY OF RESEARCH ACTIVITY

My main scientific interest is in galaxy formation and evolution, with a particular focus on the kinematics and dynamics of gas in galaxies from both an observational and theoretical perspective. My research has been focussed on the following topics:

- i)** The gaseous halos of late-type galaxies. Galaxies are surrounded by a multiphase, low-density gas component built by a combination of material accreting onto their disc from the intergalactic medium and gas expelled from their disc by supernova feedback. Studying this disc-halo interplay is important to understand how galaxies replenish their ‘fuel’ for star formation. I have led and co-authored several studies aimed at characterising the morphological and dynamical properties of the gaseous halo of the Milky Way and of nearby disc galaxies.
- ii)** The HI properties of galaxies in hydrodynamical simulations. Numerical simulations are powerful tools to study the physics of gas in galaxies. In my work I have used state-of-the art hydrodynamical simulations, both in a cosmological (EAGLE, APOSTLE) and in an isolated framework to study various aspects associated to the galactic HI physics, like how stellar feedback affects the kinematics and morphology of HI discs, how the HI kinematics of dwarf galaxies is influenced by the shape of their dark matter halo, and the mode by which the environment regulates the HI content of galaxies. All these studies were accompanied by a detailed comparison with the observations.
- iii)** Galaxy scaling relations and their evolution. Galaxies obeys to simple scaling laws that link their luminous mass to their rotational speed, specific angular momentum, central black hole mass and dark matter content. I have participated in several studies aimed at the characterisation and theoretical understanding of these scaling laws.
- iv)** Stellar and AGN feedback in galaxies. Feedback from supernovae and/or AGNs is thought to have a key role in quenching star formation in galaxies by launching large-scale winds that can empty a system of its gas reservoir. I study this process using optical and near-IR integral-field spectroscopic data in order to characterise the dynamics and energetics of the diffuse ionised gas in galaxies.
- v)** Digital image processing. Photometric and astrometric measurements on images from single and multi-conjugated adaptive optics suffer from the variability of the PSF in time and across the field of view. I am developing *SuperStar*, a new software for photo/astro-metric measurements in stellar fields. The software processes the image while iteratively building a grid of numerical PSFs using as an input the image itself. I also collaborate with groups working on a-priori characterisation of the PSF via PSF-reconstruction methods.

PRIZES AND AWARDS

- 17/10/2015: *Livio Gratton Prize*, for the best PhD thesis in Astronomy in Italy in the period 2012/2013-2013/2014; INAF, Roma (IT)
- 19/05/2014: Lions Club “*Claudio Bonivento*” Prize, for the best PhD thesis in Astronomy at University of Bologna in the period 2012-2013; University of Bologna (IT)

SUPERVISING AND MENTORING ACTIVITIES

- 2019 – ongoing: PhD co-advisor of Anqi Li, Kapteyn Institute, NL
- 01/03/2019-10/07/2019: Co-supervisor of the bachelor thesis of Janke Prins, Kapteyn Institute, NL.
Thesis title: The radial growth of disc galaxies at $z=1$
- 01/04/2018-06/07/2018: Co-supervisor of the bachelor thesis of Manou Ijtsma, Kapteyn Institute, NL.
Thesis title: The specific angular momentum in galaxies at $z=1$
- 01/04/2018-06/07/2018: Co-supervisor of the bachelor thesis of Lotte Elzinga, Kapteyn Institute, NL.
Thesis title: Hydrostatic equilibrium in the Milky Way
- 01/09/2012-15/03/2013: Co-supervisor of the master thesis of Martina Valleri, University of Bologna (IT),
Thesis title: Extraplanar gas in nearby disc galaxies

TEACHING ACTIVITIES

- 11/05/2016: lecture on the HI properties of the Milky Way for the class “Physics of galaxies”, Kapteyn Institute, NL

CO-I SHIP IN SUCCESSIFUL OBSERVATIONAL PROPOSALS

- 2021: Chasing molecular outflows in local Seyferts with the deepest ACA CO observations, ALMA Cycle 8, PI: G.Venturi (INAF-OAA)
- 2021: The mystery of the giant ionised nebula around MR2251-178, MUSE, PI: A. Mannucci (INAF-OAA)
- 2019: *The TRICEPS survey: Tracing Rotation with Ionized Carbon in Early Primeval Systems*; ALMA Cycle 7, PI: Lelli (Cardiff Univeristy)
- 2019: *Testing cosmology with globular clusters*; CHFT (rank B), PI: Posti (University of Strasbourg)

OTHER PROFESSIONAL ACTIVITIES

- 2020-ongoing: Organizer of weekly lunch talk (Astrobignè) at INAF-OAA
- 2020-ongoing: Organizer of the extragalactic group meeting and journal club at INAF-OAA
- 12/12/2019: oral contribution at the Arcetri Open-day for bachelor and master students (INAF-OAA)
- 2013-2015: Co-organiser of the Blaauw Professors’ “wine and cheese lectures” at the Kapteyn Institute (NL)
- 2013-2015: Co-organisers of the weekly “Monday lunch talks” at the Kapteyn Institute (NL)
- 2013-ongoing: Regular refereeing for MNRAS, A&A e ApJ

MEMBERSHIPS AND SCIENTIFIC AFFILIATIONS

- 11/06/2019 – ongoing: IAU junior member
- 01/10/2018 – ongoing: member of the HALOGAS (Hydrogen Accretion in Local GALaxieS) group.
International team for the study of extraplanar HI in nearby galaxies.
<https://www.astron.nl/halogas/index.php>
- 01/12/2016 – ongoing: member of the APOSTLE (A Project Of Simulating The Local Environment) group.
International team for the study of the Local Group via cosmological simulations.

FUNDINGS RECEIVED

- 13/08/2017: Leiden Kerkhoven-Bosscha travelling fund, subsidy number 17.0.043 (452 €)
- 2011: Marco Polo program for mobility of PhD students, 3 months granted (3450 €)

PRESENTATIONS AT CONFERENCES AND WORKSHOPS**As an invited speaker:**

- 2018: (*Review talk*) Breathing in and out, the cycle of gas in galaxies. EWASS 2018, Liverpool (UK).
 2014: Galaxies in different environments: theory vs observations. PHISCC 2014, ASTRON, Dwingeloo (NL)

As a contributed speaker:

- 2021: *Assessing the performances of image analysis packages using AO-assisted synthetic observations*, AO4ASTRO2, Marseille (FR)
 2020: *A new software for photometry and astrometry in the AO era*. AO2020, Accademia dei Lincei, Roma (IT)
 2019: *A new software for photometry and astrometry in the AO era*. Science with Mavis, Firenze (IT)
 2019: *Stellar-to-halo mass relation and missing baryons in spiral galaxies: a lesson from the study of rotation curves*. GEE6, Trieste (IT)
 2019: *HALOGAS: the properties of extraplanar HI in disc galaxies*. MIAPP, ESO Garching (DE)
 2019: *A new software for photometry and astrometry in the AO era*. AO4ASTRO, Marseille (FR)
 2018: *Environmental HI stripping in the EAGLE simulations*.
 The HI/Story of the Nearby Universe, Groningen (NL)
 2017: *Dark bars and non-circular motions in simulated dwarf galaxies*.
 The role of gas in galaxy dynamics, Valletta (MT)
 2015: *Disk-corona gas cycle in simulated Milky-Way like galaxies*. Life cycle of gas in galaxies, Dwingeloo (NL)
 2015: *On the origin of the high-velocity features in the halo of the Milky Way*. IGM@50, Abbazia di Spineto (IT)
 2015: *Hot-mode mass assembly in Milky Way-like galaxies*. PHISCC 2015, New Brunswick, New Jersey (US)
 2014: *The formation of the high-velocity clouds of the Milky Way*. The Periphery of disks, Sydney (AU)
 2013: *Ionized absorbers in the MW's halo: the footprint of the disk-corona interplay*.
 Waves and Particles, Multi-Messengers from the Universe, Tübingen (DE)
 2012: *Fountain-driven gas accretion in the Milky Way*. EWASS 2012, Roma (IT)

Poster presentations

- 2016: *Environmental HI stripping in the EAGLE simulations*.
 Crossing the Rubicon, Santarcangelo di Romagna (IT)
 2011: *Modelling the HI layer of the Milky Way*. Assembling the puzzle of the Milky Way, Le Grand-Bornand (FR)

INVITED COLLOQUIA

- 2020: Strasbourg Observatory (FR) - High- and low-mass simulated galaxy discs.
 2015: Kapteyn Institute (NL) - Fountain-driven gas accretion onto the Milky Way.
 2015: University of Central Lancashire, Preston (UK) - Supernova-driven gas accretion in the Milky Way.
 2014: Macquarie University, Sydney (AU) - Supernova-driven gas accretion in the Milky Way.

OUTREACH ARTICLES AND ACTIVITIES

- 08/2021: Press release “*Così si parlano galassie, materia oscura e buchi neri*”, published on the INAF electronic newspaper, <https://www.media.inaf.it/2021/08/23/relazione-galassie-aloni-buchi-neri/>
 04/2021: Outreach seminar (in Italian) “*Inspirazione ed espirazione: il ciclo di gas nelle galassie*” for “*Astronomiamo*” association
 10/2019: Press release “*La misteriosa origine delle galassie ultra-diffuse*”, published on the INAF electronic newspaper. <https://www.media.inaf.it/2019/10/29/origine-galassie-ultra-diffuse/>
 12/2015: Publication of the article “*Il gas d’alone della via Lattea*” in “*Giornale di Astronomia*”, di A. Marasco; Fabrizio Serra Editore, Vol. 41/4, pp. 56
 06/2015: Press release “*Tien miljard jaar aan ster-evolutie doorgerekend*” published on the electronic newspaper of the University of Groningen. <https://www.rug.nl/research/kapteyn/news/2015/tien-miljard-jaar-aan-ster-evolutie-doorgerekend>

TALKS AND COLLOQUIA GIVEN

In total, about 30 talks and colloquia in International conferences, meetings, and Institutes.

OVERVIEW OF PUBLICATIONS

31 publications in peer review journals, 3 proceeding.

of which 13 first author's paper, 9 second/third author's papers, 1 first author proceeding

Total number of citations: 731 [NASA/ADS], H-index: 16 [NASA/ADS]

PUBLICATIONS IN PEER-REVIEWED JOURNALS**First-author's papers:**

- 2021: A universal relation between the properties of supermassive black holes, galaxies, and dark matter halos, **A. Marasco** et al, MNRAS, in press
- 2020: Galaxy-scale ionised winds driven by ultra-fast outflows in two nearby quasars; **A. Marasco** et al., A&A 644, A15.
- 2020: Massive disc galaxies too dominated by dark matter in cosmological hydrodynamical simulations, **A. Marasco**, L. Posti, K. Oman, B. Famaey, G. Cresci, and F. Fraternali, A&A 640, A70.
- 2019: HALOGAS: the properties of extraplanar HI in disc galaxies; **A. Marasco** et al., A&A 631, A50.
- 2019: The angular momentum of disc galaxies at $z=1$; **A. Marasco**, F. Fraternali, L. Posti, M. Ijtsma, E. M. Di Teodoro, and T. Oosterloo; A&A 621, L6.
- 2018: Bars in dark-matter-dominated dwarf galaxy discs; **A. Marasco**, K. A. Oman, J. F. Navarro, C. S. Frenk, and T. Oosterloo; MNRAS 476 pp. 2168–2176.
- 2017: Distribution and kinematics of atomic and molecular gas inside the solar circle; **A. Marasco**, F. Fraternali, J. M. van der Hulst, and T. Oosterloo; A&A 607, A106.
- 2017: The Galactic fountain as an origin for the Smith Cloud; **A. Marasco** and F. Fraternali; MNRAS 464 pp. L100–L104.
- 2016: The environmental dependence of HI in galaxies in the EAGLE simulations; **A. Marasco**, R. A. Crain, J. Schaye, Y. M. Bahé, T. van der Hulst, T. Theuns, and R. G. Bower; MNRAS 461 pp. 2630–2649.
- 2015: The effect of stellar feedback on a Milky Way-like galaxy and its gaseous halo; **A. Marasco**, V. P. Debattista, F. Fraternali, T. van der Hulst, J. Wadsley, T. Quinn, and R. Roškar; MNRAS 451 pp. 4223–4237.
- 2013: On the origin of the warm-hot absorbers in the Milky Way's halo; **A. Marasco**, F. Marinacci, and F. Fraternali; MNRAS 433 pp. 1634–1647.
- 2012: Supernova-driven gas accretion in the Milky Way; **A. Marasco**, F. Fraternali, and J. J. Binney; MNRAS 419 pp. 1107–1120.
- 2011: Modelling the H I halo of the Milky Way; **A. Marasco** and F. Fraternali; A&A 525, A134.

Second/third-author's papers:

- 2021: A Kinematic Analysis of Extraplanar Ionised Gas in the DiskMass $H\alpha$ Sample; A. Li, **A. Marasco** et al., MNRAS, 504, pp. 3013-3028
- 2021: Connecting X-ray nuclear winds with galaxy-scale ionised outflows in two $z\sim 1.5$ lensed quasars; G. Tozzi, G. Cresci, **A. Marasco** et al., A&A, 648, A99
- 2020: Pushing point-spread function reconstruction to the next level: application to SPHERE/ZIMPOL; O. Beltramo-Martin, **A. Marasco** et al., MNRAS 494 pp.775-778
- 2020: Successful application of PSF-R techniques to the case of the globular cluster NGC 6121 (M 4); D. Massari, **A. Marasco**, O. Beltramo-Martin, J. Milli, G. Fiorentino, E. Tolstoy, F. Kerber; A&A 634, L5
- 2019: Galaxy disc scaling relations: a tight linear galaxy-halo connection challenges abundance matching; L. Posti, **A. Marasco**, F. Fraternali and B. Famaey, A&A 629, A59.
- 2019: Peak star formation efficiency and no missing baryons in massive spirals; L. Posti, F. Fraternali, and **A. Marasco**; A&A 626 pp. A56. 2019
- 2019: Non-circular motions and the diversity of dwarf galaxy rotation curves; K. A. Oman, **A. Marasco**, J. F. Navarro, C. S. Frenk, J. Schaye, and A. Benítez-Llambay; MNRAS 482 pp. 821–847. 2019
- 2015: Galactic hail: the origin of the high-velocity cloud complex C; by F. Fraternali, **A. Marasco**, L. Armillotta, and F. Marinacci; MNRAS 447 pp. L70–L74. 2015
- 2013: Ionized absorbers as evidence for supernova-driven cooling of the lower galactic corona; F. Fraternali, **A. Marasco**, F. Marinacci, and J. Binney; ApJ 764, L21 p. L21. 2013

Co-author of additional 9 papers.