

# Federico Lelli

## Curriculum Vitae

INAF - National Astrophysical Institute  
Arcetri Astrophysical Observatory  
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### Personal Information

Date of Birth 16 July 1984  
Place of Birth Chiaravalle (Ancona), Italy  
Nationality Italian

### Education & Degrees

- 2009–2013 **Ph.D.**, *Astronomy (cum laude – top 5%)*, University of Groningen, Netherlands.  
Thesis: Starbursts and gas dynamics in low-mass galaxies
- 2006–2009 **M.S.**, *Astrophysics & Cosmology (cum laude)*, University of Bologna, Italy.  
Thesis: Dark and luminous matter in giant low surface brightness galaxies
- 2003–2006 **B.S.**, *Astronomy (cum laude)*, University of Bologna, Italy.  
Thesis: Stationary models for the rotation of extra-planar gas in disc galaxies

### Work Experience

- 2021–Present Research Staff, Arcetri Astrophysical Observatory, INAF, Florence (IT)  
2020 Research Associate, Cardiff University, Cardiff (UK)  
2019–2020 Regular Visitor, Kavli Institute for Cosmology, Cambridge (UK)  
2017–2019 Reserach Fellow, European Southern Observatory (ESO), Garching (Germany)  
2014–2016 Research Associate, Case Western Reserve University (CWRU), Cleveland (Ohio)

### Fundings & Awards

- 2017–2019 ESO Fellowship (~€200k). Three years of independent research at ESO Germany.
- 2014–2016 Grant from the John Templeton Foundation (~\$365k) for three years of research at CWRU (PI: S.S. McGaugh, Co-Is: F. Lelli & M. Pawlowski).
- 2009–2013 Ubbo Emmius Scholarship from the Groningen Graduate School of Science (~€100k). Four years of Ph.D. research on a project proposed and designed by the student.
- 2009–2013 Leids Kerkhoven-Bosscha Fonds (~€3k) to attend international meetings.

### Scientific Outputs

- Publications: **52** refereed papers: **19** as 1<sup>st</sup> author, **16** as 2<sup>nd</sup> author. Median # of authors = **4**.  
H-index = **25**. Total Citations = **2401** (source: NASA/ADS on 26/11/2021).
- Conferences: **10** invited reviews. **1** invited opening talk. **29** contributed talks. **2** posters.
- Other Talks: **15** invited colloquia and **30** short seminars in America, Australia, Asia, and Europe.

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## Main Collaborations

- 2021–Present **SKA**: The Square Kilometer Array is the next-generation radio interferometer. I am a member of the HI Galaxy Science Working Group. Chairs: *B. Catinella & P. Serra*.
- 2021–Present **EUCLID**: I am a member of the Science Working Group 6: “Low surface brightness and dwarf galaxies” and coordinator of its Task 7 “Synergies with HI surveys”.
- 2020–Present **WISDOM**: CO program with ALMA to measure black-hole masses in nearby galaxies. I have the role of expert in dynamical modeling. PIs: *T. Davis & M. Bureau*.
- 2019–Present **TRICEPS**: [CII] survey with ALMA to study the distribution and kinematics of cold gas in galaxies at  $z = 4 - 5$  at unprecedented resolutions of  $\sim 500$  pc. **PI**: **F. Lelli**.
- 2019–Present **WALLABY**: all-sky HI survey with the Australian SKA Pathfinder (ASKAP). I am a member of several working groups. PIs: *B. Koribalski & L. Staveley-Smith*.
- 2018–Present **DWALIN** collaboration, including *G. Cresci* and *L. Hunt*. Multi-wavelength study of starburst dwarf galaxies with VLT/MUSE, HI from VLA, and CO from ALMA.
- 2017–Present **SONG**: spectro-photometric survey with Subaru and the ESO-VLT to study dwarf satellite systems around major galaxies within 10 Mpc. PIs: *O. Müller & E. Jerjen*.
- 2015–Present **TDG** collaboration, including *P.-A. Duc* and *E. Brinks*. A multi-wavelength study of tidal dwarf galaxies around interacting systems. I am the PI of HI and CO campaigns.
- 2014–Present **SPARC** collaboration, including *S.S. McGaugh* and *J.M. Schombert*. SPARC is a publicly available database providing rotation curves and mass models for 175 galaxies at  $z \simeq 0$ . I am a *core member* of the team and lead several resulting papers.

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## Students Supervision

- 2021–Present **T. Visgaitis**, *Ph.D. student*, CWRU (USA). Co-supervision with S.S. McGaugh. *Status*: working on HI data of galaxy mergers to identify tidal dwarf galaxies.
- 09–12 2020 **N. Kovakkuni**, *Master student*, Cardiff University (UK). *Status*: Master thesis completed. Paper in preparation.
- 2016–2020 **P. Li**, *Ph.D. student*, CWRU (USA). Co-supervision with S.S. McGaugh. *Status*: Thesis completed. Five papers published. Now postdoctoral fellow at AIP.
- 05–06 2019 **J. Petersen**, *Ph.D. student*, University of Southern Denmark (Odense). *Status*: 2 months visit at ESO-Germany with Danish funds. One paper published.
- 2018–2019 **A. Shelest**, *Master student*, Ludwig Maximilian University (Munich, Germany). *Status*: Thesis completed. One paper published. Now PhD student at Lausanne University.
- 2017–2018 **N. Starkman**, *Bachelor student*, CWRU (USA). Co-supervision with S.S. McGaugh. *Status*: Thesis completed. One paper published. Now Ph.D. student at Toronto University.
- 2015–2016 **E. Tarantino**, *Bachelor student*, CWRU (USA). Co-supervision with S.S. McGaugh. *Status*: Thesis completed. Now Ph.D. student at the University of Maryland.

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## Functional Work at ESO

- 2018–2019 ALMA Helpdesk Triage. User support via the ALMA helpdesk (European ARC).
- 2017–2018 ALMA Astronomer on Duty (28 days in total). Scheduling and execution of observations at the ALMA site (Operations Support Facility, Chile).
- 2017–2018 ALMA Data Analyst. Calibration, imaging, and quality assurance of ALMA data.

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## Commissions of Trust

- February 2021 Member of the *PhD reading committee* of Valentina Cesare (Univ. of Torino).
- October 2020 Supplement member of the *PhD defence committee* of S. Taibi (Univ. of La Laguna).
- June 2020 Member of the *PhD defence committee* of Pengfei Li (CWRU).
- March 2019 Co-chair of the *selection committee* of the ESO Summer Research Program.
- June 2018 Request to be a panel member for the NASA's Astrophysics Data Analysis Program (ADAP 2018). I had to decline due to ALMA commitments.
- June 2017 Request to be a panel member for the NASA's Astrophysics Data Analysis Program (ADAP 2017). I had to decline due to other commitments.
- February 2017 Member of the *PhD defence committee* of A. Ponomareva (Univ. of Groningen).
- October 2016 Member of the *PhD reading committee* of K. M. Mogotsi (Univ. of Cape Town).

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## Reviewing Activities

- October 2020 Reviewer for the Chilean Research Council (FONDECYT).
- April 2020 Reviewer for the Time Allocation Committee of the JCMT.
- October 2019 Reviewer of job applications for the ESO Fellowship Programme (Garching).
- October 2018 Reviewer for the Chilean Research Council (FONDECYT).
- January 2018 Reviewer for the Time Allocation Committee of the GMRT (India).
- October 2017 Reviewer for the South Africa National Research Foundation (NRF).
- 2013–Present Reviewer for all major Astronomy and Physics journals (A&A, AAS journals, Annals of Physics, Ap&SS, Galaxies, MNRAS, Physical Review journals, Physics of the Dark Universe, Science, Universe).

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## Teaching Activities

- May 2021 Contributed lecture “Alternatives to dark matter” as part of the PhD course on Dark Matter at the University of Florence (~2 hrs). Course held by Edvige Corbelli.
- Sep. 2020 Summer School on Galaxies and Cosmology (Institut Teknologi Bandung, Indonesia). Invited lecture “Alternatives to dark matter” at a master level (~3 hrs).
- Feb. 2019 Knowledge Exchange Series (KES). Invited lecture on the Tully-Fisher relation at a master level as part of the KES program at ESO (~1 hr).
- 2015-2016 Astronomy 151. Contributed lectures on basic extragalactic Astronomy to bachelor students at CWRU (~4 hrs). Course held by Prof. C. Mihos.

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## Academic Activities

- 2017–2018 Fellow Mentor of the Ph.D. student Christian Peest (internal ESO responsibility).
- March 2017 Organizer of the ESO Garching Science Day 2017.
- 2015–2016 Organizer of the Colloquium Series at CWRU Astronomy Department.
- 2014–2015 Organizer of the weekly Journal Club at CWRU Astronomy Department.
- 2011–2013 Organizer of the weekly lunch-talks at the Kapteyn Astronomical Institute.

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## Training Activities

- July 2021 Safety Training Course for Italian employees (half day).
- July 2019 ERC Grant Writing Training for ESO Staff & Fellows (1 day).

- June 2019 Supervising Training Course for ESO Fellows & Students (half day).
- October 2018 Basic Management Training Course for ESO Fellows & Students (2 days).
- October 2017 Courtesy, Respect & Fair-Treatment Training for ESO Fellows & Students (2 days).

## Organization of Workshops/Conferences

- 2021 Member of the SOC of the ESO workshop “*The present and future of Astronomy: A critical look at hiring, evaluation processes, the way we do science and our role in society*”, virtual meeting.
- 2020 Member of the SOC of the EAS symposia “*Stellar & Gas Kinematics in Galaxies across cosmic time, connecting observations with theory*” held in Leiden.
- 2018 Co-organizer of the international workshop “*Galaxy interactions and mergers across cosmic time*” held at the Sexten Center for Astrophysics and supported by RadioNet.
- 2017 Co-organizer of the international workshop “*Dwarf galaxies on the shoulders of giants*” held at CWRU and supported by the John Templeton Foundation.

## Accepted Observing Proposals

Summary: Total = **22** PI = **11** Co-I = **11** Total hours > **500**

- 22. CFHT 2020 – PI: Boyce H. – 28.2 hours (A priority)
- 21. ALMA 2019 – **PI: Lelli F.** – 26.9 hours (A priority)
- 22. ALMA 2019 – PI: Bisbas T. – 16.3 hours (B priority)
- 20. ALMA 2019 – PI: Rizzo F. – 11 hours (C priority)
- 19. CFHT 2019 – PI: Posti L. – 15.7 hours (B priority)
- 18. ALMA 2018 – **PI: Lelli F.** – 7.8 hours (C priority)
- 17. ALMA 2018 – PI: Hunt L. – 8.1 hours (C priority)
- 16. Subaru 2018 – PI: Jerjen H. – 2 nights
- 15. GMRT 2018 – PI: Fraternali F. – 65 hours
- 14. WHT 2018 – PI: Knapen J. – 3 nights
- 13. VLA 2018 – PI: Janz J. – 25 hours (C priority)
- 12. ALMA 2017 – **PI: Lelli F.** – 4.3 (A priority)
- 11. VLT 2017 – PI: Müller O. – 46 hours (A & B priority)
- 10. VLA 2017 – PI: Hunt L. – 87 hours (B & C priority)
- 9. ALMA 2015 – **PI: Lelli F.** – 13.4 hours (B priority)
- 8. HST 2016 – PI: Duc P.-A. – 8 orbits
- 7. GMRT 2016 – PI: Verheijen M. – 55 hours
- 6. GMRT 2015 – **PI: Lelli F.** – 24 hours
- 5. VLA 2014 – **PI: Lelli F.** – 25 hours (B priority)
- 4. GMRT 2014 – **PI: Lelli F.** – 25 hours
- 3. WSRT 2012 – **PI: Lelli F.** – 12 hours
- 2. VLA 2012 – **PI: Lelli F.** – 17 hours (B priority)
- 1. VLA 2010 – **PI: Lelli F.** – 20 hours (B priority)

## Refereed Publications

### Papers as first author

19. **Lelli F.** “*Gas Dynamics in Dwarf Galaxies*”, **2021**, Nature Astronomy, invited review, in press
18. **Lelli F.**, Di Teodoro E. M., Fraternali F., Man A.W.S., Zhang Z.-Y., De Breuck C., Davis T., Maiolino R. “*A massive stellar bulge in a regularly rotating galaxy 1.2 billion years after the Big Bang*”, **2021**, Science, 371, 713
17. **Lelli F.**, McGaugh S.S., Schombert J.M., Desmond H., Katz H. “*The baryonic Tully-Fisher relation for different velocity definitions and implications for galaxy angular momentum*”, **2019**, MNRAS, 484, 3267
16. **Lelli F.**, De Breuck C., Falkendal T., Fraternali F., Man A.W.S., Nesvadba N.P.H., Lehnert M. 2018, “*Neutral versus ionized gas kinematics at  $z \simeq 2.6$ : The AGN-host starburst galaxy PKS 0529-549*”, **2018**, MNRAS, 479, 5440
15. **Lelli F.**, McGaugh S.S., Schombert J.M. “*Testing Verlinde’s emergent gravity with the radial acceleration relation*”, **2017**, MNRAS, 468, L68
14. **Lelli F.**, McGaugh S.S., Schombert J.M., Pawlowski M.S. “*One law to rule them all: The radial acceleration relation of galaxies*”, **2017**, ApJ, 836, 152
13. **Lelli F.**, McGaugh S.S., Schombert J.M., Pawlowski M.S. “*The relation between stellar and dynamical surface densities in the central regions of disk galaxies*”, **2016**, ApJL, 827, 19
12. **Lelli F.**, McGaugh S.S., Schombert J.M. “*SPARC: Mass models for 175 disk galaxies with Spitzer Photometry and Accurate Rotation Curves*”, **2016**, AJ, 152, 157
11. **Lelli F.**, McGaugh S.S., Schombert J.M. “*The small scatter of the baryonic Tully-Fisher relation*”, **2016**, ApJL, 816, L14
10. **Lelli F.**, Duc P.-A., Brinks E., McGaugh S.S. “*Tidal dwarf galaxies: Disc formation at  $z = 0$* ”, **2015**, Galaxies, 3, 184. Special issue “3D View on Interacting and Post-Interacting Galaxies from Clusters to Voids”.
9. **Lelli F.**, Duc P.-A., Brinks E., Bournaud F., McGaugh S.S., Lisenfeld U., Weilbacher P.M., Boquien M., Revaz Y., Braine J., Koribalski B.S., Belles P.-E. “*Gas dynamics in tidal dwarf galaxies: Disc formation at  $z = 0$* ”, **2015**, A&A, 584, A113
8. **Lelli F.**, Verheijen M.A.W., Fraternali F. “*The triggering of starbursts in low-mass galaxies*”, **2014**, MNRAS, 445, 1694
7. **Lelli F.** “*The inner regions of disc galaxies: A constant baryonic fraction?*”, **2014**, Galaxies, 2, 292. Special issue “Beyond Standard Gravity and Cosmology”.
6. **Lelli F.**, Verheijen M.A.W., Fraternali F. “*Dynamics of starbursting dwarf galaxies. III. A HI study of 18 nearby objects*”, **2014**, A&A, 566, A71
5. **Lelli F.**, Fraternali F., Verheijen M.A.W. “*Evolution of dwarf galaxies: A dynamical perspective*”, **2014**, A&A, 563, A27
4. **Lelli F.**, Fraternali F., Verheijen M.A.W. “*A scaling relation for disc galaxies: Circular-velocity gradient versus central surface brightness*”, **2013**, MNRAS, 433, L30
3. **Lelli F.**, Verheijen M.A.W., Fraternali F., Sancisi R. “*Dynamics of starbursting dwarf galaxies. II. UGC 4483*”, **2012**, A&A, 544, A145
2. **Lelli F.**, Verheijen M.A.W., Fraternali F., Sancisi R. “*Dynamics of starbursting dwarf galaxies: I Zw 18*”, **2012**, A&A, 537, A72

1. **Lelli F.**, Fraternali F., Sancisi R. “*Structure and dynamics of giant low surface brightness galaxies*”, **2010**, A&A, 516, A11

### Papers led by students

8. Li P., **Lelli F.**, McGaugh S.S., Schombert J.M., Chae K.-H. “*A cautionary tale in fitting galaxy rotation curves with Bayesian techniques: does Newton’s constant vary from galaxy to galaxy?*”, **2021**, A&A, 646, L13
7. Shelest, A. & **Lelli F.** “*From spirals to lenticulars: evidence from the rotation curves and mass models of three early-type galaxies*”, **2020**, A&A, 641, 31
6. Petersen, J. & **Lelli F.** “*A first attempt to differentiate between modified gravity and modified inertia with galaxy rotation curves*”, **2020**, A&A, 636, 56
5. Li P., **Lelli F.**, McGaugh S.S., Schombert J.M. “*A comprehensive catalog of dark matter halo models for SPARC galaxies*”, **2020**, ApJS, 247, 31
4. Li P., **Lelli F.**, McGaugh S.S., Pawlowski M., Zwaan M., Schombert J.M. “*The halo mass function of late-type galaxies from HI kinematics*”, **2019**, ApJL, 886, 11
3. Li P., **Lelli F.**, McGaugh S.S., Starkman N., Schombert J.M. “*A constant characteristic volume density of dark matter haloes from SPARC rotation curve fits*”, **2019**, MNRAS, 482, 5106
2. Starkman N., **Lelli F.**, McGaugh S.S., Schombert J.M. “*A new algorithm to quantify maximum discs in galaxies*”, **2018**, MNRAS, 480, 2292
1. Li P., **Lelli F.**, McGaugh S.S., Schombert J.M. “*Fitting the radial acceleration relation to individual SPARC galaxies*”, **2018**, A&A, 615, A3

### Papers as second or third author

15. Müller O., **Lelli F.**, Famaey B., and 5 co-authors “*The Cen A galaxy group: dynamical mass and missing baryons*”, **2021**, A&A, in press
14. McGaugh S.S., **Lelli F.**, Schombert J.M., Li P., Visgaitis T., Parker K., Pawlowski M. S. “*The Baryonic Tully-Fisher Relation in the Local Group and the Equivalent Circular Velocity of Pressure Supported Dwarfs*”, **2021**, AJ, 162, 202
13. Chae K.-H., Desmond H., **Lelli F.**, McGaugh S.S., Schombert J.M. “*Testing the Strong Equivalence Principle. II. Relating the External Field Effect in Galaxy Rotation Curves to the Large-Scale Structure of the Universe*”, **2021**, ApJ, 921, 104
12. Querejeta M., **Lelli F.**, Schinnerer E. and 12 co-authors “*ALMA Resolves Giant Molecular Clouds in a Tidal Dwarf Galaxy*”, **2021**, A&A, 645, A97
11. Müller O., Pawlowski M. S., **Lelli F.** and 6 co-authors “*The coherent motion of Cen A dwarf satellite galaxies remains a challenge for  $\Lambda$ CDM cosmology*”, **2021**, A&A, 645, L5
10. Chae K.-H., **Lelli F.**, Desmond H., McGaugh S.S., Li P., Schombert J.M. “*Testing the Strong Equivalence Principle: Detection of the External Field Effect in Rotationally Supported Galaxies*”, **2020**, ApJ, 904, 51
9. Schombert J.M., McGaugh S.S., **Lelli F.** “*Using the baryonic Tully-Fisher relation to measure  $H_0$* ”, **2020**, ApJ, 160, 71
8. Desmond H., Katz H., **Lelli F.**, McGaugh S.S. “*Uncorrelated velocity and size residuals across galaxy rotation curves*”, **2019**, MNRAS, 484, 239
7. Schombert J.M., McGaugh S.S., **Lelli F.** “*The mass-to-light ratios and the star-formation histories of disk galaxies*”, **2019**, MNRAS, 483, 1496



6. Katz H., Desmond H., **Lelli F.**, McGaugh S.S., Di Cintio A., Brook C.B., Schombert J.M. “*Stellar feedback and the energy budget of late-type galaxies: Missing baryons and core creation*”, **2018**, MNRAS, 480, 4287
5. Katz H., **Lelli F.**, McGaugh S.S., Di Cintio A., Brook C.B., Schombert J.M. “*Testing feedback-modified dark matter haloes with galaxy rotation curves: Estimation of halo parameters and consistency with  $\Lambda$ CDM*”, **2017**, MNRAS, 466, 1648
4. McGaugh S.S., Schombert J.M., **Lelli F.** “*The star-forming main sequence of dwarf low surface brightness galaxies*”, **2017**, ApJ, 851, 22
3. McGaugh S.S., **Lelli F.**, Schombert J.M. “*The radial acceleration relation in rotationally supported galaxies*”, **2016**, Physical Review Letters, 117, 201101
2. Di Cintio A. & **Lelli F.** “*The mass discrepancy acceleration relation in a  $\Lambda$ CDM context*”, **2016**, MNRAS, 456, L127
1. McQuinn K.B.W., **Lelli F.**, Skillman E.D., Dolphin A.E., McGaugh S.S., Williams B.F. “*The link between mass distribution and starbursts in dwarf galaxies*”, **2015**, MNRAS, 450, 3886

### Papers as contributing author

10. Wong I. and 37 co-authors (including **Lelli F.**) “*WALLABY pre-pilot survey: Two dark clouds in the vicinity of NGC 1395*”, **2021**, MNRAS, 507, 2905
9. Müller O., Fahrion K., Rejkuba M., Hilker M., **Lelli F.** and 5 co-authors “*The properties of dwarf spheroidal galaxies in the Cen A group: Stellar populations, internal dynamics, and a heart-shaped  $H\alpha$  ring*”, **2021**, A&A, 645, A92
8. Davis T. and 16 co-authors (including **Lelli F.**) “*Revealing the intermediate-mass black hole at the heart of the dwarf galaxy NGC 404 with sub-pasec resolution ALMA observations*”, **2020**, MNRAS, 496, 4061
7. Fahrion, K. and 8 co-authors (including **Lelli F.**) “*Metal-poor nuclear star clusters in two dwarf galaxies near Centaurus A suggesting formation from the in-spiraling of globular clusters*”, **2020**, A&A, 634, 53
6. Müller O., Rejkuba M., Pawlowski M.S., Ibata R., **Lelli F.**, Hilker M., Jerjen H. “*The dwarf galaxy satellite system of Centaurus A*”, **2019**, A&A, 629, 18
5. Fensch J. and 11 co-authors (including **Lelli F.**) “*Massive star cluster formation and evolution in tidal dwarf galaxies*”, **2019**, A&A, 628, 60
4. Emsellem E. and 17 co-authors (including **Lelli F.**) “*The ultra-diffuse galaxy NGC 1052-DF2 with MUSE: I. Kinematics of the stellar body*”, **2019**, A&A, 625, 76
3. Katz. H, Desmond H., McGaugh S.S., **Lelli F.** “*The tight empirical relation between dark matter halo mass and flat rotation velocity for late-type galaxies*”, **2019**, MNRAS, 483, 98
2. Müller O., Pawlowski M.S., Jerjen. H., **Lelli F.** “*A whirling plane of satellite galaxies around Cen A challenges cold dark matter cosmology*”, **2018**, Science, 359, 534
1. Lisenfeld U., Braine J., Duc P.-A., Boquien M., Brinks, E., Bournaud F., **Lelli F.**, Charmandaris V. “*Molecular gas and star formation in the tidal dwarf galaxy VCC 2062*”, **2016**, A&A, 590, 92

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## Unrefereed Publications & Proceedings

4. McGaugh S.S., **Lelli F.**, and Schombert J. “*Scaling Relations for Molecular Gas and Metallicity: Impact on the Baryonic Tully-Fisher Relation*”, **2020**, Research Notes of the AAS, Vol. 4, id.45
3. McGaugh S.S., **Lelli F.**, Li P. and Schombert J. “*Dynamical regularities in galaxies*”, **2019**, invited review for the IAU Symposium 353: “Galaxy dynamics in the era of large surveys”, arXiv:1909.02011
2. McGaugh S.S., Li P., **Lelli F.**, Schombert J.M. “*Presence of a fundamental acceleration scale in galaxies*”, **2018**, Nature Astronomy, 2, 924
1. McGaugh S.S., **Lelli F.**, Pawlowski M. and 21 co-authors, *Comment on “Evidence for dark matter in the inner Milky Way”*, **2015**, arXiv:1503.07813

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## Invited Participation at International Events

11. **Review Talk**, at “*Extragalactic spectroscopic surveys: past, present and future of galaxy evolution*”, ESO, Santiago (Chile), April 2021.
10. **Review Talk**, at “*Less Travelled Path for Dark Matter*”, International Centre for Theoretical Sciences (ICTS), Bangalore (India), cancelled due to Covid-19.
9. **Review Talk**, at “*Linking gas and star formation throughout cosmic time*”, EAS, Leiden (Netherlands), 30 June - 01 July 2020.
8. **Review Talk**, at “*ESO Cosmic Duologues: Dark Matter and MOND*”, ESO online event to celebrate the 100<sup>th</sup> anniversary of the “Great Debate”, 27 April 2020.
7. **Review Talk**, “*The functioning of galaxies: challenges for Newtonian and Milgromian dynamics*”, Bonn (Germany), 23-27 September 2019.
6. **Review Talk**, “*Cosmology@Malta2019*”, (declined due to other commitments). Valletta (Malta), 19-22 March 2019
5. **Review Talk**, at “*Cosmology on small scales 2018*”. Czech Academy of Sciences, Prague (Czech Republic), 26-29 September 2018
4. **Review Talk**, at “*Dark Matter 2018: from the smallest to the largest scales*”. Santander, Spain, 26-30 June 2018
3. **Lecture (1 hr)**, at “*Probing the dark sector and general relativity at all scales*”. CERN TH Institute, Geneva (Switzerland), 14-25 August 2017
2. **Lecture (1.5 hr)**, at “ *$\Lambda$ CDM, modified gravity or new dark matter models?*”. LTPHE, Paris (France), 29-31 May 2017
1. **Opening Talk & Session Chair**, at “*Dwarf galaxy workshop*”. ESO, Garching bei München (Germany), 10-13 October 2016

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## Contributions to International Events

31. **Talk**, “*The Third National Workshop on the SKA Project - The Italian Route to the SKAO Revolution*”. virtual meeting, 04-08 October 2021
30. **Talk**, “*Crossing the characteristic mass scales in galaxy evolution*”. EAS virtual meeting, 29 June - 3 July 2020
29. **Talk**, “*The Local Group in context: Galaxies in the local volume as a testbed of cosmology*”. EAS virtual meeting, 29 June - 3 July 2020



28. **Talk**, *“Views of the interstellar medium in galaxies in the ALMA era”*.  
Bologna (Italy), 2-6 September 2019
27. **Talk**, *“Galaxy evolution in a new era of HI surveys”*.  
MIAPP, Garching bei München (Germany), 1-9 August 2019
26. **Talk**, *“Nine billion years of neutral gas evolution”*.  
ESO, Garching bei München (Germany), 29-31 July 2019
25. **Talk**, *“Galaxy dynamics in the era of large surveys”*.  
Shanghai (China), 1-5 July 2019
24. **Talk**, *“Birth, life and fate of massive galaxies and their central beating heart”*.  
Favignana (Italy), 3-7 September 2018
23. **Talk**, *“Tensions in the  $\Lambda$ CDM paradigm”*.  
Mainz (Germany), 14-18 May 2018
22. **Talk**, *“Galaxy interactions and mergers across cosmic time”*.  
Sexten (Italy), 12-16 March 2018
21. **Talk**, *“The role of gas in galaxy dynamics”*.  
Valletta (Malta), 2-6 October 2017
20. **Talk**, *“Challenges in galaxy evolution: From black holes to the cosmic web”*.  
Florence (Italy), 28 August - 1 September 2017
19. **Talk**, *“The galaxy ecosystem. Flow of baryons through galaxies”*.  
Garching bei München (Germany), 24-28 July 2017
18. **Talk**, *“In & Out. What rules the galaxy baryon cycle?”*.  
Garching bei München (Germany), 26 June -7 July 2017
17. **Talk**, *“Dwarf galaxies on the shoulders of giants”*.  
Cleveland (Ohio), 5-8 June 2017
16. **Talk**, *“Crossing the Rubicon: The fate of gas flows in galaxies”*.  
Santarcangelo di Romagna (Italy), 5-9 September 2016
15. **Talk**, *“Mapping the pathways of galaxy transformation across time and space”*.  
Catalina Island (California), 31 July - 5 August 2016
14. **Talk**, *“11<sup>th</sup> Great Lakes Cosmology and Galaxies Workshop”*.  
Hamilton (Canada), 19-22 June 2016
13. **Talk**, *“The journey of dwarf galaxies (EWASS)”*.  
Tenerife (Spain), 25-26 May 2015
12. **Talk**, *“Observational anomalies challenging the  $\Lambda$ CDM cosmological model (EWASS)”*.  
Tenerife (Spain), 22 May 2015
11. **Talk**, *“3D view on interacting and post-interacting galaxies (EWASS)”*.  
Tenerife (Spain), 22-23 May 2015
10. **Talk**, *“Multiwavelength dissection of galaxies”*.  
Sydney (Australia), 24-29 May 2015
9. **Talk**, *“The role of Hydrogen in the evolution of galaxies”*.  
Kuching (Malaysia), 15-19 September 2014
8. **Poster**, *“Galaxy masses as constraints of formation models (IAU Symp. 311)”*.  
Oxford (United Kingdom), 21-25 July 2014
7. **Talk**, *“Dwarf and irregular galaxies: Origins and dynamics (221<sup>th</sup> AAS meeting)”*.  
Long Beach (California), 6-10 January 2013

6. **Talk**, “*Gas for cosmology in the nearby Universe (EWASS 2012)*”.  
Rome (Italy), 1-6 July 2012
5. **Talk**, “*Star formation in dwarf galaxies - Lowell observatory workshop*”.  
Flagstaff (Arizona), 19-22 June 2012
4. **Poster**, “*Galaxy formation: An international conference*”.  
Durham (United Kingdom), 18-22 July 2011
3. **Talk**, “*Dark matter from globular clusters to clusters of galaxies*”.  
Bologna (Italy), 27-29 June 2011
2. **Talk**, “*40<sup>th</sup> Young European Radio Astronomers Conference (YERAC)*”.  
Alcala de Henares (Spain), 5-8 July 2010
1. **Talk**, “*Dark haloes from smallest to largest scales*”.  
Bologna (Italy), 29-30 June 2009

## Invited Colloquia

15. University of Nottingham, Nottingham (UK), June 2021
14. Nanjing University, Nanjing (China), May 2020
13. Kapteyn Astronomical Institute, Groningen (Netherlands), January 2020
12. AIP, Potsdam (Germany), September 2017
11. Strasbourg Observatory, Strasbourg (France), May 2017
10. University of Basel, Basel (Switzerland), April 2017
9. Florence Observatory (INAF), Florence (Italy), March 2017
8. Virtual Institute of Astroparticle Physics (VIA), December 2016
7. University of Rochester, Rochester (USA), November 2016
6. University of Wisconsin-Madison, Madison (USA), February 2016
5. Indiana University, Bloomington (USA), October 2015
4. Mount Stromlo Observatory, Canberra (Australia), June 2015
3. Australia Telescope National Facility, Sydney (Australia), May 2015
2. Kapteyn Astronomical Institute, Groningen (Netherlands), Dec. 2013
1. Case Western Reserve University, Cleveland (USA), January 2013

## Seminars & Other Talks

30. Seminar for the CASPER/GNOME collaboration, on-line meeting, May 2021
29. Lunch Talk, Arcetri Astrophysical Observatory, Florence (Italy), May 2021
28. Informal Discussion, Harvard University, Cambridge (USA), July 2020
27. Seminar, Oxford University, Oxford (UK), May 2020
26. Lunch Talk, Cardiff University, Cardiff (UK), May 2020
25. Seminar, Kavli Institute for Cosmology, Cambridge (UK), November 2019
24. Seminar, ESO, Santiago (Chile), August 2018
23. Informal Discussion, ESO, Garching bei München (Germany), October 2018
22. Informal Discussion, ESO, Garching bei München (Germany), July 2018
21. Lunch Talk, Kapteyn Astronomical Institute, Groningen (Netherlands), Feb. 2017
20. Lunch Talk, ESO, Garching bei München (Germany), February 2017
19. Lunch Talk, Case Western Reserve University, Cleveland (USA), November 2016

18. Seminar, Institute of Astronomy, Cambridge (UK), July 2015
17. Seminar, Swinburne University, Melbourne (Australia), June 2015
16. Seminar, Pennsylvania State University, State College (USA), March 2015
15. Seminar, Observatory of Florence (INAF), Florence (Italy), December 2014
14. HI Meeting Talk, ASTRON, Dwingeloo (Netherlands), April 2013
13. Seminar, ASTRON, Dwingeloo (Netherlands), January 2013
12. Seminar, Leiden Observatory, Leiden (Netherlands), January 2013
11. Seminar, Columbia University, New York (USA), January 2013
10. Seminar, National Radio Astronomy Observatory, Socorro (USA), January 2013
9. Seminar, University of California, Santa Barbara (USA), January 2013
8. Seminar, University of Bologna, Bologna (Italy), October 2012
7. Lunch Talk, Kapteyn Astronomical Institute, Groningen (Netherlands), Sept. 2011
6. DART Meeting Talk, ISSI, Bern (Switzerland), September 2011
5. Local-Group Meeting Talk, University of Bologna, Bologna (Italy), June 2011
4. HI meeting Talk, ASTRON, Dwingeloo (Netherlands), May 2011
3. Lunch Talk, Kapteyn Astronomical Institute, Groningen (Netherlands), June 2010
2. Master Graduation Talk, University of Bologna, Bologna (Italy), October 2009
1. Prospective PhD Symposia, Leiden Observatory, Leiden (Netherlands), Feb. 2009

## Outreach & Media

- Jun. 2021 Outreach seminar for "Notti d'Estate" at Arcetri Astrophysical Observatory.
- Jun. 2021 Outreach seminar for the Italian association AstronomiAmo.
- Feb. 2021 Interviews for *New Scientist*, *Gizmodo*, *ZME Science*.
- Jan. 2021 Interview for the Italian newsletter *Media INAF* by Luca Nardi
- Dec. 2020 Interview for the Italian newsletter *Media INAF* by Maura Sandri
- August 2020 Interview for Pythagorean Astronomy podcast by Christopher North
- July 2020 Interview for the Italian newsletter *Media INAF* by Luca Nardi
- June 2018 Interview for *Physics World* by Tim Wogan
- May 2018 Interview for *Quanta Magazine* by Natalie Wolchover
- March 2018 Interview for the Italian newspaper *Il Corriere Adriatico* by Lucilla Niccolini
- March 2018 Video contribution to the Italian web-show *Occhi al Cielo* by Ass. AstronomiAmo
- February 2018 Interview for the Italian newspaper *La Repubblica* by Massimiliano Razzano
- February 2018 Interview for the *ESO blog* by Lauren Fuge
- February 2018 Interview for the Italian newsletter *Media INAF* by Marco Malaspina
- August 2017 Interview for *BBC Focus* magazine by Robert Matthews
- March 2017 Video contribution to the Italian web-show *Occhi al Cielo* by Ass. AstronomiAmo
- October 2016 Interview for the Italian newsletter *Media INAF* by Corrado Ruscica
- October 2016 Interview for the Italian newspaper *Il Manifesto* by Andrea Capocci