

CURRICULUM VITAE of LAURA ELISA MARCUCCI

Place and date of birth Lucca, 12/12/1971
Nationality Italian
Marital status Married, mother of two daughters

Academic history

since 01/12/2020: Full Professor, Physics Department, University of Pisa
12/2015-11/2020: Associate Professor, Physics Department, University of Pisa
01/2015: “Abilitazione Scientifica Nazionale” as Full Professor
01/2014: “Abilitazione Scientifica Nazionale” as Associate Professor
10/2002-12/2015: “Ricercatore”, Physics Department, University of Pisa
10/2000-9/2002: “Assegnista di ricerca”, Physics Department, University of Pisa
6/2000: Ph.D. in *Theoretical Nuclear Physics*, Physics Department, Old Dominion University, Norfolk, Virginia, USA
6/1996-6/2000: *Graduate Research Assistant*, Physics Department, Old Dominion University, Norfolk, Virginia, USA
11/1995: “Laurea” in physics (110/110 *summa cum laude*), Physics Department, University of Pisa

Awards

Since November 2014, **Fellow** of the **American Physical Society**, “*For advancing the understanding of electroweak interactions in nuclei, particularly for precise studies of low-energy radiative and weak capture processes of astrophysical relevance in the few-nucleon systems*”.

Winner of the “Luise Meyer-Schutzmeister” Prize for the year 2000, awarded by the *Association for Women in Science (AWIS) Educational Foundation*, as “*outstanding female graduate student in physics*”.

Publication records (from ISI/WoS, September 23, 2024)

102 articles on peer-reviewed journals
6 review articles
49 conference proceedings
4071 citations (3369 without self citations)
h-index = 35

Talks in the period 2019-2024

1. **Nuclear reactions of astrophysical interest: *ab-initio* studies within chiral EFT** (*invited talk*), International Nuclear Physics Conference - INPC 2019, Glasgow (UK), July 2019
2. **Momentum Distributions and Short-Range Correlations in Few-Nucleon Systems Using Realistic Interactions**, International Nuclear Physics Conference - INPC 2019, Glasgow (UK), July 2019
3. ***Ab-initio* studies of few-nucleon systems: Recent progress and applications**(*invited talk*), 106^o Congresso Nazionale della Società Italiana di Fisica - SIF106, virtual conference, September 2020

4. **Few-nucleon radiative captures in chiral effective field theory**(*invited talk*), MITP Virtual Workshop: Uncertainties in Calculations of Nuclear Reactions of Astrophysical Interest, December 2020
5. **Recent progress in *ab-initio* studies of light nuclei and few-nucleon reactions** (*invited talk in plenary session*), 107^o Congresso Nazionale della Società Italiana di Fisica - SIF107, virtual conference, September 2021
6. **Momentum Distributions and Short-Range Correlations in Few-Nucleon Systems with Local and Non-Local Interactions** (*invited talk*), 3rd Workshop on Quantitative Challenges in EMC and SRC Research, virtual workshop, March 2021
7. **Recent progress in *ab-initio* studies of light nuclei and few-nucleon reactions**, *invited online colloquium* at the Univ. of Ljubljana, January 2022
8. ***Ab-initio* studies of light nuclei and few-nucleon reactions of astrophysical interest** (*invited talk*), Topical meeting of IReNA - FA1 and ChETEC-INFRA “Nuclear reaction measurements in Underground Laboratories”, Rome, April 2022
9. **WG1 - $^1\text{H}(\text{p}, e^+ \nu)^2\text{H}$, $^3\text{He}(\text{p}, e^+ \nu)^4\text{He}$, electron captures** (*invited talk*), Solar Fusion Cross Sections III, University of Berkeley, Berkeley, USA, July 2022
10. **Recent progress in *ab-initio* studies of light nuclei and few-nucleon reactions** (*invited seminar*), University of Berkeley, Berkeley, USA, July 2022
11. **Recent progress in *ab-initio* studies of light nuclei and few-nucleon reactions** (*invited seminar*), Jefferson Lab, Newport News, USA, August 2022
12. **Recent progress in *ab-initio* studies of light nuclei and few-nucleon reactions**(*invited talk*), Exploring low-energy nuclear properties: latest advances on reaction mechanisms with light nuclei - Workshop in honor of Pierre Descouvemont, Bruxelles, June 2023
13. **Sergio Rosati (May18, 1934 - February 27, 2022)**, (*invited talk*), TNPI2023 - XIX Conference on Theoretical Nuclear Physics in Italy, Cortona, October 2023
14. **Microscopic *ab-initio* approach to few-nucleon systems**, (*invited seminar*), Collaboration meeting with École Polytechnique Fédérale de Lausanne (EPFL) and University of Southampton, virtual seminar, April 2024
15. **Recent progresses in few-nucleon structure and dynamics in chiral effective field theory**, The 11th International Workshop on Chiral Dynamics (CD24), online talk, August 2024

Conferences and Workshops organization

1. **XI Convegno su Problemi di Fisica Nucleare Teorica**, Cortona (Italy), October 2006
2. **The 20th European Conference on Few-Body Problems in Physics**, Pisa (Ital), September 2007
3. **Electron-Nucleus Scattering X**, Marciana Marina (Isola d’Elba - Italy), June 2008
4. **XII Convegno su Problemi di Fisica Nucleare Teorica**, Cortona (Italy), October 2008
5. Leader of the *working group* for the *hep* reaction at the workshop **Solar Fusion Cross Sections for the pp chain and CNO cycle**, INT, University of Washington, Seattle, USA, January 2009, (see E.G. Adelberger *et al.*, Rev. Mod. Phys. **83**, 195 (2011))
6. **Electron-Nucleus Scattering XI**, Marciana Marina (Isola d’Elba - Italy), June 2010
7. **XIII Convegno su Problemi di Fisica Nucleare Teorica**, Cortona (Italy), April 2011
8. **Electron-Nucleus Scattering XII**, Marciana Marina (Isola d’Elba - Italy), June 2012
9. **XIV Convegno su Problemi di Fisica Nucleare Teorica**, Cortona (Italy), October 2013
10. **Electron-Nucleus Scattering XIII**, Marciana Marina (Isola d’Elba - Italy), June 2014

11. **CHIRAL DYNAMICS 2015 - The 8th International Workshop on Chiral Dynamics** (*Co-chair of the organizing committee*), Pisa (Italy), June 2015
 12. **EXOTIC 2015 - Re-writing Nuclear Physics textbooks: 30 years of radioactive ion beam physics**, Pisa (Italy), July 2015
 13. **XV Convegno su Problemi di Fisica Nucleare Teorica**, Pisa (Italy), April 2016
 14. **Lepton-Nucleus Scattering XIV**, Marciana Marina (Isola d'Elba - Italy), June 2016
 15. **Summer School 2017: Rewriting Nuclear Physics Textbooks: Basic nuclear interactions and their link to nuclear processes in the cosmos and on earth**, Pisa (Italy), July 2017
 16. **XVI Convegno su Problemi di Fisica Nucleare Teorica**, Cortona (Italy), October 2017
 17. **Lepton Interactions with Nucleons and Nuclei-XV**, Marciana Marina (Isola d'Elba - Italy), June 2019
 18. **Summer School 2019: Rewriting Nuclear Physics Textbooks**, Pisa (Italy), July 2019
 19. **XVII Convegno su Problemi di Fisica Nucleare Teorica**, Cortona (Italy), October 2019
 20. **XVIII Convegno su Problemi di Fisica Nucleare Teorica**, Pisa (Italy), October 2021
 21. Leader of the *working group* for the *pp* reaction at the workshop **Solar Fusion Cross Sections III**, University of Berkeley, Berkeley, USA, July 2022, (see B. Acharya *et al.*, arXiv:2405.06470)
 22. **3rd International Conference on Quantum Gases, Fundamental Interactions, and Cosmology - QFC2022**, Pisa, October 2022
 23. **Marciana2023 - Lepton Interactions with Nucleons and Nuclei**, Marciana Marina (Isola d'Elba - Italy), September 2023
 24. **XIX Convegno su Problemi di Fisica Nucleare Teorica**, Cortona (Italy), October 2023
- Editor for the *proceedings* of the Cortona workshop series and of the international conference *Chiral Dynamics 2015*
 - Member of the **International Program Committee** for the *15th International Symposium on Nuclei in the Cosmos (NIC2018)*
 - Member of the **International Advisory Committee** for the *CHIRAL DYNAMICS 2018 - The 9th International Workshop on Chiral Dynamics*, *CHIRAL DYNAMICS 2021 - The 10th International Workshop on Chiral Dynamics*, *CHIRAL DYNAMICS 2024 - The 11th International Workshop on Chiral Dynamics*
 - Member of the **International Advisory Committee** for the *International Nuclear Physics Conference - INPC 2019*
 - Member of the **International Advisory Committee** for the *4th International Conference on Quantum Gases, Fundamental Interactions, and Cosmology - QFC2024*
 - Member of the **International Advisory Committee** for the *14th International Spring Seminar on Nuclear Physics, "Cutting-edge developments in nuclear structure physics" (2025)*

Editorial and referee activity

- March 2018 - May 2022: **Specialty Chief Editor** for the journal *Frontiers in Physics - Nuclear Physics Section*, ISSN: 2296-424X
- **Referee for the evaluation of grant proposals** for the *Department of Energy* (USA) and the *Natural Sciences and Engineering Research Council* (Canada)
- **Referee for the VQR 2011-2014 and VQR 2015-2019**

- **Referee for the following journals:** Astronomy and Astrophysics, Astrophysical Space Science, European Physical Journal A, Few-Body Systems, Journal of Physics G: Nuclear and Particle Physics, Indian Journal of Physics, International Journal of Modern Physics E, Modern Physics Letters A, Nuclear Physics A, Physical Review C, Physical Review Letters.

Administrative duties

- Member of the **commissione scientifica d'area 02 - scienze fisiche**, University of Pisa, 2009-2012
- Member of the **comitato ordinatore della Scuola di Specializzazione in Fisica Medica**, University of Pisa, 2009-2014
- Member of the **giunta** of the Physics Department at the University of Pisa, 2013-2015
- Member of the **commissione didattica paritetica** of the Physics Department at the University of Pisa, 2013-2015
- **Local Coordinator** for the INFN Pisa branch of the research project **Few-Body Systems: Structure and Reactions with Light Nuclei** (FBS), 2014-2020
- Member of the **commissione per l'accesso aperto alla letteratura scientifica** of the University of Pisa, 2018-2020
- Member of the **collegio del dottorato** of the Physics Department at the University of Pisa, since December 2018
- **Local Coordinator** of the theory group at the INFN Pisa branch, 2020-2021
- **Vice-director** of the Physics Department at the University of Pisa, 2020-2022
- **Rector's delegate for academic guidance**, since November 2022

Teaching Activity

Teaching Activity at the University of Pisa since 2002

Physics major:

“Esercitatore” of the course **Fisica 1**, academic years 2002/2003 – 2005/2006, 2009/2010, 2010/2011, 2016/2017, 2023/2024, 2024/2025

Co-lecturer of the course **Fisica 3**, academic years 2015/2016 and 2016/2017

Lecturer of the course **Reazioni nucleari di interesse astrofisico**, academic years 2004/2005–2006/2007, 2009/2010, 2011/2012–2016/2017. Since the year 2017/2018, I have become co-lecturer, due to other teaching duties

Lecturer of the course **Fisica 1**, since the academic year 2017/2018

Others:

Lecturer of the course **Fisica**, *laurea* in Computer Science, academic years 2006/2007 and 2007/2008

Co-Lecturer of the course **Fisica 1 + Esercitazioni**, *laurea* in Chemistry, academic year 2016/2017

Lecturer of the course **Complementi di fisica: modellistica nucleare I**, *scuola di specializzazione* in Medical Physics, academic years 2009/2010–2012/2013, and 2016/2017

Co-Lecturer of the course **Fisica Generale**, *laurea* in Biotechnology, academic years 2023/2024, 2024/2025

Teaching activity at other institutions

Lecturer for the course **Nuclear Astrophysics** at the Gran Sasso Science Institute - Center of Advanced Studies - (L'Aquila), for the PhD course in Astroparticle Physics, academic years 2013/2014–2016/2017.

Thesis Supervision

Academic year 2003/2004, Erminia Bressi, *Laurea triennale* - Thesis: **Studio teorico della reazione $p + d \rightarrow {}^3\text{He} + \gamma$**

Academic year 2005/2006, Maria Piarulli, *Laurea triennale* - Thesis: **Studio del fattore di forma del nucleo di ${}^4\text{He}$**

Academic year 2005/2006, Valentina Fogli, *Laurea triennale* - Thesis: **Studio del fattore di forma magnetico dei nuclei con $A = 3$**

Academic year 2007/2008, Maria Piarulli, *Laurea magistrale* - Thesis: **Cattura muonica su nucleo di deuterio**

Academic year 2009/2010, Marco Mariti, *Laurea triennale* - Thesis: **Gli operatori di carica e corrente nucleare**

Academic year 2015/2016, Alessandro Grassi, *Laurea magistrale* - Thesis: **Multipotential analysis of the radiative capture reaction $\alpha + d \rightarrow {}^6\text{Li} + \gamma$**

Academic year 2015/2016, Luca Genchi, *Laurea triennale* - Thesis: **Il deutone**

Academic year 2016/2017, Silvia Benegiano, *Laurea triennale* - Thesis: **Studio teorico della reazione $p + p \rightarrow d + e^+ + \nu_e$**

Academic year 2016/2017, Leonardo Barontini, *Laurea triennale* - Thesis: **Alla scoperta del nucleo atomico: dall'esperimento di Rutherford alla formula semi-empirica di massa**

Academic year 2016/2017, Ambra Frediani, *Laurea triennale* - Thesis: **Studio del fattore di forma nucleare**

Academic year 2017/2018, Luana Modafferi, *Laurea triennale* - Thesis: **La nucleosintesi al Big Bang: reazioni nucleari e abbondanze primordiali**

Academic year 2017/2018, Alessia Nannini, *Laurea magistrale* - Thesis: **Non-Symmetrized Hyper-spherical Harmonics for a three-body system**

Academic year 2019/2020, Ylenia Capitani, *Laurea magistrale* - Thesis: **Il metodo delle armoniche ipersferiche per lo studio del continuo**

Academic year 2020/2021, Laura Ceccarelli, *Laurea magistrale* - Thesis: **The reaction $\mu^- + d \rightarrow n + n + \mu_n u$ in chiral effective field theory**

Academic year 2019/2020, Alex Gnech, *PhD at the GSSI* (co-supervision) - Thesis: **Theoretical calculation of nuclear reactions of interest for Big Bang Nucleosynthesis**

Academic year 2022/2023, Rahul Singh, *Master degree at the Indian Institute of Science Education and Research (IISER), Behampur (India)* - external supervisor - Thesis: **Free and Vortex Muon Decay**

Academic year 2023/2024, Margherita Sagina, *Laurea magistrale* - Thesis: **The hyperon-nucleon interaction in low-energy Effective Field Theory**

Ongoing, Vittorio Barlucchi, *Laurea magistrale* - Thesis: **Bayesian analysis for the proton-proton weak capture reaction** (TBC)

Ongoing, Daniele Poidomani (co-supervision), *Laurea magistrale* - Thesis: **Neutrino capture on polarized Tritium absorbed on Graphene** (TBC)

Ongoing, Eleonora Proietti (co-supervision), *PhD* - Thesis: **TBD**

Ongoing, Rahul Singh (co-supervision), *PhD at EPFL* - Thesis: **TBD**

Public outreach

19/05/2011, Liceo Scientifico F. Buonarroti, Pisa. Seminar: *A 100 anni dalla scoperta del nucleo: la fisica nucleare, principi e applicazioni*

16/07/2011, Fondazione Silvestro Marcucci ONLUS, Quiesa di Massarosa (LU). Seminar: *A 100 anni dalla scoperta del nucleo: la fisica nucleare, principi e applicazioni*

23/01/2013, Liceo Artistico A. Passaglia, Lucca. Seminar: *La ricerca in fisica oggi: una “chiacchierata”*

21/01/2015, Scuola Media C. Del Prete, Lucca. Seminar: *Il sole, le stelle, l'universo ... e noi: una “chiacchierata”*

21/08/2015, Fondazione Silvestro Marcucci ONLUS, Quiesa di Massarosa (LU). Seminar: *All'improvviso le stelle*, in the occasion of the inaugural day of the painting exhibition of **Antonio Possenti** with the title “All'improvviso le stelle”

28/10/2015, Istituto Tecnico Industriale A. Meucci, Firenze. Seminar: *Il sole, le stelle, l'universo ... e noi: una “chiacchierata”*, (within the project Pianeta Galileo 2015)

07/02/2017, Polo tecnologico A. Manetti - P. Porciatti, Grosseto. Seminar: *Il “nucleare” che fa “paura”: a più di 100 anni dalla scoperta del nucleo* (within the project Pianeta Galileo 2016)

01/03/2017, Istituto delle Suore Mantellate, Pistoia. Seminar: *Il “nucleare” che fa “paura”: a più di 100 anni dalla scoperta del nucleo* (within the project Pianeta Galileo 2016)

03/03/2017, Auditorium of the “Fondazione Banca del Monte di Lucca”. Seminar: *“Il cielo stellato sopra di me” (I. Kant): un viaggio alla scoperta delle stelle*, during the workshop “E le stelle stanno a guardare ...”, organized by the *Federazione Italiana Donne Arti Professioni Affari* (FIDAPA)

10/12/2018, Aula Magna Fratelli Pontecorvo, Pisa. Seminar: *La fisica nucleare dal 1909 al 1934*, within the event “Enrico Fermi: 80 anni dal Nobel”, organized by the *Centro Pontecorvo* of the Physics Department of the University of Pisa, and the local branch of the *Associazione Italiana Studenti in Fisica* (AISF)

22/02/2022, Associazione Culturale La Finestra, Lucca. Seminar: *“Il cielo stellato sopra di me” (I. Kant): un viaggio alla scoperta delle stelle*

25/03/2022, Liceo Scientifico A. Vallisneri, Lucca. Seminar: *Il “nucleare” che fa “paura”: conoscere per decidere*

26/04/2022, Liceo F. Enriques, Livorno. Seminar: *“Il cielo stellato sopra di me” (I. Kant): un viaggio alla scoperta delle stelle* (within the project Pianeta Galileo 2021-2022)

29/04/2022, Scuole paritarie D. Lighieri, Firenze. Seminar: *“Il cielo stellato sopra di me” (I. Kant): un viaggio alla scoperta delle stelle* (within the project Pianeta Galileo 2021-2022)

24/11/2022, Università dell'Età Libera Lucca. Seminar: *“Il cielo stellato sopra di me” (I. Kant): un viaggio alla scoperta delle stelle*

11/01/2023, Associazione Culturale La Finestra, Lucca. Seminar: *Il “nucleare” ... che fa “paura”: conoscere per decidere*

28/06/2023, 117° Corso di Orientamento Universitario organizzato dalla Scuola Normale Superiore di Pisa, Convento Santa Chiara di San Miniato. Seminar: *“Il cielo stellato sopra di me” (I. Kant): un viaggio alla scoperta delle stelle*

06/05/2024, Liceo Scientifico Majorana, Capannori (Lucca). Seminar: *Fisica nucleare: dagli atomi alle stelle* (within the high school students guidance activities organized by the University of Pisa)

29/01/2024, Fisica al Pub (Pisa). Seminar: *100 anni dalla scoperta del nucleo: cosa manca ancora?*