ELENA LACCHIN

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PRESENT POSITION

1 April 2023 - present	**Postdoctoral Research Fellow** Università degli Studi di Padova, Dipartimento di Fisica e Astronomia "G. Galilei" Mentor: Prof. Michela Mapelli

EDUCATION

1 november 2019 - 30 june 2023	**Ph.D. in Astrophysics** Università di Bologna, Dipartimento di Fisica e Astronomia "Augusto Righi" & Istituto Nazionale di Astrofisica - Osservatorio di Astrofisica e Scienza dello Spazio Bologna Thesis on: "Hydrodynamic simulations of multiple stellar populations in globular clusters" Supervisor: Dr. Francesco Calura
2 October 2017 - 20 September 2019	**Master's degree in Physics - curricula Astrophysics and Cosmology** Università degli Studi di Trieste Grade: 110/110 cum laude Thesis on: "Chemical evolution of ultra-faint dwarf galaxies: the effects of the initial mass function" Supervisor: Prof. Francesca Matteucci
29 September 2014 - 14 July 2017	**Bachelor's degree in Physics** Università degli Studi di Trieste Grade: 109/110 Thesis on: "Analisi dei cicli di attività solare dal 1749 al 2017" Supervisor: Prof. Mauro Messerotti

EXPERIENCE

April - June 2022	**Visiting Student** GEPI laboratory at the Observatoire de Paris, France Project title: "Mass loss in Magellanic Clouds Globular Clusters" Collaborators: A. Mastrobuono-Battisti, P. Di Matteo

22-25 NOVEMBER 2022	**Visiting Student** Institute of Theoretical Astrophysics at the Zentrum für Astronomie of the Universität Heidelberg, Heidelberg, Germany.

RESEARCH INTEREST

Globular Clusters: Multiple Stellar Populations Formation - Stellar Feedback - Supernova Feedback - Rotation - Dynamical and Chemical Evolution - Star Formation in the Early Universe
Chemical Evolution of Galaxies: Ultra-Faint Dwarfs - Milky Way - Initial Mass Function -Nucleosynthesis - Stellar evolution- Dark Matter
Simulations: N-Body/Hydrodynamics - High Performance Computing and Parallel Computing

LIST OF PUBLICATIONS

ORCID ID: 0000-0001-9936-0126
ResearchGate: Elena-Lacchin

8. **Lacchin E.**, Mastrobuono-Battisti A., Calura F., Nipoti C., Milone A., Meneghetti M., Vanzella E. ,"Multiple stellar population mass loss in massive Galactic globular clusters ", 2023, submitted.
7. Pascale R., Calura F., Lupi A., Rosdahl J., **Lacchin E.**, Meneghetti M., Nipoti C., Vanzella E. , Vesperini E., Zanella A.,"Shaping the unseen: the influence of baryons and environment on low-mass, high-redshift dark matter halos in the SIEGE simulations ", 2023.
6. **Lacchin E.**, Calura F., Vesperini E., Mastrobuono-Battisti A., "The role of rotation on the formation of second generation stars in globular clusters", 2022, MNRAS, 517, 1171.
5. Calura F., Lupi A., Rosdahl J., Vanzella E., Meneghetti M., Rosati P., Vesperini E., **Lacchin E.**, Pascale R., Gilli R.,"Sub-parsec resolution cosmological simulations of star-forming clumps at high redshift with feedback of individual stars", 2022, MNRAS, 516, 5914.
4. **Lacchin E.**, Calura F., Vesperini E., "On the role of Type Ia supernovae in the second-generation star formation in globular clusters", 2021, MNRAS, 506, 5951.
3. **Lacchin E.**, Matteucci F., Vincenzo F., Palla M., "Chemical evolution of ultra-faint dwarf galaxies: testing the IGIMF", 2020, MNRAS, 495, 3276.
2. Palla M., Calura F., Matteucci F., Fan X. L., Vincenzo F., **Lacchin E.**, "The influence of a top-heavy integrated galactic IMF and dust on the chemical evolution of high-redshift starbursts", 2020, MNRAS, 494, 2355.
1. Gjergo E., Palla M., Matteucci F., **Lacchin E.**, Biviano A., Fan X. L.,"On the origin of dust in galaxy clusters at low-to-intermediate redshift", 2020, MNRAS, 493, 2782.

ACCEPTED COMPUTATIONAL PROPOSALS

Almost 17M core hours on different supercomputers which is equivalent to ~ 600k € of research funds.

2022	**PI** of the proposal: "Towards a holistic view of the origin of multiple stellar populations in globular clusters", PRACE, EuroHPC grant, **14M core hours** on Discoverer (BG).
2021	**PI** of the proposal: "Hydrodynamic simulations of proto-globular clusters: the role of Type Ia SNe", **2M core hours** on MARCONI 100/GALILEO 100, CINECA (IT).

2020 **CO-I** of the proposal: "Hydrodynamic simulations of the young star cluster PW1 in the Magellanic Stream" (PI: Francesco Calura), **500k core hours** on GALILEO, CINECA (IT).
2020 **PI** of the proposal: "Hydrodynamic simulations of iron-complex clusters", **500k core hours** on GALILEO, CINECA (IT).
2020 **PI** of the proposal: "Hydrodynamic simulations of Globular Clusters", **250k core hours** on MARCONI 100, CINECA (IT).

HONOURS & AWARDS

JULY 2023	**"Christine Vandemoortele for research" Prize** of 3000 € awarded by the Department of Physics and Astronomy (DIFA) "Augusto Righi" for the best PhD's thesis in astrophysics at DIFA.
OCTOBER 2022	**Travel Grant** of 500 € awarded by the MIAPbP to partecipate to the workshop "Star-Forming Clumps and Clustered Starbursts across Cosmic Time" in Garching, Germany.
AUGUST 2022	**Travel Grant** of 500 € awarded to partecipate to the conference "Star formation in different environments 2022" in Quy Nhon, Vietnam (not used).
JUNE 2022	**Travel Grant** of ~ 350 € awarded by the PNCG to partecipate to the conference "Journées scientifiques 'Galaxies' du PNCG 2022" in Strasbourg, France.
APRIL - JUNE 2022	**Grant** of 3450 € awarded by the University of Bologna for the MARCOPOLO project to work at the GEPI laboratory at the Observatoire de Paris (France) with Dr. A. Mastrobuono-Battisti on "Mass loss in Magellanic Clouds Globular Clusters".
NOVEMBER 2019	**CO-I** of the PRIN INAF "Sub-parsec resolution simulations of globular clusters in a cosmological model" (PI F. Calura, INAF-OAS), awarded ~ 66k € for 2 years.
JANUARY 2018 – SEPTEMBER 2019	**Scholarship** of 6000 € awarded by Collegio Universitario di Eccellenza "Luciano Fonda" for the master's degree.

CONFERENCES, WORKSHOPS AND SCHOOLS

12. **A multi-wavelength view on globular clusters near and far: from JWST to the ELT** — **Sexten, Italy**
Invited talk: "Modelling the formation of multiple stellar population in globular clusters" — *July 3-7, 2023*

11. **Ramses User Meeting 2023** — **Oxford, United Kingdom**
Contributed talk: "Internal rotation in a star-forming globular cluster" — *April 19-21, 2023*

10. **Wheel of star formation** — **Prague, Czech Republic**
Contributed talk: "Supernova feedback effects in a star-forming globular cluster" — *September 12-16, 2022*

9. **Star formation in different environments 2022** — **Quy Nhon, Vietnam (Online)**
Contributed talk: "Supernova feedback effects on a star forming globular cluster" — *August 21-27, 2022*

8. **Journées scientifiques "Galaxies" du PNCG 2022** — **Strasbourg, France**
Contributed talk: "Internal rotation in a star-forming globular cluster" — *June 20-22, 2022*

7. **PoSTER 2022 - Galaxy Evolution Symposium** — **Online**
Contributed Poster — *May 3-5, 2022*

6. **EuroHPC Summit Week 2022** — **Paris, France**
Contributed talk: "The role of Type Ia supernovae on the second generation formation in globular clusters" — *March 22-24, 2022*

5. **The 5th Azarquiel School of Astronomy** — **Online**
   Contributed talk: "The role of Type Ia supernova feedback on the second generation formation in globular clusters" — *November 15-19, 2021*

4. **Star clusters: the Gaia revolution** — **Online**
   Contributed Poster — *October 5-7, 2021*

3. **Ramses User Meeting 2021** — **Paris, France (Online)**
   Contributed talk: "The role of Type Ia supernova feedback on the second generation formation in globular clusters" — *September 27-29, 2021*

2. **European Astronomical Society 2021** — **Online**
   Contributed Poster — *June 28 - July 2, 2021*

1. **Chemical evolution of galaxies: the next 25 years** — **Sexten, Italy**
   Contributed talk: "Chemical evolution of ultra-faint dwarf galaxies: testing the IGIMF" — *January 7-11, 2020*

Other attended workshops/schools:

4. Star-Forming Clumps and Clustered Starbursts across Cosmic Time — **Garching, Germany** *October, 4-28, 2022*

3. International Summer School on the Interstellar Medium of Galaxies, from the Epoch of Reionization to the Milky Way — **Online** *July 12-23, 2021*

2. Introduction To Parallel Computing with MPI and OpenMP — **HPC Cineca, Italy** *March 3-5, 2021*

1. Europlanet Summer School — **Vilnius, Lituania** *June 11-21, 2019*

TALKS AT SEMINARS

6. **Star formation Group** — **Online**
   Heidelberg University — *October 19, 2022*
   "Modelling the formation of multiple stellar populations in globular clusters"

5. **Star Formation Talk** — **Paris, France**
   Université Paris-Saclay — *June 24, 2022*
   "Modelling stellar feedback and internal rotation in a star-forming globular cluster"

4. **Paris Observatory Joint Galaxies and Cosmology Seminar** — **Paris, France**
   Observatoire de Paris-Meudon — *April 21, 2022*
   "Hydrodynamic simulations of multiple stellar populations within globular clusters"

3. **Cosmo/Astro India Group** — **Online**
   "Hydrodynamic simulations of multiple stellar populations within globular clusters" — *January 31, 2022*

2. **Star Formation/ISM Rendezvous** — **Online**
   Princeton University — *December 15, 2021*
   "Hydrodynamic simulations of multiple stellar populations in globular clusters"

1. **Astrochronometry seminars** — **Online**
   University of Bologna — *November 29, 2021*
   "Hydrodynamic simulations of multiple stellar populations within globular clusters"

SUPERVISION OF STUDENTS

JULY 2022- NOW	**Co-supervisor** of a master student at the University of Bologna.
SUMMER 2022	**Co-supervisor** of two Indiana University data science graduate students working on visualization of hydrodynamical simulations of formation of multiple populations in globular clusters, who have been awarded of the Faculty Assistance in Data Science Grand Prize.

EXAMS COMMISSIONS

2019	Oral exams of Introduction to Astrophysics, Stellar Astrophysics, Stellar and Galactic Evolution at the University of Trieste (with Prof. Francesca Matteucci)

OUTREACH AND SERVICE

2018	Organizing and volunteering at public physics events such as TriesteNext, Researcher Night.
2017-2019	Representative at the Physics Department Council at the University of Trieste.
2017	Volunteering, as part of the AISF (Italian Society of Physics Students), to the German Italian Physics Exchange program aimed at presenting the physics research centres in the area of Trieste.

IT KNOWLEDGE

Operating systems: Linux/Unix (very good), Mac OS (very good), Windows (good).

Programming languages: Python (very good), Fortran 77 and 90 (very good), bash (good), IDL (good), Arduino (basic).

Astronomical softwares: Aladin, DS9, GAIA, IRAF, Muniwin, McLuster, Topcat.

Other softwares: LaTeX (very good), Microsoft Office (very good).

Experience in parallel computing: usage of MPI and OpenMP in high-performance computing.

Codes: RAMSES (Adaptive Mesh Refinement for self-gravitating magnetized fluid flows) (https://www.ics.uzh.ch/~teyssier/ramses/RAMSES.html)

LANGUAGE KNOWLEDGE

Italian (mother tongue), English (fluent), Spanish (basic), French (basic)