Mariachiara Stellato

Born: September 3, 1999, Brescia (BS), Italy
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I'm a Physics Master's degree graduate, currently attending my PhD in physics. I have a solid foundation in radiological physics, medical imaging, radiation therapy, and in particular in the field of spheroid analysis and radiomics.

My current research topic is cancer three-dimensional (3D) multicellular aggregates, typically known as spheroids. They are in vitro models widely used for testing drugs and radiotherapy treatments. In particular, the team I work with developed open-source software tools capable of performing an automatic image analysis of the spheroids, to guide researchers in performing experiments based on 3D models. Finally, we proceeded in performing high-content screening experiments using 3D cell cultures, meanwhile designing customized software for the different analyses.

Current position

2023 - Present

Department of Physics and Astronomy "Augusto Righi" (DIFA), University of Bologna, Bologna, Italy.
PhD student

Education

2021-2023

Alma Mater Studiorum – University of Bologna, Italy
Master's degree in physics (curriculum of Applied Physics)

Thesis: "Deep learning-based tool for radiomics analysis of cancer 3D multicellular spheroids"
Supervisor: Prof. Gastone Castellani
Co-Supervisors: Prof. Filippo Piccinini and Prof. Giovanni Martinelli
Final Degree Mark: 110/110 cum laude

2018-2021

University of Trento, Italy
Bachelor's degree in physics

Thesis: "Development and Applications of The High-speed Atomic Force Microscope"
Supervisor: Dr. Marina Scarpa
Final Degree Mark: **98/110**

2013-2018

Liceo Scientifico Vincenzo Capirola, Leno (BS), Italy,
High school diploma.

Final Degree Mark: **100/100**

Honors and awards

2023 **Merit scholarship** awarded by BCC Brescia (800 euros).

2023 **Announcement for the awarding of 12 prizes for the best thesis, intended for students who graduated on time in the academic years 2021-22 and 2022-23 in the Master's Degree programs of DIFA.** Awarded by the university of Bologna (1000 euros)

2023 **Scholarship** for the attainment of the master's degree with a final grade of 110/110 cum laude, granted by Comune di Manerbio (BS), Italy (200 Euros).

2014-2018 **Scholarship** for school merits for the school years, granted by comune di Manerbio(BS), Italy (150 Euros each year).

Publications

Journal publication

2024 Piccinini, F.; Tazzari, M.; Tumedei, M.M.; Stellato, M.; Remondini, D.; Giampieri, E.; Martinelli, G.; Castellani, G.; Carbonaro, A. **Data Science for Health Image Alignment: A User-Friendly Open-Source ImageJ/Fiji Plugin for Aligning Multimodality/Immunohistochemistry/Immunofluorescence 2D Microscopy Images.** *Sensors*

IF 2023 (3.847)

2023 F. Piccinini, A. Peirsman, M. Stellato, J. Pyun, M. Tumedei, M. Tazzari, O. de Wever, A. Tesei, G. Martinelli and G. Castellani **Deep learning-based tool for morphotypic analysis of 3d multicellular spheroids.** *JMMB.*

IF 2023 (0.883)

Conference Abstract and posters

2024 F. Piccinini, F. Pilutti, L. Rigoni, M. Stellato, M. Tazzari, E. Giampieri, D. Remondini, G. Castellani, A. Carbonaro. **Comparative analysis of commercial, freely-available, and open-source software for single-cell analysis within a histological image ROI.** *XXIII International Conference on Mechanics in Medicine and Biology (ICMMB)*, Bruxelles, Belgium, September 11–13, 2024.

2024 F. Piccinini, M. Stellato, J.-C. Pyun, M. Lee, B. Kwak, B. Ku, A. Bevilacqua, D. Remondini, G. Castellani. **Techniques for single-cell isolation from 3D multicellular spheroids.** *XXIII International Conference on Mechanics in Medicine and Biology (ICMMB),* Bruxelles, Belgium, September 11–13, 2024.

2024 Stellato M., Rydzyk M.M., Pannella M., Rossi F., Cappadone C., Remondini D., Pyun J.-C., Castellani G., Malucelli E., Iotti S., Lucarelli E., Piccinini F. **From 2D brightfield images to quantitative radiomics features: A non-destructive analysis of 3D spheroids.** *110° Italian Congress Italian Physical Society (SIF),* Bologna, Italia, September 9-13, 2024.

2024 F. Piccinini, M. Tazzari, M.M. Tumedei, M. Stellato, D. Remondini, E. Giampieri, G. Martinelli, G. Castellani, A. Carbonaro. **Data Science for Health Image Alignment: A User-Friendly Open-Source ImageJ/Fiji Plugin for Aligning Multimodality/Immunohistochemistry/Immunofluorescence**

2D Microscopy Images. *National Forum of the Precision Medicine*, Palermo, Italia, June 13-15, 2024.

2024 F. Piccinini, F. Pilutti, L. Rigoni, M. Stellato, M. Tazzari, E. Giampieri, D. Remondini, G. Castellani, A. Carbonaro. **Comparative analysis of commercial, freely-available, and open-source software for single-cell analysis within a histological image ROI.** *Summer School on Mathematics and Machine Learning for Image Analysis,* University of Bologna, Italy, June 4-12, 2024.

2024 M. Stellato, M.M. Rydzyk, M. Pannella, F. Rossi, C. Cappadone, D. Remondini, J.-C. Pyun, G. Castellani, E. Malucelli, S. Iotti, E. Lucarelli, F. Piccinini. **From 2D brightfield images to quantitative radiomics features: a non-destructive analysis of 3D spheroids.** *Summer School on Mathematics and Machine Learning for Image Analysis*, University of Bologna, Italy, June 4-12, 2024.

2024 M. Stellato, M.M. Rydzyk , M. Pannella, F. Rossi, C. Cappadone, D. Remondini, J.-C. Pyun, G. Castellani, E. Malucelli, S. Iotti, E. Lucarelli, F. Piccinini. **From 2D brightfield images to quantitative radiomics features: a non-destructive analysis of 3D spheroids.** *Straub Conference 2024*, Biological Research Centre (BRC), Szeged, Hungary, May 30-31, 2024.

2024 F. Piccinini, M. Stellato, J.-C. Pyun, M. Lee, B. Kwak, B. Ku, A. Bevilacqua, D. Remondini, G. Castellani. **Techniques for single-cell isolation from 3D multicellular spheroids.** *Straub Conference 2024*, Biological Research Centre (BRC), Szeged, Hungary, May 30-31, 2024.

2023 M. Stellato, F. Piccinini, J. Pyun, M. Lee, B. Kwak, D. Remondini, G. Martinelli, G. Castellani. **Morphological and intensity-based features for radiomics analysis of 3D multicellular spheroids used in high-content screening experiments.** *Second Internetional Stemnet Meeting, Brescia (Italy)*.

2022 F. Piccinini, A. Peirsman, O. De Wever, M. Stellato, A. Tesei, G. Martinelli, G. Castellani. **Deep learning models for segmenting brightfield images of cancer multicellular spheroids used for radiomics analysis.** *XXII International Conference on Mechanics in Medicine and Biology* (ICMMB), Bologna, Italy.

Article reviews

Reviewed for **BioMed Research International**, Hindawi Limited, ISSN: 2314-6133

Professional affiliations

2023 - Present **Department of Physics and Astronomy "Augusto Righi" (DIFA), University of Bologna, Bologna, Italy.**
PhD student

Teachings

2024 **For the fulfillment of OFA (Additional Learning Requirements) in biology, chemistry, and mathematics/physics – [cod. B7315].**

	2024	**Tutoring activities in support of the DIFA Summer School laboratories - VI edition [cod. B7102].**
	2021 - Present	**Private tutor for high school students in math, physics, biology and chemistry.**
	2023	**Private tutor for university students in medical physics and radiation physics.**

Languages

Italian	Native language
English	Advanced Listening and Reading, Intermediate Speaking and Writing.
French	Basic overall knowledge.

Computer skills

Programming	**Advanced**: MATLAB, C/C++ **Intermediate**: Phyton, RStudio
Applications	Word, Latex, PowerPoint, Excel, Adobe Illustrator, GIMP, Fiji,Git.
Platforms	GitHub, Overleaf

References

Prof. Filippo Piccinini	RTDB, Dipartimento di Scienze Mediche e Chirurgiche (DIMEC), University of Bologna, Italy. Email: f.piccinini@unibo.it
Prof. Gastone Castellani	Full Professor, Dipartimento di Scienze Mediche e Chirurgiche (DIMEC), University of Bologna, Italy. Email: gastone.castellani@unibo.it