

# Mariachiara Stellato

Born: September 3, 1999, Brescia (BS), Italy

Mobile (Italian): +39 3311660579

Work E-mail: m.stellato@unibo.it

Personal E-mail: mariachiara.stellato@gmail.com

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.

<b>Current position</b>	2023 - Present	<b>Department of Physics and Astronomy "Augusto Righi" (DIFA), University of Bologna, Bologna, Italy.</b> PhD student
<b>Education</b>	2021-2023	<b>Alma Mater Studiorum – University of Bologna, Italy</b> <b>Master's degree in physics (curriculum of Applied Physics)</b>  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 <b>Final Degree Mark: 110/110 cum laude</b>
	2018-2021	<b>University of Trento, Italy</b> <b>Bachelor's degree in physics</b>  Thesis: "Development and Applications of The High-speed Atomic Force Microscope" Supervisor: Dr. Marina Scarpa Final Degree Mark: <b>98/110</b>
	2013-2018	<b>Liceo Scientifico Vincenzo Capirola, Leno (BS), Italy,</b> <b>High school diploma.</b>  Final Degree Mark: <b>100/100</b>

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## Honors and awards

2025	<b>Young investigator award (YIA)</b> awarded at the GISM conference in Perugia (500 euros)
2023	<b>Merit scholarship</b> awarded by BCC Brescia (800 euros).
2023	<b>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.</b> Awarded by the university of Bologna (1000 euros)
2023	<b>Scholarship</b> 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	<b>Scholarship</b> for school merits for the school years, granted by comune di Manerbio(BS), Italy (150 Euros each year).

## Publications

Journal publication	2024	M. Stellato, M. M. Rydzyk, M. Pannella, F. Rossi, C. Cappadone, D. Remondini, J. Pyun, N. Normanno, T. Ibrahim, G. Castellani, E. Malucelli, S. Iotti, E. Lucarelli, F. Piccinini; <b>Radiomic analysis of 3D spheroids using 2D brightfield images.</b> <i>Biomedical Signal Processing and Control</i> .  IF 2023 (4.9)
	2024	Piccinini, F.; Tazzari, M.; Tumedei, M.M.; Stellato, M.; Remondini, D.; Giampieri, E.; Martinelli, G.; Castellani, G.; Carbonaro, A. <b>Data Science for Health Image Alignment: A User-Friendly Open-Source ImageJ/Fiji Plugin for Aligning Multimodality/Immunohistochemistry/Immunofluorescence 2D Microscopy Images.</b> <i>Sensors</i>  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 <b>Deep learning-based tool for morphotypic analysis of 3D multicellular spheroids.</b> <i>JMMB</i> .  IF 2023 (0.883)
Conference Abstract and posters	2025	M. Stellato, V. Pál, A. Diódsi, M. Harmati, D. Remondini, N. Normanno, G. Castellani, F. Piccinini, P. Horváth. <b>2.5D analysis of 3D spheroids for cancer stem cells isolation.</b> <i>Straub Days Conference 2025, Szeged, Hungary, May 20-21, 2025.</i>
	2025	M. Stellato, V. Pal, A. Diosdi, M. Harmati, D. Remondini, N. Normanno, G. Castellani, F. Piccinini, P. Horvath. <b>2.5D analysis of 3D spheroids for cancer stem cells isolation.</b> <i>6th Annual Meeting of the Italian Mesenchymal Stem Cell Group (GISM), Perugia, Italy, May 08-09, 2025.</i>
	2024	F. Piccinini, F. Pilutti, L. Rigoni, M. Stellato, M. Tazzari, E. Giampieri, D. Remondini, G. Castellani, A. Carbonaro. <b>Comparative analysis of commercial, freely-available, and</b>

- open-source software for single-cell analysis within a histological image ROI.** *Annual Meeting Alliance Against Cancer (ACC2024)*, Reggio-Emilia, Italy, November 28-30, 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.** *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.
- 2023 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.

2022 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 International 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  
 Reviewed for **Computational and Structural Biotechnology Journal**, Elsevier, ISSN: 2001-0370  
 Reviewed for **GigaScience**, OXFORD UNIV PRESS, ISSN: 2047-217X  
 Reviewed for **BMC Bioinformatics**, BMC, ISSN: 1471-2105

## 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:** Python, 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