

# Rajiv Boscolo Agostini, Ph.D. student

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🐦 @Raj94\_

🌐 Rajiv Boscolo Agostini

🌐 <https://raj94b.github.io/>

## Research experience




- 11/2024 – ongoing     📌 **Research Fellow.** Life Sciences and Biotechnology Department, Population Genomics Research Group, University of Ferrara.  
*Statistical and bioinformatic analyses on ancient human genomic and metagenomic variability to reconstruct the Neolithic transition process in the Mediterranean basin.*
- 12/2020 – 01/2021     📌 **Collaborator.** Life Sciences and Biotechnology Department, Population Genomics Research Group University of Ferrara.  
*Application of machine learning algorithms on the analysis of genomic data of ancient and modern human populations.*
- 04/2020 – 07/2020     📌 **Research Fellow.** Life Sciences and Biotechnology Department, Population Genomics Research Group, University of Ferrara.  
*Hybrid genome assembly analyses of Tortoise (*Testudo hermanni*) data.*
- 12/2019 – 10/2021     📌 **Attending Graduate.** Life Sciences and Biotechnology Department, Population Genomics Research Group, University of Ferrara.  
*Genome assembly of the Appenine Brown Bear (*Ursus arctos mariscanus*) using long reads.*

## Education

- 2021 – ongoing     📌 **Ph.D., Evolutionary Biology and Ecology**, University of Florence.  
Thesis title: *The evolutionary history of Italy from the Mesolithic to the present: lessons from ancient genomes*
- 2017 – 2019     📌 **M.Sc. Biomolecular and Evolutionary Sciences**, University of Ferrara  
Thesis title: *Worldwide Helicobacter pylori genetic variation is informative about the evolutionary history of anatomically modern humans.*  
Final mark: 110 cum laude
- 2014 – 2017     📌 **B.Sc. Biological Sciences**, University of Ferrara  
Thesis title: *Worldwide genetic variability of Helicobacter pylori and identification of European groups.*

## Publications in peer-reviewed journals and preprints

- 1     **R. Boscolo Agostini**, M. T. Vizzari, A. Benazzo, and S. Ghirotto, “Disentangling the worldwide invasion process of *Halyomorpha halys* through Approximate Bayesian Computation,” *Heredity*, 2024.  
🔗 DOI: 10.1038/s41437-024-00735-9.
- 2     F. F. Vale, **HpGP Research Network**, R. J. Roberts, I. Kobayashi, M. C. Camargo, and C. S. Rabkin, “Gene content, phage cycle regulation model and prophage inactivation disclosed by prophage genomics in the helicobacter pylori genome project,” *Gut Microbes*, 2024. 🔗 DOI: 10.1080/19490976.2024.2379440.
- 3     M. T. Vizzari, S. Ghirotto, **R. Boscolo Agostini**, P. Maisano Delser, L. Cassidy, A. Manica, and A. Benazzo, “Low-ABC: A robust demographic inference from low-coverage whole-genome data through abc,” *BiorXiv*, 2024. 🔗 DOI: 0.1101/2024.08.01.606209.

- 4 K. Thorell, Z. Y. Muñoz-Ramírez, D. Wang, S. Sandoval-Motta, **R. Boscolo Agostini**, S. Ghirotto, R. C. Torres, D. Falush, M. C. Camargo, and C. S. Rabkin, "The *Helicobacter pylori* genome project: Insights into *H. pylori* population structure from analysis of a worldwide collection of complete genomes," *Nature Communications*, 2023.  DOI: 10.1038/s41467-023-43562-y.
- 5 A. Modi\*, M. T. Vizzari\*, G. Catalano, **R. Boscolo Agostini**, S. Vai, M. Lari, C. Vergata, V. Z. Zaro, L. Liccioli, M. Fedi, S. Barone, L. Nigro, H. Lancioni, A. Achilli, L. Sineo, D. Caramelli, and S. Ghirotto, "Genetic structure and differentiation from early bronze age in the mediterranean island of Sicily: Insights from ancient mitochondrial genomes," *Frontiers in Genetics*, 2022.  DOI: 10.3389/fgene.2022.945227.
- 6 S. Sarno\*, **R. Boscolo Agostini\***, S. De Fanti, G. Ferri, S. Ghirotto, G. Modenini, D. Pettener, and A. Boattini, "Y-chromosome variability and genetic history of commons from Northern Italy," *American Journal of Physical Anthropology*, 2021.  DOI: 10.1002/ajpa.24302.

## Contributions to conferences and meetings

### Seminars

- 1 **R. Boscolo Agostini**, *La ricostruzione delle dinamiche popolazionistiche attraverso il DNA antico*. Department of Historical Sciences and Cultural Heritage, University of Siena, 30/05/2024.
- 2 **R. Boscolo Agostini**, S. Vai, M. T. Vizzari, S. Perretti, F. De Pizzol, A. Mittnik, D. Luiselli, O. Rickards, L. Sineo, N. Volante, D. Reich, S. Ghirotto, and D. Caramelli, *The evolutionary history of Italy from Mesolithic to the Middle Ages: Lessons from ancient genomes*, SIBE Congress 2024, University of Naples "Parthenope", 11/09/2024.
- 3 S. Vai, **R. Boscolo Agostini**, A. Mittnik, D. Luiselli, O. Rickards, L. Sineo, N. Volante, D. Reich, S. Ghirotto, and D. Caramelli, *1000 Ancient Italian Genomes: Evidence from ancient biomolecules for unravelling past human population Dynamics*, EAA Congress 2024, tandem presentation, University of Rome La Sapienza, 29/08/2024.

### Poster presentations

- 1 **R. Boscolo Agostini**, S. Vai, M. T. Vizzari, S. Perretti, F. De Pizzol, A. Mittnik, D. Luiselli, O. Rickards, L. Sineo, N. Volante, D. Reich, S. Ghirotto, and D. Caramelli, *The evolutionary history of Italy from Mesolithic to the Middle Ages: Lessons from ancient genomes*, EMBO | EMBL Symposium, Heidelberg, 09/2024.
- 2 **R. Boscolo Agostini**, M. T. Vizzari, A. Benazzo, and S. Ghirotto, *Disentangling the worldwide invasion process of halyomorpha halys through ABC*, SMBE, Ferrara 2023.
- 3 **R. Boscolo Agostini**, M. T. Vizzari, A. Benazzo, and S. Ghirotto, *Disentangling the worldwide invasion process of halyomorpha halys through ABC*, Joint Meeting AGI SIMAG 2023, Cortona 2023.
- 4 **R. Boscolo Agostini**, M. T. Vizzari, A. Benazzo, and S. Ghirotto, *Reconstructing the global invasion routes of Halyomorpha halys through Approximate Bayesian Computation*, SIBE Congress, Ancona 2022 and FISV, Napoli 2022.
- 5 Y. Moodley, S. Ghirotto, A. Brunelli, **R. Boscolo Agostini**, N. De Serio, V. Chelysheva, A. Klyubin, A. Maady, K. Mominyalev, B. Linz, and M. Achtman, *The genetic history of modern humans in Siberia: A bacterial perspective*, SIBE Congress, Padova 2019.






## Outreach

### Talks



- 6/11/2023  **L'Ominazione: il giro del mondo in sei milioni di anni.** Talk presented in the outreach event "SCIENZE. PANORAMI SCIENTIFICI L'UOMO" hosted by Arci Rovigo

## Teaching and tutoring

### Academic tutor





- 01/2024 – 09/2024  **Genetics.** Tutoring for the Genetics course in the Biotechnology B.Sc program, University of Ferrara. (55 hours)
- 02/2023 – 09/2023  **Genetics.** Tutoring for the Genetics course in the Biotechnology B.Sc program, University of Ferrara. (55 hours)
- 02/2022 – 02/2023  **Genetics.** Tutoring for the Genetics course in the Biotechnology B.Sc program, University of Ferrara. (55 hours)
- 02/2019 – 07/2019  **Genetics.** Genetics course in the Biological Sciences B.Sc. program, University of Ferrara. (55 hours)
- 11/2018 – 07/2019  **Biostatistics.** Tutoring for the Biostatistics course in the Biological Sciences B.Sc. program, University of Ferrara. (68 hours)

### Final thesis tutoring




- 2021 – 2023  **Master thesis.** Students: Giulia Battaglia.
- 2021 – 2022  **Bachelor thesis.** Students: Camilla Giacometti, Silvia Fiori, Brigida Pantaleo.

## Workshops and courses

### Workshops

- 6/06/2023 – 9/06/2023  **Phylogenetics workshop.** Workshop organized by the Italian Society for Evolutionary Biology (SIBE) at the University of Trento.
- 12/06/2023 – 13/06/2023  **The ancient DNA revolution: from the initial attempts to the Nobel Prize.** Genetics school "Mario Polsinelli" organized by The Italian Geneticists Association (AGI) at Cortona.
- 31/07/2023 – 4/08/2023  **Introduction to Ancient Metagenomics Summer School.** Online workshop organized by SPAAM Community on data processing and ancient metagenomic analyses.
- 24/02/2021 – 26/02/2021  **SIBE PHYLO Crash Course** Online workshop by the Italian Society for Evolutionary Biology (SIBE), Exploring evolution using tree based methods: phylogenetics, molecular clocks, barcoding, and phylogenomics.

## Skills

- Languages  Strong reading, writing and speaking competencies for English (level C1).
- Coding  Bash, Python, R, Github
- Genomic analyses  Relatedness, Genomic structure, Phylogenomics, Coalescent simulations (fastsim-coal, ms), Uniparental markers

## Skills (continued)

|                   |   |
|-------------------|---|
| Bioinformatics    | high-performance computing (HPC) clusters, reads processing, Genotype likelihoods, Imputation, Variant calling, Genome assembly |
| Web Dev           | HTML, CSS,  |
| Operating Systems | Windows, MacOS, Linux   |
| Misc.             | Academic research, teaching, training, consultation.  |

## Other

### Volunteering

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|-------------------|--|
| 05/2023 - 07/2023 | <b>Volunteer at SMBE 2023.</b><br>Volunteer for the international scientific congress SMBE23 at Ferrara organized by the Society for Molecular Biology and Evolution (SMBE) and the University of Ferrara.   |
| 01/2025 - ongoing | <b>Summer School Organizer.</b><br>Organizer for the SIBE (Italian Society of Evolutionary Biology) Summer School 2025.<br><a href="https://sites.google.com/view/sibesummerschool/home-page">https://sites.google.com/view/sibesummerschool/home-page</a> |

### Language certifications

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| 2006 | <b>Certified Level B2 English (FCE)</b> . Awarded by Cambridge ESOL. |
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### References

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| University of Ferrara (Italy) | <b>Prof. Silvia Ghirotto.</b> email: <a href="mailto:silvia.ghirotto@unife.it">silvia.ghirotto@unife.it</a>          |
| University of Ferrara (Italy) | <b>Prof. Giorgio Bertorelle.</b> email: <a href="mailto:giorgio.bertorelle@unife.it">giorgio.bertorelle@unife.it</a> |

### **Publications currently under review**

A. Tommasi\*, **R. Boscolo Agostini\***, G. Villani\*, ..., A. Achilli\*\*, Silvia Ghirotto\*\*, Alessandro Achilli\*\*.

*Fifteen millennia of human mitogenome evolution in Sicily.* Under review at Science Advances

\*contributed equally

\*\*contributed equally

### **Contributions to research projects**

During my research career, I have been involved in a variety of projects. My contributions have primarily included planning and performing computational analyses, mainly demographic inference and genetic structure analyses, on a range of subjects, including modern and ancient humans, invasive species, and bacteria. I have also contributed to manuscript writing and actively engaged in science communication at international conferences and interdisciplinary environments (archeology and anthropology).