

# CHIARA VILLA

University of St Andrews  $\diamond$  PhD  $\diamond$  Mathematical Biology

**Email** cv23@st-andrews.ac.uk  
**Website** <https://chiaravilla.github.io/website/index.html>  
**Languages** Italian, English, French  
**Programming** MATLAB, Python, LaTeX, Fortran90, COMSOL, Maple, R, HTML5

## EDUCATION

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09/18 - 03/22 **Phd, Mathematics**, *University of St Andrews*, St Andrews (UK)  
Supervisors: Prof Mark Chaplain, Dr Tommaso Lorenzi  
Funding awarded by the School of Mathematics and Statistics (£49124.25)  
2014 - 2018 **MMaths, Applied Mathematics**, *University of St Andrews*, St Andrews (UK)  
Fast Track, First Class Honours awarded. Academic Prizes: Dean's list (2014-2018),  
The Principal's Scholarship for Academic Excellence (£1000)  
Summer 2017 Undergraduate Summer Research Internship (*University of St Andrews*)  
Summer 2016 Complex Systems Biology Research Internship (*Università degli Studi di Torino*)

## RESEARCH INTERESTS AND PUBLICATIONS

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I am interested in mathematical modelling of cell populations to study problems in development (vasculogenesis) and cancer (intratumour phenotypic heterogeneity). I have been focussing on continuous, deterministic models of time- and space-dependent population dynamics. These models comprise systems of nonlinear, nonlocal partial differential equations, pose interesting analytical and numerical challenges, and complement experimental research by providing a theoretical framework for *in silico* investigations.

### Journal articles and conference proceedings

6. C. Villa, A. Gerisch, M.A.J. Chaplain, A novel nonlocal partial differential equation model of endothelial progenitor cell cluster formation during the early stages of vasculogenesis, *Journal of Theoretical Biology*, 534(1):110963, 2022
5. F. Mottes, C. Villa, M. Osella, M. Caselle, The impact of whole genome duplications on the human gene regulatory networks, *PLoS Computational Biology* 17(12): e1009638, 2021
4. C. Villa, M.A.J. Chaplain, A. Gerisch, T. Lorenzi, Mechanical models of pattern and form in biological tissues: the role of stress-strain constitutive equations, *Bulletin of Mathematical Biology*, 83(4):1-38, 2021
3. C. Villa, M.A.J. Chaplain, T. Lorenzi, Evolutionary dynamics in vascularised tumours under chemotherapy: Mathematical modelling, asymptotic analysis and numerical simulations, *Vietnam Journal of Mathematics*, 49(1):143-167, 2021
2. C. Villa, M.A.J. Chaplain, T. Lorenzi, Modelling phenotypic heterogeneity in vascularised tumours, *SIAM Journal on Applied Mathematics*, 81(2):434-453, 2021
1. T. Lorenzi, F.R. Macfarlane, C. Villa, Discrete and continuum models for the evolutionary and spatial dynamics of cancer: a very short introduction through two case studies, (pp. 359-380) in *Trends in Biomathematics: Modeling Cells, Flows, Epidemics, and the Environment*, Ed. R. Mondaini, Springer, Cham, 2019

## PROFESSIONAL RESPONSIBILITIES AND OUTREACH

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\**School of Mathematics and Statistics, University of St Andrews*

09/20 - today **StAMBio seminars organiser\***, Weekly talks by internal and guest speakers, online  
09/18 - today **Mentor in Peer Mentoring scheme\*** of 4 Undergraduate, 3 Master, 1 PhD students  
03/21 - 04/21 **Journal Peer Reviewer**, *Frontiers in Ecology and Evolution*  
11/20 **Piscopia Society\***, PhD testimonial to promote equality and diversity in STEM  
09/18 - 09/19 **PGR Rep & PGR Exec Rep\***, **UoSA Student Rep**, **SMSTC**  
11/18 **Outreach event organiser\***, 'MT234 Research and Party'

## SELECTED CONFERENCES, WORKSHOPS AND FORUMS

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Selected meetings in which I presented my research in the form of a talk/poster (talk details on my website)

Jan-Mar 2022	<b>Mathematical modeling of organization in living matter</b> Thematic trimester program at Institut Henri Poincaré (IHP), Paris, Financial support awarded by IHP (€4500)
Jun 2021	<b>SoftMech Workshop</b> <i>University of St Andrews</i> , Online
May 2021	<b>Mathematical Biology on the Mediterranean Coast (Invited speaker)</b> <i>Sorbonne University (LJLL)</i> , Online
Apr 2021	<b>Mathematical Population Dynamics, Ecology and Evolution</b> <i>CIRM</i> , Online
Aug 2020	<b>Society for Mathematical Biology</b> Online conference, Awarded SMBdevBio Poster Prize 1 (\$250)
Jun 2020	<b>Interplay between Oncology, Mathematics and Numerics (Invited speaker)</b> <i>Sorbonne University (LJLL)</i> , <i>Inserm</i> , <i>University of Poitiers</i> , Online conference
Dec 2019	<b>Scottish Mathematical Biology Forum (Invited speaker)</b> <i>Maxwell Institute for Mathematical Sciences</i> , Edinburgh
May 2019	<b>EMS Postgraduate Meeting</b> <i>Edinburgh Mathematical Society</i> , The Burn House, Edzell
May 2019	<b>Research School: PDEs in Mathematical Biology: Modelling and Analysis</b> <i>London Mathematical Society &amp; Clay Mathematics Institute</i> , ICMS, Edinburgh
Apr 2019	<b>British Applied Mathematics Colloquium</b> <i>University of Bath</i> , Bath

Other conferences and yearly recurrent meetings attended.

Oct 2021	<b>Mathematics Challenges in Biology and Medicine</b> <i>Politecnico di Torino</i> , Torino
Apr 2021	<b>British Applied Mathematics Colloquium</b> <i>University of Glasgow</i> , Online
2019-2021	<b>Postgraduate Interdisciplinary Mathematics Symposium (2020 Organiser)</b> <i>School of Mathematics and Statistics</i> , The Burn House, Edzell (Online in 2021)
2019-2021	<b>School of Mathematics and Statistics Research Day</b> <i>School of Mathematics and Statistics</i> , St Andrews (Online in 2021)
Aug 2020	<b>S12th European Conference on Mathematical and Theoretical Biology (Minisymposium invited speaker)</b> <i>SMB &amp; ESMTB</i> , Cancelled due to COVID-19, LMS ECR Travel Grant awarded (£500)
Nov 2019	<b>Modeling, analysis and simulation – 50 years of Laboratoire Jacques-Louis Lions</b> <i>Sorbonne University</i> , Paris

## TEACHING

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All available student feedback data is included and reported on a scale of 1 (excellent) to 5 (poor) in the categories of Explanation (E), Organisation (O) and Availability (A).

Autumn 2020	<b>MT2000 Computing Workshop</b> , <i>Demonstrator</i> , <i>University of St Andrews</i>
Autumn 2019	<b>MT2000 Computing Workshop</b> , <i>Demonstrator</i> , <i>University of St Andrews</i>
Autumn 2019	<b>MT2501 Linear Mathematics</b> , <i>Tutor</i> , <i>University of St Andrews</i> E=1.44, O=1.33, A=1.33
Spring 2019	<b>MT2507 Mathematical Modelling</b> , <i>Tutor/Demonstrator</i> , <i>University of St Andrews</i> E=1.45, O=1.85, A=1.45
Autumn 2018	<b>MT2503 Multivariate Calculus</b> , <i>Tutor</i> , <i>University of St Andrews</i> E=1.17, O=1.5, A=1.17