CHIARA VILLA

PhD student ⋄ University of St Andrews ⋄ Mathematical Biology

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EDUCATION

Phd, Mathematics, *University of St Andrews* Sep 2018 - Present
Supervisors: Prof Mark Chaplain, Dr Tommaso Lorenzi
Research topic: Mathematical Modelling of Tumour Growth and Anti-cancer Therapy
Funding awarded by the School of Mathematics and Statistics, University of St Andrews

Scottish Mathematical Sciences Training Center Sep 2018 - Sep 2019
Graduate courses in Continuum Mechanics, Numerical Methods, Mathematical Biology and Physiology

MMaths, Applied Mathematics, *University of St Andrews* 2014 - 2018
First Class Honours awarded
Academic Prizes: The Principal's Scholarship for Academic Excellence, Dean's list
Final project: Mathematical Modelling of Tumour-Induced Angiogenesis

Scientific High School, *Istituto Internazionale Edoardo Agnelli*, Torino (IT) 2009 - 2014
Diploma awarded: grade 100/100
Maths and Physics extra-curricular activities: Physics Olympic games, "Festa della matematica", Maths Olympic games and Archimedes' games, Maths summer internship in Bardonecchia

Study abroad, *Epsom Girls Grammar School*, Auckland (NZ) Summer 2011
Award for "Highly commended in Mathematics" during mid-term exams

WORK EXPERIENCE

Bar Staff 2017 - 2018
University of St Andrews Students' Association, St Andrews (UK)

Visiting Days Student Ambassador Spring 2018
School of Mathematics and Statistics, University of St Andrews, St Andrews (UK)

Undergraduate Summer Research Internship Summer 2017
StAMBio group, School of Mathematics and Statistics, University of St Andrews, St Andrews (UK)
Topic: Mathematical modelling of spatio-temporal evolutionary dynamics of cancer cells focusing on the phenotypic landscape of a solid tumor (Numerical simulations in Matlab)

Complex Systems Biology Research Summer 2016
Prof Michele Caselle, Dipartimento di Fisica, Università degli Studi di Torino, Torino (IT)
Topic: Role of ohnolog genes in regulatory networks, with a focus on co-regulation and self-regulation of paralogue pairs (Data analysis in Python)

Au-pair Childcare Summer 2015
Full-time nanny in a family with 3 kids, Genova (IT)

Group Leader in Local Community 2011 - 2014
Volunteer group leader with GiOC, Torino (IT)
Preparation and coordination of group discussions with educational and aggregative purpose, organisation and supervision of all activities in summer camps

ONLUS Volunteer Summer 2013
Volunteer for the ONLUS foundation "Aiutare i Bambini", Araćuai (BR)
Supervision of the project to support the Assant Centre and the 45 children assigned to it from the juvenile Court, preparation of documents for long-distance adoption

Private Tutor 2010 - 2013
Private tutor in Maths and English to secondary school pupils, Torino (IT)

English Teacher Summer 2012
Primary school English teacher in a summer camp, Su Zhou (CHN)
English language lessons in three classes with pupils aged 8-9, 9-10, 10-11 respectively, afternoon after-school management and recreational activities for primary and secondary school kids

UNIVERSITY TEACHING AND MARKING

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).

MT2000 Computing Workshop, *University of St Andrews* Autumn 2020
Demonstrator in Python Computing Workshop for 2000 level courses
MT2501 Linear Mathematics, *University of St Andrews* Autumn 2019
Tutor of two groups (11 students each) – E=1.44, O=1.33, A=1.33
MT2000 Computing Workshop, *University of St Andrews* Autumn 2019
Demonstrator in Python Computing Workshop for 2000 level courses
MT2507 Mathematical Modelling, *University of St Andrews* Spring 2018
Tutor of two groups (11 students each) – E=1.45, O=1.85, A=1.45
Demonstrator of three groups (50 students each)
MT2503 Multivariate Calculus, *University of St Andrews* Autumn 2018
Tutor of two groups (10-12 students each) – E=1.17, O=1.5, A=1.17
MT2504 Combinatorics and Probability, *University of St Andrews* Autumn 2018
Computer projects marker

TALKS

SoftMech Workshop, *Online* June 2021
"Mechanical models of pattern and form in biological tissues: the role of stress-strain constitutive equations"
Mathematical Biology on the Mediterranean Coast, *Online* May 2021
"Mathematical modelling of early stages vasculogenesis and cell-matrix interactions."
StAMBio Seminar, *Online* April 2021
"A mathematical model of endothelial progenitor cell cluster formation during the early stages of vasculogenesis"
Mathematical Population Dynamics, Ecology and Evolution, *Online* April 2021
"Modelling the adaptive dynamics of space- and phenotype-structured populations of cancer cells"
StAMBio Seminar, *Online* April 2021
"A mathematical model of endothelial progenitor cell cluster formation during the early stages of vasculogenesis"
SoftMech Seminar, *Online* March 2021
"Mechanical models of pattern and form in biological tissues: the role of stress-strain constitutive equations"
StAMBio Seminar, *Online* July 2020
"Mathematical modelling of early-stages cluster-based vasculogenesis"
Interplay between Oncology, Mathematics and Numerics , *Online* June 2020
"Modelling the emergence of pre-treatment phenotypic heterogeneity in vascularised tumours"
Postgraduate Interdisciplinary Mathematics Symposium, *The Burn House* January 2020
"Pattern formation in linear viscoelastic materials"
School of Mathematics and Statistics Research Day, *University of St Andrews* January 2020
"Pattern formation in linear viscoelastic materials"
Scottish Mathematical Biology Forum, *ICMS* December 2019
"Modelling the emergence of phenotypic heterogeneity in vascularised tumours"
Visit to Laboratoire Jacques-Louis Lions, *Sorbonne University* November 2019
"Modelling the emergence of phenotypic heterogeneity in vascularised tumours"

EMS Postgraduate Meeting, *The Burn House* May 2019
"Models of viscoelasticity and their pattern formation potential"
StAMBio Internal Seminar, *University of St Andrews* April 2019
"Assessing the impact of tissue vascularisation on intratumour heterogeneity using a formal Hamilton-Jacobi approach"
Postgraduate Interdisciplinary Mathematics Symposium, *The Burn House* January 2019
"A snapshot of Mathematical Biology"
MT234 Research and Party, Outreach event, *University of St Andrews* November 2018
"Cancer modelling: towards virtual biopsies"
Master thesis defence, *University of St Andrews* April 2018
"Mathematical modelling of tumour-induced angiogenesis"
Undergraduate Summer Research Conference, *University of St Andrews* November 2017
"Dissecting cancer through mathematics: how the tumour microvasculature and microenvironment influence the eco-evolutionary dynamics of cancer cells"
Reading Party, *University of St Andrews* February 2017
"Mathematical modelling of avascular tumour growth"

CONFERENCES, WORKSHOPS AND FORUMS

SoftMech Workshop June 2021
University of St Andrews, Online conference
Mathematical Biology on the Mediterranean Coast May 2021
Sorbonne University (LJLL), Online conference
Mathematical Population Dynamics, Ecology and Evolution April 2021
CIRM, Online conference
British Applied Mathematics Colloquium April 2021
University of Glasgow, Online conference
Postgraduate Interdisciplinary Mathematics Symposium January 2021
University of St Andrews, Online conference
Society for Mathematical Biology (Awarded SMBdevBio Poster Prize 1) August 2020
Online conference
Society for Mathematical Biology & European Society for Mathematical and Theoretical Biology (Cancelled due to COVID-19) August 2020
Mini Symposium invited speaker, LMS ECR Travel Grant awarded (£500)
Interplay between Oncology, Mathematics and Numerics (Invited speaker) June 2020
Sorbonne University (LJLL), Inserm, University of Poitiers, Online conference
Postgraduate Interdisciplinary Mathematics Symposium (Organiser) January 2020
School of Mathematics and Statistics, The Burn House, Edzell
School of Mathematics and Statistics Research Day January 2020
School of Mathematics and Statistics, St Andrews
Scottish Mathematical Biology Forum (Invited speaker) December 2019
Maxwell Institute for Mathematical Sciences, ICMS, Edinburgh
Modeling, analysis and simulation November 2019
Laboratoire Jacques-Louis Lions, Sorbonne University, Paris
EMS Postgraduate Meeting May 2019
Edinburgh Mathematical Society, The Burn House, Edzell
Computational Approaches in Mathematical Biology May 2019
University of Dundee, Dundee
Research School: PDEs in Mathematical Biology: Modelling and Analysis May 2019
London Mathematical Society & Clay Mathematics Institute, ICMS, Edinburgh
British Applied Mathematics Colloquium April 2019
University of Bath, Bath

Postgraduate Interdisciplinary Mathematics Symposium January 2019
University of St Andrews, The Burn House, Edzell
School of Mathematics and Statistics Research Day January 2019
University of St Andrews, St Andrews
Scottish Mathematical Biology Forum December 2018
Maxwell Institute for Mathematical Sciences, Edinburgh
Scottish Mathematical Training Center Symposium October 2018
SMSTC, Perth
Undergraduate Summer Research Conference November 2017
School of Mathematics and Statistics, St Andrews

SKILLS AND ACTIVITIES

Languages
Italian – native speaker
English – advanced (C2): CAE–C1 (03/13) and TOEFL (12/13) certificates
French – intermediate (B1): DELF B1 (08/12) certificate and attendance of several intensive courses in Torino (Alliance Française), Nice (International House) and St Andrews (evening language courses)
Brazilian Portuguese – beginner (A1): attendance of a course with mother tongue teacher
Programming and Computer Skills
Proficient: MATLAB, Python, LaTeX, Fortran90
Basic: COMSOL, Maple, R, HTML5
Microsoft Office tools (ECDL Full Certificate), video editing (Movie Maker, AVS Video Editor)
Personal interests
Acoustic guitar, photography, travelling, swimming, hip-hop dancing, figure ice-skating, yoga
Outreach activity
Piscopia Society outreach: testimonial to encourage female/non-binary students considering a PhD

PROFESSIONAL RESPONSIBILITIES

School of Mathematics and Statistics, *StAMBio online seminars organiser* Sep 2020 - today
School of Mathematics and Statistics, *Mentor in Peer Mentoring scheme* Sep 2018 - today
School of Mathematics and Statistics, *PGR Rep & PGR Exec Rep* Sep 2018 - Sep 2019
Scottish Mathematical Sciences Training Center, *UoSA Student Rep* Sep 2018 - Sep 2019

PUBLICATIONS

5. C. Villa, A. Gerisch, M.A.J. Chaplain, A mathematical model of endothelial progenitor cell cluster formation during the early stages of vasculogenesis, preprint arXiv:2105.11221, 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, in press, 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, 143–167, 2021
2. C. Villa, M.A.J. Chaplain, T. Lorenzi, Modelling phenotypic heterogeneity in vascularised tumours, SIAM Journal on Applied Mathematics, 81, 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