

# Giacomo Albi

## Curriculum Vitae

Office: Strada Le Grazie 14, Ca Vignal 2  
Verona, Italy 37134  
✉ [giacomo.albi@univr.it](mailto:giacomo.albi@univr.it)



### Personal Data

Born 22/02/1985  
Citizenship Italian

### Employments

#### Current

Nov 2019 - Assistant Professor (RTDb S.C. 01/A5 - S.S.D. MAT/08, Numerical Analysis) at  
now Department of Computer Science, University of Verona

#### Previous

Mar 2017- Assistant Professor (RTDa S.C. 01/A5 - S.S.D. MAT/08, Numerical Analysis) at  
Nov 2019 Department of Computer Science, University of Verona  
May 2014- Postdoc at Technische Universität München (TUM), Fakultät für Mathematik,  
Mar 2017 within "ERC project: High-Dimensional Sparse Optimal Control" (Responsible, M. Fornasier).

### Education

- 2014 **Ph.D. in Mathematics and Computer Science (Doctor Europeus)**,  
*03/03/2014, with honors*, University of Ferrara,  
Thesis: Kinetic approximation, stability and control of collective behavior in self-organized systems (Prize INdAM-SIMAI-UMI 2017).  
Advisor: Prof. Lorenzo Pareschi.
- 2010 **Master in Mathematics**, *18/02/2010*, University of Padova,  
Thesis: Law of large numbers and fluctuations for the random Curie-Weiss model.  
Tutor: Prof. Paolo Dai Pra.
- 2007 **Bachelor in Mathematics**, *19/09/2007*, University of Trento,  
Thesis: Finite-Difference method for pay-off options with discontinuous barrier.  
Tutor: Prof. Aldo Tagliani.

### Prizes & Recognitions

- 2018 ASN: National qualification to the role of Associate Professor in Numerical Analysis  
S.C. 01/A5 - S.S.D. MAT/08: 31/08/2018-31/08/2024.

- 2017 Prize INdAM-SIMAI-UMI 2017 for the *Best PhD thesis in Applied Mathematics*.  
2015 Award for the *Best PhD thesis for the XXVI cycle* University of Ferrara.  
2014 *Nicolò Copernico recognition* for innovative PhD thesis in science and technology.

## Research interests

My main research interests are focused on the development of numerical methods for kinetic equations, hyperbolic-type system, and optimal control problems. In particular I am interested in: high-order time integrator techniques, and structure preserving schemes for hyperbolic system with relaxation terms; development of efficient algorithms, such as stochastic and iterative methods for high-dimensional problems in kinetic theory and optimal control.

Applications of these methods range from the equations of statistical physics, to biological processes, up to the description of multi-agent systems in socio-economic modelling.

- Keywords Numerical analysis, Boltzmann equation, multi-agent systems, optimal control, Monte-Carlo methods, uncertainty quantification, mathematical modeling, hyperbolic systems, Asymptotic Preserving schemes, IMEX schemes.
- Affiliations Gruppo Nazionale Calcolo Scientifico, (GNCS-INdAM); Complex System group, (SisCo-SIMAI).

## Publications

Total 27 Documents: 3 Preprint, 16 Articles, 1 Review article, 3 Book chapters, 4 Proceedings.

### Preprints

- 4 [Mean field feedback stabilization of collective behaviors](#), G. Albi, L. Pareschi, M. Zanella, preprint, 2020.
- 3 [Mean field feedback stabilization of collective behaviors](#), G. Albi, L. Pareschi, M. Zanella, preprint, 2020.
- 2 [Mean field feedback stabilization of collective behaviors](#), G. Albi, M. Herty, D. Kalise, C. Segala, preprint, 2020.
- 1 [High order semi-implicit multistep methods for time dependent partial differential equations](#), G. Albi, L. Pareschi, (arXiv:2001.03974), 2019.

### Articles in referred journals

- 17 [Implicit-Explicit multistep methods for hyperbolic systems with multiscale relaxation](#), G. Albi, G. Dimarco, L. Pareschi, accepted in SIAM Sci. Comp., 2020.
- 16 [Linear multistep methods for optimal control problems and applications to hyperbolic relaxation systems](#) G. Albi, M. Herty, L. Pareschi, App. Math. & Comp. 354, pp. 460-477, 2019. DOI: 10.1016/j.amc.2019.02.021.
- 15 [Boltzmann Games in Heterogeneous Consensus Dynamics](#) G. Albi, L. Pareschi, M. Zanella, J. of Stat. Phys. 175(1), pp. 97-125, 2019. DOI: 10.1007/s10955-019-02246-y.

- 14 [Leader formation with mean-field birth and death models](#), G. Albi, F. Rossi, F. Solombrino, *Math. Models Methods Appl. Sci.*, 29(4), pp. 633-679, 2019. DOI: 10.1142/S0218202519400025.
- 13 [Selective model-predictive control for flocking systems](#), G. Albi, L. Pareschi, *Comm. in App. and Ind. Math.* 9(2), pp. 4-21, 2018. DOI: 10.2478/caim-2018-0009.
- 12 [Pressureless Euler alignment with control](#), G. Albi, Y-P. Choi., A-S. Häck, *Math. Models Methods Appl. Sci.*, 28 (09), pp. 1635-1664, 2018. DOI: 10.1142/S0218202518400018.
- 11 [Mean field control hierarchy](#), G. Albi, Y-P. Choi, M. Fornasier, D. Kalise, *App. Math. Optim.*,76(1):93-135, 2017. DOI: 10.1007/s00245-017-9429-x
- 10 [Opinion dynamics over complex networks: kinetic modeling and numerical methods](#), G. Albi, L. Pareschi, M. Zanella, *Kin. Rel. Med.*, 10(1): 1-32, 2017. DOI: 10.3934/krm.2017001.
- 9 [Biological transportation network: modeling and simulation](#), G. Albi, M. Artina, M. Fornasier, P. A. Markovich, *Analysis and Applications*, 14(01), pp. 185-206, 2016. DOI: 10.1142/S0219530515400059.
- 8 [Invisible control of self-organizing agents leaving unknown environments](#), G. Albi, M. Bongini, E. Cristiani, D. Kalise, *SIAM J. Appl. Math.*, 76(4), 1683 - 1710, 2016. DOI: 10.1137/15M1017016.
- 7 [Uncertainty quantification in control problems for flocking models](#), G. Albi, L. Pareschi, M. Zanella, *Mathematical Problems in Engineer*, 2015. DOI: 10.1155/2015/850124.
- 6 [Kinetic description of optimal control problems and applications to opinion consensus](#), G. Albi, M. Herty, L. Pareschi, *Comm. Math. Scien.*,13(6), pp. 1407-1429, 2015. DOI: 10.4310/CMS.2015.v13.n6.a3
- 5 [Boltzmann type control of opinion consensus through leaders](#), G. Albi, L. Pareschi, M. Zanella, *Proc. of the Roy. Soc. A.*, 372(2028), 2014. DOI: 10.1098/rsta.2014.0138.
- 4 [Stability analysis of flock and mill rings for 2nd order models in swarming](#), G. Albi, D. Balagué, J. A. Carrillo, J. von Brecht, *SIAM J. Appl. Math.*, 74(3), pp. 794-818, 2014. DOI: 10.1137/13091779X.
- 3 [Asymptotic Preserving time-discretization of optimal control problems for the Goldstein–Taylor model](#), G. Albi, M. Herty, C. Jörres, L. Pareschi, *Num. Meth. for PDE*, 30(6), 1770-1784, 2014. DOI: 10.1002/num.21877.
- 2 [Binary interaction algorithms for the simulation of flocking and swarming dynamics](#). G. Albi, L. Pareschi. *SIAM Multiscale Model. Simul.*, 11(1), pp. 1-29, 2013. DOI: 10.1137/120868748.
- 1 [Modeling self-organized systems interacting with few individuals: from microscopic to macroscopic dynamics](#). G. Albi, L. Pareschi, *App. Math. Lett.*, 26, pp. 397-401, 2013. DOI: 10.1016/j.aml.2012.10.011.

Review articles

- 1 [Vehicular traffic, crowds, and swarms. From kinetic theory and multiscale methods to applications and research perspectives.](#), G. Albi, N. Bellomo, L. Fermo, S.-Y. Ha, J. Kim, L. Pareschi, D. Poyato and J. Soler, *Math. Models Methods Appl. Sci.*, Vol. 29, No. 10, pp. 1901-2005, 2019. DOI: 10.1142/S0218202519500374.

#### Articles in books

- 4 [Mathematical models and methods for crowd dynamics control.](#), G. Albi, E. Cristiani, L. Pareschi, D. Peri, in L. Gibelli, editor, *Crowd Dynamics Volume 2 - Theory, Models, and Applications*. Birkhauser-Springer, 2020.
- 3 [Recent advances in opinion modeling: control and social influence.](#), G. Albi, L. Pareschi, G. Toscani, M. Zanella, in N. Bellomo, P. Degond, and E. Tadmor, editors, *Active Particles Volume 1, Theory, Methods, and Applications*. Birkhauser-Springer, 2016. DOI: 10.1007/978-3-319-49996-3\_2.
- 2 [Recent advances in opinion modeling: control and social influence.](#), G. Albi, L. Pareschi, G. Toscani, M. Zanella, in N. Bellomo, P. Degond, and E. Tadmor, editors, *Active Particles Volume 1, Theory, Methods, and Applications*. Birkhauser-Springer, 2016. DOI: 10.1007/978-3-319-49996-3\_2.
- 1 [Continuum Modeling of Biological Network Formation.](#), G. Albi, M. Burger, J. Haskovec, P. A. Markowich, M. Schlottbom, in N. Bellomo, P. Degond, and E. Tadmor, editors, *Active Particles Volume 1, Theory, Methods, and Applications*. Birkhauser-Springer, 2016. DOI: 10.1007/978-3-319-49996-3\_1.

#### Conference proceedings

- 4 [Relaxation approximation of optimal control problems and applications to traffic flow models](#), G. Albi, M. Herty, L. Pareschi, *AIP Conference Proceedings* 1975, 020001, 2018. DOI: 10.1063/1.5042169.
- 3 [\(Sub\)Optimal feedback control of mean-field multi-population dynamics: a Boltzmann-Bellman approach](#), G. Albi, D. Kalise, *IFAC-PapersOnLine* 51(3), pp. 86-91, 2018. DOI: 10.1016/j.ifacol.2018.06.020.
- 2 [A Boltzmann approach to mean-field sparse feedback control](#), G. Albi, M. Fornasier, D. Kalise, *IFAC-PapersOnLine* 50(1), pp. 2898-2903, 2017. DOI: 10.1016/j.ifacol.2017.08.646.
- 1 [On the optimal control of opinion dynamics on evolving networks](#), G. Albi, L. Pareschi, M. Zanella, in *IFIP TC7 2015 proceedings*. DOI:10.1007/978-3-319-55795-3\_4.

#### Bibliometric indexes (update: 30/01/2020)

	Publications	h-index	Citation
WOS	22	10	277
Mathschinet	19	–	204
Scopus	23	11	362
GScholar	26	13	630

## Dissemination & other media

- 1 *Manuale per un leader: Strategie matematiche di controllo dell'opinione pubblica.* Gli Stati Generali, May 2015.
- 2 *L'effetto gregge esisite.* Le Scienze. May 2015.
- 3 *Effetto gregge e controllo di folle.* MaddMaths, June 2015.

## Computer skills

Standard C, C++, PYTHON, FORTRAN, R, MAPLE, HTML, EXCEL, OFFICE.  
Advanced MATLAB, MATHEMATICA, FREEFEM++, L<sup>A</sup>T<sub>E</sub>X.

## Languages

Italian Mother tongue  
English Advanced  
German Intermediate

## Research projects

### Coordination of research projects

- 2019 Project PRIN 2017: *Innovative numerical methods for evolutionary partial differential equations and applications.* ([Local Coordinator](#) of Verona unit),  
Responsible: Prof. Giovanni Russo.
- 2018 Project GNCS-INDAM 2018: *Metodi Numerici per problemi di controllo multiscala.*  
Responsible: Dr. Giacomo Albi
- 2012 5x1000 Young Researchers Grant University of Ferrara: *Differential equations and collective behavior with applications to social, economics and natural sciences.*  
Responsible: Dr. Giacomo Albi

### Participation in research projects

- 2019 Project GNCS-INDAM 2019: *Approssimazione numerica di problemi di natura iperbolica e applicazioni.*  
Responsible: Prof. Elisabetta Carlini.
- 2014-2017 ERC-Starting Grant: *High-Dimensional Sparse Optimal Control.*  
Responsible: Prof. Massimo Fornasier.
- 2013 Project GNCS-INDAM: *Hyperbolic dominated multi-scale problems: numerical methods and applications.*  
Responsible: Dr. Matteo Semplice.
- 2010-2012 Bilateral project Italy–Germany Vigoni: *Adjoint IMEX methods for the numerical solution to optimization problems.*  
Responsables: Prof. Lorenzo Pareschi and Prof. Michael Herty.

- 2011-2013 PRIN: *High-order numerical methods for systems of balance laws with sources in fluid-dynamics*.  
Responsable: Prof. Lorenzo Pareschi.
- 2011 FAR: *Metodi numerici e statistici avanzati per le applicazioni*. Responsable: Prof. Lorenzo Pareschi.

---

## Organizer of scientific meetings

- 2019 - Minisymposium: "Novel Concepts in Model-driven Optimization and Control of Agent-based Systems", 15-19/07 ICIAM 2019 Valencia, Spain, ([MS Organizer](#)).
- Summer School: "Trails in Kinetic Theory: theoretical aspects and numerical methods", 20-25/05, HIM Bonn, Germany, ([Organizer](#)).
- 2018 - Winter School: "From Interacting Particle Systems to Kinetic equations", 26-30/11, Verona, Italy, ([Organizer](#)).
- Conference: "Numerical aspects of hyperbolic balance laws and related problems", 26-30/04, Ferrara, Italy, ([Organizer](#)).
- 2016 - Minisymposium: "Recent developments in numerical methods for HJB and Multi-agent systems", WONAPDE 2016, Fifth Chilean Workshop on Numerical Analysis of Partial Differential Equations, 11 - 15/01 Universidad de Concepcion, Concepcion, Chile. ([MS Organizer](#)).
- 2015 - Minisymposium: "Mean-field modeling and control of multi-agents systems", 13th Viennese Workshop on Optimal Control and Games, 13-16/05, Vienna, Austria. ([MS Organizer](#))
- 2012 - Conference: "Numerical aspects of hyperbolic balance laws and related problems", 3-4/04, Ferrara, Italy. ([Organizer](#)).

---

## Invited communications

- 2019 - *Kinetic control of emergent behavior*, Recent Advances in Nonlocal Kinetic, Fluid and Diffusive PDEs, Jeju, South Korea 19-23/08. (Invited speaker).
- *Boltzmann-type control in multi-agent systems*, Workshop in Control Theory and applications, GSSI L'Aquila, Italy 28-29/03. (Invited speaker).
  - *Boltzmann-type optimal control problems*, Sussex University, 24-26/03 (Invited seminar).
- 2018 - *Boltzmann game in heterogeneous consensus dynamics*, Recent Trends in Kinetic Modelling and Related Fields, 25-26/10, Torino, Italy. (Invited speaker).
- *Multistep methods in hyperbolic systems with relaxation*, Interactive workshop on hyperbolic equations (WIDEI), Ferrara, 10-12/09, 2018. (Invited speaker).
  - *Boltzmann-type optimal control problems*, Workshop on Kinetic Theory for Control, Games and Uncertainty, Aachen, 15-16/05, 2018. (Invited speaker).
  - *Numerical methods for optimal control in multiscale differential problems*, Conference on Frontiers in Industry and Applied Mathematics 2018, 26-27/04 Hamirpur, Himchal-Pradesh, India. (Plenary speaker).

- 2017 - *Boltzmann-type control for consensus dynamics*, Inha University, 18/10, Incheon-Seoul, South Korea. (Invited seminar).  
*Mean-field control hierarchy*, LSIS, 12-15/03, Marseilles, France. (Invited speaker).
- 2016 - *Kinetic approximation and control of multi-agent systems*, 01/02, WWM Münster, Germany. (Invited seminar).
- 2015 - *Kinetic approximation and control of multi-agent systems*, Numerical aspects of hyperbolic balance laws and related problems, 17-19/12, Ferrara, Italy. (Invited speaker).
- *Kinetic modeling and control of self-organizing systems*, 02/12, KAUST, Thuwal, KSA. (Invited seminar).
  - *Multi-scale modeling and control of self-organizing systems*, IperGSSI, 16th Italian Meeting on Hyperbolic Equations, 22-25/10, L'Aquila, Italy. (Invited speaker).
  - *AP and IMEX RK schemes for optimal control hyperbolic problems with relaxation*, Numerics for Nonlinear PDEs, in Roma 3, 29-30/01, Roma, Italy. (Invited speaker).
- 2014 - *Kinetic description of optimal control problems in consensus modeling*, Multiscale kinetic and fluid problems: asymptotic analysis, modelling and numerical simulation, in Cargèse (IESC), 28/09-4/10, Corsica, France. (Invited speaker).
- *Modeling self-organized systems numerical methods and control dynamics*, 29/01, KU Leuven, Belgium. (Invited seminar).
- 2013 - *Modeling self-organized systems numerical methods and interaction with few individuals*, 10/09, 2013, RTWH, Aachen, Germany. (Invited seminar)
- 2012 - *Modeling self-organized systems interacting with few individuals: from microscopic to macroscopic dynamics*, 12/12, 2012, CASA colloquium TU Eindhoven, Eindhoven, NL. (Invited seminar)

## Contributed Talks

- 2019 - *IMEX Linear Multistep Methods for hyperbolic problems with relaxation*, Invited Minisymposium "Asymptotic preserving methods for kinetic equations", sciCADE 2019, 20-25/07, Innsbruck, Austria.
- *Boltzmann control strategies for multi-agent systems*, Minisymposium: "Novel Concepts in Model-driven Optimization and Control of Agent-based Systems", ICIAM 2019, 15-19/07, Valencia, Spain.
  - *Linear multistep methods for optimal control problems and applications to hyperbolic relaxation systems*, "Efficient high-order time discretization methods for PDEs", 8-10/05, Villa Orlandi, Anacapri, Italy.
  - *Boltzmann-type optimal control problems*, Minisymposium: "Recent advances in PDE models describing emergent behaviour and collective dynamics", BAMC 2019, 24-26/04, Bath, UK.
- 2018 - *Boltzmann-type optimal control problems*, "Advances in Kinetic Theory", UMI-SIMAI-PTM, 17-20/09, Wrocław, Poland.

- [Boltzmann game in heterogeneous consensus dynamics](#), Special Session: "Advances in kinetic theory", AIMS Conference, Taipei, Taiwan, 05-09/07.
- [Boltzmann-type optimal control problems](#), Special Session: "Kinetic and related equations: collisions, mean field, and organized motion", AIMS Conference, Taipei, Taiwan, 05-09/07.
- 2017 - [Boltzmann-type optimal control](#), IperPV 2017, 06-09/09, Pavia, Italy.
- [Mean-field control hierarchy for opinion dynamics](#), AMMCS 2017, 20-25/08, Waterloo, Ontario, Canada.
- [Mean-field control hierarchy](#), BAMC 2017, 10-12/04, Guildford, UK.
- [Mean-field control hierarchy in consensus models](#), SIAM CSE, 27/02-03/03, Atlanta, GA, US.
- 2016 - [Binary interaction approximation for mean-field optimal control problems](#), SIMAI 2016, 13-16/09, Milano, Italy.
- [Binary interaction approximation for mean-field optimal control problems](#), CMAM-7 2016, 01-05/08, Jyväskylä, Finland.
- [Kinetic modeling and control of self-organizing systems](#), KTMP 2016, 22-25/01, Stellenbosch, South Afrika.
- [Kinetic modeling and control of self-organizing systems](#), WONAPDE 2016, 11-15/01, Concepcion, Chile.
- 2015 - [Invisible control of self-organizing agents leaving unknown environments](#), 27th IFIP Conference on System Modelling and Optimization, 29/06-3/07, Sophia Antipolis, France.
- [Uncertainty quantification in control problems for flocking models](#), 26th Biennial Numerical Analysis Conference, 23-26/06, University of Strathclyde, Glasgow, UK.
- 2014 - [Boltzmann type control for consensus dynamic with leaders](#), 13/09, 2014, CNR, Roma, Italy.
- [Binary algorithm for the simulation of self-organized systems](#), 07/07, 2014, SIMAI Conference, Taormina, Italy.
- [Kinetic description of optimal control problems in consensus modeling](#), 08/07, 2014, SIMAI Conference, Taormina, Italy.
- [Asymptotic Preserving schemes for optimal control problem for hyperbolic relaxation system](#), 08/07, 2014, SIMAI Conference, Taormina, Italy.
- [Binary algorithm for the simulation of self-organized systems](#), 07/04, MCQMC14, KU Leuven, Belgium
- 2013 - [Modeling self-organized systems numerical methods and interaction with few individuals](#), 10/09, 2013, School on Mathematical Physics, INdAM, Ravello, SA, Italy
- [AP schemes for optimal control problem for hyperbolic relaxation system](#), 10/09, 2013, HyperBALLs, Indam GNCS Workshop, Milano, Italy
- 2012 - [Modeling self-organized systems interacting with few individuals: from microscopic to macroscopic dynamics](#), poster session, 4/09, 2012, CRM, UAB, Barcelona, Spain



- *Binary interaction algorithm for the simulations of swarming and flocking dynamics*, 2<sup>nd</sup> Young researcher meeting, BIOMAT 2012 Granada, Spain.
- 2011 - *Monte Carlo algorithms for the Boltzmann equation*, 26/10, 2011 Young Researcher Seminars, ICERM, Brown University, Providence RI, US.

## Visiting and supported participation in research institutes

### Long stays and affiliations at research institutes and universities

- 2019 Semester on "Quantum and Kinetic Problems: Modeling, Analysis, Numerics and Applications" at IMS National University of Singapore (NUS), 1 Oct 2019 –15 March 2020, (15 days)
- 2019 HIM Junior Trimester program: Kinetic Theory, 20/05-27/06, Hausdorff Research Institute Bonn, Germany. (1,25 months)
- 2018 Trimester on "Mathematical Biology" at Institut Mittag-Leffler, 10-28/10, Djursholm, Sweden. (19 days)
- 2016 HIM Trimester program: Mathematics of Signal Processing, 05/02-20/03, Hausdorff Research Institute, Bonn, Germany. (1 month)
- 2015 KAUST, 15/11-01/12, Jeddah, Saudi Arabia, contact person: Prof. P. A. Markowich, (17 days)
- 2014 IAC-CNR Roma, 01-15/09, Roma, Italy, person: Dr. E. Cristiani (15 days)
- 2014 Postdoc at Technische Universität München, May 2014 March 2017 (2,85 years)
- 2011-2013 Visiting PhD student at RTWH Aachen, tutor: Prof. M. Herty (total: 3 months)
- 2012-2013 Visiting PhD student at Universitat Autònoma de Barcelona, tutor: Prof. J. A. Carrillo (total: 3 months)
- 2011 - Trimester on "Kinetic Theory and Computation", Sep 7 - Dec 9, 2011 (1,25 months)

### Supported participation in scientific events

- 2017 - School on Uncertainty Quantification for kinetic equations, GSSI, 10-12/04, L'Aquila, Italy.
- 2016 - Conference: Transport phenomena in collective dynamics: from micro to social hydrodynamics, 01-04/09, ETH Zurich, Swiss.
  - Summer school: Complex networks: theory, methods and applications, 18-22/05, Lake Como School of Advanced Studies, Como, Italy.
- 2014 - Conference: NETGCOOP2014, International conference on Network Games, Control and Optimization, 29-31/10, Trento, Italy.
  - Conference: "Collective Behavior: Macroscopic versus Kinetic Descriptions", 19-23/05, Imperial College London, UK.
- 2013 - XXXVII Summer School on Mathematical Physics, 14-28/09, Ravello, SA, Italy. (14 days)
  - 12th Summer School on Scientific Visualization, 10-14/06, CINECA, Milano, Italy.
  - Mathematics for Planet Earth, Workshop INdAM, 27-29/05, Roma, Italy.

- 2012 - 15-16/11, 2012, Dagli individui alla collettività: folle e sciame, CNR Roma, Italy.
  - Applied Differential Equations in Physics, Biology and Social Sciences: Classical and Modern Perspectives, ESF Conference, CRM, UAB, 3 - 7/09, Barcelona, Spain.
  - School: Analysis, Modeling and Simulation of Collective Dynamics from Bacteria to Crowds, CISM, 9-13/07, Udine, Italy.
  - School: BIOMAT 2012, 2-6/07, Granada, Spain.
- 2011 - Workshop on Boltzmann Models in Kinetic Theory, ICERM, Brown University, 7 - 11/11, Providence RI, US.
  - Workshop on Novel Applications of Kinetic Theory and Computations, ICERM, Brown University, Providence RI, US.
  - Spring School on Mathematical Fluid Dynamics, TU Darmstadt, 28/02 - 3/03, Germany.

## Students supervision

### Doctoral students

- 2018-now PhD advisor: Chiara Segala, University of Trento.
- 2015-2017 PhD Mentor at the International Research Training Group IGDK, student: J. Sigl.  
Web:<http://igdk.eu/IGDK1754/Mentors>

### Tutor of master and bachelor thesis

- 2020 Master thesis, University of Verona: Optimized leaders strategies in crowd dynamics, student: F. Corsini.
- 2020 Master thesis, University of Verona: Stochastic algorithms for populations biology, student: F. Ferrarese.
- 2019 Master thesis, University of Verona: Kinetic approximation of particle swarming optimization, student: F. Rubes.
- 2019 Bachelor thesis, University of Verona: Modelli cinetici e problemi di controllo ottimo per le disuguaglianze economiche, student: M. Framba.
- 2019 Bachelor thesis, University of Verona: Metodi IMEX per problemi stiff e applicazioni, student: M. Ambrosi.
- 2019 Master thesis, University of Verona: On a system of nonlocal parabolic equations modelling evolutionary dynamics of healthy and cancer cell populations, student: C. Langella.
- 2018 Master thesis, University of Verona: Control and learning of interaction kernel in multi-agent systems, student: E. Frison.
- 2017 Bachelor thesis, University of Verona: Modelli matematici per lo studio delle mutazioni di Luria - Delbrück, student: A. Sfilio.

- 2017 Bachelor thesis, University of Verona: Metodi di shooting e applicazioni alla fisica, student: F. Ferrarese
- 2016 Master thesis, TU München: Optimal planning for a traffic model on networks, student: M. Stachl.

## Teaching duties

- a.a. 2019/20 Responsible for: "Foundation of Data Analysis", University of Verona.  
per semester: 56 hours.
- a.a. 2019/20 Responsible for: "Numerical Modelling and Optimization", University of Verona.  
per semester: 24 hours.
- a.a. 2018-20 Responsible for: "Metodi Matematici e Statistici per la Biologia", University of Verona.  
per semester: 24 hours.
- a.a. 2017-19 Co-Responsible for: "Advanced Numerical Analysis II", University of Verona.  
per semester: 28 hours.
- a.a. 2017-19 Responsible for: "Research Modelling Seminar" (ECMI course), University of Verona.  
per semester: 8 hours.
- a.a. 2016/17 Responsible for: "Calcolo Numerico I con Laboratorio", University of Verona.  
per semester: 56 hours.
- a.a. 2015/16 Mentor and Assistant for: Traffic flow on networks, Haupt-Seminar for master students, TU München, web: [www-m15.ma.tum.de/Allgemeines/TrafficFlow](http://www-m15.ma.tum.de/Allgemeines/TrafficFlow).  
Total: 20 hours.
- a.a. 2012/13 Assistant for: "Geometria", Engineer bachelor degree course, University of Ferrara.  
Responsible: Prof. Paltin Ionescu. Total: 20 hours.
- a.a. 2012/13 Assistant for: "Matematica Applicata", Architecture bachelor degree course, University of Ferrara. Teacher: Prof. Lorenzo Pareschi.  
Total: 60 hours.
- a.a. 2012/13 Assistant for: "Analisi II", Engineer bachelor degree course, University of Ferrara.  
Total: 30 hours.
- a.a. 2011/12 Assistant for: "Analisi II", Engineer bachelor degree course, University of Ferrara.  
Total: 30 hours.
- a.a. 2011/12 Assistant for: "Metodi e Modelli Numerici", Mathematics master degree course, University of Ferrara. Responsible: Prof. Lorenzo Pareschi.  
Total: 30 hours.
- a.a. 2011/13 Responsible for PLS project "Laboratorio sulle dinamiche socio-economiche", web: <https://laboratoriopls.wordpress.com/>.  
Total: 80 hours.