

UNIVERSITÀ DEGLI STUDI DI MILANO

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Codice concorso 3966

**[Alessia Nota]
CURRICULUM VITAE**

INFORMAZIONI PERSONALI

COGNOME	NOTA
NOME	ALESSIA
DATA DI NASCITA	[19, Aprile, 1987]



Alessia Nota

Curriculum Vitae

Personal details

First name Alessia
Family name Nota
Date of birth 19/04/1987
Place of birth Rome (IT)
Nationality Italian
Email nota@iam.uni-bonn.de ; alessianota.mat@gmail.com

Current position

01/01/2017 **Post Doctoral Researcher**
–31/12/2020 Research Institution: Institute for Applied Mathematics, University of Bonn.
Postdoctoral mentor: Prof. Dr. Juan J. L. Velázquez.
SFB Postdoc Position. Member of Collaborative Research Centre 1060 (SFB 1060): The Mathematics of Emergent Effects, project B5, funded by the German Research Foundation (DFG).

01/01/2019 *Investigator of the Research Area C1 (Mathematical modeling of matter and materials) of the Cluster of Excellence: Hausdorff Center for Mathematics, Bonn.*

Previous positions

01/12/2015 **Post Doctoral Researcher**
–31/12/2016 Research Institution: Institute for Applied Mathematics, University of Bonn.
Postdoctoral mentor: Prof. Dr. Juan J. L. Velázquez.
SFB Postdoc Position. Member of Collaborative Research Centre 1060 (SFB 1060): The Mathematics of Emergent Effects, project B5, funded by the German Research Foundation (DFG).

01/01/2015 **Post Doctoral Researcher**
–30/11/2015 Research Institution: Department of Mathematics and Statistics, University of Helsinki.
Postdoctoral mentor: Dr. Jani M. Lukkarinen.
Research group: Mathematical Physics.

5/2011–7/2011 **Research fellowship for post-graduate students**
International School for Advanced Studies (SISSA), Trieste.
Supervisors: Prof. Gianfausto Dell’Antonio & Prof. Ludwik Dabrowski.
Research area: Mathematical Physics (Quantum mechanics).
(Position with scholarship)

Formation

01/11/2011 **Ph.D. in Mathematics**
–22/12/2014 *Dipartimento di Matematica Guido Castelnuovo*, Sapienza, Università di Roma.
(Position with scholarship)

Ph.D. Thesis

Title ***From microscopic dynamics to macroscopic equations: scaling limits for the Lorentz gas***
Supervisor Prof. Mario Pulvirenti
Research area Mathematical Physics (Kinetic theory)
Committee Prof. Laurent Desvillettes, Prof. Benedetto Scoppola
Prof. Guido Cavallaro
Defence date December 22, 2014

Education

12/2008–3/2011 **Master in Mathematics**
Dipartimento di Matematica Guido Castelnuovo, Sapienza, Università di Roma.

Master Thesis

Title ***Teoremi adiabatici e applicazioni all’Effetto Hall quantistico***
(Adiabatic theorems and applications to the quantum Hall Effect)
Supervisor Prof. Gianluca Panati
Final grade 110/110 cum laude
Research area Mathematical Physics (Quantum mechanics)

10/2005–10/2008 **Bachelor in Mathematics**
Dipartimento di Matematica Guido Castelnuovo, Sapienza, Università di Roma.

Bachelor Thesis

Title *Onde viaggianti per equazioni di reazione-diffusione*
(*Traveling waves for reaction-diffusion equations*)

Supervisor Prof. Corrado Mascia

Final grade 110/110 cum laude

Research area Mathematical Analysis (Partial differential equations)

2000–2005 **High School Diploma**, *Liceo Scientifico Statale “Augusto Righi”*, Roma.

Final grade 100/100 cum laude.

Research

Kinetic theory, statistical mechanics, analysis of PDE, quantum mechanics.

- Rigorous derivation of effective evolution equations (Boltzmann equation, Landau equation, Vlasov equation, Non Markovian Boltzmann equation) from deterministic or stochastic particle systems;
- Derivation of macroscopic equation and phenomenological laws (Fourier’s and Fick’s law) from particle systems under diffusive limit;
- Well-posedness theory, qualitative analysis and asymptotic behaviour of the solutions of these macroscopic evolution equations;
- Dynamics of particle systems with long range interactions;
- Analysis of correlations for strongly correlated random variables and central limit theorem;
- Rigorous derivation of coagulation equations (Smoluchowski equation) from mechanical particle systems, analysis of coalescence processes and related continuum percolation theory, well-posedness theory, qualitative analysis and asymptotic behaviour of the solutions of these equations.

Research Papers

1. **A Diffusion Limit for a Test Particle in a Random Distribution of Scatterers**
Giada Basile, Alessia Nota and Mario Pulvirenti
Journal of Statistical Physics, Vol. 155, Issue 6, pp. 1087-1111 (2014)
2. **Diffusive limit for the random Lorentz gas**
Alessia Nota
From Particle Systems to Partial Differential Equations II, Springer Proceedings in Mathematics & Statistics, Vol. 129, pp. 273-292 (2015)
3. **Derivation of the Fick’s Law for the Lorentz Model in a low density regime**
Giada Basile, Alessia Nota, Federica Pezzotti and Mario Pulvirenti
Communication in Mathematical Physics, Vol. 336, Issue 3, pp. 1607-1636 (2015)

4. **Derivation of the linear Landau equation and linear Boltzmann equation from the Lorentz model with magnetic field**
Matteo Marcozzi, Alessia Nota
Journal of Statistical Physics, Vol.162, Issue 6, pp. 1539-1565 (2016)
5. **Harmonic chain with velocity flips: thermalization and kinetic theory**
Jani Lukkarinen, Matteo Marcozzi and Alessia Nota
Journal of Statistical Physics, Vol. 165, Issue 5, pp. 809-844 (2016)
6. **On the growth of a particle coalescing in a Poisson distribution of obstacles**
Alessia Nota, Juan J. L. Velázquez
Communication in Mathematical Physics, Vol. 354, Issue 3, pp. 957-1013 (2017)
7. **On the theory of Lorentz gases with long range interactions**
Alessia Nota, Sergio Simonella, Juan J. L. Velázquez
Reviews in Mathematical Physics, Vol. 30 No. 3, 1850007 (2018)
8. **Summability of connected correlation functions of coupled lattice fields**
Jani Lukkarinen, Matteo Marcozzi and Alessia Nota
Journal of Statistical Physics, Vol. 171, Issue 2, pp. 189-206 (2018)
9. **Self-similar profiles for homoenergetic solutions of the Boltzmann equation: particle velocity distribution and entropy**
Richard D. James, Alessia Nota, Juan J.L. Velázquez
Archive for Rational Mechanics and Analysis, Vol. 231, Issue 2, pp. 787-843 (2019)
10. **Self-similar asymptotic behavior for the solutions of a linear coagulation equation**
Barbara Niethammer, Alessia Nota, Sebastian Throm, Juan J.L. Velázquez
Journal of Differential Equations, Vol. 266, Issue 1, pp. 653-715 (2019)
11. **Long time asymptotics for homoenergetic solutions of the Boltzmann equation. Collision-dominated case**
Richard D. James, Alessia Nota, Juan J.L. Velázquez
arXiv:1808.06941 (2018) Accepted for publication in *Journal of Nonlinear Science*

Conference Proceedings

Kinetic description for the Lorentz Gas with long range interactions

Alessia Nota

To appear in *Oberwolfach Reports, Classical and Quantum Mechanical Models of Many-Particle Systems*, Report No. 56/2017, DOI: 10.4171/OWR/2017/56

Preprints

1. **Long time asymptotics for homoenergetic solutions of the Boltzmann equation. Hyperbolic-dominated case**
Richard D. James, Alessia Nota, Juan J.L. Velázquez

2. **A Kac model for annihilation of particles**
Bertrand Lods, Alessia Nota, Federica Pezzotti
3. **Kinetic description of a Rayleigh Gas with annihilation**
Bertrand Lods, Alessia Nota, Raphael Winter

In preparation

1. **On the theory of kinetic equations for interacting particle systems with long range interactions**
Alessia Nota, Juan J.L. Velázquez, Raphael Winter
2. **Rigorous derivation of the linear Landau equation for Lorentz gases with Coulombian potentials**
Alessia Nota, Juan J.L. Velázquez

Scientific Communications

Invited talks

Upcoming

- 14-18/10/2019 *Advances in Kinetic Theory*, Chongqing University, Chongqing, China.
 15-21/09/2019 *Large Scale Stochastic Dynamics*, MFO workshop, Oberwolfach.
 02-07/09/2019 *XXI Congresso U.M.I. (Unione Matematica Italiana)*, Pavia.
 17-18/06/2019 *Women in PDEs @ Vienna*, University of Wien.

Past

- 06/12/2018 **Rigorous derivation of kinetic equations from particle systems** “Konstanz Women in Mathematics-Festtage”, University of Konstanz.
 20/11/2018 **On the derivation of a linear Smoluchowski equation** *Nonlinear Phenomena in Stockholm: Kinetic Meets Dispersive*, KTH, Sweden.
 25/10/2018 **Homoenergetic solutions for the Boltzmann Equation**, *Recent Trends in Kinetic Modelling and Related Fields*, Politecnico di Torino.
 20/09/2018 **On a particular class of solutions for the Boltzmann Equation**, *Joint meeting of the Italian Mathematical Union, the Italian Society of Industrial and Applied Mathematics and the Polish Mathematical Society*.
 03/05/2018 **On the growth of a particle coalescing in a random distribution of particles**, *German Chapter Conference 2018 - EWM*, University of Heidelberg.
 26/04/2018 **Homoenergetic Solutions for the Boltzmann Equation**, *Institute of Mathematics*, University of Zürich.
 21/03/2018 **On the growth of a particle coalescing in a Poisson distribution of obstacles** *Dipartimento di Scienze Matematiche*, Politecnico di Torino.
 12/03/2018 **Self-similarity in Smoluchowski’s coagulation equation**, *Presentation for SFB 1060, Project B05*, Retreat of the Collaborative Research Centre 1060, Bad Neuenahr.

- 13/12/2017 **Homoenergetic Solutions for the Boltzmann Equation**, *Seminario di Fisica Matematica*, Dipartimento di Matematica “F. Brioschi”, Politecnico di Milano.
- 3-9/12/2017 **On the Lorentz gases with long range interactions**, *Mathematisches Forschungsinstitut Oberwolfach*, Oberwolfach-Walke.
- 11/08/2017 **Homoenergetic Solutions for the Boltzmann Equation**, *Institute for Mathematics and its Applications*, University of Minnesota, Minneapolis.
- 2/12/2016 **On the growth of a particle coalescing in a Poisson distribution of obstacles**, *Mathematical Physics & PDEs Group*, LAGA, Université Paris 13. Paris.
- 28/11/2016 **On the asymptotic behaviour for equidispersive solutions of the Boltzmann equation**, *Mathematical Institute*, University of Oxford, Oxford.
- 18/11/2016 **On the asymptotic behaviour for equidispersive solutions of the Boltzmann equation**, *Functional analysis seminar*, Institute for Applied Mathematics, University of Bonn.
- 20/10/2016 **On the growth of a particle coalescing in a Poisson distribution of obstacles**, *Kinetic Theory and its neighbours*, GSSI, Gran Sasso Science Institute, L’Aquila.
- 7/10/2016 **On the growth of a particle coalescing in a Poisson distribution of obstacles**, *The Mathematics of Disorder*, Young Women in Probability and Analysis 2016, University of Bonn.
- 15/04/2016 **From Hamiltonian dynamics to kinetic equations. Known results and perspectives for the Lorentz Gas**, *Functional analysis seminar*, Institute for Applied Mathematics, University of Bonn.
- 19/01/2016 **Summability of joint cumulants of nonindependent lattice fields**, *CRC seminar*, University of Bonn.
- 11/01/2016 **From microscopic dynamics to macroscopic equations. Scaling limits for the Lorentz Gas**, *Geometric Analysis and Partial Differential Equations seminar*, University of Cambridge.
- 12/10/2015 **From microscopic dynamics to macroscopic equations: The Lorentz Gas**, *Tullio Levi-Civita lectures*, Dipartimento di Matematica Guido Castelnuovo, Sapienza, Università di Roma.
- 14/7/2015 **Scaling limits for the Lorentz Gas**, *Nonlinear evolutions: Kinetic equations and defect dynamics*, Hausdorff School, University of Bonn.
- 3/06/2015 **Fick’s law for the Lorentz model**, *Periodic and Ergodic Spectral Problems Seminar*, Isaac Newton Institute for Mathematical Sciences, Cambridge.
- 17/3/2015 **Scaling limits for the Lorentz Gas**, *Ciclo di Seminari “Modelli matematici per le teorie cinetiche”*, Dipartimento di Matematica, Sapienza, Università di Roma.
- 19/2/2015 **Trails in a kinetic land**, *Bernoullis Tafelrunde*, Mathematisches Institut. Universität Basel.
- 9/12/2014 **From microscopic dynamics to macroscopic equations. Scaling limits for the Lorentz Gas**, *PhD defence seminar*, Dipartimento di Matematica Guido Castelnuovo. Sapienza, Università di Roma.

- 9/12/2014 **Derivation of the Fick's law for the Lorentz model in a low density regime**, *CRC Seminar*, University of Bonn.
- 4/12/2014 **Derivation of the Fick's law for the Lorentz model in a low density regime**, *Seminario di Fisica Matematica*, Workshop dei dottorandi di area fisico-matematica del XXVII ciclo. Dipartimento di Matematica, Sapienza, Università di Roma .
- 8/10/2014 **Derivation of the Fick's law for the Lorentz model in a low density regime**, *Mathematical Physics Seminar*, University of Helsinki.
- 21-26/07/2014 **Derivation of the Fick's law for the Lorentz model in a low density regime**, *Mathematical Physics, Analysis and Stochastics*, Summer School at Universität Heidelberg.
- 26-28/05/2014 **Derivation of the Fick's law for the Lorentz model in a low density regime**, *Young Women in Probability 2014*, University of Bonn.
- 21/01/2014 **A diffusion limit for a test particle in a random distribution of scatterers**, *HFAKT Seminar*, University of Bristol.
- 16/12/2013 **Propagazione della luce in mezzi aleatori: un problema di omogeneizzazione**, *Kinetic Theory Methods Toward Applications*, Dipartimento di Scienze Matematiche, Politecnico di Torino.
- 12/12/2013 **A diffusion limit for a test particle in a random distribution of scatterers**, *Particle systems and PDE's - II*, Braga, Portugal.
- 17-28/06/2013 **A diffusion limit for a test particle in a random distribution of scatterers**, *Kinetic Description of Multiscale Phenomena*, Heraklion, Crete.
- 23-29/09/2012 **A rigorous derivation of linear kinetic equation of Fokker-Planck type in the limit of grazing collisions**, *XXXVII Summer School on Mathematical Physics*, Ravello.

Summer Schools (INdAM)

- 23-29/09/2012 **XXXVII Summer School on Mathematical Physics**, Ravello, IT.
- 27/06- **Scuola Matematica Interuniversitaria**, Perugia, IT.
- 28/08/2009 *Completed courses: Functional Analysis, Partial Differential Equations in Mathematical Physics.*

Short Visits to International Research Institutions

- 10/2018 **University of Zurich.**
- 10/2018 **Politecnico di Torino.**
- 06/2018 **University of Oxford.**
- 04/2018 **University of Zurich.**
- 03/2018 **Università degli Studi di Torino.**
- 03/2018 **Université Paris Diderot.**
- 12/2017 **Politecnico di Milano.**
- 12/2017 **Mathematisches Forschungsinstitut Oberwolfach.**
- 08/2017 **Institute for Mathematics and its Applications, University of Minnesota.**

06/2017 **Institute Henri Poincaré**,
Thematic trimester: Stochastic Dynamics Out of Equilibrium.

04/2017 **Technische Universität München.**

03/2017 **University of Torino.**

12/2016 **LAGA, Université Paris 13.**

11/2016 **University of Oxford.**

03/2016 **University of Torino.**

01/2016 **DPMMS, University of Cambridge.**

01/2016 **University of Torino.**

10/2015 **Sapienza, University of Rome.**

06/2015 **Isaac Newton Institute for Mathematical Sciences.**

03/2015 **Institute Henri Poincaré (IHP).**

02/2015 **University of Basel.**

12/2014 **Hausdorff Center for Mathematics.**

09/2014 **Kumpula Campus, University of Helsinki.**

05/2014 **University of Bristol.**

01/2014 **University of Bristol.**

Teaching Experience

Winter Term 2017/2018 **On the mathematical theory of Landau Damping**, *Graduate Seminar on Analysis (S4B1)*, Institute for Applied Mathematics, University of Bonn.

Winter Term 2016/2017 **Spectral Theory in Quantum Mechanics**, *Graduate Seminar on Analysis (S4B1)*, Institute for Applied Mathematics, University of Bonn.

Summer Term 2015/2016 **Scaling limits for particle systems**, *Graduate Seminar on Analysis (S4B1)*, Institute for Applied Mathematics, University of Bonn.

10/2014–12/2014 **OFA course in Mathematics (Analysis)**, *Sapienza*, Università di Roma.

10/2013–2/2014 **Teaching assistant for the Linear Algebra course at the Mathematics Department Guido Castelnuovo**, *Sapienza*, Università di Roma.

Since December 2015 assistant and examiner for the exams of the Functional Analysis group, University of Bonn.

Thesis Supervisions

- **Second advisor for Master Thesis**
 Candidate: Cintia Pacchiano, Institute for Applied Mathematics, University of Bonn
 First Advisor: Prof. Dr. Juan J. L. Vélazquez
 Thesis: The Hilbert Expansions in Kinetic Theory
 Defence date: 16/03/2018
- **Second advisor for Master Thesis**
 Candidate: Sarah Schreyer, Institute for Applied Mathematics, University of Bonn
 First Advisor: Prof. Dr. Juan J. L. Vélazquez
 Thesis: Drift-Diffusion Equations for Dye-Sensitized Solar Cells
 Defence date: 02/11/2018

- **Advisor for Master Thesis.**

Candidate: Simone Sommariva, Institute for Applied Mathematics, University of Bonn

Thesis: On the asymptotic behaviour of the solutions of a linear Smoluchowski equation

Expected Defence date: Summer Term 2019

Projects

- From 2019 investigator of the **Research Area C1** (Mathematical modeling of matter and materials) of the **Cluster of Excellence: Hausdorff Center for Mathematics**, Bonn, Germany.
<https://www.hcm.uni-bonn.de/research-areas/#c13643>
- From 2016 member of the **Collaborative Research Centre 1060** (SFB 1060): The Mathematics of Emergent Effects, project B5. Funded by the German Research Foundation (DFG).

Organization of Scientific Events

10 - 14/06/2019 **Derivation of effective equations: classical and quantum (*Workshop*)**, Hausdorff Research Institute for Mathematics, Bonn.

Organizers: Roberta Bianchini, Serena Cenatiempo, Lingbing He, Alessia Nota, Chiara Saffirio, Sergio Simonella, Raphael Winter

<https://www.him.uni-bonn.de/programs/future-programs/future-junior-trimester-programs/kinetic-theory-2019/workshop-effective-equations-frontiers-in-classical-and-quantum-systems-june-24-28-2019/>

20 - 24/05/2019 **Trails in kinetic theory: foundational aspects and numerical methods (*Summer school*)**, Hausdorff Research Institute for Mathematics, Bonn.

Organizers: Giacomo Albi, Sara Merino-Aceituno, Alessia Nota, Mattia Zanella

<https://www.him.uni-bonn.de/programs/future-programs/future-junior-trimester-programs/kinetic-theory-2019/summer-school/>

03 - 09/03/2019 **Lorentz Gas Dynamics: particle systems and scaling limits (*Mini-Workshop*)**, Mathematisches Forschungsinstitut Oberwolfach.

Organizers: Alessia Nota, Chiara Saffirio, Juan J.L. Velázquez

https://www.mfo.de/occasion/1910b/www_view

24 - 26/09/2018 **Young Women in Mathematical Physics (*Workshop*)**, Hausdorff Center for Mathematics, Bonn.

Organizers: Alessia Nota, Elena Pulvirenti

<https://www.iam.uni-bonn.de/ywmp>

Scientific Responsibilities

Institutional Responsibilities:

February 2019: selected as **Early career Researchers' representative** in the **Excellence Strategy Evaluation** for the **University of Bonn** (Excellence Strategy of the German Federal and State Governments to Promote Science and Research at German Universities)

Referee Activity:

Referee for AMS, Kinetic and Related Models, Computers and Mathematics with Applications.

Professional Affiliations

Member of the International Association of Mathematical Physics (IAMP).

Member of Unione Matematica Italiana (UMI).

Scientific Transfer (Broad Audience)

Talks

12/01/2019 **Fisica: Isaac Newton**, “*Giornate di studio: la Fisica*”, via Roma Libera, 23, Roma.

06/11/2015 **Materia energia pensiero: tra fisica e teoria della nascita**, *Aula Magna*, Sapienza, Università di Roma.

21/11/2015 **Luce, Gravità e Musica**, *Conferenza in occasione del centenario della Relatività Generale*, Biblioteca Vaccheria Nardi, Roma.

Contributed papers for broad audience

1. Energia

Alessia Nota

Sec. **Materia, energia, pensiero: fisica e teoria della nascita**

in *Atti Convegni all’Aula Magna Università di Roma*.

L’Asino d’oro edizioni (2016). ISBN: 978-88-6443-372-1

References

Prof. Dr. Juan J. L. Velázquez, University of Bonn, velazquez@iam.uni-bonn.de ;

Prof. Richard D. James, University of Minnesota, james@umn.edu ;

Prof. Mario Pulvirenti, Sapienza, Università di Roma, pulvirenti@mat.uniroma1.it ,
pulviren@mat.uniroma1.it ;

Prof. Jani M. Lukkarinen, University of Helsinki, jani.lukkarinen@helsinki.fi

Prof. Dr. Stefan Müller, University of Bonn, stefan.mueller@hcm.uni-bonn.de ;

Prof. Dr. Sergio Albeverio, University of Bonn, albeverio@uni-bonn.de

Languages

Italian *Native*

English *Fluent*

French *Fluent*

German *Basic*

Data

20.02.2019

Luogo

Bonn