PDEs in kinetic theories: kinetic description of biological models

Nov 08, 2010 - Nov 12, 2010

15 South College Street, Edinburgh EH8 9AA

Organisers

Name	Institution
Bournaveas, Nikolaos	University of Edinburgh
Carrillo, José A	ICREA & Universitat Autònoma de Barcelona
Jin, Shi	University of Wisconsin
Markowich, Peter	University of Cambridge
Tadmor, Eitan	University of Maryland

Arrangements

Programme

Presentations

Participants

This workshop is a satellite event of the semester on Kinetic PDEs at the Isaac Newton Institute.

This event is co-sponsored by KAUST.

Kinetic equations occur naturally in the modelling of the collective motion of large individual particle ensembles such as molecules in rarefied gases, beads in granular materials, charged particles in semiconductors and plasmas, dust in the atmosphere, cells in biology, or the behaviour of individuals in economical trading. They include several classical equations of mathematical physics: the Boltzmann equation of rarified gas dynamics, the fermionic and bosonic Boltzmann equations and the relativistic Vlasov-Maxwell system of particle physics, the quantistic Wigner-Poisson system, to name just a few.

The workshop will bring together leading researchers to review the recent developments in research on mathematical modelling, analysis, numerical schemes and simulation of kinetic models in Biology.

Arrangements

Participation
Participation in this workshop is by invitation only. If you have a enquiry about participation please email Audrey Brown who will contact the Organisers on your behalf.

Venue
The venue for this INI satellite workshop will be ICMS, 15 South College Street, Edinburgh, EH8 9AA, (see this link

and the 'Travel' section below for directions). All lectures will be held in the Newhaven Lecture Theatre. To view this room and a list of the visual equipment available click here. In addition, two blackboards have recently been installed and a PC outputting to a high definition projector and audio system.

Wireless Access
The workshop venue, 15 South College Street, has wireless access throughout. On arrival at Registration you will be given instructions and a code for accessing the wireless network. For those without laptops, there will also be a couple of computers available for you to check your emails.

UK Visas
If you are travelling from overseas you may require an entry visa. A European visa does not guarantee entry to the UK. Please use this link to the UK Visas site to find out if you need a visa and if so how to apply for one.

Travel
Information about international travel to the UK and Edinburgh is available here. You may also find this map and this link useful for the workshop. The map shows the workshop venue and other city centre landmarks.

A taxi directly from the airport will cost approximately 15.00 - 20.00 GBP to the city centre for a one-way journey. There is also a bus service from the airport to the city centre.

Within the city, Lothian buses charge £1.20 for a single, £3.00 for a day ticket. Please note that the exact fare is required and no change is given.

If travelling by train, please note that Edinburgh has two railway stations - Waverley Railway Station being the main station and closest to the workshop venue at 15 South College Street. If you alight at Edinburgh Waverley, the workshop venue is an easy 10 minute walk over North and South Bridge map. The second railway station is called Haymarket and is at the West End of the city centre.

Travel Insurance
Please note that it is your responsibility to have adequate travel insurance to cover medical and other emergencies that may occur on your trip.

Accommodation
ICMS has arranged en-suite rooms in accommodation nearby for those who requested this. Accommodation is typically no more than 5-10 minutes walk from the workshop venue.

North British Differential Equations Seminar (NBDES)
On Tuesday 9 November the workshop will combine briefly with NBDES for a talk by Eitan Tadmor (University of Maryland) entitled “Linear PDEs in critical regularity spaces: hierarchical construction of their nonlinear solutions”. There will be a brief pause in the workshop Programme between 14.50 and 15.00 to allow the NBDES

visitors to be seated in the lecture theatre for the start of the talk at 15.00.

Catering
Refreshments will be provided during the coffee breaks for the duration of the event. A light lunch will be provided on Tuesday 9 November only. On all other days participants are free to explore the many cafés, sandwich shops and restaurants nearby. On Wednesday 10 November there will be a workshop dinner at the Magnum Restaurant, 1 Albany Street, Edinburgh, EH1 3PY. All participants are welcome to attend free of charge.

Financial Matters
For all 'invited participants' the workshop funding will cover the cost of bed and breakfast accommodation and refreshments during the coffee breaks for the duration of the workshop, lunch on Tuesday only, and a workshop dinner at the Magnum Restaurant on Wednesday evening.

If it has been agreed that the INI will reimburse some of your travel costs, this will have been advised in your 'final information' email. An INI expenses claim form will be issued at Registration and should be returned directly to the INI.

Programme

Monday 8 November 2010

09.00 - 09.30	Registration and coffee
09.30 - 10.20	**Pierre Degond** (Université de Toulouse & CNRS) *Modelling self-organization in complex systems* pdf of presentation
10.20 - 11.10	**Mohammed Lemou** (IRMAR, CNRS & Univestité Rennes 1) *Non linear stability of gravitational systems*
11.10 - 11.40	Coffee/tea in Chapterhouse (ground floor)
11.40 - 12.30	**Raffaele Esposito** (Università dell'Aquila) *Stability and instability of equilibria in a Vlasov-Boltzman binary mixture undergoing a phase transition* pdf of presentation
12.30 - 14.00	Lunch break
14.00 - 14.50	**Rosanna Marra** (Università di Roma Tor Vergata) *Hydrodynamic limits for the Boltzmann equation in some slightly compressible cases*
14.50 - 15.40	**Sebastien Motsch** (University of Maryland) *Mathematical modelling of animal displacements: from microscopic to macroscopic description*
15.40 - 16.10	Coffee/tea in Chapterhouse, (ground floor)

16.10 - 17.00	**José Alfredo Cañizo** (Universitat Autònoma de Barcelona) *Estimates and exponential convergence to equilibrium for the growth-fragmentation equation* pdf of presentation

Tuesday 9 November 2010

09.30 - 10.20	**José A Carrillo** (Universitat Autònoma de Barcelona) *Kinetic models for swarming: mean-field limit and qualitative properties* pdf of presentation
10.20 - 11.10	**Benoit Perthame** (Université Pierre et Marie Curie) *Kinetic models of chemotaxis and traveling bands Kinetic models for swarming: mean-field limit and qualitative properties* pdf of presentation
11.10 - 11.40	Coffee/tea in Chapterhouse (ground floor)
11.40 - 12.30	**Timothy Pedley** (University of Cambridge) *Collective behaviour of swimming micro-organisms*
12.30 - 14.00	Lunch provided in the Chapterhouse (ground floor)
14.00 - 14.50	**Massimo Fornasier** (RICAM) *Particle systems and kinetic equations modelling interacting agents in high-dimension*
14.50 - 15.00	Short pause in Programme to allow NBDES guests to be seated.
15.00 - 15.50	**North British Differential Equations Seminar (NBDES)** **Eitan Tadmor (**University of Maryland) *Linear PDEs in critical regularity spaces: hierarchical construction of their nonlinear solutions* *pdf of abstract*
15.50 - 16.20	Coffee/tea in Chapterhouse, (ground floor)
16.20 - 17.10	**Jorge Zubelli** (Instituto Nacional de Matemática Pura e Aplicada) *Structured population models: direct and inverse problems* pdf of presentation

Wednesday 10 November 2010

09.30 - 10.20	**Adrien Blanchet** (Université de Toulouse) *Asymptotics for the critical mass Keller-Segel model* pdf of presentation
10.20 - 11.10	**Zhongyi Huang** (Tsinghua University) *Bloch decomposition based method for waves in periodic media* pdf of presentation
11.10 - 11.40	Coffee/tea in Chapterhouse (ground floor)
11.40 - 12.30	**Klemens Fellner** (University of Cambridge) *Aggregation-pattern in non-local evolution equation* pdf of presentation
12.30 - 14.00	Lunch break
14.00 - 14.50	**Piotr Gwiazda** (University of Warsaw) *Split-up algorithm in the metric space for the equations of structured*

	population dynamics
14.50 - 15.40	**Clement Mouhot** (University of Cambridge) *A new quantitative method for the mean-field limit*
15.40 - 16.10	Coffee/tea in Chapterhouse, (ground floor)
16.10 - 17.00	**Francesco Salvarani** (Università degli Studi di Pavia) *Modelling gas flows in the lower pulmonary airways* pdf of presentation
19.00	Workshop dinner at Magnum Restaurant, 1 Albany Street (dress informal)

Thursday 11 November 2010

09.30 - 10.20	**Thierry Paul** (CNRS & CMLS, École Polytechnique) *Semiclassical methods with rough potentials*
10.20 - 11.10	**Laurent Desvillettes** (École Normale Supérieure de Cachan) *Infinite-dimensional reaction-diffusion equations, modelling and analysis* pdf of presentation
11.10 - 11.40	Coffee/tea in Chapterhouse (ground floor)
11.40 - 12.30	**Alexander Lorz** (University of Cambridge) *Dirac concentration in a multidimensional nonlocal parabolic equation*
12.30 - 14.00	Lunch break
14.00 - 14.50	**Athanasios Tzavaras** (University of Crete) *Kinetic models for dilute suspensions of rigid rods* pdf of presentation
14.50 - 15.40	**Clemens Heitzinger** (University of Cambridge) *Homogenization and related topics for transport in nano-structures* pdf of presentation
15.40 - 16.10	Coffee/tea in Chapterhouse (ground floor)
16.10 - 17.00	**Armando Majorana** (Università degli Studi di Catania) *A deterministic numerical model for the nonlinear Boltzmann equation* pdf of presentation

Friday 12 November 2010

09.30 - 10.20	**Pierre-Emmanuel Jabin** (University of Nice) *Dynamics of toxic algae in the mediterranean* pdf of presentation
10.20 - 11.10	**Kevin Painter** (Heriot-Watt University) *Amoeboid and mesenchymal migration of cells in the extracellular matrix*
11.10 - 11.40	Coffee/tea in Chapterhouse (ground floor)
11.40 - 12.30	**Anne Nouri** (CMI, Université de Provence) *Well-posedness of a diffusive gyrokinetic model*
12.30	Close of workshop

Presentations:

Presentation Details
Blanchet, Adrien *Asymptotics for the critical mass Keller-Segel model* View Abstract
Cañizo, José Alfredo *Estimates and exponential convergence to equilibrium for the growth-fragmentation equation* View Abstract
Carrillo, José A *Kinetic models for swarming: mean-field limit and qualitative properties* View Abstract
Degond, Pierre *Modelling self-organization in complex systems* View Abstract
Desvillettes, Laurent *Infinite-dimensional reaction-diffusion equations, modelling and analysis* View Abstract
Esposito, Raffaele *Stability and instability of equilibria in a Vlasov-Boltzman binary mixture undergoing a phase transition* View Abstract
Fellner, Klemens *Aggregation-pattern in non-local evolution equation* View Abstract
Fornasier, Massimo *Particle systems and kinetic equations modelling interacting agents in high-dimension* View Abstract
Gwiazda, Piotr *Split-up algorithm in the metric space for the equations of structured population dynamics* View Abstract
Heitzinger, Clemens *Homogenization and related topics for transport in nano-structures* View Abstract
Huang, Zhongyi *Bloch decomposition based method for waves in periodic media* View Abstract
Jabin, Pierre-Emmanuel *Dynamics of toxic algae in the Mediterranean* View Abstract

Lemou, Mohammed

Non linear stability of gravitational systems

View Abstract

Lorz, Alexander

Dirac concentration in a multidimensional nonlocal parabolic equation

View Abstract

Majorana, Armando

A deterministic numerical model for the nonlinear Boltzmann equation

View Abstract

Marra, Rosanna

Hydrodynamic limits for the Boltzmann equation in some slightly compressible cases

View Abstract

Motsch, Sebastien

Mathematical modelling of animal displacements: from microscopic to macroscopic description

View Abstract

Mouhot, Clement

A new quantitative method for the mean-field limit

View Abstract

Nouri, Anne

Well-posedness of a diffusive gyrokinetic model

View Abstract

Painter, Kevin

Amoeboid and mesenchymal migration of cells in the extracellular matrix

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Paul, Thierry

Semiclassical methods with rough potentials

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Collective behaviour of swimming micro-organisms

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View Abstract

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View Abstract

Zubelli, Jorge

Structured population models: direct and inverse problems

View Abstract

Participants

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Blanchet, Adrien	Université de Toulouse
Bournaveas, Nikolaos	University of Edinburgh
Cañizo, José Alfredo	Universitat Autònoma de Barcelona
Carrillo, José A	ICREA & Universitat Autònoma de Barcelona
Chiarcos, Olga	Springer-Verlag GmbH
Crouseilles, Nicolas	INRIA
Degond, Pierre	Imperial College London
Desvillettes, Laurent	École Normale Supérieure de Cachan
Dong, Xuanchun	National University of Singapore
Esposito, Raffaele	Università dell'Aquila
Fedotov, Sergei	University of Manchester
Fellner, Klemens	University of Cambridge
Fornasier, Massimo	RICAM
Gwiazda, Piotr	University of Warsaw
Heitzinger, Clemens	University of Cambridge
Hua, Jiale	Institut de Mathématiques de Toulouse
Huang, Zhongyi	Tsinghua University
Jabin, Pierre-Emmanuel	University of Nice
Lemou, Mohammed	IRMAR, CNRS & Univestité Rennes 1
Leroy-Lerêtre, Mathieu	Université de Toulouse & CNRS
Lorz, Alexander	University of Cambridge
Majorana, Armando	Università degli Studi di Catania
Markowich, Peter	University of Cambridge
Marra, Rosanna	Universita' di Roma Tor Vergata
Martin, Stephan	Technische Universität Kaiserslautern
Motsch, Sebastien	University of Maryland (CSCAMM)
Mouhot,	

Clement	University of Cambridge
Nouri, Anne	CMI, Université de Provence
Painter, Kevin	Heriot-Watt University
Paul, Thierry	École Polytechnique
Pedley, Timothy	University of Cambridge
Perthame, Benoit	Université Pierre et Marie Curie
Salvarani, Francesco	Università degli Studi di Pavia
Tadmor, Eitan	University of Maryland
Tzavaras, Athanasios	University of Crete
Vecil, Francesco	Universitat de Valencia
Watson, Stephen	University of Glasgow
Yang, Xiongfeng	Shanghai Jiao Tong University
Zubelli, Jorge	Instituto Nacional de Matemática Pura e Aplicada