

Collisionless Boltzmann (Vlasov) equation and modeling of self-gravitating systems and plasmas

CIRM, Luminy, Marseille, Oct. 30-Nov. 3, 2017

| | Sunday Oct. 29 | Monday Oct. 30 | Tuesday Oct. 31 | Wednesday Nov. 1 | Thursday Nov. 2 | Friday Nov. 3 | | | |
|-------|-----------------------------|-------------------|--------------------|---------------------|--------------------|------------------|----------------|--------------|--------------|
| 9h00 | | Welcome address | Besse | Teyssier | Sonnendrücker | Taruya | | | |
| 9h20 | | Yoshikawa | | | | Mehrenberger | Shandarin | Imadera | Colombi |
| 9h40 | | | Skiff | Kraus | | | | | Ogiya |
| 10h00 | | | | | | | | | |
| 10h20 | | Coffee break | Coffee break | Coffee break | Coffee break | Coffee break | | | |
| 10h50 | | Morrison | Grandgirard | Hahn | Tronko | Mocz | | | |
| 11h10 | | | | | | | | | Besse II |
| 11h30 | | Vittot | Mauser | Sousbie | Abel | Kopp | | | |
| 11h50 | | Barré | Saffirio | | Miot | Round table | | | |
| 12h10 | | Pegoraro | Di Troia | | Suto | | Ambrus | | |
| 12h30 | | Lunch | Lunch | Lunch | Lunch | Lunch | | | |
| 13h45 | | | Group photo | | | | | | |
| 14h00 | | Jabin | Bénisti | Free discussions | Binney | | | | |
| 14h20 | | | | | | | | | |
| 14h40 | | | | | | | Pickl | Figotin | Perez |
| 15h00 | | | | | | | Yamaguchi | Brull | Hozumi |
| 15h20 | | | | | | | Beraldo | Bardos | Vasiliev |
| 15h40 | | | | | | | Hosseini Jenab | Casetti | Nuñez |
| 16h00 | | | | | | | Coffee break | Coffee break | Coffee break |
| 16h30 | Bertschinger | | | | | | Touma | Dellar | |
| 16h50 | Després | | | | | | | | |
| 17h10 | Welcome at CIRM until 23h00 | | | | | | Manfredi | Chavanis | Pezzi |
| 17h30 | | Andréasson | Fouvry | Lesur | | | | | |
| 17h50 | | Ribeiro | Brenig | Vlad | | | | | |
| 18h10 | | Poster session | Rocha Filho | Spineanu | | | | | |
| 18h30 | | | | | | | | | |
| 19h00 | Aperitif | | | | | | | | |
| 19h30 | Cold dinner until 22h00 | Dinner | Dinner | Dinner | Conference Dinner | | | | |
| 21h00 | | | Concert | | | | | | |

| | Sunday Oct. 29 | Monday Oct. 30 |
|-------|------------------------------------|---|
| 9h00 | | Welcome address |
| 9h20 | | Kohji Yoshikawa: <i>Vlasov-Poisson simulation of collisionless self-gravitating systems and its application to cosmological neutrinos in the large-scale structure of the universe</i> |
| 10h00 | | Fred Skiff: <i>On putting experimental data into the Vlasov-Poisson equations</i> |
| 10h20 | | Coffee break |
| 10h50 | | Phil Morrison: <i>The Continuum Hamiltonian Hopf bifurcation of Vlasov theory</i> |
| 11h30 | | Michel Vittot: <i>A geometrical version of the Maxwell-Vlasov Hamiltonian structure</i> |
| 11h50 | | Julien Barré: <i>Bifurcations of Vlasov equation</i> |
| 12h10 | | Francesco Pegoraro: <i>Action principle for relativistic magnetohydrodynamics</i> |
| 12h30 | | Lunch |
| 14h00 | | Pierre-Emmanuel Jabin: <i>Quantitative estimate of propagation of chaos for stochastic systems with $W^{1,\infty}$ kernels</i> |
| 14h40 | | Peter Pickl: <i>Microscopic derivation of the Vlasov equation</i> |
| 15h00 | | Yoshiyuki Yamaguchi: <i>Relaxation and long-time correlation of finite-size fluctuation in thermal equilibrium</i> |
| 15h20 | | Leandro Beraldo e Silva: <i>The arrow of time in the collapse of collisionless self-gravitating systems: non-validity of the Vlasov-Poisson equation during violent relaxation</i> |
| 15h40 | | Seyyed Mehdi Hosseini Jenab: <i>Vlasov simulation study of mutual collisions of ion-acoustic solitons: transition between kinetic and fluid regimes</i> |
| 16h00 | | Coffee break |
| 16h30 | | Edmund Bertschinger: <i>Chaos and the Vlasov equation</i> |
| 16h50 | | Bruno Després: <i>Scattering structure of Vlasov equations around inhomogeneous Boltzmannian states</i> |
| 17h10 | Welcome at CIRM until 23h00 | Giovanni Manfredi: <i>Cosmology in one dimension: Vlasov dynamics</i> |
| 17h30 | | Håkan Andréasson: <i>Approximating gravitational collapse for dust with Vlasov matter</i> |
| 17h50 | | Bruno Ribeiro: <i>Brownian regime of finite-N corrections in the XY hamiltonian mean field model</i> |
| 18h10 | | Poster session |
| 19h00 | Cold dinner until 22h00 | Aperitif |
| 19h30 | | Dinner |

Poster session

Oct. 30

- 18h10 **Mohamad Ansari Fard:** *Late time sky as a probe of steps and oscillations in primordial Universe*
- 18h12 **Marcel Braukhoff:** *Global existence of a solution of the Vlasov-Dirac-Benney equation with a small linear relaxation time collision operator*
- 18h14 **Pierfrancesco Di Cintio:** *Dynamics and relaxation of N-body systems with long-range interactions*
- 18h16 **Erwan Deriaz:** *Six-dimensional adaptive hierarchical basis for Vlasov equations*
- 18h18 **Paola Domínguez Fernández:** *Evolution of inhomogeneities on a Dark Matter halo with the Vlasov equation using a TVD scheme*
- 18h20 **Anaëlle Halle:** *Phase-space structure of self-gravitating collisionless spherical systems*
- 18h22 **Julien Medina:** *Test particles dynamics in low-frequency tokamak turbulence*
- 18h24 **Damien Minenna:** *Degree-of-freedom reduction for nonlinear N-body wave-particle interaction*
- 18h26 **Robert Axel Neiss:** *Generalized symplectization of Vlasov dynamics and application to the Vlasov-Poisson system*
- 18h28 **Jerôme Perez (for Nuritdinov et al.):** *Modelling of self-gravitating systems: pulsating versions and their instabilities*
- 18h30 **Dragos Iustin Palade:** *Non-equilibrium hydrodynamic pressure tensors from kinetic perspectives*
- 18h32 **Devon Powell:** *Adaptive beam tracing: radiation transport and synthetic observations of the CDM phase-space sheet*
- 18h34 **Bruno Ribeiro:** *Kinetic limit of wave-particle self-consistent interaction in an open domain*
- 18h36 **Shohei Saga:** *Analysis of the phase-space structure in the pre-collapse perturbation theory*
- 18h38 **Alicia Simon-Petit:** *What is isochrony in 3D static potentials?*
- 18h40 **Emanuele Tassi:** *A reduced Landau fluid model for collisionless magnetic reconnection*
- 18h42 **Pallavi Trivedi:** *Vlasov simulations of driven electrostatic phase space vortices in a 1-D electron-ion plasma*

| Tuesday Oct. 31 | |
|--------------------|--|
| 9h00 | Nicolas Besse: <i>A partial review of semi-Lagrangian methods for the Vlasov equation</i> |
| 9h40 | Michel Mehrenberger: <i>About recurrence time for a semi Lagrangian discontinuous Galerkin Vlasov solver</i> |
| 10h00 | Michael Kraus: <i>Discontinuous Galerkin variational integrators</i> |
| 10h20 | Coffee break |
| 10h50 | Virginie Grandgirard: <i>Gyrokinetic simulations of magnetic fusion plasmas</i> |
| 11h30 | Norbert Mauser: <i>The quantum Vlasov equation</i> |
| 11h50 | Chiara Saffirio: <i>Lagrangian solutions to the Vlasov-Poisson system with a point charge</i> |
| 12h10 | Claudio Di Troia: <i>Non-perturbative guiding center transformation: the gyro-phase is the <i>Kaluza-Klein</i> 5th dimension</i> |
| 12h30 | Lunch |
| 13h45 | Group photo |
| 14h00 | Didier Bénisti: <i>Analytic results for the Vlasov-Gauss system pertaining to nonlinear wave propagation in a plasma</i> |
| 14h40 | Alexander Figotin: <i>Lagrangian formalism for electron beam interacting with multi-transmission line</i> |
| 15h00 | Stéphane Brull: <i>Angular moment models for plasma physics</i> |
| 15h20 | Claude Bardos: <i>The Maxwell-Boltzmann approximation for ion kinetic modeling</i> |
| 15h40 | Lapo Casetti: <i>Nonequilibrium states with temperature inversion in long-range interacting systems</i> |
| 16h00 | Coffee break |
| 16h30 | Jihad Touma: <i>Secular collisionless dynamics around massive central bodies</i> |
| 17h10 | Pierre-Henri Chavanis: <i>Kinetic theory of stellar systems</i> |
| 17h30 | Jean-Baptiste Fouvry: <i>Finite-N effects and secular evolution of self-gravitating systems</i> |
| 17h50 | Léon Brenig: <i>About the convergence of the kinetic equation for gravitational and Coulomb systems</i> |
| 18h10 | Tarcisio Rocha Filho: <i>Vlasov equation and violent relaxation – the self-gravitating ring model</i> |
| 19h30 | Dinner |
| 21h00 | Concert |

| Wednesday Nov. 1 | |
|---------------------|---|
| 9h00 | Romain Teyssier: <i>High performance N body simulations for modelling large scale structures in the universe</i> |
| 9h40 | Sergei Shandarin: <i>Tracing the dark matter web</i> |
| 10h20 | Coffee break |
| 10h50 | Oliver Hahn: <i>Simulating the collisionless dynamics of dark matter</i> |
| 11h30 | Thierry Sousbie: <i>ColdICE: 6D collisionless phase space hydrodynamics using a Lagrangian tessellation</i> |
| 12h10 | Yasushi Suto: <i>Non-sphericity of collisionless gravitating systems in the universe</i> |
| 12h30 | Lunch |
| 14h00 | Free discussions |
| 19h30 | Dinner |

| Thursday Nov. 2 | |
|--------------------|---|
| 9h00 | Eric Sonnendrücker: <i>Geometric electromagnetic PIC models</i> |
| 9h40 | Kenji Imadera: <i>5D full-f gyrokinetic simulation for ion turbulence and transport barrier in tokamak plasmas</i> |
| 10h20 | Coffee break |
| 10h50 | Natalia Tronko: <i>Second order Hamiltonian gyrokinetic models for particle-in-cell codes</i> |
| 11h30 | Tom Abel: <i>Simplex in cell techniques for Vlasov-Poisson and Vlasov-Maxwell modeling</i> |
| 11h50 | Evelyne Miot: <i>The gyrokinetic limit for the Vlasov-Poisson system with a point charge</i> |
| 12h10 | Victor Ambrus: <i>Lattice Boltzmann models for rarefied flows</i> |
| 12h30 | Lunch |
| 14h00 | James Binney: <i>Angle-action coordinates for resonantly trapped orbits</i> |
| 14h40 | Jérôme Perez: <i>Why isochrony in self-gravitating systems evolution?</i> |
| 15h00 | Shunsuke Hozumi: <i>Phase-space evolution of merging collisionless stellar systems reproduced with a self-consistent field method</i> |
| 15h20 | Eugene Vasiliev: <i>Beyond collisionless Boltzmann equation: when relaxation is important</i> |
| 15h40 | Darío Núñez: <i>On the equilibrium states of the distribution function</i> |
| 16h00 | Coffee break |
| 16h30 | Paul Dellar: <i>Studying the nonlinear suppression of Landau damping in the Vlasov-Poisson system using Hermite mode fluxes in a Fourier-Hermite spectral representation</i> |
| 17h10 | Oreste Pezzi: <i>Collisional dissipation of fine velocity structures in weakly collisional plasmas</i> |
| 17h30 | Maxime Lesur: <i>Transport driven by velocity-space structures in toroidal plasmas</i> |
| 17h50 | Madalina Vlad: <i>Hidden drifts and turbulence evolution</i> |
| 18h10 | Florin Spineanu: <i>Singular states of the 2D Euler fluid and of the density of eigenvalues of random matrices</i> |
| 19h30 | Conference Dinner |

| | Friday Nov. 3 |
|--------------|---|
| 9h00 | Atsushi Taruya: <i>Perturbative description of Vlasov-Poisson system in cosmology: approaching and going beyond shell-crossing</i> |
| 9h20 | Stéphane Colombi: <i>Solving Vlasov-Poisson equations with a “metric” approach</i> |
| 9h40 | Go Ogiya: <i>What sets the central density structure of dark matter halos?</i> |
| 10h00 | Jens Stücker: <i>The complexity of the dark matter sheet</i> |
| 10h20 | Coffee break |
| 10h50 | Philip Mocz: <i>Solving Vlasov-Poisson dynamics on an integer lattice</i> |
| 11h10 | Nicolas Besse: <i>On regularity of weak solutions of the relativistic Vlasov-Maxwell system</i> |
| 11h30 | Michael Kopp: <i>Solving the Vlasov equation in 2D with Schrödinger method</i> |
| 11h50 | Round table |
| 12h30 | Lunch |