



SHOCK Workshop on Heliospheric Plasma Kinetics: Simulation vs. Data

Monday 12th May - Wednesday 14th May 2014

Department of Physics & Astronomy,
University of Florence, Arcetri (Florence), Italy

SHOCK.

SOLAR AND HELIOSPHERIC COLLISIONLESS KINETICS

Organised by **Prof. David Burgess**
Astronomy Unit
School of Physics and Astronomy
Queen Mary, University of London
EU FP7 Project SHOCK Coordinator
<http://project-shock.eu/>



Programme

Day 1: Monday 12th May 2014

09:30-10:00	REGISTRATION	
10:00-10:30	David Burgess Queen Mary University of London	Introduction – Project SHOCK
10:30-11:00	Roberto Bruno Istituto Fisica Spazio Interplanetario	On the Frequency Break Between Fluid and Kinetic Regimes in Solar Wind Fluctuations During Radial Expansion
11:00-11:30	REFRESHMENTS	
11:30-12:00	Andrea Verdini Università degli Studi Firenze	Impact of cascade anisotropy and expansion anisotropy on the solar wind turbulent spectrum
12:00-12:30	Petr Hellinger Astronomical Institute – Ondrejov/Prague	Protons and alpha particles in the expanding solar wind
12:30-13:00	Luca Del Zanna Università degli Studi Firenze	Parametric decay of parallel and oblique Alfvén waves: multidimensional MHD simulations within the expanding box model
13:00-14:15	LUNCH	
14:15-15:15	Mr Jiri Vizdal Sprinx Systems, a.s.	The SHOCK project VML (Virtual Mission Laboratory) portal: Current status
15:15-15:45	REFRESHMENTS	
15:45-16:30	Luca Sorriso-Valvo LICRYL - INFN/CNR	Small scales processes in solar wind turbulence
16:30-17:00	Christopher Chen Imperial College London	Measurements of Kinetic Scale Turbulence in the Solar Wind
17:00	END OF DAY ONE	

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Day 2: Tuesday 13th May 2014

09:00-09:45	Marco Velli JPL, USA	Solar Probe Plus - future challenges in Solar Wind physics (TBC)
09:45-10:30	Stuart Bale SSL, UCB, USA	Solar wind electron measurements - The SPP/FIELDS experiment
10:30-11:00	Simone Landi Università degli Studi Firenze	Can the electron heat flux be collisional at 1AU? Results from kinetic simulations
11:00-11:30	REFRESHMENTS	
11:30-12:00	Lorenzo Matteini Imperial College London	Kinetic instabilities driven by secondary species in space plasmas
12:00-12:45	Christian Mazelle IRAP/CNRS, Toulouse	Recent results on terrestrial shock and foreshock by Cluster
12:45-14:15	LUNCH	
14:15-14:45	Pierre-Louis Sulem CNRS Lagrange, Observatoire de la Côte d' Azur	Fluid simulations of collisionless plasmas at the ion scales
14:45-15:15	Thierry Passot CNRS Observatoire de la Côte d' Azur	Fluid modeling for ion scale plasmas
15:15-15:45	REFRESHMENTS	
15:45-16:15	Peter Gingell Queen Mary University of London	Evolution of 3D ion-scale current sheets in the solar wind: temperature anisotropy, tearing and drift-kink instabilities
16:15-16:45	Thomas Neukirch University of St Andrews	Force-free collisionless current sheets: an overview
16:45-17:15	Fiona Wilson University of St Andrews	Preliminary results of PIC simulations of collisionless force-free current sheets
17:15	END OF DAY TWO	

20:00 Workshop Dinner at Trattoria Omero," Arcetri

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Day 3: Wednesday 14th May 2014

09:00-09:30	Torbjorn Sundberg Queen Mary University of London	Cyclic reformation of Mercury's quasi-parallel bow shock
09:30-10:00	Filippo Pantellini CNRS Observatoire de Paris	MHD simulations of the solar wind - Mercury interaction
10:00-10:30	Simone Landi Università degli Studi Firenze	Two-dimensional hybrid simulations of Alfvénic fluctuations in the expanding solar wind
10:30-10:45	David Burgess Queen Mary University of London	A model for sub-proton scale magnetic holes
10:45-11:00	Torbjorn Sundberg Queen Mary University of London	Cluster observations of sub-proton scale magnetic holes in the plasma sheet
11:00	REFRESHMENTS	
11:30-12:00	Discussion	Workshop summary and future work
12:00	END OF DAY THREE	

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Synopsis

State of the art computer simulations are increasingly revealing the central role played by kinetic plasma physics in all aspects of the Sun-Heliosphere system: solar wind heating and acceleration, interaction of the solar wind and planetary magnetospheres, shocks and particle acceleration. At the same time there is a growing repository of data sets from spacecraft missions.

Attendees

This workshop will bring together members of the SHOCK consortium and experts in observational space plasma physics to explore collaborations for the extended use of modern simulations as a tool for enhanced data analysis.

Attendance is by invitation only. Please contact Prof. David Burgess (d.burgess@qmul.ac.uk) if you are interested in attending.

Information on SHOCK

SOLAR AND HELIOSPHERIC COLLISIONLESS KINETICS (SHOCK) is a project funded by the European Commission – Space – FP7 and aims to provide a focus for the increased use of kinetic simulations in enhancing space data analysis for European Space Agency (ESA) missions such as Cluster, Cassini, Ulysses, Helios, and Solar Orbiter, and also for international missions such as Themis, MMS, Solar Probe Plus, etc.

More information on the project can be found at: <http://project-shock.eu/home/>.

Venue

Department of Physics & Astronomy, University of Florence, Arcetri (Florence), Italy.

The workshop will be held in "Aula A", in the Garbasso Building of the Department of Physics and Astronomy of the University of Florence. This is located on the hill of Arcetri in Florence (see map). The address of the main gate is Largo Enrico Fermi 2, Florence, then you should walk or drive to the building at the top of the big old stairs that you will find shortly after the gate. Don't go too uphill to the Observatory, that is a long uphill walk to the wrong place. Stop at the Department!

Local information, hotels and directions to the venue can be found at: <http://www.astro.unifi.it/intro/info/index.html> and on the SHOCK website: <http://project-shock.eu/project-shock/events-meetings/shock-workshop-on-heliospheric-plasma-kinetics-sim/>

Fees

The workshop fee is 130 euros for the 2 ½ days to be paid by cash only upon arrival on Monday 12th May.

The workshop fee includes: refreshment breaks, 2 lunches and the social dinner on Tuesday 13th May 2014. If you do not wish to stay for the dinner please let the organiser know.

Participants list

Title	Name	Affiliation	Country
Prof	Stuart Bale	SSL, UCB	USA
Mr	Francesco Boffa	School of Physics and Astronomy, Queen Mary University of London	UK
Prof	Roberto Bruno	Istituto Fisica Spazio Interplanetario - INAF	Italy
Prof	David Burgess	School of Physics and Astronomy, Queen Mary University of London	UK
Dr	Christopher Chen	Faculty of Natural Sciences, Department of Physics. Imperial College London	UK
Dr	Luca Del Zanna	Dipartimento di Fisica e Astronomia, Università degli Studi Firenze	Italy
Dr	Peter Gingell	School of Physics and Astronomy, Queen Mary University of London	UK
Dr	Petr Hellinger	Astronomical Institute of the Academy of Sciences of the Czech Republic, Ondrejov/Prague	Czech Republic
Mr	Jindrich Kovar	Sprinx Systems, a.s., Prague	Czech Republic
Dr	Simone Landi	Dipartimento di Fisica e Astronomia, Università degli Studi Firenze	Italy
Dr	Lorenzo Matteini	Imperial College London	UK
Dr	Christian Mazelle	IRAP/CNRS Toulouse	France
Prof	Thomas Neukirch	Solar and Magnetospheric MHD Theory Group, School of Mathematics and Statistics, University of St Andrews	UK
Dr	Filippo Pantellini	LESIA, Observatoire de Paris, CNRS, UPMC, Université Paris Diderot, Meudon	France
Dr	Thierry Passot	CNRS, Laboratoire J.-L. Lagrange, UMR 7293, UNS, CNRS, Observatoire de la Côte d'Azur, Nice	France
Dr	Pierre-Louis Sulem	CNRS, Laboratoire J.-L. Lagrange, UMR 7293, UNS, CNRS, Observatoire de la Côte d'Azur, Nice	France
Dr	Torbjorn Sundberg	School of Physics and Astronomy, Queen Mary University of London	UK
Dr	Luca Sorriso-Valvo	Liquid Crystal Laboratory, LICRYL - INFN/CNR, Dipartimento di Fisica – Univ. della Calabria	Italy
Prof	Marco Velli	JPL	USA
Dr	Andrea Verdini	Dipartimento di Fisica e Astronomia, Università degli Studi Firenze	Italy
Mr	Jiri Vizdal	Sprinx Systems, a.s., Prague	Czech Republic
Dr	Fiona Wilson	Solar and Magnetospheric MHD Theory Group, School of Mathematics and Statistics, University of St Andrews	UK