

INSTITUT d'ETUDES
SCIENTIFIQUES de Cargèse

2011

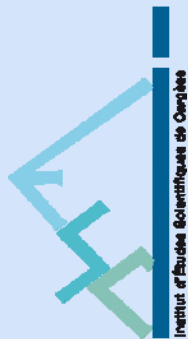
PROGRAMME
et
Projets

**Direction
scientifique:**
Giovanna Chimini
giovanna.chimini@iesc.univ-corse.fr

Contact:
Dominique Donzella
Institut d'études
scientifiques
Ménasina
20130 Cargèse
tel. +33 (0)4 95 26 80 40
dominique.donzella@iesc.univ-corse.fr



www.iesc.univ-corse.fr



Programme des rencontres et écoles 2011

- 21 mars - 23 mars** **What you need to know to be effective in publishing your work**
Hochberg Michael (Inst. des sciences de l'évolution Montpellier)
- 28 mars - 2 avr** **Ecole Technique IN2P3**
Patrick Nayman (IN2P3 - Paris)
- 4 avr - 16 avr** **Heterogeneous quantum rod and quantum dot nanomaterials Summer School**
Bruno Grandidier (IEMN - Lille)
- 18 avr - 23 avr** **Univers jeune : Enrichissement du milieu intergalactique et étoiles de Pop III**
Elisabeth Vangioni (Inst. Astrophysique de Paris)
- 25 avr - 30 avr** **Transits, Eclipses et Occultations en Astronomie**
Jean Souchay (Syrte Obs. de Paris)
- 25 avr - 30 avr** **Search and Exploration**
Gleb Oschanin (LPTMC - Paris)
- 2 mai - 7 mai** **Recent Developments in Wave Physics of Complex Media**
Mathias Fink (LOA ESPCI - Paris)
- 9 mai - 14 mai** **SW5 : New topics in modern cosmology**
Roland Triay (Centre de Physique Théorique Luminy - Marseille)
- 9 mai - 14 mai** **Passive imaging in wave physics from seismology to ultrasound**
Michel Campillo, Philippe Roux (LGIT Maison des Géosciences - Grenoble)
- 16 mai - 21 mai** **ESNIE 2011**
Eric Brousseau (Univ. Paris X)
- 23 mai - 28 mai** **Gravitational Waves: from theory to experiment**
Gérard Auger (Univ. Paris VII)
- 30 mai - 11 juin** **Disordered Systems: From Condensed-Matter Physics to Ultracold Atomic Gases**
Thierry Giamarchi (DCMC - MaNEP - Genève)
- 15 juin - 18 juin** **Comité exécutif du programme bâtiment et collectivités de l'AIE**
Pierre Héran (ADEME - Valbonne)
- 20 juin - 2 juil** **Dynamic Organization and Function of Biomembranes**
Geritt Van Meer (Utrecht University - Pays Bas)
- 4 juil - 16 juil** **Institut d'Ete de Physique et Mathématique(PhyMSI) : «Double Affine Hecke algebras, the Langlands, Program, Super Yang-Mills theories and AdS-CFT correspondence»**
Vladimir Kazakov (ENS - Paris)
- 18 juil - 30 juil** **Morphologie et dynamique des écoulements anisotropes**
Luminata Danaila (Lab. Coria - St Etienne du Rouvray)
- 1 août - 13 août** **ICAM School on emergent phenomena in correlated electron system**
Marino Marcy (Univ. Paris Sud - Orsay)
- 15 août - 27 août** **International Workshop on Electronic Crystals, ECRYS-2011**
Serguei Brazovskii (Univ. Paris Sud - Orsay)
- 29 août - 10 sept** **5ème International Summer School on Surface Ocean-Lower Atmosphere Study**
Véronique Garçon (LEGOS - Toulouse)
- 12 sept - 24 sept** **Algèbres (de Hecke, de Cherednik et amassées) et Théorie des Représentations**
Michel Broué (Univ. Paris Diderot - Paris)
- 12 sept - 24 sept** **The Scope of Unconscious Cognition**
Bert Timmermans (Univ. libre de Bruxelles)
- 26 sept - 01 oct** **Modélisations physiques et numériques pour les écoulements multiphasiques**
Bernard Rebourcet, Daniel Bouche (CEA - Arpaçon)
- 28 sept. - 01 oct** **Les rencontres de Cargèse : économie, gestion et sociologie de l'innovation**
Michel Poix (IMRI - Paris Dauphine)
- 03 oct - 15 oct** **International school on oxide electronics**
Manuel Bibes (Thalès - Palaiseau)
- 17 oct - 22 oct** **Paléogénomique**
Eva-Maria Geigl (Inst. Jacques Monod - Paris)



Programme par thématique 2011

MATHÉMATIQUES, PHYSIQUES, PLANÈTES ET UNIVERS

Mathématiques et outils de modélisation

- 23 mai - 28 mai **Gravitational Waves: from theory to experiment**
Gérard Auger, Univ. Paris VII
contact : auger@apc.univ-paris7.fr
- 4 juil - 16 juil **Institut d'Été de Physique et Mathématique(PhyMSI) :
« Double Affine Hecke algebras, the Langlands Program,
Super Yang-Mills theories and AdS-CFT correspondence »**
Dimitri Kazakov ENS - Paris
contact : kazakov@lpt.ens.fr
- 26 sept - 1 oct **Modélisations physiques et numériques pour les
écoulements multiphasiques**
Daniel Bouche, Bernard Rebourec CEA - Arpajon
contact : daniel.bouche@cea.fr
- 20 sept - 25 sept **Algèbres (de Hecke, de Cherednik et amassées) et Théorie
des Représentations**
Michel Broué Université Paris-Diderot - Paris
contact : broue@math.jussieu.fr

Matière condensée: organisation et dynamique

- 9 mai - 14 mai **Passive imaging in wave physics from seismology to
ultrasound**
Michel Campillo, Philippe Roux, Maison des Géosciences - Grenoble
contact : michel.campillo@obs.ujf-grenoble.fr
- 13 sept - 18 sept **International Workshop on Electronic Crystals, ECRYS-2011**
Serguei Brazovskii, Univ. Paris-Sud - Paris
contact : brazov@lptms.u-psud.fr

Matière condensée : Structures et propriétés électroniques

- 4 avril - 16 avril **Heterogeneous quantum rod and quantum dot
nanomaterials Summer School**
Bruno Grandidier IEMN - CNRS - Lille
contact : bruno.grandidier@isen.iemn.univ-lille.fr
- 30 mai - 11 juin **Disordered Systems: From Condensed-Matter Physics to
Ultracold Atomic Gases**
Thierry Giamarchi, DCMC-MaNEP - Geneve
contact : thierry.giamarchi@unige.ch

- 1 août - 13 août **ICAM School on emergent phenomena in correlated electron systems**
Marino Marcy, Université Paris-Sud - Orsay
contact : alloul@lps.u-psud.fr
- 13 sept - 18 sept **International Workshop on Electronic Crystals, ECRYS-2011**
Serguei Brazovskii, Univ. Paris-Sud - Paris
contact : brazov@lptms.u-psud.fr
- 3 oct - 15 oct. **International School on Oxide Electronics**
Manuel Bibes, Thales Research and Technology - Palaiseau
Contact : manuel.bibes@thalesgroup.com

Mécanique - Génie des matériaux - Acoustique

- 2 mai - 7 mai **Acoustical imaging of complex media : applications in medicine , seismology and Oceanography**
Mathias Fink, LOA ESPCI - Paris
Contact : mathias.fink@espci.fr
- 9 mai - 14 mai **Passive imaging in wave physics from seismology to ultrasound**
Michel Campillo, Philippe Roux, Maison des Géosciences - Grenoble
contact : michel.campillo@obs.ujf-grenoble.fr
- 15 juin - 18 juin **Comité exécutif du programme bâtiment et collectivités de l'AIE**
Pierre Hérant ADEME - Valbonne
contact : pierre.herant@ademe.fr

Phénomènes physiques, théories et modèles

- 25 avr - 30 avr **Search and Exploration**
Gleb Oshanin, LPTMC Univ. Pierre et Marie Curie - Paris
contact : Gleb.oshanin@gmail.com
- 23 mai - 28 mai **Gravitational Waves: from theory to experiment**
Gérard Auger, Univ. Paris VII
contact : auger@apc.univ-paris7.fr
- 13 sept - 18 sept **International Workshop on Electronic Crystals, ECRYS-2011**
Serguei Brazovskii, Univ. Paris-Sud - Paris
contact : brazov@lptms.u-psud.fr
- 20 sept - 25 sept **Morphologie et dynamique des écoulements anisotropes**
Luminata Danaila, Lab. CORIA - Paris
contact : luminata.danaila@coria.fr
- 3 oct - 15 oct. **International School on Oxide Electronics**
Manuel Bibes, Thales Research and Technology - Palaiseau
Contact : manuel.bibes@thalesgroup.com

Atomes et molécules - Optique et laser - Plasma chauds

- 30 mai - 11 juin **Disordered Systems: From Condensed-Matter Physics to Ultracold Atomic Gases**
Thierry Giamarchi, DCMC-MaNEP - Geneve
contact : thierry.giamarchi@unige.ch

Système solaire et univers lointain

18 avr - 23 avr **Univers jeune : Enrichissement du milieu intergalactique et étoiles de Pop III**

Elisabeth Vangioni, Patrick Petitjean, Inst. d'astrophysique - Paris
contact : vangioni@iap.fr

25 avr - 30 avr **Transits, Eclipses et Occultations en Astronomie**

Jean Souchay, Observatoire Paris SYRTE, Paris
contact : jean.souchay@obspm.fr

9 mai - 14 mai **SW5 : New topics in modern cosmology**

Roland Triay, Centre de physique théorique - Marseille
contact : triay@cpt.univ-mrs.fr

Electronique, semi-conducteurs - Photonique - Génie électrique

2 mai - 7 mai **Acoustical imaging of complex media : applications in medicine , seismology and Oceanography**

Mathias Fink, LOA ESPCI - Paris
Contact : mathias.fink@espci.fr

Elaboration, caractérisation et modélisation du solide

4 avril - 16 avril **Heterogeneous quantum rod and quantum dot nanomaterials Summer School**

Bruno Grandidier IEMN - CNRS - Lille
contact : bruno.grandidier@isen.iemn.univ-lille.fr

Thérapeutique et médicaments : concepts et moyens

2 mai - 7 mai **Acoustical imaging of complex media : applications in medicine , seismology and Oceanography**

Mathias Fink, LOA ESPCI - Paris
Contact : mathias.fink@espci.fr

Planète Terre : enveloppes superficielles

9 mai - 14 mai **Passive imaging in wave physics from seismology to ultrasound**

Michel Campillo, Philippe Roux, Maison des Géosciences - Grenoble
contact : michel.campillo@obs.ujf-grenoble.fr

29 août - 10 sept **5ème International Summer School on Surface Ocean-Lower Atmosphere Study**

Véronique Garçon, LEGOS - Toulouse
Contact : veronique.garcon@legos.obs-mip.fr

Biomolécules : structure et mécanismes d'action

25 avr - 30 avr **Search and Exploration**

Gleb Oshanin, LPTMC Univ. Pierre et Marie Curie - Paris
contact : Gleb.oshanin@gmail.com

20 juin - 2 juil **Dynamic Organization and Function of Biomembranes**
Geritt Van Meer, Utrecht University - Pays-Bas
contact : j.a.f.opdenkamp@uu.nl

Biomolécules : relations structure—Fonction

20 juin - 2 juil **Dynamic Organization and Function of Biomembranes**
Geritt Van Meer, Utrecht University - Pays-Bas
contact : j.a.f.opdenkamp@uu.nl

SCIENCES HUMAINES ET SOCIALES

Economie et société

31 oct - 5 nov **Les rencontres de Cargèse : économie, gestion et sociologie de l'innovation**
Michel Poix IMRI Paris
contact : stephanie.pitoun@dauphine.fr

16 mai - 21 mai **ESNIE 2011**
Eric Brousseau Univ. Paris 10
contact : maria.breidy@u-paris10.fr

12 sept - 24 sept **The Scope of Unconscious Cognition**
Bert Timmermans, Univ. libre de Bruxelles
Contact : thedudesupreme@gmail.com

SCIENCES DU VIVANT

Biologie cellulaire - Virus et parasites

20 juin - 2 juil **Dynamic Organization and Function of Biomembranes**
Geritt Van Meer, Utrecht University - Pays-Bas
contact : j.a.f.opdenkamp@uu.nl

Interactions cellulaires

20 juin - 2 juil **Dynamic Organization and Function of Biomembranes**
Geritt Van Meer, Utrecht University - Pays-Bas
contact : j.a.f.opdenkamp@uu.nl

Diversités biologiques, population, écosystèmes et évolution

25 avr - 30 avr **Search and Exploration**
Gleb oshanin, LPTMC Univ. Pierre et Marie Curie - Paris
contact : Gleb.oshanin@gmail.com

Fonctions mentales - Neurosciences intégratives - Comportements

12 sept - 24 sept **The Scope of Unconscious Cognition**
Bert Timmermans, Univ. libre de Bruxelles
Contact : thedudesupreme@gmail.com

INSTITUT NATIONAL DE PHYSIQUE DES PARTICULES ET DE PHYSIQUE NUCLÉAIRE

Des particules et des noyaux

18 avr - 23 avr **Univers jeune : Enrichissement du milieu intergalactique
et étoiles de Pop III**

Elisabeth Vangioni, Patrick Petitjean, Inst. d'astrophysique - Paris
contact : vangioni@iap.fr

19 juil - 31 juil **Ecole technique IN2P3**

Patrick Nayman, LPNHE Jussieu - Paris
contact : nayman@in2p3.fr

SCIENCES ET TECHNOLOGIES DE L'INFORMATION ET DE L'INGENIERIE

**Sciences et technologies de l'information (informatique, automatique,
traitement du signal)**

26 sept - 1 oct **Modélisations physiques et numériques pour les
écoulements multiphasiques**

Daniel Bouche, Bernard Rebourcet CEA - Arpajon
contact : daniel.bouche@cea.fr

Programme des conférences en 2011

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Timmermans Bert, <i>Univ. de Bruxelles - Bruxelles</i> The Scope of Unconscious Cognition	<i>12 sept - 24 sept</i>	<i>Page 20</i>
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GRAVITATIONEL WAVES: FROM THEORY TO EXPERIMENT

23/05/2011 - 28/05/2011

G rard Auger auger@apc.univ-paris7.fr

APC Bat. Condorcet 10 rue A.Domon et L.Duget 75013 Paris

SCIENTIFIC BOARD

Bernard Schutz	Max Planck Institute for Gravitational	Bernard.Schutz@aei.mpg.de
Ericourgoulhon	LUTH Observatoire de Meudon	Eric.Gourgoulhon@obspm.fr
Frederique Marion	LAPP Annecy	marion@lapp.in2p3.fr
G�rard Auger	APC Paris	auger@apc.univ-paris7.fr
Karsten Danzmann	Albert-Einstein-Institut Hannover	danzmann@aei.mpg.de
Neil Cornish	Montana State University	cornish@physics.montana.edu

La description th orique des ondes gravitationnelles fait appel   la relativit  g n rale introduite par Albert Einstein. Bien que de nombreux efforts techniques aient  t  faits pour les d tecter, aucune d tection directe n'a encore eu lieu. Il n'emp che que leur existence  t  prouv es indirectement par Hulse et Taylor (Prix Nobel 1993).

Depuis maintenant quelques ann es des grands interf rom tres terrestres tels que VIRGO en Italie, LIGO aux U.S.A, GEO en Allemagne et TALMA au Japon ont fait des progr s techniques cons quents et devraient dans les ann es   venir obtenir leurs premi res d tection. Parall lement, un grand d tecteur spatial (LISA) est en cours d' tude pour  tre r alis  conjointement par l'Europe et les U.S.A. Il serait ainsi compl mentaire dans le domaine en fr quence des observatoires terrestres.

Outre leurs int r ts purement th oriques les ondes gravitationnelles ouvrent un nouveau champ d'investigation du cosmos. En effet, elles ne sont pas d vi es et peu absorb es et permettent donc l'observation de ph nom nes tr s lointains.

L'ann e 2011 sera une p riode faste dans ce domaine, outre le fait que l'ensemble des d tecteurs terrestres seront en pleine activit , la mission de d monstration technologique de LISA (LISAPathfinder) sera en orbite.

Le programme propos  ici couvrira tous les aspects des ondes gravitationnelles, de la th orie   l'analyse des signaux en passant par les syst mes de d tection.

De 14h   16h heures : Discussion informelle sur les cours pr c dents.

Cours 1 (4h30) General Relativity and Gravitational waves.

Cours 2 (3h30) Sources of Gravitational waves.

Cours 3 (6h00) Modes of Gravitational waves.

Cours 4 (6h00) Gravitational waves and cosmology.

Cours 5 (3h30) Data analysis.

Cours 6 (3h30) Detection of Gravitational waves.

Cours 7 (1h30) Multimessengers

and 3 Seminars : a) Multimessengers, b) EMRI : a difficult problem, c) LISAPathfinder

INTERNATIONAL SCHOOL ON OXIDE ELECTRONICS

03/10/2011 - 15/10/2011

Manuel Bibes manuel.bibes@thalesgroup.com

Unité Mixte de Physique CNRS/Thales 1 avenue Fresnel, Campus de l'Ecole 91767 Palaiseau

SCIENTIFIC BOARD

Agnès Barthélémy	Unité Mixte de Physique CNRS/Thales	agnes.barthelemy@thalesgroup.com
Beatriz Noheda	University of Groningen	b.noheda@rug.nl
Jacobo Santamaria	Universidad Complutense de Madrid	jacsan@fis.ucm.es
James Scott	University of Cambridge	jfs32@hermes.cam.ac.uk

For many decades electronics has been based on the electron charge and built from semiconductors, typically Si and III-Vs. Even though semiconducting nanostructures will certainly be the basis of microelectronics for a few more years, a massive research effort is being made worldwide to unveil new physical effects, design better performing and multifunctional materials, devise novel circuit architectures, invent paradigms for information processing. All these advances will ultimately be the basis of information processing/storage devices beyond 2020.

On the materials research front, one of the routes currently being investigated relies on the use of transition metal oxides. This family of compounds presents many advantages : (i) as for III-V systems, atomically sharp heterostructures can now be grown ; (ii) oxides exhibit a wide range of physical properties and thus of functionalities (superconductors, ferromagnets, ferroelectrics, multiferroics, etc) within only a few crystallographic families; (iii) they can have extremely high responses to external stimuli (such as strain, magnetic field or electric field as in colossal magnetoresistance manganites).

Initiated by the progress in thin film growth since the discovery of high TC superconductors, the field of oxide electronics really took off at the end of the 1990's and is now growing at an exponential pace (with ~15 articles being published in major journals such as Nature, Science or Nature Materials each year). Major breakthroughs over the last 5 or 6 years include the advent of multiferroics (discovery of BiFeO₃ as a room-temperature multiferroic, discovery of several novel mechanisms of coupling between ferroelectricity and magnetism, etc) and the unveiling of several unexpected phases at oxide interface, epitomized by the high-mobility two-dimensional electron gas found at the interface between two band insulators, LaAlO₃ and SrTiO₃. The topics of multiferroics and oxide interfaces have been recognized by Science magazine as one of the ten major scientific discoveries of 2006 and 2007, respectively.

Despite this impressive flurry of scientific advances, the community of oxide electronics is still not well structured. Researchers of the field meet annually at the Workshop on Oxide Electronics that gathers ~200 scientists. However, no major efforts have really been made so far to build a community of young researchers and give them opportunities to spend several days in company of world-class experts.

The time thus seems perfectly right to organize an extensive Summer School on Oxide Electronics during which selected high-quality PhD students, post-docs and young researchers will acquire new knowledge - both basic and technological - from the best internationally recognized experts. Just to mention a few, J.F. Scott (Cambridge), S. Parkin (IBM), A. Barthélémy (Orsay), J. Santamaria (Madrid), H.Y. Hwang (Tokyo) and D.G. Schlom (Cornell) and have already accepted to participate.

INTERNATIONAL WORKSHOP ON ELECTRONIC CRYSTALS, ECRYS-2011

15/08/2011 - 27/08/2011

Serguei Brazovskii brazov@lptms.u-psud.fr

LPTMS Univ. Paris Sud 91405 Orsay

SCIENTIFIC BOARD

Antonio Bianconi	University Roma "La Sapienza"	Antonio.Bianconi@romal.infn.it
Christina Marchetti	Syracuse University	mcm@physics.syr.edu
Daniel C. Tsui	Princeton University	tsui@princeton.edu
Dragana Popovic	State University of Florida, Tallahassee	dragana@magnet.fsu.edu
Eva Andrei	Dept. of physics, Rutgers University	eandrei@physics.rutgers.edu
Herre Van der Zant	Technical University of Delft	herre@qt2.tn.tudelft.nl

The planned meeting continues a series of tri-annual conferences ECRYS on Electronic Crystals, organized since 1993 in France by S. Brazovskii and P. Monceau. The events of 2005 and 2008 already have taken place at the IESC in Cargèse. The popularity of the ECRYS meeting is constantly growing, e.g. in 2008 we were forced to refuse 1/3 (50) of good applications. To release this pressure, and to add more introductory and tutorial lectures, we are applying for two weeks in 2011.

The earlier meetings were attended by key researchers from over the world. The Proceedings (published in a record time of 4-5 month) presented the state of the art of the research activity in this field. They collect approximately 2500 web references. The field is rapidly developing and new discoveries emerge even during three years between the meetings.

Topics of ECRYS are on agenda in many laboratories of Europe, so their students and young researchers will benefit in participation. The openness towards young people is an important criteria to select invited speakers. The program will avoid parallel sessions and emphasize poster sessions as a natural forum. The planning will be focused upon cross linking problems rather than on particular materials or methods.

ECRYS conferences are intended to provide a cross-link between various communities engaged in studies of spontaneous superstructures formed by electrons in solids, with extensions to such related systems as charged object in soft matter and biology, vortices in superconductors, magnetic and ferroelectric domains, pattern formation, etc. The electronic crystals are known in forms of the charge- and spin density waves, 2D Wigner crystals in the bulk and at an interface, with special realizations in high magnetic fields. The family members are also stripe phases in doped oxides, charge ordering and ferroelectricity in organic conductors. There is a growing understanding on the impact of electronic crystals in mesoscopics (Wigner crystals in quantum wires) and in nano-fabricated devices including the graphene, in biophysics (charged proteins and DNA), and soft matter (charged membranes, polymeric electrolytes).

Common unifying concepts of the ECRYS field are: quantum and mesoscopic effects at low temperatures; the collective transport; the problem of pseudogaps; physics of topological objects - solitons, instantons, phase slips, dislocations; the current conversion, contact effects and plastic flows; the glass states.

The ECRYS follows the leading edge experimental techniques such as ARPES, STM, ultra-high magnetic fields, coherent synchrotron micro-diffraction, nano-structures fabricated by focused ion beams, femto-second nonlinear optics.

ALGÈBRES (DE HECKE, DE CHEREDNIK ET AMASSÉES) ET THÉORIE DES REPRÉSENTATIONS

12/09/2011 - 24/09/2011

Michel Broué broue@math.jussieu.fr

Institut de Mathématiques de Jussieu, IUF Université P7, UFR Maths, Case postale 7012 75251 Paris cedex 05

SCIENTIFIC BOARD

Gunter Malle

Mathematik, Universität Kaiserslautern

malle@mathematik.uni-kl.de

Meinolf Geck

Mathematics, University of Aberdeen

geck@maths.abdn.ac.uk

Vera Serganova

Mathematics, University of California

serganova@math.berkeley.edu

Il s'agit d'une école d'été avancée, s'adressant aux jeunes chercheurs et post-docs, mais également aux chercheurs confirmés en théorie des représentations qui souhaitent se familiariser avec des aspects récents de la théorie. En effet, les progrès des dernières années dans ce domaine ont dégagé plusieurs nouvelles structures très prometteuses. Nous souhaitons donc pouvoir organiser des cours assurés par des spécialistes et les agréments de groupes de travail, afin que chaque participant puisse maîtriser ces nouveaux objets et les utiliser dans ses recherches.

Des questions venant souvent de la physique théorique (théorie des champs, théorie des cordes) ont poussé les mathématiciens à s'intéresser, autour de la théorie des représentations, à des structures algébriques riches, dégagant de nouvelles classes d'algèbres, et utilisant l'approche de la théorie des catégories. Dans ce contexte (et venant également de questions de "mathématiques pures"), les groupes de réflexions complexes se sont avérés une structure de base, pour la construction des algèbres et des catégorifications (algèbres de Hecke, de Cherednik), et pour la "géométrisation" (actions des groupes de tresses associés).

Nous souhaitons donc que l'école d'été couvre, de manière didactique et construite, une grande partie des ces "nouveaux" sujets. Nous nous sommes assurés de la participation d'orateurs qui sont, non seulement parmi les meilleurs spécialistes des sujets (et des scientifiques jeunes et actifs), mais aussi d'excellents pédagogues.

PASSIVE IMAGING IN WAVE PHYSICS FROM SEISMOLOGY TO ULTRASOUND

09/05/2011 - 14/05/2011

Michel Campillo michel.campillo@obs.ujf-grenoble.fr

LGIT Maison des Géosciences - BP53 38041 Grenoble cedex 9

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Arie Verdel	Shell International Exploration and	Arie.Verdel@shell.com
Haruo Sato	Dept of Geophysics - Tohoku University	sato@zisin.geophys.tohoku.ac.jp
Josselin Garnier	LPMA - University of Paris	garnier@math.jussieu.fr
Mathias Fink	Institut Langevin - ESPCI	mathias.fink@espci.fr
Michel Campillo	LGIT - University Joseph Fourier	michel.campillo@obs.ujf-grenoble.fr
Nicolas Shapiro	IPGP	nshapiro@ipgp.jussieu.fr

The Green's function (GF) of a medium between two points A and B represents the record we would get at A if an impulse source was applied at B. Passive imaging consists of the crosscorrelation of wavefields recorded at two points in order to converge to the GF of the medium, including all reflection, scattering and propagation modes. Various experimental, numerical and theoretical approaches have been developed to demonstrate passive imaging and to define more precisely under which assumption it is valid.

Historically speaking, Aki (1957) proposed a long time ago to use seismic noise in seismology to retrieve frequency by frequency the dispersion properties of surface waves in the subsoil. Later on, helioseismology was the first field where ambient noise crosscorrelation directly performed in the time-domain was used for imaging. The recordings of the Sun's surface random motion were processed to retrieve time-distance information on the solar subsurface (Duvall et al., 1993, Gilles et al., 1997, Rickett and Claerbout, 1999). The same idea developed as day-light imaging was proposed by Claerbout (1968) in the context of geophysical prospecting. More recently, a seminal paper was published by Weaver and Lobkis (2001) that showed how diffuse thermal noise recorded and cross-correlated at two ultrasonic transducers (working at MHz frequencies) fastened to one face of a 10-cm side duralumin cube provided the complete time-domain GF between these two points. This spectacular result was the start of a complete revival of the subject since experimental evidence of ambient noise crosscorrelations were then demonstrated in:

- (1) acoustics and elastic plates (Lobkis and Weaver, 2001, Weaver and Lobkis, 2001, Larose et al., 2004, Larose et al., 2007, Sabra et al., 2008),
- (2) seismology (Paul and Campillo, 2001; Campillo and Paul, 2003, Schuster et al., 2004, Shapiro and Campillo, 2004), where passive seismic imaging (Shapiro et al., 2005, Sabra et al., 2005a) was performed in California from seismic noise at stations separated by distances of hundreds to thousands of kilometers,
- (3) seismic exploration (Draganov et al., 2007), where seismic body wave reflections were retrieved from noise measurements by an array of 3-component geophones laid out in a desert area,
- (4) oceanography where both direct and reflected wavefronts were retrieved from ambient noise crosscorrelation in shallow underwater acoustics (Roux and Kuperman, 2004, Sabra et al., 2005b).

We propose to gather in June 2011 the principal actors of passive imaging in these different fields to share our theoretical, numerical and experimental expertise. This one-week-long interdisciplinary summer school will be the natural follow-up of the summer schools organized over the last ten years through the GDR POAN, PRIMA and IMCODE.

MORPHOLOGIE ET DYNAMIQUE DES ÉCOULEMENTS ANISOTROPES

18/07/2011 - 30/07/2011

Luminita Danaila danaila@coria.fr

CORIA UMR 6614 Avenue de l'Université 76801 Saint Etienne d'Orve

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Christos VASSILICOS	Imperial College	j.c.vassilicos@imperial.ac.uk
Claude CAMBON	LMFA, Lyon	claudc.cambon@ec-lyon.fr
Fabien GODEFERD	LMFA, Lyon	fabien.godefere@ec-lyon.fr
Jan-Bert FLOR	LEGI, Grenoble	jan-bert.flor@hmg.inpg.fr
Keith MOFFATT	Univ. Cambridge	hkm2@cam.ac.uk
Luminita DANAILA	CORIA, Rouen	danaila@coria.fr

La description de l'anisotropie des écoulements passe naturellement par quelques étapes :

1) Une première problématique vise la morphologie des écoulements anisotropes, i.e. la structure locale et instantanée de l'écoulement (ou d'une zone de l'écoulement). Les écoulements discutés seront : turbulence en rotation pure (milieu ouvert et confiné) ; turbulence en recirculation dans un réacteur de mélange (voir figure jointe), turbulence en rotation associée à un cisaillement (canal tournant), jet axisymétrique éventuellement en contre-courant (la zone de cisaillement située aux bornes externes présentera de fortes recirculations). Une question particulière concerne la présence de structures cohérentes (tourbillons), leur taille, durée de vie, dynamique en milieu en rotation. La connaissance précise de la dynamique de ces structures en lien étroit avec l'écoulement environnant ouvre des perspectives vers le contrôle (passif ou actif) de ces écoulements. L'écoulement environnant peut être simple, ou peuplé d'ondes anisotropes qui interagissent avec les structures tourbillonnaires et modulent, voire dominent (turbulence d'ondes), la turbulence classique. Ces ondes concernent la turbulence dans les fluides en rotation, stratifiés et/ou électro-conducteurs (avec MHD).

2) La description statistique des écoulements anisotropes, qui peut être faite dans :

- i) l'espace de Fourier (décomposition anisotrope selon deux types de directions : axiale et radiale) et équations de transport énergétique en espace spectral.
- ii) l'espace physique, en utilisant le champ filtré à une échelle donnée (incrément). Par exemple, des équations de transport pour l'énergie cinétique à une échelle peuvent être écrites dans une turbulence homogène axisymétrique.

Le lien précis entre la description spectrale et celle dans l'espace physique est à discuter.

RECENT DEVELOPMENTS IN WAVE PHYSICS OF COMPLEX MEDIA

02/05/2011 - 07/05/2011

Mathias Fink mathias.fink@espci.fr

Institut Langevin 10 rue Vauquelin 75005 Paris

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Claude Boccara

Institut Langevin

claudio.boccara@espci.fr

Georg Maret

University of Konstanz

georg.maret@uni-konstanz.de

John Pendry

Imperial college

j.pendry@imperial.ac.uk

Mathias Fink

Institut Langevin

mathias.fink@espci.fr

Two years ago, the Institut Langevin has organized a summer school about non-conventional focusing and imaging techniques. The school gathered researchers and students from around the world. The success of the school encourages us to organize a new session.

For the next school entitled 'Recent advances in Wave Physics of Complex Media', some of the best researchers in optics, acoustics, microwave will present the exciting progress realized during these last years in wave propagation through complex media. Lectures will be given on many different fields : meta-material, photonic and acoustic crystals, gratings, wave localization, negative refraction, random laser, coherent control of wave fields in complex media, multi-wave imaging. As the previous summer school, the aim is to gather all those different communities so that they can present their contributions, explain their motivations, and exchange with others.

This school is interdisciplinary because researchers from many different communities are gathered. This school is especially devoted to the young generation of scientist (PhD, post-doc, young scientist) from all around the world. That is why we will financially support many PhD students. A poster session will be organized on wednesday afternoon for the young (and not so young) scientists to show their works to each others and to some of the best physicists.

The fast development of the subjects treated during this summer school justify to propose it every two years. Moreover since the last school, many students have begun their PhD. The previous edition was organized in may 2009. Hence, the new one organized in may, 2010 seems to us timeliness.

FIFTH INTERNATIONAL SUMMER SCHOOL ON SURFACE OCEAN - LOWER ATMOSPHERE STUDY

29/08/2011 - 10/09/2011

Véronique Garçon veronique.garcon@legos.obs-mip.fr

LEGOS, UMR5566 CNRS/CNES/IRD/UPS 18 Avenue Edouard Belin 31401 Toulouse Cedex 9

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BOYD Philip	University of Otago	p.boyd@niwa.co.nz
DAI Minhan	University of Xiamen	mdai@xmu.edu.cn
GARCON Véronique	LEGOS/CNRS	veronique.garcon@legos.obs-mip.fr
LE QUERE Corinne	University of East Anglia	C.Lequere@uea.ac.uk
LEVASSEUR Maurice	University Laval	maurice.levasseur@bio.ulaval.ca
LISS Peter	University of East Anglia	p.liss@uea.ac.uk

The international research initiative on Surface Ocean-Lower Atmosphere Study (SOLAS, sponsored by IGBP/SCOR/ICACGP, with strong support from WCRP) aims to achieve quantitative understanding of the key biogeochemical-physical interactions and feedbacks between the ocean and the atmosphere, and to understand how this coupled system affects and is affected by climate and environmental change. The Earth System has clearly moved far outside the range experienced over the last 700,000 years and is hence operating in a “no-analogue” state. The world population is increasing exponentially probably reaching 10 milliards of inhabitants in 2050. Sustained use of resources (food, water, carbon, human health) must be achieved to ensure future prosperity. Simultaneously, greenhouse gas concentrations (CO₂, N₂O, CH₄,...) are increasing at a very unprecedented swift pace. Ocean acidity has increased by 30% since the beginning of the Industrial Revolution. If the concentration of atmospheric CO₂ continues to increase at the current rate, the oceans will become corrosive to the shells of many organisms by the end of the century. How or if marine organisms may adapt is not known. The ocean’s capacity to absorb CO₂ from the atmosphere is being degraded by ocean acidification, which will make it more difficult to stabilise atmospheric CO₂ concentrations. The last decade (1990-2000) has been the warmest one over the last 1000 years and the Earth warming has been $0.74 \pm 0.2^{\circ}\text{C}$ over the last century. The global ocean is warming, and some oceanic areas witness a decrease in their oxygen content. Sea level increase is a dramatic reality for many inhabitants of our planet, Arctic sea ice and glaciers are melting faster than expected. The last IPCC Report states: “Climatic warming is unambiguous.”

Today, some air-sea exchange processes are well understood at the local level, but remain inaccurately quantified globally. For example, in spite of the fact that the partial pressure of CO₂ in water and the atmosphere is relatively well measured in the North Atlantic ocean for instance, the mean flux of CO₂ is known to less than 50% accuracy and its variability is unknown. For other processes, even the theoretical principles of local interactions remain uncertain. The generation of dimethylsulphide (leading to sulphate aerosols) is for instance linked to phytoplankton through unknown mechanisms. Building both on recent oceanographic and atmospheric research, SOLAS is a willful attempt at advancing the understanding of air-sea processes through interdisciplinary collaborations. This 5th SOLAS summer school will bring young researchers in contact with leading scientists of different components of SOLAS research, not only in a theoretical framework, but also through practical exercises, laboratory experiments and special sessions. The SOLAS vision is to provide scientific knowledge and educate the younger generation of scientists to improve the sustainability of the living Earth.

PALEOGENOMICS

17/10/2011 - 22/10/2011

Eva-Maria Geigl geigl.eva-maria@ijm.univ-paris-diderot.fr

Institut Jacques Monod 15 rue Hélène Brion 75013 Paris

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Elalouf Jean-Marc	CEA Saclay	Jean-Marc.Elalouf@cea.fr
Geigl Eva-Maria	Institut Jacques Monod	geigl.eva-maria@ijm.univ-paris-diderot.fr
Grange Thierry	Institut Jacques Monod	thierry.grange@univ-paris-diderot.fr
Heyer Evelyne	Musée de l'Homme	heyer@mnhn.fr
Orlando Ludovic	University of Copenhagen	orlando.ludovic@gmail.com
Ricaut Xavier	Université Paul Sabatier Toulouse	fx.ricaut@infonie.fr

La paléogénomique est une discipline en émergence qui prend son essor à l'échelle internationale mais qui est encore à l'état embryonnaire en France.

Afin de rester internationalement compétitif, le domaine de la paléogénomique a besoin d'un coup de pouce pour catalyser la réorientation des laboratoires effectuant la paléogénétique ainsi que le démarrage de projets et collaborations.

GRANDS AXES DU PROGRAMME :

Les grands axes :

- 1) Mise à jour de l'état des connaissances du domaine de la paléogénomique (séquençage des génomes entiers du mammoth, de l'ours des cavernes, du néanderthalien, d'un eskimo ancien)
- 2) Génomique comparative et évolution des génomes
- 3) Métagénomique bactérienne
- 4) Modèles de génétique des populations
- 5) Formation didactique interdisciplinaire
 - a) Présentation des méthodes actuelles de séquençage de nouvelle génération
 - b) Traitement des données de séquençage de nouvelle génération
 - c) Obtention de matériel fossile, procédure de fouille et présentation des contraintes et méthodes des archéologues, détermination et datation, contamination et dégradation de l'ADN

DISORDERED SYSTEMS: FROM CONDENSED-MATTER PHYSICS TO ULTRACOLD ATOMIC GASES

30/05/2011 - 11/06/2011

Thierry Giamarchi Thierry.Giamarchi@unige.ch

DPMC-MaNEP 24, Quai Ernest-Ansermet 1211 Geneva

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Eugene Demler	Université de Harvard	demler@physics.harvard.edu
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Randall Hulet	Université de Rice - Texas	randy@rice.edu
Subir Sachdev	Université de Harvard	subir_sachdev@harvard.edu
Zvi Ovadyahu	Israel	zvi@vms.huji.ac.il

Disorder is a central subject in many areas of physics, eg condensed-matter physics, optics, acoustics, seismology, and atomic physics. It is more active than ever, with landmark results obtained in the very recent years, for instance on Anderson localization [Physics Today, 2009]. This progress paves the way to new challenges. In particular, the interplay of disorder and interactions is one of the most challenging problems that one has to face in quantum systems.

In condensed-matter physics, this question has been intensively studied. For non-interacting systems, disorder leads to Anderson localization. Interactions have dramatic effects, which are not fully understood. The combined effect of disorder and interactions is very rich and depends on the nature (fermions, bosons, or spins) and dimension of the system. Many experimental realizations of disordered systems have been studied, eg semiconductors, superconducting films, Josephson junction arrays, magnets, etc. Despite important progress accomplished on both theoretical and experimental fronts, many important questions remain, testifying to the complexity and the richness of the problem.

Recently, ultracold atoms have provided very controlled systems, in which to study many fundamental questions, with new tools, new viewpoints, and thus new challenges. In these systems, disorder can be introduced in a very controlled way using speckle patterns or bichromatic lattices. Ultracold atoms have also the advantage to be able to produce bosonic or fermionic systems, and even mixtures of the two. Recently spectacular observation of Anderson localization was reported in such systems, and several investigations of the interplay of disorder and interactions are currently being performed as well. Although each community (condensed-matter physics and ultracold atoms) has its own meetings, there has been so far very few conferences where they could meet and share their expertise and results on the above questions. In view of the rapid development in the field, it is also necessary for young researchers to have a good introduction to the subject. This is the goal of the school we plan to organize. We plan to have both long pedagogical talks, that will serve as an introduction to the subject, and focussed shorter talks on hot topics of current research. In addition, participants will present their own work on the subject, either through short talks or poster sessions.

The field is very active at the international level and CNRS is strongly involved at the forefront of this research (see 'Rapport d'activité du CNRS 2008', and special focus in preparation in 'Images de la Physique 2009'). We thus feel that such a meeting is very timely given the amount of efforts that is invested on both sides on these issues and the speed of progress in the field. We certainly expect a very strong cross fertilization of ideas, both on the experimental and on the theoretical side by putting the two communities together.

HETEROGENEOUS QUANTUM ROD AND QUANTUM DOT NANOMATERIALS SUMMER SCHOOL

04/04/2011 - 16/04/2011

Bruno Grandidier bruno.grandidier@isen.iemn.univ-lille1.fr

IEMN-CNRS ISEN, 41 bd Vauban 59000 Lille

SCIENTIFIC BOARD

Celso de Mello-Donaga	UTRECHT UNIVERSITY	c.demello-donega@uu.nl
Daniel Vanmaekelberg	UTRECHT UNIVERSITY	D.A.M.Vanmaekelbergh@phys.uu.nl
Dries Van Thourhout	IMEC-LEUVEN	Dries.VanThourhout@intec.U
Eric Meulenkamp	PHILIPS ELECTRONICS NEDERLAND B.V.	eric.meulenkamp@philips.co
Gerhard Meyer	IBM Zürich	GME@zurich.ibm.com
Manfred Bayer	TECHNISCHE UNIVERSITAET DORTMUND	manfred.bayer@udo.edu

Over the last 20 years, the synthesis of inorganic colloidal nanoparticles has experienced a rapid progress. Nowadays, a wide range of metal, metal oxide and semiconductor nanoparticles can be synthesized. Various synthetic approaches provide control over size and shape, and complex heterostructures can be made. As a result, research into applications of colloidal nanoparticles is rapidly increasing. The bottom line of the herodot approach is simple: adding up the advantages of individual components leads to a combined material whose characteristics can be flexibly optimized by reconfiguring, adjusting or tuning the individual parts. In the case of herodots, this possibility for tuning and control is due to the combination of two features: the size-dependent electronic structure of semiconductor nanocrystals due to quantum confinement and dielectric confinement, and the new degrees of freedom offered by a junction between two types of semiconductor material.

Novel developments in nanomaterials research are merged with existing technology to design materials with nanoscale precision and improved or new functionalities. This newly emerging technology is not linked to a single scientific domain but relies on input from physics, chemistry and biochemistry. Moreover, it will be of use for different technological fields like, for instance, photonics and nanoelectronics. If Europe wants to be part of this ongoing technological developments in nanomaterials and benefit from its results, training of researchers in this field is a must. A summer school thus intends to give researchers working with or interested in colloidal nanoparticles an overview of the state-of-the art in the synthesis, characterization, modelling, manipulation and applications of nanoscale heterojunctions based on colloidal semiconductor nanoparticles. It will be organized in the framework of the Herodot Marie Curie Initial Training Network, that consists in an european research program for the development of electro-optical hybrid nanomaterials and their applications in photonics (http://cordis.europa.eu/fetch?CALLER=FP7_PROJ_EN&ACTION=D&DOC=18&CAT=PROJ&QUERY=01247c921e83:a13e:40b2a9fd&RCN=87686)

The program Herodot that started in September 2008, has a duration of 48 months and must provide a 10-day summer school during Spring 2011, to enhance the quality of the training in the network and give the trainees the opportunity to discuss their work with senior scientists from outside the network.

COMITE EXECUTIF DU PROGRAMME BÂTIMENT ET COLLECTIVITES DE L'AIE

15/06/2011 - 18/06/2011

Pierre HERANT pierre.herant@ademe.fr

ADEME 500 route des Lucioles 06560 Valbonne

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La réunion prévue est la réunion des membres du Comité Exécutif du "Programme économies d'énergie dans les bâtiments et les collectivités" de l'Agence Internationale de l'Énergie.

Ce comité rassemble les représentants d'une quinzaine de pays et les experts en charge de la coordination du programme d'étude et de recherche internationale collaborative, soit une quarantaine de personnes au total.

Ce programme de travail a été mis en place depuis 1975 et la France y participe depuis 1992. J'ai déjà organisé une réunion du Comité Exécutif à Nice en 1992 et à Bordeaux en 2001.

Je souhaite organiser la réunion en juin 2011 à Cargèse.

WHAT YOU NEED TO KNOW TO BE EFFECTIVE IN PUBLISHING YOUR WORK

21/03/2011 - 23/03/2011

Michael Hochberg mhochber@univ-montp2.fr

Institut des Sciences de l'Evolution Université Montpellier II - UMR5554 34095 Montpellier

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"A naturalist's life would be a happy one if he had only to observe and never to write"

Charles Darwin, Letter to C. Lyell, 1867

This quote from Darwin very appropriately summarizes the sentiment of scientists through the ages. Doing and publishing science are two very different activities, involving different perspectives and employing different techniques. Arriving at the PhD level means that we have a demonstrated desire and ability to conduct scientific research, but we are usually not trained formally about how to publish our work. Such training is important, because publishing is not only a requirement of institutions such as universities and granting agencies, but it is also a formal vehicle for communicating discoveries with our contemporaries and with future scientists.

"What you need to know to be effective in publishing your work" capitalizes on my experience as Editor in Chief of the journal *Ecology Letters* for over a decade, to provide PhD students in the fields of ecology and evolution with unique insights into the publishing world. Understanding the many facets of publishing will help your development within the scientific community, and provide the tools to communicate your science more effectively.

The course will include both lectures and practical work over three days. The lectures will be interactive, and cover a wide range of topics, including why we publish, the importance of impact factors and how they are calculated, different journal types, and how journals are run and what editors are looking for. I will go into depth regarding ethical issues such as concurrent submissions, plagiarism, citing previous work, acknowledgments, authorship, copyright issues and publication bias. I will stress the importance of obtaining feedback on manuscripts before they are submitted, writing the cover letter, and how to write inquiries to editors. Finally, I will discuss journal decisions, including reasons for rejection, replying to decision letters calling for revision, and appealing decisions of rejection.

The practical work will provide training in several important ways. First, the quality of cover letters (content and style) is increasingly regarded as essential to getting manuscripts assessed by editorial boards and external reviewers. Students will participate individually and in groups in drafting a cover letter for a manuscript. Second, attracting potential readers to your work means that you are able to effectively write titles, abstracts, and choose keywords that will catch the attention of both specialists and the wider scientific community. Students will have the opportunity to practice these skills for different prospective journals. Third, students will be placed in a situation where they have to deal with a manuscript rejection, including contacting coauthors, deciding on a plan of action, and writing an appeal letter.

“DOUBLE AFFINE HECKE ALGEBRAS, THE LANGLANDS PROGRAM, SUPER YANG-MILLS THEORIES AND AdS-CFT CORRESPONDANCE”

04/07/2011 - 16/07/2011

Vladimir Kazakov kazakov@lpt.ens.fr

ENS Lab. de Physique théorique 24 rue Lhomond 75231 Paris

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I. Cherednik
J. Bernstein
P. Delorme
P. Etingof
S. Ariki

The Langlands program and Double affine Hecke algebras. They play a major role in modern representation theory, number theory, mathematical physics, harmonic analysis and geometry.

The main topics will be :

- (a) various aspects of the theory of double affine Hecke algebras, their relations to affine Hecke algebras, applications in algebra, analysis and in the theory of integrable models
- (b) the geometric and quantum Langlands program, the theory in finite characteristic and the p-ad Langlands program

The quantum geometric Langlands program is a breakthrough development, which opens a direct road for using quantum groups and the DAHA methods; there is fundamental recent progress in the arithmetic direction. The Super Yang-Mills theory already proved to be very important for understanding the geometric Langlands program and related matters. The modern theory of Verlinde algebras and the coordinate Bethe ansatz via the representations of DAHA will be other major directions, including applications to Lusztig's modular conjectures and relations to the AHA theory.

Super Yang Mills theories and Conformal Field Theory. They are the core directions of modern theoretical physics.

The major lines of the conference will be:

- (a) various aspects of the super Yang-Mills theory and mathematical applications (LP, DAHA),
- (b) the AdS-CFT correspondence and its integrability aspects (superstring sigma models),
- (c) 2D quantum gravity, string theory (branes, Calabi-Yau manifolds) and related topics.

The discovery of integrability in AdS-CFT correspondence is a breakthrough development in 3D and 4D conformal supersymmetric gauge theories (SYM) and its gravity duals, which are superstring sigma-models on non-trivial gravitational backgrounds. One of the main achievements is the exact calculation of anomalous dimensions of asymptotically long operators in 4D SYM theory with N=4 supersymmetries, as well as in 3D Chern-Simons theory with N=8 supersymmetries, for all values of SYM coupling. The same problem for arbitrary operators is still open. Such problems require deep understanding of the underlying quantum integrability structures. Joint efforts of physicists and mathematicians are needed; the meeting can be an important step in this direction. We will cover other important developments in conformal field theory and supersymmetric gauge theory as well, such as algebras of boundary states, domain walls, instanton calculus, and dynamical supersymmetry breaking.

ICAM SCHOOL ON EMERGENT PHENOMENA IN CORRELATED ELECTRON SYSTEMS

01/08/2011 - 13/08/2011

Marino Marsi marsi@lps.u-psud.fr

Lab. Physique des Solides Université Paris Sud 91405 ORSAY

SCIENTIFIC BOARD

Henri Alloul	LPS Orsay	alloul@lps.u-psud.fr
Marino Marsi	LPS Orsay	marsi@lps.u-psud.fr
Ricardo Lobo	ESPCI	lobo@espci.fr

In 2011 the main theme covered will concern developments on correlated electron systems, for which a new family of intriguing layered superconductors involving Fe/As layers have been discovered in 2008 and create intense debates and comparisons with the other families of superconductors which can switch between magnetic and superconducting phases with minute chemical modifications .

The field is quite important in condensed matter and drags a large part of this scientific community , including chemical physics departments which are essential in the discovery of new materials which such astonishing properties. So the attendance will be balanced between materials, physics measurements and theory.

With the ICAM support we shall have no difficulty to invite as lecturers some of the most distinguished international actors in this field . Cargèse has progressively become a well known Institution in most campuses working in the field since we have developed this regular schools /workshop which are always focussed on extremely new developments .

The organizers, the actual content of the program will be of course adapted depending of the upcoming new discoveries.

H. Alloul

ECOLE TECHNIQUE IN2P3

28/03/2011 - 02/04/2011

Patrick Nayman

IN2P3 3 rue Michel-Ange 75794 PARIS

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Bernard Tamain	IN2P3 / LPC Caen
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Patrick Nayman	IN2P3 / LPNHE
Philippe Bredy	CEA Saclay

Cette école a pour but de permettre aux personnels Techniciens et AI de l'IN2P3 et du CEA / DAPNIA (ainsi qu'à de nouveaux entrants ingénieurs) de parfaire leurs connaissances dans le domaine des détecteurs de particules, tant pour la physique nucléaire que de la physique des particules. Les intervenants, ingénieurs confirmés ou jeunes chercheurs, détailleront les principes de fonctionnement des détecteurs ainsi que leurs principes de construction et leurs limitations. Des conférences de vulgarisation scientifiques permettront par ailleurs aux stagiaires de mieux appréhender les problèmes de physique qui se posent actuellement ou vont se poser dans un futur relativement proche.

Cette école permettra ainsi aux techniciens d'intégrer leur travail dans le contexte scientifique, technique, sociétal qui les environne et leur donnera les connaissances nécessaires pour qu'ils puissent assimiler les évolutions dans les techniques liées aux accélérateurs.

L'école permettra par ailleurs de créer et souder une communauté autour des métiers de nos instituts.

Exemples de cours ou de conférences abordés dans cette école :

- détecter : quoi, pourquoi, comment, avec quels résultats (particules chargées et neutres)
- les particules et leurs signatures
- collisionneurs et détecteurs
- exemples de détecteurs
- les objets de la physique des particules
- 100 ans de physique
- exposé sur une expérience
- électronique des détecteurs
- cryogénie, supraconduction
- CEM dans les détecteurs
- accélérateurs de particules
- techniques du vide

EXPLORATION AND SEARCH

25/04/2011 - 30/04/2011

Gleb Oshanin oshanin@lptmc.jussieu.fr

LPTMC, UPMC 4 Place Jussieu 75252 Paris

SCIENTIFIC BOARD

Klafter Joseph

Krapivsky Paul

Lindenberg Katja

Moreau Michel

Redner Sid

Tamm Mikhail

Search processes play an important role in physical, chemical and biological systems. Examples include the encounter of molecules involved in a chemical reaction; search for a stable minimum in a complex energy landscape; proteins searching for their specific target sites on DNA; animal foraging; automated searches of registers in high-capacity databases; or search engines exploring the internet.

The search for a desired target may depend on a variety of conditions. Targets may be sparse, hidden, or difficult to detect even when found. The targets may be mobile or immobile, they may try to avoid searchers, there may be one target or many. They may have a finite life-time and vanish before they are detected. Searchers may search "blindly", detecting the target only upon encounter, or may perceive distant targets and adjust their motion accordingly. They may have no memory of previously visited areas, or they may avoid such areas. The searchers may act individually or in swarms, optimizing their search efficiency by exchanging information. Finally, the "efficiency" of a search may be judged by a variety of measures, including the time to reach the target, the number of encounters of searchers and targets per unit time, or the exploration range of space per unit time. In general, for each specific situation different search strategies may be appropriate. The quest for optimal strategies given specific boundary conditions has motivated a great deal of work and currently represents one of the most rapidly growing research fields.

Although the applications are diverse, the underlying physical mechanisms are often the same. Moreover, the inherent complexity of the problem, the abundance of ideas and methods found in this interdisciplinary field of research is studied in many areas of physics. In particular, the concepts and methods of statistical mechanics naturally lend themselves to the study of random search. On the one hand, the goal is to find the global or local maxima of search efficiency functions with incomplete information. On the other hand, random search can also be studied from the perspectives of diffusion and transport properties, stochastic processes, non-local Lévy walks and flights, complex systems and fractal geometry. Some important questions in random searches, especially in the case of discrete landscapes, are also associated with graph theory, random lattices, and complex networks.

The aim of this workshop is to bring together leading scientists working in the field of search, and to exchange recent theoretical and experimental advances in the understanding of various search processes ranging from those occurring in living cells, up to the search of animals for food. This workshop will lead to a substantial cross-fertilization of ideas and approaches, and to a new vista of the field. It will also help to deepen existing collaborations.

MODÉLISATIONS PHYSIQUES ET NUMÉRIQUES POUR LES ÉCOULEMENTS MULTIPHASIQUES

26/09/2011 - 01/10/2011

Bernard Rebourcet bernard.rebourcet@cea.fr

CEA DAM Ile de France Le grand Rué F-91290 Arpajon

SCIENTIFIC BOARD

Antoine Llor	CEA DAM IDF	antoine.llor@cea.fr
Bruno Després	Paris 6	despres@ann.jussieu.fr
Celine Baranger	CEA CESTA	celine.baranger@cea.fr
David Youngs	AWE	david.youngs@awe.co.uk
Florian De-Vuyst	ECP MAS	florian.de-vuyst@ecp.fr
Jean-Michel Ghidaglia	CMLA ENSC	jmg@cmla.ens-cachan.fr

L'école sera consacrée à la simulation des écoulements multiphasiques couplés à certains autres phénomènes comme la magnétohydrodynamique, le transport de particules en phase dispersée. On abordera aussi la simulation des plasmas complètement ionisés apparaissant notamment en fusion par confinement inertiel, en insistant sur la confrontation des modèles fluides et cinétiques.

Cette école est par essence multidisciplinaire et regroupe des spécialistes de trois domaines : modélisation des phénomènes physiques ci-dessus, conception et analyse des méthodes numériques appliquées à ces problèmes, implantation sur machines parallèles.

Plus précisément, seront traités les thèmes suivants :

A - Modélisation des phénomènes physiques :

- écoulements multimatériaux
- approche gaz et particules comparée à l'approche diphasique,
- transport de particules chargées ou neutres
- plasmas de fusion inertielle
- magnétohydrodynamique

B - Méthodes numériques :

- méthodes numériques pour les problèmes à plusieurs fluides (Lagrange, Euler, particulières)
- traitement des interfaces et modèles de sous mailles
- méthodes de Monte-Carlo et méthodes déterministes pour le transport des particules
- confrontation de codes numériques avec des cas-tests, validation

C - Implantation sur machines parallèles.

- performances comparées sur processeurs classiques et cartes graphiques.

TRANSITS, ECLIPSES, ALIGNEMENTS ET OCCULTATIONS EN ASTRONOMIE

25/04/2011 - 30/04/2011

Jean SOUCHAY Jean.Souchay@obspm.fr

SYRTE/UMR8630 CNRS / Obse 61, av. de l'observatoire 75014 Paris

SCIENTIFIC BOARD

Danielle BRIOT	Obs. Paris	danielle.briot@obspm.fr
Jean SOUCHAY	SYRTE	Jean.Souchay@obspm.fr
Teddy CARLUCCI	SYRTE	teddy.carlucci@obspm.fr

Le but de cette école est l'étude des cas dans lesquels le fait que deux objets, ou plus, soient situés sur la même ligne de visée de l'observateur, permet d'obtenir d'importantes découvertes.

Les thématiques abordées seront :

- Les Eclipses de Lune et de Soleil (P. Rocher)
- Les satellites de Jupiter (J.E. Arlot)
- Les passages de Vénus et Mercure devant le Soleil (TBD)
- Les étoiles doubles à éclipse (D.Briot)
- Les résultats récents du satellite Corot sur les transits stellaires (A.Baglin ou collègue)
- Les planètes extrasolaires (J. Schneider ou collègue)
- Lentilles gravitationnelles (TBD)
- L'astrométrie des astéroïdes (D.Hestroffer)

THE SCOPE OF UNCONSCIOUS COGNITION

12/09/2011 - 24/09/2011

Bert Timmermans bert.timmermans@ulb.ac.be

Université Libre de Bruxelles - CP191 (CO3) Av. F.-D. Roosevelt, 50 1050 Brussels

SCIENTIFIC BOARD

David Chalmers	Centre for Consciousness, Australian	chalmers@anu.edu.au
Geraint Rees	Wellcome Trust Centre for Neuroimaging,	g.rees@fil.ion.ucl.ac.uk
John-Dylan Haynes	Bernstein Center for Computational	haynes@bccn-berlin.de
Patrick Haggard	Institute of Cognitive Neuroscience,	p.haggard@ucl.ac.uk
Stanislas Dehaene	Cognitive Neuroimaging Unit, INSERM-CEA	stanislas.dehaene@cea.fr
Steven Laureys	Coma Science Group, Université de	steven.laureys@ulg.ac.be

The human unconscious mind has been the subject of much debate ever since Freud introduced the concept. Crucial questions here include for instance: what is the use of consciousness if there is unconscious processing? Do the two modes of processing differ or is there just one way of processing information, which can come with or without consciousness? Following a period in which behaviorist approaches of human cognition as being a 'black box' ignored unconscious processing, cognitive psychology began to address cognitive processes that are unconscious. These are processes to which we seemingly have no conscious access, and which often occur in very short time intervals. Research has been focusing on for instance subliminal perception, influence of subliminal information on subsequent behavior, whether this is stimulus identification or for instance social processes such as deciding whether to help somebody. Basically, what one has been trying to do is to exclude consciousness.

In the past couple of decades however, the amount of research related to consciousness has increased considerably, and the rise of neuroimaging methods has seen an increasing number of papers trying to pin down what consciousness actually is, and whether and where it can be located in the brain - known as the search for the Neural Correlates of Consciousness. The question that we want to ask is, after all this research on unconscious processes and the nature of consciousness, what can we conclude about the unconscious mind? How powerful is the unconscious mind? Could we live our lives if we were totally unconscious of our actions?

The aim of this school therefore, is to bring together research from different domains and to try and integrate this information in order to get a clear image about what the unconscious mind is capable of. Specifically, in terms of content the focus will lie on 3 goals:

- 1) Provide a theoretical overview of processing with, and without consciousness. How can we begin to think about unconscious processes, and what are the consequences of adopting one stance versus another?
- 2) Investigate the methods that are used to assess consciousness, and unconsciousness. How can we exclude the possibility that somebody is conscious of something - if at all?
- 3) Integrate the findings from different domains, such as philosophy, cognitive psychology, social psychology, modelling, and neuroimaging, and provide a much needed critical assessment of what exactly constitutes the scope of unconscious cognition.

It is specifically the interdisciplinary nature of the school, that should allow for the third aim, bringing together different points of view on what unconscious processes are, and what they are capable of.

DYNAMIC ORGANIZATION AND FUNCTION OF BIOMEMBRANES

20/06/2011 - 02/07/2011

Gerrit Van Meer g.vanmeer@uu.nl

Membrane Enzymology, Bijvoet Center Padualaan 8 3584CH Utrecht

SCIENTIFIC BOARD

Janet Shaw

University of Utah

shaw@biochem.utah.edu

Peter Walter

Howard Hughes Medical Institute and

pwalter@biochem.ucsf.edu

Biomembranes, a vital area of research. The principles, new developments and perspectives of research on biological membranes will be the topic of the Course, emphasizing the dynamic structural interactions between membrane constituents and their consequences for membrane function. Membranes form a protective skin around the cell itself and its intracellular compartments, but are also the sites where many cellular machines carry out their function. They are essential for cellular organization and play vital roles in most critical cellular functions including cell division, cellular defense, signal transduction, photosynthesis and oxidative phosphorylation, cell-cell interaction and selective transport of ions, nutrients and waste products. The basic building stones of membranes are the water-insoluble (phospho)lipids, required for stability and barrier functions, and proteins necessary to execute membrane bound enzymatic and transport functions as well as signal recognition and protection. A molecular understanding of membrane protein structure and the transient interactions between proteins and lipids will be taught as the basis for discussions on membrane function in health and disease.

The need for interdisciplinary training. Biological membranes are necessarily complex structures that vary considerably in composition depending on their function(s) and location. Multi-disciplinary approaches are vital to understanding the functional, structural and compositional complexity of membrane biogenesis and function. Detailed insights into the pathways and mechanisms leading to the assembly and proper functioning of membranes require co-operative research efforts of biochemists, biophysicists, structural biologists, and molecular and cell biologists. However, students, postdoctoral fellows and junior scientists who specialize in one particular experimental area often find it hard to grasp and apply this mixture of approaches without a broad overview. The proposed Course is an excellent platform and opportunity to acquire an integrated overview of the structure, function and genesis of biomembranes and their components, to gain more insight in the possibilities offered by different disciplines and to discuss and learn about the multiple approaches, techniques and specialities in membrane research.

In short. The large number of highly active groups illustrates the scientific importance of this area of research. The substantial progress made in the last few years calls for a regular schooling and teaching event for all those interested. It is clear from previous Courses that this formula presents an excellent opportunity to all participants - students and experts - to obtain a complete overview of the field and to learn in an efficient way about the new progress and developments. We are confident that the Course will once again make a substantial contribution to the promotion of research in the complex matter of membrane and organelle biogenesis.

UNIVERS JEUNE : ENRICHISSEMENT DU MILIEU INTERGALACTIQUE ET ÉTOILES DE POP III

18/04/2011 - 23/04/2011

Elisabeth Vangioni vangioni@iap.fr

Institut d'Astrophysique de Paris 98 bis bd Arago 75014 Paris

SCIENTIFIC BOARD

Elisabeth Vangioni	Institut d'Astrophysique de Paris	vangioni@iap.fr
Françoise Combes	Observatoire de Paris	
Joop Schaye	Université de Leiden	
Keith Olive	Université du Minnesota	
Monique Arnaud	Sap, CEA Saclay	
Patrick Petitjean	Institut d'Astrophysique de Paris	ppetitje@iap.fr

L'information obtenue grâce à la mission WMAP en 2003 sur la réionisation offre une fenêtre de choix sur la nucléosynthèse stellaire primaire (étoiles de population III) susceptible d'enrichir l'Univers précocement. Actuellement l'histoire et la dynamique de cette réionisation ne sont pas comprises. Ce contexte scientifique très nouveau est favorable à l'émergence de nouveaux scénarios relatifs à cette étape de l'histoire de l'Univers, à savoir la formation des premières étoiles.

Ces dernières années, l'horizon relatif à l'étude des abondances s'est considérablement étendu ; c'est l'un des développements en cosmologie observationnelle parmi les plus excitants : on est passé de l'étude chimique de l'Univers local à une exploration à grand décalage vers le rouge, cela grâce à la mise en service de télescopes tels que le Keck, le VLT et plus récemment le télescope Subaru. L'explosion de ces données spectroscopiques dans différents sites astrophysiques à grand z permet désormais d'utiliser les abondances chimiques, témoins de la nucléosynthèse stellaire, comme traceurs privilégiés de l'évolution de l'Univers à grande échelle. L'étude spectroscopique de la ligne de visée de sources distantes est sans égale pour sonder le milieu interstellaire et le milieu intergalactique (en particulier avec les instruments UVES et FORS au VLT). Les quasars et plus récemment les sursauts gamma permettent d'accéder à des décalages spectraux très grands, $z \sim 8$ et sans doute à 10 dans un futur proche.

Le spectre des quasars et des rémanences de sursauts gamma présente des raies d'absorption dues au milieu interstellaire de la galaxie hôte ou à des structures présentes le long de la ligne de visée (milieu intergalactique et galaxies intervenantes). L'analyse de ces raies permet de caractériser les propriétés physiques (composition chimique, température du gaz absorbant, etc.) de l'Univers lointain et donc d'apporter des contraintes observationnelles aux scénarios d'évolution globale de l'Univers (et notamment l'enrichissement en éléments lourds du milieu intergalactique par les vents galactiques). Enfin, au plan local, les abondances des étoiles très pauvres en métaux fournissent une foison d'informations (observations VLT, ESO) sur les différents stades de l'évolution chimique de notre Galaxie, notamment l'abondance des éléments (Fe, CNO, Si, éléments r et s ...) et la fonction de distribution de la métallicité. L'époque de la formation de ces étoiles très pauvres en métaux est, en toute vraisemblance, contemporaine de l'Univers à grand z ; cela donne ainsi des contraintes sur les premières étoiles massives responsables de l'enrichissement du gaz où ces petites étoiles se forment. En particulier, ces étoiles nous permettent d'étudier la formation et l'évolution des éléments ainsi que les processus nucléosynthétiques impliqués. Tout cela est indispensable à notre compréhension de l'évolution cosmique globale de l'Univers liée à la formation des structures.