

INTRODUCTION

This mini-workshop will focus on applications of relativistic quantum field theories to physics of Dirac and Weyl semimetals, graphene, fermionic superfluids, quark - gluon plasma, and anomalous transport effects. The general idea of the mini-workshop is to gather physicists actively working on these subjects in the broad ranges from condensed matter physics and field theory to lattice gauge theory and string theory and to provide participants with an informal environment to encourage mutually beneficial interactions.

13 JUNE 2016

08H30 Registration / welcome coffee

SESSION 1

CHAIR: DR MAXIM CHERNODUB

09H00 Opening
Nicola Fazzalari Scientific Director of LE STUDIUM

09H20 **Dr Grigory Volovik**

3He topological fermionic fluids and their relativistic analogs

10H10 **Pr Baruch Rosenstein**

Nonlocality of transport in graphene and other Weyl semimetals due to long range interactions

11H00 Coffee break

11H20 **Pr Maria Vozmediano**

Chiral anomaly and axial gauge fields in Dirac matter

12H10 **Dr Alberto Cortijo**

Generalized magnetotransport and chiral elastic vector fields in solid-state based Weyl semimetals

13H00 Lunch

SESSION 2

CHAIR: DR ALBERTO CORTIJO

14H00 **Dr Maxim Chernodub**

Chiral waves and kinks in chiral fluids

14H50 **Pr Igor Lukyanchuk**

Quantum oscillations and magnetic properties of graphene-related compounds and nanoclusters

15H40 Coffee break

16H00 **Pr Michael Stone**

Effective Actions for Superconducting Chiral Fermions

16H50 **Pr Michael Volkov**

Superconducting non-Abelian vortices in Weinberg-Salam theory

18.30 **Pr Mark Oliver Goerbig**

French grand public conference, LE STUDIUM LECTURE (Hôtel de Ville)
Des théories d'Einstein aux matériaux les plus innovants

LE STUDIUM
LECTURES
TOURS | 2016

ENTRÉE LIBRE

13 Juin 2016 - 18h30
**Des théories d'Einstein
aux matériaux les plus
innovants**

Hôtel de Ville
Salle des Mariage
37000 Tours

INTERVENANT
Pr Mark Oliver Goerbig
Laboratoire de Physique des Solides
Université Paris-Sud

Cette lecture publique est organisée
dans le cadre de la conférence :
Condensed matter physics meets
relativistic quantum field theory

INFORMATIONS
lecture@lestudium-ias.fr
www.lestudium-ias.fr

LE STUDIUM
Centre-Val de Loire
CIRIS
UNIVERSITÉ PARIS-SUD

14 JUNE 2016

08H30 Opening

SESSION 3

CHAIR: PR VLADIMIR MIRANSKY

09H00 **Pr Dmitry Kharzeev**

Anomalies, knots and currents

09H50 **Pr Mark Oliver Goerbig**

Dirac cones in 2D and 3D Weyl semimetals - implications of pseudorelativistic covariance

10H40 Coffee break

11H00 **Dr Mikhail Zubkov**

Momentum space topology, anomalous quantum Hall effect, and problems with the equilibrium static chiral magnetic effect

11H50 **Dr Pavel Buividovich**

Numerical study of chiral plasma instability

12H40 Lunch

SESSION 4

CHAIR: PR BARUCH ROSENSTEIN

13H40 **Pr Vladimir Miransky**

Origin of dissipative Fermi arc transport in Weyl semimetals

14H30 **Pr Igor Shovkovy**

Anomalous chiral plasmas: from Dirac semimetals to cosmology

EXCURSION IN AMBOISE

16H00 Departure of the shuttle

17H00 Guided visit of Chateau d'Amboise

18H30 Free walk in the old city

19H30 Shuttle to Montlouis

20H00 Gala dinner at La Cave

23H00 Shuttle back to Tours

15 JUNE 2016

08H30 Opening

SESSION 5

CHAIR: DR MIKHAIL ZUBKOV

09H00 **Dr Victor Braguta**

Catalysis of Dynamical Chiral Symmetry Breaking by Chiral Chemical Potential

09H50 **Andrey Kotov**

Numerical simulation of Dirac semimetals

10H40 Coffee break

11H00 **Pr Munetto Nitta**

Nambu-Goldstone/Higgs modes and vortex dynamics in relativistic and non-relativistic theories

11H50 **Semen Valgushev**

Study of Negative Magnetoresistivity in an interacting lattice model of Dirac semimetal

12H40 **Dr Maxim Ulybyshev**

Numerical study of the phase diagram of extended Hubbard model on hexagonal lattice

13H30 Lunch

SESSION 6

CHAIR: PR IGOR SHOVKOVY

14H30 **Pr Peter Horvathy**

Helicity of semiclassical chiral particles

15H20 **Dr Evangelos Papalazarou**

Out-of-equilibrium electron dynamics in photo-excited topological insulators studied by time-resolved photoelectron spectroscopy

16H10 **François Konschelle**

Non-Abelian electromagnetism in Spin Textured Josephson junctions

17H00 Wine and cheese cocktail

SPEAKERS

Dr Mikhail Zubkov

Institute for Theoretical and Experimental Physics - Moscow, RU

Dr Maxim Chernodub

Laboratoire de Mathématiques et Physique Théorique, Tours, FR

Dr Grigory Volovik

Aalto University, Finland and Landau Institute for Theoretical Physics, RU

Pr Dmitry Kharzeev

Brookhaven National Laboratory and Stony Brook University, New York, USA

Pr Vladimir Miransky

University of Western Ontario, CA

Pr Maria Vozmediano

Instituto de Ciencia de Materiales de Madrid, ES

Pr Mark Oliver Goerbig

Laboratoire de Physique des Solides -CNRS, Université Paris-Sud, FR

Pr Munetto Nitta

Keio University, JP

Pr Boruch Rosenstein

National Chiao Tung University (TW), and Ariel University (IL)

Pr Michael Volkov

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Dr Evangelos Papalazarou

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Dr Victor Braguta

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Dr Pavel Buividovich

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Pr Alberto Cortijo

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Pr Igor Lukyanchuk

University of Picardy, FR

Pr Igor Shovkovy

Arizona State University, USA

Pr Michael Stone

University of Illinois, USA

Dr Maxim Ulybyshev

University of Regensburg, DE

François Konschelle

Centro de Física de Materiales, ES

Andrey Kotov

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LE STUDIUM

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Institute for Advanced Studies

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LE STUDIUM

WORKSHOP

TOURS | 2016

PROGRAMME

13-15 June 2016 Condensed matter physics meets relativistic quantum field theory



LOCATION

Centre d'Études Supérieures de la Renaissance (CESR)
59 Rue Néricault Destouches
37000 Tours - FRANCE

CONVENORS

Dr Mikhail Zubkov

LE STUDIUM RESEARCH FELLOW

FROM: Institute for Theoretical and Experimental Physics - Moscow, RU

IN RESIDENCE AT: Laboratory of Mathematical and Theoretical Physics (LMPT), CNRS, Université François-Rabelais, Tours, FR

Dr Maxim Chernodub

Laboratory of Mathematical and Theoretical Physics (LMPT), CNRS, Université François-Rabelais, Tours, FR

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