

## Foreword to the Proceedings of the Corfu Summer Institute “School and Workshops on Elementary Particle Physics and Gravity” (CORFU2012)

*Dedicated to the memory of Robert Brout, a great scientific and human personality, who has honoured with his enthusiastic support the Corfu Meetings*

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### 1. Foreword

These are the Proceedings of the scientific activities of the Corfu Summer Institute “School and Workshops on Elementary Particle Physics and Gravity” (CORFU2012) that took place from 8 to 27 September 2012.

The present Proceedings are dedicated to Robert Brout, whose memory will stay forever with us. With the occasion of the discovery of the scalar particle of the Standard Model at LHC we include in these proceedings a special article written by François Englert on the “Spontaneous Symmetry Breaking” based on lectures of Brout and himself given during the CORFU2001.

We refer to the website:

<http://www.physics.ntua.gr/corfu2012/>

for all organizational and practical details.

The Corfu Summer Institute has a very long, interesting and successful history. The Corfu Meeting started in 1982 as a Summer School on EPP mostly for Greek graduate students and since then it has developed into a leading international Summer Institute in the field of elementary particle physics (covering both experimental and theoretical advances) and more recently of gravity. In addition, it launched a very rich outreach program to teachers and school students that has been widely appreciated by the local society and scientific community over the years.

The structure of the “Summer Institute on EPP and Gravity 2012” was based on the general format developed and established and tested in all previous Corfu Meetings. This year was hosted again by the newly established European Institute for Science and their Applications. The new Institute aims to serve as permanent extension of the Corfu Summer Institutes with the additional target to attract first class scientists that can stay for a long period and produce locally a significant research output. The scientific activities of CORFU2012 were held in the conference hall of the garden of Mon Repos in the town of Corfu, which is expected to become the permanent basis of EISA.

*Proceedings of the Corfu Summer Institute 2012 "School and Workshops on Elementary Particle Physics and Gravity"*  
*Corfu, Greece*  
*September 8-27, 2012*

As in previous events organized in Corfu, there was a number of European Research Networks, European Grants, Institutes and Universities that joined forces organizationally and contributed financial and human resources that led to the success of the Corfu Meetings.

The first event, ***Summer School and Workshop on the Standard Model and Beyond*** (took place from September 8<sup>th</sup> to September 15<sup>th</sup> 2012. It was organized and supported by the ITN “Unification in the LHC Era” ITN: “Invisibles”, ITN: “LHCPhenoNet, ERC Grant: LHC theory, Theoretical Predictions and Analyses of LHC Physics: “Advancing the Precision Frontier”, ERC Grant: MassTeV, ERC Grant: SUPERFIELDS and the institutes: Max Planck Institute for Physics, CERN, SAMPS - National Technical University of Athens, Deutsches Elektronen-Synchrotron (DESY), IPPP Durham, LAPP, IFT Madrid, Sommerfeld Center for Theoretical Physics, SISSA, LPTENS, ICTP, LAPTH, NCSR "Demokritos".

The Scientific Organizers were:

F. del Aguila (Granada U.)  
I. Antoniadis (Ecole Polyt. & CERN)  
R. Barbieri (SNS, Pisa)  
M. B. Gavela (Autonoma U., Madrid)  
W. Hollik (MPI, Munich)  
J. Kalinowski (Warsaw U.)  
R. Pittau (U. Granada)  
M. N. Rebelo (T. U. Lisbon)  
A. Ringwald (DESY)  
G. Rodrigo (IFIC Valencia)  
S. Sarkar (Oxford U.)  
E. Tsesmelis (Dortmund U, CERN)

The second event, ***TR33 - Summer Institute: Particles and the Universe***, took place from September 16<sup>th</sup> to 22<sup>th</sup> 2012. It was co-organized and partially supported by the “Transregional Collaborative Research Centre TRR 33 - The Dark Universe”, University of Heidelberg, University of Bonn, University of München, SAMPS - National Technical University of Athens.

The Scientific Organizers were:

M. Bartelmann (Heidelberg U.)  
M. Drees (Bonn U.)  
J. Mohr (München U.)  
P. Schneider (Bonn U.)  
J. Weller (München U.),  
C. Wetterich (Heidelberg U.)  
G. Wolschin (Heidelberg U.)  
G. Zoupanos (NTUA)

The third event, *XVIII European Workshop on String Theory*, took place from September 19<sup>th</sup> to September 27<sup>th</sup> 2012. It was co-organized and supported by ERC Advanced Grant Projects: MassTeV, SUPERFIELDS, ITN: UNILHC, Humboldt Foundation under Alexander von Humboldt Professorship held by Georgi Dvali, and partially supported by Sommerfeld Center for Theoretical Physics, Max Planck Institute for Physics, Max Planck Institute for Gravitational Physics (Albert Einstein Institute), CERN, LPTENS, SAMPS - National Technical University of Athens, University of Patras, Deutsches Elektronen-Synchrotron (DESY), IPPP Durham, LAPTH, SISSA, CPHT Ecole Polytechnique, ITP Heidelberg, ICTP Trieste, NCSR Demokritos.

The Scientific Organizers were:

I. Bakas (NTUA)  
A. Ceresole (Torino U.)  
G. Dvali (LMU, MPI & CERN)  
C. Hull (Imperial Coll.)  
A. Kehagias (NTUA)  
C. Kounnas (ENS, Paris)  
U. Lindstrom (Uppsala U.)  
Y. Lozano (Oviedo U.)  
D. Luest (LMU & MPI, Munich)  
A. Sevrin (Brussels U.)  
D. Sorokin (INFN Padua)  
A. Van Proeyen (Leuven U.)

The outcome was indeed very successful! An impressive element is that these consecutive events attracted about 210 senior and young scientists in total. The School lecturers were about 18 and the Workshop speakers about 110; whereas the young scientists were about 115.

Internationally leading scientists have been gathered to participate to the School and Workshops, giving lectures and creating a rather unique and stimulating scientific environment for the senior as well as the young scientists.

More specifically, the *Summer School and Workshop on the Standard Model and Beyond* attracted 97 seniors and young scientist in total, 18 of them were invited school lecturers and 25 of them have presented their current research project as workshop speakers.

The invited review lecturers were the following:

*Guido Altarelli, Karsten Buesser, Laura Covi, Daniel de Florian, Albert de Roeck, Giuseppe Degrassi, Emilian Dudas, Elias Kiritsis, Viatcheslav Mukhanov, Hans Peter Nilles, Gilad Perez, Monica Pepe-Altarelli, Arkadi Santamaria, Graham Ross, Guido Tonelli, Emmanuel Tsesmelis, Kyriakos Papadodimas, Pippa Wells*

and the workshop speakers:

*Genevieve Belanger, Gustavo. Branco, David. Emmanuel-Costa, Marta. Felcini, Dumitru. Ghilencea, Thomas Hahn, Robert. Harlander, Arthur Hebecker, Florian Herrmann, Lydia. Iconomidou-Fayard, Abhishek. Iyer, Maria Krawczyk, Fabio Maltoni, Miha Nemevsek, Marek, Oleckowski, Per. Osland, Stefano. Porto, Costas Papadopoulos, Roberto Pittau, Margarida Nesbitt Rebelo, Arkadi Santamaria, Aniello Spiezia, Charilaos. Tsarouchas, Joao Varela, Giulia. Zanderighi.*

The **full programme** of the School and Workshop was the following:

### Saturday 8<sup>th</sup> of September 2012

Arrival Date

### Sunday 9<sup>th</sup> September 2012

09.00-10.00	<i>Theory of Electroweak Interactions</i>	<b>Giuseppe Degrassi</b> (INFN sez. Roma Tre, Universita' Roma Tre)
10.00-11.00	<i>Theory of Electroweak Interactions</i>	<b>Giuseppe Degrassi</b> (INFN sez. Roma Tre, Universita' Roma Tre)
11.00-11.30	Coffee Break	
11.30-12.30	<i>QCD</i>	<b>Guido Altarelli</b> (CERN)
12.30-13.30	<i>QCD</i>	<b>Guido Altarelli</b> (CERN)
13.30-16.00	Lunch Break	

16.00-17.00	<i>Flavor Physics in the LHC era</i>	<b>Gilad Perez</b> (CERN & Weizmann Inst.)
17.00-18.00	<i>Flavor Physics in the LHC era</i>	<b>Gilad Perez</b> (CERN & Weizmann Inst.)
18.00-18.30	Coffee Break	
18.30-19.10	<i>Understanding B-Initiated Processes at the LHC</i>	<b>Fabio Maltoni</b> (Louvain U., CP3)
19.10-19.50	<i>Discussion Session</i>	
19.50-20.30	<i>New Physics in the Flavour Sector in the presence of heavy fermions</i>	<b>Gustavo Branco</b> (Louvain U., CP3)

**Monday 10<sup>th</sup> September 2012**

09.00-10.00	<i>Flavor Physics in the LHC era</i>	<b>Gilad Perez</b> (CERN & Weizmann Inst.)
10.00-11.00	<i>QCD</i>	<b>Guido Altarelli</b> (CERN)
11.00-11.30	Coffee Break	
11.30-12.30	<i>Theory of Electroweak Interactions</i>	<b>Gilad Perez</b> (CERN & Weizmann Inst.)
12.30-13.30	<i>LHCb</i>	<b>Monica Pepe-Altarelli</b> (CERN)
13.30-16.00	Lunch Break	
16.00-17.00	<i>Neutrino Physics</i>	<b>Arcadi Santamaria</b> (IFIC, Valencia)
17.00-18.00	<i>Neutrino Physics</i>	<b>Arcadi Santamaria</b> (IFIC, Valencia)
18.00-18.30	Coffee Break	
18.30-19.10	<i>Recent progress in perturbative QCD</i>	<b>Giulia Zanderighi</b> (Oxford U)
19.10-19.50	<i>Discussion Session</i>	
19.50-20.30	<i>Quantum field theory in four dimensions</i>	<b>Roberto Pittau</b> (Granada U.)

**Tuesday 11<sup>th</sup> September 2012**

09.00-10.00	<i>Higgs Physics</i>	<b>Daniel de Florian</b> (Buenos Aires U.)
10.00-11.00	<i>Higgs Physics</i>	<b>Daniel de Florian</b> (Buenos Aires U.)
11.00-11.30	Coffee Break	

11.30-12.10	<i>Minimal Flavour Violation with two Higgs Doublets</i>	<b>Margarida Nesbitt Rebelo</b> (CFTP/IST/UTL)
12.10-12.50	<i>Discussion Session</i>	
12.50-13.30	<i>Neutrino Mass and the LHC</i>	<b>Miha Nemevsek</b> (Yerevan State U.)

**Free Afternoon**
**Wednesday 12<sup>th</sup> September 2012**

09.00-10.00	<i>SUSY</i>	<b>Graham Ross</b> (Oxford U.)
10.00-11.00	<i>MSSM</i>	<b>Graham Ross</b> (Oxford U.)
11.00-11.30	Coffee Break	
11.30-12.30	<i>Extra dimensions and Braneworlds</i>	<b>Emilian Dudas</b> (Ecole Polytechnique, CPHT)
12.30-13.30	<i>Extra dimensions and Braneworlds</i>	<b>Emilian Dudas</b> (Ecole Polytechnique, CPHT)
13.30-16.00	Lunch Break	
16.00-16.40	<i>New Features in FormCalc 7</i>	<b>Thomas Hahn</b> (MPI)
16.40-17.00	<i>Shift symmetries for the Higgs and the Inflaton</i>	<b>Arthur Hebecker</b> (Heidelberg U.)
17.00-17.40	<i>Neutrinoless double beta decay with small neutrino masses</i>	<b>Arcadi Santamaria</b> (IFIC, Valencia)
18.40-19.00	<i>Discussion Session</i>	

**Thursday 13<sup>th</sup> September 2012**

09.00-10.00	<i>Beyond the SM and the LHC</i>	<b>Graham Ross</b> (Oxford U.)
10.00-11.00	<i>Beyond the SM and the LHC</i>	<b>Graham Ross</b> (Oxford U.)
11.00-11.30	Coffee Break	
11.30-12.30	<i>Introduction to Cosmology</i>	<b>Viatcheslav Mukhanov</b> (LMU, Munich)

12.30-13.30	<i>Introduction to Cosmology</i>	<b>Viatcheslav Mukhanov</b> (LMU, Munich)
13.30-16.00	Lunch Break	
16.00-16.40	<i>Constraining the 2HDM and identifying benchmarks</i>	<b>Per Osland</b> (Bergen U.)
16.40-17.00	<i>Geometrical CP violation and non-renormalisable Higgs potentials</i>	<b>David Emmanuel-Costa</b> (CFTP/IST)
17.00-17.40	<i>Higgs in the NMSSM and the LHC</i>	<b>Genevieve Belanger</b> (Annecy, LAPP)
17.40-18.10	Coffee Break	
18.10-18.50	<i>Discussion Session</i>	
18.50-19.30	<i>Supersymmetric Higgs production at the LHC</i>	<b>Robert Harlander</b> (BU Wuppertal)
19.30-20.10	<i>Recent results of the CMS experiment at CERN</i>	<b>Joao Varela</b> (LIP Lisbon)

**Friday 14<sup>th</sup> September 2012**

09.00-10.00	<i>Higgs Physics</i>	<b>Albert de Roeck</b> (CERN)
10.00-11.00	<i>CLIC</i>	<b>Albert de Roeck</b> (CERN)
11.00-11.30	Coffee Break	
11.30-12.30	<i>CMS</i>	<b>Guido Tonelli</b> (INFN, Pisa)
12.30-13.30	<i>LHC Upgrade</i>	<b>Emmanuel Tsesmelis</b> (CERN)
13.30-16.00	Lunch Break	
16.00-17.00	<i>The International Linear Collider ILC</i>	<b>Karsten Buesser</b> (DESY)
17.00-17.20	<i>Physical processes in strong external fields at linear colliders</i>	<b>Stefano Porto</b> (Hamburg U.)
17.20-18.00	<i>Discussion Session</i>	
18.00-18.40	<i>The fine tuning cost of the likelihood in SUSY models and phenomenological</i>	<b>Dumitru Ghilencea</b> (CERN & NIPNE Bucharest)

	<i>implications</i>	
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**Saturday 15<sup>th</sup> September 2012**

09.00-10.00	<i>Supergravity</i>	<b>Hans Peter Nilles</b> (Bonn U.)
10.00-11.00	<i>String Theory and applications</i>	<b>Elias Kiritsis</b> (UoC and APC)
11.00-11.30	Coffee Break	
11.30-12.30	<i>Latest highlights from the ATLAS experiment</i>	<b>Pippa Wells</b> (CERN)
12.30-13.30	<i>Gauge/Gravity Duality</i>	<b>Kyriakos Papadodimas</b> (CERN)
13.30-16.00	Lunch Break	
16.00-17.00	<i>Gauge/Gravity Duality</i>	<b>Kyriakos Papadodimas</b> (CERN)
17.00-17.20	<i>ATLAS experiment concerning B Physics</i>	<b>Charilaos Tsarouchas</b> (CERN)
17.20-18.00	<i>Results on Higgs search with the ATLAS experiment</i>	<b>Lydia Iconomidou-Fayard</b> (LAL, Orsay)
18.00-18.30	Coffee Break	
18.30-19.10	<i>Discussion Session</i>	
19.10-19.30	<i>Search for new physics with same-sign isolated dilepton events in CMS</i>	<b>Aniello Spiezia</b> (INFN Perugia)
19.30-20.10	<i>Reduction at the integrand level beyond NLO</i>	<b>Costas Papadopoulos</b> (NCSR "DEMOKRITOS")

**Sunday 16<sup>th</sup> September 2012**

09.00-10.00	<i>String Theory and applications</i>	<b>Elias Kiritsis</b> (UoC and APC)
10.00-11.00	<i>Astroparticle Physics and Cosmology</i>	<b>Laura Covi</b> (ITP - Goettingen U.)
11.00-11.30	Coffee Break	
11.30-12.10	<i>A 125 GeV Higgs boson in 2HDM</i>	<b>Maria Krawczyk</b> (Warsaw U.)
12.10-12.30	<i>Lepton Masses and Flavour Violation in Randall Sundrum Model</i>	<b>Abhishek Iyer</b> (Indian Institute of Science, Bangalore)



12.30-12.50	<i>Exploring fundamental questions of nucleon structure through Generalized Parton Distributions</i>	<b>Florian Herrmann</b> (Freiburg)
12.50-13.30	<i>Higgs boson mass in MSSM with inverted hierarchy of sfermion masses</i>	<b>Marek Oleckowski</b> (Warsaw U.)
13.30-16.00	Lunch Break	
16.00-16.40	Discussion Session	
16.40-17.20	<i>Experimental searches for BSM physics at the LHC</i>	<b>Marta Felcini</b> (UCLA)
17.20-17.50	Coffee Break	
17.50-18.50	<i>Astroparticle Physics and Cosmology</i>	<b>Laura Covi</b> (ITP - Goettingen U.)
18.50-19.50	<i>Supergravity</i>	<b>Hans Peter Nilles</b> (Bonn U.)

Monday 17<sup>th</sup> September 2012

Departure Date

The **TR33 - Summer Institute: Particles and the Universe** attracted 80 senior and young scientists in total, and 35 of them have presented their current research project.

*The workshop speakers were:*

*Nabila Aghanim, Marco Baldi, Eric Bergshoeff, Nicolas Bernal, Hans Boehringer, Katharina Borm, Laura Covi, Ioannis Dalianis, Cristiano de Boni, Encieh Erfani, Ulrich Feindt, Johanna Gramling, Julia Harz, Dieter Horns, Benjamin Joachimi, Josef Jochum, Sonia Kabana, Matthias Klein, Oleg Lebedev, Andrea V. Maccio, Dan Maoz, Katarina Markovic, Yannick Mellier, Piotr Mijakowski, Hans Peter Nilles, Constantinos Pallis, Jennifer Pollack, Ewald Puchwein, Thomas Reiprich, Nina Roth, Tomo Takahashi, Krzysztof Turzynski, Lorenzo Ubaldi, Norbert Wermes, Christof Wetterich.*

The **full programme** of the workshop was the following:

**Sunday 16th September 2012**

Arrival Date

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**Monday 17<sup>th</sup> September 2012**

09.15-09.30	<i>Opening and Welcome</i>	
9.30-10.30	<i>Current status of dark matter search experiments</i>	<b>Josef Jochum</b> (Tübingen U.)
10.30-11.00	Coffee Break	
11.00-12.00	<i>Cosmic shear and the Euclid mission</i>	<b>Yannick Mellier</b> (Institut d'Astrophysique de Paris)
12.00-12.30	<i>Getting into shape for Euclid-Intrinsic galaxy shapes and alignments, and impact on weak lensing</i>	<b>Benjamin Joachimi</b> (Edinburgh U.)
12.30-16.00	Lunch Break	
16.00-17.00	<i>Dark matter candidates</i>	<b>Laura Covi</b> (ITP - Goettingen U.)
17.00-17.30	<i>Indirect searches for dark matter at Super-Kamiokande</i>	<b>Piotr Mijakowski</b> (National Centre For Nuclear Research, Warsaw, Poland)
17.30-18.00	Coffee Break	
18.00-19.00	<i>Effects of baryons on the dark matter distribution</i>	<b>Andrea V. Maccio</b> (Max Planck Institute for Astronomy)
19.00-19.30	<i>Probing dark matter with monojets at the LHC</i>	<b>Johanna Gramling</b> (Geneva U.)

**Tuesday 18<sup>th</sup> September 2012**

09.00-10.00	<i>Recent results from Planck</i>	<b>Nabila Aghanim</b> (Institut d'Astrophysique Spatiale)
10.00-10.30	<i>Hydrodynamical simulations of galaxy clusters in dark energy cosmologies</i>	<b>Cristiano de Boni</b> (Bologna U.)
10.30-11.00	Coffee Break	
11.00-12.00	<i>Latest results from the LHC</i>	<b>Norbert Wermes</b> (Bonn)
12.00-12.30	<i>Higgs portal dark matter and the LHC</i>	<b>Oleg Lebedev</b> (DESY)
12.30-16.00	Lunch Break	

16.00-17.00	<i>Strings for everyone</i>	<b>Hans Peter Nilles</b> (Bonn U.)
17.00-17.30	<i>Models of non-minimal chaotic inflation in supergravity</i>	<b>Constantinos Pallis</b> (Cyprus)
17.30-18.00	<i>Axiology</i>	<b>Encieh Erfani</b> (Bonn U.)
18:00-20:00 TR33_PI-Meeting		

**Wednesday 19<sup>th</sup> September 2012**

09.00-10.00	<i>Cluster cosmology and prospects for eRosita</i>	<b>Thomas Reiprich</b> (Bonn U.)
10.00-10.30	<i>Galaxy clusters as cosmological probes</i>	<b>Hans Boehringer</b> (MPI fuer extraterr. Physik)
10.30-11.00	Coffee Break	
11.00-11.30	<i>Simulating structure formation in the dark universe</i>	<b>Marco Baldi</b> (Excellence Cluster Universe)
11.30-12.00	<i>Effects of modified gravity and baryonic physics on structure formation</i>	<b>Ewald Puchwein</b> (Heidelberg Institute for Theoretical Studies)
12.00-12.30	<i>The APEX-SZ weak lensing follow-up project</i>	<b>Matthias Klein</b> (Bonn U.)

**Thursday 20<sup>th</sup> September 2012**

9.00-10.00	<i>High-energy gamma ray constraints on the extragalactic background light</i>	<b>Dieter Horns</b> (Hamburg U.)
10.00-10.30	<i>Effects of warm dark matter on the large-scale structure</i>	<b>Katarina Markovic</b> (U. Observatory Munich)
10.30-11.00	Coffee Break	
11.00-11.30	<i>Scale dependence of non-gaussianities as a probe of the early universe</i>	<b>Tomo Takahashi</b> (Saga U.)
11.30-12.30	<i>A new road to massive gravity?</i>	<b>Eric Bergshoeff</b> (Groningen U.)
12.30-16.00	Lunch Break	

16.00-16.30	<i>X-ray galaxy cluster properties with eRosita</i>	<b>Katharina Borm</b> (Bonn U.)
16.30-17.00	<i>How accurate are measurements of primordial nongaussianities obtained from galaxy clustering surveys?</i>	<b>Nina Roth</b> (Bonn U.)
17.00-17.30	<i>Light neutralinos and white dwarfs</i>	<b>Lorenzo Ubaldi</b> (Bonn U.)
17.30-18.00	Coffee Break	
18.00-18.30	<i>A natural solution to the gravitino overabundance problem</i>	<b>Ioannis Dalianis</b> (NTUA)
18.30-19.00	<i>A new method to measure galaxy bias from the bispectrum</i>	<b>Jennifer Pollack</b> (Bonn U.)

20.00 Conference Dinner

#### Friday 21<sup>st</sup> September 2012

9.00-10.00	<i>Progenitors of SN Ia explosions</i>	<b>Dan Maoz</b> (Tel-Aviv U.)
10.00-10.30	<i>Investigating anisotropies in the local universe with the SN factory</i>	<b>Ulrich Feindt</b> (Bonn U.)
10.30-11.00	Coffee Break	
11.00-11.30	<i>Impact of QCD and Susy-QCD corrections on the neutralino dark matter relic density</i>	<b>Julia Harz</b> (DESY)
11.30-12.30	<i>Multi-field inflationary trajectories with a fast-turn feature</i>	<b>Krzysztof Turzynski</b> (Warsaw U.)
12.30-16.00	Lunch Break	
16.00-16.30	<i>Heavy-ion physics at RHIC and LHC with cosmological implications</i>	<b>Sonia Kabana</b> (SUBATECH and Nantes U.)
16.30-17.00	<i>Quantum gravity and emergent metric</i>	<b>Christof Wetterich</b> (ITP Heidelberg)
17.00-17.30	<i>Phenomenology of WIMPy baryogenesis models</i>	<b>Nicolas Bernal</b> (Bonn U.)
18.00-18.30	<i>Farewell: End of Conference</i>	

The *XVIII European Workshop on String Theory* attracted 79 senior and young scientists in total, and 49 of them presented their current research project.

*The workshop speakers were:*

*Pascal Anastasopoulos, Daniel Arean, Leon Berdichevsky, Eric Bergshoeff, Federico Bonetti, Andrea Borghese, Matthew Buican, Ana Ceresole, Athanasios Chatzistavrakidis, Johanna Erdmenger, Anton Faedo, Fotis Farakos, Ioannis Florakis, Federico Galli, Jakob Gath, Luca Giacone, Dimitrios Giataganas, Alessandra Gnechchi, Christopher Hull, Nikos Irges, Kewang Jin, Neil Lambert, Claudius Klare, Jean-Luc Lehners, Matias Leoni-Olivera, Ulf Lindstrom, Arthur Lipstein, Yolanda Lozano, Carlo Maccaferri, Niall T. Macpherson, Raffaele Marotta, Damian Kaloni Mayorga-Pena, Daniel Musso, Vasilis Niarchos, Eoin O Colgain, George Orfanidis, Gabriele Tartaglino Mazzucchelli, Eleftherios Papantonopoulos, Achilleas Passias, Blaise Rollier, Alexander Sevrin, Dimitrios Skliros, Dimitri Sorokin, Wieland Staessens, Nikolaos Toumbas, Arkady Tseytlin, Joris Vanhoof, Bert Vercnocke, Yihao Yin.*

The **full programme** of the Workshop was the following:

### Wednesday 19<sup>th</sup> September 2012

Arrival Date

### Thursday 20<sup>th</sup> September 2012

9.00-10.30	<i>Double field theory and string duality</i>	<b>Christopher Hull</b> (Imperial College)
10.30-11.00	Coffee Break	
11.00-12.30	<i>Some recent developments in generalized geometry</i>	<b>Ulf Lindstrom</b> (Uppsala U.)
12.30-13.15	<i>Some recent developments in generalized geometry</i>	<b>Ulf Lindstrom</b> (Uppsala U.)
13.15-13.30	<i>Discussion</i>	
13.30-16.30	Lunch Break	
16.30-16.55	<i>Extended supersymmetric sigma-models in 3d AdS</i>	<b>Gabriele Tartaglino Mazzucchelli</b> (Western Australia)

16.55-17.20	<i>Supersymmetry on curved spaces and holography</i>	<b>Claudius Klare</b> (Milano U.)
17.20-17.45	<i>Supersymmetric backgrounds of M-theory and AdS(4)/CFT(3)</i>	<b>Achilleas Passias</b> (Kings' College)
17.45-18.10	<i>Heterotic brane wrapping rules</i>	<b>Eric Bergshoeff</b> (Groningen)
18.10-18.30	Coffee Break	
18.30-18.55	<i>Discrete symmetries in D-brane constructions</i>	<b>Pascal Anastasopoulos</b> (TU Vienna)
18.55-19.20	<i>Matrix theory origins of non-geometric fluxes</i>	<b>Athanasios Chatzistavrakidis</b> (Bonn U.)
19.20-19.45	<i>Lessons from model building from the <math>Z_2 \times Z_4</math> orbifold</i>	<b>Damian Kaloni Mayorga-Pena</b> (Bonn U.)

20.30 Welcome Reception

### Friday 21<sup>st</sup> September 2012

9.00-10.30	<i>Double field theory and string duality</i>	<b>Christopher Hull</b> (Imperial College)
10.30-11.00	Coffee Break	
11.00-12.30	<i>On duality symmetry in perturbative field theory</i>	<b>Arkady Tseytlin</b> (Imperial College)
12.30-13.15	<i>On duality symmetry in perturbative field theory</i>	<b>Arkady Tseytlin</b> (Imperial College)
13.15-13.30	Discussion	
13.30-16.30	Lunch Break	
16.30-16.55	<i>Some aspects of <math>N=(2,2)</math> supersymmetric sigma models</i>	<b>Alexander Sevrin</b> (Brussels)
16.55-17.20	<i>KK-inspired actions for self-dual tensors</i>	<b>Federico Bonetti</b> (MPI Munich)
17.20-17.45	<i>Non-Abelian T-duality and consistent truncations</i>	<b>Eoin O Colgain</b> (Oviedo U.)

17.45-18.10	<i>Boundary state from open string field theory invariants</i>	<b>Carlo Maccaferri</b> (Torino U.)
18.10-18.30	Coffee Break	
18.30-18.55	<i>One-loop amplitudes as BPS state sum</i>	<b>Ioannis Florakis</b> (MPI Munich)
18.55-19.20	<i>String amplitudes with coherent vertex operators and fixed loop momenta</i>	<b>Dimitrios Skliros</b> (Nottingham U.)
19.20-19.45	<i>Scattering amplitudes in three dimensions</i>	<b>Arthur Lipstein</b> (Oxford U.)
19.45-20.10	<i>Scattering amplitudes in <math>N=6</math> Chern-Simons matter theories</i>	<b>Matias Leoni-Olivera</b> (Buenos Aires U.)

**Saturday 22<sup>nd</sup> September 2012**

9.00-10.30	<i>Non-Abelian branes in M-theory</i>	<b>Neil Lambert</b> (Kings' College & CERN)
10.30-11.00	Coffee Break	
11.00-12.30	<i>Non-Abelian branes in M-theory</i>	<b>Neil Lambert</b> (Kings' College & CERN)
12.30-13.15	<i>Higher spin gravity and exact holography</i>	<b>Kewang Jin</b> (ETH Zurich)
13.15-13.30	Discussion	
13.30-16.30	Lunch Break	
16.30-16.55	<i>Non-linear deformations of duality-symmetric theories</i>	<b>Dimitri Sorokin</b> (Padova U.)
16.55-17.20	<i>Non-perturbative constraints on light sparticles from properties of the RG flow</i>	<b>Matthew Buican</b> (CERN)
17.20-17.45	<i>Towards the standard model with rigid D-branes</i>	<b>Wieland Staessens</b> (Mainz)
17.45-18.10	<i>Magnetized branes on <math>T^6</math></i>	<b>Raffaele Marotta</b> (Napoli U.)
18.10-18.30	Coffee Break	

18.30-18.55	<i>A geometric bound for F-term inflation</i>	<b>Andrea Borghese</b> (Groningen U.)
18.55-19.20	<i>Dimensional reduction of <math>N=1</math> <math>E_8</math> SYM over <math>SU(3)/U(1) \times U(1) \times Z_3</math> and its four-dimensional effective action</i>	<b>George Orfanidis</b> (NTU Athens)

**Sunday 23<sup>rd</sup> September 2012**

Excursion

**Monday 24<sup>th</sup> September 2012**

9.00-10.30	<i>Aspects of string cosmology</i>	<b>Nikolaos Toumbas</b> (Cyprus U.)
10.30-11.00	Coffee Break	
11.00-12.30	<i>Applications of gauge/gravity duality</i>	<b>Johanna Erdmenger</b> (MPI Munich)
12.30-13.15	<i>Some properties of d-geometries</i>	<b>Anna Ceresole</b> (Torino U.)
13.15-13.30	Discussion	
13.30-16.30	Lunch Break	
16.30-16.55	<i>Non-perturbative aspects of gauge/gravity correspondence</i>	<b>Luca Giaccone</b> (Torino U.)
16.55-17.20	<i>Near horizon solutions of brane systems preserving 16 supercharges</i>	<b>Leon Berdichevsky</b> (Weizmann U.)
17.20-17.45	<i>Toward a superpotential for the Papadopoulos-Tseytlin ansatz</i>	<b>Anton Faedo</b> (Swansea U.)
17.45-18.10	<i>Black branes as piezoelectrics</i>	<b>Jakob Gath</b> (NBI Copenhagen)
18.10-18.30	Coffee Break	
18.30-18.55	<i>Duality invariance for black holes in <math>N=2</math> gauged supergravity</i>	<b>Alessandra Gnechi</b> (Padova U.)



18.55-19.20	<i>Microstates for non-extremal black holes</i>	<b>Bert Vercoocke</b> (Saclay)
19.20-19.45	<i>Scalars with higher derivatives in supergravity and cosmology</i>	<b>Jean-Luc Lehners</b> (AEI Golm)

**Tuesday 25<sup>th</sup> September 2012**

9.00-10.30	<i>Applications of gauge/gravity duality</i>	<b>Johanna Erdmenger</b> (MPI Munich)
10.30-11.00	Coffee Break	
11.00-12.30	<i>Aspects of string cosmology</i>	<b>Nikolaos Toumbas</b> (Cyprus U.)
12.30-13.15	<i>Entropy of the self-dual string soliton</i>	<b>Vasilis Niarchos</b> (Crete U.)
13.15-13.30	Discussion	
13.30-16.30	Lunch Break	
16.30-16.55	<i>Holographic duals of (2+1)-d QFTs with minimal SUSY with massive flavours</i>	<b>Niall T. Macpherson</b> (Swansea U.)
16.55-17.20	<i>Holographic thermalization</i>	<b>Federico Galli</b> (Brussels)
17.20-17.45	<i>The spectral function in a strongly coupled, thermalizing CFT</i>	<b>Joris Vanhoof</b> (Brussels)
17.45-18.10	<i>Probing strongly coupled anisotropic plasma</i>	<b>Dimitrios Giataganas</b> (Witwatersrand U.)
18.10-18.30	Coffee Break	
18.30-18.55	<i>FFLO states in holographic superconductors</i>	<b>Eleftherios Papantonopoulos</b> (NTUA)
18.55-19.20	<i>Unbalanced holographic superconductors and spintronics</i>	<b>Daniel Musso</b> (Brussels)
19.20-19.45	<i>Lifshitz holographic renormalization from AdS</i>	<b>Blaise Rollier</b> (Bern U.)

20.30 Banquet

**Wednesday 26<sup>th</sup> September 2012**

9.00-10.30	<i>Black holes, quivers and wall crossing</i>	<b>Boris Pioline</b> (Jussieu and CERN)
10.30-11.00	Coffee Break	
11.00-12.30	<i>Black holes, quivers and wall crossing</i>	<b>Boris Pioline</b> (Jussieu and CERN)
12.30-13.15	<i>Strings and non-commutative/non-associative geometry</i>	<b>Dieter Luest</b> (LMU and MPI Munich)
13.15-13.30	Discussion	
13.30-16.30	Lunch Break	
16.30-16.55	<i>Non-singlet baryons in AdS/CFT</i>	<b>Yolanda Lozano</b> (Oviedo U.)
16.55-17.20	<i>Emergent potentials in consistent higher derivative <math>N=1</math> supergravity</i>	<b>Fotis Farakos</b> (NTU Athens)
17.20-17.45	<i>“Topological massive” spin-2 theory beyond 3d</i>	<b>Yihao Yin</b> (Groningen U.)
17.45-18.10	<i>The spectrum of (h)QCD in the Veneziano Limit</i>	<b>Daniel Arean</b> (ICTP Trieste)
18.10-18.30	Coffee Break	
18.30-18.55	<i>Lattice gauge theory - gravity duality</i>	<b>Nikos Irges</b> (NTUA)

**Thursday 27<sup>th</sup> September 2012**

Departure Date

Most of the presentations appeared on line in the CORFU2012 homepage just after they were delivered: <http://www.physics.ntua.gr/corfu2012/lectures.html>

We sincerely thank everybody who contributed to the success of CORFU2012, in particular the young students that came long ways from many different countries. Special thanks are due to all speakers and the organizers, the conference secretary Mrs. Ifigenia Moraiti and the group of our graduate students who helped in various ways and contributed in a very significant manner to the success of the meeting. Finally, we wish to express our gratitude to our sponsors whose financial contribution made it all possible.

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14. CERN
15. Deutsches Elektronen-Synchrotron (DESY)
16. Max Planck Institute for Physics
17. Max Planck Institute for Gravitational Physics (Albert Einstein Institute)
18. Sommerfeld Center for Theoretical Physics
19. National Center of Scientific Research “Demokritos”
20. SISSA: Scuola Internazionale Superiore di Studi Avanzati
21. ICTP: The Abdus Salam International Centre for Theoretical Physics
22. IPPP Durham: Institute for Particle Physics Phenomenology

23. LAPP: Laboratoire d'Annecy – le - Vieux de Physique des Particules
24. LAPTH: Laboratoire d'Annecy – le - Vieux de Physique Theorique
25. LPTENS: Laboratoire de physique théorique ENS
26. Universidad Autonoma de Madrid
27. Instituto de Fisica Teorica UAM/CSIC
28. ITP Heidelberg
29. University of Patras
30. University of Athens
31. CPHT, Ecole Polytechnique
32. Plaisio Computers

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