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1.4 INTERNAL REPORTS AND PREPRINTS

1.4.1 By the members in Benin

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 J. Chem. Phys. (Submitted)

1.4.2 By the members outside Africa

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Banach Partial \star -Algebras: Basic Properties, Representations, Spectrum,
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1.5 INVITED LECTURES

1.5.1 By the members outside Africa

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2. J. Govaerts,
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3. J. Govaerts,
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1.6 SEMINARS GIVEN

1.6.1 By members in Benin

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New Families of Orthogonal Polynomials.
3. M. N. Hounkonnou,
Chair of Seminars of Theoretical Physics Research Unit de l'Institut de Mathématiques et de Sciences Physiques (IMSP), 2004,
Functional Analysis Methods for Mathematical and Theoretical Physics.
4. M. N. Hounkonnou,
April 2004, *Mathematical Sciences Education in Benin*,
New Jersey University of Rutgers.
5. L. Gouba,
Two-Dimensional Scalar QED: The Gauge Invariant Formulation,
May 2004, National Seminars at Institut de Mathématiques et de Sciences Physiques (IMSP).
6. K. Sodoga,
April 2004,
Generalized Creation and Annihilation Operators for Shape-Invariant Potentials,
National Seminars at Institut de Mathématiques et de Sciences Physiques (IMSP).

7. L. Gouba,
April 2004,
Sur l'Intégrale Fonctionnelle: Cas d'un Système Mécanique à Deux Dégrés de Liberté,
Theoretical Physics Research Unit Seminars at Institut de Mathématiques et de Sciences Physiques (IMSP).
8. L. Gouba,
April 2004,
Sur les Solitons,
Theoretical Physics Research Unit Seminars at Institut de Mathématiques et de Sciences Physiques (IMSP).
9. L. Gouba,
May 2004,
Fermionisation d'un Champ Scalaire Complexe de Masse Nulle en Dimension 2,
Theoretical Physics Research Unit Seminars at Institut de Mathématiques et de Sciences Physiques (IMSP).
10. M. N. Hounkonnou,
Mathematical Physics Seminar,
ICMPA, November 27th, 2004,
On the Solutions of Non Linear Recurrence Equations for the Generalized Charlier Semi-Classical Orthogonal Polynomials.
11. J. Ben Geloun,
Mathematical Physics Seminar,
ICMPA, November 27th, 2004,
On The Lagrangian Formulation of Quantum Field Theory: The Noether Theorem.
12. A. D. Kanfon,
On F-Harmonic Maps in Cosmology,
October 2004,
National Seminars at Institut de Mathématiques et de Sciences Physiques (IMSP).
13. C. Hounga,
March 2004,
New Families of Orthogonal Polynomials: Continuous Case,
National Seminars at Institut de Mathématiques et de Sciences Physiques (IMSP).
14. C. Hounga,
June 2004,
New Families of Orthogonal Polynomials: Discrete Case,
National Seminars at Institut de Mathématiques et de Sciences Physiques (IMSP).
15. G. Edah,
June 2004,
Effet de la Corrélation dans les Réactions ($e, 2e$) et ($\gamma, 2e$),

Theoretical Physics Research Unit Seminars at Institut de Mathématiques et de Sciences Physiques (IMSP).

16. M. N. Hounkonnou,
June 2004,
On Sturm-Liouville Second Order Difference Equations,
Theoretical Physics Research Unit Seminars at Institut de Mathématiques et de Sciences Physiques (IMSP).
17. K. Sodoga,
October 2004,
On Lie Group Representations,
Theoretical Physics Research Unit Seminars at Institut de Mathématiques et de Sciences Physiques (IMSP).
18. K. Sodoga,
March 2004,
Factorisation des Opérateurs de Sturm-Liouville,
Theoretical Physics Research Unit Seminars at Institut de Mathématiques et de Sciences Physiques (IMSP).
19. K. Sodoga,
April 2004,
Propriétés Fondamentales des Opérateurs de Sturm-Liouville,
Theoretical Physics Research Unit Seminars at Institut de Mathématiques et de Sciences Physiques (IMSP).
20. G. Edah,
June 2004,
Description du Double Continuum de Deux Electrons Emis dans le Champ du Noyau,
National Seminars at Institut de Mathématiques et de Sciences Physiques (IMSP).

1.6.2 By the members outside Africa

1. J. Govaerts,
3 February 2004,
Gauge Fixing and the Cosmological Constant,
Center for Particle Physics and Phenomenology (CP3), Catholic University of Louvain (Louvain-la-Neuve, Belgium).
2. D. Lauvergnat and M. Desouter-Lecomte,
26 October 2004,
Dynamique Quantique : Réduction de Dimension,
Laboratoire de Chimie Physique, Comité d'évaluation (Orsay, France).
3. D. Lauvergnat,
January 15 2004,

Dynamique de molécules déformables : Apport des méthodes "ab-initio" ,
Laboratoire de Chimie Physique, Habilitation à Diriger des Recherches (Orsay, France).

1.7 PARTICIPATION TO INTERNATIONAL CONFERENCES AND WORKSHOPS

1.7.1 By the members in Benin

1. G. Edah,
Fifteenth Engelbrecht Summer School in Theoretical Physics,
KwaZulu Natal, South Africa, January (2004).
2. L. Gouba, J. Govaerts and M. N. Houkonnou,
Université de Lomé, (Togo) October 27 (2004),
Sur la Dualité Fermion/Boson en Dynamique Quantique de Dimension 2.
3. E. S. Azatassou, H. Hounga and M. N. Houkonnou,
Université de Lomé, (Togo) October 27 (2004),
Discrete Semi-Classical Orthogonal Polynomials of Class Two.
4. G. Honnouvo,
International Workshop: Wavelets: Theory and Applications,
University of Prince Edward Island, Charlottetown, P.E.I., Canada, 26 April - 7 May, 2004.
5. G. Honnouvo,
Séminaire de Physique Mathématique,
Centre de Recherches Mathématiques,
Fourier Transforms on Lie Groups and Applications for Imaging and Data Processing,
(Conférencier: A. Atoyan), Université de Montréal, November 2 (2004).
6. G. Honnouvo,
Séminaire de Physique Mathématique,
Application de l'Extension Continue d'une Transformée de Type Fourier dans l'Analyse des Données Radar,
(Conférencier: M. Germain),
Centre de Recherches Mathématiques, Université de Montréal, November 9 (2004).
7. Ezinvi Baloïtcha,
Faraday Discussion 127 -*Non-Adiabatic Effects in Chemical Dynamics*
Oxford (United Kingdom), April 5-7(2004).
8. Ezinvi Baloïtcha,
18th International Symposium on Gas Kinetics, Bristol August 7-12(2004).
9. Ezinvi Baloïtcha and Gabriel G. Balint-kurti
Photodissociation of Ozone in the Hartley Bands Conical intersections, potential energy surfaces and dynamics.

Core Strategic Measurement for Atmospheric Science (COSMAS), Bristol August 12-13(2004).

1.7.2 By the members outside Africa

1. S.T. Ali, VII International Workshop on Wavelets, Quantization and Partial Differential Equations: Theory and Applications, University of Havana, Cuba, February 23-27, 2004.
2. S.T. Ali, International Workshop: Wavelets – Theory and Applications, University of Prince Edward Island, Charlottetown, PEI, April 26 – May 7, 2004.
3. S.T. Ali, XXIII-rd Workshop on Geometrical Methods in Physics, Bialowieza, Poland, June 27 – July 4, 2004.
4. S.T. Ali, Workshop on wavelets and their Applications, King Abdul Aziz City of science and Technology (KACST), Riyadh Saudi Arabia, Dec. 14, 2004.
5. S.T. Ali, International Conference on Operator Theory, Quantum Probability and Non-commutative Geometry, Kolkata, India, Dec. 20 – 23, 2004.
6. J-P. Antoine,
Rencontre Nationale de Physique Théorique,
Tanger (Maroc), May 27-29 (2004).
7. J-P. Antoine,
Université d'été "Sciences mathématiques et modélisation",
IREM-Bordeaux, August 23-27 (2004).
8. J-P. Antoine,
XII. European Signal Processing Conference,
EUSIPCO-2004, Vienna, September 6-10, (2004).
9. V. Tayal, G.P. Gupta, A.N. Tripathi, and A.Z. Msezane,
Fine - Structure Energy Levels, Oscillator Strengths, and Lifetimes in Mg-Like Argon,
ECAMP VIII 8th European Conf. On Atomic and Molecular Physics,
(Rennes, France), July 6 - 10 (2004).
10. G.P. Gupta and A.Z. Msezane,
Large Scale CIV3 Calculations of Fine-Structure Energy Levels and Lifetimes in Ti X, Fe XIV and Ni XVI,
ECAMP VIII 8th European Conf. On Atomic and Molecular Physics,
(Rennes, France), July 6 - 10 (2004).
11. M.Ya. Amusia, L.V. Chernysheva, N.A. Cherepkov, Z. Felfli and A.Z. Msezane,
Spin Polarization of Photoelectrons from 3d Electrons of Xe, Cs and Ba,
The 14th APS Topical Conference on Atomic Processes in Plasmas,
(La Fonda in Santa Fe, NM), April 19-22 (2004).

12. D. Lauvergnat,
Reduction of dimensionality,
 COST P4 WG4 (theory), (Brussels, Belgium),
 October 30, 2004.
13. D. Lauvergnat, A. Nauts, M. Desouter-Lecomte and G. Dive,
Exact numerical computation of kinetic energy operator: Reaction Path Hamiltonian on Adenine+OH reaction.,
 Radiation Damage in Biomolecular Systems (Lyon, France),
 24-27 june, 2004.

1.8 PH.D. THESIS SUPERVISED AND DEFENDED 2004

1.8.1 By the members in Benin

- M.N. Hounkonnou:
 1. L. Gouba (with J. Govaerts, co-supervisor),
Théories de Jauge en Dimension 2,
 Université d'Abomey-Calavi.
 2. C. Hounga,
Sur de Nouvelles Familles de Polynômes Orthogonaux,
 Université d'Abomey-Calavi.
 3. E. S. Azatassou,
Sur les $D_{q,\omega}$ Polynômes Orthogonaux Semi-Classiques,
 Université d'Abomey-Calavi.
 4. J. Ben Geloun (with J. Govaerts, co-supervisor),
Modèle de Schwinger dans un Espace-Temps 1+1 non Commutatif,
 Université d'Abomey-Calavi.
 5. K. Sodoga,
Sturm-Liouville Differential Operators: Factorization and Solvable Potentials,
 Université d'Abomey-Calavi.
 6. A. Anjorin,
On Differential Operators of Mathematical Physics: Supersymmetric Factorization and Solvable Potentials,
 Université d'Abomey-Calavi.
 7. F. Guédjé (with G. Débiais, co-supervisor),
On Optical Parameter Determination of the Atmosphere from a LIDAR Signal,
 Université d'Abomey-Calavi and Université de Perpignan.
 8. K. Mahaman (with B. Somé, co-supervisor),
Contribution à la Modélisation du Cancer du Cerveau,
 Université d'Abomey-Calavi.
 9. G. Honnouvo (with S. T. Ali, co-supervisor),
On von Neumann Quantization of Bohm-Aharonov Operator: Scattering and Spectral

Theory,

Université d'Abomey-Calavi and Concordia University.

- E. Houngninou,
Dynamics and Disturbance of Equatorial Aeronomy as Observed by HF Radar,
PhD thesis (Thése d'Etat) defended, CETP- S^t Maur, France.

1.8.2 By the members outside Africa

- S. T. Ali:
 1. R. Deptula, *Coherent States Based on the Euclidean Group*, Concordia University, defended Dec. 2004.
 2. G. Honnouvo (with M. N. Hounkonnou, co-supervisor),
On Discrete Wavelets: Theory and Applications,
Concordia University.
 3. Tamara Diaz Chang (with V. Hussin, co-supervisor), *Coherent States from the Jaynes Cummings Model*, Université de Montréal.
- J-P. Antoine:
 1. Laurent JACQUES,
Ondelettes, Repères et Couronne Solaire, defended 21.06.2004.
 2. Samuel GISSOT,
Analyse du Mouvement dans les Séquences d'Images EUV de la Couronne Solaire.
 3. Samira BISKRI (UST H.Boumedi(r), Alger),
Techniques d'Analyse en Ondelettes et Applications en Géophysique.
 4. Eddy-Evian NTIRWIHISHA (U. du Burundi),
Analyse en Ondelettes et Applications à la Séismologie.
- J. Govaerts:
 1. Geoffrey Stenuit,
Configurations de vortex magnétiques dans des cylindres mésoscopiques supraconducteurs,
Université catholique de Louvain (Louvain-la-Neuve, Belgium), defended July 9th, 2004.
 2. Emilie Burton,
Evaluation numérique automatisée de diagrammes de Feynman à une et deux boucles,
Université catholique de Louvain (Louvain-la-Neuve, Belgium).
 3. Damien Bertrand,
Champs électromagnétiques et théorie de Ginzburg-Landau relativiste pour les supraconducteurs nanoscopiques: une extension covariante relativiste de la théorie BCS scalaire,
Université catholique de Louvain (Louvain-la-Neuve, Belgium).

4. Florian Payen,
Dynamique non perturbative et topologie en électrodynamique quantique à 2+1 et 3+1 dimensions,
 Université catholique de Louvain (Louvain-la-Neuve, Belgium).
5. Bruno Bertrand,
Topologie et dynamique non perturbative en Théories de Maxwell-Chern-Simons supersymétriques à 2+1 dimensions,
 Université catholique de Louvain (Louvain-la-Neuve, Belgium).
6. Jonathan Delepine,
Constante cosmologique et gravitation quantique,
 Université catholique de Louvain (Louvain-la-Neuve, Belgium).
7. Laure Gouba (with M.N. Hounkonnou, co-supervisor),
Théories de jauge en dimension deux,
 Université d'Abomey-Calavi.
8. Joseph Ben Geloun (with M.N. Hounkonnou, co-supervisor),
Modèle de Schwinger dans un espace-temps de dimension 1+1 non commutatif,
 Université d'Abomey-Calavi.

- B. Piraux:

1. G. Edah,
Description du Double Continuum de Deux Electrons Emis dans le Champ du Noyau,
 Université d'Abomey-Calavi (2004), defended 08.07.2004.

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1.10 VISITING SCIENTISTS FROM ABROAD

1. Prof. Bernard Piraux, (Catholic University of Louvain, Louvain-la-Neuve, Belgium).
2. Prof. S. T. Ali, (Concordia University, Montreal, Canada).
3. Dr. Hans-Peter Thamm, (University of Bonn, Germany).
4. Prof. S. Dossou-Gbété, (Université de Pau, France).
5. Dr D. Batossi, (France).

6. Prof. K. Tchakpélé, (Université de Lome, Togo).
7. Prof. T. Assih, (Université de Lome, Togo).
8. Dr M. Gosset, (LTH, Grenoble, France).
9. Prof. A. Banyaga, (Pennsylvania State University, USA).
10. Mr A. Agim Oketchuku, (University of Lagos, Nigeria).
11. Mr M. Aina, (Université de Limoges, France).

2 FINANCIAL REPORT

2.1 ICMPA GRANTS PROGRAMME FOR UNDERGRADUATE STUDENTS 2004

This programme intends to help the best undergraduate students with limited means and who need assistance to pursue their studies in African Universities. For 2004, this programme has permitted to support 6 students of the Université d'Abomey-Calavi. The 2004 fellows are:

1. Alia Didier Yelognissé (Benin);
2. Anago E. K. Romual (Benin);
3. Faton Elfried Grita Fifa (Benin);
4. Godonou S. Parfait (Benin);
5. Houngbénon Parfait (Benin);
6. Osséni Rachidi (Benin).

The ICMPA Grants Programme for Undergraduate Students (The ICMPA-GPUS) is currently sponsorized by Professor Odon Vallet Foundation (France).

2.2 ICMPA RESEARCH FELLOWSHIPS 2004

In 2004, due to lack of financial resources, this programme has not been well accomplished. Only limited actions have been developed in benefit of Ph.D students of the Institut de Mathématiques et de Sciences Physiques and local researchers from University of Abomey-Calavi. These actions have mainly consisted in acquiring computer facilities. Besides, the stay at the ICMPA of the following two foreign Ph.D students have been partly supported (rooms):

1. Ben Geloum Joseph from Senegal and
2. Anjorin Aderibigbe from Nigeria.

Dr Hubert Onibon from Benin has benefited of a postdoral position. The ICMPA Research Fellowships 2004 has been sponsorized mainly by the Daniel Iagolnitzer Foundation and by the Institut de Recherche pour le Développement (IRD, France)

2.3 ICMPA TRAINING PROGRAMS 2004

The ICMPA training programs have been financed, in terms of grants for students, in 2004 by the following sponsors:

1. UNESCO;
2. Service de Cooperation et d'Action Culturelle (SCAC, French Embassy, Cotonou)

The following students have been granted in 2004:

For UNESCO grants:

1. Afouda Eric (Benin) and
2. Nounawon Parfait (Benin);

For SCAC grants :

1. Alamou Eric (Benin).