Troisième Biennale en Mathématique.

NLAGA-BIRS 2023.

Du 21 au 25 août 2023 à Aims-Sénégal, Mbour, Sénégal.
Hôtel Royal Saly.

1 Programme des activités scientifiques

Horaires	Lundi	Mardi	Mercredi	Jeudi	Vendredi
08h30 - 09h00					
09h00 - 09h30	Cérémonie d'ouverture	EGF 3	EGF 5	EGF 7	Journée porte ouverte
09h30 - 10h00	EGF 1	EGF 3	EGF 5	EGF 7	Journée porte ouverte
10h00 - 10h30	EGF 1	Papier 6	Papier 12	Papier 18	Journée porte ouverte
					Journée porte ouverte
10h30 - 11h00	Pause Café	Pause Café	Pause Café	Pause Café	Pause Café
					Journée porte ouverte
11h00 - 11h30	Papier 1	Papier 7	Papier 13	Papier 19	Journée porte ouverte
11h30 - 12h00	Papier 2	Papier 8	Papier 14	Papier 20	Journée porte ouverte
12h00 - 12h30	Papier 3	Papier 9	Papier 15	EGF 8	Journée porte ouverte
12h30 - 13h00	Papier 4	Papier 10	Papier 16	EGF 8	Cérémonie de cloture
13h00 - 15h00	Pause Déjeuner	Pause Déjeuner	Pause Déjeuner	Pause Déjeuner	Pause Déjeuner
15h00 - 15h30	EGF 2	EGF 4	EGF 6		
15h30 - 16h00	EGF 2	EGF 4	EGF 6		
16h00 - 16h30	Papier 5	Papier 11	Papier 17	- - -	
16h30 - 17h00	- - -	- - -	- - -	- - -	
17h00 - 18h00	- - -	- - -	- - -	- - -	- - -

2 Exposés Grand Format (EGF).

Exposés Grand Format	Orateurs
EGF 1 : Recent Contributions On Inverse Problems And On Iterative Method For Some Nonlinear Equations In Classical Banach Spaces	Ngalla Djitte (UGB)
EGF 2 : Oscillatory Dynamics For Evolution Equations Using Favard's Theory In Uniformly Convex Banach Spaces.	Khalil Ezzinbi (UCAM)
EGF 3 : Sur les variétés fortement stables du flot géodésique sur une surface hyperbolique.	Françoise Dal'Bo (IRMAR)
EGF 4 : Sur la Conjecture de Hopf	Athoumane Niang (UCAD)
EGF 5 : Couplage en Optimisation de Formes et Quelques Applications	Alassane Sy (UADB)
EGF 6 : DC Programming: Theory And Applications	Babacar Mbaye Ndiaye (UCAD)
EGF 7 : Recent Progress On Master Equations In Mean Field Games.	Wilfried Gangbo (UCLA)
EGF 8 : Probabilistic approach to nonlinear PDEs	Mouhamadou Sy (AIMS)

Abstract EGF 1. First, we present recent contributions of our group to inverse problems from demand theory in economy and from calculus of variations. The tools used here are that of exterior differential systems. Second, we present an in-depth and up-to-date coverage of the main ideas, concepts and most important results on iterative algorithms for the approximation of zeros of accretive and monotone type mappings, of solutions of Hammerstein type equations involving accretive and monotone type mappings. We also present some applications to convex minimization problems and to variational inequality problems.

Abstract EGF 2. In this work, we use an approach due to Favard (Acta Math 51:31–81, 1928) to study the existence of weakly almost periodic and almost automorphic solutions for some evolution equation whose linear part generates a C0-group satisfying the Favard condition in uniformly convex Banach spaces. When this C0-group is bounded, which is a condition stronger than Favard's condition, we prove the equivalence between almost automorphy and weak almost automorphy of solutions.

Abstract EGF 3. Nous nous intéresserons à la topologie des variétés fortement stables du flot geodesique et décrirons un exemple inattendu construit par Alexandre Bellis.

Abstract EGF 4. (1) Présentation de la conjecture de Hopf. (2) Quelques travaux sur la conjectures, en particuliers nous parlerons de résultats obtenus avec de jeunes collabateurs sur cette conjecture.

Abstract EGF 5. L'objectif de cette présentation est de faire une brève introduction à l'optimisation de formes (géométrique et topologique), rappeler quelques résultats principaux. Ensuite, nous proposons une méthode qui permet de faire un couplage entre ces deux techniques d'optimisation. Nous terminons par donner queques applications pratiques.

Abstract EGF 6. We develop a theory of optimization for a class of smooth/nonsmooth nonconvex functions, called DC - Difference of Convex - functions. In many cases, objective function and constraints are not convex, and so methods on convex functions prove insufficient. DC programming constitutes the backbone of smooth/nonsmooth nonconvex programming and global optimization (which is concerned with finding global solutions to nonconvex programs). Most real life optimization problems are nonconvex. As an application, it is discussed how to determine the automated guided vehicle dispatching in port container terminals to reduce the AGV processing time (loading and discharging) and guarantee port efficiency. The problem statement and its mathematical formulation are developed. It can be reformulated, thanks to exact penalty techniques in DC Programming, as a polyhedral DC Program and globally solved.

Abstract EGF 7. Mean Field Games were independently introduced by Lasry–Lions, and by Huang–Caines–Malham ´e, to study strategic decision making by small interacting agents in very large populations. The master equation is a Hamilton–Jacobi equation on the set of probability measures, which encapsulates all the game information, but its non-local nature makes a well– posedness theory a challenge, unless a monotonicity condition is satisfied by the data. The first successful condition was the so-called Lasry–Lions monotonicity condition. To handle non–separable Hamiltonians, we introduce an alternative condition which we term displacement monotonicity. The latter condition allows to also handle games which are either only deterministic or games where only the common noise is present. (This talk is based on works in collaboration with A. Meszaros, C. Mou and J. Zhang).

Abstract EGF 8. Probabilistics methods have become particularly fruitful in the analysis of nonlinear partial differential equations, allowing to achieve groundbreaking results towards initial value problems and asymptotic in time properties. In this talk, I will present some principles of this approach and discuss recent developments as well as some interesting perspectives.

3 Présentation de papiers (Papiers).

Papier ..	Auteurs
1 : A New Krasnoselskii's Type Iterative Method For Hammerstein Equations With Monotone Mappings In Certain Banach Spaces	A. Adoum, M. Sène, M. Ndiaye, N. Djitte
2 : Operators Intertwinings With Translation Operators On Hypergroups	K. Germain Brou, I. Touré
3 : A New Fixed Point Theorem For System Of Inclusion Problems in Banach Spaces	T. M. M. Sow, A. Coulibaly
4 : Large Deviation Locally Periodic Depending Two Parameters	I. Sané, J. Diatta, C. Manga
5 : Large Deviations For Mckean-Vlasov Jump-Equations With Subdifferential Operator	A. Coulibaly, T. Sow, M. M. Mbaye
6 : On Dual Quaternions, Dual Split Quaternions and Cartan-Schouten Metrics on Cotangent Bundles Of Simple Lie Groups	A. Diatta, B. Manga, F. Sy
7 : Some Geometric Properties On Weil Bundle	A S. Bouesso, B. G. R. Bossoto
8 : Complex Structure on Pseudo-Riemannian Poisson Manifolds	- - - -
9 : Criterion For The Existence Of η-Einstein Contact Metric Structures	A. Wade, A. Ndiaye and A. S. Diallo
10 : The Rozenberg-Zelinsky Sequence For The Category of the Dyslectic Hopf Yetter-Drinfel'd (S;H)-Module Algebras	C. L. Nango
11 : Metrics Induced By $\mathbb{R}^{6+k}$ On The Graph of $k-$Smooth Functions And The Hopf Conjecture	A. Niang, T. Seck, A. Thiandoum
12 : Variational Image Denoising Based On Topological Optimization	E. H. S. Diop, O. Sarr, A. Sy, M. Mbow
13 : On a NonLinear Dirichlet Eighenvalue Problem	R. M. Gouton, A. Marcos, D. Seck
14 : Hamilton-Jacobi Equations and Mathematical Morphology in Pseudo-Riemannian Manifolds	E. Diop, A. Mbengue, B. Manga. D. Seck
15 : On The Eigenvalue Problem For Complex Hessian Operators	P. Badiane, A. Zeriahi
16 : Traces Of Pluriharmonic Functions	S. Diatta, S. Sambou, E. Bodian…
17 : Optimal Covid-19 Control on Effectiveness of Detection Campaign and Treatment	M. A.M.T. Balde, S. Ly, L. Tendeng.
18: Nonparametric Prediction and Supervised Classification For Spatial Dependent Functional Data Under Fixed Sampling Design	M. Ndiaye, S. D. Niang, P. Ngom, …
19 : Generation and Structural characterization for randomly dispersed nonoverlapping spheres by Lennard-Jones potential based ..	S. Kane, C. Sam, M. Faye
20 : Parametrization Of Algebraic Points Of Low Degree On The Hyperelliptic Curves Of …	M. Camara, M. Fall, O. Sall

4 Programme de la journée porte ouverte du vendredi 25 août 2023

Les activités de la journée porte ouverte se dérouleront à l'Hôtel Royal Saly.

Horaire	Activité
09h00 - 09h30	Accueil et installation des invités
09h30 - 09h40	Allocution du Directeur de NLAGA
09h40 - 10h30	Panel du CAOSP sur le thème «Les sciences et les techniques : un défi à ta mesure»
10h30 - 11h00	Pause Café
11h00 - 11h40	Conférence grand public de SWMA sur le thème «Les Maths autrement ...»
11h40 - 12h00	Cérémonie de clôture de la biennale de mathématiques
12h00 - 12h40	Visite de stands
12h40 - 13h40	Pause déjeuner.