Franco-Moroccan Mathematics Days

Summary Program

Day	Time	Activity
Tuesday, May 13 (Science Mediation Day)	**Morning**	09:00–10:30 Opening ceremony
		10:30–11:00 Coffee Break
		11:00–11:40 Conference Pr. Rittaud De Thalès aux Fractales : Pourquoi les Éléphants ne Ressemblent-t-ils pas aux Souris ?
		11:50–12:30 Conference Pr. Vivier L'Algèbre Linéaire en début d'Université - Espace de Travail Mathématique et Paradigmes
		12:30–13:30 Training Session: “Vulgarisation des Mathématiques”
	Afternoon	15:00–16:30 Workshop “Jeux et énigmes Mathématiques”
		16:30–17:00 Coffee Break
		17:00–17:40 Conference Pr. Kettani Impact on Digitalization: Cybersecurity Threats and Emerging Issues
		17:00–18:00 - MS5: ID 21, 39, 109, 130
Wednesday, May 14	**Morning**	**09:00–09:40 Conference Pr. Maniar** Logarithmic Convexity of Semigroups and Inverse Problems of Ornstein-Uhlenbeck Equation
		09:50–10:30 Conference Pr. Lafitte Reproducing Kernels of Hilbert Spaces: PDE Analysis for Optimal Margin Separators in Learning
		10:40–11:00 Coffee Break
		11:00–12:30 - MS1-1: ID 7, 12, 19, 52, 123, 134, 135
		11:00–12:30 - MS2-1: ID 36, 46, 54, 55, 57, 72, 138
		11:00–12:30 - MS3-1: ID 9, 16, 17, 23, 27, 31, 80
		11:00–12:30 - MS4: ID 15, 34, 48, 92, 93, 99, 111
	Afternoon	**14:00–14:40 Conference Pr. Bendahmane** Stochastic Electromechanical Bidomain Model in Electrocardiology
		14:50–15:30 Conference Pr. Chollet Efficient Simulation of Quantum Circuits
		15:40–16:00 Coffee Break
		16:00–18:00 - MS1-2: 10, 30, 74, 101, 115, 149
		16:00–18:00 - MS2-2: ID 44, 53, 59, 91, 108, 112, 121
		16:00–18:00 - MS3-2: ID 11, 33, 37, 43, 45, 60, 61, 65, 81
		16:00–18:00 - MS6: ID 24, 51, 66, 75, 132
Thursday, May 15	**Morning**	**09:00–09:40 Conference Pr. Alaa** On a Fractional Reaction–Diffusion System Applied to Image Restoration and Enhancement
		09:50–10:30 Conference Pr. Ezzinbi Reduction of Complexity for Partial Differential Equations, New Results and Open Problems
		10:40–11:00 Coffee Break
		11:00–12:30 - MS1-3: ID 20, 22, 25, 40, 41, 63
		11:00–12:30 - MS2-3: ID 58, 77, 78, 82, 119, 120, 148
		11:00–12:30 - MS3-3: ID 76, 87, 88, 102, 103, 106, 107, 110
	Afternoon	**14:00–14:40 Conference Pr. Azroul** Fractional Modeling of Complex Biological Dynamics: From Blood Cells to Epidemics
		14:50–15:30 Conference Pr. Yebari A comprehensive study of isogeometric methods for solving partial differential equations
		15:40–16:00 Coffee Break
		16:00–16:40 Conference Pr. El Harti Crossed product Banach algebras associated with dynamical systems
		16:50–18:30 - MS1-4: ID 71, 95, 96, 105, 131, 150
		16:50–18:30 - MS3-4: ID 1, 26, 28, 49, 85, 98, 122, 124, 127
		16:50–18:30 - DOS-1: ID 3, 13, 14, 70, 86, 97, 116, 133, 136, 137
		16:50–18:30 - DOS-2: ID 50, 139, 140, 141, 142, 143, 144, 145, 146

Official F2MDays'25 Program

Franco-Moroccan Mathematics Days

		MS5: Pedagogical Innovation and Development of Teaching	
		MS5	Chairs:
Tuesday, May 13 17:00–18:00	21	Rafik Bouifden and Aziz Haddi	Congruence Modulo n and Minimal Polynomial: A Bridge Between High School and Linear Algebra in Undergraduate Education
	39	Nisrine El Ayat, Mohammed Boutalline, Adil Tannouche and Hamid Ouanan	The Impact of Student Behavioral Engagement on Mathematics Performance in Adaptive Learning Systems: A Statistical and Machine Learning Approach
	109	El Moubarik Moulay Mbarek, El Jid Rachid and Hanini Mohamed	The "Data Processing and Organization" A comfortable habitat for teaching mathematical modeling in primary schools in Morocco
	130	Asmae Bahbah and Mohamed Erradi	The Teaching of Problem Solving and its Impact on Students' Performance in Solving Problems in Mathematics: An Experimental Study

Franco-Moroccan Mathematics Days

		MS1: Algebra, Functional Analysis and Applications	
		MS1 - Session 1	**Chairs:**
Wednesday, May 14 11h-12H30	**7**	**Khaireddin Assila and Khalid El Ouartiti**	**Zero-Divisors in Commutative Rings: A Graph-Theoretic Perspective**
	12	**Rachida El Khalfaoui and Iliass Rouijel**	**An introduction to essential exact sequences**
	19	**M'Hammed El Kahoui, Najoua Essamaoui and Miloud Ez-Zinbi**	**Generic coordinate systems in two variables over a principal ideal domain**
	52	**Mustapha Haddaoui**	**Generalization of Chika's divisibility mapping**
	123	**Ikrame Daqaq**	**The 2-class group of certain imaginary triquadratic fields**
	134	**Mohamed Charkani and Abdelouahid Acharqy**	**On Discriminant and Separability of Commutative Algebras**
	135	**Mhammed Boulagouaz**	**Cloture integrale d'un anneau gradué**
		MS2: Mathematical Modeling and Machine Learning	
		MS2 - Session 1	**Chairs:**
	36	**Ismail Jamiai and Atmane Babni**	**A Comparative Study of Ordinary and Partial Differential Equations Resolution Using Artificial Neural Networks and Physics-Informed Neural Networks**
	46	**Mohammed Arrazaki, Mohamed Zohry, Adel Babbah and Othman El Ouahabi**	**Enhancing BEMD Decomposition with Adaptive Compact Support for Radial Basis Functions**
	54	**Nisrine Marrakchi, Amal Bergam and Hanane Fakhouri**	**Application of a deep learning-based recurrent neural network for PM10 air pollution prediction: the TANGIER case study**
	55	**Hiba Akir, Hanane Fakhouri and Chakir Tajani**	**Artificial Intelligence in PredictingWater Quality**
	57	**Mohamed Mrini, Abdelaziz Chahed, Amal Bergam and Anouar El Harrak**	**Improving PINNs by Integrating Vanilla PINNs with the Deep Finite Element Method**
	72	**Jallal Amiri, Brahim Jarmouni and Aziz Darouichi**	**Deep Learning Techniques for Brain Tumor Detection and Classification Based on Metaheuristics**
	138	**Rafia Belhajjam, Nabil El Moçayd, Mohammed Seaid and Naji Yebari**	**Mathematical modelling and numerical simulation of urban inundation**
		MS3: Nonlinear Analysis and Applications	
		MS3 - Session 1	**Chairs:**
	9	**Youssef Hajji and Hassane Hjiaj**	**Existence of Renormalized Solutions for some noncoercive elliptic problem in a two-component domain with L^{1} data**
	16	**Ouidad Azriabi, Badr El Haji and Jalal El Hajouji**	**Entropy Solution for Some Nonlinear Parabolic Problems in Musielak Spaces with L^1 Data**
	17	**Abdelkarim Derham, Ouidad Azraibi, Badr Badr El Haji and Anouar Marsou**	**Nonlinear elliptic problem with a penalization term in the anisotropic space**
	23	**Badr El Haji, Bouchaib Ferrahi and Mohamed Samadi**	**On the existence of renomalized solution for some nonlinear parabolic problems in Musielak-Orlicz spaces**
	27	**Brahim El Omari, Youssef Hajji, Hassane Hjiaj and Ismail Jamiai**	**Entropy solutions for some elliptic unilateral problems with degenerate coercivity**
	31	**Mohamed Badr Benboubker, Hayat Benkhalou, Hassane Hjiaj and Saad Rian**	**Entropy solutions for some quasilinear and non-coercive Neumann p(x)−elliptic equation**
	80	**Rajae Zerouali, Bouchaib Ferrahi and Hassane Hjiaj**	**Existence and uniqueness of solutions for some anisotropic quasilinear parabolic problem with measure data**
		MS4: Numerical Analysis and Optimization	
		MS4	**Chairs:**
	15	**Abdelaziz El Baraymi, Youness El Yazidi and Bouchaib Ferrahi**	**On the first eigenvalue of the p(.)-Laplacian problem with Robin boundary conditions**
	34	**Nada Tassi, Lahcen Azrar and Nadia Fakri**	**Mathematical Modeling of High-Temperature Dependent Thermo-Elastic Composites Using a Micromechanical Method**
	48	**Oumaima Boukhris, Mustapha Serhani, Abdellah Alla and Achraf Bouhmady**	**Nonconvex stochastic optimal control for a biological wastewater treatment model.**
	92	**Mohamed Chaher, Abdellah Lamnii and Mohamed Yassir Nour**	**An algebraic and trigonometric tension B-spline collocation method to solve time-dependent singularly perturbed convection-diffusion problems**
	93	**Hasnae Chihi and Asaad Chahboun**	**Visual Cryptography: Secure Image Sharing and Its Practical Implications**
	99	**Moussa Ziggaf, Mohamed Boubekeur and Imad Kissami**	**An advanced finite volume scheme on general meshes for the two-dimensional multi-layer shallow water equations**
	111	**Essouadi Yousef, Adil Babbah and Ben Said Mohamed**	**Finite Volume Method and Numerical Solution of a Black-Scholes Model in Finance.**

Wednesday, May 14 16h-18H		**MS1: Algebra, Functional Analysis and Applications.**	
		MS1 - Session 2	**Chairs:**
	10	Mustapha Bachaou, Ignacio Bajo and Mohamed Louzari	Compatible Kahler structures on pseudo-Hermitian quadratic Lie algebras
	30	Abdessamad Ahouita and M'Hammed El Kahoui	On the automorphism group of generic A^1-fibrations over the affine line
	74	Iz-Iddine El-Fassi	Stability analysis of advanced multi-quadratic mappings via Lipschitz conditions
	101	Abdessamad Assadi, Mohamed Louzari, Laiachi El Kaoutit and Abdenacer Makhlouf	From Groups to Groupoids: The Structure of Wide Subgroupoid Lattices
	115	Adel Louly	Local derivations of $\mathbb{K}[x][y,\sigma,\delta]$
	149	Noureddine Essaidi, Abdelhamid Tadmori and Hafsa El Khattabi	On linking some quantum codes over rings
		MS2: Mathematical Modeling and Machine Learning	
		MS2 - Session 2	**Chairs:**
	44	Khalid El Azzaoui, Brahim Jarmouni and Aziz Darouichi	Deep Neural Network-Based Discrete Gradient Flow Approximations for High-Dimensional Evolution PDEs
	53	Abdelaziz Chahed, Mohamed Mrini, Amal Bergam and Anouar El Harrak	A Modified Deep Finite Volume Methods
	59	Chbili Sfia, Serhani Mustapha and Rafiki Abdeljebbar	On class of the mean-reversion non-homogeneous stochastic models with with a non-homogeneous, multifactorial drift function
	91	Chaimae Ouazri and Abderrahim Elmhouti	Application of Machine Learning for Forest Fire Prediction: Optimization and Risk Assessment
	108	Taoufik Soumia, Ben Hamza Abdessamad and Yebari Naji	Graph-based Kolmogorov Arnold Networks: A Survey and New Perspectives
	112	Boutaina Ouriarhli, Badreddine Benyacoub, Hafida Benazza and Abdelhadi Sabry	A Hybrid Classification Model Based on the Hidden Markov model and Generalized Inverse method
	121	Najlae El Haddad, Dounia Zouggar, Bouchaib Ferrahi and Abdelkader Elalaoui	Neural Network Approaches for Forecasting Cryptocurrency Volatility in particular Stablecoin Efficiency
		MS3: Nonlinear Analysis and Applications	
		MS3 - Session 2	**Chairs:**
	11	Abdelghani Az-Edine and Mostafa El Moumni	Renormalized solutions of elliptic problems with measure data and without sign condition
	33	Youssef Hajji, Hassane Hjiaj, Ismail Jamiai and Mohamed Yarmak	Unilateral problem associated to the quasilinear elliptic equation in anisotropic weighted Sobolev spaces
	37	Hayat Benkhalou, Hassane Hjiaj and Mohamed Badr Benboubker	Existence and uniqueness of renormalised solutions for parabolic Dirichlet problem with measure
	43	Nouhaila Moussa and Hassane Hjiaj	Existence and uniqueness of renormalized solution for some quasilinear and non-coercive elliptic problems
	45	Abdellatif Yassir and Mostafa El Moumni	Existence of Weak Solutions for (p(x),q(x))-Laplacian-like Systems
	60	Nourdine El Amarty, Badr El Haji and Mostafa El Moumni	Nonlinear variationnel parabolic inequalities with lower order term in Orlicz-Sobolev spaces
	61	Abdelkarim Derham and El Haji Badr	Nonlinear elliptic problem without monotonicity condition in generalized sobolev spaces
	65	Rachid Bouzyani, Badr El Haji and Mostafa El Moumni	On a nonlinear parabolic problem in Musielak-Orlicz-Sobolev spaces
	81	Badr El Haji, Ibrahim En-Naji and Ismail Jamiai	On the study of some nonlinear unilateral problems in orlicz spaces
		MS6: Statistics, Probability and Operational Research	
		MS6	**Chairs:**
	24	Aziz Arbai, Mohamed El Merouani and Amina Bellekbir	Exact Solutions for Finite-State Birth-Death Processes: A Matrix-Theoretic Approach and Generalizations
	51	Fadoua El Asri, Chakir Tajani and Hanane Fakhouri	Solving Uncertain Journeys in the Probabilistic TSP Using Social Algorithms: A Comparative Study
	66	Youssef Karkour and Chakir Tajani	Mountain Gazelle Optimizer method for incomplete pairwise comparison matrix
	75	Nafia Aghoutane, Mohamed Ben Said and Lahcen Azrar	Dynamics of a stochastic SEIR model with a saturated incidence rate driven by Lévy noise
	132	Mariam Aarras and Mohamed El Merouani	Statistical Inference for Multi-Parameter Lognormal Diffusion Processes via Maximum Likelihood Estimation

Thursday May 15 11h-12H30		**MS1: Algebra, Functional Analysis and Applications**	
		MS1 - Session 3	**Chairs:**
	20	Lahcen Oumertou, Mohammed Sefian Lamarti and Ismail Tahiri	Meir-Keeler Contractions in Probabilistic Controlled Generalized Metric Spaces
	22	Soukaina El Bazi and Ahmed Zeghal	On uniqueness results for some fixed point theorems
	25	Aziz Arbai, Mohammed Chaouki Abounaima and Amina Bellekbir	Solving quadratic equations with complex coefficients & determining the second root for any complex number
	40	Kaoutar El-Khattabi and Fadil Chabbabi	On the Numerical Range of Composition Operators: A Case Study in \(\mathcal{H}^2\).
	41	Hicham Abida, Ismail Tahiri and Ahmed Nuino	Fixed Point Theorems in Probabilistic Metric Spaces and Novel Contractions
	63	Sanaa Boumnidel	A study on Positive operators
		MS2: Mathematical Modeling and Machine Learning	
		MS2 - Session 3	**Chairs:**
	58	Mariam Redouane, Aadil Lahrouz, Omar Zakary and Hamza El Mahjour	Applications of Artificial Intelligence to design a control for Nonlinear Systems.
	77	Asma Driouich, Abdellatif El Ouissari and Ismail Akharraz	Hybrid SMOTE-PSO-SVM: Improving Oversampling for Imbalanced Datasets Using Modified SMOTE and Particle Swarm Optimized SVM
	78	Saloua Amrani Zerrifi and Ahmed Doghmi	A generalization of the Nash equilibrium solution
	82	Najoua Aafar, Bouchaib Ferrahi and Ahmed El Hilali Alaoui	Feature Selection in Granular Ball Support Vector Machines using DC Programming
	119	Najlae El Haddad, Bouchaib Ferrahi and Abdelkader El Alaoui	Hybrid Machine learning and Deep Learning with GARCH-family models for forecasting volatiliteis : Application in Islamic equities
	120	Zouggar Dounia, Ferrahi Bouchaib and El Alaoui Abdelkader	Balancing communication in equity markets under heterogeneous beliefs: a novel agent-based modeling approach
	148	Jamiai Ismail and Omari Abdelmajid	Some methods for solving partial differential equations with neural networks
		MS3: Nonlinear Analysis and Applications	
		MS3 - Session 3	**Chairs:**
	76	Mouhssin Bakhadda, Arij Bouzelmate and Mohamed El Hathout	Existence and Uniqueness of Solutions for a Fully Nonlinear Elliptic Equation with Geophysical Applications to Fluid Flows
	87	Arij Bouzelmate and Tahiri Hasnae	Asymptotic behavior of large solutions of a nonlinear elliptic equation
	88	Said Ait Dada Alla, Ouidad Azraibi and Badr El Haji	Existence of entropy solutions for some nonlinear elliptic unilateral problems in non-reflexive Orlicz-Sobolev spaces
	102	Zahia Daoui, Arij Bouzelmate and Said El Aboudi	Asymptotic Analysis of Radial Solutions of a Nonlinear Equation with Singular Term
	103	Said El Aboudi, Arij Bouzelmate and Zahia Daoui	The Form near Infinity of Radial Solutions of a p-Laplacian Equation with Singular Coefficient
	106	Arij Bouzelmate and Inssaf Raiss	Asymptotic Behavior of a Nonlinear p-Laplacian Equation with Convection and Reaction Terms
	107	Arij Bouzelmate and Hikmat El Baghouri	Singular Solutions of a p-Laplacian Equation with a Source Term Exhibiting Mixed Power-Law Nonlinearity
	110	Arij Bouzelmate and Fatima Sennouni	Asymptotic Behavior and Blow-Up Solutions of a Singular Parabolic Equation

Thursday May 15 16h50-18H30		**MS1: Algebra, Functional Analysis and Applications**	
		MS1 - Session 4	Chairs:
	71	Sanae Touiaher and Mohamed Rossafi	Controlled generalised fusion frame on Hilbert C*-modules
	95	Latifa Malki and Mohamed Louzari	A generalization of annihilator condition for modules and their extensions
	96	Safae El Filali and Khalid Bouras	About the class of Null almost L- and Null almost M-weakly compact operators on Banach lattices
	105	Anouar Gaha, Abdelmonaim Bouchikhi and Soufiane Mezroui	On the Diophantine equation $(p^n)^x + (3^mp + 2)^y = z^2$ where p, $3^mp + 2$ are prime numbers
	131	Khalid Amanchar and Adil Babbah	Produits de Blaschke, ensembles de niveaux et conjecture de Crouzeix
	150	Rachid Ech-Chaouy and Rachid Tribak	Some results on simple-separable modules
		MS3: Nonlinear Analysis and Applications	
		MS3 - Session 4	Chairs:
	1	Mouhssine Zakaria and Abdelaziz Moujahid	On Galerkin spectral element method for solving Riesz fractional diffusion equation based on Legendre polynomials
	26	Badr El Haji, Aymane El Janathi and Hassane Hjiaj	Existence and uniqueness of solutions to some nonlinear L_{\varphi}-elliptic problems
	28	Hasssane Hjiaj, Oussama Messbahi and Youssef Hajji	Entropy solutions for some elliptic unilateral problems with degenerate coercivity
	49	Hassane Hjiaj and Mohamed Sasy	Renormalized solutions for a class of non-coercive elliptic problems in Musielak-Orlicz Spaces
	85	Mouhssin Bakhadda, Arij Bouzelmate and Mohamed El Hathout	Existence of Solutions for Mathematical Models in Geophysical Fluid Flowse
	98	Said Ait Dadda Alla, Ouidad Azraibi and Badr El Haji	on some nonlinear elliptic equations with measurable boundary conditions in Anisotropic weighted Sobolev spaces
	122	Hamid Boutanfit, Mustapha Serhani and Ossama Lazaar	Viscosity Solutions of HJB Equation for model of wastewater treatment
	124	Mohamed Belayachi, Mohamed Bourahma, Hassane Hjiaj and Jabir Ouazzani Chahdi	On the study of some quasilinear elliptic equation in weighted anisotropic elliptic problems
	127	Hamza El Bazi and Abdellatif Sadrati	Weighted sp-pseudo s-asymptotically periodic solutions for some systems of nonlinear integral equations

Thursday, May 15 16h50-18H30		**Dedicated Online Sessions**	
		DOS - Session 1	**Chairs:**
	3	Amine Arhandou, Abdellah Lamnii and Mohamed-Yassir Nour	Comparative Study of Classical Subdivision Schemes and AI-Based Models for Geometric Modeling Optimization
	13	Baba Philippe Dakouo and Joseph Bayara	Algebras satisfying $(xy)z=y(zx)$ and $(xy)z=\alpha (xz)y$ with $\alpha \in K$
	14	Joseph Bayara and Poussyan Patrice Ouedraogo	Algebraic structure of algebras satisfying $x^2x^3=\omega(x)x^4$
	70	Abdelmonaim Bouchikhi, Lidiya Yushchenko and Soufiane Mezroui	On Representation Numbers by quaternary quadratic forms
	86	Joël Kabore and Mohammed E. Charkani	On Skew Cyclic DNA codes over $\mathbb{F}_4[v]/<v^4-v>$
	97	Souleymane Savadogo	Derivations in 3-Jordan algebras
	116	Maissâ Boughrara and Hatem Zaag	Radial blow-up standing solutions for the semilinear wave equation
	133	Moussa Fall	Quartic points on C_a:y^7=x^a (x-1)^a
	136	Fihi Hiba and Mamouni Abdellah	Commutativity and generalized derivations in prime ring involving symmetric elements
	137	Ilyas Naji	Comparison of a posteriori error estimators
		Dedicated Online Sessions	
		DOS - Session 2	**Chairs:**
	50	Imane Hssini, Fatima Ezzahra Achamrah and Fouad Riane	Integrating Quantile Regression LSTM with Robust Optimization for Blood Supply Chain Management During Disasters
	139	Nassira Madani, Zakia Hammouch and El Houssine Azroul	The vaccination strategy within the nonlinear dynamics of fractional model of herpes simplex virus (HSV) transmission
	140	Ghizlane Diki and Elhoussine Azroul	Modeling the Dynamics of Tuberculosis Using the Caputo Fractional Derivative: Memory Effects in Disease Transmission
	141	Sara Bouda and Elhoussine Azroul	A Mathematical Insight into Zika Virus Transmission Dynamics
	142	Salima Abaydi, Youssef Hajji, Hassan Hjiaj and Mounir Mekkour	Elliptic Equations on Two-Component Structures: Renormalized Solutions under Robin Boundary Conditions
	143	Nezha Kamali, Mohammed Shimi and Elhoussine Azroul	Topological degree approach to nonlocal Kirchhoff-type problem with Dirichlet boundary conditions
	144	Youness Azroul, Hamid Tairi and Jamal Riffi	Deep learning for microvascular imaging in diabetes-related foot ulcers
	145	Meryeme Hadni, Hassane Hjiaj, Mounir Gouiouez and Meryeme Amane	A Genetic-Grey Wolf Hybrid Approach for Feature Selection in Arabic Text Analysis
	146	Safae L'Kima and Elhoussine Azroul	Fractional-Order Modeling of Dengue Infection Dynamics: Homotypic Reinfection, Stability, and Numerical Validation