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Présentation du laboratoire :

Le Laboratoire de Modélisation et Structures Mathématiques (LMSM) est accrédité en janvier 2020 dans le cadre de la nouvelle stratégie de restructuration de la recherche scientifique au sein de l'université Sidi Mohamed Ben Abdellah qui repose sur la création d'une nouvelle génération de laboratoires. Le LMSM résulte de la fusion des deux anciens laboratoires de mathématiques à la Faculté des Sciences et Techniques : le Laboratoire de Modélisation et Calcul Scientifique (LMCS) et le Laboratoire Algèbre, Analyse Fonctionnelle et Applications (LAAFA).

La recherche scientifique est un facteur de développement majeur dans tous les secteurs ; socioéconomique, industriel, agricole, médical, financier et autres. Les mathématiques jouent le rôle de la branche centrale de cette recherche. Elles construisent le pont entre les différents domaines scientifiques. Elles fournissent les outils nécessaires au développement des nouvelles technologies qui transforment notre quotidien. La recherche en mathématiques est scindée aujourd'hui en deux sous branches ; les mathématiques appliquées et les mathématiques fondamentales. Le laboratoire de Modélisation et Structures Mathématique avait la force de réunir les deux. Il a le défi de fournir à ses chercheurs des compétences en mathématiques pures et appliquées. Son objectif principal est de former des chercheurs en mathématiques de grande qualité avec des connaissances de base très poussées en mathématiques fondamentales et appliquées. Sa mission ne se limite pas qu'à l'encadrement et la recherche mais également à la coopération scientifique au niveau national et international via l'organisation des conférences, manifestations scientifiques, des stages et des projets. Le laboratoire LMSM est composé de 25 enseignants chercheurs et 40 doctorants qui mènent leurs recherches dans plusieurs domaines sur différentes thématiques à savoir ;

Thématiques de recherche :

- **Thème 1 : Algèbre**

Les enseignants chercheurs travaillant sur cette thématique de recherche sont : Mohamed Bekkali, Lahcen Oukhtite, Mohamed Chhiti, Aziza Rahmouni Hassani, Mohamed Sobrani, Anisse Ouadghiri, Abdelmajid Hilali, Najib Mahdou.

- **Thème 2 : Probabilité et Statistique, Processus stochastiques, Modélisation et Recherche Opérationnelle**

Les enseignants chercheurs travaillant sur cette thématique de recherche sont : Fatima Ezzaki, Ouafae Ammor, Mohammed El Khomssi, Ghizlane Chaïbi, Hassane Ziat, Redouane qesmi, Mohamed Ettaouil.

- Thème 3 : Analyse Numérique et Analyse fonctionnelle

Les enseignants chercheurs travaillant sur cette thématique de recherche sont : Azzeddine El Baraka, Mohammed Akhmouch, Khadija Ben Aicha, Mohamed Bellahmar, Omar Sidki, Rachid Elkhaoulani El Idrissi, Rachid El Ayadi, Mohammed Masrar, Zakariae Mouhcine, Iz-Iddine El-Fassi.

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Production Scientifique des 5 dernières années :

 Publications des 5 dernières années:

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2) **M. Akhmouch**, A time semi-exponentially fitted scheme for chemotaxis-growth models. *Calcolo* volume 54, pages 609–641(2017).

3) **M. Akhmouch**, A corrected decoupled scheme for chemotaxis models. *J. Comput. Appl. Math.* 323, 36--52 (2017).

- 4) **A. El Baraka** - M. Toumlilin: "Global Well-Posedness for Fractional Navier-Stokes Equations in critical Fourier-Besov-Morrey Spaces" Moroccan J. Pure and Appl. Anal.(MJPAA), Vol 3(1) 2017, pp. 1-14.
- 5) **A. El Baraka** - M. Toumlilin: " Global well-posedness and decay results for 3D generalized magneto-hydrodynamic equations in critical Fourier-Besov-Morrey spaces", Electron. J. Differential Equations, Vol. 2017 (2017), No. 65, pp. 1-20.
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<https://doi.org/10.1007/s10473-019->
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- 8) **A. El Baraka** - M. Masrouf: »Regularity results for solutions of linear elliptic degenerate boundary value problems » Arab. J. Math. (2020)
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- 58) **R. Qesmi**, A. Hammoumi, *A stochastic delay model of HIV pathogenesis with reactivation of latent reservoirs*, (Scopus) *Chaos, Solitons and Fractals: the Inter. Journal of Nonli. Sci., and Nonequil. and Compl. Phenom.* (2020).
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- 60) **R. Qesmi**, *A Short Survey on Delay Differential Systems with Periodic Coefficients* (Scopus), *J. of Applied Analysis and Computation*, Vol. **8**(2018), Pages 296-330

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- 63) A. Intissar, **Z. Mouhcine**, M. V. Moustapha. An integral transform connecting spherical analysis on harmonic NA groups to that of odd dimensional real hyperbolic spaces. *Journal of Lie Theory*, (29) 95–106, 2019.
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- 66) **N. Mahdou**, Prüfer-like conditions in the amalgamated duplication of a ring along an ideal, (with M. Chhiti, M. Jarrar and S. Kabbaj), *Communications in Algebra*, 43 (2015) No. 1, 249–261.
- 67) **N. Mahdou**, On almost valuation and almost Bézout rings, (with A. Mimouni and M. A. Moutui), *Communications in Algebra*, 43 (2015) No. 1, 297–308.
- 68) **N. Mahdou**, About some flatness properties over commutative rings, (with F. Cheniour), *Acta Mathematica Hungarica*, Volume 146, Issue 1, (2015), 142--152.
- 69) **N. Mahdou**, Rings in which every homomorphic image satisfy (strong) Property (A) , (with K. Louartiti), *Gulf Journal of Mathematics*, Vol. 8 (2015), 23–29.
- 70) **N. Mahdou**, On Gorenstein global dimension of tensor product of algebras over a field, (with M. Tamekkante), *Gulf Journal of Mathematics*, Vol. 8 (2015), 30–37.
- 71) **N. Mahdou**, Power of maximal ideal, (with M. Zennayi), *Palestine Journal of Mathematics*, Vol. 4(2) (2015), 1–7.
- 72) **N. Mahdou**, On Steinitz-like conditions (with H. Mouanis), *Journal of Taibah University for Science (Elsevier)*, Vol. 9 (2015), 340–345.
- 73) **N. Mahdou**, Amalgamated algebras along an ideal defined by Gaussian condition, (with M. A. Moutui), *Journal of Taibah University for Science (Elsevier)*, Vol. 9 (2015), 373–379.
- 74) **N. Mahdou**, Finite conductor property in amalgamated algebra along an ideal, (with K. Alaoui Ismaili), *Journal of Taibah University for Science (Elsevier)*, Vol. 9 (2015), 332–339.
- 75) **N. Mahdou**, On adequate rings, (with M. Zennayi), *Journal of Taibah University for Science (Elsevier)*, Vol. 9 (2015), 320–325.
- 76) **N. Mahdou**, Clean property in Amalgamated algebras along an ideal, (with M. Chhiti, M. Tamekkante), *Hacettepe Journal of Mathematics and Statistics*, Vol. 44 (1) (2015), 41--49.
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- 78) **N. Mahdou**, On rings over which every P-flat ideal is singly projective, (with F. Cheniour), *International Electronic Journal of Algebra (IEJA)*, Vol. 18 (2015), 46--56.
- 79) **N. Mahdou**, fqp-property in amalgamated algebras along an ideal, (with M. A. Moutui), *Asian-European Journal of Mathematics*, Vol. 8, No. 3 (2015), 1550050 (10 pages).
- 80) **N. Mahdou**, On (n, d) - property in amalgamated algebra, (with K. Alaoui Ismaili), *Asian-European Journal of Mathematics*, Vol. 9, No. 1 (2016) 1650014 (13 pages).
- 81) **N. Mahdou**, About G-Rings, *Comment. Math. Univ. Carolin.*, Vol. 58 (1) (2017), 13–18.
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- 86) **N. Mahdou**, On Armendariz-like properties in Amalgamated algebras along ideals, (with M. El Ouarrachi and A. Mimouni), *Turkish Journal of Mathematics*, vol. 41, no. 6, (2017), 1673–1686.
- 87) **N. Mahdou**, Duplication of a module along an ideal, (with E.M. Bouba and M. Tamekkante), *Acta Mathematica Hungarica*, (February 2018), Volume 154, Issue 1, pp 29–42.
- 88) **N. Mahdou**, On (A)-rings and strong (A)-rings issued from amalgamations, (with A. M. Moutui), *Studia Scientiarum Mathematicarum Hungarica*, vol. 55, no. 2, (2018), 270–279.
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- 90) **N. Mahdou**, Coherence in bi-amalgamated algebras along ideals, (with M. El Ouarrachi), *Springer Proceedings in Mathematics and Statistics*, vol. 228, (2018), 127–138.
- 91) **N. Mahdou**, Trivial Extensions defined by 2-absorbing-like conditions, (with M. Issoual), *Journal of Algebra and Its Applications*, Vol. 17, N. 11, (2018), 1850208, 10 pp.
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- 93) **N. Mahdou**, On power serieswise Armendariz rings, (with M. El Ouarrachi), *Palestine Journal of Mathematics*, Vol. 7 (Special Issue I) (2018), 79–87.
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 **Thèses soutenues durant les 5 dernières années:**

Nom & prénom du doctorant	Titre de la thèse	Date de soutenance	Directeur(s) de thèse
Benzakour Mohamed Amine	Schémas volumes finis implicites linéarisés pour des modèles de chimiotaxie.	15 Avril 2017	Akhmouch Mohammed
Mohamed Toumlilin	Sur certaines équations de la mécanique des fluides dans les espaces de Fourier-Besov-Morrey	7 Juillet 2018	Azzeddine El Baraka
MoulayAbdallah A. Idrissi	Identités différentielles sur les anneaux premiers à involution.	08 février 2020	Lahcen Oukhtite
Badr Nejjar	Etude de la commutativité de certaines anneaux, approximation de l'opérateur moyenne quasi-arithmétique	16décembre 2017 (Fac. Sciences Kénitra)	Lahcen Oukhtite (co-directeur)
Nour-Eddine JOUDAR	Stability and parameters estimation in dynamical systems of type recurrent networks, contribution to new non-linear optimization models : applications to real problems	8 décembre 2018	Mohamed Ettaouil
Mohammed EL ALAOUI	Optimisation des requêtes dans les bases de données décisionnelles via la programmation par contraintes	16 novembre 2018	Mohamed Ettaouil
Hassan RAMCHOUN	Estimation des paramètres et hyper-paramètres des réseaux de neurones bayésiens et régularisation :	19 juin 2019	Mohamed Ettaouil

	application aux problèmes de classification et de régression		
Zakaria EN-NAIMANI	Modèles stochastiques et amélioration des algorithmes d'apprentissages : Régularisation et estimation des paramètres dans les RNA	30 mars 2018	Mohamed Ettaouil
Mohammed Zennayi	Transfert de certaines propriétés dans les produits cartésiens, les extensions triviales, produits fibrés et amalgamés	28 Février 2015	Mahdou Najib (Co-encadrant FSDM Fès, Doctorat d'Etat)
Karima Ismaili Alaoui	Autour de la cohérence et de la propriété (n,d)-Krull dans l'amalgamé algébrique d'anneaux commutatifs	14 Novembre 2015	Mahdou Najib
Mounir El Ouarrachi	Autour des propriétés d'Armendariz, de la cohérence, et de Bézout	10 Février 2018	Mahdou Najib
Mohammed Issoual	Autour des idéaux n-absorbants et des idéaux (m,n)-fermés d'anneaux commutatifs	16 Novembre 2019	Mahdou Najib
Rachida El Khalifaoui	Classes de produits fibrés et d'extensions triviales d'anneaux définies par des conditions homologiques	1 Février 2020	Mahdou Najib
GhizlaneChaabi	Modélisation, Analyse et Approche Probabiliste des Structures Micro-économiques : Application aux activités génératrices de revenus	22 octobre 2016.	Mohammed EL KHOMSSI
Fatima EL AZZOUZI	Problèmes Non Lin éaires des Equations de London et Ginzburg-Landau	15 Juin 2019	Mohammed EL KHOMSSI
Badreddine EL GOUMI	Modélisation, Optimisation et Simulation du Problème deRetraite avec Choix Multicritères d'Aide à la Décision	7 juillet 2019	Mohammed EL KHOMSSI

Collaboration :



Prix et distinction :



Projets de recherche financés durant les 5 dernières années :



En tant que coordonateur

Cadre du projet	Intitulé du projet	Période (de --- à ----)	Responsable du projet	Budget alloué



En tant que membre

Cadre du projet	Intitulé du projet	Période (de --- à ----)	Responsable du projet	Etablissement (laboratoire) coordonnateur
