

# Curriculum Vitae

## PERSONAL AND ACADEMIC DATA

Name: Mourad BEN SLIMANE, Nationality: Tunisian, Date of Birth: 07/06/1969,  
Married, 3 children  
Current Academic Rank: Full Professor,  
Address: Department of Mathematics, College of Science, King Saud University, P.O.  
Box 2455, Riyadh 11451, Saudi Arabia  
Emails: [mbenslimane@ksu.edu.sa](mailto:mbenslimane@ksu.edu.sa) & [mbenslimane2000@yahoo.com](mailto:mbenslimane2000@yahoo.com)

## Research Interests:

Wavelet analysis, Fractal Analysis, Functional Analysis, Pointwise regularity,  
Singularities, and Multifractals.

## Academic Degrees:

- B.A./B.Sc. with a major in Mathematics with high honors (1<sup>st</sup> in Tunisia) and Presidential Prize, Tunis University, Tunisia, June, 15 (1992).
- M.A./M.Sc. with very high honors: Applied mathematics (Nonlinear Analysis and Applications), University Paris 9 Dauphine, France, June, 15 (1993). Supervisor: Yves Meyer.
- Ph.D. with very high honors , Applied mathematics: Wavelet and Multifractal Analysis, Ecole Nationale des Ponts et Chaussées, Paris, France. Defended September 9 (1996). Title of Ph.D. Dissertation: Study of the multifractal formalism for functions. Supervisor: Stéphane Jaffard.
- ``Habilitation Universitaire`` with very high honors, Tunis El-Manar University, Tunisia, May 12 (2003).

## Administrative Responsibilities

- 1- Member of the Academic accreditation for Master and Ph.D. in Mathematics at KSU.
- 2- Member of Analysis Committee at the Mathematics Department of King Saud University.
- 3- Member of Applied Mathematics Committee at the Mathematics Department of King Saud University

## Research Group:

Principle investigator of the research group (RG-1435-063), Deanship of Scientific Research, King Saud University

## Publications:

- 1- **M. Ben Slimane:** Multivariate multifractal formalism for simultaneous pointwise  $(T^{p_i}_{u_i})_i$  regularities (with M. Ben Abid, I. Ben Omrane and B. Halouani), [Applicable Analysis](#) 2022, VOL.101, NO.16, 5824–5849  
Published: [November \(2022\)](#) (ISI)
- 2- **M. Ben Slimane:** MULTIVARIATE WAVELET LEADERS RENYI DIMENSION AND MULTIFRACTAL FORMALISM IN MIXED BESOV SPACES (with M. Ben Abid, I. Ben Omrane and M. Turkawi), [International Journal of Wavelets, Multiresolution and Information Processing](#) Vol. 20, No. 2 (2022) 2150047, 1--32  
Published: [\(2022\)](#) (ISI)
- 3- **M. Ben Slimane:** Multifractal Analysis of Rectangular Pointwise Regularity with Hyperbolic Wavelet Bases (with M. Ben Abid, I. Ben Omrane and M. Turkawi), [Journal of Fourier Analysis and Applications](#) 27:90 : [November \(2021\)](#) (ISI)
- 4- **M. Ben Slimane:** Dimension prints for continuous functions on the unit square (with M. Ben Abid, I. Ben Omrane and M. Turkawi), [Acta Mathematica Hungarica](#), Volume: 161 Issue: 1 Pages: 78-99 Published: [September \(2021\)](#) (ISI)
- 5- **M. Ben Slimane:** Pointwise Rectangular Lipschitz Regularities for Fractional Brownian Sheets and Some Sierpinski Selfsimilar Functions (with M. Ben Abid, I. Ben Omrane and M.M. Turkawi), [Mathematics](#) , Article 8, 1179 Published: [17 July \(2020\)](#) (ISI)
- 6- **M. Ben Slimane:** On the Baire generic validity of the  $t$ -multifractal formalism in Besov and Sobolev spaces (with M. Ben Abid, I. Ben Omrane and B. Halouani), [Journal of Function Spaces](#), Article 4358261 Published: [August \(2019\)](#) (ISI)
- 7- **M. Ben Slimane:** Directional multifractal analysis in the  $L^p$  setting (with M. Ben Abid, I. Ben Omrane, B. Halouani and F. Alshormani), [Journal of Function Spaces](#), Article 1691903 Published: [July \(2019\)](#) (ISI)
- 8- **M. Ben Slimane:** Directional thermodynamic formalism (with M. Ben Abid, I. Ben Omrane and B. Halouani), [Symmetry-Basel](#) , Volume: 11 Issue: 6 Article: 825 Pages: 1-32 Published: [21 June \(2019\)](#) (ISI)
- 9- **M. Ben Slimane:** On Wavelet and Leader Wavelet Based Large Deviation Multifractal Formalisms for Non-uniform Hölder Functions (with M. Ben Abid, I. Ben Omrane and B. Halouani), [Journal of Fourier Analysis and Applications](#), Volume: 25 Issue: 2 Pages: 506-522 Published: [APR \(2019\)](#) (ISI)
- 10- **M. Ben Slimane:** Criteria of pointwise and uniform directional Lipschitz regularities on tensor products of Schauder functions (with M. Ben Abid, I. Ben Omrane and B. Halouani), [Journal of Mathematical Analysis and Applications](#), Volume 460 [\(2018\)](#) 496-515 (ISI)
- 11- **M. Ben Slimane:** Mixed Wavelet Leaders Multifractal Formalism in a Product of Critical Besov Spaces (with M. Ben Abid, I. Ben Omrane and B. Halouani), [Mediterranean Journal of Mathematics](#), Volume 14: 176 [\(2017\)](#), 1—20 (ISI)
- 12- **M. Ben Slimane:** Mixed Multifractal Analysis for Functions: General Upper Bound and Optimal Results for Vectors of Self-Similar or Quasi-Self-Similar of Functions and Their Superpositions (with J. Aoudi and A. Ben Mabrouk) [Fractals Complex Geometry, Patterns, and Scaling Nature and Society](#), Volume 24 No. 4 [\(2016\)](#), 1650039 (ISI)
- 13- **M. Ben Slimane** and H. Ben Braiek: Baire generic anisotropic multifractal formalism in anisotropic function spaces, [Revista Matematica Complutense](#), Volume [\(2016\)](#) 29:127–167 (ISI)
- 14- **M. Ben Slimane:** Mixed wavelet leader multifractal formalism for Baire generic

- functions in a product of intersections of Holder spaces with noncontinuous Besov spaces (with M. Ben Abid and I. Ben Omrane), *Mediterranean Journal of Mathematics*, Volume 13 (6) (2016), 5093—5118 (ISI)
- 15- **M. Ben Slimane** : Baire typical results for mixed Holder spectra on product of continuous Besov or oscillation spaces, *Mediterranean Journal of Mathematics*, Volume 13 (2016), 1513–1533 (ISI)
  - 16- **M. Ben Slimane**: Multifractal formalism of oscillating regularities for random wavelet series (with B. Halouani), *Fractals Complex Geometry, Patterns, and Scaling Nature and Society*, Volume 23 No. 2 (2015), 1550005 (ISI)
  - 17- **M. Ben Slimane**: Analysis of a fractal boundary: the graph of the Knopp function (with C. Melot), *Abstract and Applied Analysis*, Volume 2015 (2015), Article ID 587347 (ISI)
  - 18- **M. Ben Slimane**: A wavelet multifractal formalism for simultaneous singularities of functions (with J. Aouidi and A. Ben Mabrouk), *INTERNATIONAL JOURNAL OF WAVELETS MULTIREOLUTION AND INFORMATION PROCESSING* Volume 12 No.6 (2014), 1491001 and Volume 12 No.1 (2014), 1450009 (ISI)
  - 19- **M. Ben Slimane**: Anisotropic two-microlocal spaces and regularity, *Journal of Function Spaces*, Volume 2014 (2014), Article ID 505796  
<http://dx.doi.org/10.1155/2014/505796>. (ISI)
  - 20- **M. Ben Slimane**: Interpolation of gentle spaces (with H. Ben Braiek), *Abstract and Applied Analysis*, Volume 2014 (2014), Article ID 801531  
<http://dx.doi.org/10.1155/2014/801531> (ISI)
  - 21- **M. Ben Slimane**: Wavelet characterization of multi-directional regularity, *Fractals Complex Geometry, Patterns, and Scaling Nature and Society*, 20, Nos. 3 & 4 (2012), 245–256. (ISI)
  - 22- **M. Ben Slimane**: Directional and anisotropic regularity and irregularity criteria in Triebel wavelet bases (with H. Ben Braiek), *Journal of Fourier Analysis and Applications*, 18(2012), 893–914. (ISI)
  - 23- **M. Ben Slimane**: The Thermodynamic Formalism for the de Rham function: increment method, *Izvestiya: Mathematics*, 76:3(2012), 431-445. (ISI)
  - 24- **M. Ben Slimane**: On the gentle properties of anisotropic Besov spaces (with H. Ben Braiek), *Journal of Mathematical Analysis and Applications*, 396(2012), 21-48. (ISI)
  - 25- **M. Ben Slimane**: Directional regularity criteria (with H. Ben Braiek), *Comptes Rendus Mathématique*, 349(2011), 385-389 (ISI)
  - 26- **M. Ben Slimane**: Baire generic histograms of wavelet coefficients and large deviation formalism in Besov and Sobolev spaces, *Journal of Mathematical Analysis and Applications*, 349(2009), 403-412. (ISI)
  - 27- **M. Ben Slimane**: Multifractal analysis and formalism for the generalized de Rham function, *Current Development in Theory and Applications of Wavelets*, 2(2008), 45-88.
  - 28- **M. Ben Slimane**: On the Completeness of Oscillation Spaces, *Nonlinear Oscillations*, 8(2005), 435-443. (ISI)
  - 29- **M. Ben Slimane**: Multifractal formalism for selfsimilar functions associated to the  $n$ -scale dilation family, *Mathematical Proceedings of the Cambridge Philosophical Society*, 6(2004), 195-212. (ISI)
  - 30- **M. Ben Slimane**: Multifractal formalism for non-selfsimilar functions (with J. Aouidi), *Integral Transforms and Special Functions*, 15(2004), 189-207. (ISI)

- 31- **M. Ben Slimane:** Some functional equations revisited: the multifractal properties, [Integral Transforms and Special Functions](#), 14(2003), 333-348. (ISI)
- 32- **M. Ben Slimane:** Multifractal formalism for quasi-selfsimilar functions (with J. Aouidi), [Journal of Statistical Physics](#), 108(2002), 541-590. (ISI)
- 33- **M. Ben Slimane:** Multifractal formalism for selfsimilar functions expanded in singular basis, [Applied Computational Harmonic Analysis](#), 11(2001), 387-419. (ISI)
- 34- **M. Ben Slimane:** Multifractal formalism for selfsimilar functions under the action of non-linear dynamical systems, [Constructive Approximation](#), 15(1999), 209-240. (ISI)
- 35- **M. Ben Slimane:** Multifractal formalism and anisotropic selfsimilar functions, [Mathematical Proceedings of the Cambridge Philosophical Society](#), 124(1998), 329-363. (ISI)
- 36- **M. Ben Slimane :** Formalisme multifractal pour quelques généralisations des fonctions autosimilaires, [Comptes Rendus Mathématique](#), 324 (1997), 981-986. (ISI)
- 37- **M. Ben Slimane:** Multifractal formalism and logarithmic chirps for n scale dilation functions, [Reports of ENPC](#), Paris, 56, 1996.
- 38- **M. Ben Slimane:** Study of the multifractal formalism for functions, [Reports of ENPC](#), Paris, 1996.

#### Recent Participations in Conferences:

- 1- Fractals and related Fields III, [Porquerolles, France](#), September 19-25, 2015.
- 2- Periodic and Other Ergodic problems, [Cambridge, United Kingdom](#), March 23-27, 2015.
- 3- Sixth international conference on "Advanced Computational Methods in Engineering", [Ghent- Belgium](#), June 23-28. 2014.
- 4- International Conference on Mathematical, Statistical and Computational Sciences, [Madrid, Spain](#), March 28-29, 2013.
- 5- International Conference on Mathematical and Statistical Sciences, [Zurich, Switzerland](#), January, 2012.
- 6- International Conference Geometry and Global Analysis, [Santiago de Compostela, Spain](#), Dec. 13-17, 2010.
- 7- International Conference Wavelets and fractals, [Domaine du rond-chene in Esneux, Belgium](#), April 26-28, 2010.
- 8- International Conference 'PDE and Applications', March 2008, [Hammamet \(Tunisia\)](#).
- 9- International Conference 'Fractals and related Fields', organized in honour of Professor Jacques Peyriere, September 2007, [Monastir \(Tunisia\)](#), organizing committee.

#### Supervision of Graduate Students:

1. IMTITHAL MOHAMMED I ALZUGHAIBI 439204397 KSU (still)
2. Hnia Ben Braiek, Ph.D., Tunis University, Tunisia, Subject: Gentle spaces and multifractal analysis. Defended on Jan. 2013.
3. Hnia Ben Braiek, Master thesis, Tunis University, Tunisia, Subject: Banach spaces of distributions and multifractal analysis, Defended in Sep. 2007.
4. Mohamed Chaouachi, Master thesis, Tunis University, Tunisia, Subject: Some

generic results in wavelet multifractal analysis. Defended on Nov. 2006.

### **Graduate Courses:**

1. Functional analysis
2. Wavelet analysis
3. Fractal analysis
4. The theory of distributions

### **Supervision of Under-Graduate Students:**

Math 499 Saad Mohammed Alkhalaf 433106371, King Saud University, Subject: On the continuous nowhere differentiable Weierstrass function. Defended on Jan. 2017

**Theses Examined:** 13 Ph.D and 10 Master theses.

### **Responsibility in the world of research:**

- Referee for Nonlinearity, Journal of Mathematical Analysis and its Applications, Journal of Functional Analysis and Applications, SIAM Journal of Mathematical Analysis, Journal of Fourier Analysis and Applications, Filomat
- Reviewer for Zentralblatt MATH.

**Published Book:** M. Ben Slimane, Textbook for Analysis, University of Tunis, 2003.

### **Employment History (in Descending Order—Last Given First):**

- 09/26/2009 – Present: King Saud University, College of Science, Department of Mathematics, Riyadh, KSA.
- 10/01/1997-09/25/2009: Tunis University, College of Science, Department of Mathematics, Tunisia.
- June 2005: Professor (Invited) at Paris 7 University, France.
- May 2005: Professor (Invited) at Aix en Provence University, France.
- A. Y. 1996-97: Center of Research in Mathematics (CRM), University of Montréal, Canada.
- A. Y. 1994-96: University Marne La-Vallée, College of Science, Department of Mathematics, Paris, France.

### **Grants, Scholarships, and Awards:**

- a) Research group project No. RG1435-063, King Saud University 2014-Present.
- b) Research group project No. RGP-VPP-024, King Saud University 2011-2013.
- c) Research group project No. 206 (PDE), University of Tunis, 2005-Present.
- d) The French Institute of Cooperation CMCU project (Wavelets and multifractal geometry), 2001-Present.
- e) Research group project (Harmonic analysis on hypergroups), University of Tunis, 1998-2000.
- f) Grant from University of Montréal, Canada, A. Y. 1996-97.
- g) Scholarship from French Ministry of Higher Education, 09/01/1992 to 09/30/1996.
- h) Scholarship from Tunisian Ministry of Higher Education, A. Y. 1991-92.
- i) Bachelor of Science with a major in Mathematics with high honors (1<sup>st</sup> in Tunisia and Presidential Prize), 07/20/1992.