Mohammed BENAISSA, Professor

Born on the 9th of April, 1967, in Rabat
Married, 3 children
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Fields of expertise

- Nano-materials and Solid state physics
- Characterization Techniques (structural, optical, magnetic and electronic properties)
- Management of Core-Lab facilities

Education

1994 **Ph.D. in Nano-Materials Physics -** Louis Pasteur University, Strasbourg-France
1990 **Master's (DEA) in Solid State Physics -** Blaise Pascal University- France

Experience

2015 - … **Full Professor (**Professeur de l'Enseignement Supérieur**, PES)**
Université Mohammed-V de Rabat, Faculté des Sciences
Head of Nanomaterials Team @ LaMCScI Laboratory (URL-CNRST 17)

2002 - 14 **Head of UATRS Division (**National Facility**)**
Centre National pour la Recherche Scientifique et Technique (CNRST)- Rabat

2008 - 17 **Short periods** Visiting Scientist
Max Planck Institute - Stuttgart, Germany

1999 - 2001 **CNRS Associate Researcher**
Centre National de la Recherche Scientifique CNRS (UMR 7514 and UPR 0010) France

1997 **Post-Doc.,**
University of California in Berkeley (UCB), Lawrence Berkeley National Lab. - USA

1994 – 99 **Assistant Professor**
Universidad Nacionale Autonoma de Mexico (UNAM), Instituto de Fisica, Mexico

1992 **Advanced training in Transmission Electron Microscopy,**
University of Cambridge - UK

1991 - 92 **Assistant Researcher-student**
École Européenne des Hautes Études des Industries Chimiques de Strasbourg

Languages

- **Arabic** (mother tongue)
- **French** (fluent)
- **English** (fluent)
- **Spanish** (good)

National Core-Lab facility set-up (UATRS-CNRST)

As part of the Government Five-Year Plan 2000-2004, I was hired in 2002 to set up a national central laboratory, called the UATRS Division. As the head of this division (from 2002 to 2011), I was in charge of recruiting scientific staff, designing/implementing infrastructure, and drafting specifications for around twenty scientific equipments to serve as a national analysis platform. My team was made up of more than 30 collaborators (researchers, engineers, technicians and administrators) spread across three departments (chemistry, materials and biology). Thanks to its original design, unique of its kind at the time, the UATRS division is still nowadays an open facility serving national scientists (universities, small/medium E&I, national laboratories, etc.) in accordance with international ISO standards.
More details can be provided upon request.

Scientific Research Activity

Current projects:

2020 – …: Nanoparticules Dendronisées : Agents de Contraste pour diagnostic IRM
APRD Multithématiques 2020

2020 – …: Nouvelles technologies 3D pour traitement des eaux usées
APRD Multithématiques 2020

Past projects:

2016 – 20: Le potentiel du *phosphorène* pour le stockage et la conversion de l'énergie,
Apphos TRT-NAJ-01/2017

2016 – 20: Développement d'un prototype de réacteur pour le traitement et le recyclage des eaux usées,
Apphos MAT-MOU-01/2017

2015 – 19: Nanoparticules de ferrites superparamagnétiques pour la nano-médecine,
PHC-Toubkal/16/ 26– Campus France : 34725YB

2017: Atomic and electronic structures of individual nanosheets : HRTEM and VEELS studies,
DAAD project, collaboration with Max Planck Institute, Stuttgart, Germany

2013 – 16: EURO-MEDITERRANEAN COOPERATION ON RESEARCH & TRAINING IN SUN BASED RENEWABLE ENERGIES
FP-7 European project: (withdrawn in 2014 due to my move from CNRST to UM-5)

2008 – 11: Valence electron spectroscopy,
CNRST-DFG project, collaboration with Max Planck Institute, Stuttgart, Germany

2004 – 09: Systèmes quantiques dans les hétérostructures à base de semiconducteurs,
CNRST-CNRS project, collaboration with Laboratoire CRHEA UPR-10, Sophia Antipolis, France.

2000 – 02: Nitrides-based Light Emitting Diodes,
CRHEA-CNRS project, Sophia Antipolis, France.

1999: Carbon nanotubes coupled to organic macromolecules, in collaboration with IGBMC-CNRS
CNRS project, Laboratoire CRHEA UPR-10, Sophia Antipolis, France.

1997 - 98: Fe-Nd-B and SmCo magnets,
DoE project, Lawrence Berkeley National Laboratory, USA

1995 - 98: Synthesis of nano-GaN,
UNAM project, in collaboration with University of Connecticut-USA

1995 - 97: Solid acids - Sulfated ZrO_2,
UNAM project, in collaboration with Mobil Central Research Laboratory, NJ, USA

1991 - 94: Microstructure, growth, and application of silicon carbide as a catalyst support,
Thesis, Institut de Physique et Chimie des Matériaux de Strasbourg, CNRS, France

Current Post-Docs

Titre du sujet	Auteur	Période
Valorisation des Nanoparticules super-paramagnétiques de $MnFe_2O_4$ en tant qu'agent de contraste pour diagnostic IRM	W. Azouzi	2022 - 25
Nouvelles technologies de photocatalyseurs solaires flottants à base d'Ag_3PO_4, pour traitement des eaux usées domestiques	H. El Masaoudi	2022 - 25
Modélisation des propriétés magnétiques et de relaxométrie des nanoparticules super-paramagnétiques de $MnFe_2O_4$	A. Al Shami	2023 - 25

Current Ph.D. students

Titre de la thèse	Auteur	Année de soutenance
Nanoparticules super-paramagnétiques de $ZnMnFe_2O_4$ pour la nano-médecine	I. Boulahya	2027
Le Phosphate d'argent (Ag_3PO_4), sous forme de poudre et couches minces en tant que photocatalyseur solaire : Élaboration, caractérisation et test photocatalytique	A. Aliti	2027

Past Ph.D. students

Titre de la thèse	Auteur	Année de soutenance
Optical and electronic properties of exfoliated black phosphorus and quantum dots	I. Benabdallah *Currently @ UM6P as Faculty*	2021
Structural and Optical properties of $LaFe(V,Ag)O_3$ for Solar applications: Experimental and Theoretical studies	W. Azouzi *Currently @ UM5 as postdoc*	2021
Phosphorene as a promising 2D material for Energy Conversion, Energy Storage and Sensing Applications: ab-initio study	A. Sibari *Currently @ Ecole Centrale as Faculty*	2020
Strained SnO2 : Properties and Applications as predicted by Density Functional Theory (DFT)	Z. Kerrami *Currently @ Paris-Saclay as postdoc*	2020
Le Phosphate d'argent (Ag_3PO_4), sous forme de poudre et couches minces en tant que photocatalyseur solaire : Élaboration, caractérisation et test photocatalytique	H. El Masaoudi *Currently @ UM5 as postdoc*	2021
Système solaire à collecteurs cylindro-paraboliques pour le maintien en chauffe d'un stockage de bitume : modélisation, optimisation et analyses expérimentales	M. Ghazouani *Currently @ UIR as Faculty*	2020
Magnetocaloric effect in Gd-based alloy thin films and heterostructures	M. Tadout *Currently @ ...?*	2019
Synthèse et fonctionnalisation de nano-ferrites pour le traitement par hyperthermie	M.A. Ait Kerroum *Currently @ ... ?*	2019
Les nanoparticules de $MnFe_2O_4$ superparamagnétiques pour la nano-médecine	A. Essyed *Currently @ ICPEES Strasbourg as associate researcher*	2019

Brevet

Titre du brevet	Auteur(s)	Référence	Année et pays de dépôt.
Système hybride solaire autonome compact, indirectement couple pour la production simultanée de la chaleur et de l'électricité et son procédé de réalisation.	H. LABRIM, M. HAJJI, **M. BENAISSA**, H. EZ-ZAHRAOUY, H. JABRI	N° de publication : MA 44814 A1 CI Internationale : H01L 35/00	2020 OMPIC - MAROC

Publications "Most Cited" :

Pyramidal defects in metalorganic vapor phase epitaxial Mg doped GaN
Vennéguès, P., Benaissa, M., Beaumont, B., ...Leroux, M., Gibart, P.
Applied Physics Letters, 2000, 77(6), pp. 880–882

Phosphorene as a promising anode material for (Li/Na/Mg)-ion batteries: A first-principle study
Sibari, A., El Marjaoui, A., Lakhal, M., Benaissa, M., Benyoussef, A., Mounkachi, O.
Solar Energy Materials and Solar Cells, 2018, 180, pp. 253–257

CuO-SiO_2 sol-gel catalysts: Characterization and catalytic properties for NO reduction
Díaz, G., Pérez-Hernández, R., Gómez-Cortés, A., Benaissa, M., Mariscal, R., Fierro, J.L.G.
Journal of Catalysis, 1999, 187(1), pp. 1–14, jcat.1999.2578

Atomic structure of pyramidal defects in Mg-doped GaN
Vennéguès, P., Leroux, M., Dalmasso, S., Benaissa, M., ...Massies, J., Gibart, P.
Physical Review B - Condensed Matter and Materials Physics, 2003, 68(23)

Band-gap engineering of SnO_2
Mounkachi, O., Salmani, E., Lakhal, M., Benaissa, M., Ennaoui, A., Benyoussef, A.
Solar Energy Materials and Solar Cells, 2016, 148, pp. 34–38

Synthesis of high active-site density nanofibrous MnO_2-base materials with enhanced permeabilities
Xiao, T.D., Strutt, P.R., Benaissa, M., Chen, H., Kear, B.H.
Nanostructured Materials, 1998, 10(6), pp. 1051–1061

Photovoltaic and thermoelectric indirect coupling for maximum solar energy exploitation
Hajji, M., Labrim, H., Benaissa, M., ...Meot, J., Benyoussef, A.
Energy Conversion and Management, 2017, 136, pp. 184–191

Magnetic anisotropy and its microstructural origin in epitaxially grown SmCo thin films
Benaissa, M., Krishnan, K.M., Fullerton, E.E., Jiang, J.S.
IEEE Transactions on Magnetics, 1998, 34(4 PART 1), pp. 1204–1206

The effect of basic pH on the elaboration of $ZnFe_2O_4$ nanoparticles by co-precipitation method: Structural, magnetic and hyperthermia characterization
Ait Kerroum, M.A., Essyed, A., Iacovita, C., Benaissa, M., Ersen, O.
Journal of Magnetism and Magnetic Materials, 2019, 478, pp. 239–246

Optical and microstructural characterization of chemically synthesized gallium nitride nanopowders
Gonsalves, K.E., Rangarajan, S.P., Carlson, G., Benaissa, M., José-Yacaman, M.
Applied Physics Letters, 1997, 71(15), pp. 2175–2177

Interaction of sulfate groups with the surface of zirconia: An HRTEM characterization study
Benaïssa, M., Santiesteban, J.G., Díaz, G., Chang, C.D., José-Yacamán, M.
Journal of Catalysis, 1996, 161(2), pp. 694–703, 0231

La liste complète des publis est sur les liens suivants :

https://www.scopus.com/authid/detail.uri?authorId=7005588706

https://scholar.google.com/citations?hl=en&user=P8fpY7AAAAAJ&view_op=list_works&authuser=1