

CURRICULUM VITAE

PERSONAL

Family name	Marhaba
Name	Salem
Date of birth	09/09/1980
Place of birth	Tripoli – Lebanon
Marital status	married, 4 children
Nationality	Lebanese, French
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CURRENT POSITION

Sep. 15 – Present	<ul style="list-style-type: none"> ❖ Associate Professor ❖ Beirut Arab University – Faculty of Science – Department of Physics Tripoli – Lebanon ❖ Email: s.marhaba@bau.edu.lb
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EMPLOYMENT

Feb. 11 – Aug. 15	❖ Assistant Professor – Beirut Arab University – Faculty of Science – Department of Physics – Tripoli – Lebanon
Sep. 09 – Aug. 10	❖ Assistant professor – University of Littoral – Dunkerque – France Thermo-Physics Laboratory of Condensed Matter (LTPMC)
Sep. 08 – Aug. 09	❖ Assistant professor – University of Paris VI – Paris – France NanoSciences Institute of Paris (INSP)

DOCTORAL STUDIES

Sep. 05 – Aug. 08	<ul style="list-style-type: none"> ❖ Ph.D in Physics <ul style="list-style-type: none"> ❖ Laboratory of Molecular and Ionic spectrometry (LASIM) Claude Bernard University – Lyon – France ❖ Thesis: “Influence of the morphology on the optical properties of single metallic nano-objects” ❖ Supervisor: Mr. Michel Pellarin ❖ Grant: National Ministry of higher education and Research-France
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GRADUATE STUDIES

Sep. 04 – Aug. 05	<ul style="list-style-type: none"> ❖ Master of Physics and Technology <ul style="list-style-type: none"> ❖ Laboratory of Molecular and Ionic spectrometry (LASIM) Claude Bernard University – Lyon – France ❖ Thesis: “Description and implementation of a new device to deposit size-selected clusters” ❖ Supervisor: Mr. Michel Broyer
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TEACHING COURSES	
Sep. 08 – Aug. 26	<p>Undergraduate courses: Introduction to Physics, General Physics, Physical Optics, Thermal Physics, Classical Mechanics and Waves, Modern Physics, Electromagnetism, Quantum Physics I, Mathematical Methods for Physics, Relativity, Quantum Physics II, Electrodynamics, Solid State Physics, Statistical Physics, Biophysics, Computational Physics, Astrophysics, Electronics, Circuit Analysis.</p> <p>Graduate courses: Advanced Classical Mechanics, Research Techniques, Materials Science, Selected Topics in Nanoscience and Nanotechnology.</p> <p>University Elective courses: Physics for Every Day Life, Introduction to Astronomy, Scientific Thinking.</p>
RESEARCH INTERESTS	
<p>My research interests are in the area of plasmonic metal nanostructures, from a single nanoparticle to ensembles. In particular, the metallic nanoparticles display potential for such applications as enhancing the fluorescence of biological molecules. The optical properties of noble and transition metals nanoparticles are dominated by their localized surface plasmon resonance (LSPR), which is known to closely depend on the size, shape and dielectric environment of the particle, and also on their chemical composition in the case of composite systems. In order to study the optical response of a single, dimer or well organized nanoparticles, we used a sensitive spectroscopic technique in far field. This technique enables the absolute extinction cross-section of the nanostructure to be determined. In the case of single nanoparticles, we can obtain from the measured optical response the quantitative information on their size, shape and environment. In the case of agglomerated nanoparticles (from dimer, to chain), we used direct observation of the nanostructures by Transmission Electron Microscopy (TEM). The coupling of optical technique with TEM images turns out to be essential to get an unambiguous description of their optical response in relation with their exact morphologies and interparticle distances. The measured optical response of nanostructure is compared with that computed by Finite Element Method (FEM) implanted in COMSOL multiphysics.</p>	
SUPERVISION DUTIES	
Mar. 09 –July 09	Alexandros Mouskeftaras (Master): <i>Nano light heat converters and applications</i>
Oct. 11 – Oct. 13	Roaa Yassin (Master): <i>Influence of the size on the optical properties of bimetallic nanoparticles</i>
Jan. 12 – June 13	Hiba Miari (Master): <i>Size and shape effects on the optical properties of silver nanoparticles</i>
June 13- Jan. 16	Hadi Basma (Ph.D.): <i>Ion Beam Analysis and Magnetic Properties of High Temperature Superconductor Samples Added with Nano Ferrite</i>

June 14- Nov. 15	Majed Sharrouf (Master): Preparation and characterization of magnetic diluted semiconductor samples
July 19 – July 22	Samaya El Samad (Ph.D.): Surface Plasmon Resonance of Single or Assembled Noble and Transition Metals Nanoparticles
Sep. 21 - June 22	Nourhan El Kawni (Master): Size and Shape Effect on the Localized Surface Plasmon Resonance of Palladium Nanoparticles
Mar. 22 – Feb. 25	Ahmad Zeid (Master): Optical Properties of palladium-gold and gold-palladium bimetallic core-shell nanoparticles
June 22 – Apr. 25	Mohammed Khalaf (Master): Morphological Effects on the Optical Properties of Palladium nanoparticles
Nov. 22 - Present	Farah Fattouh (Ph.D.): Plasmonic Coupling of Well Organized Metal NanoStructure.
Nov. 22 - Present	Mohammad Abou Ghouseh (Ph.D.): Light Polarization Effects on The Localized Surface Plasmon Resonance of Metallic Nanostructures

PUBLICATIONS

- 1) « Fine tailoring of the localized surface plasmon resonance of transition metal nanocube chains » M Abou Ghouseh, S Marhaba **Materials Research Express** 13 165001 (2026)
- 2) « Plasmonic properties of spherical platinum nanoparticles » F Fattouh, S El Samad, M Khalaf, S Marhaba **Current Applied Physics** 58 56-68 (2026)
- 3) « Localized surface plasmon resonance of single and dimer platinum nanocubes » M Abou Ghouseh, S Marhaba **Physics Open** 27 100396 (2026)
- 4) « Light polarization effect on the extinction spectrum of silver nanostructures » S El Samad, M Jneid, HEB Yassine, S Marhaba **Physics Letters A** 546 130509 (2025)
- 5) « Platinum nanocubes arrays: Plasmon coupling effect on the optical spectral response » S Marhaba **Physics Letters A** 556 130834 (2025)
- 6) « Optical response of palladium nanocube singles and dimers: Plasmon coupling effect between nanoparticles » M Jneid, M Daher, M Awad, S Marhaba **Next Materials** 9 101108 (2025)
- 7) « A Novel Approach for Time-Local Fractional Solutions of Certain Nonlinear Partial Differential Equations in Fractal Dimension » M Jneid, M Daher, M Awad, S Marhaba **International Journal of Analysis and Applications** 22 207 (2024)
- 8) « Size effect on the Optical Response of Cylindrical Palladium Nanoparticles » S Marhaba, M Khalaf **BAU Journal-Science and Technology** 4 2 (2023)
- 9) « Localized Surface Plasmon Resonance of Palladium Parallelepiped Nanoparticles » S Marhaba, N El Kawni **BAU Journal-Science and Technology** 4 2 (2023)
- 10) « How Light Polarizations Affect the Localized Surface Plasmon Resonance of Asymmetric Palladium Nanostructures » S El Samad, S Marhaba **Nano** 17 2250051 (2022)
- 11) « Localized Surface Plasmon Resonance of Copper Nanoparticles Using Finite Element Method » S El Samad, S Marhaba **BAU Journal-Science and Technology** 3 2 (2022)
- 12) « Interparticle Distance Effect on the Optical Response of Platinum Dimer Nanoparticles » S Marhaba, SE Samad **Chemistry Africa** 4 477 (2021)
- 13) « Plasmonic Coupling of One-Dimensional Palladium Nanoparticle Chains » S Marhaba, SE Samad **Nano** 15 2050060 (2020)
- 14) « A comparative study on the influence of the addition of different nano-oxide particles on the thermopower of (Bi, Pb)-2223 superconductor » HT Rahal, R Awad, AM Abdel-Gaber, S Marhaba, Al Abou-Aly **Applied Physics A** 125 365 (2019)

- 15)« *Thermoelectric power of (Cu_{0.5}Tl_{0.5})-1223 superconducting phase added with BaSnO₃ nanoparticles* » A Srour, W Malaeb, S. Marhaba, R Awad **Journal of Physics: Conference Series** 869 012017 (2017)
- 16)« *Effect of Size, Shape and Environment on the Optical Response of Metallic Nanoparticles* » S. Marhaba **IntechOpen** Book chapter London (2017)
- 17)« *Electrical and mechanical properties of (Bi,Pb)-2223 substituted by holmium* » W. Abdeen, S. Marhaba, R. Awad, A. I. Abou Aly, I. H. Ibrahim, M. Matar **Journal of Advanced Ceramics** 5 54 (2016)
- 18)« *Structural, Optical and Room Temperature Magnetic Study of Mn-Doped ZnO Nanoparticles* » M. Sharrouf, R. Awad, S. Marhaba, D.E. Bakeer **Nano** 11 1650042 (2016)
- 19)« *Study of the Irreversibility Line of GdBa₂Cu₃O_{7-δ} Added with Nanosized Ferrite CoFe₂O₄* » H. Basma, R. Awad, M. Roumie, S. Isber, S. Marhaba, A. I. Abou Aly **Journal of Superconductivity and Novel Magnetism** 29 179 (2016)
- 20)« *Ion Beam Analysis and Electric Properties of GdBa₂Cu₃O_{7-δ} Added with Nanosized Ferrites ZnFe₂O₄ and CoFe₂O₄* » H. Basma, M. Roumié, R. Awad, S. Marhaba, M. Albast, A. Abualy **Materials Sciences and Applications** 6 828 (2015)
- 21)« *Structural, Optical and Room Temperature Magnetic Study of Mn₂O₃ Nanoparticles* » M. Sharrouf, R. Awad, M. Roumié, S. Marhaba **Materials Sciences and Applications** 5 850 (2015)
- 22)« *Gold Nanoparticle Arrays Spectroscopy: Observation Of Electrostatic And Radiative Dipole Interactions* » S. Marhaba **Nano** 10 1550007 (2015)
- 23)« *Investigation of Temperature Dependence of the Irreversibility Line of GdBa₂Cu₃O_{7-δ} Added with Nanosized Ferrite ZnFe₂O₄* » R. Awad, M. Roumié, S. Isber, S. Marhaba, A. I. AbouAly, H. Basma **Journal of Superconductivity and Novel Magnetism** 28 535 (2015)
- 24)« *Improvement of superconducting parameters of Bi_{1.8}Pb_{0.4}Sr₂Ca₂Cu₃O_{10+δ} added with nano-Ag* » R. Mawassi, S. Marhaba, M. Roumié, R. Awad, M. Kork and I. Hassan **Journal of Superconductivity and Novel Magnetism** 27 1131 (2014)
- 25)« *Effect of Fe₂O₃ Nano-Oxide Addition on the Superconducting Properties of the (Bi,Pb)-2223 Phase*» M. Roumié, S. Marhaba, R. Awad, M. Kork, I. Hassan, R. Mawassi **Journal of Superconductivity and Novel Magnetism** 27 143 (2014)
- 26)« *Absolute optical extinction measurements of single nano-objects by Spatial Modulation Spectroscopy using a white lamp*» P. Billaud, S. Marhaba, N. Grillet, E. Cottancin, C. Bonnet, J. Lermé, N. Del Fatti, F. Vallée, J. L. Vialle, M. Broyer, and M. Pellarin **Review of Scientific Instruments** 81 043101 (2010)
- 27)« *Linear optical properties of single metallic nanoparticles* » S. Marhaba **European academic editions** Berlin (2010)
- 28)« *Quantitative size dependence of the surface plasmon resonance damping in single Ag@SiO₂ nanoparticles* » H. Baida, P. Billaud, S. Marhaba, D. Christofilos, E. Cottancin, A. Crut, J. Lermé, P. Maioli, M. Pellarin, M. Broyer, N. Del Fatti and F. Vallée; A. Sánchez-Iglesias, I. Pastoriza-Santos and L.M. Liz-Marzán **Nano-Letters** 9 3463–3469 (2009)
- 29)« *Surface plasmon resonance of single gold nanoparticle pairs near the conductive contact limit* » S. Marhaba, G. Bachelier, C. Bonnet, M. Broyer, E. Cottancin, N. Grillet, J. Lermé, J. L. Vialle, and M. Pellarin **Journal of Physical Chemistry C** 113 4349-4356 (2009)
- 30)« *Optical response of metal or dielectric nano-objects in strongly convergent light beams* » J. Lermé, C. Bonnet, M. Broyer, E. Cottancin, S. Marhaba, and M. Pellarin **Physical Review B** 77 245406 (2008)
- 31)« *Optical response of a single spherical particle in a tightly focused light beam: application to the spatial modulation spectroscopy technique* » J. Lermé, G. Bachelier, P. Billaud, C. Bonnet,

M. Broyer, E. Cottancin, S. Marhaba, and M. Pellarin **Journal of the Optical Society of America A** 25 493-514 (2008)

32)« *Correlation between the extinction spectrum of a single metal nanoparticle and its electron microscopy image* » P. Billaud, S. Marhaba, E. Cottancin, L. Arnaud, G. Bachelier, C. Bonnet, N. Del Fatti, J. Lermé, F. Vallée, J. L. Vialle, M. Broyer, and M. Pellarin **Journal of Physical Chemistry C** 112 978-982 (2008)

33)« *Organization of size-selected platinum and indium clusters soft-landed on surfaces* » R. Alayan, L. Arnaud, M. Broyer, E. Cottancin, J. Lermé, S. Marhaba, J. L. Vialle, and M. Pellarin **Physical Review B** 76 075424 (2007)

- **Google scholar citation:**

Total citations:**1140**, h-index:**13**, i10-index:**18**