Hassan Ouacha

Assistant Professor of Physics

Personal Information

King Abdullah Institute for Nanotechnology
College of Science, King Saud University
P.O. Box 2455, Riyadh, Saudi Arabia
houacha@ksu.edu.sa

Education

2002 **Ph.D. in Physics**
Thesis "*Noise Aspects of some Si-based One Port Devices and Carbon Nanotubes*"
Physical Electronics and Photonics Group, Department of Microelectronics and Nanoscience, Chalmers University of Technology, Gothenburg, Sweden

2000 **Diploma of Licentiate of Engineering**
Physical Electronics and Photonics Group, Department of Microelectronics and Nanoscience, Chalmers University of Technology, Gothenburg, Sweden

1998 **M.Sc. in Engineering Physics**
Department of Physics, Chalmers University of Technology, Gothenburg, Sweden

1994 **B.Sc. in Physics**
Department of Physics, Faculty of Science, Moulay Ismail University, Meknes, Morocco

Academic Employment

2013-Present **Assistant Professor of Physics**
King Abdullah Institute for Nanotechnology
College of Science, King Saud University, Riyadh, Kingdom of Saudi Arabia

2007-2013 **Lithography Process Manager**
National Center for Micro-and Nanofabrication, Technical University of Denmark, Lyngby, Denmark

2005-2006 **JSPS Fellow, Japan Society for the Promotion of Science**
Nanoarchitectonics Research Center, National Institute of Advanced Industrial Science and Technology, , Tsukuba, Japan

2003-2004 **Postdoctoral Scientist**
Center for Interdisciplinary Nanostructure Science and Technology, University of Kassel, Germany

2002-2003 **Postdoctoral Scientist**

Foundation for Research and Technology-Hellas, Heraklion, Crete, Greece

Languages

Fluent in English, Arabic and French

Research Interests

Strong interest in the following research fields for new opportunities of innovation:

- Materials science
- Materials processing
- Condensed matter physics
- Semiconductor materials and devices
- Micro-fabrication
- Nanomaterials and nano-devices
- Nanolithography and nanofabrication processes
- Synthesis and growth of thin films and nanostructures with different techniques
- Structural, electrical and optical characterization of materials and devices
- Photovoltaics , gas-sensors, photonic and optoelectronic devices
- Plasmonics for energy and photonics applications

Selected Courses and Trainings

- "*Personal Safety Course*" September 14-15, 2011, Technical University of Denmark
- "*Fabrication of Semiconductor Microcavities by Molecular Beam Epitaxy (MBE)*" Training, May 2003, University of Paderborn, Germany
- "*Technical Reporting in English*" 1999, Chalmers University of Technology, Sweden
- "*Presentation Techniques*" 1996, Linkoping University, Sweden

Thesis Supervision

- Hussein Sayed El Afifi, M.Sc. student "*Effect of Fe and Fe2O3 Dopants on the Optical Properties of TiO2 Thin Films Prepared by Pulsed Laser Deposition Method*" King Saud University

Honors, Awards and Affiliations

- Reviewer and editorial board member for *Journal of Bioelectronics and Nanotechnology*
- Invited lecturer at the *NATO Advanced Study Institute* (ASI) 2005, Orford, Quebec, Canada
- Member of the organizing committee of the Conference "*Photon-based Nanoscience and Technology*" 2005, Orford, Quebec, Canada
- JSPS Fellowship (*Japan Society for the Promotion of Science*) 2005-2006, Japan
- Member of the Japan Society of Applied Physics (JSAP)
- Awarded the "*Certificate of Teaching*" University of Kassel, Germany
- Awarded the "*Certificate in Scientific Qualification*" within the "*European Young Researchers Project*", Paderborn University, 2003 Germany
- Awarded the "*Foundation for Strategic Research programs Fellowship*", Sweden 1998-2002
- Awarded the "*Swedish Institute Fellowship*" 1995-1998 Sweden

Research Grants

2015- ***Role: PI***
"*Advanced waveguide based nano-photonic sensors for gas detection in the petrochemical industry*" Budget 3,219,060 Saudi Riyals
King Abdullah Institute for Nanotechnology and University of Manchester (Prof. Iain Crowe) Submitted

2015- ***Role: PI***
"*Plasmonic Photonic Nanostructures for Light Concentration in Enhanced Solar Cells*" Budget ***2,447,000 Saudi Riyals***
King Abdullah Institute for Nanotechnology and University of Nottingham (Prof. Mohamed Henini) Submitted

2014- ***Role: PI***
"*Ultrafast Active and Nonlinear Nanoplasmonics-Hybrid Quantum Systems for Nano-integrated Light Wave Electronics"* Project ID: 13-NAN1967-02, budget ***1,990,200 Saudi Riyals***. Accepted (Funds not yet delivered)
King Abdullah Institute for Nanotechnology, Max Planck Institute Munich and Ludwig Maximilians University (Prof. Dr. Ulf Kleineberg)

2014-2015 ***Role: PI***
"*International Research Group on Ultrafast Nanophotonics*" Agreement No: IRG14-07A, budget ***300,000 Saudi Riyals***
King Abdullah Institute for Nanotechnology, Max Planck Institute Munich and Ludwig Maximilians University (Prof. Dr. Ulf Kleineberg)

2013-2015 ***Role: Researcher***
"*Vanadium Oxide Thin-Film Microbolometers for Infrared Sensing*" Project ID: TK 1041, budget ***601,000 Saudi Riyals***
King Abdullah Institute for Nanotechnology and Prince Sultan Advanced Tech. Research Institute (Dr. Mohamed Ramy)

2005-2006 ***Role: PI***
"*Preparation and characterization of Nanoparticle-aggregated structures and one-dimensional nanostructures for electronic and opto-electronic applications*"
Nanoarchitectonics Research Center, Tsukuba, Japan

2003-2004 ***Role: PI***
"*Monodispersed Inorganic Nanoclusters as Building Blocks for Functional Materials-Nanocluster*"
Center for Interdisciplinary Nanostructure Science and Technology, University of Kassel, Germany

2002-2003 Role: *PI*
"*New Optimisation Concepts for High Quality UV-Coatings*"
Materials Group, Foundation for Research and Technology-Hellas, Heraklion, Crete, Greece

Selected Workshop Presentations

April 28, 2015	Title: *Engineered Metallic Nanoparticles for Increased Light Absorption in Solar Cells* King Abdullah Institute for Nanotechnology - Sustainable Energy Technologies center (SET) Workshop
April 16, 2015	Title: *Plasmonics for Solar Cells Enhancement* *King Saud University and British Council – "Nanotechnology and its Applications" Research Workshop*
December 30, 2014	Title: *Plasmonics for Solar Energy* King Abdullah Institute for Nanotechnology - Saudi Basic Industries Corporation (SABIC) workshop

Conferences

1. SPIE Optics & Photonics, Nanoscience & Engineering conference, San Diego August 21, 2014
2. Japan Society of Applied Physics (JSAP) Meeting, March 22–26, 2006 Tokyo, Japan
3. International Nanoarchitectonics Workshop, March 9, 2006 Tsukuba, Japan
4. 7th AIST International Symposium on Photoreaction Control and Photofunctional Materials, PCPM2006, March 17-19, 2006 AIST, Tsukuba, Japan
5. Invited Lecturer "*Controlling the shape of nanoparticles by laser light*" at the NATO Advanced Study Institute (ASI) on Photon-based Nanoscience and Technology, September 19-29, 2005 Orford, Quebec, Canada
6. 7th International Conference on Nanostructured Materials, NANO2004, June 20-24, 2004 Wiesbaden, Germany
7. "NanoCluster: *The synthesis of monodispersed cluster systems*", 18-21 November 2003 Leuven, Belgium
8. "*Optical Properties of Nanoparticles*", 16-18 June 2003 University of Kassel, Germany
9. SPIE's First international Symposium on Microtechnologies for the New Millennium 2003, 19-21 May 2003 Gran Canaria, Spain
10. Nanotechnology Conference, NANO2002, 24 July - 2 August, Crete, Greece
11. Summer School organized by the Integrate Electronics Systems (INTELECT) and High Frequency Silicon Programs, 27-29 August 2001 Örebro, Sweden
12. Conference organized by Ericsson Microwave Systems, 30 November 2000 Mölndal, Sweden
13. 5th International Symposium on Plasma Process-Induced Damage, 23-24 May 2000 Santa Clara, California, USA
14. 5th Symposium on Gigahertz Electronics, 13-14 March 2000 Gothenburg, Sweden
15. Summer School organized by the SSF (Foundation for Strategic Research) programs, August 1999, Särö, Sweden
16. 2nd International Conference on Unsolved Problems of Noise and Fluctuations (UPoN'99), 12-15 July 1999, Adelaide, Australia
17. SSF meeting, January 1999, Stockholm, Sweden
18. MIC conference "Microelectronics Center", 27-28 May 1998, Copenhagen, Denmark
19. 17th Nordic Semiconductor Meeting, 17-20 June 1996 Trondheim, Norway

Publications

Manuscripts

1. S. H. Chew, A. Gliserin, J. Schmidt, H. Bian, S. Nobis, F. Schertz, M. Kübel, Y. Yang, **H. Ouacha**, A. M. Azzeer and U. Kleineberg "*Laser intensity effects in carrier-envelope phase-tagged time of flight-photoemission electron microscopy*" ***Submitted to Applied Physics B, 2015***

Book Chapters

2. **Hassan Ouacha** and Frank Träger, "*Controlling the Surface Plasmon Resonances in Metal Nanoparticles by Laser Light*", in Photon-based Nanoscience and Nanobiotechnology: Materials, Diagnostics and Nanobiodevices, edited by Jan J. Dubowski and Stoyan Tanev, p. 345-360, Springer Publisher, Dordrecht, The Netherlands, 2006
3. G. Kiriakidis, **H. Ouacha**, and N. Katsarakis, "*Nano-Structured metal oxide films with room temperature gas sensing properties*", *in Nanostructures*: Synthesis, Functional Properties and Applications, edited by T. Tsakalakos, I. A. Ovid'ko, A. K. Vasudevan, p. 363-382, Kluwer Academic Publishers, Dordrecht, 2003

Papers Presented at International Conferences

4. Kelliie Pearce, Robin Dehde, Jürgen Schmidt, Christian Späth, Huaihai Pan, Sabbir Ahsan, Mahmoud Hezam, **Hassan Ouacha**, Abdallah M.A. Azzeer, U. Kleineberg *"Transmission characterization and control of metallic nanohole arrays by sub 5 fsec laser light pulses*" SPIE Optics & Photonics, Nanoscience & Engineering conference, August 21, 2014 San Diego, USA
5. **H. Ouacha**, K. Kirihara, M. Kogiso, and N. Koshizaki "*Lipid nanotubes as templates for the preparation of CuOx nanowires and Cu nanoparticles*", 8th International Conference on Nanostructured Materials, NANO2006, August 20 - 25, 2006 Bangalore, INDIA
6. **H. Ouacha**, K. Kirihara, and N. Koshizaki, "*Characterization of indium oxide 1D-nanostructures prepared by thermal evaporation*", 8th International Conference on Nanostructured Materials, NANO2006, August 20 - 25, 2006 Bangalore, INDIA
7. **H. Ouacha**, K. Kirihara, M. Kogiso and N. Koshizaki, "*Fabrication and property of copper and copper oxide nanowires using lipid nanotubes*"**,** The Japan Society of Applied Physics (JSAP) conference, March 22 – 26, 2006 Kyoto, JAPAN
8. **H. Ouacha**, K. Kirihara, M. Kogiso, and N. Koshizaki, "*Fabrication and characterization of metal and metal oxides nanowires using lipid nanotubes*" Proceedings of the International Nanoarchitectonics Workshop, March 9, 2006 Tsukuba, JAPAN
9. **H. Ouacha**, C. Hendrich, David Blázquez Sanchez, F. Hubenthal, F. Träger, and N. Koshizaki, "*Tailoring the size and shape of nanoparticles with laser pulses*", in the Proceeding of the 7th AIST International Symposium on Photoreaction Control and Photofunctional Materials, PCPM2006, March 17-19, 2006 AIST/Tsukuba, JAPAN
10. **H. Ouacha** "*Controlling the shape of Nanoparticles by Laser Light*", in the Advanced Study Institute (ASI) Conference on Photon-based Nanoscience and Technology, September 19-29, 2005 Orford, Quebec, CANADA
11. F. Hubenthal, C. Hendrich, T. Ziegler, **H. Ouacha**, and F. Träger, "*Size and shape manipulation of supported gold and silver nanoparticles by laser light*", 7th International Conference on Nanostructured Materials, NANO2004, June 20 - 24, 2004 Wiesbaden, GERMANY
12. G. Kiriakidis, **H. Ouacha**, N. Katsarakis, K. Galatsis, and W. Wlodarski, "*Low Temperature InOx Thin Films for O_3 and NO_2 Gas Sensing*", Proceedings of SPIE, Smart Sensors,

Actuators, and MEMS, Vol. 5116. 2003, 19-21 May 2003, Gran Canaria, SPAIN

13. H. Ouacha, M. Mamor, M. Willander, A. Ouacha, F. D. Auret, and S. A. Goodman "*Two abnormal peaks induced by plasma process in the noise spectra of etched Si and Si1-xGex*" in the Proceeding of the 5th International Symposium on Plasma Process-Induced Damage (P2ID'00)", Santa Clara, 23-24 May 2000, California, USA
14. H. Ouacha, M. Willander, and A. Ouacha "*Noise properties in some Si-based diodes*" in the Proceeding of the 5th Symposium on Gigahertz Electronics, 13-14 March 2000, Gothenburg, SWEDEN
15. M. Mamor, H. Ouacha, M. Willander, F. D. Auret, S. A. Goodman, E. Sveinbjörnsson, and K. Bouziane "*Impact of defects introduced by irradiation on the noise properties of SiGe Schottky diodes*", in the Proceeding of the 5th Symposium on Gigahertz Electronics, 13-14 March 2000, Gothenburg, SWEDEN
16. H. Ouacha, M. Willander, Q. Wahab, A. Ouacha, and G. Holmén "*Impact of the Geometry on the Noise Properties of the 6H-SiC Diodes*", in the Proceeding of the 2nd International Conference on Unsolved Problems of Noise and Fluctuations (UPoN'99), 12-15 July 1999, Adelaide, AUSTRALIA

Papers in Peer Reviewed Journals

17. H. Ouacha, C. Hendrich, F. Hubenthal, and F. Träger "*Laser-assisted growth of gold nanoparticles: Shaping and optical characterization*" Appl. Phys. B 81, p. 663-668 (2005)
18. Frank Hubenthal, Christian Hendrich, Hassan Ouacha, David Blazquez-Sanchez, and Frank Träger "*Preparation of gold nanoparticles with narrow size distributions and well defined shapes*" International Journal of Modern Physics B. Vol 19, Nos. 15, 16 & 17 p. 2604 (2005)
19. G. Kiriakidis, H. Ouacha, and N. Katsarakis, "*InOx Nanostructured Thin Films: Electrical and Sensing Characterization*", Rev. Adv. Mater. Sci. 4 (1), pp. 32-40 (2003)
20. H. Ouacha, M. Willander, H. Y. Yu, Y. W. Park, M. S. Kabir, S. H. Magnus Persson, L. B. Kish, and A. Ouacha "*Noise properties of an individual and two crossing multiwalled carbon nanotubes*", Appl. Phys. Lett. 80, p. 1055-1057 (2002)
21. H. Ouacha, O. Nur, Y. Fu, M. Willander, A. Ouacha, and R. Turan "*Comparison between the noise properties of PtSi/p-Si1-xGex and Pt/p-Si1-xGex Schottky contacts prepared by co-sputtering and thermal reaction*", Semicond. Sci. Technol. 16, p. 255-259 (2001)
22. M. Mamor, H. Ouacha, M. Willander, F. D. Auret, S. A. Goodman, A. Ouacha, and E. Sveinbjörnsson "*High energy He-ion irradiation induced defects and their influence on the noise behavior of Pd/n-Si1-xGex Schottky junctions*", Appl. Phys. Lett. 76, p. 3750-3752 (2000)
23. H. Ouacha, M. Mamor, M. Willander, A. Ouacha, and F. D. Auret "*The impact of plasma etching on the noise performance of Ti/p-Si and Ti/p-Si1-xGex Schottky contacts*", J. Appl. Phys. 87, p. 3858-3863 (2000)
24. H. Ouacha, M. Willander, Q. Wahab, A. Ouacha, and G. Holmén "*Noise in 6H-SiC ion implanted p-n diodes: Effect of the active area on the noise properties of these junctions*", J. Appl. Phys. 85, p. 6557-6562 (1999)
25. H. Ouacha, O. Nur, M. Willander, Y. Fu, and A. Ouacha "*1/f noise characterization of Ir/p-Si and Ir/p-Si1-xGex low Schottky barrier junctions*", Appl. Phys. Lett. 69, p. 2382-2384 (1996)