

## Vita

Zain Hassan Yamani (<http://faculty.kfupm.edu.sa/phys/zhyamani/>) was born in Dhahran, Saudi Arabia on June 10<sup>th</sup>, 1969.

In 1991, he received a Bachelors degree, followed by a Masters degree in Physics in 1993, with concentration in Atomic and Molecular Physics, from the King Fahd University of Petroleum and Minerals (KFUPM), Dhahran-Saudi Arabia. His Masters thesis was on the “Experimental Determination of the Frequency Spectrum of the Rose Bengal Picosecond Fluorescence Using Two Beating Ring Dye Lasers”.

In 1999 he received his Ph.D. in physics, specializing in condensed matter, from the University of Illinois at Urbana-Champaign. His Ph.D. thesis studied “Optical Properties of Size Selected Nanocrystallites in Porous Silicon”.

In the same year he was appointed as an assistant professor in the KFUPM physics department. He was promoted to associate professor in 2005.

In December of 2007 he was appointed Founding Director of the Center of Excellence in Nanotechnology (CENT) at KFUPM, leading research activities for nanotechnology related to petroleum and petrochemical applications.

Zain is a Founding member of the Saudi Physical Society (SPS) and the Director of its Teachers’ Division. He is a Board Member of the Saudi Society for Microscopes and a Board Member of the Saudi Nanotechnology Society. He is also an active member of the American Physical Society, the Optical Society of America, the American Association of Physics Teachers, and the American Chemical Society.

Dr. Yamani enjoys “popularizing” science, and has developed a course into the KFUPM curriculum: “The Physics of How Things Work”.

Dr. Yamani received a number of awards amongst which was The King Abdul-Aziz Medal of the First Type for his scientific accomplishment.

His research interests are in the fields of laser spectroscopy, photo-induced chemistry and nanotechnology, related to which he was issued two USPTO patents while others are pending.

Dr. Yamani *current* (December, 2011) list of projects include:

Principle Investigator in:

- a- Study of the Structural Properties and Hydrodesulfurization Activity of MoS<sub>2</sub> and Co/Ni/MoS<sub>2</sub> Catalysts Prepared by Laser Pyrolysis
- b- Development of Metal-Oxide Zeolite Nanostructures for Hydrogen and Hydrogen Sulfide Detection
- c- Nanoagents for Residual Oil Sensing

Co-Investigator in:

- a- Carbon Nanofibers Grown on 3-D Solid Structures for Applications in Energy-Related Catalysis
- b- Zeolite Nanosheets as a Materials Platform for Improved Refining Catalysts
- c- Development of Highly Efficient Visible-light-driven Mesoporous Nanostructured Materials for Photocatalytic Applications

Numerous others proposals are in the proposal stage.

Dr. Yamani has over fifty publications in refereed international scientific journals and another fifty presentations in workshops and conferences, including:

## **Publications List:**

### **Journal Publications:**

- 1- U.K.A. Klein, J. Mastromarino, **Z. Yamani** and A. Suwaiyan, "Fluorescence demodulation spectroscopy. A new method of determining fluorescence decays using two beating ring dye lasers". Chem. Physics Letters. **217**(1-2), 80-85 (1994)
- 2- W.H. Thompson, **Z. Yamani**, L.H. Abu-Hassan, J. Green, M. Nayfeh and M-A Hasan, "Room temperature oxidation enhancement of prorous Si(001) using ultraviolet-ozone exposure". J. of Appl. Phys. **80**(9), 5415 (1996)

- 3- N. Rigakis, **Z. Yamani**, L.H. Abu-Hassan, J. Hilliard and M.H. Nayfeh, "Time-resolved measurements of the photoluminescence of Cu-quenched porous silicon". *Appl. Phys. Lett.* **69**(15), 2216-2218 (1996)
- 4- **Zain Yamani**, W.Howard Thompson, Laila Abu Hassan and Munir Nayfeh, "Ideal anodization of silicon". *Appl. Phys. Lett.* **70**(25), 3404 (1997)
- 5- M. Nayfeh, N. Rigakis and **Z. Yamani**, "Photoexcitation of Si-Si surface states in nanocrystallites". *Phys. Rev. B* **56**(4), 2079 (1997)
- 6- **Zain Yamani**, Sahel Ashhab, Ammar Nayfeh, W.Howard Thompson and Munir Nayfeh, "Red to Green Rainbow Photoluminescence from unoxidized silicon nanocrystallites". *J. of Appl. Phys.* **83**(7), 3929 (1998)
- 7- **Z. Yamani**, N. Rigakis, and M.H. Nayfeh, "Excitation of size selected nanocrystallites in porous silicon". *Appl. Phys. Lett.* **72**(20), 2556 (1998)
- 8- W.H. Thompson, **Z. Yamani**, L. Abu-Hassan, O. Gurdal and M. Nayfeh, "The effect of ultrathin oxides on luminescent silicon nanocrystallites". *Appl. Phys. Lett.* **73**(6), 841 (1998)
- 9- L. H. Abu-hassan, A. J. Abu El-Haija, S. Mahmood, **Z. Yamani**, M.H. Nayfeh, "Structural characterization of porous silicon as a function of depth". *Dirasat: Natural and Engineering Sciences*, **25**(3), 427-433 (1998)
- 10- **Z.H. Yamani**, A. Alaql, J. Therrien, O. Nayfeh and M. Nayfeh, "Revival of interband crystalline reflectance from nanocrystallites in porous silicon by immersion plating". *Appl. Phys. Lett.* **74**(23), 3483-3485 (1999)
- 11- **Z.H. Yamani**, O. Gurdal, A. Alaql and Munir Nayfeh, "Correlation of diffuse scattering with nanocrystallite size in porous silicon using transmission microscopy". *J. Appl. Phys.* **85**, 8050 (1999)
- 12- M. Nayfeh, O. Akcakir, J. Therrien, **Z.H, Yamani**, N. Barry, W. Yu, and E. Gratton, "Highly nonlinear photoluminescence threshold in porous silicon". *Appl. Phys. Lett.* **75**(26), 4112 (1999)

- 13- M.A Dastageer, **Z.H. Yamani** and F.F. Al-Adel, "The Collisional Cooling Effect of Different Carrier Gases on a Selected  $\nu_2$ " Hot Band of Sulphur Dioxide", Asian Journal of Spectroscopy **4**(4), 173 (2000)
- 14- M. A. Gondal, A. Dastgeer, **Zain. H. Yamani**, M. A. Arfaj and M.A. Ali, "Laser-induced fluorescence monitoring of higher alkanes production from pure methane using non-oxidative processes", Talanta, **59**(2), 295-302 (2003)
- 15- M.A. Gondal, **Z.H. Yamani** A. Dastageer, M.A. Ali and A. Arfaj, "Photo-conversion of Methane into Higher Hydrocarbons Using 355 nm Laser Radiation", Spectroscopy Letters, **36**(4), 313-326 (2003)
- 16- M.A. Gondal, A. Dastageer, **Z.H. Yamani**, A. Arfaj "Investigation of Stimulated Raman Scattering of  $\nu_1$  and  $\nu_2$  Modes in  $\text{CH}_4$ ", Chemical Physics Letters, **377**(1-2), 249-255 (2003)
- 17- Gondal, M. A., A. Hameed, **Z.H. Yamani**, and A. Al-Suwaiyan, Production of Hydrogen and Oxygen by Water Splitting Using Laser Induced Photo-Catalysis over  $\text{Fe}_2\text{O}_3$ , Applied Catalysis **268**(1-2), 159-167 (2004).
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- 19- M. A. Gondal, A Hameed, **Z. H. Yamani** and A. Arfaj, Photocatalytic Transformation of Methane into Methanol under UV Laser Irradiation over  $\text{WO}_3$ ,  $\text{TiO}_2$  and NiO Catalysts, Chemical Physics Letters **392**(4-6), 372-377(2004).
- 20- M. A.Gondal, A. Hameed , **Z. H. Yamani**, Hydrogen Generation by Laser Transformation of Methanol using n-type  $\text{WO}_3$  Semiconductor Catalyst, J. Molecular Catalysis A, **222**(1-2), 259-264 (2004).
- 21- A. Hameed , M. A. Gondal, **Z.H. Yamani**, Effect of Transition Metal Doping on Photocatalytic Activity of  $\text{WO}_3$  for water splitting under Laser Illumination: Role of 3d-orbitals. Catalysis Communication. **5**(11), 715-719 (2004).

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- 24- **Zain H. Yamani**, "Clean Production of Hydrogen Via Laser-Induced Methane Conversion", Energy Sources, **27**(8), 661-668 (2005).
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- 26- Gondal, M. A. T. Hussain, and **Z.H. Yamani**, M.A. Baig. Detection of Heavy Metals in Arabian Crude Oil Residue using Laser Induced Breakdown Spectroscopy, TALANTA **69**(5), 1072-1078 (2006).
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- 28- Gondal, M. A, T. Hussain, **Z.H. Yamani** and A.H. Bakry, Study of hazardous metals in iron slag waste using laser induced breakdown spectroscopy, J. Environmental Science and Health, part-A **42**(6), 767-775 (2007).
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- 41- M.A. Gondal, Q.A. Drmosh, **Z.H. Yamani** and T.A. Saleh , Synthesis of  $\text{ZnO}_2$  nanoparticles by laser ablation in liquid and their annealing transformation into ZnO nanoparticles, *Applied Surface Science*, **256** (1), 298-304 (2009).
- 42- M. Qamar, M.A. Gondal, **Z.H. Yamani** Removal of Rhodamine 6G induced by laser and catalyzed by Pt/ $\text{WO}_3$  nanocomposite, *Catalysis Comm.* Volume **11**, 768-772 (2010).
- 43- Q. A. Drmosh, M.A. Gondal, **Z.H. Yamani** and T.A. Saleh, Spectroscopic Characterization Approach to Study Surfactants Effect On  $\text{ZnO}_2$  Nanoparticles Synthesis by Laser Ablation Process, *Applied Surface Science*, **256**, pp. 4661-4666 (2010).
- 44- Nacir Tit , **Z.H. Yamani**, J. Graham, A. Ayesh, Origins of visible-light emissions in hydrogen-coated silicon nanocrystals: Role of passivating coating, *Journal of Luminescence* **130**, 2226–2237 (2010).
- 45- Nacir Tit, **Zain H. Yamani**, John Graham, Ahmad Ayesh, Effects of the passivating coating on the properties of silicon nanocrystals, *Materials Chemistry and Physics*, **124**, 927–935 (2010).
- 46- Ahmed A.I., Khalil , Fathy, Salman , **Zain, Yamani**, [UV laser-induced electrical properties change in silver metaphosphate glass](#), *Optics Communications*, **283**(24), 5173-5182 (2010).
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- 48- Gondal, M.A., Dastageer, M.A., Khalil, A., Hayat, K., and **Yamani, Z.H.**, Nanostructured ZnO synthesis and its application for effective disinfection of Escherichia coli micro organism in water, *Journal of Nanoparticle Research*, **13**(8), 3423-3430 (2011).

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- 50- Gondal, M.A., Nasr, M.M., Ahmed, M.M., **Yamani, Z.H.**, and Alsalhi, M.S., Detection of lead in paint samples synthesized locally using-laser-induced breakdown spectroscopy, *Journal of Environmental Science and Health Part A*, **46**, 42-49 (2011).
- 51- Tawfik A. Saleh, M.A. Gondal. Q.A. Drmosh, **Z.H. Yamani** and A. Al-Yamani, Enhancement in Photocatalytic Activity for Acetaldehyde Removal by Embedding ZnO nano particles on Multiwall Carbon Nanotubes, *Chemical Engineering Journal*, **166**, 407-412 (2011).
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- 55- M. A. Gondal, X. Chang, **Z.H. Yamani**, G. Yang and G. Ji, GaN thin films growth and their application in photocatalytic removal of sulforhodamine B from aqueous solution under UV pulsed laser irradiation *Journal of Environmental Science and Health Part A* **46**, 1–5 (2011).
- 56- Mohammed Ashraf Gondal, Xiaofeng Chang, Mohammad Ashraf Ali, **Zain Hassan Yamani**, Qin Zhou, Guangbin Ji, Adsorption and degradation performance of Rhodamine B over BiOBr under monochromatic 532 nm pulsed laser exposure, *Applied Catalysis A*, 397(1-2), 192-200 (2011).



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- 58- Gondal, M.A., Hayat, K., Khaled, Mazen M., **Yamani, Z.H.**, Ahmed, Shakeel, Photocatalytic removal of hazardous dye from water using nanostructured WO<sub>3</sub>, *International Journal of Nanoparticles*, 4(1), 53-63 (2011).
- 59- Zhijian Li, Mohammed Ashraf Gondal, and **Zain Hasan Yamani**, Preparation of magnetic separable CoFe<sub>2</sub>O<sub>4</sub>/PAC composite and the adsorption of bisphenol A from aqueous solution, *Journal of Saudi Chemical Society* (in press).
- 60- M. Qamar, Z.H. Yamani and S.J. Kim. Effect of post-hydrothermal treatment on the properties and photocatalytic activity of TiO<sub>2</sub>-based nanotubes. *Microporous and Mesoporous Materials* (Under revision)

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- 2- M. Nayfeh, N. Rigakis and **Z. Yamani**, "Photoexcitation of Si-Si radiative surface states in nanocrystallites". *MRS Symp. Proc.* **486**, 243 (1998).
- 3- Munir H. Nayfeh , **Zain Yamani**, Osman Gurdal and A.A. Alaql. Nanostructure of Porous Silicon Using Transmission Microscopy: Observation of Restructured Nanoclusters. *MRS Symp. Proc.* **536**, 191-196. (1999).
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- 5- M.A. Gondal, A. Dastageer, **Z.H. Yamani**, M.A. Ali, A. Arfaj, "355-nm Photodissociation of CH<sub>4</sub> and Production of Hydrogen", *CLEO Technical Digest Series* **56**, 462 (2001).

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- 10- M.A. Gondal, A. Hameed, **Zain H. Yamani** and A. Suwaiyan, "Photocatalytic Splitting of Water into Hydrogen and Oxygen Using Laser", Petrotech-Bahrain (2003).
- 11- **Z.H. Yamani**, M.A. Gondal, A. Hameed, A. Dastgeer, and A. Arfaj, "Hydrogen Production by Photo-dissociation of Methane with UV Laser", Petrotech-Bahrain (2003).
- 12- **Z. Yamani**, M.A. Gondal, E. Hegazi, H.M. Masoudi, Industry Oriented Laser Research at KFUPM, 1<sup>st</sup> Saudi Physical Society Meeting, Dec. 2003. (Abha, Saudi-Arabia).
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- 15- M. A. Gondal, A. Hameed, **Z. H. Yamani**, A. Suwaiyan and A. Arfaj, Activity of WO<sub>3</sub>, NiO and Fe<sub>2</sub>O<sub>3</sub> Catalysts for Hydrogen Production under UV Laser Irradiation,

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