



Detailed Report for Dr. Walid Tawfik Younes Mohamed

Personal Data

Name	Walid Tawfik Younes Mohamed
Date & Place of Birth	6th July 1969, Cairo.
Marital	Married
Home Address	45, Borhan St., Helwan, Cairo, Egypt.
Present Office Address	Department of Physics, Pohang University of Science and Technology POSTECH , San 31 Hyoja-Dong, Namku Pohang, Kyungbuk 790-784 Republic of Korea Home: +82 54 2238166 office: +82 54 2798357 Secretary: +82 54 2792089 Fax:+82 54 279 5564 Mob. +821086892353
Permanent Office address	National institute of laser enhanced sciences, NILES, Cairo University, Giza, Egypt.
Nationality	Egyptian

Attached Scientific

- [Personal Data & Academic Qualification.](#)
- [Research interests](#)
- [Referees & references](#)
- [professional Experience.](#)
- [supervision of M.sc. and PhD. Thesis.](#)
- [Peer-review activities.](#)
- [Publications.](#)

CURRICULUM VITA

Dr. Walid Tawfik Younes Mohamed

PERSONAL DATA

Family name : Mohamed

First Name : Walid

Middle Names : Tawfik Younes

Email address: Walid_Tawfik@hotmail.com, walid@postech.ac.kr

Nationality : Egyptian.

Date and place of Birth : 6th July 1969, Cairo.

Sex : Male.

Marital status : Married

Number of Children : Three Children (ten years old, eight years old, five years old).

Present Job: Research associate (Associate Prof.) Department of Physics, Pohang University of Science and Technology POSTECH , Pohang, south Korea.

Permanent Job: Staff Member (Associate Prof.) at the department of Environmental, Photochemical and Agriculture Laser applications, NILES, Cairo University, Cairo, Egypt.

KNOWLEDGE OF LANGUAGES:

English (Inst. Toefl 540 (A)) writing and speaking excellent.

Deutsch (Primary - secondary school level)

Arabic (Mother tongue language)

PROFESSIONAL EXPERIENCE:

- (2010-2011) Research associate (Associate Prof.) Department of Physics, Pohang University of Science and Technology POSTECH , Pohang, south Korea. This is a joint project with prof. Ferenc Krausz group at Max Planck Institute of Quantum Optics (MPQ) Munich, Germany.
- (2008 –till now)-Associate prof. –sabbatical leave - at the department of Environmental, Photo Chemical and Agriculture Laser applications, NILES, Cairo University, Cairo, Egypt.
- (2003- 2009)- Assistant Prof. - academic staff member at the department of Physics, Faculty of Education for girls, Qurayate, Algouf university, Kingdom of Saudi Arabia.
- (2000-2003)-Lecturer- at the department of Environmental, Photo Chemical and Agriculture Laser applications, NILES, Cairo University, Cairo, Egypt.
- (1999-2000)-Assistant Lecturer- at the department of Environmental Photo Chemical and Agriculture Laser applications, NILES, Cairo University, Cairo, Egypt.
- (1996-1999)-Physics Specialist- at the department of Environmental Photo Chemical and Agriculture Laser applications, NILES, Cairo University, Cairo, Egypt.
- (1993-1996)- Physics Specialist- (temporary contract)-Department of Physics, Faculty of Science, Cairo University, Giza, Egypt.

Teaching Experience:

Courses *taught at* Algouf university, department of Physics, Faculty of Education for girls, Saudi Arabia.

- Atomic & molecular spectroscopy
- Laser physics and its applications
- Solid state physics I & II
- Computer science
- C++ programming
- Physical Optics
- Automatic Analysis Methods
- Electronics and Circuits
- Electricity and Magnetism
- Modern Physics
- General physics
- Thermodynamics

Courses *taught at* NILES, Cairo University

- * Physical Optics (diploma students).
- * Experimental optics (diploma students).
- * Experimental Projects (M.Sc. students and Ph.D. students).

RESEARCH INTERESTS:

- 1- Ultrafast laser spectroscopy and its applications.
- 2- Attosecond streaking and transient absorption spectroscopy of ultrafast electron motion.
- 3- Few cycle generation via Supercontinuum in a Gas-Filled Hollow-Core Fiber.
- 4- Development of ultrashort UV and deep-UV light sources.
- 5- Laser plasma channels of ionic molecules.
- 6- Development of new laser-driven, brilliant X-ray sources.
- 7- Precision spectroscopy of simple atomic systems; laser cooling of atoms; optical frequency synthesizer (frequency comb); XUV frequency combs.
- 8- Laser-driven electron acceleration and radiation generation.
- 9- Laser-Induced Breakdown Spectroscopy (**LIBS**) applications in both analytical atomic spectroscopy and plasma spectroscopy.

ACADEMIC QUALIFICATION

Field (Physics)	Year	University
B. SC.	1992	Department of Physics, Faculty of Science, Cairo University, Giza, Egypt.
M. SC.	1996	Department of Physics, Faculty of Science, Cairo University, Giza, Egypt.
Ph.D	2000	The experimental part was done at the Department of Physical Chemistry, TU, Munich, Germany and the degree is awarded from the Department of Environmental, Photo Chemical and Agriculture Laser applications, NILES, Cairo University, Giza, Egypt.

Graduation project in 1992 : Plasma Diagnostics Via Interferometric Laser Holography .
Project Grade : Excellent. **Graduation Grade :** Good (72%).

Preparation studies Grade for Master of physics Degree (1993):Very Good(80%)

Master thesis title (1996) : Laser Propagation In Water.

Topics of the M.Sc. Thesis (1996): i) The experimental findings and the discussion cited in this thesis give an evidence for the occurrence of several nonlinear phenomena such as self-focusing, filamentation, optical-breakdown, cavitations (bubbles) and shock waves, due to propagation of high power Nd: YAG laser beam water.

ii) The self-focusing process is manifested by a luminescent track. The luminescence track itself; whose length varies inversely with the laser power; is formed due to the appearance of successively initiated self-focused hot spots' foci each at a distance Z_f ,away from the chamber entrance window. The generated foci appear to have life times varying between 30-200 ps.

iii) The experimental findings confirm the theory of Moving foci.

IV) Optical breakdown at self-focusing hot spots gives rise to shock wave propagating at 5km/s and formation of bubbles with diameter about 100-200 μm . Shock wave amplitude depends on the laser wavelength and power.

Ph.D. thesis title (2000) : Study of the Photon-Molecular Interaction Dynamics Using Short Laser Pulses : ZEKE Spectroscopy

Topics of the Ph.D. Thesis: i) The stability and neutrality of the high Rydberg states using the role of electric fields in the production of long-lived molecular Rydberg states which is the basis of the ZEKE (Zero Electron Kinetic Energy) spectroscopy.

ii) Observing long lifetime enhancement (up to $\sim 66 \mu\text{s}$) in the Rydberg states of Benzene using an experimental method, which externally imposes controlled stabilization of the Rydberg states using fast switching applied field in case of benzene molecule. The latter is called 1-locking technique which is applied between the ion optic plates (where the benzene cation molecules are exist after laser excitation). This 1-locking technique is examined for

both of the 0^{0+} transition and the $6^1 (3/2)$ transition of benzene cation molecule by applying that 1-locking field between the ion optic plates with a variable delay time (100 ns-1 microsecond) with respect to the excitation laser.

iii) A maximum enhancement is reached by optimizing the locking field strength at 100mV/cm and the delay time at 100ns after laser excitation. Switching an electric field which changes its case (on or off) with different delay times after excitation locks the majority of the Stark mixed levels in states which are free of low-l character.

iv) It is concluded that the ZEKE signal intensity enhancement observed for both of the 0^{0+} transition and the $6^1_{(3/2)}$ transition confirm the assumption that the ions field play an important role in stabilizing of ZEKE state lifetime.

Ph.D. Advisor:

1- Prof. Dr. E. W. Schlag

TU, Muenchen, Germany

Inst. Of Phys. Chernie Lichtenbergstr 4,

85748 Garching

E-mail: schlag@ch.tum.de ; schlag@mytum.de

2- Prof. Dr. Y. E. E. Gamal

Professor of laser Physics

Vice dean of NILES Cairo University, Cairo, Egypt.

E-mail: drygamal@gmail.com

3- Prof. Dr. M. H. Abdel-kader

Professor of Physical Chemistry

Vice dean of NILES

Cairo University, Giza, Egypt.

REFEREES & REFERENCES:

1- Prof. Dr. Mohamad Sabsabi

Research Officer

National Research Council Canada

Industrial Materials Institute

75 de Mortagne Blvd.,

Boucherville (Québec) J4B 6Y4

Numéro téléphone : 450-641-5113

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Field of research

Material analysis using Laser-Induced Breakdown Spectroscopy. Application of the LIBS technique to the metals, mining, pharmaceutical and environmental sectors.

2- Prof. Dr. Eon Dong Kim

Professor, Physics Department

Director, Center for Attosecond Science and Technology(CASTECH)



Asian Director, Max Planck Center for Attosecond Science (MPC-AS)
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Pohang, Kyungbuk 790-784
Republic of Korea
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Fax: +82 54 279 5564
E-mail : kimd@postech.ac.kr

Field of research

Ultrafast laser spectroscopy, HHG for Attosecond pulse generation, Nanoscience in Fabrication of Silicon nanowires, and Few cycles generation and stabilization.

3-Prof. Dr. Y. E. E. Gamal

Professor of Laser Physics
NILES, Cairo University, Cairo, Egypt.
drygamal@gmail.com
Tel.: 0020101074012
Tel.: 00966507538199

Field of research

Theoretical modeling and simulation of Laser-Induced Breakdown Spectroscopy and its application, specially in gases using shot laser pulses.

3- Prof. Dr. Dr. Tharwat El-sherbini

Professor of Laser Physics
Faculty of Science, Physics Department
Laser Physics Lab.
Cairo University, Cairo, Egypt.
Tel.: 0020102501511
E-mail: thelsherbini@yahoo.com

Field of research

Theoretical modeling and experimental of laser spectroscopy and laser plasma deposition thin films.

4- Prof. Dr. E. W. Schlag

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85748 Garching,
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Fax: +49 89 289 13389
E-mail: schlag@ch.tum.de Or : schlag@mytum.de
Web: <http://www.phys.chemie.tu-muenchen.de/staff/schlag/>

Field of research

Multiphoton ionization mass spectrometry, High resolution sub-Doppler molecular spectroscopy and dynamics, ZEKE spectroscopy which include spectroscopy and kinetics of molecular ions and dynamics of photoexcited states and van der Waal's molecules.

5- Asst. Prof. Ashraf M. Eldakrory

Department of Physics,
Faculty of science,
Alqassium university,
Alzolfy, KSA
(Mob. +977501793259)
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Field of research

Laser plasma spectroscopy and laser plasma deposition of thin films on nylon-6 .

6- Prof. Mahmoud Abdel-Aty

Department of Mathematics,
Faculty of science,
Bahrain university,
Bahrain
Tel.: 0097339839285
E-mail: abdelatyquantum@gmail.com
Web: <http://www.abdelaty.tk>

Field of research

Quantum optics and quantum information, including theoretical modeling of ultra-cold atoms (Mazer), quantum new states, semiclassical laser theory, quantum entanglement, and Trapped ions interacting with a laser field.

7-Asst. Prof. Dr. Mostafa Lotfy Abdel-Hady

Department of Physics,
Faculty of Education for girls,
Qurayate, Algouf university,
Kingdom of Saudi Arabia
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8- Prof. Dr. Lotfia El-Nadi

Professor of laser Physics
Faculty of Science, Physics Department, Laser Physics Lab.
Cairo University, Cairo, Egypt.
E-mail: lotfianadi@gmail.com

Field of research

laser spectroscopy and laser plasma deposition thin films, preparation of metallic and non metallic thin films under high vacuum evaporation and sputtering techniques.

9- Prof. Dr. Wolfgang Derntroeder

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10- Prof. Dr. Dolores Gaudy

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List of Thesis under Supervision of

Dr. Walid Tawfik Younes Mohamed

<u>Name</u>	<u>Date Record/award</u>	<u>Title</u>	<u>Degree</u>
<u>1- Marwa Ahmed Mohamed Ismail</u>	<u>2001</u> <u>2004</u>	<u>Study of Laser Induced Breakdown Spectroscopy (LIBS) limit of detection of some common elements in two different metallic matrices</u>	<u>M.Sc</u>
<u>2- Asmaa Elhassan Ramadan Mohamed</u>	<u>2001</u> <u>2004</u>	<u>Study the effect of static electric field on Laser induced plasma signal</u>	<u>M.Sc</u>
<u>3- Mohamed soliman</u>	<u>2001</u> <u>2006</u>	<u>Quantitative elemental analysis of agricultural drainage water using laser induced breakdown spectroscopy.</u>	<u>PhD</u>
<u>4- Abeer Asker</u>	<u>2001</u> <u>2006</u>	<u>Qualitative and quantitative analysis of heavy elements contaminated sediments using LIBS</u>	<u>M.Sc</u>

Membership in Scientific Societies :

- European Society of Photobiology (since 1997).
- The Egyptian Materials Research Society (Eg-MRS) since 2006.

Participation In Scientific Meetings And Conferences

- *[The Atto3 conference Sapporo, Hokaido university, Japan 6-9 July 2011.](#) Two posters "Toward high-order harmonic generation from ions by a femtosecond terawatt laser in plasma waveguide produced by clustered gas jet" and " Attosecond light facility constructed in CASTECH"
- *The 4th Asian Workshop on Generation and Applications of Coherent XUV and X-ray Radiation will be held on Jan. 20-21, 2011 at POSTECH, Pohang, Korea.
- * The GRDC Symposium 2010 "Green Science and Engineering for Health and Environment" Maria Hall at the Catholic University of Korea in Seoul, Korea 15-16 Nov. 2010.
- *First international Conference on Modern Trends in Physics Research MTPR-04, Cairo, Egypt 4-9 April **2004**
- *Second Euro-Mediterranean Symposium on Laser Induced Breakdown Spectroscopy, Hersonissos, Crete, Greece, **September 30th – October 3rd, 2003.**
- **The 4th Euro-Mediterranean Conference on Laser & photobiology applications in Medicine and Environment 13-16 Feb. 2001 hold at NILES, Cairo University, Egypt.
- ***Training course on laser diagnostics of combustion processes organized by NILES, Cairo University in cooperation with ICS- UNIDO, Trieste , Italy, Cairo, Egypt, 18Nov.- 22 Nov. 2000.
- ***Training course on industrial laser application organized by NILES, Cairo University in cooperation with ICS- UNIDO, Trieste, Italy, Cairo, Egypt, 27 May- 8 June 2000.
- **Workshop on laser applications organized by NILES, Cairo University, Egypt, 4-8 Feb.2000.
- ***Training Course on Laser Science and its applied Technologies organized by NILES Cairo University in cooperation with ICS-UNIDO, Trieste -Italy, Cairo 9-21 November 1998.
- * Winter college on Quantum optics: novel Radiation Sources - Trieste -Italy - 3-21 march 1997.
- *4th workshop on Plasma and Laser Physics, Sonesta Hotel, Naser City, Cairo Egypt.26-29 Feb. **1997**," Self Focusing and associated Phenomenon induced by high intensity Q-Switched Nd: YAG Laser Beam in Water", **W. Tawfik**, A. Abd El-Fattah, Yosr E.E. Gamal and L. El-Nadi.
- * **Participant with paper or poster.**
- ** **Member of the organizing Committee.**
- *** **Local Organizer.**

PEER-REVIEW ACTIVITIES

Journal reviewer for journal of [Sensor Letters \(American Scientific Publishers\)](#).

Journal reviewer for journal of The Journal of Physical Chemistry

PUBLICATIONS

BOOKS:

- **Walid Tawfik Mohamed** and Jungkwuen An, and Dong Eon Kim, 2011, "Generation of Few Cycle Femtosecond Pulses via Supercontinuum in a Gas-Filled Hollow-Core Fiber" published as a chapter in book "'Optical Fibers/ Book 4 InTech , Croatia, [ISBN 979-953-307-653-8](#).
- **Walid Tawfik Y. Mohamed** and Mahmoud Abdel-Aty (Editor), 2007, "Recent advances in laser induced breakdown spectroscopy as elemental analytical technique for environmental applications and space exploration" book titled "Aspects of Optical Sciences and Quantum Information", Research Signpost 37/661 (2), Fort P.O., Trivandrum-695 023, Kerala, India, [ISBN: 81-308-0147-7](#).

PAPERS:

A- To be published soon:

1- Guanglong Chen, Tawfik Walid, Xiaotao Geng, Hongxia Xu, Jaehoon Kim and Dong Eon Kim "A low-intensity femtosecond laser pulse induced plasma waveguide using argon cluster jet" under submission to Journal of Applied Physics.

B- Published peer reviewed journals:

[1] **Walid Tawfik Mohamed**, Guanglong Chen, Jaehoon Kim, Geng Xiao Tao1, Jungkwen Ahn and Dong Eon Kim, 2011, "Controlling the length of plasma waveguide up to 180 Rayleigh lengths, produced by femtosecond laser pulses in atomic clustered gas" [Optics Express 19\(17\)15919-15928](#).

[2] **Walid Tawfik Y. Mohamed**, 2008, "Improving Detection Limits of trace elements in Aluminum Alloys using LIBS with a Time-resolved high resolution Echelle

Spectrometer", [Journal of Optics & Laser Technology, Vol. 40, pp.30-38.](#) **(one of the best hot 25 papers ranked by science direct)**

[3] **Walid Tawfik Younes Mohamed**, 2007, "Calibration Free LIBS Identification Of seawater Salinity", [Optica Applicata Vol. 37, No. 1, 5-19.](#)

[4] **Walid Tawfik Y. Mohamed**, 2007, "Fast LIBS Identification of Aluminum Alloys", [Progress in Physics, Vol. 2, pp. 87-92.](#)

[5] **Walid Tawfik Y. Mohamed** and Abeer Askar, 2007, "study of the matrix effect on the plasma characterization of heavy elements in soil sediments using LIBS with a portable Echelle spectrometer", [Progress in Physics, Vol. 1, pp. 47-53.](#)

[6] **Walid Tawfik Y. Mohamed**, 2007, " Study of the Matrix Effect on the Plasma Characterization of Six Elements in Aluminum Alloys using LIBS with a Portable Echelle Spectrometer", [Progress in Physics, Vol. 2, pp. 42-49.](#)

[7] **Walid Tawfik Younes Mohamed** and Ali Saafan, 2006, "Quantitative analysis of mercury in silver dental amalgam alloy using laser induced breakdown spectroscopy with a portable Echelle spectrometer", [International Journal of Pure and Applied Physics, Vol.2, No.3, pp. 195-203.](#)

[8] **Walid Tawfik Y. Mohamed**, 2006, " Quantitative elemental analysis of seawater by laser induced breakdown spectroscopy", [International Journal of Pure and Applied Physics, vol. 2, No.1, pp. 11-21.](#)

[9] **Walid Tawfik**, Taher Salah, Mahmoud H. Abdelkader, S.A.Hassan and Mohamed A. Harith, 2006, "Fast analysis of animal feeds using Laser-induced breakdown spectroscopy", [Science Echoes, vol. 6, pp. 19-31](#)

[10] **Walid Tawfik**, Mohamed A. Harith, Mohamed Elbatanony and Said El-Tayeb, 2006, "Human enamel in ancient (3400-1085 BC) and recent Egypt, [Science Echoes, vol. 7, pp. 28-38.](#)

[11] **Walid Tawfik**, Magdy M. Omar, Yoser E. Gamal and Lotfia El Nadi , 2005, " Ultrafast moving bubbles of focused laser pulsed in water", American Institute of Physics AIP conference proceedings, vol. 748, pp. 280-288.

[12] Marwa A. Ismail, Hisham Imam, Asmaa Elhassan, **Walid T. Youniss** and Mohamed A. Harith, 2004, "LIBS limit of detection and plasma parameters of some elements in two different metallic matrices" [J. Anal. At. Spectrom. , vol. 19, pp. 1-7.](#)

[13] M. Sabsabi, V. Detalle, M. Harith, **W. Tawfik** and H. Imam, **2003**, "Comparative study of two new commercial echelle spectrometers equipped with intensified CCD for analysis of laser-induced breakdown spectroscopy" [Applied Optics, Vol. 42, No. 30, pp. 6094-6098.](#)

[14] M. soliman, **W. Tawfik** and M. A. Harith, **2003**, "quantitative elemental analysis of agricultural drainage water using laser induced breakdown spectroscopy, First Cairo conference on plasma physics & applications," Cairo, Egypt, Forschungszentrum Juelich GmbH, Bilateral Seminars of the International Bureau, Vol. 34, pp. 240-243.

[15] **Walid T. Mohamed**, Mahmoud H.A. Elkader, Yosr E.E. Gamal and E.W. Schlag " Long lived High Rydberg States of Benzene as an air pollutant " in proceeding of the 4th Euro-Mediterranean Conference on Laser & photobiology applications in Medicine and Environment **13-16 Feb. 2001** hold at NILES, Cairo University, Egypt.

[16] **Walied Tawfik**, M.M.Omer, Yosr E.E-D Gamal and EL-Nadi (1997)," Photo dissociation of H₂O molecule in intense Laser field " Proceeding of solar energy storage conference " Solar 97Cairo,Egypt , **6th Jan. 1997**

[17] **Walid Tawfik**, M.A. Abdelnaser, Yosr E. Gamal, and Lotfia Einadi (**1997**): "self-focusing of Nd:YAG laser beam in water" international center for theoretical physics, Internal Report, MIRAMARE TRIEST, Italy.

[18] **WALIED TAWFIK**, MAGDY M. OMARA, YOSR E. GAMAL and L. EL – NADI , (**1995**) , " Bulk and surface effects in liquids due to interaction of high power pulsed laser beams ", Proceeding of Femtochemistry: The Lausanna Conference Sept. 4 – 8 Lausanne Switzerland, page 483-490. World scientific.