

Firas Fandi Awwadi

فiras فندي محمود عوادي

Academic Curriculum Vitae

Assistant Professor of Chemistry
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1 November 2014
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Personal Information

Birth date; 24/03/1972
Marital Status; Married
Number of kids; two
Nationality; Jordanian

Education Qualifications

- 2001-2005 Ph.D student in Physical Chemistry, Washington State University, Washington, USA. Dissertation Title; A Crystallographic and Theoretical Study of Halogen-Halogen and Halogen-Halide Synthons. Supervisor Prof. Dr. Roger D. Willett.
- 1995-1998 Master student in Physical Chemistry, Yarmouk University, Jordan. Thesis title; Fluorescence Properties of 4,4'-Diaminophenyl Sulfone and Related Compounds in α , β , and γ -Cyclodextrins Aqueous Solutions. Supervisor Prof. Dr. Khader Al-Hassan.
- 1990-1994 B. Sc. in Applied Chemistry, Jordan University of Science and Technology, Jordan.

Professional Skills

Considerable experience in single crystal X-ray determination, developing HPLC assays for determination of drugs and metabolites in biological fluids and chemical synthesis.

Familiar with many analytical techniques: crystallography (Siemens, Syntex P2₁ diffractometer upgraded to Bruker P4 specifications, fluorometers, UV/Vis spectrometers, HPLC, IR...etc

Familiar with many software; the SHELXTL program suit, Gaussian and MolPro software for quantum mechanical calculations.

Professional Experience

- 2011- Assistant professor, the University of Jordan
- January 2012-June 2012 Post Doc. ; Studying the magneto-structural correlations. Clark University, Worcester, Massachusetts, USA.
- 2008-2011 Assistant professor, Tafila Technical University
- May 2010- July 2010 Visiting Professor; Studying halogen bonding interactions in hybrid organic-inorganic interactions, Bologna University, Bologna, Italy.
- 2006-2008 Lecturer Tafila Technical University.
- 2005-2006 Instructor, Jordan University of Science and Technology.

2002-2005	Teaching assistant; assisting in teaching physical chemistry labs and classes, Washington State University.
1999-2001	Assistant lecturer; teaching general chemistry class and general and organic chemistry labs, Al-Balqa` Applied University, Jordan.
1998-1999	Research Assistant; Worked on effect of oxygen on the intersystem crossing quantum yield of quinoline, Yarmouk University, Jordan.
1994-1995	Research Assistant; Worked on metabolism of drug <i>in vivo</i> and bio-availability studies, my role was to develop HPLC quantitative assays for drug determination in biological fluids (urine, plasma and serum), Jordan University of Science and Technology (Department of Pharmacology, Faculty of Medicine), Jordan.
1996-1997	Teaching Assistant; assisted in teaching general, physical, analytical and inorganic chemistry labs, Yarmouk University.

Teaching Experience:

I taught at Tafila Technical University since fall 2006 till summer 2011; in this time the offered classes cover standard undergraduate general and physical chemistry subjects. The physical chemistry (both lecture and labs) includes thermodynamics, electrochemistry, chemical kinetics, computer applications in chemistry and catalysis. During the period of my PH. D. study, I taught physical chemistry labs (both I and II).

I have been teaching at the University of Jordan since fall 2011; the offered classes cover quantum chemistry for undergraduates and master students, chemical kinetics, electrochemistry, physical chemistry labs I and II, and general chemistry.

Manuscript Reviewer for:

- 1-Crystal Growth and Design
- 2-Inorganic Chemistry
- 3-CrystEngComm
- 4-Journal of Molecular Structure
- 5-Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy
- 6-Polyhedron
- 7-Jordan Journal of Chemistry
- 8-Dirrasat (Jordan University)

Conferences:

1. **Invited speaker, Firas F. Awwadi**, The Competition between Halogen and Hydrogen bond Interactions in Halopyridinium Tetrahalocuprate(II) Salts. *1st International Symposium on Halogen Bonding*, 18-22 June, 2014, Porto Cesareo, Italy.
2. **Firas F. Awwadi**; Salim F. Haddad; Brendan Twamley and Roger Willett, Effect of Intermolecular Interactions on the Molecular Structure; Theoretical study and Crystal Structures of 4-Bromopyridinium Tetrafluoroborate and diaqua(3-bromopyridine)difluorocopper(II). *Eurasia Conference on Chemical Sciences-11*, 6-10 October 2010, The Dead Sea, Jordan
3. **Firas F. Awwadi**; Willett, Roger D.; Peterson, Kirk; Twamley, Brendan, Crystallographic and Theoretical Studies on the Role of Halogen-halide Synthons in the Crystal Structures of (nYP)X,

(nYP)₂CuX₄ and Cu(nyp)₂X₂, *American Crystallographic Association, 2004 Annual Meeting*, July 17 – 22. Chicago, Illinois, USA.

4. **Firas F. Awwadi**; Willett, Roger D.; Haddad, Salim; Twamley, Brendan, The Role of the Aryl C-Br...X⁻ Synthons in the Crystal Structure of Copper(II) Halide Salts, *American Crystallographic Association, 2003 Annual Meeting*, July 26 – 31. Cincinnati, Ohio, USA.

5. Willett, Roger D.; **Firas F. Awwadi**; Zhenming, Wang; Twamley, Brendan, Structure and Magnetic Properties of MX₄²⁻ Salts of Cu(TIM)²⁺, *American Chemical Society Northwest Regional Meeting*. Spokane, WA, USA. June 2002.

Master Thesis Committee Member

- 1- Alaa Omar Zayed, Theoretical Study of the Structure of 2,6-Dibromopyridinium Halide Salts, December 2010. Dept. of Chem., the University of Jordan.
- 2- Abdu Al-raziq Za.arour, a Spectroscopic and Thermodynamic Studies of Complexation of Acyclic Thiocrown Ethers with [60]Fullerenes, 2012. Dept. of Chem, Mutah University.
- 3- Aisha Nawaf Alblawi, Synthesis and Characterization of Poly(1,4-Benzenedimethylene Phthalate) and the Study of its Ability to Adsorb Pb(II), Cd(II), and Zn(II) ions, November 2012. Dept. of Chem., the University of Jordan.
- 4- Ayman S. Almomani, Correlation between Sensory and Chemical Properties with Fluorescence Characteristics of Olive oil in Jordan, December 2012. Dept. of Chem., Yarmouk University.
- 5- Yousef Alomari , The Use of Fluorescence Spectroscopy as a Tool to Classify and to Follow Quality and Purity of Jordanian Honey, July 2013. Dept. of Chem., Yarmouk University.
- 6- Amer W. Al-Wardat, Quantification of Polyphenols, α -Tocopherols and Some other Components in Olive and leaves by Means of Optical Absorption and Fluorescence Spectroscopy. A way to Distinguish between Olive Oil Produced in Jordan from Irrigated and non-Irrigated Areas, December, 2013. Dept. of Chem., Yarmouk University.

I was Ph. D. external examiner for

1. The thesis “Magnetostructural Correlations in Tetrahalocuprates” submitted by Chris Saunders for the degree Doctor of Philosophy at Canterbury University, Christchurch, New Zealand.

Awards:

- 1- Fulbright post.doc award, Clark University, Worcester, Massachusetts, USA, January-June, 2012.
- 2- Erasmus Mundus academic staff scholarship, University of Bologna, Bologna, Italy, May-July, 2010.
- 3- Harold Dodgen Outstanding Graduate Seminar Award. Physical Chemistry and Material Science Program, Department of Chemistry, Washington State University Pullman, Washington, USA. April 2004.

- 4- Donald S. Matteson Graduate Fellowship Fund in the Department of Chemistry, Washington State University, Pullman, Washington, USA.
- 5- Margret C. Etter Student Lecturer Award, American Crystallographic Association, 2003 Annual Meeting July 26-31. Cincinnati, Ohio, USA.
- 6- Harold Dodgen Outstanding Graduate Seminar Award. Physical Chemistry and Material Science Program, Department of Chemistry, Washington State University Pullman, Washington, USA. May 2003.
- 7- Travel Grant Award, American Crystallographic Association, 2003 Annual Meeting July 26 – 31. Cincinnati, Ohio, USA.
- 8- Harold Dodgen Outstanding Graduate Seminar Award. Physical Chemistry and Material Science Program, Department of Chemistry, Washington State University Pullman, Washington, USA. April, 2002.
- 9- Listed on the honor list, Department of Chemical Sciences, Faculty of Science, Jordan University of Science and Technology, Irbid Jordan. Spring 1993.
- 10- Listed on the honor list, Department of Chemical Sciences, Faculty of Science, Jordan University of Science and Technology, Irbid Jordan. Fall 1993.

References:

Professor Dr. Roger Willett

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Professor Dr. Christopher Landee.

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Publications:

- 1- Abdulhakem Betrow, Usama Karama, Mousa Al-Noaimi, ***Firas F. Awwadi***, Belkheir Hammouti, Smaail Radi, Taibi Ben Hadda, Ismail Warad: *Crystal structure of 3-(pyrazin-2-*

- ylamino)-2-benzofuran-1(3H)-one, C12H9N3O2. Zeitschrift für Kristallographie 10/2014; 229:3.*
- 2- Barakat E Abu Irmaileh, Amal M F Al-Aboudi, Musa H Abu Zarga, **Firas F. Awwadi**, Salim F Haddad: *Selective phytotoxic activity of 2,3,11 β ,13-tetrahydroaromaticin and ilicic acid isolated from Inula graveolens..* Natural Product Research 09/2014, in press.
 - 3- Amal M.F. Al-Aboudi, Musa H. Abu Zarga, Barakat E. Abu-Irmaileh, **Firas F. Awwadi**, Monther A. Khanfar: *Three new seco-ursadiene triterpenoids from Salvia syriaca.* Natural Product Research 09/2014, in press
 - 4- Ismail Warad, Mousa Al-Noaimi, Obadah S Abdel-Rahman, **Firas F. Awwadi**, Belkheir Hammouti, Taibi B Hadda: *Trans/cis isomerization of [RuCl₂{H₂CC(CH₂PPh₂)₂}(diamine)] complexes: Synthesis, spectral, crystal structure and DFT calculations and catalytic activity in the hydrogenation of α,β -unsaturated ketones..* Spectrochimica Acta Part A Molecular and Biomolecular Spectroscopy (2014); 117:250-258.
 - 5- Mousa Al-Noaimi, **Firas F. Awwadi**, Ahmad Mansi, Obadah S. Abdel-Rahman, Ayman Hammoudeh, Ismail Warad: *Ruthenium(II) bipyridine Complexes Bearing New Keto-enol Azoimine Ligands: Synthesis, Structure, Electrochemistry and DFT Calculations..* Spectrochimica Acta Part A Molecular and Biomolecular Spectroscopy 135, 828-839 (2015)
 - 6- Mohammad El-khateeb, Khalil J Asali, Mousa Al-Noaimi, Enas Al-Rabae, **Firas F Awwadi**, Deeb Taher, Marcus Korb, Heinrich Lang: *Thio- and Selenosulfonato Complexes of Iron Bearing Aromatic and Heterocyclic Groups.* Inorganica Chimica Acta 421, 553-558 (2014).
 - 7- Tao Hong, K. P. Schmidt, K. Coester, **Firas. F. Awwadi**, M. M. Turnbull, Y. Qiu, J. A. Rodriguez-Rivera, M. Zhu, X. Ke, C. P. Aoyama, Y. Takano, Huibo Cao, W. Tian, J. Ma, R. Custelcean, H. D. Zhou, M. Matsuda: *Magnetic ordering induced by interladder coupling in the spin-1/2 Heisenberg two-leg ladder antiferromagnet C₉H₁₈N₂CuBr₄.* Physical Review B 05/2014; 89:174432.
 - 8- Mustafa M. El-Abadelah, Hanan H. Mohammed, Mohammed M. Abadleh, Salim S. Sabri, **Firas F. Awwadi**: *A Facile One-Pot Synthesis of Model Diethyl 6,6'-Dioxotetrahydro-5,5'-bi(1,2,4-triazine)-5,5'-dicarboxylates.* Heterocycles 2014, pp.1211-1220.
 - 9- **Firas F. Awwadi**, Deeb Taher, Salim F. Haddad, Mark M. Turnbull: *Competition between Hydrogen and Halogen Bonding Interactions: Theoretical and Crystallographic Studies..* Crystal Growth & Design 03/2014; 14(4):1961-1971.
 - 10- Mousa Al-Noaimi, Obadah S Abdel-Rahman, Ismail I Fafous, Mohammad El-Khateeb, **Firas F Awwadi**, Ismail Warad: *Ruthenium(II) bipyridine complexes bearing quinoline-azoimine (NN'N'') tridentate ligands: Synthesis, spectral characterization, electrochemical properties and single-crystal X-ray structure analysis..* Spectrochimica Acta Part A Molecular and Biomolecular Spectroscopy 02/2014; 125:375-383.
 - 11- Mousa AL-Noaimi, Mohammad I. Choudhary, **Firas F. Awwadi**, Wamidh H. Talib, Taibi Ben Hadda, Sammer Yousuf, Ashraf Sawafta, Ismail Warad: *Characterization and biological activities of two copper(II) complexes with dipropylenetriamine and diamine as ligands.* Spectrochimica Acta Part A Molecular and Biomolecular Spectroscopy (2014)127, 225-230.
 - 12- Mahmoud A. Abdalrahman, **Firas F. Awwadi**, Geoffrey B. Jameson, Christopher P. Landee, Christopher G. Saunders, Mark M. Turnbull, Jan L. Wikaira: *Effects of halogen and hydrogen bonding on defect disorder: the ladder that wasn't there.* CrystEngComm 05/2013; 15:4309–4320.

- 13- Zakariyya Ishtaiwi, Tobias Rüffer, Alexander Hildebrandt, **Firas F. Awwadi**, Harald Hahn, Akerke Abylaikhan, Deeb Taher, Uwe Siegert, Bernhard Walfort, Heinrich Lang: *Allyl-End-Grafted Carbosilane Dendrimers Based on 1,4-Phenylene Units: Synthesis, Reactivity, Structure, and Bonding Motifs*. European Journal of Inorganic Chemistry 04/2013; 2013(13):2368–2381.
- 14- **Firas F. Awwadi**, Deeb Taher, Alaa Maabreh, Fadel Z. Alwedian, Hamdan Al-Ebaisat, Tobias Rüffer, Heinrich Lang: *The role of Fe–X…X–Fe contacts in the crystal structures of [(2-iodopyridinium)2FeX4]X (X = Cl, Br)*. Structural Chemistry 04/2013; 24(2):401–408.
- 15- **Firas F. Awwadi**, Salim F. Haddad, Mark M. Turnbull, Christopher P. Landee, Roger D. Willett: *Copper–halide bonds as magnetic tunnels; structural, magnetic and theoretical studies of trans-bis(2,5- dibromopyridine)dihalo copper(II) and trans-bis(2- bromopyridine)dibromo copper(II)*. CrystEngComm 03/2013; 15(16):3111–3118.
- 16- **Firas F Awwadi**: *trans-Dibromidobis(3-methyl-pyridine-κN)copper(II)*. Acta Crystallographica Section E Structure Reports Online 02/2013; 69(Pt 2):m116.
- 17- Deeb Taher, **Firas F Awwadi**, Mohammed H Kailani: *4-(4-Nitro-benz-yl)pyridin.*. Acta Crystallographica Section E Structure Reports Online 01/2013; 69(Pt 7):o1164.
- 18- Mousa Al-Noaimi, Ismail Warad, Obadah S. Abdel-Rahman, **Firas F. Awwadi**, Salim F. Haddad, Taibi B. Hadda: *Synthesis, structure, spectroscopic properties, electrochemistry, and DFT correlative studies of trans-[Ru(P-P)2Cl2] complexes*. Polyhedron 01/2013; 62(7):110–119.
- 19- Deeb Taher, **Firas F. Awwadi**, Ulrike Pfaff, J. Matthäus Speck, Tobias Rüffer, Heinrich Lang: *A series of Se-ferrocenyl thiophene carboselenoates – Synthesis, solid-state structure and electrochemistry*. Journal of Organometallic Chemistry 01/2013; 736: 9-18.
- 20- **Firas F. Awwadi**, Salim F. Haddad: *Polymorphism in 2,6-dimethylpyridinium Tetrachlorocuprate(II); Theoretical and Crystallographic Studies*. Journal of Molecular Structure 08/2012; 1020:28-32.
- 21- **Firas F. Awwadi**, Louise N. Dawe, Christopher P. Landee, Mark M. Turnbull: *Catena-bis(aqua(3-oxy-2-pyridono)copper(II))μ-pyrazine diperchlorate: a perchlorate-bridged magnetic ladder*. Journal of Coordination Chemistry 07/2012; 65 (17): 3064-3074.
- 22- Deeb Taher, **Firas F. Awwadi**, Mohammad El-khateeb and Heinrich Lang: *Synthesis and reactivity of cyclopentadienyl iron complexes containing ferrocenyl selenolates.*. Transition Metal Chemistry 07/2012; 37:601.
- 23- **Firas F. Awwadi**, Salim F. Haddad, Brendan Twamley and Roger D. Willett: *Effect of intermolecular interactions on the molecular structure; theoretical study and crystal structures of 4-bromopyridinium tetrafluoroborate and diaqua(3-bromopyridine)difluorocopper(II)*. CrystEngComm 07/2012; 14:6761-6769.
- 24- **Firas F. Awwadi**, RD Willett, B Twamley: *Tuning Molecular Structures Using Weak Noncovalent Interactions: Theoretical Study and Structure of trans-Bis (2-chloropyridine) dihalocopper (II) and trans-Bis (3-chloropyridine) dibromocopper (II)*. Crystal Growth & Design 10/2011; 11(12):5316-5323.
- 25- **Firas F. Awwadi**: *The Correlation between Calculated Electrostatic Potential and Crystal Structures; Theoretical Study and the Crystal Structure of 3-Bromopyridinium Aquatrchlorocuprate(II)*. Jordan Journal of Chemistry. 01/2011; 6(2):175-185.

- 26- Muhammad Ashram, shehadeh A. mizyed and **Firas F. Awwadi**: *A New and Convenient Synthetic Method for 1,2,3,5,6,11b-hexahydroimidazo [1,2-d][1,4]benzoxazepine and its Derivatives*. ARKIVOC: archive for organic chemistry 01/2011; 10:277-286.
- 27- **Firas F. Awwadi**, Salim F. Haddad, Roger D. Willett, Brendan Twamley: *The Analogy of C–Br…Br–C, C–Br…Br–Fe, and Fe–Br…Br–Fe Contacts: Crystal Structures of (26DAPH)FeBr₄ and (26DA35DBPH)₂FeBr₄·Br*. *Crystal Growth & Design* 11/2009; 10(1):158-164.
- 28- Robert T Butcher, Juan J Novoa, Jordi Ribas-Ariño, Anders W Sandvik, Mark M Turnbull, Christopher P Landee, Brian M Wells, **Firas F Awwadi**: *Strong through-space two-halide magnetic exchange of -234 K in (2,5-dimethylpyrazine)copper(II) bromide..* *Chemical Communications* 04/2009; 1359-1361.
- 29- **Firas F. Awwadi**, Roger D. Willett, Brendan Twamley: *The role of charge assisted arylhalogen–halide ion interactions in the structures of the dibromopyridinium halide salts*. *Journal of Molecular Structure* 01/2009; 913(1-3):116-122.
- 30- **Firas F. Awwadi**, Roger D Willett, Brendan Twamley, Ryan Schneider, Christopher P Landee: *Strong rail spin 1/2 antiferromagnetic ladder systems: (dimethylammonium)(3,5-dimethylpyridinium)CuX₄, X = Cl, Br..* *Inorganic Chemistry* 10/2008; 47(20):9327-9332.
- 31- Brian M. E. Markowitz, Mark M. Turnbull, **Firas F. Awwadi**: *Dibromidobis(quinoxaline-κN)zinc(II)*. *Acta Crystallographica Section E Structure Reports Online* 08/2007; 63(8) m2043-m2043.
- 32- Ryan T. Schneider, Christopher P. Landee, Mark M. Turnbull, **Firas F. Awwadi** and Brendan Twamley: *Copper azine compounds: Synthesis, structure and magnetic analyses of Cu(phenazine)Cl₂, (phenazinium)₂CuCl₄·H₂O, and [Cu(phenazine)Cl₂·H₂O]₂*. *Polyhedron* 06/2007; 26(9-11):1849.
- 33- **Firas F Awwadi**, Roger D Willett, Kirk A Peterson, Brendan Twamley: *The nature of halogen...halide synthons: theoretical and crystallographic studies..* *The Journal of Physical Chemistry A* 04/2007; 111(12):2319-28.
- 34- **Firas F. Awwadi**, Roger D. Willett, Brendan Twamley: *The Aryl Chlorine–Halide Ion Synthon and Its Role in the Control of the Crystal Structures of Tetrahalocuprate(II) Ions*. *Crystal Growth & Design* 03/2007; 7(4):624.
- 35- **Firas F Awwadi**, Roger D Willett, Kirk A Peterson, Brendan Twamley: *The nature of halogen...halogen synthons: crystallographic and theoretical studies..* *Chemistry* 01/2007; 12(35):8952-60.
- 36- **Firas F. Awwadi**, Roger D. Willett, Salim F. Haddad, Brendan Twamley: *The Electrostatic Nature of Aryl–Bromine–Halide Synthons: The Role of Aryl–Bromine–Halide Synthons in the Crystal Structures of the trans-Bis(2-bromopyridine)dihalocopper(II) and trans-Bis(3-bromopyridine)dihalocopper(II) Complexes*. *Crystal Growth & Design* 07/2006; 6(8):1833.
- 37- Brian M. E. Markowitz, Mark M. Turnbull, **Firas F. Awwadi**: *Dichloro-diquinoxalinezinc(II)*. *Acta Crystallographica Section E Structure Reports Online* 06/2006; 62(6): m1278-m1280.
- 38- **Firas F. Awwadi**, Christopher P. Landee, Mark M. Turnbull, Brendan Twamley, Brian M. Wells: *Low-dimensional quantum magnetic systems: Synthesis, structure and magnetic behavior of (2,5-dimethylpyrazine)copper(II) chloride and synthesis and magnetic behavior of bis(2,6-dimethylpyrazine)copper(II) chloride*. *Polyhedron* 11/2005; 24:2153-2159.

- 39- Sebastian Andrews, Jessica Corwin, Brian Landry, Michaela Martin, Katherine Parnass, Andrew Suen, Mark M Turnbull, Ryan T Schneider, Christopher P Landee, **Firas F Awwadi**: *Bis (2-Amino-5-bromopyrimidinium) Tetrahalometallates: Crystal structures of (2-amino-5-bromopyrimidinium) 2 MCl4 (M= Co, Zn)*. Journal of Coordination Chemistry 02/2005; 59(13):1451-1465.
- 40- Brian M. Wells, Christopher P. Landee, Mark M. Turnbull, **Firas F. Awwadi**, Brendan Twamley: *Design and synthesis of magnetic ladders: structure and magnetic properties of Cu(2,3-dimethylpyrazine)Br 2*. Journal of Molecular Catalysis A Chemical 01/2005; 228(1):117-123.
- 41- Salim Haddad, **Firas F. Awwadi** and Roger D. Willett: *A Planar Bibridged Cu10Br222-Oligomer: Dimensional Reduction and Recombination of the CuBr2 Lattice via the N–H···Br- and the C–Br···Br- Synthons*. Crystal Growth & Design 05/2003; 3(4):501.
- 42- Roger D. Willett, **Firas F. Awwadi**, Robert Butcher: *The Aryl Bromine–Halide Ion Synthons and Its Role in the Control of the Crystal Structures of Tetrahalocuprate(II) Ions*. Crystal Growth & Design 04/2003; 3(3):301.
- 43- Jong-Ho Peter Lee, Blaine D. Lewis, Jessica M. Mendes, Mark M. Turnbull, **Firas F. Awwadi**: *Transition metal halide salts and complexes of 2-aminopyrimidine: manganese(II) compounds - crystal structures of (2-aminopyrimidinium)4 [MnCl4(H2O)]2, [(2-aminopyrimidine)2MnBr2(H2O)2·2H2O and (2-aminopyrimidinium)2+[MnBr2(H2O)4]Br2*. Journal of Coordination Chemistry 01/2003; 56(16).
- 44- Roger D. Willett, **Firas F. Awwadi**: *Tris-(propane-1,3-di-amine)-nickel(II) bis-(tetra-fluoro-borate)*. Acta Crystallographica Section E Structure Reports Online 09/2002; 58(9).
- 45- Y M Irshaid, N M Rawashdeh, **Firas F. Awwadi**, M K Kato: *Comparative pharmacokinetics of two brands of atenolol following a single oral administration..* International journal of clinical pharmacology and therapeutics 11/1996; 34(10):457-61.
- 46- Y M Irshaid, H F al-Hadidi, A Latif, **Firas F. Awwadi**, M al-Zoubi, N M Rawashdeh: *Dextromethorphan metabolism in Jordanians: dissociation of dextromethorphan O-demethylation from debrisoquine 4-hydroxylation..* European Journal of Drug Metabolism and Pharmacokinetics 01/1996; 21(4):301-7.

Workshops:

- 1- Electronic structure of Molecules, Petra, Jordan, January, 2006.

Instructors

Dr. Roald Hoffmann, Cornell University, Ithaca, New York, **Nobel Prize Laureate**.

Dr. Pere Alemany, University of Barcelona, Spain.

- 2- Solving Twinned Structures Cincinnati, Ohio, USA, July, 2003.