

Curriculum Vitae

Faady “Mohammad Yusri” Siouri

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Date of Birth : July 10, 1986

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Gender : Male

Marital Status : Single

Nationality : American

Education:

University of California Santa Barbara, Santa Barbara CA

Doctor of Philosophy in Physical and Analytical Chemistry, June 2017

GPA 4.00 / 4.00

Thesis Title: “Excited State Dynamics of Isolated Nucleobases and Base Pairs”

University of California Santa Barbara, Santa Barbara CA

Masters of Arts in Physical and Analytical Chemistry, June 2014

GPA 4.00 / 4.00

Thesis Title: “Resonance-Enhanced Multiphoton Ionization to Study the Electronic Structure and Excited State Dynamics of Isolated Thymine and Uracil in the Gas Phase.”

University of California Irvine, Irvine CA

Bachelor of Science in Chemistry, June 2011

GPA 3.95 / 4.00

Cypress College, Cypress CA

Associate Degree in Science, June 2009

GPA 3.89 / 4.00

Catholic High School, Ramallah West Bank

High School Diploma, July 2004

GPA 87.4% / 100%

Honors and Awards:

- Best Instructor Award by AAUP Student Association, Arab American University, Palestine, 2017.
- Outstanding Service to the Department of Chemistry and Biochemistry Award, University of California, Santa Barbara, 2015.
- Physical Chemistry Chemical Physics Poster Prize at the 62nd Pacific Conference on Spectroscopy and Dynamics, Royal Society of Chemistry, 2015.
- Phi Lambda Upsilon Award for Outstanding Academic Achievement, University of California, Santa Barbara, 2013.
- Outstanding Teaching Assistant Award in Chemistry, University of California, Santa Barbara, 2013.
- Phi Lambda Upsilon Award for Outstanding Academic Achievement, University of California, Irvine, 2011.
- Magna Cum Laude, University of California, Irvine, 2011
- Golden Key International Honor Society, University of California, Irvine, 2010.
- National Society of Leadership and Success (Sigma Alpha Pi), University of California, Irvine, 2009.
- “Michael Jacob” honor as best science student, Cypress College, 2008.
- Deans Honor Roll and President Honor Roll each quarter/semester at Cypress College and University of California, Irvine, 2005-2011.

Fellowships/Scholarships:

- AAUP Internal Fellowship, The Arab American University, Jenin, Palestine, 2019.
- Central Continuing Student Fellowship, University of California, Santa Barbara, 2016-2017
- Philip & Aida Siff Educational Foundation Graduate Fellowship, University of California, Santa Barbara, 2015-2016
- Elliott Family Foundation Scholarship, University of California, Irvine, 2009-2010
- Beall Family Foundation Scholarship, University of California, Irvine, 2009
- “Michael Jacobs” Scholarship for Science/Engineering/Mathematics, Cypress College, 2008

Languages:

- Fluent English (Reading: Excellent; Writing: Excellent; Conversation: Excellent).
- Fluent Arabic (Reading: Excellent; Writing: Excellent; Conversation: Excellent).

Qualifications & Computer Skills:

- Microsoft Office Word
- Microsoft Office Excel
- Microsoft Office PowerPoint
- Internet Explorer
- Gaussian Program
- Mathematica Program
- Origin Program

Other Skills:

- Build and fix laboratory instruments
- Expert in gas phase laser spectroscopy
- Great mentoring experience
- Experience organizing large scientific events and lab tours
- Work with LASERS and optics
- Work and manage general, physical, and analytical chemistry laboratories
- Analyze spectral data
- Test chemical samples using techniques such as NMR, FT-IR, GCMS, HPLC, MALDI, ESI-MS, DRIFTS, ATR, UV-VIS, and REMPI.
- Manage a chemistry stock room
- Teach graduate and undergraduate chemistry courses
- Teach and simplify mathematics up to linear algebra/differential equations
- Teach chemistry and mathematics using analogies and real-life examples.
- Teach chemistry courses while being enrolled in them
- Summarize books into simplified and organized notes
- Write my own chemistry and physics curriculum
- Manage a tutoring center
- Tutor student in discussions and one on one.

Training Courses:

- Computer programming C++ .
- Advanced chemical instrumentation and instrumental analysis.
- Physical science 5 (How to teach mathematics and science at an elementary school).
- TI-86 graphing calculator.

Experience:

Research Experience

The Arab American University, Chemistry Department.

Faculty Researcher, September 2017 – Present

- Prepare thin films of CuO metal chalcogenides by simple and convenient electrodeposition technique on FTO/glass substrates for PEC purpose (to convert sunlight to electricity).
- Study the electrical and optical properties of the prepared CuO thin film electrodes.
- Modify the prepared CuO thin film electrodes by coating them with different conducting polymers.
- Enhance efficiency and stability of the prepared CuO thin films by pre-annealing the prepared thin film electrodes at different temperatures and time and controlling the pre-annealed film cooling rate.
- Study the effect of film thickness on surface morphology and PEC characteristics of the prepared CuO film electrodes.
- Study the effect of different electrolytic solutions on PEC characteristics.

Mattanjah de Vries, University of California, Santa Barbara, Chemistry Department.

Graduate Researcher, September 2012 – April 2017

- Constructed a new beam instrument (laser desorption, jet cooling, mass spectrometry instrument) to explore the electronic structure excited state dynamics of base pairs in the gas phase.
- Used resonance-enhanced multiphoton ionization (REMPI) to study the electronic structure and excited state dynamics of isolated nucleobases, nucleobase analogues, and base pairs.
- Used the application of high resolution laser spectroscopy and mass spectrometry to answer some questions on the ancient past of the Mayans.

Anouk M. Rijs, FELIX Laboratory, Radboud University, Nijmegen.

Visiting Researcher, February 22nd – March 4th, & November 15th- December 2nd, 2016

- Used FELIX (Free Electron Laser for Infrared Experiments) to collect IR spectra for base pairs in the far-IR region.
- Structurally characterized these base pairs with the help of BOMD simulations.
- Studied intermolecular hydrogen-bond vibrations of these base pairs in their ground and excited states.

Nien-hui Ge, University of California, Irvine, Chemistry Department.

Undergraduate Research Assistant, January 2010 - June 2011

- Determine vibrational properties of the amide-I, -II and -A modes in alkyl amide compounds used as models of peptide unit.
- Synthesized amides with different number of methyl groups on the terminal carbon atoms.

Teaching Experience

The Arab American University, Chemistry Department.

Assistant Professor, September 2017 – Present

- Courses Taught:
 - Pre-chemistry
 - Chemistry for medical sciences (Chem 162)
 - Chemistry lab for medical students (Chem 165)
 - General chemistry I (Chem 101)
 - General chemistry lab I (Chem 105)
 - Chemistry II for Dentistry (Chem 120)
- Supervised chemistry students in their graduation projects (seminar)

University of California, Santa Barbara, Chemistry Department.

Teacher Assistant and Lab Instructor, September 2012 – June 2016

- Courses Taught:
 - General chemistry laboratory for freshmen and sophomores. (Chem 1AL)
 - Honors general chemistry laboratory (Chem 2BC)
 - Environmental chemistry (Chem 123)
 - Photochemistry (Chem 118/218)
 - Analytical chemistry (Chem 150)

Personal Business

Private Tutor, August 2006 – June 2013

- Tutored high school chemistry, math, and physics
- Tutored college mathematics
- Tutored undergraduate chemistry courses

Dar Al-Ma'refa Middle/High School – Jerusalem

Science, Chemistry, and Physics Teacher, August 2011 – July 2012

- Courses Taught

- Science: For sixth, seventh, eighth, and ninth graders.
- Chemistry: For tenth, eleventh, and twelfth graders.
- Physics: For tenth, eleventh, and twelfth graders.
- Wrote my own science, chemistry, and physics curriculum

Lowell Elementary School - Santa Ana.

CAL Teach, March 2011 – June 2011

- Taught mathematics and science to fifth graders.

University of California, Irvine, Chemistry Department.

Discussion Leader, September 2009 – June 2011.

- Held discussion sessions for thermodynamics, quantum mechanics, statistical mechanics, analytical chemistry, and instrumentation chemistry

Cypress College, Science Department.

Supplemental Instructor, August 2006 – May 2009

- Held Sessions for:
 - Chemistry: General chemistry I, general chemistry II, organic chemistry I, and organic chemistry II.
 - Mathematics: Algebra, statistics, calculus I, and calculus II
 - Physics: Mechanics and electricity and magnetism.

Work Experience

The Arab American University, Chemistry Department.

Head of Chemistry Department, August 2019 – Present

- Draw up a teaching schedule and distribute it among instructors.
- Oversee the teaching that goes on within the chemistry department.
- Oversee the strategic development of the chemistry department, including curriculum planning, safety, and day to day administration.
- Provide support for staff, if required.
- Monitor student progress and performance.
- Advise students on matters related to progress and achievement.
- Participate in the appointment of new members of staff.
- Organize department meetings in order to discuss various topics and issues regarding the department.
- Attend heads of department meetings and disseminate information to the department as necessary.

- Ensure that adequate work has been set in the case of teaching staff absence.
- Oversee the work of the chemistry department lab technicians.

University of California, Santa Barbara, Chemistry Department.

Lead Teaching Assistant at the Chemistry Department, September 2013 – June 2015

- Observed teaching assistants teaching general chemistry laboratories and provided them with comments and feedback to improve their teaching skills.
- Enhanced the quality of instruction in general chemistry labs by assisting the chemistry department's graduate teaching assistants.

Cypress College, Science Department.

Lab Technician Assistant, September 2007 – May 2009

- Prepared chemical solutions for labs to use
- Trained volunteers on how to become proficient in solution chemistry.

Research Projects:

Faculty Research

In my current work, I prepare cupric oxide (CuO) thin film electrodes using a simple and inexpensive electrodeposition method on the fluorine- doped tin oxide (FTO)/glass substrates. Several parameters are controlled to enhance the conversion efficiency and stability of the prepared films under photoelectrochemical (PEC) conditions. These parameters include controlling the films deposition time, pre-annealing the prepared CuO film electrodes at different temperatures and times, controlling the cooling rate, and studying the effect of different electrolytic solutions. Moreover, the pre-annealed CuO films are modified by coating them with different conducting polymers to form CuO/conducting polymer composite. Effects of modifications on different film properties such as X-ray diffraction (XRD) patterns, surface morphology, photoluminescence (PL) spectra, and electronic absorption spectra are then investigated. In addition, PEC properties and efficiency of the prepared composite are studied by plotting J-V curves and by measuring stability of the prepared composite under illumination for prolonged times.

Graduate Research

The purpose of my research was to use resonance-enhanced multiphoton ionization to study the electronic structure and excited state dynamics of isolated nucleobases and base pairs in the gas phase. This was done using an instrument that combines laser desorption, jet cooling,

and mass spectrometry. First, we measured well-resolved vibronic spectra of all the molecules we studied by resonant two-photon ionization (R2PI). Then, we performed double-resonance spectroscopy to further elucidate the structure and excited state dynamics of the target molecules. Because nucleobases typically exist in several tautomeric forms which are isolated under gas phase jet-cooled conditions, we used UV-UV double resonance spectroscopy to determine the number of tautomers present and their origins. IR-UV double resonance spectroscopy was used to obtain tautomer-specific IR spectra. We measured excited state lifetimes of tautomer-selected nucleobases by nanosecond and picosecond pump-probe spectroscopy.

With the use of a free-electron laser, we were able to collect IR spectra for multiple base pairs in the far-IR region ($<880\text{ cm}^{-1}$). Although the far IR region has been difficult to access both experimentally and computationally, we were able to structurally characterize the molecules with the help of Born–Oppenheimer Molecular Dynamics (BOMD). This far-IR region yields new information because it is characterized by large-scale delocalized vibrations that cannot be observed in the mid-IR region.

Finally, we used R2PI in combination with supersonic jet cooling and mass spectrometry to examine archaeological samples. We studied organic residues within pottery sherds from Maya vessels (600–900 CE) and Mississippian vessels (1100–1200 CE), successfully detecting three molecular markers, caffeine, theobromine, and theophylline, associated with the use of cacao.

Undergraduate Research

I joined a project which aims to simulate amide-I/II two-dimensional infrared (2D-IR) spectra of short peptides composed of $C_{\alpha,\alpha}$ -dialkylated amino acid residues, and reveal their backbone structure by comparing measured and simulated 2D-IR spectra. One of the important steps to accurately calculate a 2D-IR spectrum is the initial setting of the vibrational properties, such as resonant frequency and transition dipole moment, of the amide modes on each peptide unit along the backbone chain.

My role in this project was to experimentally determine such vibrational properties of the amide-I, -II and -A modes in alkyl amide compounds used as models of peptide unit. To this end, I synthesized nine amides with a different number of methyl groups on the terminal carbon atoms and characterized them by $^1\text{H-NMR}$ and mass spectrometry. Each amide was dissolved in tetrachloroethane to measure a transmission FT-IR spectrum of its monomer form. I analyzed the three amide vibrational bands in the acquired spectra by curve fitting, and investigated how the peak frequencies and the transition dipole moment depend on the number of methyl groups. The acquired information is useful to develop a more sophisticated simulation protocol which takes into account subtle differences of the local environment around a peptide unit.

Publications:

1. J.A. Berenbeim, S. Boldissar, S. Owens, M.R. Haggmark, G. Gate, **F.M. Siouri**, T. Cohen, M. F. Rode, C. Schmidt Patterson, and M.S. de Vries. *Excited State Intramolecular Proton Transfer in Hydroxyanthraquinones: Predicting Fading of Organic Red Colorants in Art*. Submitted to Science Advances.
2. Jacob Berenbeim, Samuel Boldissar, **Faady Siouri**, Gregory Gate, Michael R. Haggmark, Briana Aboulache, Trevor Cohen, Mattanjah de Vries. *Excited State Dynamics of Isocytosine; a Hybrid Case of Canonical Nucleobase Photodynamics*. The Journal of Physical Chemistry Letter., **8**, 5184-5189 (2017)
3. **Faady M. Siouri**, Samuel Boldissar, Jacob Berenbeim, Mattanjah de Vries. *Excited State Dynamics of 6-Thioguanine*. The Journal of Physical Chemistry A., **121** (28), 5257-5266 (2017)
4. Shawn C Owens, Jacob Berenbeim, Marshall Ligare, Lisa E Gulian, **Faady M Siouri**, Samuel Boldissar, Stuart Tyson-Smith, Gregory Daniel Wislon, Anabel Ford, Mattanjah S De Vries. *Direct Analysis of Xanthine Stimulants in Archeological Vessels by Laser Desorption Resonance Enhanced Multiphoton Ionization*. American Chemical Society., **89** (5), 2838-2843 (2017)
5. Marshall Ligare, **Faady Siouri**, Ota Bludsky, Dana Nachtigallova, Mattanjah S. de Vries. *Characterizing the dark state in thymine and uracil by double resonance spectroscopy and quantum computation*. Phys. Chem. Chem. Phys., **17** (37), 24336-24341 (2015)
6. **Faady Siouri**, Anouk Rijs, Jerome Mahe, Samuel Boldissar, Kas Houthuijs, Mattanjah S. de Vries. *Structural Characterization of DNA Base Pairs using Far-IR spectra and Born–Oppenheimer Molecular Dynamics (BOMD) Simulations*. In Preparation.
7. **Faady Siouri**, Anouk Rijs, Jerome Mahe, Samuel Boldissar, Kas Houthuijs, Mattanjah d. de Vries. *Intermolecular Hydrogen-Bond Signatures in the Far-IR Region of Guanine-Guanine and Guanine-Cytosine Base-Pairs. Ground State vs Excited State*. In Preparation.

Presentations:

1. Poster Presentation: *Intermolecular Hydrogen Bond Signatures in the Far-IR Region of Guanine-Cytosine Base-Pair Structures*, 2017
Gordon Research Seminar on Gaseous Ions: Structures, Energetics & Reactions (GRS) at Ventura Beach Marriot, CA.
2. Oral Presentation: *Introduction to Undergraduate Research*. 2013-2017 University of California Santa Barbara Chemistry Department, CA.
Every quarter, I organized a volunteer seminar where I introduced undergraduates to the different research fields at the University of California, Santa Barbara. The seminar was designed to help students get involved in research as early as possible, explain to them their responsibilities as undergraduate researchers, introduce them to graduate school, and more. After the seminar, I took the students to the de Vries research lab and showed them how a research lab looks like, explained my research and its application, and showed them some laser demonstrations to prove to them that research is also fun.
3. Poster Presentation: *Resonance-Enhanced Multiphoton Spectroscopy of Thymine and Uracil; A High Resolution Probe for Gas Phase Structure and Dynamics*. 2015
62nd Pacific Conference on Spectroscopy and Dynamics at Pacific Grove, CA.
4. Poster Presentation: *Shining Light on Our Origin*. 2014, 2015 University of California Santa Barbara, CA
Chemistry Department Recruitment Event.
5. Oral Presentation: *How to Study?* 2017-Current. The Arab American University, Jenin.
Every semester, I organized multiple volunteer lectures where I give advice to undergraduates on the best study methods, things they should do, things they should avoid, and how to overcome the fear of becoming a university student. Hundreds of undergraduates, particularly freshmen and sophomores, attend and these lectures quickly turn into discussion sessions. These lectures were proven to be very successful that even other universities such as Birzeit University asked me to give few lectures at their university.

References:

1. Dr. Mattanjah S. de Vries: Chemistry Professor and my Principle Investigator.

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2. Dr. Martin Moskovits: Chemistry Professor and the Chair of my Committee.

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Isla Vista, CA, 93106

3. Dr. Petra Van Koppen: Chemistry Professor and my Teaching Advisor

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5. Dr. Muayad Abu Saa: Assistant Professor of Physics, Former Dean of Sciences, and the Vice President of Academic Affairs.

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7. Dr. Iqab Daraghmeh: Assistant Professor of Chemistry and the Former Head of the Department.

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8. Dr. Nien-Hui Ge: Chemistry Professor and my Undergraduate Research Advisor.

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9. Dr. Reginald M. Penner: Chemistry Professor and my Analytical Chemistry Instructor.

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