

Dr. Malkiat S. Johal

*Associate Professor of Chemistry, Department of Chemistry
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Higher Education

- Ph.D. **University of Cambridge, Cambridge, U.K., Physical Chemistry, 1997.**
Thesis Advisor: Professor Paul B. Davies. Ph.D. Thesis Title: Surface Vibrational Sum-Frequency Spectroscopy of Monomolecular Films at the Solid-Liquid Interface. Details: nonlinear spectroscopic measurements of two-dimensional phase transitions in alcohol films at buried interfaces; spectroscopic analysis of molecular structure and interactions in mixed surfactant films at the solid-liquid interface.
- B.Sc. **University of Warwick, Coventry, U.K., First Class Degree with Honors, Chemistry, 1993.**
Thesis Advisor: Professor David M. Hirst. Undergraduate Thesis Title: *Ab Initio* Quantum Chemistry Calculations.

Employment/Affiliations

Associate Professor of Chemistry, Pomona College, Claremont, California.

2006 – Current Courses: Chemistry 51 (Accelerated General Chemistry), Chemistry 158b (Chemical Thermodynamics and Kinetics), Chemistry 185 (Soft Nanomaterials), and participation in Chemistry 161 (Advanced Analytical Chemistry with Laboratory), Chemistry 162 (Advanced Physical Chemistry with Laboratory). Active research program in nano-material fabrication and characterization.

Associate Professor of Chemistry, New College of Florida, Sarasota, Florida.

2005 - 2006 Courses: Physical Chemistry I (Quantum Mechanics, Spectroscopy & Group Theory), General Chemistry (Module 1 - Introduction to Atomic & Molecular Structure), Physical Chemistry II (Statistical Mechanics and Thermodynamics), Chemical Dynamics, Advanced Chemistry Laboratory. Active research program in nano-material fabrication and characterization.

Sabbatical Leave Appointment, Pomona College, Claremont, California.

Spring 2005 Course: Physical Chemistry in Molecular Biology (Chem 156). Active research program in nano-material fabrication and characterization.

Assistant Professor of Chemistry, New College of Florida, Sarasota, Florida.

2000 - 2005 Courses: Physical Chemistry I (Quantum Mechanics, Spectroscopy & Group Theory), Physical Chemistry II (Statistical Mechanics, Kinetics, Reaction Dynamics and Thermodynamics), Physical Chemistry Laboratory, Instrumental Methods and various tutorials in physical chemistry and surface/material chemistry (including Molecular Photochemistry, Nuclear/Radiochemistry, Polymers at Surfaces, and Group Theory). Research program: Fabrication of functional nano-assemblies using ESA, LB deposition, and spin-assembly. Immobilization of enzymes/proteins using polyelectrolyte self-assembly. Fundamental studies of polymer-surfactant interactions. Assembly of luminescent polyelectrolytes (electroluminescence, photoluminescence and energy transfer studies). Assemblies with large NLO coefficients. Number of thesis students during tenure track: 16 (12 co-authored in papers published, submitted, or in preparation).

Affiliate, Los Alamos National Laboratory (LANL).

2003 - Current Uncleared affiliation to LANL permits collaborative research and student exchange activities.

Visiting Assistant Professor, Pomona College, Claremont, California.

1999 - 2000 Courses: Physical Chemistry (Chem 158, Quantum Mechanics, Spectroscopy, and Statistical Mechanics), Physical Chemistry Laboratory, General Chemistry Laboratory instruction, Surface and Colloid Chemistry (Chem 185). Supervised five undergraduate students' special research projects in surface chemistry throughout academic year, and one student's semester-long research project (Chem 199).

Postdoctoral Research Associate, Los Alamos National Laboratory, Los Alamos, New Mexico.

1997 - 1999 Research in nonlinear optics (SHG, SFG, OPA and OPG) and the chemistry of ordered materials at interfaces. Use of picosecond lasers for nonlinear laser spectroscopy. Self-assembly and heterogeneous atmospheric chemistry under UHV conditions. Assembly of novel polymers into thin organic films with large nonlinear optical coefficients.

Teaching Assistant, University of Cambridge, Cambridge, UK.

1993-1997 Teaching/supervision of organic, physical and inorganic chemistry undergraduate classes and laboratories.

Research Associate, Kodak Ltd., London, UK.

1993-1996 Research on synthesis and spectral characterization of partially deuterated organic surfactants and characterization of liquid crystal phases using optical microscopy and tensiometry.

Selected Honors, Awards and Grants

2005, Principal Investigator, Faculty Development Grant, New College (\$3,000); 2004, Principal Investigator, Faculty Development Grant, New College (\$3,000); 2003, Collaborator: DOE (Synthesis and Processing Center) Funded "Nanotribology: Experimental and Computational Lubrication at the Nanoscale" Los Alamos National Laboratory; 2003, Principal Investigator, Faculty Development Grant, New College (\$2,500); 2002 Principal Investigator, Faculty Development Grant, New College (\$3,000); 2000, Camille and Henry Dreyfus Foundation Award for Undergraduate Institutions (\$ 20,000); 2000, Research and Creative Scholarship Award, University of South Florida (\$ 7,500); 1999 – 2000, Collaborator: DOE LDRD Grant, Los Alamos National Laboratory (\$ 250,000/year, 3 years); 1993-1996, Collaborative Award in Science & Engineering, held in conjunction with Kodak, Ltd.; 1993-1996, Engineering and Physical Sciences Research Council Studentship Award; 1995, First Prize for best poster, 3rd UK Colloid & Interface Science Student Meeting.

Patents

"Controlled Nano-Fabrication using Polyelectrolyte Spin-Assembly" Patent filed in collaboration with Los Alamos National Laboratory. Patent application publication: "Fabrication of multilayered thin films via spin-assembly" *U.S. Pat. Appl. Publ.* (2004), 11 pp. US 2004086649 A1 20040506 CAN 140:384233 AN 2004:372626

Professional Memberships/Affiliations

1996 - to date: Member, American Chemical Society (ACS), 2003 - 2006: Member and CHAIR, Regional ACS Sarasota/Manatee subsection, 1993 - to date: Life member, Corpus Christi College Cambridge, 1993 - 1997: Elected Fellow, Cambridge Philosophical Society, 1993 - 1996: Member, Infrared and Raman Discussion Group. 2004 - to date: Marquis Who's Who in Science and Engineering, 2004 – to date: Marquis Who's Who in American Education, 2006 – to date: Marquis Who's Who in the World.

Other Professional Activities

2005 to date: Article Referee, *Nature: Materials*, 2005 to date: Article Referee, *Journal of the American Chemical Society*, 2005 to date: Article Referee, *Polymer* (Elsevier), 2000 to date: Article Referee, *Journal of Physical Chemistry* (American Chemical Society, ACS), 2000 to date: Article Referee *Macromolecules* (ACS), 2002 to date: Research grant reviewer for the ACS *Petroleum Research Fund* and the *Research Corporation*, 2002 to date: Judge for the Sarasota County Regional Science & Technology Fair, 1998 to date: Article Referee, ACS journal *Langmuir*.

Committee Services

New College of Florida: 2004 to date: Member, NCF Library Committee, 2002 – 2004: New College Admissions Committee (CHAIR – Spring 2004, including NCF Diversity Committee Member in 2002), 2002 to date: Member, NCF Divisional Budget Committee, 2002 to date: Faculty Information Officer, Duke-TIP Program, 2001 – 2002: Member, NCF International Studies Committee.

Current Collaborative Research Activities

Los Alamos National Laboratory Collaborating with Dr. Hsing-Lin Wang (expertise: polymer synthesis), and Dr. Jeanne Robinson (expertise: lasers/optics) on projects involving the self-assembly of novel polymers into multilayered lattices. The collaboration provides access to lasers for SHG studies, neutron scattering and advanced modeling capabilities.

University of California, Davis Collaborating with Dr. Atul Parikh (expertise: materials, biomimetics, photolithography, lipid membranes and surface analysis). Dr. Parikh provides access to an imaging ellipsometer and other imaging equipment.

Recent Professional Presentations

- “Fabricating Enzymatic Surfaces using Electrostatic Self-Assembly.” Invited speaker at the Chemistry Seminar, University of Tampa, November, 2005.
- Co-author on 2 presentations at the 229th ACS National Meeting in San Diego, CA March 13-17, 2005.
- Co-author on 2 presentations at the 226th ACS National Meeting in New York, September 7-11, 2003.
- Co-author on 2 presentations at the 55th Southeastern Meeting of the ACS, Atlanta, GA, November 2003.
- Co-author on 6 presentations at the 224th ACS National Meeting and Exposition in New Orleans, LA, March 2003.
- “Fabrication of Charge Alternating Polyelectrolyte Multilayers by Self-Assembly and Spin-Assembly.” Invited speaker at the Physical Chemistry Seminar, University of Florida, March 4, 2003.
- Thesis students/professor presentation at the New College Admissions Open House, November 2001, 2002, & 2003.
- “Polymer-Surfactant Interactions in Polyelectrolyte Multilayers.” (In addition to being co-author on 3 other presentations) 223rd ACS National Meeting and Exposition in Orlando, FL, April 7-11, 2002.
- Thesis students/professor presentation at the Florida Collegiate Honors Council, 2002 Conference, New College of Florida, Sarasota.
- MRS Meeting, Boston, Massachusetts, November 26-30, 2001, Polymer Interfaces and Thin Films, “Spin-Assembly of Polyelectrolyte Multilayered Thin Films: An Alternative for Self-Assembly.” Hsing-Lin Wang, Jeanne M. Robinson, Joanna L. Casson; Peter Chiarelli, Malkiat S. Johal.
- “Spin-Assembly of Polyelectrolytes,” Western Spectroscopy Association Conference, Pacific Grove, California, 2001.
- “Optical Properties of Self-Assembled Polyelectrolyte Superlattices,” Western Spectroscopy Association Conference, Pacific Grove, California, 2001.
- “Polyelectrolyte Self-Assembly,” Western Spectroscopy Association Conference, Pacific Grove, California, 2001.
- “Optical Properties of Self-Assembled Polyelectrolyte Superlattices,” Western Spectroscopy Association Conference, Pacific Grove, California, 2000.
- “NLO Studies of a Novel Phenothiazine Self-Assembled Monolayer,” The International Society for Optical Engineering, 1999 SPIE Conference, Denver, Colorado, 1999.
- “Workshop on Self-Assembling and Biomimetic Materials,” Los Alamos, New Mexico, 1997.
- “Spontaneously Self-Assembled Polar Multilayers with High Second-Order Optical Nonlinearity” Thin Films for Photonics Applications, Optical Society of America, Long Beach, California, 1997.
- “Coadsorption of DDAB and Dodecanol at the Solid-Liquid Interface,” Faraday Discussion Group No. 104, Cambridge, UK, 1996.
- “Coadsorption of Tri-Chain Surfactants at the Solid-Liquid Interface,” International Symposium on Micelles, Monolayers and Microemulsions, Gainesville, Florida, 1995.
- “Sum-Frequency Spectroscopy at the Solid-Liquid Interface,” Poster, Third UK Colloid & Interface Science Student Meeting, Hull, UK, 1995.
- “Structure of Surfactants at Buried Interfaces,” Department of Chemistry, Harvard University, Cambridge, Massachusetts, September 1995.

Peer Reviewed Publications (Undergraduate/thesis students underlined)

- [27] Malkiat S. Johal, Talya L. Dayton, Hsing-Lin Wang “Fabricating Enzymatic Surfaces” (Book Chapter) **2006**, *Soft Nanomaterials*, American Scientific Publishers, in press.
- [26] Johal, M.S.; Chiarelli, P.A. “Polyelectrolyte-Surfactant Complexation in Electrostatically Self-Assembled LBL Multilayers” (Review Article) **2006**, *Soft Matter*, submitted
- [25] Tang, Z.; Caculitan, N.; Johal, M.S.; Scudder, P.H.; Magyar, R.J.; Tratiak, S.; Wang, H-L. “A Study of the Non Covalent Interactions in Langmuir-Blodgett Films: An Interplay Between π - π and Dipole-Dipole Interactions” **2005**, *Soft Matter*, submitted.
- [24] Howland, Michael, C.; Johal, Malkiat S.; Parikh, Atul, N. “Transition from Homogeneous Langmuir-Blodgett Monolayers to Striped Bilayers Driven by a Wetting Instability in Octadecylsiloxane Monolayers” *Langmuir* **2005**, 21(23), 10468-10474.
- [23] Chiarelli, Peter, A.; Lui, D-G.; Watkins, E.B.; Trouw, F.R.; Majewski, J.; Casson, Joanna, L.; Tang, Z.; Johal, Malkiat, S.; Robinson, Jeanne, M.; Wang, H-L. "Interpenetration and Long-Range Order in the Langmuir-Blodgett

Assembly of a Model Azobenzene Amphiphile" **2006**, *J. Phys. Chem. B*, submitted.

- [22] Campbell, V.E.; Chiarelli, P.A.; Kaur, S.; **Johal, M.S.** "Coadsorption of a Polyanion and an Azobenzene Dye in Self-Assembled and Spin-assembled Polyelectrolyte Multilayers" *Chemistry of Materials*. **2005**, *17*, 186-190.
- [21] Caculitan, N.; Scudder, P.H; Casson, J.L.; Wang, H-L.; Robinson, J.M.; **Johal, M.S.** "In Situ Kinetics of LBL Assembled NLO Amphiphiles Using Dynamic Surface Force Measurements" *Langmuir* **2004**, *20*, 8735-8739.
- [20] **Johal, M.S.**; Ozer, B.H.; St. John, A.; Casson, J.L.; Wang, H.L.; Robinson, J.M. "Polymer-Surfactant Interactions in Polyelectrolyte Multilayers" *Langmuir* **2004**, *20*(7), 2792-2796.
- [19] **Johal, M.S.**; Howland, M.; Robinson, J.M.; Casson, J.L.; Wang, H-L. "Photoluminescent Studies of Spin-Assembled MPS-PPV/Dendrimer Multilayers" *Chemical Physics Letters*. **2004**, *383* (3-4), 276.
- [18] Chiarelli, Peter A.; Robinson, Jeanne M.; Casson, Joanna L.; **Johal, Malkiat S.**; Wang, Hsing-Lin. "Fabrication of multilayered thin films via spin-assembly" *U.S. Pat. Appl. Publ.* (**2004**), 11 pp. US 2004086649 A1 20040506 CAN 140:384233 AN 2004:372626
- [17] **Johal, Malkiat S.**; Casson, Joanna L.; Wang, Hsing-Lin; Robinson, Jeanne M.; El-Khoury, Rita Jaqueline. "Fine-tuning the wetting behavior of polyelectrolyte films containing ionic surfactants" *Polymeric Materials Science and Engineering* **2003**, *89*, 841-843.
- [16] Casson, Joanna L.; **Johal, Malkiat S.**; Chiarelli, Peter A.; Liu, Ding-Guo; Shaw, Jennifer A.; Robinson, Jeanne M.; Wang, Hsing-Lin. "Polyelectrolyte trilayer combinations using spin-assembly and ionic self-assembly" *Polymeric Materials Science and Engineering* **2003**, *89*, 33-34.
- [15] El-Khoury, R. J.; **Johal, M.S.** "Fine-Tuning the Wetting Behavior of Polyelectrolyte Films with Sodium Dodecyl Sulfate", *Langmuir* **2003**, *19*, 4880.
- [14] **Johal, M.S.**; Casson, J.L.; Chiarelli, P.; Lui, D-G.; Shaw, J.A.; Robinson, J.M.; Wang, H-L. "Polyelectrolyte Trilayer Combinations Using Spin-Assembly and Ionic Self-Assembly" *Langmuir* **2003**, *19* (No.21), 8876.
- [13] Chiarelli, P. A.; **Johal, M. S.**; Holmes, D.J.; Casson, J. L; Robinson, J. M.; Wang, H. "Polyelectrolyte Spin-Assembly" *Langmuir* **2002**, *18*, 168-173.
- [12] Casson, J.L.; Wang, H.; Roberts, J.B.; Parikh, A.N.; Robinson, J.M.; **Johal, M.S.** "Kinetics and Interpenetration of Ionically Self-Assembled Dendrimer and PAZO Multilayers" *Journal of Physical Chemistry B*. **2002**, *106*, 1697-1702.
- [11] Chiarelli, P. A.; **Johal, M. S.**; Casson, J. L.; Roberts, J. B.; Robinson, J. M.; Wang, H. "Controlling Polyelectrolyte Multilayer Thin Film Fabrication Using Spin-Assembly" *Advanced Materials* **2001**, *13*, No. 15, August 3, 1167-1171.
- [10] Casson, J. L.; **Johal M. S.**; Roberts, J. B.; Wang, H.; Robinson, J. M. "Reversal of Interfacial Dipole Orientation in Polyelectrolyte Superlattices Due to Polycationic Layers" *Journal of Physical Chemistry B*. **2000**, *104*, 11996-12001.
- [9] **Johal, M. S.**; Parikh, A. N.; Lee, Y.; Casson, J. L.; Foster, L.; Swanson, B. I.; McBranch, D. W.; Li, D. Q.; Robinson, J. M. "Study of the Conformational Structure and Cluster Formation in a Langmuir-Blodgett Film Using Second Harmonic Generation, Second Harmonic Microscopy, and FTIR Spectroscopy" *Langmuir*, **1999**, *15*(1), 1275-1282.
- [8] **Johal, M. S.**; Cao, Y. W.; Smilowitz, L. B.; Robinson, J. M.; McBranch, D. W.; Li, D. Q. "Spontaneously Self-Assembled Polar Asymmetric Multilayers Formed by Complementary H-Bonds" *Chemistry of Materials*, **1999**, *11*(8), 1962-1965.
- [7] Briggs, A. M.; **Johal, M. S.**; Davies, P. B.; Cooke, D. J. "Structure and Thermal Stability of Dichain Sugar Surfactants at the Solid/Water Interface Studied by Sum-Frequency Vibrational Spectroscopy" *Langmuir*, **1999**, *15*(5) 1817-1828.

- [6] Huang, W.; Helvenston, M.; Casson, J. L.; Wang, R.; Bardeau, J. F.; Lee, Y.; **Johal, M. S.**; Swanson, B. I.; Robinson, J. M.; Li, D. Q.; "Synthesis, Characterization, and NLO Properties of a Phenothiazine-Stilbazole Monolayer" *Langmuir*, **1999**, 15(19), 6510-6514.
- [5] Casson, J. L.; Huang, W.; Lee, Y.; Bardeau, J. F.; **Johal, M. S.**; Wang, R.; Li, D. Q.; Swanson, B. I.; McBranch, D. W.; Helvenston, M.; Robinson, J. M. "NLO-Studies of a Novel Phenothiazine Self-Assembled Monolayer" *Proceedings of the International Society for Optical Engineering*, **1999**, 3796, 238-241.
- [4] **Johal, M. S.**; Robinson, J. M.; McBranch, D. W.; Li, D. Q.; "Spontaneously Self-Assembled Polar Multilayers with High Second-Order Optical Nonlinearity" *Organic Thin Films for Photonics Apps*, **1997**, Technical Digest Series, 14, 155-157.
- [3] **Johal, Malkiat S.**, Ward, Robert N., Davies, Paul B., "Coadsorption of Tri-Chain Surfactants and Dodecanol at a Hydrophobic Surface Studied by Sum-Frequency Spectroscopy" *Journal of Physical Chemistry*, **1996**, 100, 274-276.
- [2] **Johal, Malkiat, S.**, Usadi, Eric W., Davies, Paul B., "Structural Phase Transition of a 1-Dodecanol Monolayer at the Solid-Liquid Interface studied by Sum-Frequency Spectroscopy" *Journal of the Chemical Society Faraday Transactions.*, **1996**, 92(4), 573-578.
- [1] **Johal, Malkiat S.**, Usadi, Eric W., Davies, Paul B., "Coadsorption of Didodecyl dimethylammonium Bromide and 1-Dodecanol on a hydrophobic surface studied by Sum-Frequency Spectroscopy" *Faraday Discussion*, **1996**, 104, 231-243.

Recent ACS Abstract Publications

- [20] Caculitan, Nina G.; Scudder, Paul H.; Casson, Joanna L.; Robinson, Jeanne M.; Rodriguez, Analiz; Tang, Zhexiong; Wang, Hsing-Lin; **Johal, Malkiat S.** "Incorporating NLO surfactants into polyelectrolyte multilayers and Langmuir-Blodgett assemblies" Abstracts of Papers, 229th ACS National Meeting, San Diego, CA, United States, March 13-17, 2005 (2005), COLL-321.
- [19] Dayton, Talya L.; Walstrom, Katherine M.; **Johal, Malkiat S.** "Using polyelectrolyte films to study M15 and alpha-protein interactions" Abstracts of Papers, 229th ACS National Meeting, San Diego, CA, United States, March 13-17, 2005 (2005), COLL-381.
- [18] **Johal, Malkiat S.**; Casson, Joanna L.; Wang, Hsing-Lin; Robinson, Jeanne M.; El-Khoury, Rita Jaqueline "Fine-tuning the wetting behavior of polyelectrolyte films containing ionic surfactants" Abstracts of Papers, 226th ACS National Meeting, New York, NY, United States, September 7-11, **2003**.
- [17] Casson, Joanna L.; **Johal, Malkiat S.**; Chiarelli, Peter A.; Liu, Ding-Guo; Shaw, Jennifer A.; Robinson, Jeanne M.; Wang, Hsing-Lin. "Polyelectrolyte trilayer combinations using spin-assembly and ionic self-assembly" Abstracts of Papers, 226th ACS National Meeting, New York, NY, United States, September 7-11, **2003**.
- [16] Hicks, R.; El-Khoury, R.J.; **Johal, M.S.** "Further Investigations in Fine-Tuning the Wetting Behavior of Polyelectrolyte Films with Sodium Dodecyl Sulfate" *Abstract of Papers, 55th Southeastern Meeting of the ACS*, Atlanta, GA, November 2003, 909.
- [15] Huang, P.; Browne, W.; Blower, P.; **Johal, M.S.** "Data Acquisition of Chemical Processes using UV-Visible Spectrophotometry and LabVIEW" *Abstract of Papers, 55th Southeastern Meeting of the ACS*, Atlanta, GA, November 2003, 329.
- [14] Campbell, V.; **Johal, M.S.** "Incorporating Azobenzene Dyes into Self-Assembled and Spin-Assembled Polyelectrolyte Multilayers" *Abstracts of Papers, 224rd ACS National Meeting*, New Orleans, LA, United States, March 23-27, **2003**. COLL-211.
- [13] Joanna L. Casson, Peter A. Chiarelli, **Malkiat S. Johal**, Dan Hooks, Jaroslaw Majewski, Greg S. Smith, Ding-Guo Liu, Gabriela E. Sanchez, Jeanne M. Robinson, Hsing-Lin Wang. "Polyelectrolyte Trilayer Combinations Using

Spin-Assembly and Ionic Self-Assembly.” *Abstracts of Papers, 224rd ACS National Meeting*, New Orleans, LA, United States, March 23-27, **2003**. COLL-214.

- [12] Robinson, Jeanne M.; Liu, Ding-Guo; Majewski, Jaroslaw; Chiarelli, Peter A.; Casson, Joanna L.; Lookman, Turab; **Johal, Malkiat S.**; Wang, Hsing Lin. “Aligning amphiphilic molecules in ultrathin films.” *Abstracts of Papers, 225th ACS National Meeting*, New Orleans, LA, United States, March 23-27, **2003**, COLL-209.
- [11] Michael Howland, **Malkiat S. Johal**, Joanna L. Casson, Jeanne M. Robinson, Hsing-Lin Wang “Photoluminescence Studies of Polyelectrolyte Spin-Assembled Multilayers.” *Abstracts of Papers, 224rd ACS National Meeting*, New Orleans, LA, United States, March 23-27, **2003**. COLL-213.
- [10] Rita Jaqueline El-Khoury, **Malkiat S. Johal**. “Dynamic Contact Angles Measurements of Polyelectrolyte Multilayers Containing Sodium Dodecyl Sulfate.” *Abstracts of Papers, 224rd ACS National Meeting*, New Orleans, LA, United States, March 23-27, **2003**. COLL-210.
- [9] Ashlee St. John, **Malkiat S. Johal**, Joanna L. Casson, Jeanne M. Robinson, Hsing-Lin Wang. “Mixed Surfactant-Polyelectrolyte Multilayers Containing Sodium Dodecylsulfate and Poly(ethyleneimine).” *Abstracts of Papers, 224rd ACS National Meeting*, New Orleans, LA, United States, March 23-27, **2003**. COLL-212.
- [8] Casson, Joanna L.; Wang, Hsing Lin; Roberts, Jerrad; Parikh, Atul N.; Robinson, Jeanne M.; **Johal, Malkiat S.** “Kinetics of dendrimer/PAZO multilayer films and the effect of interfacial dipole interactions on NLO properties”. *Abstracts of Papers, 223rd ACS National Meeting*, Orlando, FL, United States, April 7-11, **2002** (2002), COLL-371.
- [7] Robinson, Jeanne M.; Liu, Ding-Guo; Wang, Hsing-Lin; Casson, Joanna L.; Mc Branch, Duncan W.; Whitten, David; **Johal, Malkiat S.**; Chiarelli, Peter A.; Smith, Gregory S.; Majewski, Jaroslaw. “Fabrication and characterization of multilayered NLO films based on a novel alternating copolymer”. *Abstracts of Papers, 223rd ACS National Meeting*, Orlando, FL, United States, April 7-11, **2002** (2002), COLL-370.
- [6] Ozer, Byram H.; **Johal, Malkiat S.**; Casson, Joanna L.; Robinson, Jeanne M.; Wang, Hsing-Lin. “Polymer-surfactant interactions in a polyelectrolyte multilayer”. *Abstracts of Papers, 223rd ACS National Meeting*, Orlando, FL, United States, April 7-11, **2002** (2002), COLL-188.
- [5] **Johal, Malkiat S.**; Ozer, Byram H.; Casson, Joanna L.; Robinson, Jeanne M.; Chiarelli, Peter A.; Wang, Hsing-Lin. “Polyelectrolyte multilayers containing amphiphiles constructed by "dipping" and spin-assembly”. *Abstracts of Papers, 223rd ACS National Meeting*, Orlando, FL, United States, April 7-11, **2002** (2002), COLL-147
- [4] Wang, Hsing-Lin; Chiarelli, Peter; Robinson, Jeanne M.; Casson, Joanna L.; **Johal, Malkiat S.**; Holmes, Daniel J. “Polyelectrolyte Spin-Assembly”. *Abstracts of Papers, 223rd ACS National Meeting*, Orlando, FL, United States, April 7-11, **2002** (2002), COLL-020.
- [3] Wang, Hsing-Lin; Robinson, Jeanne M.; **Johal, Malkiat S.**; Casson, Joanna L.; Chiarelli, Peter A.; Roberts, Jerrad B. “Synthesis and characterization of spin-assembled polyelectrolyte multilayered thin films”. *Abstracts of Papers, 222nd ACS National Meeting*, Chicago, IL, United States, August 26-30, **2001** (2001), COLL-259.
- [2] Robinson, Jeanne M.; Foster, Laura L.; Wilson, Kevin R.; Smilowitz, Laura B.; Casson, Joanna L.; Dubey, Manvendra K.; **Johal, Malkiat S.**; Wilson, Bryan F. “Capillary absorption of methane on model Titan ices: Implications for a hidden hydrocarbon ocean”. *Book of Abstracts, 218th ACS National Meeting*, New Orleans, Aug. 22-26 (**1999**), PHYS-290.
- [1] Lee, Yongwoo; **Johal, M. S.**; Parikh, A. N.; Foster, L.; Robinson, J. M.; McBranch, D. W.; Li, D. “An SHG study of L-B films from 4-eicosyl-oxo-(E)-stilbazolium iodide”. *Book of Abstracts, 216th ACS National Meeting*, Boston, August 23-27 (**1998**), COLL-145.

Thesis Students

List of thesis students, thesis titles, published work based on thesis, and student’s postgraduate institution.

1. Daniel Holmes

Graduated: Fall 2001
Thesis Title: Spin-Assembly of Polyelectrolytes and Dendrimer Macromolecules
Thesis Publications: *Langmuir* **2002**, 18, 168-173.
Graduate School: Ph.D. program, Department of Chemistry, University of California, Berkeley.

2. Byram H. Ozer

Graduated: Spring 2001
Thesis Title: Polymer-Surfactant Interactions during Electrostatic Self-Assembly onto Thin Film Surfaces
Thesis Publications: *Langmuir* **2004**, 20(7), 2792-2796.
Graduate School: **FULBRIGHT FELLOW**: Max Planck Institute, Germany. MD-PhD Program, University of Wisconsin, Madison.

3. Jennifer A. Shaw

Graduation: Spring 2002
Thesis Title: Polyelectrolyte Spin-Assembly and Characterization of Polycation + Polyanion + Polyanion Thin Films
Thesis Publications: *Langmuir* **2003**, 19 (No.21), 8876. *Polymeric Materials Science and Engineering* **2003**, 89, 33-34.
Post-Graduate: Ph.D. program, Department of Chemistry, University of Maryland.

4. Michael C. Howland

Graduated: Spring 2003
Thesis Title: Photoluminescence Studies of Poly(2,5-Methoxy-Propyloxysulfonate Phenylene Vinylene) Multilayers: Engineering Stable, Efficient Films.
Thesis Publications: *Chem. Phys. Lett.* **2004**, 383 (3-4), 276.
Graduate School: Ph.D. program, Department of Applied Sciences, University of California, Davis.

5. Victoria E. Campbell

Graduated: Spring 2003
Thesis Title: Incorporation of Direct Red 80 into Self-Assembled and Spin-Assembled Polyelectrolyte Multilayers.
Thesis Publications: *Chem. Mater.* **2005**, 17, 186-190.
Graduate School: Ph.D. program, Department of Material Science, University of Wisconsin, Madison.

6. Rita El-Khouri

Graduated: Spring 2003
Thesis Title: Fine-tuning the wetting behavior of polyelectrolyte films containing ionic surfactants
Thesis Publications: *Langmuir* **2003**, 19, 4880. *Polymeric Materials Science and Engineering* **2003**, 89, 841-843.
Graduate School: Ph.D. program, Department of Chemistry, University of California, Davis.

7. Ashlee St. John

Graduated: Spring 2004
Thesis Title: PEI-SDS Interactions in Polyelectrolyte Multilayers Constructed by Spin-Assembly and Self-Assembly
Thesis Publications: *Langmuir* **2004**, 20(7), 2792-2796.
Graduate School: Ph.D. program, Department of Chemistry, Georgia Institute of Technology.

8. Patrick Blower

Graduated: Spring 2004
Thesis Title: Investigations into UV/Ozone Patterned Photolithography and Vesicle Adsorption Kinetics of Liquid-Crystalline POPC: Novel Techniques to Determine Structure and Dynamics of Lipid Bilayers
Thesis Publications: In preparation
Graduate School: Ph.D. program, Department of Chemistry, University of Oregon, Eugene.

9. William K. Browne

Graduated: Spring 2004

Thesis Title: ATR-FTIR Studies of the Photodegradation of POPC at the Solid-Liquid Interface
 Thesis Publications: In preparation
 Graduate School: Ph.D. program, Department of Chemistry, University of California, Berkeley.

10. Niña Caculitan,

Graduated: Spring 2005
 Thesis Title: Synthesis of NLO-Active Surfactants and Investigation of the Effects of Noncovalent Interactions on Molecular Orientation in Multilayer Films
 Thesis Publications: *Langmuir* **2004**, *20*, 8735-8739.
 Graduate School: Ph.D. Program, Department of Chemistry, University of California, Berkeley.

11. Talya Dayton

Graduated: Spring 2005
 Thesis Title: Polyelectrolyte Multilayer Assemblies and Protein Immobilization: A Study of Protein-Protein and Protein-Polyelectrolyte Interactions
 Thesis Publications: Protein Immobilization on Polyelectrolyte Surfaces: Effect of the Terminal Polyion on Enzymatic Surface Activity” *Biophysical Journal*, submitted.
 Graduate School: **FULBRIGHT FELLOW**: Università degli studi di Palermo, Palermo, Italy.

12. Rebecca Martin

Graduated: Spring 2005
 Thesis Title: Incorporating Active Lactate Dehydrogenase into Polyelectrolyte Multilayer Assemblies
 Graduate School: Planned (Currently working at Los Alamos National Laboratory).

13. Shannon Carpenter

Graduated: Spring 2005
 Thesis Title: Fabricating Functionalized Gold Nano-shells

14. Raea Hicks

Graduated: Spring 2005
 Thesis Title: Critical Aggregation Phenomenon in PEI-SDS Complexes in LBL Multilayers
 Graduate school: Planned (Currently working at Los Alamos National Laboratory).

15. Jerrad B. Roberts

Graduated: Spring 2000
 Thesis Publications: *Advanced Materials* **2001**, *13*, No. 15, August 3, 1167-1171. *J. Phys. Chem. B.* **2002**, *106*, 1697-1702. *J. Phys. Chem.* **2000**, *104*, 11996-12001.
 Graduate School: Laban/Bartenieff Institute of Movement Studies in New York City

16. Peter Chiarelli,

Graduated: Spring 2003
 Thesis Publications: *Chem. Mater.* **2005**, *17*, 186-190. *Polymeric Materials Science and Engineering* **2003**, *89*, 33-34. *Langmuir* **2003**, *19* (No.21), 8876. *Langmuir* **2002**, *18*, 168-173. *Advanced Materials* **2001**, *13*, No. 15, August 3, 1167-1171.
 Graduate School: **RHODES SCHOLAR**, Ph.D. program, Department of Clinical Medicine, Oxford University, UK. MD-Ph.D. Program, Harvard Medical School

17. Sarah Sherlock

Graduation: Spring 2006
 Thesis Title: Growth of Single-Walled Carbon Nanotubes.
 Graduate School: Ph.D. program, Department of Chemistry, Stanford University

END