

Francis Ted Limpoco
117 NW 15th St., Gainesville, FL 32603
(352) 871-1456 ♦ flimp@ufl.edu ♦ ftlimpoco@gmail.com

EDUCATION

Ph.D. candidate in Chemistry (expected May 2009), UNIVERSITY OF FLORIDA, Gainesville, FL

- Earned 39 research credit units; 4.00 cumulative GPA.
- Transferred from the University of Houston: earned 63 credit units; 3.20 cumulative GPA; Passed Ph.D. candidacy exam.
- Dissertation: *Nanotribology of Polymer Brushes Investigated by Atomic Force Microscopy*.
- Adviser: Scott S. Perry.

M.S. in Chemistry (2001), ATENEO DE MANILA UNIVERSITY, Philippines

- Earned the degree through a Faculty Development Grant; 3.75 cumulative GPA.

B.S. in Chemistry (1991) & **Computer Engineering** (1993), ATENEO DE MANILA UNIVERSITY, Philippines

- Earned double degrees in a 5-year program; 3.48 cumulative GPA in Chemistry; 3.37 cumulative GPA in Computer Engineering.

TEACHING & ACADEMIC EXPERIENCE

Instructor (2001-2004), ATENEO DE MANILA UNIVERSITY, Philippines

Assistant Instructor (1998-2001), ATENEO DE MANILA UNIVERSITY, Philippines

Lecturer (1992-1997), ATENEO DE MANILA UNIVERSITY, Philippines

- Experience in Undergraduate Level Chemistry:
 - Extensive experience in teaching undergraduate level chemistry:
 - ✓ **General Chemistry** (lecture/lab): ~60 courses of 20-40 students each
 - ✓ **Instrumental Analysis** (lecture/lab): ~6 courses of 10-15 students each
 - ✓ **Quantitative Analysis** (lecture/lab): ~6 courses of 10-20 students each
 - ✓ **Organic Chemistry** (1 lecture, mostly lab): ~7 courses of 10-20 students each
 - ✓ **Physical Chemistry** (lab): 1 course of ~15 students
 - Instructed a diverse cross-section of students: from freshmen to senior level students, from science to non-science majors, including those from Chemistry, Physics, Biology, Psychology, Computer Science, Management, and the Liberal Arts.
 - Supervised the thesis of undergraduate Chemistry students (2003-2004):
 - *Determination of Optimal TiO₂/CaCO₃ Pigment/Extender Formulation in Acrylic Paints by Dynamic Mechanical Analysis*
 - *Preparation and Characterization of Carageenan, Chitosan, & Calcium Carbonate Composites*
 - *Extraction and Characterization of Soluble Proteins from Mineralized Layers of Perna viridis*
 - *Construction of Low-cost RAIR Attachment for Shimadzu FTIR for Multilayer Surface Analysis*
 - Trained students in instrumental techniques, including:
 - Chromatography: GC and HPLC
 - Spectrophotometry: AAS, UV-vis, FTIR

- Thermal analysis of polymers: TGA, DSC, DMA
- Developed my own course websites for General Chemistry, Quantitative Analysis, utilizing Adobe and Macromedia software.
- Experience in Other Undergraduate Level Science Courses:
 - Developed and taught a course on Computer Applications in Manufacturing, by tailoring the generic computer course for Management majors to meet the needs of students in Management of Applied Chemistry by integrating topics on Computer Aided Design and Manufacturing (CAD/CAM).
 - Developed and taught—as part of a science faculty team—the course Science & Society for Liberal Arts students, which included modules on the Origin of the Universe, the Origin of Life, Biotechnology, Environment, and Sustainability.
 - Developed my own course websites for Science & Society utilizing Adobe and Macromedia software.
 - Contributed articles in the textbook, *Romancing Science: Readings in Science & Society*, published in-house by the university for use in the Science & Society course.
- Other Teaching & Training Activities:
 - Conducted reviews of General and Organic Chemistry to pre-med students taking the National Medical Admission Test (NMAT) (2003-2004).
 - Resource Person/Lecturer for the Philippine Institute of Pure and Applied Chemistry's (PIPAC) instrumental methods seminar/workshops, given to academic and industry participants, on the following topics (2002-2004):
 - *High-Performance Liquid Chromatography, Basic Theory*
 - *Gas Chromatography, Basic Theory*
 - *Ultraviolet-Visible Spectroscopy, Basic Theory*
 - Gave a seminar/workshop titled *When Chemistry and English Bond* for the series *English in the Disciplines: Putting Grammar into Practice* for college English and Chemistry teachers, at the 29th Ateneo Center for English Language Teaching (ACELT) Bi-Annual Conference (2003).
 - Science Judge, *Battle of the Brains*, quiz show for elementary to college level students, televised on RPN-9 (1998-2000).

Teaching Assistant (2004-2006), UNIVERSITY OF HOUSTON, Houston, TX

- Taught two semesters of undergraduate organic chemistry laboratories, and graded for organic chemistry lecture courses.
- Responsibilities included providing pre-lab lectures, preparing quizzes, grading lab reports, and training students in the use of the IR spectrophotometer and refractometer.

PROFESSIONAL & RESEARCH EXPERIENCE

Research Assistant (2006-present), Materials Science & Engineering, UNIVERSITY OF FLORIDA

- **Dissertation:** *Nanotribology of Polymer Brushes Investigated by Atomic Force Microscopy*.
- **Adviser:** Scott S. Perry (Professor, MSE); **Committee members:** Ken Wagener (Butler Professor, Polymer Chemistry), Benjamin Smith (Scientist, Analytical Chemistry), David Powell (Scientist, Analytical Chemistry), Christopher Batich (Professor, MSE & Biomedical Engineering).
- **Primary research activity:** tribological properties of polymer brush systems as a function of solvent environment (polarity, pH, ionic strength), deposition time, polymer architecture, and temperature, investigated by atomic force microscopy.

- **Other research activities:** friction and contact mechanics under nanonewton loads of contact lenses and corneal epithelial cells; adsorption, retention, and solvent uptake studies of polymers on quartz crystal resonators; synthesis of interpenetrating polymer network (IPN) hydrogels; routine AFM imaging of a broad range of samples from PTFE wear tracks to sea snake skin; humidity effects on MoS₂ dry solid lubricants
- **Areas of specialization:** atomic force microscopy (AFM), friction force microscopy (FFM), X-ray photoelectron spectroscopy (XPS), ellipsometry, quartz crystal microbalance (QCM), surface initiated polymerization (SIP), biomimetic aqueous lubrication.
- Research projects funded by the Air Force Office of Scientific Research (AFOSR), Alcon.
- Collaborators: UF Materials Science and Engineering Department, UF Mechanical and Aerospace Department, Eidgenössische Technische Hochschule (ETH) Zürich.
- Developed our research group's website, *Nanotribology and Surface Science at UF MSE*.
- Participated in the development of the *Atomic-scale Friction Research and Education Synergy Hub (AFRESH)*, "an NSF-sponsored electronic virtual organization for the atomic-scale friction community"; contributed the article on *Friction-Load Maps* which provide experimental details for employing AFM in friction measurements.

Research Assistant (2004-2006), Chemistry, UNIVERSITY OF HOUSTON

- **Primary research activity:** tribological properties of polymer brush systems as a function of solvent environment (polarity, pH, ionic strength), deposition time, polymer architecture, and temperature, investigated by atomic force microscopy.
- **Other research activity:** surface initiated polymerization (SIP), surface modification via silane chemistry, surface characterization techniques—QCM, XPS, ellipsometry.
- Collaborators: Prof. Rigoberto Advincula, Eidgenössische Technische Hochschule (ETH) Zürich.

Faculty, full-time & part-time, (1992-2004), Chemistry, ATENEO DE MANILA UNIVERSITY

- In-charge of maintaining equipment in the Polymer and Materials Lab: FTIR, TGA, DSC, DMA.
- Developed a document of safe practices and emergency procedures for the Chemistry Department.
- Screened applicants to the university and gave nationwide recruitment talks as member of the Committee on Admissions and Aid
- Helped on the *Primer for Student Centered Learning* as member of the Committee on Student-Centered Learning
- Assisted Dr. Fabian Dayrit organize a national meeting of chairs of various chemistry departments to establish a Technical Panel for the Commission on Higher Education to select Centers of Excellence in Chemistry.
- Gave lectures to industry and academic participants of seminar/workshops of the Philippine Institute of Pure and Applied Chemistry (PIPAC)—a university-based research institute.
- Gave a seminar/workshop to college English and Chemistry teachers, at the 29th Ateneo Center for English Language Teaching (ACELT) Bi-Annual Conference.

Research Assistant, (1998-2001), Chemistry, ATENEO DE MANILA UNIVERSITY

- **Thesis:** *Composition, Microstructure, and Viscoelastic Response of Portunus pelagicus Carapace*.
- **Adviser:** Maria Assunta C. Cuyegkeng.
- **Primary research activity:** viscoelastic properties of polymers and biomaterials; investigation of mechanical properties of organic/inorganic composites (biominerals).

- **Areas of specialization:** dynamic mechanical analysis (DMA), thermogravimetric analysis (TGA), differential scanning calorimetry (DSC), Fourier-transform infrared (FTIR) spectrophotometry, viscoelastic properties of polymers and biomaterials.
- Research project funded by university research grant.

Technical Sales Engineer (1994-1998) HANDELSHAUS CONSULT PHILIPPINES, INC. (a family business concern), Parañaque City, Philippines

- Responsible for the sales and service of the following products: STOLL CMS computer flat-knitting machines, Ems-Chemie Grilon separation and fusible-bonding yarns, Comez crochet machines.
- Trained in Sintral programming, Intarsia and full-fashion programming, CMS handling and servicing at STOLL GmbH., Reutlingen, Germany.
- Trained in crochet knitting programming at Comez S.p.A., Cilavegna, Italy.
- Participated in Yarn Meetings by international EMS-Chemie Grilon yarn distributors held in Bergamo, Italy (1997), Paris, France (1998), and Luzern, Switzerland (1999).
- Trained local knitting factory technicians in the SIRIX/CMS CAD/CAM knitting system from STOLL.

PUBLICATIONS

1. *Solvent-dependent friction response of poly(ethyleneimine)-graft-poly(ethylene glycol) brushes investigated by atomic force microscopy*, Michael Brady, F. T. Limpoco, Scott S. Perry (in preparation).
2. *Tribological properties of Poly(L-lysine)-g-Poly(ethylene glycol)-Coated Silicon Oxide Surfaces Probed by AFM at Physiological pH: Influence of Deposition Time and Polymer Architecture* (in preparation).
3. *Nanomechanical probes of single corneal epithelial cells: Shear stress and elastic modulus*, Joelle M. Payne, F. T. Limpoco, Benjamin Keselowsky, W. Gregory Sawyer, Scott S. Perry (in preparation).
4. *Experimental considerations when characterizing materials friction with atomic force microscopy*, F. T. Limpoco, Joelle M. Payne, Scott S. Perry (submitted to Tribology Letters).
5. *Solvent dependent friction force response of polystyrene brushes prepared by surface initiated polymerization*, F. T. Limpoco, Rigoberto C. Advincula, and Scott S. Perry, *Langmuir*, 23(24) (2007) 12196-12201.
6. Limpoco, Francis Ted "A Brief History of Science" in *Romancing Science: Readings in Science & Society*, ed. M. A. C. Cuyegkeng, Office of Research and Publication: Ateneo de Manila University, 2003.
7. Rojas, Nina R. and Limpoco, Francis Ted "The Emergence of Life" in *Romancing Science: Readings in Science & Society*, ed. M. A. C. Cuyegkeng, Office of Research and Publication: Ateneo de Manila University, 2003.
8. Gabinete, Carmen A. E., Musa, M. J. T., and Limpoco, Francis Ted "More on the Origins of Life" in *Readings in Science & Society*, ed. M. A. C. Cuyegkeng, Office of Research and Publication: Ateneo de Manila University, 2001.
9. *Viscoelastic response of Portunus pelagicus carapace using dynamic mechanical analysis*, Francis Ted Limpoco, *Loyola Schools Review*, Vol. 1 (2001).

PRESENTATIONS

Oral Presentations:

1. April 6-10, 2008, 235th ACS National Meeting, New Orleans, LA: *Solvent-switchable tribological response of polymer brush-modified silicon surfaces probed by atomic force microscopy.*
2. May 24-26, 2004, 19th Philippine Chemistry Congress, Iloilo City, Philippines: *Determination of Optimal TiO₂/CaCO₃ Pigment/Extender Formulation in Acrylic Paints by Dynamic Mechanical Analysis.*
3. May 22-25, 2000, 16th Philippine Chemistry Congress, Manila, Philippines: *Composition, Microstructure, and Viscoelastic Response of Portunus pelagicus Carapace.*

Poster Presentations:

1. April 2008, Particle Engineering Research Center (PERC) 2008 Industrial Advisory Board Meeting (IAB) Poster Competition: *Solvent-dependent friction response of poly(ethyleneimine)-graft-poly(ethylene glycol) brushes investigated by atomic force microscopy, won 1st place.*
2. April 6-10, 2008, 235th ACS National Meeting, New Orleans, LA: *Solvent-dependent friction response of poly(ethyleneimine)-graft-poly(ethylene glycol) brushes investigated by atomic force microscopy.*
3. May 26, 2006, Texas Surface Science Round-Up, Round Top, TX: *Friction force measurements of polystyrene brushes in various solvent environments.*
4. March 26-30, 2006, 231st ACS National Meeting, Atlanta, GA: *Friction force measurements of polystyrene brushes in various solvent environments.*
5. May 2000, 20th Philippine-American Academy of Science and Engineering, Manila, Philippines: *An Investigation of Mechanical Properties of Crab Shells by Dynamic Mechanical Analysis.*
6. May 26-29, 1999, 15th Philippine Chemistry Congress, Cebu City, Philippines: *Preparation and Characterization of Ultrathin Multilayer Films of κ -Carrageenan and Chitosan.*

Seminar/Workshops:

1. June 2004, May 2003, Philippine Institute of Pure and Applied Chemistry (PIPAC), Instrumental Methods Seminar/Workshop: *High-Performance Liquid Chromatography, Basic Theory.*
2. May 2004, May 2003, April 2003, October 2002, Philippine Institute of Pure and Applied Chemistry (PIPAC), Instrumental Methods Seminar/Workshop: *Gas Chromatography, Basic Theory.*
3. May 2003, Philippine Institute of Pure and Applied Chemistry (PIPAC), Instrumental Methods Seminar/Workshop: *Ultraviolet-Visible Spectroscopy, Basic Theory.*
4. February 1, 2003, 29th Ateneo Center for English Language Teaching (ACELT) Bi-Annual Conference: *"When Chemistry and English Bond" in English in the Disciplines: Putting Grammar into Practice.*

CONFERENCES

1. Gordon Research Conference, Chemistry at Interfaces, *Surfaces with Spatial Property Gradients*, July 13-18, 2008, Waterville Valley, NH
2. 235th ACS National Meeting, April 6-10, 2008, New Orleans, LA
3. Tribology Program Review, Air Force Office of Scientific Research, Chemistry and Life Sciences Directorate, November 6-8, 2007, Gainesville, FL
4. Annual Joint Symposium, Florida Chapter of the AVS Science and Technology Society, and Florida Society for Microscopy, March 11-16, 2007, Orlando, FL
5. Texas Surface Science Round-Up, May 26, 2006, Round Top, TX
6. 231st ACS National Meeting, March 26-30, 2006, Atlanta, GA
7. 49th Conference on Chemical Research, *Charge Transfer at Electrodes and Biological Interfaces*, The Welch Foundation, October 25, 2005, Houston, TX
8. Texas Surface Science Round-Up, May 2005, Round Top, TX
9. 19th Philippine Chemistry Congress, May 24-26, 2004, Iloilo City, Philippines
10. 20th Philippine-American Academy of Science and Engineering, May 2000, Manila, Philippines
11. 16th Philippine Chemistry Congress, May 22-25, 2000, Manila, Philippines
12. 15th Philippine Chemistry Congress, May 26-29, 1999, Cebu City, Philippines
13. Internationale Textilmaschinen Ausstellung (ITMA) Exhibition, October 17-26, 1995, Milan, Italy
14. K '95, 13th International Plastics and Rubber Convention and Exhibition, October 5-12, 1995, Düsseldorf, Germany

AWARDS, HONORS, DISTINCTION RECEIVED

- Poetry Fellow, 39th National Writer's Workshop, Dumaguete City, Philippines, under the tutelage of Edith L. Tiempo, National Artist for Literature (2000).
- Graduated with Honors, B.S. in Chemistry, Ateneo de Manila University (1991).
- Bank of the Philippine Islands, Science Award, given to the top-three science students at Ateneo de Manila University (1991).
- Class Valedictorian; Insular Life Gold Eagle Award; Bro. Alphonsus Bloeman, FSC, Honor's Society, at La Salle Greenhills Highschool (1987).

REFERENCES

Scott S. Perry, Professor, Materials Science & Engineering, UNIVERSITY OF FLORIDA

Rigoberto C. Advincula, Professor, Chemistry Department, UNIVERSITY OF HOUSTON

Ma. Assunta C. Cuyegkeng, Vice-President, Loyola Schools, ATENEO DE MANILA UNIVERSITY