

## CURRICULUM VITAE

**NAME:** FRANCISCO JAVIER IBANEZ

**BUSINESS ADDRESS:** Instituto de Físico-Química Teórica y Aplicada (INIFTA)  
Laboratorio de Nanoscopías y Físicoquímica Teórica y Aplicada  
Universidad de La Plata, Buenos Aires (Argentina)  
Tel +54 221 425 7430/7291 int. 165  
e-mail 1: [fjiban02@louisville.edu](mailto:fjiban02@louisville.edu)  
e-mail 2: fibaniez@yahoo.com

**DATE & PLACE OF BIRTH:** May 6, 1973  
Mendoza, Argentina

### **EDUCATION:**

University of Louisville (Louisville, KY, USA)	Ph.D. in Chemistry	2001-2007
Universidad Tecnológica Nacional (Mendoza, Argentina)	Bachelor of Science Chemical Engineer	1992-2000
High School Homero Manzi (Mendoza, Argentina)	Chemistry Technician	1987-1992

### **PROFESSIONAL OBJECTIVE:**

Research and Development in the Areas of Nanoscience and Nanotechnology. Study of Surface Chemistry, Material Science, Electrochemistry, and Manipulation of Nanostructures. Metal Nanoparticles, Synthesis and Characterization. Their use for Applications in Areas of Sensing Gas and Vapors, Catalysis, and Fuel cells.

### **PEER-REVIEWED PUBLICATIONS:**

#7) Radhika Dasari, **Francisco J. Ibañez**, and Francis P. Zamborini. "Electrochemically grown Ag and PdAg Nanowires for H<sub>2</sub> Sensing". *En preparación*.

#6) **Francisco J. Ibañez** & Francis P. Zamborini. "FT-IR, XRD, and TGA Characterization of Amino-Protected Pd, PdAu, and PdAg Nanoparticles". *En preparación*.

#5) Laura Bergant, **Francisco J. Ibañez**, and Francis P. Zamborini. "Selectivity Improvement by Vapor- and Liquid- Phase Exchange Vapors on Films Comprised of Au MPCs ". *En preparación*.

#4) **Francisco J. Ibañez** and Francis P. Zamborini. "Chemiresistive Sensing of Volatile Organic Compounds with Films of Surfactant-Stabilized Gold and Gold/Silver Alloy Nanoparticles". *ACS Nano*. **2008**, 2, 1543

#3) **Francisco J. Ibañez** and Francis P. Zamborini. "The Reactivity of Hydrogen with Solid-State Films of Alkylamine- and Tetraoctylammonium Bromide-Stabilized Pd, PdAg, and PdAu Nanoparticles for Sensing and Catalysis Applications". *J. Am. Chem. Soc.* **2008**, 130, 622.

#2) **Francisco J. Ibañez** and Francis P. Zamborini. "Ozone- and Thermally-Activated Films of Palladium Monolayer-protected Clusters for Chemiresistive Hydrogen Sensor. *Langmuir*. **2006**, 22, 9789.

#1) **Francisco J. Ibañez**, Mark Crain, Kevin Walsh, and Francis P. Zamborini. "Chemiresistive Vapor Sensing with Microscale Films of Gold Monolayer Protected Clusters". *Anal. Chem.* **2006**, 78, 753.

### **POSGRADUATE PROFESSIONAL TRAINING:**

#### **University of Hiroshima (Japan).**

9/2000-12/2000

Japan International Cooperation Agency (JAICA). (Hiroshima, Japan)

Training on: "Environmental Resource Management Theories and Techniques for Sustainable Development". Graduate Fellowship. University of Hiroshima (Hiroshima, Japan)

#### **Universidad de Mendoza.**

10/1999-11/1999

"Environmental Engineering" Undergraduate Fellowship.

Obtained by the City Hall of Mendoza (Mendoza, Argentina)

Training on: "Introduction to Environmental Techniques for the Environmental Impact Assessment and Mitigation Control".

### **ACADEMIC AND PROFESSIONAL EXPERIENCE:**

#### **Postgraduate Course:**

***Curso de Actualización de Posgrado en Nanociencia y Nanotecnología.*** (UTNFRM), Mendoza Argentina

18 de Set.-11 Oct. 2008

*Curso aprobado por Rectorado de la Universidad Tecnológica Nacional (UTN) bajo Ordenanza N° 1194*

#### **TEMATICA GENERAL DEL CURSO (40 hrs. totales)**

1) Introducción a la Nanotecnología y Nanociencia.

2) Obtención de Nanomateriales.

3) Laboratorio (síntesis y caracterización de Nanopartículas de 15-30 nm de diámetro).

4) Técnicas Microscópicas y Espectroscópicas.

5) Aplicaciones (Seminarios y Talleres). **Seminaristas Invitados** (Dr. Gustavo Lascalea, Dr. Eduardo Bringa, Lic. Gaston Corthey, Ing. Gonzalo Dávila)

Adjunct Professor 01/07/2008-present  
Kentucky State University (KSU)  
Frankfort, Kentucky

Postdoctoral Research Associate 09/01/2007- 05/01/2008  
University of Louisville (Louisville, KY)

Senior Research Assistant 2005-2007  
University of Louisville (Louisville, KY)

Graduate Teaching Assistant 2001-2005  
University of Louisville (Louisville, KY)  
Lectured, proctored and graded General Chemistry 201.  
Lectured, supervised, and graded Analytical (Honors Analytical Chem. 206)  
and General Chemistry laboratory courses.

#### **UNDERGRADUATE AND GRADUATE RESEARCH MENTOR:**

##### **GRADUATES (MS and PhD candidates):**

*Radhika Dasari* 2006-2007  
Project: “H<sub>2</sub> Sensing with Electrochemically Grown Nanowires”

*Joseph E. Parrino* 2005-2006  
Project: “H<sub>2</sub> Sensing with Pd and Pd alloy Nanoparticles”

##### **UNDERGRADUATES:**

*Rachel Tallent* Fall 2005  
Project: “Improving Selectivity of C6 Au MPCs by the Use of Polymers”

*Rebecca Hernandez* Spring 2006  
Project: “Miniaturization of C6 Au MPC Sensor Films”

*Laura Bergant* 07/2006-07/2007  
Project: “Improving Selectivity of C6 Au MPCs by Liquid-  
and Vapor-Phase Exchanged Alkanethiolates”

*Bibek Parajuli* Summer 2007  
Project: “Catalytic Reactivity of Amino-Coated Nanoparticles”

#### **ACADEMIC AND PROFESSIONAL HONORS:**

**Graduate Dean's Citation Award**

Fall 2007

University of Louisville

“Graduate Dean's Citations are awarded at each commencement to students recommended by their departments in recognition of superior accomplishment (e.g., publications, professional service) in their graduate studies beyond the achievement of a high grade point average”

**Laboratory Safety Prize**

Department of Chemistry

2003/04/05

University of Louisville

“Conducting and Teaching Labs in a Safety Environment”

**RESEARCH EXPERIENCE:**

Synthesis of metal nanoparticles (monolayer-protected clusters) coated with alkanethiols, alkylamines and weak ligands (surfactants) comprised into films in order to be used as chemiresistive sensors. Recent terrorist attacks have imposed more pressure on the design of sensors able to detect explosive vapors. These sensors should be small, fast in response, reproducible, sensitive and easy to fabricate. Part of my research focus on the miniaturization of conventional films (cm-mm) to micro- and nano-scopic films. Besides practical benefits as portability and reduced cost, fundamental studies on the vapor and gas sensing behavior are of relevant interest as well. Other area of research is focused on the design of hydrogen (H<sub>2</sub>) sensors. Hydrogen is thought to be one of the main sources of energy in the future, however, is highly explosive when mixed with air. This sensor is based on Pd nanoparticles use as catalyst for the reaction with hydrogen gas. Just recently we are designing ethanol and methanol sensors with potential industry applications for detection of alcohol (breathalyzers) and fuel-cell technology, respectively.

**PATENTS:**

#1) **Francisco, J. Ibañez** & Francis, P. Zamborini (Principal Investigator) “Chemical Sensors and Methods of use” UN024/0UN91-ULRF Ref. 07073-U. S. Provisional Patent Application Serial No. 60/652,125. Submitted on July 2007.

**MEETING ABSTRACTS:**

# 11) **Francisco, J. Ibañez, Mónica Moreno, and Francis Zamborini. Conferencia Apertura en EnIDI (encuentro investigadores y docente de las ingenierías): “Introducción a la Nanociencia y Nanotecnología. Sensores para la Detección de H<sub>2</sub>”.** Universidad Tecnológica Nacional (FRM). Mendoza, Argentina, 3 de Noviembre del 2008.

# 10) **Francisco, J. Ibañez. Seminario en YPF (Refinería Mendoza): “Introducción a la Nanociencia y Nanotecnología. Sensores Ambientales a Base de Nanopartículas protegidas con Grupos Orgánicos”.** Refinería Mendoza. 11 de Septiembre del 2008.

#9) **Francisco, J. Ibañez** and Francis P, Zamborini. **Poster Presentation:** “The Use of Organic-Coated Pd and PdAg Alloy Nanoparticles for H<sub>2</sub> Sensing and Storage Applications”. Kentucky Nanomaterials (KYNANOMAT). University of Louisville. Mach 16-18, 2008.

#8) Francis P, Zamborini; **Francisco, J. Ibañez**. “Utilizing the electronic properties of metal nanostructures for medical diagnostics through breath analysis and antigen detection”. Brown Cancer Center. University of Louisville. Feb 18, 2008.

#7) **Francisco, J. Ibañez**. **Escuela de Nanopartículas**. Mayo-Junio 2006  
Centro Binacional (Argentina-Brasil) de Nanotecnología y Nanociencia Buenos Aires, Argentina

#6) Francis P, Zamborini; **Francisco, J. Ibañez**; Joseph E. Parrino “Chemiresistive Hydrogen Sensing with Films of Pd and PdAg Alloy Nanoparticles”, accepted at the 2007 39th Central Regional Meeting of the American Chemical Society (ACS) Covington, KY May 2007.

#5) Francis P, Zamborini and **Francisco, J. Ibañez** “Chemiresistive Sensing with Metal Nanoparticles”, accepted at the 2006 232<sup>nd</sup> ACS National Meeting of the American Chemical Society San Francisco, CA September 2006.

#4) Francis P, Zamborini and **Francisco, J. Ibañez**. “Chemiresistive Sensing with Metal Nanoparticles”, accepted at the 2006 232<sup>nd</sup> ACS National Meeting of the American Chemical Society San Francisco, CA September 2006.

#3) **Francisco, J. Ibañez** & Francis, P. Zamborini “Au and Pd Monolayer-protected Clusters used for Vapor and Gas Sensing” accepted at 2006 231<sup>st</sup> ACS National Meeting Atlanta Georgia, March 2006.

#2) **Francisco, J. Ibañez** & Francis, P. Zamborini “H<sub>2</sub> Sensing with Pd and PdAg alloy MPCs” accepted at 2005 231<sup>st</sup> ACS 61<sup>st</sup> Southeast and the 57<sup>th</sup> Southeast Joint Regional Meetings Memphis Tennessee, November 2005.

#1) **Francisco, J. Ibañez** & Francis, P. Zamborini “Chemiresistive Sensing with Microcontact Printed Lines of Gold Monolayer-protected Clusters” accepted at the 2005 Physical and Electronic Conference Meeting at Madison, Wisconsin June 2005.

## **RESEARCH INSTRUMENTATION:**

### **Characterization of Nanostructures:**

#### **Microscopy:**

Atomic Force Microscope (AFM)

Scanning Tunneling Microscope (STM)

#### **Spectroscopy:**

Raman

Ultra-Violet (UV)

Fourier Transform Infra-Red (FT-IR)  
X-ray Diffraction (XRD)

**Separation techniques:**

Electrophoresis  
Gas Chromatography, GC

**Microfabrication techniques:**

Fabrication of microelectrodes on Si/SiO<sub>x</sub>. Clean Room

**TGA (Thermal Gravimetric Analysis)**

**GRANTS:**

1. National Science Foundation Grant (CHE-0518561) for the Fall Semester 2005
2. Kentucky Science and Engineering Foundation (KSEF-1032-RDE-008) from Spring 2006 to Present.

**INVITED TALKS AND POSTERS:**

**School of Nanoparticles.**

May-June 2006

Center (Argentina-Brazil) of Nanotechnology and Nanoscience

Oral Presentation: "Synthesis and Characterization of Au Nanoparticles Stabilized by Sodium Citrate and the Effect of Addition of Zn<sup>2+</sup>."

**61<sup>st</sup> Southeast and the 57<sup>th</sup> Southeast**

November 2005

Joint Regional Meetings of the American  
Chemical Society (Memphis, TN)

Oral Presentation. Francisco J. Ibañez

"H<sub>2</sub> sensing with Pd and Pd/Ag alloy MPCs"

**Physical Electronics Conference (Madison, WI)**

June 2005

Poster Presentation. Francisco J. Ibañez

"Chemiresistive Vapor Sensing with Microcontact Printed Lines  
of Gold Monolayer Protected Clusters"

**228<sup>th</sup> American Chemical Society National Conference**  
(Philadelphia, PA)

August 2004

Attendee

**SERVICE ACTIVITY:**

**Judging:**

Poster presentations at the 4<sup>th</sup> annual Kentuckiana Undergraduate Research Symposium in Louisville, (KY). April 2004

Chemistry Graduate Student Association 2003-2004  
Officer-Secretary

**OTHER WORK EXPERIENCE:**

**City Hall of Mendoza** 1998-2000  
(Mendoza, Argentina)  
Environmental Engineer Assistant  
Air Pollution Monitoring of Mobile Sources. The Effects of Particulate Matter (PM) on the Weather and the Human Health

**LANGUAGES:**

**Spanish.** First language

**English.**

Second language. Fluent.

Classes: Hunter College (New York, USA) 04/1999-06/1999

**French.**

Basic understanding.

Classes: French Institute (Mendoza, Argentina) 1997/1998

**PROFESSIONAL AFILIATIONS:**

American Chemical Society (ACS) 2004-2007  
American Association for the Advancement of Science (AAAS) 2007-present

**REFERENCES:**

**Dr. Francis P. Zamborini** (University of Louisville, USA, e-mail: [f.zamborini@louisville.edu](mailto:f.zamborini@louisville.edu) /office #: 502-852-6550)

**Dr. David Schiffrin** (University of Liverpool, United Kingdom, e-mail: [Schiffn@liverpool.ac.uk](mailto:Schiffn@liverpool.ac.uk) /office #: +44 151 794 3574)

**Dr. Cecilia M. Yappert** (University of Louisville, USA, e-mail: [mcyapp01@gwise.louisville.edu](mailto:mcyapp01@gwise.louisville.edu) /office #: 502-852-7061)

**Dr. Donald B. DuPré** (University of Louisville, USA, e-mail: [dbdupr01@gwiselouisville.edu](mailto:dbdupr01@gwiselouisville.edu) /office #: 502-852-5976)

**Dr. Raul Miranda** (U.S. Department of Energy DOE/ Program Manager, Office of Basic Energy Sciences; Chemical Sciences, Geosciences and Biosciences, e-mail: [raul.miranda@science.doe.gov](mailto:raul.miranda@science.doe.gov) /office #: 301-903-8014)