

## EDUCATION AND TRAINING

### Department of Materials Engineering, KU Leuven, Belgium (Mar. 2019 – Present)

- **Assistant Professor** in printed energy materials for wearables.

### Hardware Engineering, Apple Inc., USA. (Jan. 2018 – Feb. 2019)

- **Senior Touch Module Process Engineer:** Designing process steps, driving vendors in Asia, collaborating with cross-functional teams.

### Department of Chemical Engineering, Stanford University, USA (Apr. 2016 – Jan. 2018)

- **Postdoctoral Researcher** at Bao Research Group.
- Project: **Inkjet-Printed Stretchable Organic and CNTs-Based Transistors for Biomedical Applications and Skin-Like Electronics.**
- Supervisor: **Prof. Zhenan Bao.**
- Acquired competences: Experience in **processing functional organic materials** (ionic dielectrics, conjugated semiconducting and conducting polymers, sorted and unsorted CNTs) from **solution, inkjet printing** of functional materials for **unconventional electronics, fabrication and characterization of stretchable and biocompatible field effect transistors.**

### Department of Chemical Engineering, Stanford University, USA (Oct. 2014 – Apr. 2016)

- **Swiss National Science Foundation Early PostDoc** research fellow at Bao Research Group.
- Project: **Tuning the Morphology of Solution-Based Organic Semiconductors for Fully-Printed Electronics with Improved Performance.**
- Supervisor: **Prof. Zhenan Bao.**
- Acquired competences: Knowledge in thin-film **preparation and morphological characterization of organic semiconductor materials** by means of **microscopy/spectroscopy** (SEM, AFM, UV-Vis) and **synchrotron x-ray diffraction** methods; fabrication and electrical characterization of **organic FETs** and organic **photovoltaic** cells; theoretical knowledge in **transport phenomena** (fluid mechanics, heat and mass transfer).

- **Collaboration** in x-ray characterization: Michael Toney's group at the **Stanford Synchrotron Radiation Lightsource (SSRL), SLAC (USA)**.

#### **Institute of Microengineering (IMT), EPFL, Switzerland** (Mar. 2010 – Jun. 2014)

- **PhD** in Microsystems Engineering.
- Dissertation title: **Inkjet-Printed Multisensor Platform on Flexible Substrates for Environmental Monitoring**.
- Supervisors: **Dr. Danick Briand** and **Prof. Nico de Rooij** at the Sensors, Actuators and Microsystems Laboratory (SAMLAB).
- Committee: Prof. H. Shea (EPFL, Switzerland), Prof. J. Brugger (EPFL, Switzerland), Prof. K. Persaud (University of Manchester, UK) and Dr. A. Oprea (University of Tübingen, Germany).
- Funding & Project framework: FP7-**Marie Curie** Initial Training Network (ITN) **fellowship** within the project **FlexSmell** - Gas Sensors on Flexible Substrates for Wireless Applications.
- Acquired competences: Knowledge on **printed, large-area and flexible electronics**; proficiency in **microfabrication** processes (**printing** and **cleanroom** related methods); proficiency in **design, fabrication and characterization** (electrical and mechanical) of **MEMS and chemical/physical sensors**; experience in integration of electronics in **smart textiles** acquired throughout the Swiss *Nano-Tera* project *TWIGS*.
- **Collaborations** in several **industrial** and **research projects** and with different **research institutions** such as CSEM (Switzerland), ETH Zürich (Switzerland), the Hebrew University of Jerusalem (Israel), Holst Centre (The Netherlands), University of Manchester (UK) and VTT (Finland).

#### **VTT Technical Research Centre of Finland, Finland** (Oct. 2011 – Jan. 2012 & Dec. 2012 – Feb. 2013)

- **PhD research visitor** under supervision of **Dr. Maria Smolander** within the frame of the FP7-**Marie Curie** ITN **FlexSmell** project.

#### **University of Granada, Spain** (Sep. 2002 – Sep. 2009)

- **Double Major** in **Electrical Engineering (GPA: 8.091 / 10)** and **Physics (GPA: 8.265 / 10)**.
- **Awarded highest GPA** in Electrical Engineering, class of 2008.

#### **University of California San Diego, USA** (Sep. 2008 – Jun. 2009)

- **Undergraduate education abroad (Year GPA: 3.771 / 4)** within the *Education Abroad* program from the University of California.

- Acquired competences: knowledge and training in Nanotechnology and Nanoelectronics; experience in microfabrication within a cleanroom facility.

**EPFL, Switzerland** (Oct. 2006 – Jun. 2007)

- **Undergraduate education abroad (Year GPA: 5.3 / 6)** within the European *Erasmus* program.
- Acquired competences: Training in analog / digital integrated electronic circuits design; experience with IC design software Cadence.

## PROFESSIONAL EXPERIENCE

**Dept. of Electrical Eng. University of California San Diego, USA** (Jul. 2009 – Aug. 2009)

- **Research Internship** at the High Speed Devices Group. Supervisor: Prof. Peter Asbeck.
- Work description: Monte Carlo simulation of carrier transport in graphene following a semi-classical approach.

**Institute of Microengineering, EPFL, Switzerland** (Jul. 2007 – Aug. 2007)

- **Research Internship** at the Laboratory of Microsystems and Microelectronics. Supervisor: Prof. R. S. Popovic.
- Work description: Measurements, characterization and simulation of a Hall-effect magnetic microsensor using a multi-step spinning current method.

## TEACHING AND MENTORING EXPERIENCE

- **Supervised and co-supervised** three **undergraduate** students and a **master student**, respectively, during semester-long research projects.
- **Assisted** for two years in a **bachelor course** of Mechanics taught by Prof. Herbert Shea at EPFL. The teaching tasks included developing/correcting weekly assignments, holding office hours for students and developing/grading exams.
- **Mentored** a first year **PhD student**.

## ACADEMIC HONORS AND AWARDS

- Awarded the *Swiss National Science Foundation Early PostDoc Mobility Fellowship*, *Fully-printed organic electronics and sensors on flexible substrates for wearable point-of-care applications*, budget of 94829 CHF to cover my salary as postdoctoral researcher and travel expenses at Stanford University from **Oct. 2014 to Mar. 2016**.

- Awarded for obtaining the **highest GPA** (8.091 out of 10) in the major of **Electrical Engineering** at the **University of Granada** (Spain) in 2008.
- Elected by the University of California to participate in its *Education Abroad Program*.
- Honors in Final Degree Project (Semester Project at EPFL).

## EDITORIAL ACTIVITY

- Reviewer of the international journals: *Sensors and Actuators A: Physical* (Elsevier), *Sensors and Actuators B: Chemical* (Elsevier), *Flexible and Printed Electronics* (IOPscience), *Small* (Wiley), and *Nature Communications* (Nature Research).

## SELECTED PUBLICATIONS (*h* index = 18, complete list in <https://scholar.google.com/citations?user=YaAZ2PIAAAAJ&hl=en>)

1. U. Kraft, **F. Molina-Lopez**, D. Son, Z. Bao and B. Murmann, *Ink Development and Printing of Conducting Polymers for Intrinsically Stretchable Interconnects and Circuits*, **Advanced Electronic Materials** (2019), pp. 1900681. DOI: 10.1002/aelm.201900681.
2. **F. Molina-Lopez**, T. Z. Gao, U. Kraft, C. Zhu, T. Öhlund, R. Pfattner, V. R. Feig, Y. Kim, S. Wang, Y. Yun and Z. Bao, *Inkjet-Printed Stretchable and Low Voltage Synaptic Transistor Array*, **Nature Communications** (2019), vol. 10, 2676. DOI: 10.1038/s41467-019-10569-3.
3. G. Chen, R. Rastak, Y. Wang, H. Yan, V. Feig, Y. Liu, Y. Jiang, S. Chen, F. Lian, **F. Molina-Lopez**, L. Jin, K. Cui, J.W. Chung, E. Pop, C. Linder and Zhenan Bao, *Strain- and Strain-Rate-Invariant Conductance in a Stretchable and Compressible 3D Conducting Polymer Foam*, **Matter** (2019), vol. 1, pp. 1-14. DOI: 10.1016/j.matt.2019.03.011.
4. J. Xu, H.-C. Wu, C. Zhu, A. Ehrlich, L. Shaw, M. Nikolka, S. Wang, **F. Molina-Lopez**, X. Gu, S. Luo, D. Zhou, Y.-H. Kim, G.-J.N. Wang, K. Gu, V.R. Feig, S. Chen, Y. Kim, T. Katsumata, Y.-Q. Zheng, H. Yan, J.W. Chung, J. Lopez, B. Murmann and Z. Bao, *Multi-scale ordering in highly stretchable polymer semiconducting films*, **Nature Materials** (2019), vol. 18, pp. 594-601. DOI: 10.1038/s41563-019-0340-5.
5. D. Son, J. Kang, O. Vardoulis, Y. Kim, N. Matsuhisa, J.Y. Oh, J.W.F. To, J. Mun, T. Katsumata, Y. Liu, A.F. McGuire, M. Krason, **F. Molina-Lopez**, J. Ham, U. Kraft, Y. Lee, Y. Yun, J.B.-H. Tok and Z. Bao, *An integrated self-healable electronic skin system fabricated via dynamic reconstruction of a nanostructured conducting network*, **Nature Nanotechnology** (2018), vol. 13 (11), pp. 1057-1065.
6. T.Z. Gao, T. Lei, **F. Molina-Lopez** and Z. Bao, *Enhanced Process Integration and Device Performance of Carbon Nanotubes via Flocculation*, **Small Methods** (2018), vol. 2 (10), pp. 1800189.

7. G.-J.N. Wang, **F. Molina-Lopez**, H. Zhang, J. Xu, H.-C. Wu, J. Lopez, L. Shaw, J. Mun, Q. Zhang, S. Wang, A. Ehrlich and Z. Bao, *Nonhalogenated Solvent Processable and Printable High-Performance Polymer Semiconductor Enabled by Isomeric Nonconjugated Flexible Linkers*, **Macromolecules** (2018), vol. 51 (13), pp. 4976-4985.
8. **F. Molina-Lopez**, H.-C. Wu, G.-J. N. Wang, H. Yan, L. Shaw, J. Xu, M.F. Toney and Z. Bao, *Enhancing Molecular Alignment and Charge Transport of Solution-Sheared Semiconducting Polymer Films by the Electrical - Blade Effect*, **Advanced Electronic Materials** (2018), vol. 4, pp. 1800110.
9. S. Wang, J. Xu, W. Wang, G.-J.N. Wang, R. Rastak, **F. Molina-Lopez**, J.W. Chung, S. Niu, V.R. Feig, J. Lopez, T. Lei, S.-K. Kwon, Y. Kim, A.M. Foudeh, A. Ehrlich, A. Gasperini, Y. Yun, B. Murmann, J.B.-H. Tok and Z. Bao, *Skin electronics from scalable fabrication of an intrinsically stretchable transistor array*, **Nature** (2018), vol. 555 (7694), pp. 83-88.
10. X. Gu, Y. Zhou, K. Gu, T. Kurosawa, Y. Guo, Y. Li, H. Lin, B.C. Schroeder, H. Yan, **F. Molina-Lopez**, C.J. Tassone, C. Wang, S.C.B. Mannsfeld, H. Yan, D. Zhao, M.F. Toney, Z. Bao, *Roll-to-roll printed large area all-polymer solar cells with 5% efficiency based on a low crystallinity conjugated polymer Blend*, **Advanced Energy Materials** (2017), vol. 7 (14), pp. 1602742.
11. Y. Wang, C. Zhu, R. Pfattner, H. Yan, L. Jin, S. Chen, **F. Molina-Lopez**, F. Lissel, J. Liu, N.I. Rabiah, Z. Chen, J.W. Chung, C. Linder, M.F. Toney, B. Murmann and Z. Bao, *A highly stretchable, transparent and conductive polymer*, **Science Advances** (2017), vol. 3 (3), pp. e1602076.
12. **F. Molina-Lopez**, H. Yan, X. Gu, Y. Kim, M.F. Toney, Z. Bao, *Electric field tuning molecular packing and electrical properties of solution-shearing coated organic semiconducting thin films*, **Advanced Functional Materials** (2017), vol. 27 (8), pp. 1605503.
13. X. Gu, H. Yan, T. Kurosawa, B.C. Schroeder, K.L. Gu, Y. Zhou, J.W.F. To, S.D. Oosterhout, V. Savikhin, **F. Molina-Lopez**, C.J. Tassone, S.C.B. Mannsfeld, C. Wang, M.F. Toney, Z. Bao, *Comparison of the morphology development of polymer-fullerene and polymer-polymer solar cells during solution-shearing blade coating*, **Advanced Energy Materials** (2016), vol. 6 (22), pp. 1601225.
14. A. Vásquez Quintero, **F. Molina-Lopez**, E.C.P. Smits, E. Danesh, J. van den Brand, K. Persaud, A. Oprea, N. Barsan, U. Weimar, N.F. de Rooij, D. Briand, *RFID label with printed multisensor platform for the monitoring of perishable goods*, **Flexible and Printed Electronics** (2016), vol. 1 (2), pp. 025003.
15. **F. Molina-Lopez**, D. Briand, N.F. de Rooij, *Inkjet and microcontact printing of functional materials on foil for the fabrication of pixel-like capacitive vapor microsensors*, **Organic Electronics** (2015), vol. 16, pp. 136-147.
16. **F. Molina-Lopez**, R.E. De Araujo, M. Jarrier, J. Courbat, D. Briand and N.F. de Rooij, *Study of bending reliability and electrical properties of platinum lines on flexible polyimide substrates*, **Microelectronics Reliability**, vol. 54 (11), pp. 2542-2549.

17. E. Danesh, **F. Molina-Lopez**, M. Camara, A. Bontempi, A. Vásquez Quintero, D. Teyssieux, L. Thiery, D. Briand, N.F. de Rooij, K.C. Persaud, *Development of a New Generation of Ammonia Sensors on Printed Polymeric Hotplates*, **Analytical Chemistry** (2014), vol. 86 (18), pp. 8951-8958.
18. J.F. Salmerón, **F. Molina-Lopez**, D. Briand, J.J. Ruan, A. Rivadeneyra, M.A. Carvajal, L.F. Capitan-Vallvey, N.F. de Rooij and A.J. Palma, *Properties and printability of inkjet and screen-printed silver patterns for RFID antennas*, **Journal of Electronic Materials** (2014), vol. 86 (18), pp. 604-617.
19. **F. Molina-Lopez**, D. Briand and N.F. De Rooij, *Decreasing the size of printed comb electrodes by the introduction of a dielectric interlayer for capacitive gas sensors on polymeric foil: Modeling and fabrication*, **Sensors and Actuators B: Chemical** (2013), vol. 189, pp. 89-96.
20. **F. Molina-Lopez**, T. Kinkeldei, G. Tröster, D. Briand, N.F. de Rooij, *Theoretical and experimental study of the bending influence on the capacitance of interdigitated micro-electrodes patterned on flexible substrates*, **Journal of Applied Physics** (2013), vol. 114, pp. 174907.
21. G. Mattana, T. Kinkeldei, D. Leuenberger, C. Ataman, J.J. Ruan, **F. Molina-Lopez**, A. Vásquez Quintero, G. Nisato, G. Tröster, D. Briand and N.F. de Rooij, *Woven temperature and humidity sensors on flexible plastic substrates for e-textile applications*, **IEEE Sensors Journal** (2013), vol. 13 (10), pp. 3901-3909.
22. **F. Molina-Lopez**, A. Vásquez Quintero, G. Mattana, D. Briand, N.F. de Rooij, *Large-area compatible fabrication and encapsulation of inkjet-printed humidity sensors on flexible foils with integrated thermal compensation*, **Journal of Micromechanics and Microengineering** (2013), vol. 23, pp. 025012.
23. **F. Molina-Lopez**, D. Briand and N.F. de Rooij, *All additive inkjet printed humidity sensors on flexible substrate*, **Sensors and Actuators B: Chemical** (2012), vol. 166-167, pp. 212-222.

## OTHER PERSONAL SKILLS

- Ability to adapt to **multicultural situations** acquired through working and living in many countries: Spain, Switzerland, Finland, USA and Belgium.
- Languages: Spanish (Native), **English** (Fluent), **French** (Fluent), German (Beginner), Mandarin (Beginner).
- Extracurricular activities: I have studied classical music for ten years, obtaining the certificate for intermediate level in piano from the Superior Conservatory of Music Victoria Eugenia of Granada (Spain).