

Martin Sauzade, Ph.D.

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- droplet microfluidics
- multiphase fluid physics
- lab-on-a-chip fabrication
- numerical simulations
- single-cell analysis
- cell encapsulation
- engineered microfluidics
- data processing
- surface science

SUMMARY

- Innovating engineer with 7+ years of research experience across microfluidics, with expertise in microfluidics for biological applications
- Proficient in designing, simulating and fabricating Lab-on-a-Chip systems
- Detail-oriented experimentalist with a profound understanding of multiphase fluid physics, surface science, and transport phenomena
- Experienced in cell imaging, fluid flow characterization, and high-speed imaging
- Proven lab leader with strong communication skills and extensive experience fostering a diverse and multidisciplinary team environment
- Adept at conveying complex technical information to both expert and lay audiences through papers, conference presentations, patent applications, seminars and workshops

RESEARCH EXPERIENCE

Postdoctoral Associate, Stony Brook University, Stony Brook NY 2014 - present

- Designed and produced a Lab-on-a-chip platform for true single cell encapsulation of precious samples using droplet microfluidics and cell manipulations, resulting in a publication and a provisional patent
- Developed a simple, broadly applicable fluid flow characterization method based on the 3D tracking of microbeads
- Supervised and trained 6 graduate students and 8 undergraduates for the conduct of independent research
- Co-managed laboratory installation and its day-to-day operation, including inventory management, equipment set-up and protocol writing
- Collaborated with researchers for the conception of a microfluidic chip for the high-throughput trapping of microorganisms

Graduate Research Assistant, Stony Brook University, Stony Brook NY 2011 - 2014

- Designed and conducted experiments to examine microfluidic multiphase flows using a high-speed imaging system, with an emphasis on bubble behavior
- Analyzed large datasets using custom-made image processing scripts in combination with theory and numerical modeling
- Led weekly recitation and bi weekly advisory sessions for Introduction to Fluid Mechanics class (64 students) and assisted students in Mechanical Engineering Laboratory II

- R&D Intern, European Aeronautic Defense and Space Company, France** 2011
- Cooperated with a team of engineers on a project focused on the integration of electrical wiring into the carbon fiber structure of planes
- Graduate Research Assistant, University of California San Diego, San Diego** 2009
- Investigated the dynamics of a swimming microorganism using applied mathematics
 - Resolved a fluid-structure interactions problem using a C/C++ code
- Research Assistant, ENSTA ParisTech, Paris** 2009
- Developed a model on COMSOL to study the effect of boundary conditions on the behavior of an elastic plate in a channel flow

PATENT

“Microfluidic device for true single-cell encapsulation,” Provisional patent.

EDUCATION

- Ph.D., Mechanical Engineering Department, Stony Brook University** 2014
- Thesis title: “Motion of bubbles in confined microgeometries: flow behavior and CO₂ dissolution regimes”
- M.S. in Engineering, ENSTA ParisTech, France** 2011

TECHNICAL SKILLS

- **Microfluidic chip design:** AutoCad, Draftsight, SolidWorks
- **Lab-on-a-chip fabrication:** multi-layer photolithography in clean room, soft lithography with PDMS, O₂ plasma activation, chip surface modification, microvalves
- **Molecular biology:** automated ultra-low volume liquid handling, mammalian cell culture, cell imaging, quantitative fluorescence imaging
- **Coding and numerical simulation:** ImageJ macros (over 10⁴ lines), COMSOL, C++, C, MATLAB, LabView, Python (basic)
- **Image acquisition and data processing:** high speed imaging, ImageJ, IgorPro
- **Business technology:** Microsoft Office (Word, Excel, PowerPoint), Adobe Photoshop, Inkscape (vector graphics software)

PUBLICATIONS

7. **Sauzade, M., & Cubaud, T.** (2017). Bubble deformation and segmented flows in corrugated microchannels at large capillary numbers, submitted.
6. **Sauzade, M., & Brouzes, E.** (2017). Deterministic trapping, encapsulation and retrieval of single-cells. *Lab on a Chip*, 17, 2186-2192.
5. **Sauzade, M., & Cubaud, T.** (2014). Bubbles in complex microgeometries at large capillary numbers. *Physics of Fluids*, 26(9), 091109.

4. **Sauzade, M.**, & Cubaud, T. (2013). Initial microfluidic dissolution regime of CO₂ bubbles in viscous oils. ***Physical Review E***, 88(5), 051001.
3. Cubaud, T., **Sauzade, M.**, & Sun, R. (2012). CO₂ dissolution in water using long serpentine microchannels. ***Biomicrofluidics***, 6(2), 022002.
2. **Sauzade, M.**, Elfring, G. J., & Lauga, E. (2011). Taylor's swimming sheet: Analysis and improvement of the perturbation series. ***Physica D: Nonlinear Phenomena***, 240(20), 1567-1573.
1. Doaré, O., **Sauzade, M.**, & Eloy, C. (2011). Flutter of an elastic plate in a channel flow: Confinement and finite-size effects. ***Journal of Fluids and Structures***, 27(1), 76-88.

CONFERENCE PRESENTATIONS

- Poster presentation, *Microfluidics, Physics & Chemistry of*, Gordon Research Conference, 2015, Mount Snow, VT.
- Oral presentation, *67th Annual Meeting of the American Physical Society's Division of Fluid Dynamics*, 2014, San Francisco, CA.
- Oral presentation, *2nd Northeast Complex Fluids and Soft Matter Workshop*, 2014, Rutgers University, NJ.
- Oral and poster presentations, *66th Annual Meeting of the American Physical Society's Division of Fluid Dynamics*, 2013, Pittsburgh, PA.
- Oral presentation, *Northeast Complex Fluids and Soft Matter Workshop*, 2013, The City College of New York, NY.
- Oral presentation, *65th Annual Meeting of the American Physical Society's Division of Fluid Dynamics*, 2012, San Diego, CA.

AWARDS

- 2nd place in the ***SBU Postdoc Spotlight***, a symposium of TED-like talks from postdoctoral associates on their research, Stony Brook University, 2016
- **Travel subsidy grant** awarded by the External Affairs Committee of the Division of Fluid Dynamics of the American Physical Society to attend conference as a presenter, 2014
- **Gallery of Fluid Motion Award**, American Physical Society, 2013, one of five winning posters out of hundreds of submissions
- **Best Poster Award**, Annual Student Research Poster Symposium, Stony Brook University, 2013

COMMUNICATION SKILLS

- Fluent in English, Native French, Intermediate Spanish
- Received specialized coaching lessons at the Alan Alda Center for Communicating Science, a center aimed at empowering scientists to communicate complex topics in clear, vivid, and engaging ways