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William S. Y. (Sai Yau) WONG

h-index: 23, citations: 1752 (Oct 2025), FWCI: 2.08

Marie-Curie (IF) / RCF Research Fellow, Applied Physics, Aalto University (E: william.wong@aalto.fi)

P: +358-0504625027 (O, FI) / +61-0449802940 (M, AU) **E (personal):** 1988williamwong@gmail.com
W: http://williamsywong.wix.com/bioinspiration **Nationality:** Singaporean.

Research Interests: Interfacial Physics and Engineering, Sustainable Chemistry, Soft Matter Physics, Energy-Passive Processes, Machine-Vision Aided Processes, AI-assisted Surface Engineering and Design.

Education and Research Experience

2018-2022 **Max Planck Institute for Polymer Research**, Mainz, Germany.
Marie-Curie ESR Postdoctoral Research Fellow (2019) | Final Year-PhD (2018).
Advisors: Prof. Dr. Doris Vollmer and Prof. Dr. Hans-Jürgen Butt.

2014-2018 **Australian National University**, Canberra, Australia.
28/08/2018 **Ph.D.**, Materials Engineering and Applied Physics
(Ph.D. awarded) Dissertation: Super(de)wettability *via* Scalable Hierarchical Surface Texturing
Advisors: Prof. Antonio Tricoli, Dr. Zbigniew Stachurski and Prof. Vincent Craig.

2009-2013 **National University of Singapore**, Singapore.
30/06/2013 **B.Eng.**, Chemical Engineering *(1st Class Hons.).*
(B.Eng. awarded) Dissertation: Tough Hybrid Composite Polymers for Anti-Scratch Purposes

Awards and Grant Funding

2022 **Emerging Investigator Award, 17th International Conference of IACIS**
- International Association of Colloid and Interface Scientists.

2022 **Research Council of Finland (RCF) Research Fellowship**
- **(PI)** 3 years: 450,000 €.
- Topic: Developing Sustainable Surface Chemistries. Objectives completed.

2022 **Marie Skłodowska-Curie (MSCA) Independent Fellowship (IF)**
- Evaluation: 100/100, Top 1% of all proposals.
- **(PI)** 2 years: 200,000 €.
- Topic: Developing Membraneless Electrolyzers. WP3/WP4 completed.

2018 **Marie Skłodowska-Curie Early-Stage Researcher (ESR) Fellowship**
- **(co-I)** 3 years: 218,000 €.
- Topic: Enhancing Durability of Liquid-Infused Surfaces. Objectives completed.

2017 **ANU Discovery Translation Fund 2.0 (DTF238)**
- **(PI)** 6 months: 50k AUD. ARC Linkage Project (ARC LP17, 2018).
- Topic: Developing Liquid Repellent Glass. Objectives completed.

2016 **"Science as Art" Award, Materials Research Society**

2016 **Graduate Student Award (Silver) with Travel Support, Materials Research Society**

2016 **Australian National University Media and Outreach Awards**

2016 **Treloar Prize for Best Oral Presentation, 36th Australasian Polymer Symposium**

2016 **Australian National University Vice-Chancellor's HDR Travel Grant**

2014 **Australian National University Research Scholarship**
- **(PI)** Ph.D. fellowship (4 years): 128k AUD. Objectives completed.

2014 **Australian National University Higher Degree (Research) Merit Scholarship**
- **(PI)** Fee waiver (4 years): 184k AUD. Objectives completed.

2013 **National University of Singapore Outstanding Undergraduate Researcher Prize**
- One of two awardees, Department of Engineering (> 1000 students).

2013 **Faculty of Engineering High Achievement Award (Innovation & Research)**
- Best project selected from the class of 2012/2013, ChBE (300 students).

2011/12 **National University of Singapore Faculty of Engineering Dean's List**

Teaching Experience, Research Supervision, and Professional Duties

Teaching Experience:

1. **Lecturer:** Co-lecturer of Soft Matter Physics, Topic: Wetting, Surfactants, Sustainable Chemistry, and Biomimetics, 30 students (M.Sc. and Ph.D. level, Aalto University, 80 hours). **Duties:** Designed topic, lectured, and planned out lab session on pairing imaging and computational analysis (PHYS-E0422). **Course grading:** 4.6/5.
2. **Lecturer:** Guest lecturer of Surface Chemistry, Topic: Surface Thermodynamics, 70 students (B.Sc. level, Aalto University, 35 hours). **Duties:** Designed topic, lectured, and provided in-class demonstrations (CHEM-C2230).
3. **Course Tutor:** Physics of Interfaces, 15 students (M.Sc. level, Johannes Gutenberg University, 20 hours). **Duties:** Assisted in course curriculum and in-class experimental designs, primarily in the topic of surface tension.

Research Supervision:

Summary: Postdoctoral researchers: **3**. Ph.D. students (w/ co-supervision): **9**. M.Sc. students: **2**. B.Sc./B.Eng. students: **8**. Breakdown: Aalto University, 3 Ph.D., 1 M.Sc., and 3 postdoctoral researchers; Max Planck Institute, 1 M.Sc., 3 Ph.D. (internal) + 3 Ph.D. (external) students; Australian National University, 6 B.Eng. students; National University of Singapore, 2 B.Eng. students.

Reviewer Duties (64 manuscripts total: *indicates multiple):

Nature, Joule*, Advanced Functional Materials*, ACS Nano*, Advanced Science*, Nature Communications*, Journal of Materials Chemistry A*, Journal of Colloid and Interface Science, Colloids and Surfaces A*, ACS Sustainable Chemistry & Engineering, ACS Applied Materials & Interfaces*, Langmuir*, RSC Advances*, Soft Matter*, Scientific Reports*, Advanced Materials Interfaces*, Surfaces and Interfaces*, Cell Physical Reports, Droplets, Polymer Bulletin, Journal of Environmental Chemical Engineering, Advanced Industrial and Engineering Polymer Research, ACS Omega, Materials, Journal of Sol-Gel Science and Technology, Coatings*, IEEE Sensors Journal.

Conference Organization:

1. **Liquid Matter Conference**, Mainz, Germany. Sep 2024.
   - Primary chair of session: “Liquid matter for energy and environment”.
2. **Hereaus Seminar**, Bad Honnef, Germany. Apr 2019.
   - Reviewed abstracts and determined suitability for poster/oral presentation.
3. **Zsigmondy Colloquium of the German Colloid Society**, Mainz, Germany. Apr 2018.
   - Reviewed abstracts and determined suitability for poster/oral presentation.
   - Session chair for plenary and symposium sessions and organized a tour.

Conference Presentations (Invited only)

1. (Oral, Invited) 3D Bubble and Foam Absorbers: Designing Membrane-Free Electrolyzer Cells. **Micro and Nano Flows Conference 2025**, Edinburgh, United Kingdom, Sep 2025.
2. (Oral, Invited) Understanding Surface-Induced Bubble Coalescence and Absorption. **International Youth Conference of Bionic Science and Engineering 2024**, Nanjing, China, Sep 2024.
3. (Oral, Invited) Designing and Understanding the Limits of Fluoro-Free Super Liquid Repellency. **International Symposium on Superwettability**$^{+}$, Singapore, Jan 2024.
4. (Oral, Invited) Popping Bubbles: Surface-Enhanced Foam Control. **N.I.C.E. (Nature Inspires Creativity Engineers) Winter Conference**, Nice, France. Dec 2022.
5. (Oral, Invited) Popping Bubbles: Surface-Enhanced Foam Control. **International Association of Colloid and Interface Scientists (IACIS)**, Queensland, Australia. June 2022.
6. (Oral, Invited) Cryofouling Avoidance in Antarctic Scallops. **Materials Research Society (MRS) Fall Meeting and Exhibit**, Boston, Massachusetts, USA. Dec 2021.

7. (Oral, Invited) Capillary Balancing: Designing Frost-Resistant Lubricant-Infused Surfaces. **Materials Research Society (MRS) Fall Meeting and Exhibit**, Boston, Massachusetts, USA. Dec 2021.
8. (Oral, Invited) Epidermis-Inspired Structurally Robust Superhydrophobicity. **The Oil and Colour Chemists' Association (OCCA) National AGM 2018**, Leeds, United Kingdom. Sep 2018.
9. (Oral, Invited) Special Talks Session: Wettability: From Liquid-Repellency to Self-Assembly. **Materials Research Society (MRS) Fall Meeting and Exhibit**, Boston, Massachusetts, USA. Dec 2016.

University Seminars (Invited only)

1. Microstructuring for Passive Anti-Foaming. **Chalmers University**, Gothenburg, Sep 2024.
2. Surface Chemistry in Enabling Liquid Repellency. **Durham University**, Durham, July 2023.
3. Surface Chemistry for Tuning Triboelectrification. **Sydney University**, Sydney, July 2022.
4. Surface Engineering Enhanced Foam Control. **Macquarie University**, Sydney, July 2022.
5. Enabling Fluoro-Free Liquid Repellency. **Nanyang Technological University**, Singapore, July 2021.
6. Capillary-Balancing: Frost Resistant Surfaces. **University of British Columbia**, Vancouver, Jan 2021.

Patents

1. US Patent ID: US11566148B2, **Wong, W. S. Y.**, Stachurski Z. H., Nisbet D. R., and Tricoli, A. Durable and Transparent Self-Cleaning Surfaces through Hierarchical Interpenetrated Polymer Networks.
2. US Patent ID: US10851260B2, Hong, L., Tay, S. W., and **Wong, W. S. Y.** Anti-Scratch Coating Composed of Two Interlocked Hybrid Polymer Networks with Chain-To-Particle Connection.
3. WIPO Patent ID: WO/2016/149735, **Wong, W. S. Y.**, Craig, V. S. J., and Tricoli, A., Highly Adhesive Superhydrophobicity and the Ideal Rose Petal Effect.

Industrial Consulting:

1. Nanostratus (Australia): Co-founder and Technological Consultant for Surface Engineering.
2. Amphico (United Kingdom): Fluoro-free and Sustainable Surfaces for Waterproofed Textiles.
3. AB InBev (Belgium): Anti-foaming Surfaces for Enhanced Beer Processing.
4. Carl Zeiss (Australia): Transparent and Highly Liquid Repellent Surfaces.
5. KRÜSS (Germany): Contact-free Drop Manipulation Devices.
6. Hisense (China): Liquid-Repellent Surfaces for Oil Splatter Management.
7. Huawei (China): Anti-Fingerprint Surfaces *via* Heterogenous Surface Texturing.

References: (* Denotes Field-Specific Advisors)

Postdoctoral supervisors (Max Planck Institute for Polymer Research, Mainz, Germany):

1. **Professor Doris Vollmer (E: vollmerd@mpip-mainz.mpg.de, T: +49-0-6131/379-113)*
2. **Professor Hans-Jürgen Butt (E: butt@mpip-mainz.mpg.de, T: +49-0-6131-379-111)*

Ph.D. supervisors (Australian National University, Canberra, Australia):

3. **Professor Vincent Craig (E: vince.craig@anu.edu.au, T: +61 2 6125 3359)*
4. Professor Antonio Tricoli (E: antonio.tricoli@anu.edu.au, T: +61 2 6125 1696)
5. Dr. Zbigniew Stachurski (E: zbigniew.stachurski@anu.edu.au, T: +61 2 6125 5681)

Full Publication List (†first authorship, *corresponding authorship)

Research Articles (peer-reviewed): Publications are largely open-access (hyperlinks in titles), and are also available on my ResearchGate profile. Publications are listed with the degrees of contribution (minor, at < 50% and major, at ≥ 50%):

1. **Wong, W. S. Y.***, Fu, W., Nallukunnel-Raju, E. M., Koochak, P., Vuckovac, M., Ang, E. H. A., Vollmer, D., and Liu, G. Designing Efficient Membrane-Free Electrolyzers *via* Bubble and Foam Absorbers. **(2025, under Review).** Developed a novel membrane-free electrolyzer design incorporating bubble- and foam-absorbing surfaces, significantly enhancing gas separation and ionic transport for energy-efficient hydrogen production. Contribution: Experimental design (major), analytics (major), and theory (major).

2. Koochak, P., Liu, K., and **Wong, W. S. Y.*** Rolling and Impacting Caustic Drops: In Situ Force and Energy Monitoring of Surface Degradation. *Advanced Functional Materials* **2025 (Accepted, *In Press*).** Established a methodology to quantify real-time forces and energy dissipation during caustic liquid impact on reactive surfaces, revealing mechanistic insights into surface degradation and durability. Contribution: Experimental design (major), analytics (major), and theory (major).

3. Koochak, P., Lin, M., Afzalifar, A., Hashemi, A., Arunachalam, S., Shoaib, A., Turkki, V., Ala-Nissila, T., Daniel, D., Vuckovac, M., and **Wong, W. S. Y.*** Self-Accelerating Drops on Silicone-Based Super Liquid Repellent Surfaces. *ACS Nano* **2025**, *19*, 23105. Described the sustainable design of next-generation superhydrophobic surfaces with surface charge suppression properties, leading to rapidly moving liquid drops exhibiting highly unique mobility-charge dynamics. Contribution: Experimental design (major), analytics (major), and theory (major).

4. Fauconnier, M., Karunakaran, B., Drago-González, A., **Wong, W. S. Y.**, Ras, R. H. A., and Nieminen H. J. Fast Capillary Waves on an Underwater Superhydrophobic Surface. *Nature Communications* **2025**, *16*, 1568. Described the behavior of how ultrasound interacts with an underwater superhydrophobic surface, of which pinned contact lines of a plastron generates much faster capillary wave motions. Contribution: Experimental design (minor) and theory (minor).

5. Koochak, P., Kiseleva, M. S., Lepikko, S., Latikka, M., Ras, R. H. A., and **Wong, W. S. Y.*** Smoothening Perfluoroalkylated Surfaces: Liquid-Like despite Molecular Rigidity? *Advanced Materials Interfaces* **2024**, 2400619. Designed and tuned the use of controlled / ambient moisture exposure for modifying molecular-level smoothness of molecular surfaces that are known for inherent roughness. Showcased the use of such surfaces for tuning condensation / heat transfer applications. Contribution: Experimental design (major), analytics (major), and theory (major).

6. Ma, J., Zhang, C., **Wong, W. S. Y.***, and Song, J.* Facile, Scalable and Substrate-Independent Omniphobic Surface. *Applied Surface Science* **2024**, *682*, 161726. Designed an omniphobic surface that is independent of substrate, ambient self-curing, and durable under harsh exposure conditions. Contribution: Experimental design (minor), analytics (major).

7. Naga, A., Rennick, M., Hauer, L., **Wong, W. S. Y.**, Vollmer, D, and Kusumaatmaja, H. Direct Visualization of Viscous Dissipation and Wetting Ridge Geometry on Lubricant-Infused Surfaces. *Communications Physics* **2024**, *7*, 306. Described the impact of location-dependent viscous dissipation under a drop moving on a lubricant-infused surface. Contribution: Experimental (minor) and theory (minor).

8. Hauer, L., Naga, A., Rodrique, Badr., Pham, Jonathan T., **Wong, W. S. Y.**, and Vollmer, D. Wetting on Silicone Surfaces. *Soft Matter* **2024**, *20*, 5273. Reviewed the state-of-the-art understanding of silicone-based surfaces and their wetting behaviors. These surfaces are set to replace the use of unsustainable fluorinated materials for liquid management in the 21st century. Contribution: Literature review on characterization methods and self-assembled PDMS-based SOCALs (major).

9. **Wong, W. S. Y.***, Naga, A., Neef, Tobias, Karunakaran, B., Poulikakos, D., and Ras R. H. A. Designing Plastrons for Underwater Bubble Capture: From Model Microstructures to Stochastic Nanostructures. *Advanced Science* **2024**, *11*, 2403366. Designed plastrons using model microstructures for investigating principles in underwater bubble capture, including the onset of rupture and subsequent absorption. Defined core design principles for enabling rapid bubble

capture and illustrated why nano-structuring still dominates the state-of-the-art. Contribution: Experimental design (major), analytics (major), and theory (major).

10. Drago-González, A., Fauconnier, M., Karunakaran, B., **Wong, W. S. Y.**, Ras R. H. A., and Nieminen H. J. Ultrasonic Healing of Plastrons. *Advanced Science* **2024**, *11*, 2403028. Described how ultrasound is used as a non-invasive and rapid tool for the recovering the Cassie-Baxter state from a completely wetted Wenzel state. Demonstrated non-contact bubble manipulation. Contribution: Experimental design (minor), analytics (minor), and theory (minor).

11. **Wong, W. S. Y.***, Kiseleva M. S., and Naga, A. Polarity-Induced Reactive Wetting: Spreading and Retracting Sessile Water Drops. *Langmuir* **2024**, 40, 13562. Designed a surface that is capable of autophobic dewetting *via* the use of polarity-induced reactive wetting principles. Contribution: Experimental design (major), analytics (major), and theory (major).

12. **Wong, W. S. Y.***, Kiseleva M. S., Zhou S., Junaid M., Pitkänen L., and Ras R. H. A.* Design of Fluoro-Free Surfaces Super-Repellent to Low-Surface-Tension Liquids. *Advanced Materials* **2023**, 35, 2300306. Designed and tuned theoretical-to-empirical phase diagrams that shows and predicts how low surface tension aqueous based liquids can be easily repelled from nanostructured surfaces without the use of environmentally-pollutive fluoroalkylated materials. Contribution: Experimental design (major), analytics (major), and theory (major).

13. **Wong, W. S. Y.***, Bista, P., Li, X., Veith, L., Sharifi-Aghili, A., Weber, S. A. L. and Butt, H-J.* Tuning the Charge of Sliding Water Drops. *Langmuir* **2022**, 38, 6224. Designed and tuned the surface chemistry of surfaces to induce dynamic (positive and negative) and adaptive (positive-to-negative, and reversible) drop slide charging. Contribution: Experimental design (major), analytics (major), and theory (major).

14. **Wong, W. S. Y.**, Hauer, L., Cziko, P. and Meister, K. Cryofouling avoidance in the Antarctic Scallops Adamussium colbecki. *Communications Biology* **2022**, *5*, 83. Described the biological origin behind underwater anti-icing properties of the Antarctic Scallop in a supercooled underwater environment, providing future roadmaps for the design of next-generation submerged anti-icing surfaces. Contribution: Experimental design (major), analytics (major), and theory (major).

15. Wang, W., Gu, W., Liu, P., Liu, J., Wang X., Liu J., Yu X.*, **Wong, W. S. Y.*** and Zhang, Y.* Heterogeneously-wetting glass with enhanced anti-fingerprint properties. *Chemical Engineering Journal* **2021**, *430*, 132902. Designed next-generation anti-fingerprint surfaces, inspired by the stenocara beetle's shell's unique micromorphology. Contribution: Experimental design (minor), analytics (major), and theory (major).

16. **Wong, W. S. Y*** and Vollmer, D.* Effervescence-Inspired Self-Healing Plastrons for Long-Term Immersion Stability. *Advanced Functional Materials* **2021**, 32, 2107831. Designed self-healing plastrons in submerged surfaces *via* on-demand triggering of effervescence reactions for long-term immersion stability. Contribution: Experimental design (major), analytics (major), and theory (major).

17. Hauer, L., **Wong, W. S. Y.**, Sharifi-Aghili, A., Kondic, L. and Vollmer, D.* Frost Spreading and Pattern Formation on Microstructured Surfaces. *Physical Review E* **2021**, *104*, 044901. Described the behavior of frost growth and propagation on structured surfaces under varying environmental exposure. Contribution: Experimental design (major), experiments (minor), analytics (minor).

18. **Wong, W. S. Y.*,** Naga, A., Hauer, L., Baumli, P., Bauer, H., Hegner, K. I., D'Acunzi, M., Kaltbeitzel, A., Butt, H-J. and Vollmer, D.* Super Liquid Repellent Surfaces for Anti-Foaming and Froth Management. *Nature Communications* **2021**, *12*, 5358. Designed super-liquid-repellent surfaces that are demonstrated for energetically passive anti-foaming. Contribution: Experimental design (major), analytics (major), and theory (major).

19. Liu, G., **Wong, W. S. Y.**, Kraft, M., Ager, J. W., Vollmer, D. and Xu, R. Wetting-Regulated Gas-Involving (Photo)electrocatalysis: Biomimetics in Energy Conversion. *Chemical Society Reviews* **2021**, *50*, 10674-10699. Reviewed the state-of-the-art in the novel and interdisciplinary field of wettability-electrocatalysis. Contribution: Literature review on wettability and theory (major).

20. Hegner, K. I., **Wong, W. S. Y.*** and Vollmer, D.* Ultrafast Bubble Bursting by Superamphiphobic Coatings. *Advanced Materials* **2021**, *33*, 2101855. Designed optimal flame spray pyrolysis

processes for enabling ultra-fast bubble rupturing. Contribution: Experimental design (major), analytics (major), and theory (major).

21. Lowe, A, **Wong, W. S. Y.**, Tsyrin, N., Chorążewski, M., Zaki, A., Geppert-Rybczyńska, M., Stoudenets, V., Tricoli, A., Faik, A. and Grosu, Y. Effect of Surface Entropy on Heat of Non-Wetting Liquid Intrusion into Nanopores. *Langmuir* **2021**, *37*, 4827-4835. Described the use of intrusion pressure for energy storage in superdewetting materials (superhydrophobic/superamphiphobic). Contribution: Experimental design (major), analytics (major), and theory (minor).

22. Hauer, L.[†], **Wong, W. S. Y.**[†], Donadei, V., Hegner, K. I., Kondic, L. and Vollmer, D. How Frost Forms and Grows on Lubricated Surfaces. *ACS Nano* **2021**, *15*, 4658-4668. Described how frost formation on lubricant-infused surfaces can induce capillary drainage of lubricants *via* a propagating frost front. Contribution: Experimental design (major), analytics (major), and theory (major).

23. Naga, A., Kaltbeitzel, A., **Wong, W. S. Y.**, Butt, H-J. and Vollmer, D. How a Water Drop Removes a Particle from a Hydrophobic Surface. *Soft Matter* **2021**, *17*, 1746-1755. Described how solids are typically removed from a hydrophobic surface *via* contact line dynamics. Contribution: Experimental design (minor), analytics (minor), and theory (minor).

24. Baumli, P., D'Acunzi, M., Hegner, K. I., Naga, A., **Wong, W. S. Y.**, Butt, H-J. and Vollmer, D. The Challenge of Lubricant-Replenishment on Lubricant-Impregnated Surfaces. *Advances in Colloid and Interface Science* **2020**, *287*, 102329. Reviewed the state-of-the-art techniques in fabricating and maintaining functionality of lubricant-infused surfaces under harsh drainage conditions. Contribution: Literature review and theory (minor).

25. **Wong, W. S. Y.***, Hegner, K. I., Donadei, V., Hauer, L., Naga, A. and Vollmer, D.* Capillary Balancing: Designing Frost-Resistant Lubricant-Infused Surfaces. *Nano Letters* **2020**, *20*, 8508-8515. Designed the use of dense interstitial spacing for enhancing lubricant retention in lubricant-infused surfaces during contact with micro/nano-metric frost. Contribution: Experimental design (major), analytics (major), and theory (major).

26. Jiao, X., Li, M., Yu, X., **Wong, W. S. Y.*** and Zhang, Y.* Oil-Immersion Stable Superamphiphobic Coatings for Long-term Super Liquid-Repellency. *Chemical Engineering Journal* **2020**, *420*, 127606. Designed dense interstitial spacing for long-term oil-immersion stability of superamphiphobic coatings. Contribution: Experimental design (minor), analytics (major), and theory (major).

27. **Wong, W. S. Y.**, Hauer, L., Naga, A., Kaltbeitzel, A., Baumli, P., D'Acunzi, M., Berger, R., Vollmer, D. and Butt, H-J. Adaptive Wetting of Polydimethylsiloxane. *Langmuir* **2020**, *36*, 7236-7245. Described the intriguing phenomenon of wetting-adaptation in common elastomeric PDMS when exposed to water. Contribution: Experimental design (major), analytics (major), and theory (major).

28. **Wong, W. S. Y.***, Corrales, T. P., Naga A., Baumli P., Kaltbeitzel A., Kappl M., Papadopoulos P., Vollmer, D. and Butt, H-J.* Microdroplet Contaminants: When and Why Superamphiphobic Surfaces are Not Self-Cleaning. *ACS Nano* **2020**, *14*, 3836-3846. Described the length-scales and conditions under which superamphiphobic surfaces remain "self-cleaning". Contribution: Experimental design (major), analytics (major), and theory (major).

29. **Wong, W. S. Y.***, Surface Chemistry Enhancements for the Tunable Super Liquid Repellency of Low Surface Tension Liquids. *Nano Letters* **2019**, *19*, 1892-1901. Designed and tuned extreme surface chemistry grafting that can achieve functional superamphiphobicity without explicitly re-entrant structures. Contribution: Experimental design (major), analytics (major), and theory (major).

30. **Wong, W. S. Y.*** and Tricoli, A.*, Cassie-Levitated Droplets for Distortion-Free Low Energy Solid-Liquid Interactions. *ACS Applied Materials and Interfaces* **2018**, *10*, 13999-14007. Designed a method to drastically enhance accuracy of dynamic contact angle measurements with low surface tension liquids. Contribution: Experimental design (major), analytics (major), and theory (major).

31. **Wong, W. S. Y.**, Gengenbach, T., Nguyen, H. T., Gao, X., Craig, V. S. J. and Tricoli, A., Dynamically Gas-Phase Switchable Super(de)Wetting States by Reversible Amphiphilic Functionalization: A Powerful Approach for Smart Fluid Gating Membranes. *Advanced Functional Materials* **2017**, *28*, 1704423. Designed a remotely operated gas-phase reversible hydrophobic-to-hydrophilic

functionalization of porous membranes for energy-passive fluid gating operation. Contribution: Experimental design (major), analytics (major), and theory (major).

32. **Wong, W. S. Y.**, Liu, G. and Tricoli, A., Superamphiphobic Bionic Proboscis for Contamination-Free Manipulation of Nano- and Core-Shell Droplets. *Small* **2017**, *13*, 1603688. Designed droplet tweezers for nano-/micro-droplet production and manipulation. Contribution: Experimental design (major), analytics (major), and theory (major).

33. **Wong, W. S. Y.**, Liu, G., Nasiri, N., Hao, C., Wang, Z. and Tricoli, A., Omnidirectional Self-Assembly of Transparent Superoleophobic Nanotextures. *ACS Nano* **2016**, *11*, 587-596. Designed and optimized flame spray pyrolysis processes for achieving explicitly formed re-entrant structures in stochastically assembled superamphiphobic coatings. Contribution: Experimental design (major), analytics (major), and theory (major).

34. **Wong, W. S. Y.**, Li, M., Nisbet, D. R., Craig, V. S. J., Wang, Z. and Tricoli, A., Mimosa Origami: a Nanostructure-enabled Directional Self-Organization Regime of Materials. *Science Advances* **2016**, *2*, e1600417. Designed energy-passive, self-assembling, self-pumping capillary microchannels by coupling capillarity bending and capillary flow forces. Contribution: Experimental design (major), analytics (major), and theory (major).

35. **Wong, W. S. Y.**, Stachurski Z. H., Nisbet D. R. and Tricoli, A., Ultra-Durable and Transparent Self-Cleaning Surfaces by Large-Scale Self-Assembly of Hierarchical Interpenetrated Polymer Networks. *ACS Applied Materials and Interfaces* **2016**, *8*, 13615-13623. Designed a sprayable binder from interpenetrated polymer networks for stabilizing fragile nanostructured coatings for highly durable superhydrophobic surfaces. Contribution: Experimental design (major), analytics (major), and theory (major).

36. Vahidi, A. K., Wang, Z., **Wong, W. S. Y.** and Li, Z., Immobilization of O-Acetylserine Sulfhydrylase as Highly Active and Recyclable Nanobiocatalyst: Efficient Synthesis of beta-Pyrazol-1-yl-L-alanine. *Catalysis Science and Technology* **2016**, *6*, 6286-6293. Designed enzymatically active magnetic nanoparticles *via* the immobilization of active enzymes for recyclable synthesis of drug precursors. Contribution: Experimental design (major), analytics (minor), and theory (minor).

37. Liu, G., **Wong, W. S. Y.**, Nasiri, N. and Tricoli, A., Ultraporous Superhydrophobic Gas-Permeable Nano-Layers by Scalable Solvent-Free One-Step Self-Assembly. *Nanoscale* **2016**, *8*, 6085-6093. Designed a fluoro-free, one-step method for synthesizing fractal superhydrophobic surfaces. Contribution: Experimental design (major), analytics (major), and theory (major).

38. **Wong, W. S. Y.**, Gutruf, P., Sriram, S., Bhaskaran, M., Wang Z. and Tricoli, A., Strain Engineering of Wave-like Nanofibers for Dynamically Switchable Adhesive/Repulsive Surfaces. *Advanced Functional Materials* **2016**, *26*, 399-407. Designed strain-reversible straight-to-wavy nanofibers for achieving tunable sticky hydrophobic to non-adhesive superhydrophobic surfaces. Contribution: Experimental design (major), analytics (major), and theory (major).

39. **Wong, W. S. Y.**, Nasiri, N., Liu, G., Rumsey-Hill, N., Craig, V. S. J., Nisbet, D. R. and Tricoli, A., Flexible Transparent Hierarchical Nanomesh for Rose Petal-Like Droplet Manipulation and Lossless Transfer. *Advanced Materials Interfaces* **2015**, *2*, 1500071. Designed a drop manipulation system with near-lossless drop transfer capabilities. Contribution: Experimental design (major), analytics (major), and theory (major).

40. **Wong, W. S. Y.**, Nasiri, N., Rodriguez, A. L., Nisbet, D. R. and Tricoli, A., Hierarchical amorphous nanofibers for transparent inherently super-hydrophilic coatings. *Journal of Materials Chemistry A* **2014**, *2*, 15575-15581. Designed a regime of superhydrophilic titania surfaces that does not rely on UV-activation, but meso- and nano-porosity for enhanced wicking properties. Contribution: Experimental design (major), analytics (major), and theory (major).

Book Chapter:

41. **Wong, W. S. Y.*** and Tricoli, A., Multi-Scale Engineering and Scalable Fabrication of Super(de)wetting Coatings. *Advanced Coating Materials* **2018**, Wiley-Scrivener, *13*, 394-457. Reviewed techniques to realize multiple states of superwettability based on scalable techniques. Contribution: Literature review and theory (major).