

ORCID ID: 0000-0002-5170-6412

Webpage: <https://www.epfl.ch/labs/las/>

Date of Birth: 12.23.1984



Research Interest

Scalable material chemistry & engineering at the Å length-scale for high-performance inorganic & hybrid membranes for energy-efficient molecular separation and manipulation

Education

Ph.D., Chemical Engineering, University of Minnesota, Minneapolis, MN, USA 2008-2013
Advisors: Prof. Michael Tsapatsis, Prof. Lorraine F. Francis

B. Tech., Chemical Engineering, IIT Bombay, Mumbai, India 2001-2005
(Institute Silver Medal (department rank 1))

Professional Experience

Associate Professor, GAZNAT Chair for Advanced Separations 2023 - Present
École Polytechnique Fédérale de Lausanne (EPFL), Switzerland

Co-founder and Board Member
Divea (startup on graphene membrane for carbon capture) 2024 - Present

Assistant Professor, GAZNAT Chair for Advanced Separations 2016- 2022
École Polytechnique Fédérale de Lausanne (EPFL), Switzerland

Postdoctoral Research Assistant 2014 –2016
Massachusetts Institute of Technology (MIT), Department of Chemical Engineering, USA
Advisor: Prof. Michael S. Strano

Postdoctoral Research Assistant 2013 - 2014
University of Minnesota, Department of Chemical Engineering & Material Science, USA
Advisor: Prof. Michael Tsapatsis

Engineer 2005 - 2008
Procter & Gamble, Global Hair Care R&D, Kobe, Japan

Publications

Google Scholar: <https://scholar.google.com/citations?user=uBT9VEEAAA&hl=en&oi=ao>

Publications at EPFL

1. Mamaghani, M. F., Micucci, D., Bempeli, S., Sachar, S., Detrois, Y., Singh, H. D., W. Queen, K. V. Agrawal, M. Micari*, "Optimization of Hybrid Direct Air Capture unlocks economically feasible process configurations", preprint at **ChemRxiv** doi: [10.26434/chemrxiv-2025-mv536](https://doi.org/10.26434/chemrxiv-2025-mv536)
2. Y. Shen, C. V. Goethem., H.-Y. Chi, Y. Li, K.-J. Hsu, S. Huang*, K. V. Agrawal*, "Oxygen-induced structural hierarchy in 10-nm-thick carbon membranes for high-performance hydrogen separation, preprint at **ChemRxiv** doi: [10.26434/chemrxiv-2025-cdw10](https://doi.org/10.26434/chemrxiv-2025-cdw10)
3. L. Bondaz, A. Ronghe, G. Ayappa*, K. V. Agrawal*, "Decisive role of pore edge termination in determining the CO₂ selectivity of Å-scale pores in graphene", preprint at **ChemRxiv**. doi: [10.26434/chemrxiv-2026-trxcq](https://doi.org/10.26434/chemrxiv-2026-trxcq)

4. X. Duan, S. Song, C. Besnard, P. A. Schouwink, Y. Shen, H.-Y. Chi, J. Hao, L. Piveteau, K.V. Agrawal*, "Layered ZIFs Using a Surfactant as a Structure Directing Agent", **JACS** 2026.
5. H. Fan, M. Parkinson, K.V. Agrawal, M. Barboiu, L. Bocquet, B. A. Getachew, Q. Li, Y. Li, S. Lin, C. Liu, A. Noy, R. Boya, D. Schwahn, A. Szymczyk, M. Elimelech* "A multiscale perspective for understanding transport mechanisms in desalination and ion-selective membranes", **Nature Water** 2026.
6. S. Song, C. Kocaman, A. Basil, J. Hao, S. Wang, K. V. Agrawal*, "Uniform in-plane growth of large-area ultrathin Zn₂(benzimidazole)₄ membrane", **Advanced Functional Materials**, 36, 11, 2026.
 - Invited article in Advanced Functional Materials
 - Featured on the cover page.
7. M. Micari*, K.-J. Hsu, S. Bempeli, K. V. Agrawal*, "Energy- and Cost-Efficient Carbon Capture from Dilute Emissions Using Pyridinic-Graphene Membranes", **Nature Sustainability**, 9, 164–175 2026.
8. Hsu, K. J., Micari, M., Shen, Y., Li, S., Song, S., & Agrawal, K. V. (2025). Tuning Pore Size in Porous Graphene Membrane for O₂/N₂ Separation, **Advanced Materials**, e19645, 2026.
9. K. Černevičs, L. Bondaz, K. V. Agrawal*, O. Yazyev*, "Mechanistic insights into oxidation-induced carbon vacancy formation in graphene". **Cell Reports Physical Science**, 6, 12, 2025.
10. C. Kocaman, L. Bondaz, Y. Shen, M. Chevalier, J. Hao, M. Mensi, K. V. Agrawal*, "Scalable room temperature incorporation of CO₂-selective ångström-scale pores in graphene for carbon capture", **Nature Communications**, 16, 10380, 2025.
11. X. Duan, Y. Shen, K. V. Agrawal*, "Facile Synthesis of 20-Nm-Thick ZIF-67 Films for Hydrogen Sieving Using β-Co(OH)₂ Precursor Nanosheets". **Angewandte Chemie International Edition**, e202516048, 2025.
12. G. He*, Q. Pan, Z. Yuan, L.F. Villalobos, J. Park, H.-Y. Chi, M. Kuehne, Y. Zeng, Y. Tu, J. Zhao, J. Kong, Z. Jiang*, K. V. Agrawal, D. Blankschtein, M. S. Strano, "Ångström-Scale Triangular Pore in Single-Layer Hexagonal Boron Nitride Membrane for Molecular Sieving". **Angewandte Chemie International Edition**, e202514288., 2025
13. Y. Miao, S. Zheng, K. E. Waltz, M. Ahmad, Y. Zhou, J. A. Boscoboinik, Q. Liu, K. V. Agrawal, L. Zhuang*, M. Tsapatsis*, "Spin-on Deposition of Amorphous Zeolitic imidazolate Framework (aZIF) Films for Lithography Applications", **Nature Chemical Engineering**, 2, 594–607, 2025.
14. L. Bondaz, A. Ronghe, K. G. Ayappa*, K. V. Agrawal*, "Gated CO₂ Permeation across Dynamic Graphene Pores", **Nature Communications**, 16, 6252, 2025.
15. T. Schertenleib, M. Asgari*, B. Mourino, V. V. Karve, T. Felder, D. Stoian, V. Bon, J. Hao, A. Ortega-Guerrero, E. Oveisi, K. V. Agrawal, B Smit, S. Kaskel, S. Billinge, W. L. Queen*, "Anisotropic node distortions in amorphous MOFs: Low-valent Zr sites as catalytic hotspots", **Chem**, 11, 102619, 2025.
16. K.-J. Hsu, H.-Y. Chi, Y. Shen, S. Huang, R. Goswami, K. V. Agrawal*, "Modulation of Graphene Oxidation Using Substrate-Induced Electron-Hole Puddles Advancing Molecular Separation", **Advanced Functional Materials**, 2503121, 2025.

17. J. Hao, P. Gebolis, P. Gach, M. Chevalir, L. S. Bondaz, C. Kocaman, K.-J. Hsu, K. Bhorkar, D. J. Babu, K. V. Agrawal*, "Scalable Synthesis of CO₂-Selective Porous Single-Layer Graphene Membranes", **Nature Chemical Engineering**, 2, 241–251, 2025.
 - Highlighted on the front cover page with cover page graphics.
18. K. V. Agrawal*, G. Liu*, S. Zhang*, "Advancing membrane science via two-dimensional materials", **Journal of Membrane Science**, 726, 124012, 2025.
 - Editorial with Agrawal as Executive Guest Editor to the special issue on 2D Membranes for Molecular Separation
19. Z. Dai, P. Jin*, S. Yuan*, J. Yang, K. V. Agrawal, H. Wang*, "A molecularly engineered large-area nanoporous atomically thin graphene membrane for ion separation", **Nature Communications**, 16, 4626, 2025.
20. S. R. Hosseinabadi, Q. D. Beer, L. A.J. Rutgeerts, C. V. Goethem, K. V. Agrawal, I. F. J. Vankelecom*, "Optimization of crosslinking in Poly(vinylidene fluoride) membranes for solvent-resistant nanofiltration: a comparative study between crosslinking agents", **Journal of Membrane Science**, 734, 124349, 2025.
21. W. O. Silva*, A. Mabillard, M. Soutrenon, G. Gschwend, Y. Ligen, S. Joris, L. Bondaz, K. V. Agrawal, H. H. Girault, "Print-Light-Synthesis of Electrocatalytically Active Gas Diffusion Electrodes for Fuel Cell Applications" **Journal of Material Chemistry A**, 13, 7403–7412, 2025.
22. M. Lenaerts, F. Scavone, C. V. Goethem, K. V. Agrawal, I. Vankelecom, G. Koeckelberghs*, "Stereochemical tuning, post-synthesis crosslinking and quaternizing to tune the membrane performance of ultra-stable polyamine nanofiltration membranes", **Journal of Membrane Science**, 717, 123531, 2025.
23. H.-Y. Chi, S. Song, K. Zhao, K.-J. Hsu; Q. Liu, A. Allaire, A. Belin, R. Goswami, W. Queen, K. V. Agrawal*, "Non-van-der-Waals Oriented Two-Dimensional UiO-66 Films by Rapid Aqueous Synthesis at Room Temperature", **Journal of American Chemical Society**, 147, 7255-7263, 2025.
24. S. Song, Q. Liu, S. Swathilakshmi, H.-Y. Chi, Z. Zhou, R. Goswami, D. Chernyshov, K. V. Agrawal*, "High-performance H₂/CO₂ separation from 4-nm-thick oriented Zn₂(benzimidazole)₄ film", **Science Advances**. 10 (50), eads6315, 2024.
25. R. Bautz; G. Verdán, N. Gallandat; L. Zhong, A. Züttel; K. V. Agrawal, "Greengas - project gazier innovant", **Aqua & Gas**, 11 (31 October), 36–44, 2024.
Available at <https://www.aquaetgas.ch/fr/energie/gaz/20241031-greengas-projet-gazier-innovant/>
26. T. Emmerich, N. Ronceray, K.V. Agrawal*, S. Garaj*, M. Kumar*, A. Noy*, A. Radenovic*, "Nanofluidics". **Nature Review Methods Primers** 4, 69, 2024.
27. M. Micari*, K. V. Agrawal, "Optimization of High-Performance Membrane Processes for Post-Combustion Carbon Capture", **Computer Aided Chemical Engineering** 53, 997, 2024.
28. K.-J. Hsu, S. Li, M. Micari, H.-Y. Chi, L. Zhong, L. F. Villalobos, S. Huang, X. Duan, A. Züttel, K. V. Agrawal*, "Graphene membranes with pyridinic nitrogen at pore edges for high-performance CO₂ capture". **Nature Energy**, 9, 964–974, 2024.

29. Z. Zhou, K. Zhao, H.-Y. Chi, S. Song, K.-J. Hsu, M. Chevalier, W. Shi, K. V. Agrawal*, “Electrochemical-repaired porous graphene membranes for precise ion-ion separation”, **Nature Communications**, 15, 4006, 2024.
30. C. V. Goethem, Y. Shen, H-Y Chi, M. Mensi, K. Zhao, A. Nijmeijer, P.-E. Just, K.V. Agrawal*, “Advancing molecular sieving via Å-scale pore tuning in bottom-up graphene synthesis”. **ACS Nano**. 18, 5730, 2024.
31. K. Zhao, W.-C. Lee, M. Rezaei, H.-Y. Chi, S. Li, L.F. Villalobos, K. Hsu, Y. Zhang, F. Wang, K.V. Agrawal*, “Ion Selective Transport Driven by Partial Dehydration across Angstrom-Scale Pores in Graphene”. **ACS Nano**, 18, 5571, 2024.
32. A. Ilyas, D. Madhav, I. Nulens, K. V. Agrawal, C. Van Goethem, I. F. J. Vankelecom*, “Influence of Micro-Patterned Support Properties and Interfacial Polymerization Conditions on Performance of Patterned Thin-Film Composite Membranes”, **Journal of Membrane Science**, 700, 122721, 2024.
33. S. Li, K.V. Agrawal*, “Nanolithography of the nanocorrall structure of chemisorbed oxygen atoms on the graphitic lattice”, **Carbon**, 221, 118897, 2024.
34. C. Kocaman, L. Bondaz, M. Rezaei, J. Hao, K.V. Agrawal*, “Direct synthesis of nanocrystalline single-layer porous graphene for hydrogen sieving”, **Carbon**, 2021, 118866, 2024.
35. M. Lenaerts, M. Thijs, R. Dhondt, C. Van Goethem, H.-Y. Chi, K.V. Agrawal, I. Vankelecom, G. Koeckelberghs*, “Development of tuneable polyamine top layer for nanofiltration with high stability in bleach and at extreme pHs”, **Journal of Membrane Science**, 693, 122341, 2024.
36. H. Ma, R. Yu, W. Xu, L. Zhang*, J. Chen, B. Zhang, J. Li, X. Xu, Q. An*, W. Xu, L. Ma, K. V. Agrawal, K. Zhao*, “Dynamic Behavior of Spatially Confined Sn Clusters and Its Application in Highly Efficient Sodium Storage with High Initial Coulombic Efficiency”, **Advanced Materials**, 2307151, 1-9, 2024.
37. M. T. Vahdat, S. Li, S. Huang, L. Bondaz, N. Marzari*, K. V. Agrawal*, “Mechanistic Insights on Functionalization of Graphene with Ozone”. **Journal of Physical Chemistry C**, 127, 22015–22, 2023.
38. Q. Liu, H.-Y. Chi, S. Song, R. Goswami, K.V. Agrawal*, “Towards Ultrathin Metal-Organic Frameworks Membranes for High- Performance Separation”. **APL Materials**, 11, 100602, 2023.
 - Featured on the cover page.
39. L. Bondaz, A. Ronghe, S. Li, K. Čerņevičs, J. Hao, O. Yazyev, K. G. Ayappa, K. V. Agrawal*, “Selective Photonic Gasification of Strained Oxygen Clusters on Graphene for Tuning Pore Size in Å-Regime”. **JACS Au**, 3, 2844-54, 2023.
 - Invited manuscript.
40. M. T. Vahdat, S. Li, S. Huang, C. A. Pignedoli, N. Marzari*, K. V. Agrawal*, “Unraveling the Oxidation of Graphitic Lattice : Structure Determination of Oxygen Clusters”. **Physical Review Letters**, 131, 16, 168001, 2023.
41. Q. Liu, Y. Miao, L. F. Villalobos, S. Li, D. J. Babu, H.-Y. Chi, M. T. Vahdat, J. Hao, Y. Han, M. Tsapatsis, K. V. Agrawal*, “Unit-cell-thick zeolitic imidazolate framework films for membrane application”, **Nature Materials**, 22, 1387-93, 2023.

42. X. Duan, M. Dakhchoune, J. Hao, K. V. Agrawal*, “Scalable Room-Temperature Synthesis of a Hydrogen-Sieving Zeolitic Membrane on a Polymeric Support”. **ACS Sustainable Chemistry & Engineering**, 11, 8140–8147, 2023.
 - Featured on the cover page.
43. X. Duan*, P. Kaya, H.-Y. Chi, B. Topuz*, K. V. Agrawal*, “Fabrication of ZIF-8 membranes by direct assembly of nanosheets from bottom-up synthesis growth solution”. **Journal of Membrane Science Letters**, 3, 100045, 2023.
 - Invited manuscript.
44. M. Micari, X. Duan, K. V. Agrawal*, “Atmospheric Water Harvesting in Semi-Arid Regions by Membranes : A Techno-Economic Assessment. **Journal of Membrane Science**, 672, 121437, 2023.
45. M. Dakhchoune, X. Duan, L. F. Villalobos, C. E. Avalos, K. V. Agrawal*, “Hydrogen-Sieving Zeolitic Films by Filter Deposition on Porous Polymeric Support”, **Journal of Membrane Science**, 672, 121454, 2023.
46. R. Castro-Muñoz*, K. V. Agrawal*, Z. Lai*, J. Coronas* “Towards Large-Scale Application of Nanoporous Materials in Membranes for Separation of Energy-Relevant Gas Mixtures”, **Separation and Purification Technology**, 308, 122919, 2023.
47. I. Nulens, R. Peters, R. Verbeke, D. M. Davenport, C. Van Goethem, B. De Ketelaere, P. Goos, K. V. Agrawal, I. F. J. Vankelecom*, “MPD and TMC Supply as Parameters to Describe Synthesis-Morphology-Performance Relationships of Polyamide Thin Film Composite Membranes”, **Journal of Membrane Science**, 667, 121155, 2023.
48. S. Huang, L. F. Villalobos, S. Li, M. T. Vahdat, H.-Y. Chi, K. Hsu, L. Bondaz, V. Boureau, N. Marzari, K. V. Agrawal*, “In Situ Nucleation-Decoupled and Site-Specific Incorporation of Å-Scale Pores in Graphene via Epoxidation”, **Advanced Materials**, 2206627, 2022.
 - Featured in supplementary cover page
49. M. T. Vahdat, K. V. Agrawal, Giovanni Pizzi*, “Machine-learning accelerated identification of exfoliable two-dimensional materials”, **Machine Learning: Science and Technology**, 3, 045014, 2022.
50. L. F. Villalobos, D. J. Babu, K. Hsu, C. Van Goethem, K. V. Agrawal*, “Gas Separation Membranes with Atom-Thick Nanopores: The Potential of Nanoporous Single-Layer Graphene”. **Accounts of Material Research**, 3, 1073-1087, 2022.
51. H.-Y. Chi, C. Chen, K. Zhao, L. F. Villalobos, P. A. Schouwink, L. Piveteau, K. Marshall, Q. Liu, Y. Han*, K. V. Agrawal*, “Unblocking Ion-Occluded Pore Channels in Poly (Triazine Imide) Framework for proton conduction”, **Angewandte Chemie International Edition**, 61, e202207457, 2022.
52. W. Lee, A. Ronghe, L. F. Villalobos, S. Huang, M. Dakhchoune, M. Mensi, K.-J. Hsu, K. G. Ayappa*, K. V. Agrawal*, “Enhanced Water Evaporation from Å-Scale Graphene Nanopores”, **ACS Nano**, 16, 15382–15396, 2022.
53. K. V. Agrawal*, R. Bautz*, “Capture du carbone par membranes en graphène à nanopores”, **Capture Du Carbone. Aqua & Gas**, 2022, 46–53 (2022).

Available at https://www.aquaetgas.ch/fr/energie/gaz/20220225_capture-du-carbone/

54. R. Hu, Y. Sun, L. Li, T. Wang, H. Kanda, C. Liu, Y. Yang, S. Huang, A. M. Asiri, L. Chu, X. Li, K. V. Agrawal, M. K. Nazeeruddin*, “Crack-Free Monolayer Graphene Interlayer for Improving Perovskite Crystallinity and Energy Level Alignment in Efficient Inverted Perovskite Solar Cells”, **Solar RRL**, 2200484, 1–9, 2022.
55. K. Adriaensen, J. Vercammen, C. Van Goethem, K. V. Agrawal, D. E. De Vos*, “In depth analysis of heterogeneous catalysts for the chemoenzymatic dynamic kinetic resolution of beta-amino esters”, **Catalysis Science & Technology**, 12, 2894-2902, 2022.
56. M. Rezaei, L. F. Villalobos, K.-J. Hsu, K. V. Agrawal*, “Demonstrating and Unraveling a Controlled Nanometer-Scale Expansion of the Vacancy Defects in Graphene by CO₂”, **Angewandte Chemie International Edition**, 61, e202200321, 2022.
 - Featured on the cover page.
57. S. Li, M. T. Vahdat, S. Huang, K.-J. Hsu, M. Rezaei, N. Marzari, K. V. Agrawal*, “Structural Evolution during the Oxidation of Graphitic Materials for the Generation of Vacancy Defects” **JACS Au**, 2, 723-730, 2022.
 - Featured on the cover page.
58. M. Dakhchoune, X. Duan, L. F. Villalobos, K.-J. Hsu, J. Zhao, M. Micari, K. V. Agrawal*, “Rapid gas transport from nanometer-sized channels in block-copolymer templated nanoporous carbon film” **Industrial & Engineering Chemistry Research**, 44, 16100, 2022.
59. M. Micari, K. V. Agrawal*, “Oxygen Enrichment of Air : Performance Guidelines for Membranes Based on Techno-Economic Assessment”, **Journal of Membrane Science**. 641, 119883, 2022.
60. M. T. Vahdat, D. Campi, N. Colonna, N. Marzari*, K. V. Agrawal*, “Gas Transport across Carbon Nitride Nanopores: A Comparison of van-Der-Waals Functionals against the Random-Phase Approximation”, **The Journal of Physical Chemistry C**. 125, 18896-18904, 2021.
61. S. Huang, S. Li, K.-J. Hsu, L. F. Villalobos, K. V. Agrawal*, “Systematic design of millisecond gasification reactor for the incorporation of gas-sieving nanopores in single-layer graphene”, **Journal of Membrane Science**. 637, 119628, 2021.
 - Invited article (ICOM issue)
62. K.-J. Hsu, L. F. Villalobos, S. Huang, H. Chi, W. Lee, G. He, M. Mensi, K. V. Agrawal*, “Multi-pulsed millisecond ozone gasification for predictable tuning of nucleation and nucleation-decoupled nanopore expansion in graphene for carbon capture”, **ACS Nano**, 15, 13230-13239, 2021.
63. L. F. Villalobos, C. Van Goethem, K.-J. Hsu, M. Moradi, M. Dakhchoune, S. Huang, Y. Shen, E. Oveisi, V. Boureau, K. V. Agrawal*, “Bottom-up synthesis of graphene films hosting atom-thick molecular-sieving apertures”, **Proceedings of the National Academy of Sciences**. 118, e2022201118, 2021.
 - Invited article for Membranes Special Issue
64. J. Hao, D. J. Babu, Q. Liu, A. Schouwink, M. Asgari, L. Wendy, Q, K. V. Agrawal*, “Mechanistic study on thermally-induced lattice stiffening of ZIF-8”. **Chemistry of Materials**, 33, 4035–4044, 2021.
 - Featured on the cover page.

65. M. Micari, M. Dakhchoune, K. V. Agrawal*, “Techno-economic assessment of postcombustion carbon capture using high-performance nanoporous single-layer graphene membranes”, **Journal of Membrane Science**, 624, 119103, 2021.
66. S. Huang, S. Li, L. F. Villalobos, M. Micari, D. J. Babu, M. T. Vahdat, M. Mensi, E. Oveisi, K. V. Agrawal*, “Millisecond lattice gasification for high-density CO₂- and O₂-sieving nanopores in single-layer graphene”, **Science Advances**, 7, eabf0116, 2021
67. L. F. Villalobos, S. Huang, M. Dakhchoune, G. He, W.-C. Lee, K. V. Agrawal*, “Polybenzimidazole copolymer derived lacey carbon film for graphene transfer and contamination removal strategies for imaging graphene nanopores”, **Carbon**, 173, 983-988, 2021.
68. W. Lee, L. Bondaz, S. Huang, G. He, M. Dakhchoune, K. V. Agrawal*, "Centimeter-Scale Gas-Sieving Nanoporous Single-Layer Graphene Membrane", **Journal of Membrane Science**, 618, 118745, 2021.
69. M. Dakhchoune, L. F. Villalobos, R. Semino, L. Liu, M. Rezaei, P. Schouwink, C. E. Avalos, P. Baade, V. Wood, Y. Han, M. Ceriotti, K. V. Agrawal*, “Gas sieving zeolitic membranes by the condensation of precursor nanosheets”, **Nature Materials**, 20, 362-369, 2021.
70. Q. Liu, D. J. Babu, M. T. Vahdat, D. Campi, K. V. Agrawal*, “Metal Soap Membranes for Gas Separation”, **Advanced Functional Materials**, 31, 2005629, 2021.
71. M. T. Vahdat, D. Campi, N. Colonna, L. F. Villalobos, N. Marzari*, K. V. Agrawal*, “Efficient Kr/Xe separation from triangular g-C₃N₄ nanopores”, **Journal of Material Chemistry A**, 8, 17747-17755, 2020.
72. M. Rezaei, S. Li, S. Huang, K. V. Agrawal*, “Hydrogen-sieving single-layer graphene membranes obtained by crystallographic and morphological optimization of catalytic copper foil”, **Journal of Membrane Science**, 612, 118406, 2020.
- Editor’s Choice article (June 2020).
73. G. He, S. Huang, L. F. Villalobos, M. T. Vahdat, M. D. Guiver, J. Zhao, W.-C. Lee, M. Mensi, K. V. Agrawal*, “Synergistic CO₂-sieving from polymer with intrinsic microporosity masking nanoporous single-layer graphene”, **Advanced Functional Materials**, 2003979, 1-10, 2020.
74. R. Castro-Muñoz*, K. V. Agrawal*, J. Coronas*, “Ultrathin permselective membranes: The latent way for an efficient gas separation”, **RSC Advances**, 10, 12653- 12670, 2020.
- Review article.
75. J. Hao, D. J. Babu, Q. Liu, C. Lu, Y. Liu, and K. V. Agrawal*, "Synthesis of high-performance polycrystalline metal–organic framework membranes at room temperature in a few minutes”, **Journal of Material Chemistry A**, 8, 7633-7640, 2020.
- Featured on the cover page (back).
76. L. F. Villalobos, M. T. Vahdat, M. Dakhchoune, Z. Nadizadeh; M. Mensi, E. Oveisi, D. Campi, N. Marzari, K.V. Agrawal*, “Large-scale synthesis of crystalline g-C₃N₄ nanosheets and high-temperature H₂ sieving from assembled films”, **Science Advances**, 6, eaay9851, 2020.
77. G. He, S. Huang, L. F. Villalobos, J. Zhao, M. Mensi, E. Oveisi, M Rezaei, K. V. Agrawal*, “High-permeance polymer-functionalized single-layer graphene membranes that surpass the postcombustion carbon capture target”, **Energy & Environmental Sciences**, 12, 3305-3312, 2019.
- Featured on the cover page (back).

78. M. H. Khan, M. Dakhchoune, M. Rezaei, S. Huang, J. Zhao, K. V. Agrawal*, "Hydrogen sieving from intrinsic defects of benzene-derived single-layer graphene", **Carbon**, 153, 458-466, 2019.
79. A. Bananezhad, M. Jovic, L. F. Villalobos, K. V. Agrawal, M. R. Ganjali, H. H. Girault*, "Large-scale fabrication of flexible solid-state reference electrodes", **Journal of Electroanalytical Chemistry** 847, 113241, 2019.
80. D. J. Babu, G. He, M. T. Vahdat, P. A. Schouwink, M. Mensi, K. V. Agrawal*, "Restricting lattice flexibility in polycrystalline metal-organic framework membrane for carbon capture", **Advanced Materials**, 31, 1900855, 2019.
81. S. Huang, L. F. Villalobos, D. J. Babu, G. He, M. Li, A. Züttel, K. V. Agrawal*, "Ultrathin and size-tunable carbon molecular sieve membrane for gas separation", **ACS Applied Materials & Interfaces**, 11, 16729-16736, 2019.
82. S. Dutta, M. Rezaei, K. V. Agrawal*, "Crystallization of gas-selective nanoporous graphene by chemical vapor deposition: a modeling study by kinetic Monte Carlo simulation". **Scientific Reports**, 9, 5202, 2019.
83. J. Zhao, G. He, S. Huang, L. F. Villalobos, M. Dakhchoune, H. Bassas, E. Oveisi, K. V. Agrawal*, "Etching gas-sieving nanopores in single-layer graphene with an angstrom precision for high-performance gas mixture separation". **Science Advances**, 5, eaav1851, 2019.
84. D. Babu, G. He, L. F. Villalobos, K. V. Agrawal* "Crystal engineering of metal organic thin films for gas separations", **ACS Sustainable Chemistry & Engineering**, 7,49, 2019.
 - Invited review article.
85. G. He., D. J. Babu, K. V. Agrawal*, "Electrophoretic crystallization of ultrathin high-performance metal-organic framework membranes". **Journal of Visualized Experiments**, 138, e58301, doi:10.3791/58301 (2018).
86. S. Huang, M. Dakhchoune, W. Luo, E. Oveisi, G. He, M. Rezaei, J. Zhao, A. Züttel, M. S. Strano, K. V. Agrawal*, "Single-layer graphene membranes by crack-free transfer for gas mixture separation". **Nature Communications**, 9, 2632, 2018.
87. K. V. Agrawal, "Towards the ultimate membranes: two-dimensional nanoporous materials and films", **Chimia**, 72, 313-321, 2018.
 - Invited perspective article.
88. G. He., M. Dakhchoune, J. Zhao, S. Huang, K. V. Agrawal*, "Electrophoretic nuclei assembly for crystallization of high performance membranes on unmodified supports", **Advanced Functional Materials**, 28, 1707427, 2018.

Publications before EPFL

89. D. O. Bellisario, A. T. Liu, D. Kozawa, R. Han, J. K. Harris, R. B. Zabala, Q. H. Wang, K. V. Agrawal, Y. Son, M. S. Strano*, "Experimental Observation of Real Time Molecular Dynamics Using Electromigrated Tunnel Junctions", **The Journal of Physical Chemistry C**, 121, 22550–22558, 2017.
90. Z. Yuan, A. G. Rajan, L. W. Drahushuk, R. P. Mishra, K. V. Agrawal, M. S. Strano, D. Blankshtein*, "Mechanism and Prediction of Gas Permeation through Sub-Nanometer Graphene Pores: Comparison of Theory and Simulation", **ACS Nano**, 11 (8), 7974–7987, 2017.

91. K. V. Agrawal, Jesse Benck, Zhe Yuan, Yannick Eatmon, Ananth Govind Rajan, Suneet Kale, Ximo S. Chu, Duo O. Li, Chuncheng Gong, Daniel Blankshtein, Jamie Warner, Qing Hua Wang, Michael S. Strano*, "Fabrication, Pressure Testing and Nanopore Formation of Single Layer Graphene Membranes", **The Journal of Physical Chemistry C**, 121, 14312-14321, 2017.
92. M. H. Shete, M. Kumar, D. Kim, N. Rangnekar, B. Topuz, K.V. Agrawal, E. Karapetrova, B. Stottrup, S. Al-Thabaiti, S. Basahel, K. Narasimharao, J. D. Rimer, M. Tsapatsis*, "Nanoscale Control of Homoepitaxial Growth on a Two-Dimensional Zeolite", **Angewandte Chemie International Edition**, 56, 2, 535, 2017.
93. K. V. Agrawal, S. Shimizu, L. W. Drahushuk, D. Kilcoyne, M. S. Strano*, "Observation of Extreme Phase Transition Temperatures of Water Confined Inside Isolated Carbon Nanotube Nanopores", **Nature Nanotechnology**, 12, 267, 2017.
94. K. V. Agrawal, L. W. Drahushuk, D. Kilcoyne, M. S. Strano*, "Observation and Analysis of the Coulter Effect Through Carbon Nanotube and Graphene Nanopores", **Philosophical Transactions of the Royal Society A** (Invited Article), 374, 20150357, 2016.
 - Invited review article.
95. S. Shimizu, K. V. Agrawal, M. O'Mahony, L. W. Drahushuk, N. Manohar, A. S. Myerson, M. S. Strano*, "Understanding and Analyzing Freezing-Point Transitions of Confined Fluids within Nanopores", **Langmuir**, 31, 10113, 2015.
96. K. V. Agrawal, B. Topuz, N. Sauer, T. C. T. Pham, N. Rangnekar, H. Zhang, K. Narasimharao, S. Basahel, L. F. Francis, C. W. Macosko, S. Al-Thabaiti, K. B. Yoon, M. Tsapatsis*, "Oriented MFI Membranes by Gel-less Secondary Growth of Sub-100 nm MFI-nanosheet Seed Layers", **Advanced Materials**, 21, 3243, 2015.
 - Featured on the cover page.
97. N. Rangnekar, M. Shete, K. V. Agrawal, B. Topuz, P. Kumar, K. Narasimharao, I. Ismail, A. Alyoubi, S. Basahel, L. F. Francis, C. W. Macosko, K. A. Mkhoyan, B. Stottrup, S. Al-Thabaiti, M. Tsapatsis*, "2D Zeolite Coatings: Langmuir-Schaefer Deposition of 3 nm Thick MFI Zeolite Nanosheets", **Angewandte Chemie International Edition**, 54, 6571, 2015.
98. P. Kumar, K. V. Agrawal, M. Tsapatsis, A. Mkhoyan, "Quantification of Thickness and Wrinkling of Exfoliated Two-dimensional Zeolite Nanosheets", **Nature Communications**, 6, 7128, 2015.
99. P. Kumar, K. V. Agrawal, M. Tsapatsis*, A. Mkhoyan*, "Analytical Method for Thickness and Wrinkling Measurements of 2-D Zeolites", **Microscopy and Microanalysis**, 21, 2367-2368, 2015.
100. P. Kumar, K. V. Agrawal, M. Tsapatsis*, A. Mkhoyan*, "Crystallographic Structure Determination of MFI-Zeolite Nanosheets", **Microscopy and Microanalysis**, 20 (S3), 390-391, 2014.
101. K. V. Agrawal, B. Topuz, M. Navarro, Z. Jiang, K. Nguenkam, B. Elyassi, L. F. Francis, M. Tsapatsis*, "Solution-processable Exfoliated Zeolite Nanosheets Purified by Density Gradient Centrifugation", **AIChE Journal**, 59, 3458, 2013.
 - Invited article in the special issue of AIChE J. Founders Tribute to Neal R. Amundson.
102. X. Zhang, D. Liu, D. Xu, S. Asahina, K. Cychoz, K. V. Agrawal, Y. Al Wahedi, A. Bhan, S. Al Hashimi, O. Terasaki, M. Thommes, M. Tsapatsis*, "Synthesis of Self-Pillared Zeolite Nanosheets by Repetitive Branching", **Science**, 336, 1684, 2012.

103. H. Zhang, W. J. Suszynski, K. V. Agrawal, M. Tsapatsis, S. Al Hashimi, L. F. Francis*, "Coating of Open Celled Foams, **Industrial & Engineering Chemistry Research**, 51, 9250, 2012.
104. J. A. Stoeger, M. Palomino, K. V. Agrawal, X. Zhang, G. N. Karanikolos, A. Corma, M. Tsapatsis*, "Oriented CoSAPO-5 Membranes by Microwave-Enhanced Growth on TiO₂-Coated Porous Alumina", **Angewandte Chemie International Edition**, 51, 2470, 2012.
105. K. V. Agrawal, X. Zhang, L. F. Francis, M. Tsapatsis, "Fabrication of thin zeolite membranes using exfoliated zeolite nanosheets", **Procedia Engineering**, 44, 198-199, 2012.
106. K. V. Agrawal, X. Zhang, B. Elyassi, D. D. Brewer, M. Gettel, S. Kumar, J. A. Lee, S. Maheshwari, A. Mittal, C. Y. Sung, M. Cococcioni, L. F. Francis, A. V. McCormick, K. A. Mkhoyan, M. Tsapatsis*, "Dispersible Exfoliated Zeolite Nanosheets and Their Application as a Selective Membrane", **Science**, 334, 72, 2011.
 - Featured in runner-up in **breakthrough of the year, 2011** by the Science Magazine.
107. K. Kahali, K. Varoon (Agrawal), J. Bellare*, "Preparation of Lacey Polymer Film as Efficient Specimen Supports for TEM and Cryo-Transmission Electron Microscope (Cryo-TEM)", Proceedings of XXVII Annual Meeting of EMSI and Conference on Electron Microscopy and Allied Fields, April 1-3, 150-151, 2004.

Book Chapter

L. Bondaz, S. Huang, M. Rezaei, S. Li, K. V. Agrawal, "Nanoporous Single Layer Graphene Membranes for Gas Separation", in Liu, Jin (Eds.): Two-Dimensional-Materials-Based Membranes. Preparation, Characterization, and Applications. Wiley. 2022.

Patent and Patent Applications (3 licensed, 4 under discussion for license agreement)

▪ Patents Granted

1. K. V. Agrawal; S. Huang, "Graphene membrane filter for gas separation", US 11,559,772 B2, 2023.
2. M. Tsapatsis; K. V. Agrawal; L. F. Francis, "Silica support structure for a zeolite membrane", US 10,005,674 B2, 2018.
3. M. Tsapatsis; K. V. Agrawal, "Zeolite nanosheet membrane", US 10,005,077 B2, 2018.
4. C. K. Yagnik; K. Varoon (Agrawal), "Method for assessment of friction properties of fibers or substrates upon mechanical treatment" US 8,429,963 B2, 2013.
5. K. Varoon (Agrawal), "Method for assessment of electrostatic properties of fibers or substrates", US 8,198,901 B2, 2012.

▪ Patent Applications (Pending)

6. K. V. Agrawal; J. Hao, F. Scheffler, "Method of preparation of carbon nanotube coated porous stainless steel supports & uses thereof", EP26158049, 2026.
7. K. V. Agrawal; X. Duan, "New 2D zeolitic imidazolate frameworks, methods of preparation & uses thereof", EP 25164521, 2025.
8. K. V. Agrawal; J. Hao, "Method of preparing CO₂-selective pores in graphene & uses thereof", EP 24207662.8, 2024.
9. K. V. Agrawal; M. Chevalier; C. Kocaman, "Method for producing a gas separation membrane containing a single-layer porous graphene film", EP 24174361.6, 2024.
10. K. V. Agrawal; K.-J. Hsu, "Method of functionalizing graphene nanopores" EP 22206687, 2022.
11. K. V. Agrawal; M. Tsapatsis; Q. Liu, "Method of preparing two-dimensional metal-organic frameworks films" US Provisional 63/425,025, 2022.
12. K. V. Agrawal; D. J. Babu; L. F. Villalobos, "Method of preparation of porous polymeric support layer and uses thereof", EP 20174809, 2021.

13. K. V. Agrawal; S. Huang; K.-J. Hsu, "New process for graphene membranes lattice engineering and uses thereof", EP 20166877, 2021.
14. K. V. Agrawal; G. He, "Hybrid membranes for energy-efficient carbon capture" WO 2020/011892 A1, 2020.
15. K. V. Agrawal; M. Dakhchoune; S. Huang; G. He; N. Dudani, "Ultrahigh flux gas-selective nanoporous carbon membrane and manufacturing method thereof, WO 2018/177533 A1, 2018.
16. K. V. Agrawal; L. F. Villalobos, "Crystalline poly(triazine imide) membranes and uses thereof", WO 2021/074401 A1, 2021.

Invited Lectures at International Conferences

1. Keynote lecture, ICIM 2026 (18th International Conference on Inorganic Membranes), June 2026
2. Keynote lecture, IZMM 2026 (10th International Zeolite Membrane meeting), June 2026.
3. Invited lecture, CIMTECH 2026 (16th International Ceramic Congress), June 2026.
4. Invited lecture, Nanofluidics Conference, USA, Feb 2026.
5. Keynote lecture, 2nd International Conference on Sustainable Nanomaterials Integration and Organization for Energy and Environment (2nd-iSNIOE2), India, 2026
6. Invited Lecture at the International Conference on MOFs and POPs for Energy and Sustainability (MOFES'26), India, 2026
7. Keynote lecture, Carbon Capture Science and Technology (CCST) Conference, Online, 2025
8. Invited talk, World Chemical Engineering Congress, China, 2025.
9. Invited talk, NanoKorea Conference, Goyang, South Korea, 2025.
10. Keynote lecture, MedPore 2, Marrakech-UM6P campus, Morocco, 2025.
11. Invited talk, Interdisciplinary Perspectives on Transport Mechanisms in Membranes and Nanopores, France, 2025.
12. Keynote lecture, International Conference on Carbon Capture and Utilization 2024 (ICCCU24), India, 2024.
13. Invited talk in 9th International Conference on Metal-Organic Frameworks and Open Framework Compounds (MOF2024), Singapore, 2024.
14. Invited Lecture at the international conference From Solid-state to Biophysics XI, Croatia, 2024.
15. Invited talk in Materials Research Society (MRS) Spring Meeting, Nanoscale Mass Transport Through 2D and 1D Nanomaterials, USA, 2024.
16. Invited talk in Gordon Research Conference (GRC) on Nanoporous Materials and Their Applications, Proctor Academy, USA, 2023.
17. Keynote talk in 9th International Zeolite Membrane Meeting (IZMM), China, 2023.
18. Keynote talk in GBT-SPT 2023 and 2nd GBA-MMP Symposium, 2023.
19. Invited talk at International Nanofluidic Symposium, Singapore, 2023.
20. Invited talk at 16th International Conference on Inorganic Membranes (ICIM 16), Taiwan, 2022.
21. Invited talk in MRS Spring Meeting, Nanoscale Mass Transport Through 2D and 1D Nanomaterials, USA, 2022.
22. Plenary talk (FRI/John G. Kunesh Award), Separation Division, AIChE Annual Meeting 2021, USA.
23. Invited talk in KAUST Research Conference: Advanced materials for energy-efficient separations, Addressing Vision 2030 and beyond, Saudi Arabia, 2020.
24. Invited talk in Summer School by European Membrane Society, University of Edinburgh, Scotland, 2019.
25. Invited talk in GRC on "Membranes: Materials and Processes", USA, 2018.
26. Invited talk in Young Membrane Scientist Award lecture, North American Membrane Society (NAMS), USA, 2018.

Invited Seminars and research talks

27. Webinar, Shell Technology Webinar, April 2026.
28. Invited lecture, EPFL Sustainability days, March 2026.
29. Invited lecture, EPFL Industry day, March 2026.

30. Invited lecture, Materials for Carbon Capture and Low Energy Separation Solutions, IISc Bangalore, Feb 2026.
31. Seminar, Dalian Institute of Chemical Physics, Dalian, China, July 2025.
32. Seminar, Peking University, Beijing, China, July 2025.
33. Seminar, Yonsei University, Seoul, South Korea, July 2025.
34. Research Talk, Center for Enhanced Nanofluidic Transport (CENT), August 2024.
35. Seminar, NTU Material Science Department, July 2024.
36. Research Talk, ETH Board, Lausanne, Switzerland, June 2024.
37. Seminar, Yonsei University (online), Jan 2024.
38. Seminar, Tianjin University, Fall 2023.
39. Seminar, Suzhou University, Fall 2023.
40. Seminar, University of Texas at Austin, Fall 2023.
41. Seminar, Ohio State University, Fall 2023.
42. Seminar, IISc Bangalore, 2023.
43. Seminar, Shell, June 2023.
44. Seminar, Yonsei University (online), Jan 2023.
45. Invited talk in the thematic session, “Membranes for Gas Separation” in the workshop “Thin Film Nanostructured Membranes for Gas Separation, Storage and Water Desalination” IISc Bangalore, India, Jan 2022.
46. Seminar, University of Minnesota, Jan 2022.
47. Seminar, ETH Zurich, 2021.
48. Seminar, Georgia Institute of Technology, 2021.
49. Seminar, John Hopkins University, 2021.
50. Seminar, University of Texas at Austin, 2021.
51. Research Talk, Swiss Parliament Committee for Science, Education and Research, Sion, Switzerland, 2021.
52. Research Talk, ETH Board, Sion, Switzerland 2021.
53. Young Faculty Meeting, Swiss Chemical Society, Bern, Switzerland, 2021.
54. EuroTech Seminar Series, 2021.
55. Seminar, Indian Institute of Sciences, Bangalore, 2021.
56. Research Talk, Extended EPFL Energy Event: Carbon capture, utilization and storage, 2021.
57. Seminar, National Graphene Institute, Manchester, UK, 2021.
58. Seminar, IBM Research Center, Brazil, 2021.
59. Seminar, Graphene Center, Cambridge University, 2021.
60. Seminar, Separation Technology Workshop, Yonsei University, 2021.
61. Research Talk, EPFL Alumni Day, 2020.
62. Seminar, ExxonMobil Research and Engineering, Clinton, USA, 2019.
63. Seminar, Stockholm University, Sweden, 2019.
64. Seminar, Eidgenössische Materialprüfungs- und Forschungsanstalt (EMPA), Switzerland, 2019.
65. Seminar, Imperial College London, UK, 2018.
66. Seminar, Massachusetts Institute of Technology, Boston, USA, 2018.
67. GAZNAT Global gas conference, EPFL, Lausanne, 2018.
68. Seminar, Indian Institute of Technology, Bombay, India, 2018.
69. Raman Microscopy Workshop, ETH Zurich, Switzerland, 2017.
70. Seminar, Czech Academy of Sciences, Czech Republic, 2017.
71. Inorganic Chemistry Seminar, University of Bayreuth, Germany, 2017.
72. Chemical Engineering Seminar, Indian Institute of Science, Bangalore, India, 2016.
73. Chemical and Biological Engineering seminar, University of Wisconsin-Madison, USA, 2015.
74. Chemical & Biological Engineering seminar, Northwestern University, Evanston, USA, 2015.
75. Special Chemical Engineering Seminar, Purdue University, West Lafayette, USA, 2015.
76. Chemical & Biochemical Seminar, Rutgers University, New Jersey, USA, 2015.
77. Memento ISIC Seminar, EPFL, Switzerland, 2014.
78. Seminar, Massachusetts Institute of Technology, Boston, USA, 2014.

79. CEMS Advanced Doctoral Student Seminar, University of Minnesota, Minneapolis, USA, 2013.

Funding

- NCCR Separations - phase I (co-director)
- GAZNAT seed project (2026)
- Southeast-Asia Joint Funding Scheme for Research & Innovation (2025-2028).
- Rolex Grand Challenges Project (2026-2028).
- Swiss National Science Foundation Project (2025-2028)
- Academic host for Swiss National Science Foundation Ambizione Grant to Dr. Marina Micari (2024-2028).
- Bridge Discovery Project with Prof. Vivek Subramanian (2025-2028)
- Swiss National Science Foundation Project (with National Science Foundation of USA, 2024-2027).
- Interinstitutional project grant (with HES-SO), Canton of Valais (2024).
- AIChE Inorganic Materials Graduate Student Award funding through Chevron (since 2020).
- EPFL Solutions4Sustainability Grant on CCUS (2023).
- EPFL-UNIL Climact Starting Grant (2023).
- Bridge Proof of Concept Grant with Dr. Mojtaba Rezaei (2022-2023).
- 2022 EPFL FSB Science Seed Grant (2022-2023).
- GAZNAT Project - Phase III (2021-2024).
- Postcombustion carbon capture demonstration project (funded by GAZNAT and Swiss Federal Office of Energy; 2020-2025).
- Advanced in situ TEM for atomic-scale material chemistry and engineering (2020).
- District demonstrator project (funded by Valais administration, Switzerland; 2020-2025).
- Shell postcombustion carbon capture project (2020-2023).
- Swiss National Science Foundation Project (2020-2024).
- Swiss National Supercomputing Center (2019-2020).
- ABB research grant (2019).
- GAZNAT Project - Phase II (2019-2023).
- Swiss National Supercomputing Center (2018-2019).
- European Research Council (ERC) Starting grant (2019-2023).
- Cooperation and Development Center (CODEV) seed grant (2018).
- Swiss National Science Foundation Assistant Professor Energy grant (2017- 2020).
- GAZNAT Project – Phase I (2017-2020).
- Swiss Competence Center of Energy Research – Efficiency in Industrial Processes (SCCER-EIP), Phase II (2017 – 2020).
- EPFL Valais funding on exfoliation chemistry (2017-2020).
- ETH-Board funding on collaborative energy research (2016-2017).

Honors & Distinctions

1. 2026 – Watt d’Or, Swiss Federal Office of Energy – decarbonized energy innovation platform (GAZNAT CCUS demonstrator including graphene membrane demonstration).
2. Journal of Membrane Science Oral Presentation award at International Congress on Membranes and Membrane Processes (ICOM 2023).
3. Member of the Editorial Board of the Journal of Membrane Science (2023 onwards).
4. Member of the Editorial Board of the Separation & Purification Technology (2025 onwards).
5. Member of the Early Career Editorial Board of the Separation & Purification Technology (2023 onwards).
6. FRI/John G. Kunesh Award, AIChE Separation Division, 2021.
7. Member of the Early Career Editorial Board of the Journal of Membrane Science (2020-2023).
8. Young Membrane Scientist Award, North American Membrane Society (NAMS), 2018.

9. European Research Council (ERC) Starting Grant, 2018.
10. Swiss National Science Foundation Assistant Professor Energy Grant (Career Grant, 2017).
11. Best Poster Award, Gordon Research Conference on Nanoporous Materials and Their Applications, 2015.
12. Graduate Student Research Award, AIChE Separations Division, 2013.
13. Doctoral Dissertation Fellowship (2012-2013), University of Minnesota.
14. Sigma Xi Award for best student poster presentation during DDF showcase.
15. Best Poster Award, Gordon Research Conference on Nanoporous Materials and Their Applications, 2011.
16. CEMS Outstanding Teaching Assistant Award (2009-2010), University of Minnesota.
17. Procter & Gamble R&D Vice President Power of You Gold Award.
18. Institute Silver Medal for securing 1st rank in Department of Chemical Engineering at IIT Bombay.
19. Manudhane Best Undergraduate Student Award for overall excellence at IIT Bombay.
20. IIT Bombay Merit Scholarship (2003-2005).

Professional Activities outside EPFL

1. Co-founder and Board Member, Divea.
2. Editorial Board Member of Journal of Membrane Science (2023 onwards).
3. Editorial Board Member of Separations & Purification Technology (2025 onwards).
4. Early Career Editorial Board Member of Separations & Purification Technology (2023-24).
5. Early Career Editorial Board Member of Journal of Membrane Science (2020-2022).
6. Member of the GAZNAT Steering Committee for Carbon Capture (2020 onwards).
7. Executive Guest Editor of Journal of Membrane Science for the special issue on “2D Membranes for Molecular Separation” (2024).
8. Guest Editor of Separation and Purification Technology for the special issue on “Two-Dimensional Membranes”
9. Member of the Swiss Steering Committee for Swiss-Norwegian Beamlines (SNBL, 2021-2022).

Professional Activities within EPFL

Current

1. EPFL representative to the Swiss Process & Chemical Engineers (SGVC) board (2026 onwards)
2. Member of the Science and Technology Committee, Coalition for Green Energy and Storage (CGES, 2025 onwards).
3. Member of the EPFL Flourish initiative (WP0, 2026 onwards).
4. Elected member and bureau member, EPFL Teachers Council (CCE, 2023- Present, also Vice President for one year, 2nd two-year mandate).
5. Student Exchange Coordinator (Chemical Engineering, 2024 onwards).
6. Member of the Doctoral School Committee (EDCH, 2024 onwards, two-year mandate).
7. Member of the EPFL Valais Wallis Campus Committee (2021 onwards).
8. Scientific Advisor to the EPFL Student MAKE Team (Carbon Team, 2021 onwards).

Previous

9. Member of the EPFL Vision Committee for CO₂ Sequestration (2022).
10. Member of the ISIC Physical Chemistry Faculty Hiring Committee (2021-2023).
11. Member of the Doctoral School Committee (EDCH) of EPFL (2020-2022, two-year mandate).
12. Chair of the EPFL Valais Faculty Committee (2018-2020).
13. Member of the ISIC Vision Panel (2019).
14. Member of several ISIC Hiring Committees for NMR Platform Scientist (2019).
15. Member of the SCGC Teaching Committee (2016-2017).

Organization of International Conferences

1. Solutions4Sustainability CCUS Dialogue, EPFL Valais, 2026, with Dr. Eleni Stavropoulou, Dr. Sascha Nick, and Dr. Marina Micari.
2. Symposium (Selective Separations in Nanomaterials) at the 2025 MRS Fall Meeting with Dr. Zhongwu Li, Dr. Rahul Prasanna Misra, and Dr. Qian Yang.
3. International Nanofluidics Conference 2024 with Prof. Aleksandra Radenovic and Prof. Alex Noy.
4. Conceptualized, organized, and raised funding through a sponsor (Chevron) for the Graduate Student Award Session in AIChE Material Engineering and Sciences Division, Inorganic Materials (2019-Present).
5. *Area Chair* (Inorganic Materials, Material Engineering and Sciences Division, MESD), AIChE Annual Meeting, Pittsburgh, USA, 2018
6. Chair for multiple sessions at the AIChE annual meeting since 2015.
7. Session Chair, 12th International Congress on Membranes and Membrane Processes (ICOM 2020).
8. Chair, Synthesis and Application of Inorganic Materials II: Application/Separations, AIChE Annual Meeting 2020 (online).
9. Co-chair, Inorganic Materials Graduate student award session, AIChE Annual Meeting, 2020 (online).
10. Co-chair, Two-Dimensional Materials and Thin Films, AIChE Annual Meeting, 2020 (online).
11. Chair, Inorganic Materials, North American Membrane Society 2020 (online).
12. Chair, Graduate student award session (area: MESD Inorganic Materials), AIChE Annual Meeting, Orlando, USA 2019
13. Chair, Graduate student award session (area: MESD Inorganic Materials), AIChE Annual Meeting, Pittsburg, USA 2018
14. Chair, MOFs, COFs, and Porous Polymer Materials I: Synthesis, AIChE Annual Meeting, Minneapolis, USA, 2017
15. Chair, MOFs, COFs, and Porous Polymer Materials II: Applications, AIChE Annual Meeting, Minneapolis, USA, 2017
16. Chair, Nanostructured Thin Films, AIChE Annual Meeting, San Francisco, USA, 2016
17. Co-Chair, Advances in the Synthesis and Application of Porous Materials I, AIChE Annual Meeting, San Francisco, USA, 2016
18. Chair, Advances in the Synthesis and Application of Porous Materials II, AIChE Annual Meeting, Salt Lake City, USA, 2015
19. Participant, Department of Energy's Advance Manufacturing Office Workshop on Membrane Technology, Chicago, USA, 2012

Professional Affiliations

Member of Royal Society of Chemistry (MRSC), Swiss Chemical Society, Swiss Process & Chemical Engineers, European Federation of Chemical Engineering, American Institute of Chemical Engineers, American Chemical Society, Material Research Society, European Membrane Society, North American Membrane Society, American Association for The Advancement of Science

Reviewer

Grant proposals: Horizon 2020 (European Research Council (ERC) Grants), ACS PRF

Journal Articles (~50 per year)

Science, Nature, Nature Materials, Nature Nanotechnology, Nature Energy, Nature Sustainability, Nature Chemical Engineering, Advanced Materials, Science Advances, Proceedings of National Academy of Sciences, Nature Communications, Journal of American Chemical Society, Angewandte Chemie, Advanced Functional Materials, Nano Letters, ACS Nano, ACS Applied Materials and Interfaces, Carbon, ACS Applied Nano Materials, ACS Applied Polymer Materials, Chemistry-A European Journal, Chemical Reviews, ACS Sensors, The Journal of Physical Chemistry Letters, Journal of Membrane Science, Journal of Materials Science, Nano Research, The Journal of Physical Chemistry-C, Microporous and Mesoporous

Materials, Industrial and Engineering Chemistry Research, ChemPhysChem, Journal of Chemical Technology & Biotechnology, AIChE Journal, Chemical Engineering Science.

Teaching Experience

At EPFL

- Lecturer, ChE 413: Chemical Product Design, 2025 - onwards
- Lecturer ChE 310: Fundamentals of Separation Processes, 2018- onwards
- Lecturer ChE 402: Diffusion and Mass Transfer, 2018 - onwards
- Project Coach, ChE 413: Chemical Product Design, 2016 – 2024
- Guest Lecturer, MSE-433: Towards Sustainable Materials, 2025, 2026

Guest Lectures at University of Minnesota, Minneapolis, USA

- Fall 2009, 'Absorption, Adsorption and Extraction', CHEN 2001
- Spring 2012, 'Structure of Zeolites', CHEN 8501

Guest Lecture at Massachusetts Institute of Technology, Cambridge, USA

- Fall 2015, 'Nanoporous Membranes: Zeolite and Graphene', 10.585
- Kaufman Teaching Certificate Program, MIT, 2016