INSTITUTE FOR POLYMER RESEARCH (IPR)
UNIVERSITY OF WATERLOO
WATERLOO, ONTARIO N2L 3G1

NEWSLETTER 2025

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1. NOTE FROM PROFESSOR JEAN DUHAMEL, IPR DIRECTOR

Last year was a year of renewal for the IPR with four new members joining the IPR bringing the total headcount to 16 colleagues on the Waterloo campus. Our new members are Profs. Hamed Shahsavan, Elisabeth Prince, and Milad Kamkar from Chemical Engineering and Prof. Yangju Lin from Chemistry. Their expertise spans several research fields from rheology to hydro and aerogels, sustainable materials and plastics, smart polymers, and polymers for batteries. This additional and most valuable expertise will no doubt unlock new collaborations, broadens the breadth of expertise offered by the IPR, and further establishes the IPR as a powerhouse in polymer research.

The last IPR Symposium, which was held on April 30th and May 1st, 2025, was most successful in terms of quality and number of presentation offerings. With 28 student presenters, the IPR Symposium had a record student participation in 2025, reflecting the lively atmosphere in polymer research at the institute! Among the presenters where the two IPR Awardees, Negin Bouzari supervised by Prof. Hamed Shahsavan and Yonglin Wang supervised by Prof. Yuning Li, both from Chemical Engineering. Negin gave a presentation on small-scale robots for medical applications and Yonglin explained how coordination polymers can be incorporated into organic cathodes used in lithium-ion batteries. Our two keynote speakers gave fantastic presentations. They were Dr. Nicholas Lanigan from Davwire, who discussed the formulation of photocurable resins for the fabrication of ferroelectrets, and Prof. Megan Roberts from Western University, who described the use of nanocellulose for precision applications. The student and keynote presentations concluded the first part of the symposium on April 30th. On May 1st, Profs. Leonardo Simon, Xianshe Fang, and Tizazu Mehonnen gave fascinating talks about industrial hemp and the development of sustainable materials, a unified approach toward mass transfer, perstraction, and sorption, and engineered polysaccharides and the modification of polysaccharides and poly(lactic acid). This concluded what was a spectacular 2025 IPR Symposium.

Among the highlights of 2025, Prof. Mekonnen garnered national attention by creating greener superabsorbent hydrogels for personal hygiene products based on cellulose and citric acid as crosslinker. This new material can be used for diapers and decomposes over a time scale of months compared to centuries for the current products based on crosslinked polymethacrylate salts. Links to his televised interviews can be found on the IPR website.

We certainly hope to break the record of student presenters for the next IPR Symposium which will take place on May 6th and 7th, 2026. It will be again a two-day symposium with students presenting their latest research results on Wednesday May 6th along with our two keynote speakers, Prof. Todd Hoare from McMaster University and Dr. Jenner Ngai from NRC Ottawa. Profs. Yangju Lin, Hamed Shahsavan, Milad Kamkar, and Elisabeth Prince from the University of Waterloo will offer a deeper perspective about their field in polymer research on Thursday May 7th, 2026. We certainly look forward to welcoming you in Waterloo to attend these dynamic and exciting presentations!

2. ANNUAL IPR SYMPOSIUM

The 48th Annual IPR Symposium will be held on May 6 and 7th, 2026. A schedule and registration forms will be circulated electronically.

Many thanks to all who participated in the 2025 Symposium. IPR received very positive feedback regarding the topics covered. The 2025 program and the list of industrial participants are attached (Appendix 1).

3. IPR PREPRINTS

During 2025, the IPR office sent out 16 preprints to our members (Appendix 2).

4. RESEARCH PROGRAMS

We have more than 90 research personnel (excluding faculty) involved in polymer research at the University of Waterloo. Industrial members may find it interesting to keep up to date with the various research projects that are underway.

5. RECENTLY GRADUATED STUDENTS

J. Duhamel

PhD	CHEM	Frasca, F.	Polymeric Oil Additives and their Small Molecule Analogues Studied via Pyrene Excimer Fluorescence
PhD	CHEM	Liu, D.	Dual Characterization of Hydrophobically Modified Polyamidoamine Dendrimers and their Surfactant Aggregate Hosts by Pyrene Excimer Fluorescence

X. Feng

PhD	ChE	Zhang, J.	Development of facilitated transport membranes with metal-chelating and hydrogel-like properties for efficient olefin/paraffin separation

E. Prince

MASc	ChE	Huang, Z.	Conductive biomimetic hydrogels
MASc	ChE	Rezaei, S.	Deconstructable thermosets to enable recycling of thermoset nanocomposites

Y. Li

PhD	ChE	Huang, Z.	Development of Functional Binders and Li2S@Carbon Nanocomposites for High-Performance Lithium Sulfide Batteries Novel Copolymers Based on Methoxythiophene-Flanked Diketopyrrolopyrole for Wearable Resistive Sensors

PhD	ChE	Fazaeli, R.	Advanced Separator Modifications for Lithium-Sulfur Batteries: Multifunctional Organic Frameworks and Nanostructured Composites to Mitigate the Polysulfide Shuttle Effect

T. Mekonnen

MASc	ChE	Crawford, E.	Designing Porous Polymer Systems for Water Treatment Applications
MASc	ChE	Alikiotis, P.	Kraft Lignin as a Sustainable Flame Retardant Additive for Polymer Composites
MASc	ChE	Binley, G.	Controlled Degradation of Biodegradable Polymers for Use in Melt-Blown Nonwovens

D. Schipper

PhD	CHEM	Abaeva, M.	Multimetallic Complexes Supported by an Unsymmetrical Imidazopyrimidine-Based Ligand: Synthesis, Characterization, and Catalytic Studies
MSc	CHEM	Woods, R.	Design, Synthesis, and Characterization of Multimetallic Complexes Supported by an Imidazopyrimidine-Based Trinucleating Ligand

M. Tam

PhD	ChE	Teng, Y.	Programmable Gelatin Hydrogels via Ionic Modulation and Structural Design for Mechanical Properties and Tissue Regeneration
MASc	ChE	Yan, R.	Cellulose Nanocrystal Coated Paraffin Wax Coating for Fog and Dew Water Harvesting

M. Kamkar

MASc	ChE	Ghasemi, S.	3D printable fungi-based Chitin nanofiber/CNC hydrogels: implication for fabrication of functional cryogels
MASc	ChE	Ho, M.	Chitosan/SIFSIX-3-Cu Cryogels on Printed Laser-Induced Graphene for CO2 Electric Swing Capture
MASc	ChE	Khabbaz, M.	Direct Laser Writing of Laser-Induced Graphene for flexible EMI shielding applications

E. Vivaldo-Lima

PhD	ChE	Vega-Hernandez, M. A.	Síntesis y Caracterización de Copolímeros de Celulosa insertada con Poli(ácido acrílico) y Poli(ácido acrílico-co-acrilamida) Mediante Polimerización por Radicales Libres

B. Zhao

PhD	ChE	Zhoa, F.	Polymer and Metal-Polymer Thin Films under Contact and Solvent Stimuli
MASc	ChE	Ramirez, A.	Bioderived Cyrene for Sustainably 3D Printing Organo/Hydrogels Textiles

7. ACADEMIC MEMBERS OF THE INSTITUTE FOR POLYMER RESEARCH

Professors:

R. Dhib	Chem. Eng.	TMU
J. Duhamel, Director	Chemistry	Waterloo
X. Feng	Chem. Eng.	Waterloo
J. Forrest	Phys. Astro.	Waterloo
M. Kamkar	Chem. Eng.	Waterloo
Y. Li	Chem. Eng.	Waterloo
Y. Lin	Chemistry	Waterloo
T. Mekonnen	Chem. Eng.	Waterloo
A. Penlidis	Chem. Eng.	Waterloo
E. Prince	Chem. Eng.	Waterloo
D. Schipper	Chemistry	Waterloo
H. Shahsavan	Chem. Eng.	Waterloo
L. Simon	Chem. Eng.	Waterloo
M. Tam	Chem. Eng.	Waterloo
C. Tzoganakis	Chem. Eng.	Waterloo
E. Vivaldo-Lima	Chem. Eng.	UNAM, Mexico
X. Wang	Chemistry	Waterloo
B. Zhao	Chem. Eng.	Waterloo

For a brief description of research interests and projects, along with contact information, please visit the following web link: www.uwaterloo.ca/institute-polymer-research/

8. MEMBER AND SPONSOR COMPANIES—2025

Members (2)	**Sponsors (5)**
Synthomer Inc.	BASF
Thruflow	Bridgestone Americas Inc.
	EcoSynthetix
	National Research Council of Canada
	Wanhua Chemical Canada Inc.

9. STUDENT AWARDS

J. Duhamel

Hunter Little holds an NSERC CGS D scholarship.

X. Feng

Zhaohui Fei, WIN Nano Fellowship
Iris Samputu, IBET Momentum Fellowship
Rosa Castillo, 2nd place in Student Design Competition (Circular Water Economy) at WEFTEC 2025 (the 2025 Water Environment Federation's Technical Exhibition and Conference)

Y. Li

Naixin Zhao WIN Nanofellowship
Jimmy Papazotos: WIN Nanofellowship

E. Prince

Dylan McQuarrie - Best Poster in Green Chemistry Division at the 2025 CSC conference in Ottawa, ON.

Sarah Rezaei:
- International Ontario Graduate Scholarship,
- Davis Memorial Scholarship in Ecology
- Best Poster at the National High Polymer Forum Conference.
- Finalist for GradFlix

Mina Ghorbani - Ken O'Driscoll Graduate Scholarship in Polymer Engineering/Science.
Maggie Wong - Ken O'Driscoll Graduate Scholarship in Polymer Engineering/Science

T. Mekonnen

Aklilu Mesele – Nano Fellowship – $10k
Tobechukwu Joshua – IBET PhD Fellowship - $25k/year for four years
Hossein Ipakchi – Best Poster Award - $500 Polymer Processing Society (PPS) 2025

D. Schipper

Riley Woods - UW NDRA Symposium on Neuroscience Research Riley won the Best Poster Award.

H. Shahsavan

Cole Fredericks	NSERC / CGS-MU of W/ WIN Nanofellowship and Iron Ring Graduate Scholarship
Negin Bouzari	Ontario / OGS-PhD, IPR Award for Academic Excellence and Chemical Engineering Medal (Park Reilly Medal)
Matthew Scarfo	U of W/ Dean of Engineering Master's Excellence Award and Mitacs / Globalink Research Award S2025
Irving Hafed Tejedor	Mitacs / Globalink Research Award S2025
Negar Rajabi Dehnavi	Mitacs / Globalink Research Award and U of W/ WIN Nanofellowship

Yasaman Maddah	Mitacs / Globalink Research Award
Ian Kuula Ross	Mitacs / Globalink Research Award
Melanie Bouzanne	NSERC / USRA

M. Kamkar

Shakiba Samsami	WIN fellowship Award
Drew Davidson	WIN fellowship Award and 1st Place Art of Engineering and Architecture research photo contest
Saeed Hadad	WIN fellowship Award
Mahsa Barjini Khabbaz	WIN fellowship Award
Estatira Amirieh	1st Place Art of Engineering and Architecture research photo contest

A. Penlidis

Mavani, Bhoomi	NSERC PGSD (4th year)

10. FACULTY AWARDS

D. Schipper

UPEI Inspiring Young Alumni Award.

E. Vivaldo-Lima

Became Academic Member (Académico Titular) of the Mexican Academy of Engineering in the Area of Chemical Engineering, November 2025.

E. Prince

Faculty of Engineering Distinguished Performance Award
Invitation to Emerging Materials Investigators Symposium, Canadian Institute of Chemistry, 2026
MRS Early Career Distinguished Presenter, Material Research Society, 2025
Engineering Education Future Leaders Academy, CEEA-AECG, 2025

H. Shahsavan

Emerging Investigators by Journal of Materials Chemistry A
Royal Society of Chemistry

M. Kamkar

Igor Ivkovic Teaching Excellence Award
2025/6 Photo Contest Research Award American Chemical Society, 99th Colloid Division
2025/3 Emerging Investigator Materials Horizons (IF:11)
A 3-page interview with Dr. Kamkar has been published by the journal
2025/2 Polymeric Materials: Science and Engineering Early Investigator Award American Chemical Society

11. FULL REFEREED JOURNAL PAPERS

J. Duhamel

Liu, D.; Patel, J.; Xie, Y.; Zhang, H.; Duhamel, J. Probing Macromolecular Conformations in Restricted Geometries: Application to Hydrophobically Modified PAMAM Dendrimers Isolated in Surfactant Micelles. J. Phys. Chem. B 2025, 129, 1144-1153.

Lloyd, R.; Ba Salem, A.; Gallant, N.; Duhamel, J. Interactions Between DNA and a Pyrene-Labeled Surfactant Probed by Pyrene Excimer Formation, Transmission Electron Microscopy, and Dynamic Light Scattering. Langmuir 2025, 41, 3768-3778.

Zimmer, K. J. L.; Johnson, R. E.; Little, H.; Duhamel, J.; Manderville, R. Harnessing a Fluorescent Nucleobase Surrogate for Supramolecular FRET-Aptamer Detection and Target-Site Mapping. ACS Sensor J. 2025, 10, 1822-1832.

Frasca, F.; Duhamel, J. Internal Dynamics of Pyrene-Labeled Polyols Studied through the Lens of Pyrene Excimer Formation. Polymers 2025, 17, 1979.

Liu, D.; Patel, J.; Duhamel, J. Conformation of Pyrene End-Labeled Polyamidoamine Dendrimers in Catanionic Surfactant Micelles Probed by Pyrene Excimer Formation. Langmuir 2025, 41, 20986-20998.

Lulic, K.; Duhamel, J. Persistence Length of Poly(n-butyl-co-n-stearyl methacrylate)s Determined by Pyrene Excimer Formation. Accepted in Macromolecules 2025.

Frasca, F.; Lloyd, R.; Duhamel, J. Internal Dynamics of Pyrene-labeled Polyamines Probed by Pyrene Excimer Formation. Accepted in Macromolecules 2025.

X. Feng

C.-P. Hu, J.-Z. Chen**,** X. Feng, Y.-. Sun, C.-C. Hu, W.-S. Hung, K.-R. Lee, J-Y. Lai, “The manipulation of crystal structures enables the development of silk fibroin-based membranes with potential for diverse applications,” Separation and Purification Technology, accepted (2025).

S.Y. Hu, K. Wang, X. Feng, “Composite membranes comprising of polymeric and molecular amines embedded in polyvinylalcohol matrixes to facilitate CO_2/H_2 separation,” Canadian Journal of Chemical Engineering, in press (2026)

S. Ali, X. Feng, Adsorptive membranes open new avenues for PFAS-free drinking water, Science China - Materials, accepted (2025). (Invited contribution)

Z. Fei, B. Malczewska, S. Hazarika, X. Feng (2026), “Fibroin/chitosan blend membranes for perstractive removal of Hg(II) from aqueous solutions,” Journal of Membrane Science, **738**, 124857. (Invited contribution commemorating the Journal’s 50th Anniversary)

S. Ali, J. Zhang, X. Feng (2025), “Triglycidyl isocyanurate crosslinked polybenzimidazole membranes for solvent-resistant and extreme pH nanofiltration,” Journal of Membrane Science, **736**, 124638.

S. Ali, J. Zhang, R. Karnik, X. Feng (2025), “Advances in polybenzimidazole-based membranes for uses in fluid separations and energy conversion,” Journal of Membrane Science, **735**, 124502.

Samputu, X. Feng, “Incorporating ethylene glycol into hydrophilic poly(ether-b-amide) membranes for enhanced gas dehumidification performance,” Canadian Journal of Chemical Engineering, accepted (2025)

D. Song, J. Li, P. Cai, Y. Wang, J. Liu, N. Wang, H. Meng, X. Feng, Q.-F. An (2025), “Engineering and scale-up of pervaporation membrane with an intermediate PEBA layer and an optimized PDMS layer,” AIChE Journal, **71**, e70025.

P. Hazarika, R. Duarah, R. Goswami, P. Rajguru, S. Baruah, P.K. Goswami, X. Feng, S. Hazarika (2025), “Electrospun nanofibrous adsorptive membranes for removal of heavy metals from wastewater via a flow-through adsorption/permeation process,” Chemical Engineering Journal, **591**, 164877.

X. Wang, J. Zhang, X. Feng (2025), “Enhancing VOCs/N_2 separation by embedding VOC-philic bis(2-ethylhexyl) adipate into polydimethylsiloxane matrix to form oleogel membranes,” Chemical Engineering Science, **315**, 121886.

S. Ali, J. Zhang, S. Yin, X. Feng (2025), “Tailoring pore size and chemical resistance of polybenzimidazole membranes for organic solvent nanofiltration (OSN) via chemical crosslinking and sulfocalix[4]arene impregnation,” Chemical Engineering Journal, **505**, 159244.

J. Zhang, S. Ali, X. Feng (2025), “Poly(vinyl alcohol)/poly(vinyl amine) interpenetrating network membranes for olefin/paraffin separation via facilitated transport,” Journal of Membrane Science, **719**, 123697.

C. Fan, Q. Ge, S. Lu, X. Feng, Y. Tu, L. Jia, S. Lin, Q. Pan, F. Ng (2025), “One-pot synthesis of polycarbonate-b-polyester block copolymers from CO_2/epoxide/ε-caprolactone catalyzed by salen-cobalt(III) complex,” Journal of Polymer Science, **63**, 1217-1225.

J. Zhang, S. Ali, X. Feng (2025), “Highly selective and stable facilitated transport membranes for olefin/paraffin separation,” Separation and Purification Technology, **357**, 130060.

X. Wang, J. Zhang, X. Feng (2025), “Design and optimization of oleo gel membranes with tunable and enhanced VOCs/N_2 separation performance,” Journal of Membrane Science, **713**, 123384.

E. Prince

Rezaei, Zahra*; Prince, Elisabeth. ‘Recovering nanoparticles from polymer matrixes: towards a circular economy for nanocomposite materials’. Chemical Science. (accepted, 2025)

Yip, Aaron; Weldon, Michael; Dharmasiddhi, Ida Putu Wiweka; Zubrzycki, Brian; Euler, Christian; Prince, Elisabeth; Liu, Yilan; Ingalls, Brian; Aucoin, Marc. ‘Harnessing Synthetic Biology to Empower a Circular Plastics Economy’. Canadian Journal of Microbiology. (accepted, 2025)

Ghorbani, Mina*; Prince, Elisabeth. ‘Radical ring-opening polymerization: unlocking the potential of vinyl polymers for drug delivery and regenerative medicine’. Biomacromolecules. 26, 118–139 (2025)
.

Ho, Monica; Braz-Ramirez, Aline; Akbarnia, Negar*; Croisset, Eric; Prince, Elisabeth, Fuller, Gerrald; Kamkar, Milad. Direct Ink Writing of Conductive Hydrogels. Advanced Functional Materials. 2415507, (2025).

H. Shahsavan

Herrera Restrepo R S`†, Tejedor I H*†, Scarfo M G*, Bouzari N*, Rajabi N*, Bantysh O, Torres-Andrés J, James C W V, Guix Noguera M, Aghakhani A, Ignes-Mullol J, Pane S, A Puigmart-Luis J, Shahsavan H^. Hybrid Soft Actuators from Liquid Crystal Elastomer Networks and Lyotropic Chromonic Liquid Crystal Templated Hydrogels. Advanced Materials, in-press DOI: 10.1002/adma.202516677

Bouzari N*, Ali M*, Hong E*, Suthaharan N*, Bouzanne M*, Aghakhani A, Shahsavan H^. Shape-change programming of zwitterionic hydrogels via chemical gradients directed by surface energy. Journal of Materials Chemistry A, in-press, DOI: 10.1039/D5TA08956E

Magdanz V, Pervez Y, LaBrash-White M, Ligtenberg L J W, Mulder I, van der Mijle Meijer J K, Mohsenkani S, Gorbet M, Bouzari N*, Shahsavan H, Weber L, H. Liefers R, Warl M, and Khalil I S M, Sperm Cell Empowerment: X-Ray-Guided Magnetic Fields for Enhanced Actuation and Localization of Cytocompatible Biohybrid Microrobots. npj Robotics, 3, 28. DOI:10.1038/s44182-025-00044-1

Vasanji S*†, Scarfo M G*†, Alyami A, Mekonnen T, Hajireza P, Saed M O, Jákli A, and Shahsavan H^. Stiffening Liquid Crystal Elastomers with Liquid Crystal Inclusions. Advanced Materials, 37, 2504592, DOI: 10.1002/adma.202504592.

Ju X, Chen C, Oral CM, Sevim S, Golestanian R, Sun M, Bouzari N*, Lin X, Urso M, Nam JS, Cho Y, Peng X, Landers FC, Yang S, Adibi A**, Taz N, Wittkowski R, Ahmed D, Wang W, Magdanz V, Medina-Sánchez M, Guix M, Bari N, Behkam B, Kapral R, Huang Y, Tang J, Wang B, Morozov K, Leshansky A, Abbasi SA, Choi H, Ghosh S, Fernandes BB, Battaglia G, Fischer P, Ghosh A, Sánchez BJ, Escarpa A, Martinet Q, Palacci J, Lauga E, Moran J, Ramos-Docampo M, Städler B, Restrepo RH, Yossifon G, Nicholas J, Ignés-Mullol J, Puigmartí-Luis J, Liu Y, Zarzar L, Shields C IV, Li L, Li S, Ma X, Gracias D, Velev O, Sanchez S, Esplandiu MJ, Simmchen J, Lobosco A, Misra S, Wu Z, Li J, Kuhn A, Nourhani A, Maric T, Xiong Z, Aghakhani A, Mei Y, Tu Y, Peng F, Diller E, Sakar MS, Sen A, Law J, Sun Y, Pena-Francesch A, Villa K, Li H, Fan D, Liang K, Huang T, Chen X, Tang S, Zhang X, Cui J, Wang H, Gao W, Bandari VK, Schmidt O, Wu X, Guan J, Sitti M, Nelson B, Pané S, Zhang L, Shahsavan H^, He Q, Kim ID, Wang J, Pumera M. Technology Roadmap of Micro/nanorobotics, ACS Nano, 19, 27, 24174–24334, DOI:10.1021/acsnano.5c03911.

Bouzari N*, Nasseri R**, Huang J*, Ganguly S, Tang X, Mekonnen T, Aghakhani A, and Shahsavan H^. Hybrid Zwitterionic Hydrogels with Encoded Differential Swelling and Programmed Deformation for Small-scale Robotics, Small Methods, 9, 2400812, DOI: 10.1002/smtd.202400812.

Y. Li

Zhong, Y.; Cui, S.; Song, J.; Zhao, N.; Yuan, Y.; Ngai, J. H. L.; Li, Z.; Ding, J.; Li, Y. Molecularly Imprinted Semiconducting Polymers for Size- and Interaction-Selective Gas Sensors Based on Organic Thin-Film Transistors. ACS Appl. Mater. Interfaces 2025, 17 (44), 61142–61152. https://doi.org/10.1021/acsami.5c12491.

Zhao, N.; Wang, Y.; Jin, X.; Li, Y. An Intrinsically Conductive Cross-Conjugated Polymer with a Quinhydrone-Like Donor–Acceptor Charge-Transfer Network. Angew Chem Int Ed 2025, e18109. https://doi.org/10.1002/anie.202518109.
Jeon, S. J.; Zhao, N.; Yuan, Y.; Li, Y. Solution-Processable and Ambient-Stable Highly Conductive p-Type Polymers Derived from Dihydropyrazine and Ethylenedioxythiophene. Adv Funct Materials 2025, 2424664. https://doi.org/10.1002/adfm.202424664.

Dupont, W.; Boivin, L.-P.; Mainville, M.; Yuan, Y.; Li, Y.; Leclerc, M.; Gendron, D. Vanillin-Based Diketopyrrolopyrrole Conjugated Polymers Prepared by Direct Heteroarylation Polymerization (DHAP). ACS Appl. Polym. Mater. 2025, 7 (1), 29–41. https://doi.org/10.1021/acsapm.4c02440.

Zhang, L.; Fu, J.; Gao, W.; Li, Y.; Zhang, W.; Fan, X. Study on Structural Alterations and Degradation Mechanism of Lignin from Ozone Treated Scutched Flax Tow (SFT). International Journal of Biological Macromolecules 2025, 292, 139131. https://doi.org/10.1016/j.ijbiomac.2024.139131.

Zhao, N.; Jeon, S. J.; Yuan, Y.; Venkateswarlu, S.; Stella, A.; Papazotos, J.; Li, Y. Full Conjugation in a Polymer with Non-conjugated Piperazine-2,5-dione Units via Energy-minimized Lactam-to-Lactim Tautomerization Enables Water-gated Transistor Fluoride Sensors. Angew Chem Int Ed 2025, 64 (7), e202419314. https://doi.org/10.1002/anie.202419314.

T. Mekonnen

Mebrat, K., Mekonnen, T.H* Delignified and Surface-Engineered Wood for Microplastic Removal in Water Treatment. Separation and purification Technology. 2025, 390, 136912.

Kazemi, H., Dashan, A., Haddadi, A., Mekonnen, T.H., Ramezanzadeh, B. Reza Goudarzi aGreen synthesis of Ti-MXene/Ti-MOF nano-hybrid carrying bio-inspired dopamine for advanced anti-corrosion smart coating. Sustainable Materials and Technologies, 2025, 47, e01813.

Alikiotis, P., Mekonnen, T.H.* Nanostructured lignin carriers for efficient flame retardant delivery in natural rubber composites. Material Advances. 2025. DOI: 10.1039/D5MA01531F.

Crawford, E., Mekonnen, T.H.* 3D-printed, flow-through water filters for microplastic capture: the effect of surface porosity, column height, and pressure-sensitive adhesives on removal efficiency. Separation and purification Technology. 2026, 385, 136417 (IF 9).

Behroozi, A., Champagne, P., Mekonnen, T.H.*, Koupaie, E.* Selective removal of anionic contaminants via porous polyethylene glycol -templated chitosan aerogel beads. Separation and purification Technology. 2026, 387, 136657.

Shorey, R., Esmizadeh, E., Mekonnen, T.* Progress in bioplastics blends, compatibilization, modifications, and AI-driven Innovations for material applications. Progress in Polymer Science. 2026, 173, 102064. (IF: 26.1)
High impact factor publication.

Islam, M., Sproule, D., Yohans, J., Chenannaporn, P., Yim, E., Gupta, A., Mekonnen, T.* Citric acid - crosslinked cellulose derivatives superabsorbent hydrogels (SAH) as sustainable alternatives for personal hygiene applications. Chemical Engineering Journal. 2025, 526, 170721. (IF 13.1).

Islam, S., Tadele, D., Mekonnen, T.* Corn Zein Nanocarriers for Agrochemical Delivery and Smart Packaging. Advanced Sustainable Systems 2025: e00922. (IF 6.1)

Islam, M., Shorey, R., Sproule, D., Leung, K., Gupta, A., Mekonnen, T.H.* Polysaccharide-based superabsorbent hydrogels (SAH) as sustainable material alternatives for personal hygiene products. International Journal of Biological Macromolecules. 2025, 331, 148435. (IF 8.5).

Binley, G., Mekonnen, T.H.* Controlled Degradation of PBAT for PBAT/PLA blend Melt-Blown Nonwovens. Macromolecular Rapid Communications. 2025; 46:e2500276. (IF 4.3).

Behroozi, A., Rafiei, R., Vatanpour, V., Champagne, P., Mekonnen, T.H, Koupaie, E. Engineered chitosan for water purification: Mechanistic insights and material innovations for contaminant removal. Carbohydrate Polymers. 2025, 375, 124757.

Aliyari, D., Davapanah, A., Dashan, A., Haddadi, S., Sharifi, K., Mekonnen, T.H., Ramezanzadeh, B. Hybridized 2D-Ti-based MXene/Zn-dopamine-loaded ZIF-67 MOF reinforced epoxy composite for advanced intelligent anti-corrosion application. Progress in Organic Coatings. 2025, 208, 109486. (IF 7.3).

Sravanthi, GB, Thakur, R, Giri S, Dissanayake, T, Janaswamy, S, Mekonnen, T.H., Bandara, N, Pal K, Sarkar, P. Xyloglucan films from tamarind kernels reinforced with chemically modified cellulose nanospheres. Int J Biol Macromol. 2025, 331, 148411.

Davarpanah, A., Haddadi, S., Ramezandadeh, M., Ramezanzadeh, B., Mekonnen, T.H., Covalent organic framework (COF)-enhanced carbon hollow sphere (CS): a novel nano-porous material for robust epoxy composite coating intelligent corrosion protection. Advanced Composites and Hybrid Materials. 2025, 8, 334. (IF 21.8). High Impact factor publication.

Tsegaye, G., Kiflie, Z., Mekonnen, T.H., Jida, M. Amine-functionalized magnetic bio-nanocomposite for fluoride and chromium removal in water. Results in Chemistry. 2025, 18, 102685.

Dashan, A., Montazeri, S., Haddadi, S., Ramezanzadeh, B., Qiang, Y. Mekonnen, T.H. Dual-functional smart anti-corrosion coating based on Ti3C2Tx-MXene/Zr-UIO-66-NH2 reinforced epoxy. Progress in Organic Coatings. 2025, 206, 109338. (IF 7.3).

Ramezanzadeh, M., Motamedi, M., Haddadi, A., Ghanbari, A., Mekonnen, T.H., Ramezanzadeh, B. Bio-compatible hydroxyapatite Nanoplatform wrapped covalent organic framework (COF) as sustainable stimuli-responsive nano-hybrid for multi-purpose nanocomposite coating. Sustainable Materials and Technologies. 2025, 45, e01546. (IF 9.2).

Alikiotis, P., Mekonnen, T.H.* Utilizing lignin as a sustainable filler of polyvinyl chloride (PVC) composites: Effects of ash content and loading levels on thermomechanical and combustion properties. International Journal of Biological Macromolecules. 2025, 321, 146527. (IF 8.5).

Goudarzi, R., Kazemi, H., Ramezanzadeh, B., Haddadi, S., Mekonnen, T.H. Hierarchically-ordered 2D-Mo-polydopamine nanopetals' decorated Ti3C2- MXene: A sustainable nanosheets for smart/durable epoxy coating environmental anti-corrosion performance. Process Safety and Environmental Protection. 2025, 201, 107576. (IF 7.8)

Sharifi, J., Jubinville, D., Mekonnen, T.H.* Systematic Optimization of FDM 3D Printing Parameters for PLA: PBAT–Hemp Composites Using Taguchi Design. Journal of Polymers and the Environment. 2025, 33, 3663–3676. (IF 5)

Vasanji S., Scarfo M.G., Alyami A, Mekonnen T, Hajireza P, Saed M O, Jákli A, Shahsavan H*. Stiffening Liquid Crystal Elastomers with Liquid Crystal Inclusions. Advanced Materials, 2025, 2504592. (IF = 26.8) High impact factor publication.

Jubinville, D., Mekonnen, T.* Enhanced performance 3-D printed PLA parts through a photo-initiator mediated UV-curing. Advanced Material Technologies. 2025, 2500124. (IF = 6.2)

Kalani, S., Islam, M., Li, J., Rawlins, J., Ward, V., Mekonnen, T.H.* Scalable antimicrobial air filters: polypropylene/rose bengal melt-blown nonwoven filters. Chemosphere, 2025, 384, 144514. (IF = 8.1)

Jubinville, D., Sen, R., Alikiotis, P., Mekonnen, T.* Effect of biochar on the thermal and dimensional stability of poly(vinyl chloride) (PVC) composites. Journal of Vinyl and Additive Technology. 2025, 31(4): 556. (IF = 3.8)

Chen, G., Mekonnen, T. Acoustic Emission Mechanisms During Polymer Processing and Chain Orientation: From Amorphous to Crystalline. Polymers 2025, 17, 2948. (IF 4.9)

Dissanayake, T., Vidanarachchi, J.K., Narvaez-Bravo, C., Mekonnen, T., Nandika, B.* Advances in Protein-Based Materials for Functional Food Packaging. ACS Food Science & Technology. 2025, 5, 7, 2604–2617 (IF = 2.8)

Tadele, D.T., David, D., Yim, E., Mekonnen, T.H.* Development and characterization of PVA-zein/α-tocopherol nonwoven mats for functional wound dressing applications. Colloids and Surfaces B: Biointerfaces. 2025, 246, 114355. (IF = 5.6)

Crawford, E., Mekonnen, T.H.* Effects of chain extension and clay reinforcement on PLA nanocomposite foams. Reactive and Functional Polymers, 2025, 106183. (IF = 5.1)

Ohaka, T., Mekonnen, T.H.* Recyclable and Sustainable Natural Rubber Biocomposite Vitrimers Induced by Dynamic Anhydride–Epoxy Bonds. ACS Applied Polymer Materials 2025, 7, 3, 1347–1360. (IF = 4.7)

Kalani, S., Jubinville, D., Mekonnen, T.H.* Nano-Porous Melt-Blown Poly (Lactic Acid) Fiber Mat Air Filters for High Efficiency Particulate Capture. Advanced Sustainable Systems, 2025, 2400898. (IF = 6.1)

Mekonone, S.T.*, Gemechu, T.G., Mekonnen, T.H., Momhur, AM. Optimization, thermo-mechanical loading effects and microstructure evolutions of Metal Inert Gas (MIG) welded 304L stainless steel. Materials Today Communications. 2025, 42, 111514. (IF = 4.5)

Ahmadi, P., Avesta, M.J., Khorramdel, S., Jonoobi, M., Mekonnen, T.H.* Production and use of lignocellulosic wood vinegar and tar as organic pesticides to fight bacterial canker disease. International Journal of Biological Macromolecules, 140373. (IF = 8.5)

Messele, AG, Penev, KI, Mequanint, K., Mekonnen, T.H.* Lead-free single and dual-filler loaded polychloroprene X-ray shielding nanocomposites. Applied Materials Today 2024, 42, 102558. (IF = 6.9)

Ojogbo, E., Tzoganakis, C., MekonnenT.H.* Silane-modified cellulose nanocrystals (CNCs) based natural rubber composites. Composites Part A: Applied Science and Manufacturing, 2025, 190, 108632. (IF = 8.9)

Tadele, D.T., Islam, M.S., Mekonnen, T.H.* Zein-Based Nanoparticles and Nanofibers: Co-Encapsulation, Characterization, and Application in Food and Biomedicine. Trends in Food Science & Technology, 2025, 155, 104809. (IF = 15.4)

Lee, H., Chen, G., Chang, B.P., Mekonnen, T.H.*. Recent progress in the development of porous polymeric materials for oil ad/absorption application. RSC Applied Polymers. 2025, 3, 43 - 77.

A Penlidis

Szymanski, R., S. Sosnowski, A.J. Scott and A. Penlidis (2026). On determination of reactivity ratios for living/quasi- Living copolymerization with slow initiation. Chem. Eng. Sci., 320, 122577 (14 pgs + SI); accepted on Sept 4, 2025; online on Sept 12, 2025; appeared on Sept 19, 2025; https://doi.org/10.1016/j.ces.2025.122577

Madhuranthakam, C. M. R., S. Bag, B.H. Mavani and A. Penlidis (2025). Molecular dynamics analysis of Experimental results for an optimal indium oxide dopant concentration in polyaniline for effective formaldehyde sensing. Ind. & Eng. Chem. Res., xxxx (ms length 23 pgs); accepted on Aug 12, 2025; https://doi.org/10.1021/acs.iecr.5c02102

Ghodrati, S., B.H. Mavani, K.Y. (Gina) Kim, K.M.E. Stewart and A. Penlidis (2025). Organic-inorganic hybrid materials for trace detection of formaldehyde at room temperature. Langmuir, 41, 19897-19904; accepted on
July 21, 2025; doi appeared online on July 28, 2025; https://doi.org/10.1021/acs.langmuir.5c01848

Mavani, B.H. and A. Penlidis (2025). Gas sensing with polymeric materials: Improved sensitivity and selectivity for acetaldehyde and formaldehyde. Polymers for Advanced Technologies (PAT), 36 (x), 12 pgs, # 70166; accepted on March 21, 2025; appeared on March 28, 2025; https://doi.org/10.1002/pat.70166; open access.

D. Schipper

Monika Snowdon, Ekaterina Sukhanova, Zakhar Popov, Shisheng Li, Leanddas Nurdiwijayanto, Takaaki Taniguchi, Shinsuke Ishihara, Takeshi Tanaka, Hiromichi Kataura, Kazuhito Tsukagoshi, Robert Liang, Marina Freire-Gormaly, Derek Schipper,* Dmitry Kvashnin,* Dai-Ming Tang.* "Iptycene-Assisted Alignment of Chirality-Sorted SWCNTs for Field-Effect Transistors" ACS Applied Nano Materials, 2025, 8, 944–951.

German Sciaini,* Laura Ingram, Derek J. Schipper. “From Atom Decoration to Pattern Recognition: A Novice-to-Expert Journey in Lewis Structures” J. Chem. Ed. 2025, 102, 2, 861–866.

M. Kamkar

Ho, Monica, Aline Braz Ramirez, Negar Akbarnia, Eric Croiset, Elisabeth Prince, Gerald G. Fuller, and Milad Kamkar. "Direct Ink Writing of Conductive Hydrogels." Advanced Functional Materials 35, no. 22 (2025): 2415507.

Amini, Majed, Ali Akbar Isari, Shayan Ghasemi, Gabriel Banvillet, Orlando J. Rojas, Milad Kamkar, and Mohammad Arjmand. "Tailoring pore structure in nanocellulose cryogels: Enhancing thermal and electromagnetic interference shielding properties." Carbohydrate Polymers 357 (2025): 123435.

Ghasemi, Shayan, Mahyar Panahi-Sarmad, Elnaz Erfanian, Tianyu Guo, Vahid Rad, Adel Jalaee, Gabriel Banvillet et al. "Droplet-templating soft materials into structured bead-based aerogels with compartmentalized or welded configurations." Materials horizons 12, no. 10 (2025): 3444-3451.

Samsami, Shakiba, Majed Amini, Seyed Mohammad Amin Ojagh, Estatira Amirieh, Ayako Takagi, Theo GM van de Ven, Mohammad Arjmand, Orlando J. Rojas, Kam Chiu Tam, and Milad Kamkar. "Nano-and Microscale Design of Electrically Conductive Bacterial Cellulose/PEDOT Cryogels for Electromagnetic Interference Shielding." Langmuir 41, no. 8 (2025): 5614-5623.

Samsami, Shakiba, Zahra Monsef Khoshhesab, Juan Felipe Yee-de León, Diego Alonso Quevedo Moreno, Mario Moisés Alvarez, Grissel Trujillo-de Santiago, Kam C. Tam, and Milad Kamkar. "Chaotic Direct Ink Writing (ChDIW) of Hybrid Hydrogels: Implication for Fabrication of Micro-ordered Multifunctional Cryogels." Small Methods (2025): 2500349.

Hadad, Saeed, Michael A. Pope, Milad Kamkar, and Kam Chiu Tam. "Solid-State Revolution: Assessing the Potential of Solid Polymer Electrolytes in Lithium-Ion Batteries." Advanced Sustainable Systems 9, no. 1 (2025): 2400532.

M. Tam

Liu, J.; Yang, Y.; Gu, S.; Li, J.; Zhao, F.; Yu, G.P.; Tam, K.C.; Tang, J., Ultraselective Permeable Polyamide Membranes Prepared via Interfacial Polymerization of Alkane and Deep Eutectic Solvent, Angew. Chem. Int. Ed. (2025), 137, e202507932 (1 of 9) [Impact factor: 16.9]
Cao, G.; Nguyen, H.; Xu, S.; Zhao, W.; Teng, Y.C.; Wang, J.; Du, K.; De Silva, M.; Tam, K.C Self-assembly of cellulose nanocrystals for splash suppression and enhanced pesticide delivery on hydrophobic surfaces, Journal of Colloid and Interface Science, (2025), 706, 139564 [Impact factor: 9.7]
Pradeep, T.; Tam, K.C.; Carrier, D.J.; Chen, J.; Hwang, B.J.; Meier, M.; Subramaniam, B.; Brower, R.S.; Licence, P., The ACS Sustainable Family– Complementary yet Distinct: Some Evolving Thoughts from the Editors' Desks, ACS Sustainable Chem. Eng. (2025), 13, 14675-14676 [Impact factor: 7.3]

Long, G.; Ge, D.; Yu, H.Y.; Tam, K.C., "Salt washing" adjustment of crosslinking degree to fabricate multifunctional antifreeze hydrogel for self-power and storage integrated flexible sensor, Science China Chemistry, (2025), 1-11, https://doi.org/10.1007/s11426-025-2883-7) [Impact factor: 9.8]

Zhang, J.; Xu, Z.; Chen, J.; Cai, C.; Tam, K.C.; Tan, Z., Stabilizing β-carotene-loaded Pickering emulsion with chitin nanoparticles extracted from insect shells using deep eutectic solvents, Results in Engineering, (2025), 27, 106963 [Impact factor: 7.9]

Xie, J.; Yao, F.; Zhu, S.; Tam, K.C.; Xu, J.; Chen, J., Yang, H., Deep eutectic solvents as enablers of lignin nanoparticles: Advances in extraction, valorization and challenges, Industrial Crops and Products, (2025), 233, 121422 [Impact factor: 6.2]

Cao, G.; Teng, Y.C.; Zhao, W.; Nguyen, H.; Tam, K.C., Surfactants, cellulose nanocrystals, and chitosan: Their contributions to pesticide delivery systems, Advances in Colloid and Interface Science, (2025), 345, 103642 [Impact factor: 19.3]

De Silva, M.; Cao, G.; Tam, K. C., Nanomaterials for the removal and detection of heavy metals: a review, Environ. Sci.: Nano, 2025, 12, 2154-2176 [Impact factor: 5.1]
Ghasemi, S.; Panahi-Sarmad, M.; Erfanian, E.; Guo, T.; Rad, V.; Jalaee, A.; Banvillet, G.; Foster, E.J.; Tam, K.C.; Soroush, M.; Jiang, F.; Rojas, O.J.; Kamkar, M., Droplet-templating soft materials into structured bead-based aerogels with compartmentalized or welded configurations, Materials Horizons, (2025), 12, 3444-3451 [Impact factor: 10.7]

Du, K.; Teng, Y.C.; Zhang, S.; Tam, K.C., Recent progress on solid-state electrolytes based on nanocellulose: Structures, applications, and challenges, Materials Today Energy, (2025), 51, 101891 [Impact factor: 8.6]

Samsami, S.; Khoshhesab, Z.M.; Yee-de León, J.F.; Moreno, D.A.Q. Alvarez, M.M.; de Santiago, G.T.; Tam, K.C.; Kamkar, M., Chaotic Direct Ink Writing (ChDIW) of Hybrid Hydrogels: Implication for Fabrication of Micro-ordered Multifunctional Cryogels, Small Methods, (2025), 2500349 [Impact factor: 9.1]

Huang, C.; Yu, H.Y.; Gao, Y.; Chen, Y.; Abdalkarim, S.Y.H.; Tam, K.C., Recent Advances in Green and Efficient Cellulose Utilization Through Structure Deconstruction and Regeneration, Advanced Functional Materials, (2025), 35 (30), 2424591 [Impact factor: 19.0]

Samsami, S.; Amini, M.; Ojagh, S.M.A.; Amirieh, E.; Takagi, A.; van de Ven, T.G.M.; Arjmand, M.; Rojas, O.J.; Tam, K.C.; Kamkar, M., Nano-and Microscale Design of Electrically Conductive Bacterial Cellulose/PEDOT Cryogels for Electromagnetic Interference Shielding, Langmuir, (2025), 41, 5614-5623 [Impact factor: 3.9]

Teng, Y.; Zhang, Z.; Cui, Y.; Su, Z.; Godwin, M.; Chung, T.Z.; Zhou, Y.; Leontowich, A.F.G.; Islam, M.S.; Tam, K.C.; Wu, Y.A., High-Sensitivity and Flexible Motion Sensing Enabled by Robust, Self-Healing Wood-Based Anisotropic Hydrogel Composites, Small, (2025), 21 (11), 2500944 [Impact factor: 12.1]

Gao, Z.; Dong, Y.; Huang, C.; Abdalkarim, S.Y.H.; Yu, H.Y.; Tam, K.C., On-Demand plus and minus strategy to design conductive Nanocellulose: From low-dimensional structural materials to multi-dimensional smart sensors, Chemical Engineering Journal, (2025), 510, 161552 [Impact factor: 13.2]

Li, S.; Wu, B.; Wang, S.; Jiang, M.; Pan, C.; Dong, Y.; Xu, W.; Yu, H.Y.; Tam, K.C., Multi-Level High Entropy-Dissipative Structure Enables Efficient Self-Decoupling of Triple Signals, Advanced Materials, (2025), 37, 2406054 [Impact factor: 26.8]

Cao, G.; Zhao, W.; Han, L.; Teng, Y.C.; Xu, S.; Nguyen, H.; Tam, K.C., Enhancing Droplet Spreading on a Hydrophobic Plant Surface by Surfactant/Cellulose Nanocrystal Complexes, ACS Nano (2025), 19, 3, 3549-3561. [Impact factor: 16.0]

Cao, G.; Xu, J.; Han, L.; Wang, Y.; Zhao, W.; Zhou, X.; Lee, Y.; Loh, W.; Tam, K.C., Interactions between Cellulose Nanocrystals and Conventional/Gemini Surfactants, Carbohydrate Polymers, (2025), 351, 123132 [Impact factor: 12.5]

Hadad, S.; Pope, M.A.; Kamkar, M.; Tam, K.C., Solid-State Revolution: Assessing the Potential of Solid Polymer Electrolytes in Lithium-Ion Batteries, Advanced Sustainable Systems, (2025) 9, 2400532 [Impact factor: 6.1]

Tang, C.X., Yan, X.M.; Tam, K.C., Effect of crosslinker length in CNF foams for oil recovery and sustainable agriculture, Carbohydrate Polymers, (2025), 352, 123178 [Impact factor: 12.5]

Liu, J.; Yang, Y.; Gu, S.; Li, J.; Zhao, F.; Yu, G.P.; Tam, K.C.; Tang, J., Ultraselective Permeable Polyamide Membranes Prepared via Interfacial Polymerization of Alkane and Deep Eutectic Solvent, Angew. Chem. Int. Ed. (2025), 137, e202507932 (1 of 9) [Impact factor: 16.9]

Cao, G.; Nguyen, H.; Xu, S.; Zhao, W.; Teng, Y.C.; Wang, J.; Du, K.; De Silva, M.; Tam, K.C Self-assembly of cellulose nanocrystals for splash suppression and enhanced pesticide delivery on hydrophobic surfaces, Journal of Colloid and Interface Science, (2025), 706, 139564 [Impact factor: 9.7]

E. Vivaldo-Lima

María Fernanda Munguía-Quintero, Maribel Pineda-Herrera, Alberto Rosas-Aburto, María de los Ángeles Valdivia-López, Martín Guillermo Hernández-Luna, and Eduardo Vivaldo-Lima*, Synthesis, characterization and performance evaluation of Lignosulfonate-graft-Net-Poly(acrylamide-co-(acrylic acid)-co-N,N' methylenebisacrylamide), for the Removal of Pb2+ and Cu2+ from Water, Int. J. Biol. Macromol., 336, 149394, 2026; https://doi.org/10.1016/j.ijbiomac.2025.149394.

Nelson Jiménez Reyes, Porfirio López-Domínguez, José Fernando Barragán-Aroche, and Eduardo Vivaldo-Lima*, "Understanding the kinetics of the atom transfer radical polymerization of vinyl acetate in bulk

and solution in supercritical carbon dioxide", Ind. Eng. Chem. Res., 64(46), 22160–22171, 2025; https://doi.org/10.1021/acs.iecr.5c03621.

Miriam García-Vargas, María Fernanda Munguía-Quintero, Jorge Alcaraz-Cienfuegos, Alberto Rosas-Aburto, María de los Ángeles Valdivia-López, Martin Guillermo Hernández-Luna and Eduardo Vivaldo-Lima*, Synthesis, characterization and evaluation of cellulose-graft-poly(4-vinylpirydine), using cellulose from a new pretreatment process, for heavy metal removal from wastewater, Int. J. Biol. Macromol., 284, 137986, 2025; https://doi.org/10.1016/j.ijbiomac.2024.137986.

B. Zhao

Surjyasish Mitra, A-Reum Kim, Boxin Zhao, Sushanta Mitra, "Short time spreading dynamics of elastic drops" Materials Advances, Accepted, Dec 15, 2025

A-Reum Kim, Aline Braz Ramirez, Hassan Hamza, Hongying Zhao, James Lockhart, Jin Wang, Emmanuel A. Ho, Sushanta K. Mitra*, Boxin Zhao*, "Alginate Aerogel Beads for Effective Aggregating Nanoplastics and Water Remediation", Nature Communications Chemistry, Accepted, Nov 1, 2025

Lu Yin, Ali Vahidifar, Steven Yu, Boxin Zhao "Recent Advances in Conductive Rubber Composites: Progress, Challenges, and Emerging Opportunities", Macromolecular Rapid Communications, Accepted, Nov 18, 2025

Fan Zhao, Surjyasish Mitra, Minmin Xu, Jianlin Yao, Sushanta K. Mitra, and Boxin Zhao, "Solvent-induced triradial pattern formation on solid-supported viscoelastic thin films and gels" ACS Applied Materials and Interface, 17(46), 63896–63912, 2025

Ahmet Gulsaran, Bersu Bastug Azer, Gamze Gursu, Cihat Tasaltin, Nevin Tasaltin, Dogu Ozyigit, A-Reum Kim, Boxin Zhao, Michael A. Pope, Mustafa Yavuz, "Xenes-based QCM sensors: Exploring borophene and silicene for humidity sensing", Discovery Nano, 20,110:1-18, 2025

Fan Zhao, Surjyasish Mitra, Zhao Qi, Minmin Xu, Yaxian Yuan, Jianlin Yao, Sushanta K. Mitra, Boxin Zhao, "In-situ Raman Spectroscopy for Soft Contacts", Journal of Colloid and Interface Science, 698,138084, 2025

Ashna Rajeev**, Sarswati Koul, Aaron Guan, Boxin Zhao†, "Nanochitin as a strength enhancing agent for paper-based packaging material" ACS Omega. 10,26618-26626, 2025

Pengxiang Si, Mingrui Liang, Jihua Zou, Yu Kuang, Juntao Zhang; Qingsha Cheng, Yunxin Cai, Guozhi Huang, Yun Wu, Zhu Long, Boxin Zhao, Dan Zhang, "Battery-free antenna sticker for wireless sensing joint rotation" Chemical Engineering Journal, 513,162691, 2025

Surjyasish Mitra, A-Reum Kim, Boxin Zhao, and Sushanta K. Mitra, "Spontaneous rolling on a 90° incline", Soft matter, 21, 4587-4595, 2025

Lu Yin, Ali Vahidifar, Aleksander Cholewinski, Jenna Liu, Steven Yu, Boxin Zhao, "One-pot Synthesis of Polypyrrole/Rubber Composite Latex as High-Performance Sustainable Conductive Coating", Progress in Organic Coatings, 203, 109174, 2025

Mahyar Panahi Sarmad, Ahmadreza Ghaffarkhah, Lukas Bauman, Amin Babaei-Ghazvini, Seyyed Alireza Hashemi, Bishnu Acharya, Boxin Zhao, Mohammad Arjmand, Feng Jiang,

Orlando Rojas, “Liquid printing in nanochitin suspensions: Interfacial nanoparticle assembly toward volumetric elements, organic electronics and core-shell filaments”, Small Methods, 2500100:1-11, 2025

Lukas Bauman, Boxin Zhao “Conductive Supramolecular Acrylate Hydrogels Enabled by Quaternized Chitosan Ionic Crosslinking for High-Fidelity 3D Printing”, Carbohydrate Polymer Technologies and Applications, 9, 100702, 2025

C Tzoganankis

J-C. Yang, A. Arefi, V. Gritsichine and C. Tzoganakis (2025). “Non-PFAS polymer processing aids: Slip velocity measurements and time-to-clear studies in blown film extrusion”, Journal of Plastic Film & Sheeting, 41(3), 274-291. https://doi.org/10.1177/87560879251325804

E. Ojogbo, C. Tzoganakis and T.H. Mekonnen (2025). “Silane-modified cellulose nanocrystals (CNCs) based natural rubber composites”, Composites Part A: Applied Science and Manufacturing, 190, 108632.https://doi.org/10.1016/j.compositesa.2024.108632

13. CONFERENCE PRESENTATIONS/INVITED SEMINARS

X. Feng

X. Feng, “Asymmetric and composite membranes for separation of volatile organic compounds from gas streams,” Invited Keynote at *the 12th International Membrane Science & Technology Conference*, Surfers Paradise, Australia, Dec 8-11, 2025.

C.-P. Hu, J.-Z. Chen, W.-T. Yu, C.-C. Hu, X. Feng, J.-Y. Lai, “Multifunctional sustainable silk fibroin-based separation membranes,” presented at *Federation of Asian Polymer Societies Biennial Polymer Congress* (Track 3: Engineering Aspects of Polymers), Singapore, Dec 1-4, 2025.

X. Feng, “Composite membranes for olefin/paraffin separation via facilitated olefin transport”, Invited presentation at *Federation of Asian Polymer Societies Biennial Polymer Congress* (Symp. 8: Innovations in Polymers for Membrane and Separation Technologies), Singapore, Dec 1-4, 2025.

Z. Fei, X. Feng, “Removal of Hg(II) from wastewater using fibroin as an environmentally friendly biosorbent,” presented at *the Canadian Chemical Engineering Conference*, Montreal, QC, Oct 5-7, 2025.

X. Feng, “Olefin/Paraffin separation via facilitated olefin transport,” Invited Keynote at *the 15th Conference of Aseanian Membrane Society* (AMS15), Kuala Lumpur, Malaysia, Aug 19-21, 2025

B. Malczewska, X. Feng, “Research on the chitosan/polysulfone composite's separation characteristics to improve removal of natural organic materials and mitigate fouling,” presented at *the International Scientific Conference on Applied Polymers, Nanomaterials, Membranes, and Composites*, Toruń, Poland, May 27-30, 2025.

Y. Li

Li, Y., Invited talk, Molecular Engineering of π-Conjugated Polymers for Stable and Selective Flexible Sensors, Dalian University of Technology, Dalian, China, December 25, 2025

Li, Y., Invited talk, High-Performance Temperature and Chemical Sensors pi-Conjugated Polymers, Jiangnan University, Wuxi, China, December 15, 2025

Li, Y., Keynote, Cross-Conjugated Polymer Semiconductors for Temperature and Chemical Sensing, The 3rd International Conference on New Materials for Environment and Energy (NMEE 2025), Shanghai, China, December 12-14, 2025

Li, Y., Keynote, Flexible Temperature and Chemical Sensors Enabled by Rationally Designed Conjugated Polymers, The 7th IEEE International Flexible Electronics Technology Conference (IFETC) in Vancouver, BC, Canada from Aug. 5-8, 2025

Li, Y., et al., Invited talk, Tailored Functional Polymers for High-Performance Organic Field-Effect Transistor Chemical Sensors, The Canadian Chemistry Conference and Exhibition (CSC 2025), Ottawa, June 15-19, 2025

Li, Y., et al., Invited talk, Elastomeric polymers for lithium-sulfur batteries, The Canadian Chemistry Conference and Exhibition (CSC 2025), Ottawa, June 15-19, 2025

E. Prince

Pacifichem
Making plastics and composites chemically recyclable through copolymerization
Location: Honolulu, Hawaii, USA

Pacifichem
Designing biomimetic mechanical properties into polymer hydrogels
Location: Honolulu, Hawaii, USA

McMaster University Department of Chemical Engineering Colloquium Seminars
Making plastics and composites chemically recyclable through copolymerization
Location: Hamilton, Ontario, Canada

High Polymer Forum
An additive approach for rendering commodity plastics biodegradable
Location: Barrie, Ontario, Canada

Canadian Society for Chemistry Conference
Copolymerization as a pathway toward radically polymerized covalent adaptable networks
Location: Kingston, Ontario, Canada

Canadian Society for Chemistry Conference
An additive approach for rendering polystyrene biodegradable
Location: Kingston, Ontario, Canada

Open Plastic Symposium
An additive approach for rendering commodity plastics biodegradable
Location: Kingston, Ontario, Canada

Materials Research Society – Spring 2025
Cleavable comonomer additives for rendering plastics degradable and recyclable
Location: Seattle, Washington, USA

American Chemical Society – Spring 2025
Designing biomimetic mechanical properties into polymer hydrogels
Location: San Diego, California, USA

T. Mekonnen

T. Mekonnen. Waterborne Biopolymer Dispersions for seed coating and fertilizer encapsulation. Biomass and Bioproducts to Fuel the Sustainable Bioeconomy. Nov 2025, Ottawa, ON, Canada.

T. Mekonnen. Waterborne Biopolymer Dispersions for Barrier Paper Coating. International congress Pulp and Paper, ABTCP 2025, Oct 14- 1 6, 2025, Sao Paulo, Brazil.

T. Mekonnen. Engineered polysaccharides via enzymatic polymerization for paper coating and sustainable packaging. International congress Pulp and Paper, ABTCP 2025, Oct 14- 1 6, 2025, Sao Paulo, Brazil.

T. Mekonnen (Invited talk) Polymer molecular engineering to promote plastics and rubber sustainability. Advances in Chemical Engineering - A CJCE Symposium; Canadian Chemical Engineering Conference (CSChE 2025), Oct 2025, Montreal, Canada.

T. Mekonnen. Biopolymer modifications to tune molecular structure and functionality. PPS 2025, Sept 2025, Guelph, ON, Canada

T. Mekonnen (Invited seminar). Crystallization kinetics of PHAs and impact of modified cellulose nanocrystals. NSF - NSERC Circle project meeting. San Diego, USA. 2025.

T. Mekonnen. (Invited speaker) Modificaiton of Polymers for sustainable materials applications, IPR confernece, University of Waterloo, May, 2025.

T. Mekonnen (Invited talk): Engineered Polysaccharides and the Modification of Polysaccharides and Poly(lactic acid) for Sustainable Multiphase Polymer Development (Auckland, Newzealand). April, 2025.

T. Mekonnen (Invited seminar): Chemical and mechanochemistry modification of polymers for sustainability. Trent, ON, Canada. Nov, 2025.

D. Schipper

Derek J. Schipper. “Engineering Low Exciton Binding Energies in Organic Semiconductors via Polar Heterocycle Design” 108th Canadian Chemistry Conference, Ottawa, Ontario, June 18, 2025.

Derek J. Schipper. “The Alignment Relay Technique: Advancing Carbon Nanotube Organization for Electronic Applications” 108th Canadian Chemistry Conference, Ottawa, Ontario, June 17, 2025.

Derek J. Schipper. “Rational Design of Unsymmetrical Imidazopyrimidine-Based Ligands for Selective Formation of Multi-metallic Complexes” 108th Canadian Chemistry Conference, Ottawa, Ontario, June 16, 2025.

M. Tam

Plenary talk- Canadian Chemical Engineering Conference, October, Montreal in connection to the RJ Jane Memorial Award

A Penlidis

Mavani, B. and A. Penlidis (2025). Next generation polymer-based hybrid materials for targeted trace gas detection. Paper id: 713765, Session: MOF, COF and Porous Polymer Materials II, presentation on Nov 4, 2025. AIChE Annual Conference, Nov 2-6, 2025, Boston MA, USA.

Mavani, B. and A. Penlidis (2025). Tunable synergistic polymer-metal oxide composites for trace formaldehyde detection at room temperature. Paper id: 4280948, PMSE/POLY Division, Session on 2-D nanocomposites, presentation on Aug 19, 2025. ACS Fall conference, Aug 17-21, 2025, Washington DC, USA.

M. Kamkar

D. Davidson*, M. Kamkar "Protecting Firefighters from Cancer through Multifunctional Electrospun Nanocomposites" (*IPR*, Waterloo, May)

C. Villafane*, M. Kamkar "Eco-Friendly Electrochemically Synthesized Graphene/Sodium Alginate Inks for 3D Printing Highly Conductive Hydrogels and Aerogels" (*IPR*, Waterloo, May)

M. Kamkar "Soft Matter Templating for Aerogel Design through Interfacial Co-assembly of Nanomaterials/Surfactants" (*ACS Colloid*, Alberta, Canada, Jun)

C. Villafane*, R. Ali*, Z. Zhuge*, M. Kamkar "Eco-Friendly, Highly Conductive, Electrochemically Synthesized Graphene/Sodium Alginate Inks for 3D Printing Tough Hydrogels and Aerogels" (*Polymer Processing Society*, Canada, Guelph, Sept)

C. Villafane*, S. Ghasemi*, J. Beacom*, M. Kamkar "Oppositely charged Fungal-derived chitin nanofibers/cellulose nanocrystals hydrogels for 3D printing of sustainable substrates" (*Polymer Processing Society*, Canada, Guelph, Sept)

S. Samsami*, E. Jacob*, N. Ngeyun*, M. Tam, M. Kamkar "3D Printable Cellulose/Carbon Nanotube Hydrogels Through Additive-Free Ultrasonication-Assisted Gelation" (*Polymer Processing Society*, Canada, Guelph, Sept)

S. Samsami*, M. Tam, M. Kamkar "Multi-Functional Hybrid Cryogels Through Chaotic Direct Ink Writing" (*Polymer Processing Society*, Canada, Guelph, Sept)

S. M. Amin Ojagh, M. Kamkar, T. G.M. van de Ven "Multifunctional nanocellulose-based hybrid hydrogels for 3D Printing applications" (*ACS Colloid*, Alberta, Canada, Jun)

M. Kamkar "Soft Matter Multiscale Design for the Fabrication of Functional Aerogels Short Course" (Universidad de Costa Rica, San Pedro, July 2025)

C Tzoganakis

M. Bulsari and C. Tzoganakis (2025). "Peroxide-Induced Degradation of Polypropylene Blends", Proceedings of the 84th Annual Technical Conference of the Society of Plastics Engineers, Philadephia, PA, USA.

M. Bulsari, C. Mai, M. Hashemnejad, H. Mavridis and C. Tzoganakis (2025). “Peroxide Modification of Polyolefin Elastomers”, Proceedings of the 84th Annual Technical Conference of the Society of Plastics Engineers, Philadephia, PA, USA.

E. Vivaldo-Lima

SYNTHESIS, CHARACTERIZATION AND EVALUATION OF CELLULOSE-GRAFT-POLY(2-(DIETHYLAMINO)ETHYL METHACRYLATE), USING CELLULOSE FROM A NEW PRETREATMENT PROCESS, FOR HEAVY METAL REMOVAL FROM WASTEWATER (Poster), Miriam Garcia-Vargas, Martín Guillermo Hernández Luna, Jorge Alcaraz Cienfuegos, María de Los Ángeles Valdivia López, Alberto Rosas Aburto, Eduardo Vivaldo Lima, Symposium G11, Advances in Polymers as Multipurpose Materials at the 33rd International Materials Research Congress, Cancun, Mexico in August 17 - 21, 2025.

SYNTHESIS AND CHARACTERIZATION OF LIGNOSULFONATE-GRAFT-(NETPOLY((METHACRYLAMIDE-CO-(ACRYLIC ACID)))) BY CONVENTIONAL FREE RADICAL COPOLYMERIZATION USING MICROWAVE ACTIVATION FOR LEAD REMOVAL (poster), Valeria Olvera Cázares, María Fernanda Munguía Quintero, Eduardo Vivaldo Lima, Alberto Rosas Aburto, Symposium B6, Advanced Functional Materials for a Sustainable Environment at the 33rd International Materials Research Congress, Cancun, Mexico in August 17 - 22, 2025.

B. Zhao

Boxin Zhao, “Bioinspiration and Smart Polymers for Interfacial Engineering Towards Sustainability” McMaster University Chemical Engineering Conference MUCEC 2025, Hamilton, 2025 April 29 (Keynote speech).

Boxin Zhao, “Bioadhesion Inspired Polymer Nanotechnology”, Central European Institute of Technology (CEITEC) Brno, Czech Republic, 2025 June 24

Boxin Zhao, “Recent Progress in Bioadhesion Inspired Polymer Nanotechnology”, The 9th Canadian Symposium on Teaching and Research Excellence, Grand Bend, Ontario, 2025 Aug 23

Lu Yin, Jiaqi Zhu, Boxin Zhao, “Light-Curable Solventless Adhesive for Rapid Underwater Bonding”, Canadian Chemical Engineering Conference, Montreal, Oct 5-7, 2025

Lu Yin, Ali Vahidifar, Boxin Zhao, Aleksander Cholewinski, Jenna Liu, Steven Yu, “Polypyrrole/Rubber Composite Latex-based Conductive Coating”, CSC 2025, Ottawa, June 15-19

H. Shahsavan

Maddah Y*, Siddiquee Z, Jákli A, and Shahsavan H^. Flexible Electroactive Ionic Liquid Crystal Elastomers Based on Thiol-Michael Chemistry, International Liquid Crystal Elastomer Conference (ILCEC2025), Tampere, Finland, August 2025

Tejedor I H*, Herrera Restrepo R S*, Scarfo M G*, Rajabi N*, Bouzari N*, Guix Noguera M, Ignes-Mullol J, Puigmart-Luis J, and Shahsavan H^. When Liquid Crystal Networks Meet their Chromonic Lyotropic Hydrogel Cousins, International Liquid Crystal Elastomer Conference (ILCEC2025), Tampere, Finland, August 2025

Scarfo M G*, Herrera Restrepo R S*, and Shahsavan H^. Microscale Photolithography of LCE Soft Actuators and Robots with Magnetically Driven, Discretized Alignment Domains, International Liquid Crystal Elastomer Conference (ILCEC2025), Tampere, Finland, August 2025

14. PATENTS/MAJOR TECHNICAL REPORT/CHAPTERS IN BOOKS/OTHER

E. Vivaldo-Lima

Enrique Saldívar-Guerra and Eduardo Vivaldo-Lima, Eds., Polymer Science, Engineering, and Sustainability. Volume 1. Chemistry: Polymer Synthesis and Production, John Wiley & Sons, First edition, November 2025, ISBN 9781394354276.

Enrique Saldívar-Guerra and Eduardo Vivaldo-Lima, Eds., Polymer Science, Engineering, and Sustainability. Volume 2. Physics: Polymer Characterization, Processing, and Applications, John Wiley & Sons, First edition, November 2025, ISBN 9781394354306.

Enrique Saldívar-Guerra and Eduardo Vivaldo-Lima, "Chapter 1: Introduction to Polymers and Polymer Types", in: Polymer Science, Engineering, and Sustainability, Volume 1. Polymer Chemistry: Polymer Synthesis and Production, E. Saldívar-Guerra and E. Vivaldo-Lima (Eds), John Wiley & Sons, November 2025.

Ramiro Guerrero-Santos, Enrique Saldívar-Guerra, Iván Zapata-González, José Bonilla-Cruz, and Eduardo Vivaldo-Lima, "Chapter 3: Free-Radical Polymerization", in: Polymer Science, Engineering, and Sustainability, Volume 1. Polymer Chemistry: Polymer Synthesis and Production, E. Saldívar-Guerra and E. Vivaldo-Lima (Eds), John Wiley & Sons, November 2025.

Graeme Moad, Eduardo Vivaldo-Lima, Michael Cunningham, Robin A. Hutchinson, Connor Sanders, Enrique Saldívar-Guerra, and Alex Penlidis, "Chapter 4: Reversible Deactivation Radical Polymerization (RDRP)", in: Polymer Science, Engineering, and Sustainability, Volume 1. Polymer Chemistry: Polymer Synthesis and Production, E. Saldívar-Guerra and E. Vivaldo-Lima (Eds), John Wiley & Sons, November 2025.

Marc A. Dubé, Enrique Saldívar-Guerra, Iván Zapata-González, and Eduardo Vivaldo-Lima, "Chapter 6: Copolymerization", in: Polymer Science, Engineering, and Sustainability, Volume 1. Polymer Chemistry: Polymer Synthesis and Production, E. Saldívar-Guerra and E. Vivaldo-Lima (Eds), John Wiley & Sons, November 2025.

Julio César Hernández-Ortiz, Porfirio López-Domínguez, Patricia Pérez-Salinas, Eduardo Vivaldo-Lima, "Chapter 9: Crosslinking", in: Polymer Science, Engineering, and Sustainability, Volume 1. Polymer Chemistry: Polymer Synthesis and Production, E. Saldívar-Guerra and E. Vivaldo-Lima (Eds), John Wiley & Sons, November 2025.

Mariamne Dehonor-Gómez, Enrique Saldívar-Guerra, Alfonso González-Montiel, José Bonilla-Cruz, and Eduardo Vivaldo-Lima, "Chapter 10: Polymer Modification and Grafting", in: Polymer Science, Engineering, and Sustainability, Volume 1. Polymer Chemistry: Polymer Synthesis and Production, E. Saldívar-Guerra and E. Vivaldo-Lima (Eds), John Wiley & Sons, November 2025.

Alexander Penlidis, Eduardo Vivaldo-Lima, Julio C. Hernández-Ortiz, Enrique Saldívar-Guerra, Porfirio López-Domínguez, Carlos Guerrero-Sánchez, “Chapter 12: Polymer Reaction Engineering”, in: Polymer Science, Engineering, and Sustainability, Volume 1. Polymer Chemistry: Polymer Synthesis and Production, E. Saldívar-Guerra and E. Vivaldo-Lima (Eds), John Wiley & Sons., November 2025.

Jorge Herrera-Ordóñez, Enrique Saldívar-Guerra, Eduardo Vivaldo-Lima, Francisco López-Serrano, “Chapter 14: Dispersed-phase Polymerization Processes”, in: Polymer Science, Engineering, and Sustainability, Volume 1. Polymer Chemistry: Polymer Synthesis and Production, E. Saldívar-Guerra and E. Vivaldo-Lima (Eds), John Wiley & Sons, November 2025.

Eduardo Vivaldo-Lima, Carlos Guerrero-Sánchez, Iraís A. Quintero-Ortega, Gabriel Luna-Bárcenas, Miguel Rosales-Guzmán, Christian H. Hornung, “Chapter 15: New Polymerization Processes”, in: Polymer Science, Engineering, and Sustainability, Volume 1. Polymer Chemistry: Polymer Synthesis and Production, E. Saldívar-Guerra and E. Vivaldo-Lima (Eds), John Wiley & Sons, November 2025.

T. Mekonnen

Mekonnen, Tizazu, Islam, Shahid, Gupta, Arvind. Polysaccharide-based superabsorbent hydrogels and use for personal hygiene products. United States provisional Application. No. 63/807,143, filed on May 16, 2025.

C. Tzoganakis

J.Z. Charlton, A. Schneider, A. Arefi, P.M. Giammaria, V. Gritsichine, C. Tzoganakis (2025), “Fluorine-free and silicone-free polymer processing aids”, WO2025008354A1

E. Prince

Prince, Elisabeth; Cannarozzo, Pino. Dissolvable tile leveling clips. US 63/860,371. Patent application filed on August 28, 2025.

B. Zhao

Boxin Zhao, Sushanta Mitra, A-Reum Kim, Aline Braz Ramirez, “Methods for Effective Aggregating Nanoplastics and Water Remediation Using Aerogel-Enhanced Filtration” US Provisional application for patent # 63/781,023, March 31, 2025

15. OTHER HIGHLIGHTS FOR THE YEAR 2025

Jean Duhamel

Jean Duhamel is a member of the Editorial Advisory Board of the journals Polymers and Langmuir.

Vivaldo-Lima

Appointed as Associate Editor, The Canadian Journal of Chemical Engineering, edited by John Wiley & Sons, effective January 9, 2025; https://onlinelibrary.wiley.com/page/journal/1939019x/homepage/editorialboard.html

Miembro del Consejo Editorial (Editorial Board Member) de la Revista Ingeniería, Investigación y Tecnología (Engineering, Research and Technology Journal) (https://www.revistaingenieria.unam.mx/en/), editada por la Facultad de Ingeniería de la UNAM (edited by UNAM's Faculty of Engineering), effective February 24, 2025.

Miembro de la Comisión de evaluación 1 del área 8 del S.N.I.I. (Member of the Evaluation Comittee of the Mexican Researchers System (SNII), Area 8 (Engineering)), CONAHCYT, Sistema Nacional de Investigadoras e Investigadores, March 2024 to February 2025.

Prof. Vivaldo-Lima continued his participation as member of FQ-UNAM's Editorial Committee, ongoing since June 2022.

Prof. Vivaldo-Lima continued his membership in the UK Research and Innovation International Development Peer Review College (UK, 2018 to present).

Prof. Vivaldo-Lima continued his role as Patron (Benefactor) of Faculty of Chemistry-UNAM, 2018 to present.

Prof. Vivaldo-Lima continued his participation as member of FQ-UNAM's Honorable Technical Council (HCT) (Maximum technical authority at FQ-UNAM), representing the Department of Chemical Engineering. The appointment goes from August 2023 to July 2027.

Alex Penlidis

2025, Journal reviewer, 5 manuscripts
2025, Consultant, 2 companies (USA, Europe); specific names available upon request
2025, Editorial Board Member, Polymer-Plastics Techn. and Eng.
2025, Editorial Board Member, Macromol. React. Eng.
2025, Editorial Board Member, Processes
2025, International/national academic collaborations (regular basis with co-authored articles): UNAM (Mexico); Centre for Macromolecular Studies, Polish Academy if Sciences, Lodz, Poland; Chem. Eng., Abu Dhabi Univ., UAE; and, more locally, University of Ottawa, Dalhousie Univ., and Trent Univ.

2025, Membership in Professional Societies, CIC, CSChE, MSED; Association of Professional Engineers (Europe/Greece); Canadian Academy of Engineering (CAE)

2025, Book review on emulsion technology for Springer (Aug)

Elisabeth Prince

Elisabeth Prince is a member of the Early Career Editorial Advisory Board of the journals Biomacromolecules and is Secretary for the CIC Macromolecular Science and Engineering Division.

Supervised Capstone Team "GammaSense: Radiochromic Hydrogel Patch for real time dosimetry during radiation therapy" won the Best Overall Project Bhattacharrya Award

Boxin Zhao

Board of Directors, Waterloo Institute for Nanotechnology (2022 -2025)

Awarded Mitacs Accelerate Grant for the project titled "'Single Use' Video Laryngoscope Blades: A Proof-of Concept Study".

Awarded an OCI Collaborate 2 Commercialize grant (2025-2027) for the project with Neptune Nanotechnologies, titled "Recyclable biodegradable nanochitin-based barrier coatings for advanced paper packaging"

INSTITUTE FOR POLYMER RESEARCH
CELEBRATING 41 YEARS OF OFFICIAL INSTITUTE STATUS
FORTY-SEVENTH ANNUAL SYMPOSIUM
ON POLYMER SCIENCE/ENGINEERING 2025
E7 7303-7363
Faculty Hall
University of Waterloo, Waterloo, Ontario
Wednesday April 30 and Thursday May 1, 2025

8:45 a.m.	**Open Symposium Portal**
8:50	**Welcome and Opening Remarks**
9:00 – 9:20	**Negin Bouzari (Prof. Shahsavan), Chem Eng, Waterloo** Novel Small-Scale Robots for Medical Applications **(Winner of 2024 IPR Award for Academic Excellence in Polymer Science/Engineering)**
9:20 – 10:00	**Industry Speaker: Dr. Nicholas Lanigan, Davwire.** Formulation of Photocurable Resins for the Fabrication of Ferroelectrets
10:00 – 10:20	**5-Min. Mini Presentations** **1) Periklis Alikiotis (Prof. Mekonnen)** Utilizing Lignin as a Sustainable Filler of Polyvinyl Chloride (PVC) Composites: Effects of Ash Content and Loading Levels on Thermomechanical and Combustion Properties **2) Tobechukwu Ohaka (Prof. Mekonnen)** Recyclable and Sustainable Natural Rubber Biocomposite Vitrimers Induced by Dynamic Anhydride-Epoxy Bonds **3) Lauren DiLoreto (Prof. Lin)** Upcycling of Polyolefins into Stress-Responsive Materials **4) Saba Karimi (Prof. Forrest)** Two Relaxation Mechanisms for Rejuvenation of Stable Polystyrene Glass
10:20 – 10:40	**Coffee**
10:40 – 11:00	**Mahnoor Mehmood (Prof. Forrest)** Characterization of Polymer Stable Glasses
11:00 – 11:20	**Ashna Rajeev (Prof. Zhao)** Nanochitin as a Strength Enhancing Agent for Paper-Based Packaging Material
11:20 – 11:40	**Matthew Scarfo (Prof. Shahsavan)** Microscale Photolithography of LCE Soft Actuators and Robots with Magnetically Driven, Discretized Alignment Domains

11:40 – 12:00 **Lu Yin (Prof. Zhao)**
Polypyrrole/Rubber Composite Latex as High-Performance Sustainable Conductive Coating

12:00 – 12:50 **Lunch**

12:50 – 1:30 **Academic presenter: Prof. Megan Roberts, Western**
Nanocellulose for Precision Applications: Combatting Challenges Using Intentional Surface Chemistry Design

1:30 – 1:50 **Franklin Frasca (Prof. Duhamel)**
Probing the Encounter Dynamics between the Side Chains of Small Multifunctional Macromolecules by Pyrene Excimer Formation

1:50 – 2:10 **5-Min. Mini Presentations**

5) **Iris Samputu (Prof. Feng)**
Dehydration of ethylene glycol and gases through the use of polymeric and novel polymer blend membranes

6) **Jinxuan Zhang (Prof. Feng)**
Interfacially crosslinked poly(vinyl alcohol)/poly(vinyl amine) composite membranes incorporated with silver for facilitated olefin/paraffin separation

7) **Hossein Hipakchi (Prof. Mekonnen)**
Direct Ink Writing for Conductive 3D-Printed Healthcare Sensors: Design and Fabrication

8) **Jimmy Papazotos (Prof. Li)**
Novel Polymer Semiconductor Design for Low Level Gas Detection

2:10 – 2:30 **Carlos Villafane (Prof. Kamkar)**
Eco-Friendly Electrochemically Synthesized Graphene/Sodium Alginate Inks for 3D Printing Highly Conductive Hydrogels and Aerogels

2:30 – 2:50 **Junhao Hu (Prof. Schipper)**
Harnessing Light: Exploring Pyrazine Polymers for Single-Molecule Organic Solar Cells

2:50 – 3:10 **Yonglin Wang (Prof. Li), Chem Eng, Waterloo**
Development of High-Performance Organic Cathode Materials Based on Coordination Polymers for Lithium-Ion Batteries
(Winner of the 2023 IPR Award for Academic Excellence in Polymer Science/Engineering)

3:10 – 3:40 **Coffee**

3:40 – 4:00 **Donghan Liu (Prof. Duhamel)**
Interactions of Hydrophobically Modified PAMAM Dendrimers with Surfactant Aggregates Probed by Pyrene Excimer Formation

4:00 – 4:20 **Akliu Getnet (Prof. Mekonnen)**
Lead free single and dual filler loaded nanocomposites for X-ray radiation shielding

4:20 – 4:40 **Kristijan Lulic (Prof. Duhamel)**
Improving the Sensitivity of Pyrene Excimer Formation for Persistence Length Determination of Poly(alkyl methacrylate)s

4:40 – 5:00 **Evangelin Sridhar (Prof. Simon)**
Kinetics of bio polyesters

5:00 – 5:20 **Hunter Little (Prof. Duhamel)**
Using Time-Resolved Fluorescence to Gain New Insights into the Conformation of DNA Aptamers

5:20 – 5:40 **Autumn Cheon (Prof. Tam)**
Sustainable Air Filtration Materials Using Biomacromolecular Nanomaterials

5:40 – 6:05 **5-Min. Mini Presentations**

9) **Noah Gallant**
Characterizing the Size and Structure of Pyrene-Tagged SDS and DTAB Micelles

10) **Drew Davidson (Prof. Kamkar)**
Protecting Firefighters from Cancer through Multifunctional Electrospun Nanocomposites

11) **Karthick Raj Selvam (Prof. Mekonnen)**
Silk Nanofibers for Drug Delivery: A Solution Blow Spinning Approach

12) **Maggie Wong (Prof. Prince)**
Engineering Biomimetic Strain-Stiffening into Polyacrylamide Hydrogels

13) **Dylan McQuarrie (Prof. Prince)**
Leveraging Diels-Alder Adducts for Recyclable Thermosets

6:05 – 6:10 **Closing remarks**

Thursday May 1, 2025
(E7 7303-7363)

8:45 a.m. **Open Symposium Portal**

8:50 **Welcome and Opening Remarks**

9:00 – 9:50 **Prof. Leonardo Simon, Chem Eng, Waterloo**
Industrial Hemp and Development of Sustainable Materials

9:50 – 10:40 **Prof. Xianshe Feng, Chem Eng, Waterloo**
Mass Transfer in Pervaporation, Perstraction and Sorption - A Unified Approach

10:40 – 11:00 **Coffee**

11:00 – 11:50 **Prof. Tizazu Mekonnen, Chem Eng, Waterloo**
Engineered Polysaccharides and the Modification of Polysaccharides and Poly(lactic acid) for Sustainable Multiphase Polymer Development

11:50 – 11:55 **Closing remarks**

25-001 **Conductive Supramolecular Acrylate Hydrogels Enabled by Quaternized Chitosan Ionic Crosslinking for High-Fidelity 3D Printing**
L. Bauman and B. Zhao
Carbohydrate Polymer Technologies and Applications 02/25

25-002 **Harnessing a Fluorescent Nucleobase Surrogate for Supramolecular FRET-Aptamer Detection and Target-Site Mapping**
K. Zimmer, R. Johnson, H. Little, J. Duhamel, and R. Manderville
ACS Sensors. 02/25

25-003 **Polypyrrole/Rubber Composite Latex as High-Performance Sustainable Conductive Coating**
L. Yin, A. Vahidifar, A. Cholewinski, J. Liu, S. Yu, B. Zhao
Progress in Organic Coatings. 02/25

25-004 **Gas Sensing with Polymeric Materials: Improved Sensitivity and Selectivity for Acetaldehyde and Formaldehyde**
B. Mavani and A. Penlidis
Polymers for Advanced Technologies. 03/25

25-005 **Solution-Processable and Ambient-Stable Highly Conductive p-Type Polymers Derived from Dihydropyrazine and Ethylenedioxythiophene"**
S. Jeon, N. Zhao, Y. Yuan, and Y. Li
Advanced Functional Materials. 04/25

25-006 **Cross-Conjugated Polymer Semiconductors**
N. Zhao, S. Jeon, and Y. Li
Macromolecular Rapid Communications. 06/25

25-007 **Internal Dynamics of Pyrene-Labeled Polyols Studied through the Lens of Pyrene Excimer Formation**
F. Frasca and J. Duhamel
Polymers. 07/25

25-008 **Organic-Inorganic Hybrid Materials for Trace Detection of Formaldehyde at Room Temperature**
S. Ghodrati, B. Mavani, K. Kim, K. Stewart, and A. Penlidis
Langmuir. 07/25

25-009 **Conformation of Pyrene End-Labeled Polyamidoamine Dendrimers in Catanionic Surfactant Micelles Probed by Pyrene Excimer Formation**
D. Liu, S. Patel, and J. Duhamel
Langmuir. 07/25

25-010 **Molecular Dynamics Analysis of Experimental Results for an Optimal Indium Oxide Dopant Concentration in Polyaniline for Effective Formaldehyde Sensing**
C. Madhuranthakam, S. Bag, B. Mavani, and A. Penlidis
Ind. & Eng. Chem. Res. 08/25

25-011 **On determination of reactivity ratios for living/quasi-living copolymerization with slow imitation**
R. Szymanski, S. Sosnowski, A. Scott, A. Penlidis
Chem. Eng. Sci. 09/25

25-012 **An Intrinsically Conductive Cross-Conjugated Polymer with a Quinhydrone-Like Donor–Acceptor Charge-Transfer Network**
N. Zhao, Y. Wang, X. Jin, and Y. Li
Angewandte Chemie. 10/25

25-013 **Understanding the kinetics of the atom transfer radical polymerization of vinyl acetate in bulk and solution in supercritical carbon dioxide**
N. Jiménez Reyes, P. López-Domínguez, J. Barragán-Aroche, Fernando; E. Vivaldo-Lima
Industrial & Engineering Chemistry Research. 10/25

25-014 **Synthesis, characterization and performance evaluation of Lignosulfonate-graft-(Net-Poly(acrylamide-co-(acrylic acid)-co-N,N' methylenebisacrylamide)), for the Removal of Pb2+ and Cu2+ from Water**
Ma. Fernanda Munguía-Quintero, M. Pineda-Herrera, A. Rosas-Aburto, M. de los Ángeles Valdivia-López, M. Guillermo Hernández-Luna, and E. Vivaldo-Lima