

ABDIAZIZ A. FARAH

Phone: (416) 388-6295 (mobile), (905) 230-0632 (home); E-mail: Farah.abdiaziz@gmail.com

PROFESSIONAL EXPERIENCE

Ph.D in Chemistry/Polymers/Canadian Citizen

Orow Scientific Consulting Inc. (Toronto, Ontario, Canada): *Managing Director (08/2024-present):*

- **Scientific Consulting Lead.** Technical leader (3 Scientists)
 - Provides expert guidance on materials science, nanomaterial design and application, manufacturing processes and device integration.
 - Collaborates closely with cross-function teams, including operations, engineers, product development, and others, to integrate materials innovation into product design and manufacturing.
 - Cultivates strategic partnership with research institutions, universities, industry partners and investors.
 - Handles client technical challenges and consults with external experts and research organizations to leverage their insights and resources for technical advancement.
 - Ensures effective project management, resource allocation, and timely delivery of R&D and consulting endeavors.

SABIC Corporate Research and Innovation Center at KAUST (Saudi Arabia): *Chief Scientist (2012-2014):*

- **Material research and product development:** *Polymer and polymerizations.* Technical leader (4-9 Scientists and Engineers)
 - Led and designed various customized monomers and specialty polymers with controlled chain length, morphologies and architectures: homopolymers, copolymers (block, alternating, statistical and graft), multiblock polymers, (hyper)branched (co)polymers, end-functionalized polymers, macroinitiators and macromonomers by using various polymerization methods including radical, suspension and emulsion, anionic, cationic, transition metal initiators or catalysts. Living/atom transfer radical polymerization (ATRP), Reverse Addition Fragmentation Chain Transfer (RAFT) and metathesis ring opening polymerizations (ROMP), as well as combinations of different polymerization methodologies (AP, ATRP, ROP, RAFT, ROMP, TEMPO and catalytic).
 - Executed custom small reactive organic compounds and grafted them to specialty and high performance polymers, thermoplastics, thermoplastics elastomers, elastomers, thermosets, from lab scale up to pilot-scale reactor synthesis for different industrial applications.
 - Identified process development and opportunities using compounding and extrusion for product (i.e., PE, HDPE, LDPE, LLDPE, stretched and blown films) innovation projects across multiples businesses and manufacturing to ensure commercial success
 - Led the SABIC efforts for the mass production synthesis (~ 50 g and scalable) of premium polyacrylonitrile copolymers/terpolymers as precursors for the deployment of carbon fibers with adjustable modulus and strength.
- **Biomaterials and nanomaterials development for device integration.** Technical leader (5 Scientists and Engineers)
 - Initiated and led the company efforts in the development of disruptive sensing technologies Including new materials development, sensing and device integration.
 - Research areas include: a) triboelectric and multifunctional materials, b) physical sensing devices for wearable and healthcare applications c) thin film circuitry, d) surface functionalization of polymers and 2D-semiconductor surfaces/bioconjugation of noble metals (Au, Ag and alloys) into polymeric surfaces
 - Devised a customized nanotemplating and nanofabrication procedure(s) in clean room environment applicable to soft and semiconducting materials.
 - Responsible for designing and equipping a fully functional laboratory for the deposition and processing of thin films by both physical and chemical methods
- **Bioelectronic sensor development/prototyping and device integration.** Technical leader (7 Scientists and Engineers)
 - Led a multidisciplinary, global team to develop and integrate organic and inorganic-based multifunctional materials into all thin-film glucose-monitoring device.
 - Research areas include: a) metal nanoparticles (MNPs) and nanocomposites polymeric materials preparation, b) fabrication and optical characterization (Raman, SERS, fluorescence, confocal optical microscopy and bio-conjugation).
 - Delivered the first demonstration of nanoplasmonic/TFT integrated device with electrical readout.

- **Sensors development platform.** Technical leader (5 Scientists and Engineers)
 - Delivered the first demonstration of triboelectric device sensor from non-conventional thermoplastics and perfluoro POSS composite.
 - Initiated and led disruptive sensing technologies including new materials development (polymer composites, XPC-FPOSS), sensing and system integration.
 - From lab to market in record time: advanced 2 R&D projects to pre-commercialization stage: From idea generation to prototype fabrication and validation in two years time.
 - Developed and integrated organic and inorganic multifunctional materials into an all thin film platform for different application segments including wearables for wellness monitoring, biosensing, optical displays and internet of things (IoT), to name a few.
- **Responsive and tunable surfaces (Reactive thin film and sheets).** Technical leader (3 Scientists)
 - Developed the process/strategy for surface functionalization and nanostructuring of SABIC proprietary transparent polymers to make them super hydrophobic/hydrophilic for different self-cleaning applications in semi-arid desert-like environment.
- **Obbligato Objectives INC. Toronto, Canada. Principal Research Scientist (2011-2012)**
 - Directed project teams including engineers, scientists, and technicians for assigned projects.
 - Developed and motivated technical teams for assigned projects.
 - Independently investigates difficult problems and identifies, evaluates, and implements solutions.
 - Communicated project plans, resource needs, progress, status, and implications effectively across geographic and organizational boundaries.
 - Assisted in mentoring junior staff towards technical and professional growth. Generated IP for key discoveries.

Department of Electrical and Computer Engineering. University of Toronto, Canada. Postdoctoral Fellow (PDF) /Research Scientist (2008-2010)

- Fabricated nanostructured thin films (patterned and self-assembled) and nano-scale structures for potential application in sensor devices.
- Investigated materials processing approaches using Rapid Thermal Annealing (RTA) and Raman spectroscopy conditions to elucidate structure-property relationship of semiconducting polymers.
- Developed novel thin film depositions and structural modifications of semiconducting polymers using (PECVD, wet chemical and plasma etching, ion beam irradiation, metallization and annealing), and patterning procedures (photo and e-beam lithography, templates, self-assembling) combined with analysis of the structural, electrical, and optical properties.
- Fabricated highly fluorescent CdTe quantum dots (QDs) with tunable emission bands and excellent photostability.
- Prepared scientific manuscripts for publication in international refereed journals.
- Mentored and supervised graduate/undergraduate students.

National Institute for Nanotechnology (NINT), National Research Council (NRC), Edmonton, Alberta Postdoctoral Fellow (PDF) (2006-2008)

- Developed novel spectroscopically barcoded hybrid polymeric nanomaterials for biosensing and diagnostics.
- Fabricated nanostructured hybrid polymeric latex-materials through emulsion and suspension polymerization.
- Utilized Raman scattering/SERS as biosensing and ultra-detection platforms.
- Initiated gold nanoparticles-based SERS markers for multiplexed bioassay applications.

Department of Chemistry, York University, Toronto, Ontario. Sr. Research Associate (2005-2006)

- Developed novel functional polymeric macroligands on gold and silicon substrate.
- Conducted research on electroactive and organic polymer magnetic systems via sol-gel chemistry.
- Performed studies on thermal and pH-responsive sol-gel transitions.
- Synthesized and characterized ruthenium bis-bipyridine mono and disulfinate complexes.
- Launched controlled polymerization methods for functional polymeric hybrid materials.
- Instructed and supervised graduate/undergraduate students.

National Research Council Canada, Institute for Microstructural Sciences, (IMS-NRC), Ottawa, Ontario.
Associate Research Council Officer (2003-2005)

- Conducted research on the chemical synthesis and characterization of functional polymers for 2D-molecularly imprinted technology and biosensors for security purposes.
- Investigated the self-assembly processes based on non-covalent molecular interactions, specific macromolecular architectures, nanoparticles assemblies and defined polymer substrate interactions.
- Presented scientific findings at several reputable conferences and workshops (both national and international) specific to molecularly imprinting polymers and to surface science chemistry.
- Explored bio-conjugation techniques to synthesize hydrophobic or hydrophilic surfaces for sensor applications.
- Evaluated the performance of two-dimensional molecular imprinting devices and collaborated with the Department of National Defense (DND).

EXPERTISE & CONSULTANCY SERVICES

- Polymer synthesis & material engineering, Medical devices, Bio/nanomaterials, Product development, Thermoplastic elastomers.
- Reviewer in *Macromolecules* (ACS), *J. Polymer Science* (Wiley), *European Polymer journal* (Elsevier), *J. Appl. Polym. Sci.* (Wiley), *inorganic Chimica Acta* (Elsevier).

PROJECT MANAGEMENT SKILLS

- Technical liaison on industrially collaborated projects and guaranteed timely delivery of quality service to clients (i.e.; National Research Council of Canada, Department of National defense (DND), Genome Health Canada, Vivenano, Scobill Industries, Fraunhofer ISI, KAUST, KACST and Carbon Nexus Inc.).
- Successfully initiated and managed 5 collaborative research projects between SABIC Corporate Research and Development organization and other institutions locally and internationally.
- Effective technical lead on projects towards commercialization of products/stage (i.e.; nanocomposite microspheres for biomolecular detection, 2D-molecularly imprinted devices for sensing application, screen printed displays, integrated device for glucose biosensing, touch/force sensor, scratch resistant Polypropylene compounds (PPc), LLDPE based vitrimers, development of carbon fiber precursor for high-end applications).
- Material technology and development strategies (market assessment, product development planning, project management and formation of strategic partnerships)
- Managed IP portfolios to safeguard and leverage intellectual property assets effectively.
- Hired 6 qualified and motivated professionals to form innovative team.
- Long-term team management of 4-15 people (Technicians, engineers and M.Sc./Ph.D. scientists and students)
- Worldwide Professional Network (Asia, Europe, North of America, Middle East).
- Lab management (Purchasing advanced laboratory equipment and accessories, laboratory space management and annual/routine equipment maintenance, chemicals and consumables; procurement; technical support; instructor, HSE lab representative) (SABIC CRD at KAUST)
- Co-organized SABIC polymers forums and conferences (SABIC CRD at KAUST)

HEALTH & SAFETY AWARENESS

- Experience with HSE policies and regulations (Risk Assessment; working knowledge of HSE legislation and applications (Lab Safety Plan); laboratory specific Standard Operating Procedure (SOP); accidents; Occupational Exposure Limits (OELs).
- Trained and certified first aider; lab safety; emergency and crisis management; floor warden; chemical spill and segregation; hazardous waste; class AB, ABC, AK and D fire extinguishers; safe handling liquid nitrogen, etc.

EDUCATION

Ph.D. (*Chemistry/polymer materials*), York University, Toronto, Ontario, Canada (2002).

D. Sc. (*Doctoral in Chemical Science*), Department of Chemistry and Industrial Chemistry, University of Pisa, Italy (1995).

AFFILIATIONS AND MEMBERSHIP

- Canadian Society for Chemistry (CSC), Division of Macromolecular Science and Engineering.
- Materials Research Society (MRS).
- American Chemical Society (ACS). Polymer Chemistry Division.

AWARDS AND HONOURS

- York University Graduate Development Fund (1997-1999).
- Faculty of Graduate Studies Scholarship (FGS) (2001-2002).
- Merit in Science scholarship award to Pisa University (1989-1994).
- 2008 Best Poster Award, Materials Research Society, Boston, MA, USA

RESEARCH INTERESTS

- Development of various synthetic methods to prepare organic/inorganic precursors, monomers, polymers with controlled chain length, structure, morphologies and molecular properties.
- Nanostructured hybrid polymer materials together with their physicochemical properties and ultimate applications.
- Creation of multilayered, patterned and self-assembled nano-scale structures for different potential applications and device integration (i.e., optical, electrical and touch/force sensing. Bioelectronics device and biosensors).
- Materials processing and characterization (structure-properties) including thin film depositions. Soft and solid thin film surface modifications combined with the analysis on structural, electrical, and optical properties.

SUMMARY OF TECHNICAL QUALIFICATIONS (TECHNICAL SKILLS)

- Functional polymer synthesis and characterization with expertise in colloid and interfacial science, plasmonic materials and quantum dots, self-assembling materials, nanocomposites and nanoscale structures, thin films, conductive polymers, electrical and optical characterization techniques, emulsions and microemulsions, microgels and hydrogels
- Hands-on and experience with various polymerization methods radical, suspension and emulsion, anionic, cationic, transition metal initiators or catalysts. Living/atom transfer radical polymerization (ATRP), Reverse Addition Fragmentation Chain Transfer polymerization (RAFT), classical Ring Opening Polymerization (ROP) as well as metathesis ring opening polymerizations (ROMP).
- Biomaterials and nanomaterials, nanotemplating and nanopatterning, biosensing, bioelectronics and bioimaging, coatings and paints, analytical and physical chemistry, Raman, light scattering, and calorimetric techniques.
- Skilled in surface modification procedures (plasma, bioconjugation, and wet chemistry).
- Metal nanoparticles (MNPs) and nanocomposites polymeric materials: Fabrication and optical characterization (Raman, SERS, fluorescence, confocal optical microscopy and bioconjugation).
- Skilled in nanofabrication and nanotemplating procedures in clean room environment applicable to soft and semiconducting materials (wet chemical and plasma etching, ion beam irradiation, metallization and annealing); patterning procedures (micro-contact printing, photo and e-beam lithography, templates, self-assembling).
- Thin films of organics and polymers on various substrates and their characterization (AFM, SEM, TEM, EDX, XPS, GA-FTIR, ellipsometry, contact angle measurements, PL and EL characterization).
- Proficient in solution and solid-state characterization of organics and polymers using viscosimetric analysis, gel permeation chromatography (GPC), dynamic and static laser light-scattering (DLS-SLS), GC-MS, 1D and 2D NMR techniques, UV-visible and FT-IR spectroscopy.
- Thermal analysis: Differential scanning calorimetry (DSC), thermogravimetric analysis (TGA), thermal and dynamic mechanical analysis (TMA, DMA). single crystal X-ray diffraction methods and powder diffraction analysis (XRD)).
- Fabrication of polymer microcellular foams from biodegradable (polycaprolactones (PCL) and polylactides (PLA) and testing methods.
- Electrochemical studies of transition metal complexes/metallopolymers and electroactive materials.
- Computer literate and bilingual (English and Italian). SciFinder, ChemDraw, Beilstein, IsisDraw. Independent, analytical, innovative with team-player attitude, strong leadership, result-oriented, good communication and interpersonal skills.
- Proficient in engineering research methodology, statistical design of experiment, Strong R&D, mentoring and management experience

PEER-REVIEWED PUBLICATIONS

1. A. A. Jaber, **A. A. Farah**, S. A. Abbas, K. Kopeć, Y. Al-Salik, M. A. Tayeb, N. Verghese
“Effect of fiber sizing levels on the mechanical properties of carbon fiber reinforced thermoset composites”. *Polymers* 15, 4678 (2023)
2. C. Xia, Y. Zhou, D. Velusamy, **A. A. Farah**, P. Li, Q. Jiang, I. Odeh, Z. Wang, X. Zhang, H. Alshareef.
“Anomalous Li Storage Capability in Atomically Thin 2D Sheets of Non-layered MoO₂”. *Nano letters* 18 (2), 1506-1515 (2018)
3. **A. A. Farah**, S. A. Rutledge, A. Schaarschmidt, R. Lai, J. P. Freedman, A. S. Helmy
“Conductivity enhancement of poly (3, 4-ethylenedioxythiophene)-poly (styrenesulfonate) films post-spincasting” *Journal of Applied Physics* 112 (11), 113709 (2012)
4. J. S. W. Mak, **A. A Farah**, F. Chen, A. S. Helmy
“Photonic crystal fiber for efficient Raman scattering of CdTe quantum dots in aqueous solution” *ACS nano* (5), 3823-3830 (2011)
5. **A. A. Farah**, C. Dares, W. J. Pietro
“Using a Push–Pull Azobenzene Haptan to Probe Surface– Core Electronic Communication in Surface-Functionalized CdS Quantum Dots” *J. Phys. Chem. C* 114 (48), 20410-20416 (2010)
6. S. Rutledge, **A. A. Farah**, J. Dinglasan, D. Anderson, A. Das, J. Goh, C. Goh, A. S. Helmy
“Post-synthesis crystallinity tailoring of water-soluble polymer encapsulated CdTe nanoparticles using rapid thermal annealing, in Colloidal Nanoparticle for Electronic Application-Light Emission, Detection, Photovoltaics and Transport” edited by J. Steckel, N. Kotov, D. Norris, M. Bawendi, M. Kuno, Mater. Res. Soc. Symp. Proc. Volume 1207E, 107-N03-08 (2010)
7. S. Rutledge, **A. A. Farah**, J. Dinglasan, D. Anderson, A. Das, C. Goh, J. Goh, A. S. Helmy
“Post-synthesis crystallinity improvement of colloidal CdTe nanoparticles using rapid thermal annealing” *J. Phys. Chem. C* 113, 20208-20213 (2009)
8. A. Schaarschmidt, **A. A. Farah**, A. S. Helmy
“Influence of non-Adiabatic annealing on morphology and molecular structure of PEDOT-PSS films” *J. Phys. Chem. B* 113, 9352-9355 (2009)
9. **A. A. Farah**, R. A. Alvarez-Puebla, J-P, Bravo-Vasquez, H. Fenniri
“Robust Au-PEG/PS microbeads as optically stable platforms for SERS” *Small* 5, 1283-1286 (2009)
10. R. A. Begum, **A. A. Farah**, H. N. Hunter, A. B. P. Lever
“Synthesis and characterization of Ruthenium bis bipyridine mono- and disulfinato complexes” *Inorg .Chem.*48, 2018-2027 (2009)
11. **A. A. Farah**, R. A. Alvarez-Puebla, H. Fenniri
“Chemically stable silver nanoparticle-crosslinked polymer microspheres” *J. Colloid and Interface Science* 319, 572-576 (2008).
12. **A. A. Farah**, S. Dai, B. J. Al-Hourani, J-P. Bravo-Vasquez, J-Y. Cho, H. Fenniri
“Synthesis and optical properties of SERS-active nanocomposite microspheres” in combinatorial methods for high-throughput materials science, edited by D.S. Ginley, M. J. Fasaloka, A. Ludwig and M. Upmma, *Mater. Res. Soc. Symp. Proc.* Vol. 1024-A04-03 (2008).
13. S. Dai, **A. A. Farah**, R. A. Alvarez-Puebla, J-P. Bravo-Vasquez, H. Fenniri
“Fabrication and characterization of spectroscopically encoded core-shell nanoparticle-polymer nanocomposite” in synthesis and surface engineering of three-dimensional structures, edited by Ruth Houbertz, *Mater. Res. Soc. Symp. Proc.* Vol. 1054-F12-14 (2008).
14. R. Voicu, K. Faid, **A. A. Farah**, R. Barjovanu, F. Bensebaa, C. Py, Y. Tao
“Nanotemplating for two-dimensional molecular imprinting” *Langmuir* 23, 5452-5458 (2007).

15. **A. A. Farah**, S. H. Zheng, S. Morin, F. Bensebaa, W.J. Pietro
“Thiolated poly (ϵ -caprolactones) macroligand with vacant coordination sites on gold: Synthesis and surface characterization” *Surface science* 601, 1677-1683 (2007).
16. **A. A. Farah**, N. Hall, S. Morin, W. J. Pietro
“Poly(ϵ -caprolactone)-block-polystyrene metallopolymers via sequential ROP and ATRP with in-situ generated ruthenium catalyst ” *Polymer* 47, 4282-4291 (2006).
17. **A. A. Farah**, R. Voicu, R. Barjovanu, K. Tufa, F. Bensebaa, K. Faid
“Synthesis and surface characterization of alkylthioacetyl-capped self-assembled monolayers on gold surface” *Appl. Surf. Sci.* 252, 14, 5158-5167 (2006).
18. J. Rusanova, E. Rusanov, S. I. Gorelsky, D. Christendat, R. Popescu, **A. A. Farah**, R. Beaulac, C. Reber, A. B. P. Lever
“The very covalent diammino(o-benzoquinonediimine) dichlororuthenium(II). An extreme example of very strong π back-donation” *Inorg. Chem.* 45, 6246-6262 (2006).
19. F. Bensebaa,, **A. A. Farah**, N. Patrito, P. L’Ecuyer, G. Pleizier, D. Wang, C. Book, X. Du, J. Kung, Y. Le Page
“Microwave synthesis of polymer embedded Pt-Ru catalyst for direct methanol fuel cell” *J. Phys. Chem B.* 109, 32, 15339-15344 (2005).
20. **A. A. Farah**, W. J. Pietro
“Multifunctional polymers via atom transfer radical polymerization (ATRP) of N-(ω '-alkylcarbazolyl) methacrylate initiated by heteroleptic Ru(II) polypyridyl chromophores” *J. Polym. Sci. Part A: Polym. Chem.* 43, 6057-6072 (2005).
21. A. V. Nawaby, **A. A. Farah**, L. Xia, W. J. Pietro, M. Day
“Biodegradable open cell foams of telechelic poly(ϵ -caprolactone) macroligand with ruthenium (II) chromophoric subunits via CO₂ processing” *Biomacromolecules* 6, 2458-2461 (2005).
22. **A. A. Farah**, W. J. Pietro
“Telechelic poly (ϵ -caprolactones) with tethered mixed ligand ruthenium (II) chromophores” *Can. J. Chem.* 82, 595-607 (2004).
23. **A. A. Farah**, W. J. Pietro
“Atom transfer radical polymerization (ATRP) of N-(ω '-alkylcarbazolyl) methacrylates via the use of novel heteroleptic Ru (II) polypyridyl initiator” *Inorg. Chimica Acta* 357, 3813-3824 (2004).
24. **A. A. Farah**, D. V. Stynes, W. J. Pietro
“Synthesis, characterization and crystal structure of 2-(2-pyridyl)-4-carboxyquinoline methyl ester diimine ligand and bis (2-2' bipyridine)-2-(2-pyridyl)-4-carboxyquinoline methyl ester ruthenium (II) Hexafluorophosphate” *Inorganic Chimica Acta* 343, 295-306 (2003).
25. **A. A. Farah**, W. J. Pietro
“Synthesis, structure and electrochemical properties of tris(2-(2-pyridyl)-4-methylcarbonylquinoline) ruthenium (II) hexafluorophosphate” *Inorganic Chem. Commun.* 6, 662-665 (2003).
26. H. A. Mirza, **A. A. Farah**, D. V. Stynes, A. B. P. Lever
“Binuclear trans- μ -pyrazine-bis[bromotetrapyridineruthenium (II)] dihexafluorophosphate dimethylformamide disolvate” *Acta Cryst. E59, m679-m680* (2003).
27. **A. A. Farah**, W. J. Pietro
“Cis-dichloro-bis-2-(2-pyridyl)-4-methylcarboxyquinoline ruthenium (II): A novel ruthenium (II) tris-chelated building precursor” *Inorganic Chem. Commun.* 4, 237-240 (2001).
28. **A. A. Farah**, F. Zobi, D. V. Stynes, A. J. Lough, W. J. Pietro
“Cis-(2,2'-bipyridine) bis[2-(2-pyridyl)-4-methoxycarbonylquinoline]-ruthenium (II) hexafluorophosphate” *Acta Cryst. E57, m274-m276* (2001).
29. **A. A. Farah**, W. J. Pietro
“Methyl 2-(2-pyridyl) quinoline-4-carboxylate” *Acta Cryst. E57, o667-o678* (2001).

30. **A. A. Farah**, J. G. C. Veinot, M. Najman, W. J. Pietro
 "Redox active, multi-chromophore ruthenium (II) polypyridyl-carbazole copolymers: Synthesis and characterization" *J. Macromol. Sci. Pure & Applied Chem.* 37, 1507-1529 (2000).
31. J. G. C. Veinot, **A. A. Farah**, J. Galloro, F. Zobi, V. Bell, W. J. Pietro
 "Surface functionalization of cadmium sulfide quantum confined nanoclusters 6: Evidence of facile electronic communication between remote surface sites" *Polyhedron*, 19, 331-341 (2000).
32. **A. A. Farah**, W. J. Pietro
 "Synthesis and characterization of partially crosslinked poly (N-vinylcarbazole-vinylalcohol) copolymers with polypyridyl Ru (II) luminophores: Potential materials for electroluminescence" *Polymer Bulletin*, 43, 135-142 (1999).
33. M. Carotenuto, L. Guadagno, P. Iannelli, E. Chiellini, **A. A. Farah**, G. Galli
 "Molecular structure refinement of segmented Liquid Crystalline polyester containing aromatic triad mesogen" *J. Polym. Sci. Polym. Phys. Ed.*, 33, 1097-1105 (1995)
34. . F. Decandia, L. Guadagno, E. Chiellini, **A. A. Farah**, G. Galli
 "Thermal behavior and transport properties of Liquid Crystalline polymers: Phase organization in thermotropic polyesters" *Mat. Sci. & Eng. C3*, 57-61 (1995).
35. **A. A. Farah**, G. Galli, E. Chiellini, B. Gallot
 "Synthesis and characterization of a new series of semiflexible Liquid Crystalline polyesters with aromatic triad mesogens" *Polymer Journal*, 26, 728-737 (1994).
36. **A. A. Farah**, G. Galli, E. Chiellini, B. Gallot
 "Synthesis and Liquid Crystalline properties of a new chiral polyesters with aromatic triad mesogens and spacer of different optical purity" *Gazzetta Chimica Italiana*, 124, 279-284

BOOK CHAPTERS AND CONFERENCE PROCEEDINGS

1. A. A. Jaber, **A. A. Farah**, S. A. Abbas, K. Kopeć, Y. Al-Salik, M. A. Tayeb, N. Verghese
 "Effect of fiber sizing levels on the mechanical properties of carbon fiber reinforced thermoset composites", in 11th Australian Congress on Applied Mechanics (ACAM 2024)
2. J. S. W. Mak, A. A Farah, F. Chen, A. S. Helmy
 "Efficient Raman sensor for nanoparticles using hollow core photonic crystal fiber" in Advanced Photonics, OSA Technical digest (CD) (Optical Society of America, 2011) paper SWA2
3. J. S. W. Mak, A. A Farah, F. Chen, A. S. Helmy
 "Probing quantum dot cores, their interfaces and thiol capping non-destructively in dilute solutions using Raman scattering in hollow core photonic crystal fiber" in CLEO: 2011-Laser applications to photonics, OSA Technical digest (CD) (Optical Society of America, 2011) paper CTHC3
4. J. S. W. Mak, A. A Farah, F. Chen, A. S. Helmy
 "Photonic crystal fiber for efficient Raman scattering in thiol capped quantum dots in aqueous solutions" MRS proceedings, 1346. Doi:10.1557/OPL.2011.10748
5. S. A. Rutledge, J. Dinglasan, A. A Farah, D. J. Anderson, A. Das, J. Goh, A. S. Helmy
 "Application of Raman spectroscopy using hollow core photonic crystal fiber to study aqueous semiconductor colloid nanoparticles" LEOS annual meeting conference proceedings: 2009-LEOS 2009. IEEE. 28-29
6. A. Schaarschmidt, A. A Farah, A. Aby, A. S. Helmy
 "Influence of rapid thermal annealing on the molecular structure of PEDOT-PSS thin films" LEOS annual meeting conference proceedings: 2009-LEOS 2009. IEEE. 351-352
7. S. A. Rutledge, J. Dinglasan, A. A Farah, D. J. Anderson, A. Das, J. Goh, A. S. Helmy
 "Post-synthesis crystallinity tailoring of water soluble polymer encapsulated CdTe nanoparticles using thermal annealing" MRS proceedings, 1027. Doi: 10.1557/PROC-1207-N03-08

8. S. Dai, A. A Farah, R.A. Alvarez-Puebla, J.B. Bravo-Vasquez, H. Fenniri
"Fabrication and characterization of spectroscopically encoded core-shell nanoparticle-polymer nanocomposites" MRS proceedings, 1054. Doi: 10.1557/PROC-1054-FF12-14
9. A. A Farah, S. Dai, B. J. Al-Hourani, J. Y. Cho, J. B. Bravo-Vasquez, H. Fenniri
"Synthesis and optical properties of SERS active nanocomposite microspheres" MRS proceedings, 1024. Doi: 10.1557/PROC-1024-A04-03

PATENTS AND PATENT APPLICATIONS

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| 1 | EP 4 194 501 B1 | A polypropylene composition having improved scratch resistance properties. |
| 2 | US 2017/0044340 A1 | A polypropylene composition having improved scratch resistance properties. |
| 3 | CN 116239826A | A polypropylene composition having improved scratch resistance properties. |
| 4 | EP 3 478 737 B1 | A perfluorinated copolymer for triboelectric sensor. |
| 5 | WO 2018/002753 | A perfluorinated copolymer for triboelectric sensor. |
| 6 | PCT/IB2017/053473 | A perfluorinated copolymer for triboelectric sensor. |
| 7 | EP 3 597 721 A1 | Photo-emissive nanoclusters encapsulated in nano-cavities of amphiphilic block copolymer vesicles and methods of their preparation. |
| 8 | EP 3 597 722 A1 | An electroluminescent device-using layer of photo-emissive quantum dots |
| 9 | EP 3 761 510 A1 | Thin film based triboelectric material and touch sensors |
| 10 | EP 3 783 328 A1 | Triboelectric force sensor for low and medium threshold force ranges |
| 11 | EP 3 787 177 A1 | Nanofiber based triboelectric energy harvesting system for wearable electronics. |
| 12 | EP 3 789 523 A1 | Nanofibers formed from a blend of photoactive thermoplastic polymer and trifluoropropyl polyhedral silsesquioxane and methods for using them |
| 13 | US 2017/0044340 A1 | Self-cleansing superhydrophobic polymeric materials for anti-soiling |
| 14 | US 2017/0371243 A1 | Micron patterned silicone hard-coated (SH-P) polymer surfaces |
| 15 | WO 2017/145046 A1 | Dust aerosols generating chamber |
| 16 | WO 2018/002752 A1 | Triboelectric sensors |
| 17 | WO 2019/106446 A1 | Two-dimensional transition metal oxide and semiconducting polymer hybrids with electro-activity and photosensitivity |
| 18 | WO 2019/155376 A1 | Photoactive thermoplastic materials for touch/force responsive sensors. |
| 19 | WO 2020/065535 A1 | Integrated plasmons with thin film transistor (TFT) device for molecular biosensing. |
| 20 | WO 2020/079526 A1 | Nanopatterned crosslinkable reactive thermoplastics. |
| 21 | WO 2020/089838 A1 | Nanoplasmonic sensor. |
| 22 | EP 3 789 857 A1 | Thin film transistor integrated with triboelectric layer. |
| 23 | WO 2020/082105 A1 | Photoactive thermoplastic material with integrated fluoro-polyhedral Silsesquioxane (F-POSS) molecules for triboelectric sensor and methods of making it. |
| 24 | WO 2020/106466 A1 | Preparation of two dimensional transition metal chalcogenides on Transition metal oxides by In-situ ion exchange process for self-powered photodetector-super-capacitor systems. |
| 25 | WO 2017/145046 A1 | Hierarchically Porous Polyhedral Silsesquioxane (POSS) polymers with asymmetric surfaces and methods of making them |
| 26 | WO 2017/093840 A1 | Micro-patterned Silicone Hard-Coated Polycarbonate (SHC-PC) surfaces. |
| 27 | WO 2015/183555 A2 | Self-cleaning polymeric materials for anti-soiling. |

CONFERENCE COMMUNICATIONS (ORAL PRESENTATIONS)

1. A. A. Jaber, **A. A. Farah**, S. A. Abbas, K. Kopeć, Y. Al-Salik, M. A. Tayeb, N. Verghese
“Effect of fiber sizing levels on the mechanical properties of carbon fiber reinforced thermoset composites”, in 11th Australian Congress on Applied Mechanics (ACAM, 7-9th Feb. 2024).
2. **A. A. Farah**, S. M. Gasworth
“Superhydrophobic thermoplastic materials for self-cleaning” International conference and exhibition on Advanced materials and nanomaterials ICAMN 2015, Aug. 15 (2015) (Ottawa, ON, CANADA).
3. **A. A. Farah**, S. M. Gasworth
“Thermoplastic surfaces for self-cleaning: paradigms and potentials” Nano Today Dec. 6-10. (2016) (Dubai, UAE).
4. **A. A. Farah**, R. A. Alvarez-Puebla, J-P, Bravo-Vasquez, H. Fenniri
“Synthesis and optical properties of silver and gold coated polymeric microspheres and their use as SERS substrate” MRS Fall meeting, Nov. 26-30 (2007) (Boston, MA, USA).
5. S. Dai, **A. A. Farah**, R. A. Alvarez-Puebla, J-P, Bravo-Vasquez, H. Fenniri
“Fabrication and characterization of spectroscopically encoded core-shell nanoparticle-polymer nanocomposite” MRS Fall meeting, Nov. 26-30 (2007) (Boston, MA, USA).
6. A. B. P. Lever, J. Rusanova, E. Rusanov, S. I. Gorelsky, D. Christendat, R. Popescu, **A. A. Farah**, R. Beaulac, C. Reber.
“Ruthenium complexes with (o-benzoquinone): Towards 50% π -backdonation” 231st ACS National Meeting, March 26-30 (2006) (Atlanta, GA, USA)
7. **A. A. Farah**, R. Voicu, R. Barjovanu, F. Bensebaa, K. Tufa, C. Py, K. Faid
“Molecular design of surface-grafted monomers and initiators on flat substrates and their application in 2D molecular imprinting” MRS Fall meeting, Nov. 29-Dec. 5 (2004) (Boston, MA, USA).
8. R. Voicu, **A. A. Farah**, R. Barjovanu, K. Faid
“Surface nano-templating using 2D molecular imprinting” 88th Canadian Society for Chemistry conference and exhibition, May 27-June 1 (2004) (Ottawa, Ontario, Canada).
9. **A. A. Farah**, R. Voicu, R. Barjovanu, F. Bensebaa, P. Lecuyer, C. Py, K. Faid
“Development of multifunctional polymer system for surface molecular imprinting” MRS Fall meeting, Nov. 29-Dec. 5 (2003) (Boston, MA, USA).
10. R. Voicu, **A. A. Farah**, R. Barjovanu, C. Py, K. Faid, P. Lecuyer, F. Bensebaa
“Development of a novel methodology for surface nano-templating” Synthetic receptors, October 15-17 (2003) (Lisbon, Portugal).
11. C. Py, R. Voicu, **A. A. Farah**, R. Barjovanu, K. Faid, P. Lecuyer, F. Bensebaa
“Development of a novel nano-templating methodology for molecular imprinting” Nanomaterials Crossroads, October 16 (2003) (Montreal, Quebec, Canada).
12. **A. A. Farah**, N.T. Hall, S. Morin, W. J. Pietro
“Gold surface anchored thiol-functionalized macroligand polymer with vacant coordination sites: synthesis and surface characterization” 86th Canadian Society for Chemistry Conference and exhibition, August 12-18 (2003) (Ottawa, Ontario, Canada).
13. **A. A. Farah**, W. J. Pietro
“Coordinative ring-opening polymerization (ROP) of polycaprolactones with polypyridyl Ruthenium (II) initiators” 34th annual Inorganic discussion weekend, 26-28 October (2001) (Waterloo, Ontario, Canada).
14. **A. A. Farah**, W. J. Pietro
“Various architectures of polypyridyl Ru (II) polymers: Synthesis and characterization” 84th Canadian Society for Chemistry conference and exhibition, May 26-30, (2001) (Montreal, Quebec, Canada).

15. **A. A. Farah**, W. J. Pietro
"Synthesis and characterization of mixed ligands polypyridyl Ru (II) containing polymers" 33rd annual Inorganic discussion weekend, 27-29 October (2000) (Toronto, Ontario, Canada).
16. J. G. C. Veinot, J. Galloro, **A. A. Farah**, W. J. Pietro
"Surface functionalization of CdS quantum-confined nanoclusters: Potential nanophase electronic device" 83rd Canadian Society for Chemistry conference and exhibition, May 27-31, (2000) (Calgary, Alberta, Canada).
17. **A. A. Farah**, W. J. Pietro
"Novel polypyridyl Ru (II) containing polymers: Synthesis and characterization" 83rd Canadian Society for Chemistry conference and exhibition, May 27-31, (2000) (Calgary, Alberta, Canada).
18. **A. A. Farah**, W. J. Pietro
"Covalent attachment of CdS nanoclusters into polymeric matrices: Synthesis and characterization" 83rd Canadian Society for Chemistry conference and exhibition, May 27-31, (2000) (Calgary, Alberta, Canada).
19. **A. A. Farah**, W. J. Pietro
"CdS nanocluster polymeric composites: Synthesis and characterization" 32nd annual Inorganic discussion weekend, 29-31 October (1999) (Windsor, Ontario, Canada).
20. **A. A. Farah**, J. G. C. Veinot, W. J. Pietro
"MLCT electrophosphorescence from Ru(bpy)₂ luminophore coordinated to a vinylpyridine-styrene copolymer: a new type of electroluminescent material" 82nd Canadian Society for Chemistry conference and exhibition, May 30-June 2, (1999) (Toronto, Ontario, Canada).
21. **A. A. Farah**, J. G. C. Veinot, N. Najman, W. J. Pietro
"Synthesis and characterization of polypyridyl Ru(II) luminophores covalently bound to carbazole based copolymers" 82nd Canadian Society for Chemistry conference and exhibition, May 30-June 2, (1999) (Toronto, Ontario, Canada).
22. **A. A. Farah**, J. G. C. Veinot, W. J. Pietro
"Synthesis, characterization and covalent attachment of a novel 2-(2-pyridyl)-4-carboxyquinoline-bis (2,2'-bipyridine) Ru(II) complex to poly(N-vinylcarbazole) containing copolymer" 31st annual Inorganic discussion weekend, 23-25 October (1998) (Toronto, Ontario, Canada).
23. **A. A. Farah**, J. G. C. Veinot, W. J. Pietro
"Chelate metal complexes as organic electroluminescent materials: Synthesis and characterization of 8-hydroxyquinoline aluminum derivative containing polymers" 81st Canadian Society for Chemistry conference and exhibition, May 31-June 4, (1998) (Whistler, British Columbia, Canada)
24. **A. A. Farah**, W. J. Pietro
"Synthesis and electroluminescent behavior of a novel polymeric material based on MLCT from a ruthenium luminophore chemically bound to a hole-conducting poly(N-vinylcarbazole)" 81st Canadian Society for Chemistry conference and exhibition, May 31-June 4, (1998) (Whistler, British Columbia, Canada).
25. **A. A. Farah**, W. J. Pietro
"Synthesis and characterization of a novel photorefractive polymer incorporating a ruthenium complex and polyvinylcarbazole" 30th annual Inorganic discussion weekend, 24-26 October (1997) (Toronto, Ontario, Canada).

PROFESSIONAL REFERENCES

- Available upon request.