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**Education**

* **Ph.D., Chemistry** – University of Southern California, 1990
* **B.Sc., Chemistry and Physics (with Excellence)** – Qatar University, 1985

**Professional Summary**

Professor and researcher with over 27 years of experience in teaching, research, and student mentorship in the fields of organic materials chemistry, solid-state chemistry, and electrochemistry. Proven track record of developing innovative, research-based curriculum and laboratory experiments that bridge theoretical knowledge with real-world applications. Recognized for contributions in mentoring students and advancing research in molecular crystals, drug polymorphism, and organic semiconductors.

**Research Experience and Interests**

**Research Focus Areas**

1. **Crystal Growth of Organic Functional Materials**: Investigating the crystal growth processes for applications in electronics, photonics, and molecular electronics. This research includes the synthesis of organic semiconductors and the study of charge transport in molecular crystals.
2. **Organic Semiconductors and Molecular Nanowires**: Focused on developing and characterizing new n-type organic semiconductors for solar cells, particularly electron-accepting molecules such as di- and tricyanovinyl-substituted thiophenes.
3. **Drug Polymorphism and Solubility**: Exploring new polymorphs of pharmaceuticals to improve solubility, bioavailability, and thermal stability. Emphasis on solid-state characterization techniques and their applications in drug development.
4. **Pedagogical Research in Chemistry**: Committed to integrating research with teaching by developing experimental modules that bring real-world relevance to undergraduate laboratories.

**Select Publications**

* **Recent Articles**:
  + *"Alpha-Halogenated Curcumin,"* Pham, P., & Bader, M., under review at ACS Omega, April 2024.
  + *"Di- and Tricyanovinyl-Substituted Triphenylamines: Structural and Computational Studies,"* ACS Omega, 2024.
  + *"Thiophenes Endowed with Electron-Accepting Groups: A Structural Study,"* Cryst. Growth Des., 2024.
  + *"Synthesis and Characterization of a Novel Asymmetric Fused Ladder Oligomer for Applications as Organic Semiconductor,"* MRS Advances, 2023.
* **Book Contributions**: In progress—textbook on organic materials chemistry, focusing on electron-accepting materials and their properties in electronics and photonics.

**Patents**

* Holds patents on nonlinear optical materials, including Japanese patents for second harmonic-generating devices used in organic photonic applications.

**Teaching and Curriculum Development**

**Teaching Expertise**

* **Courses Taught**: Extensive teaching experience across general, organic, polymer, and materials chemistry courses, as well as specialized courses in solid-state chemistry and environmental chemistry.
* **Laboratory Curriculum Development**: Designed research-based laboratory courses in polymer chemistry, materials science, and characterization, emphasizing practical skills such as crystallization, X-ray diffraction, and thermal analysis.
* **Innovative Teaching**: Developed interactive modules to teach complex chemistry concepts using real-world applications, such as using case studies on organic photovoltaics and electronic devices in undergraduate courses.

**Mentorship and Student Development**

* **Research Supervision**: Supervised 80+ student research projects in molecular crystals, organic electronics, and computational materials chemistry. Many projects involved interdisciplinary research, integrating chemistry with engineering applications.
* **Student-Centered Learning**: Focused on hands-on, inquiry-based learning approaches, which have proven to increase student retention and understanding, particularly for first-year and undecided students.
* **First-Year Student Support**: Mentored first-year students, helping them navigate academic challenges and advising on major selection, particularly within STEM disciplines.

**Professional Experience**

**Alfaisal University, Riyadh, Saudi Arabia**

**Professor of Chemistry (2013–Present)**

* **Curriculum and Program Development**: Developed and implemented advanced courses in materials chemistry, including modules on organic semiconductors and pharmaceutical solubility, designed for both chemistry majors and interdisciplinary students.
* **Interdisciplinary Collaborations**: Established partnerships with engineering and biochemistry departments to support interdisciplinary research projects and co-mentor students.
* **Innovations in Laboratory Instruction**: Pioneered new laboratory protocols and designed modules for undergraduate teaching labs, incorporating current research on organic materials and molecular crystals.

**Pennsylvania State University, Hazleton, Pennsylvania**

**Discipline Coordinator, Division of Science (1997–2014)**

* **Faculty Development and Mentorship**: Led initiatives to support early-career faculty, providing mentorship in research design, pedagogical innovation, and student engagement strategies.
* **Laboratory Safety and Training**: Developed comprehensive lab safety protocols and trained faculty on best practices for laboratory instruction and student safety.
* **Community Engagement**: Created outreach programs that brought STEM learning experiences to local high schools and community colleges, fostering interest in science among diverse student populations.

**Previous Roles**

* **Assistant Professor of Chemistry** – United Arab Emirates University, Al-Ain, UAE (1993–1997)
* **Postdoctoral Research Associate** – University of Minnesota, Department of Chemical Engineering and Materials Science (1992–1993)
* **Visiting Researcher** – Hitachi Research Laboratory, Japan, in the Nonlinear Optics and Liquid Crystals Group (1990–1992)

**Professional Affiliations**

* **American Chemical Society (ACS)**
* **Materials Research Society**

**Honors and Awards**

* **Outstanding Teaching Faculty Award** – Alfaisal University, 2015
* **Faculty Research Award** – Penn State, 2012
* **Student Service Award** – Penn State, 2003

**Service Activities**

**Institutional Service**

* Chaired numerous committees at Alfaisal and Penn State, including **strategic planning**, **promotion**, **safety**, and **curriculum development**.
* Developed faculty guides on teaching best practices in science labs and created faculty booklets on teaching and learning strategies to support new faculty integration and ongoing professional development.

**Professional Contributions**

* **Editorial and Review Activities**: Reviewer for leading journals, including *Journal of the American Chemical Society*, *Chemistry of Materials*, and *Macromolecules*, contributing expert insights to advance research in organic materials.
* **Advisory Roles**: Served on the G-20 scientific committee on circularity in materials and on the King Faisal Prize Science Selection Committee, assessing international research excellence.

**Community Outreach and STEM Advocacy**

* **STEM Outreach**: Hosted annual science workshops for Girl Scouts, organized STEM camps for high school students, and participated in Pennsylvania Junior Academy of Sciences as a judge and mentor.
* **Diversity Advocacy**: Actively engaged with the Luzerne County Diversity Commission to support inclusive education and promote diversity in STEM fields.

**Conferences and Invited Talks**

* Recent invited speaker engagements include the **American Chemical Society National Spring Meeting** (2024), **MRS Spring Meeting** (2023), and the **IIUM Biotechnology Conference** (2016).
* Presented research findings at over 60 conferences, with a focus on organic semiconductor materials, drug polymorphism, and applications of electron-accepting oligothiophenes.