

## *James P. Bolender, Jr.*

**Address:** Department of Chemistry and Biochemistry      Phone:      +1 619 260 4792  
University of San Diego      Cell:      +1 858 342 0678  
5998 Alcalá Park      Email: bolender@sandiego.edu  
San Diego, CA 92110

**Education :** University of Virginia, Charlottesville, VA.  
Ph. D. Physical Chemistry, May, 1994  
Dissertation : *Intermolecular Chiral Recognition and Discrimination Processes Probed by Enantioselective Excited-State Quenching Kinetics.*  
Wittenberg University, Springfield, OH., B.A. Chemistry and Physics, June, 1988

### **Experience :**

Associate Provost for International Affairs, University of San Diego, (August 1, 2022 to present).  
Associate Professor, Department of Chemistry and Biochemistry, University of San Diego (September 2003 to present).  
Visiting Professor, Department of Chemistry, Faculty of Science, Mbarara University of Science and Technology (January 2019 to March 2019)  
Assistant Professor, Department of Chemistry and Biochemistry, University of San Diego (September 1996 to 2003)

### **Key Accomplishments:**

- Presidential Fellow, Association of International Education Administrators – 2023-24 academic year
- Chair, President's Advisory Committee for Fall 2021 (COVID-19 response) – March 2021 – June 2022.
- Co-chair, Joint Provost's Office-University Senate Engaged Scholarship Task Force – May 2020 to October 2021.
- Knapp Chair of the Liberal Arts, College of Arts and Sciences; September 2015 to August 2016.
- Member, Presidential Search Committee: May 2014 to March 2015.
- Chair, Academic Assembly of the College of Arts and Sciences: May 2013 to May 2015.
- Director, Honors Program; September 2008 to July 2011
- Interim Chair, Department of Chemistry and Biochemistry; June 1, 2007 to June 30, 2008, August 15, 2019 to December 23, 2019.

### **Teaching responsibilities:**

I have taught 21 unique courses at the University of San Diego during my career. They include: Advanced Integrated Laboratory (Physical/Inorganic), Physical and Instrumental Methods Laboratory, Inorganic Chemistry, Instrumental Analysis, Physical Chemistry, Biophysical Chemistry, Special Topics (Physical Methods in Chemistry and Biochemistry, Global Water Quality Issues), Water Quality and Public Health in the Developing World), Analytical Chemistry, General Chemistry lecture and laboratory, and Chemistry and Society (with Laboratory), Honors Program Team-taught Courses (Pollution in the Sand and the Physical and Chemical Applications of Lasers), Honors Senior Thesis Seminar.

### Research interests:

- Water Dispersive Nanoparticles of Rare Earth Ion Salts:  
Synthesis and characterization of lanthanide containing nano-materials. Develop potential sensors and signal enhancers based on the unique properties of the lanthanides. Projects include synthesis and characterization of unique anion systems, characterization of physical parameters to control size distributions, surface modification chemistry, intra-particle energy transfer experiments. **Mentored 31 students since 2008 in this project.**
- Project Lead Investigator: Water Quality and Public Health in Uganda  
Leading a team that includes three schools and colleges at USD, along with collaborators at four other international academic institutions (Aix-Marseille University, University of Canterbury (NZ), Azireli University (Jerusalem, Israel), and Mbarara University of Science and Technology), and two Non-Governmental Organizations (Invaneo and Holy Innocents Children's Hospital). The purpose of this multi-year project is for Mbarara University of Science and Technology and the University of San Diego, partnered with a network of local and international academic institutions and non-profit organizations, to improve the overall health of the populace in Uganda by assessing and minimizing the impacts of poor water and chemical contamination, raising water quality, establishing internet connectivity in community health centers in outlying villages, and applying human-centered design and social network analysis methods to improve the effectiveness of interventions, while building local capacity to ensure sustainability. These outcomes will assist Uganda in achieving the United Nations Sustainable Development Goal #6, which guarantees access to clean water and sanitation for all, and Goal #3, which ensures healthy lives by ending preventable deaths of newborns and children under 5 years of age. **Mentored over 36 undergraduate students across six majors, one Masters student, and served as Vice-Chair of a doctoral committee for work on this project since its inception in 2008.**

### University Service:

- Associate Provost for International Affairs – August 2022 to present
  - Chair of International Center Advisory Committee
  - Chair of International Studies Abroad Committee
- Chair, President's Advisory Committee (COVID-19 response) – March 2021 to May 2022.
- Academic Planning Committee – Research and Intellectual Outputs Team – 10/2020 – 5/2021
- Co-chair Provost/Senate Engaged Scholarship Task Force – May 2020 to October 2021.
- Multiple Fall 2020 Re-Opening subcommittees, including: Curricular Scheduling, Student Supplemental Spaces, Faculty Teaching Guidelines, Spring 2021 Curricular Scheduling,
- University Senate – subcommittees include F20 Faculty Working Group, Zoom "Rules" Committee, Spring 2021 Calendar Committee
- Presidential Search Committee,
- Faculty Advisory Committee on Student Suicide,
- Core Planning Committee, including Integration and Smaller Core subcommittees
- Core Conference Committee
- Research Council Subcommittee,
- First Year Experience Strategic Directions Initiatives,

- Second Year Experience Strategic Directions Initiative,
- Mortar Board Faculty Advisor,
- Student Life Pavilion Planning Committee, Director,
- Honors Program (and associated committees)

College of Arts and Sciences Committees:

- Chair & Previous Past Chair, Academic Assembly
- Faculty Fundraising Committee,
- Science Representative, Honors Program Committee
- Undergraduate Goals Committee,
- Chemistry Representative, Science Facility Task Force,
- Natural Sciences Representative to the Honors Program Committee;
- Health Sciences Student Evaluation Committee,
- Chemistry Representative; Undergraduate Curriculum Committee,
- Chemistry Representative, Faculty Research Grants Committee,
- Preceptorial Advisory Panel, Undergraduate Studies Committee.

Other Service (Scientific):

- Primary masters advisor – Marie Soanirina, Aix Marseille University, Marseille, France – *“Trace Metal and Polyaromatic Hydrocarbon Assessment of the Waters and Sediments of the Rwizi River, Uganda,”* Thesis defended June 28, 2019
- Masters committee, Mbarara University of Science and Technology – Nicholas Nakora, Thesis complete March 2019
- Vice-chair, Doctoral Committee of Walter Ojok, , Mbarara University of Science and Technology – February 2019 to May 2023.
- External Reviewer for the Department of Chemistry and Biochemistry, San Diego State University, March 2008.
- Panelist, National Science Foundation, MRI-RUI, November 2009.

Grants – All funded grants have supported summer research and travel for undergraduates:

- Danvera Foundation - \$40,000, established 2019. Uganda Water Quality and Public Health
- The Marie H. Lundin Memorial Trust for Cancer Research – Funded \$110,000 since inception. Continued funding since December 2011. Funding for the development of nanocrystalline MRI Contrast Agents.
- Danvera Foundation – Funded \$400,000+ from January 2005 to present, “International Environmental Research and Education.” for continued and expanded work in Baja California Sur and Mbarara, Uganda.
- Daniel & Lucille Packard Foundation Paul Houlihan, Francisco Ollervides (SFS), Michel Boudrias, James Bolender (USD), Title: Pollution Remediation Project- Bahía Magdalena. Amount: \$130,000 (US), Funded, January 2005.

- NSF MRI/RUI-0321326: Acquisition of Laser Instrumentation for Undergraduate Research and Teaching. James Bolender, Department of Chemistry, Dr. Greg Severn, Physics; Dr. Michel Boudrias, Marine Science and Environmental Studies. \$198,367 Funded September 1, 2003
- Daniel & Lucille Packard Foundation Paul Houlihan, Pat Condy (SFS), Michel Boudrias, James Bolender (USD), Title: Pollution Remediation Project- Bahía Magdalena. Amount: \$108,000 (US), Funded, January 2003.
- Coca-Cola Foundation, Michel Boudrias, James Bolender, Lisa Baird , Title: International Environmental Studies and Education Program, Amount: \$151,000 (US), Funded as of June 2003.
- "An Environmental Investigation of Bahia Magdalena (Baja California Sur)" University of San Diego, Trans-Border Institute, \$12,500
- U.S. National Science Foundation Instrumentation for Laboratory Improvement Grant (NSF# 9750919) Funded July 1, 1997 - \$28,679

#### Awards (USD tenure):

- Presidential Fellow – Association of International Education Administrators – 2023-24 academic year.
- International Impact Award – University of San Diego, November 2016
- Knapp Chair of the Liberal Arts, University of San Diego, 2015-16 academic year.
- Men et Spiritus Award – Honors Program Professor of the Year, University of San Diego, May 2012
- Davies (now Dean's) Award for Teaching Excellence – University of San Diego, May 2007
- Honorable Mention – International Symposium on Chirality poster session, Orlando, Florida, July 2001.

#### Professional Memberships:

- Association of International Education Administrators
- NAFSA
- Forum on International Education
- American Chemical Society,
- Council for Undergraduate Research

#### Invited Presentations:

- "An Interdisciplinary Approach to Water Quality Issues and Remediation Strategies for the Region of Mbarara, Uganda." Manchester University, Research and Innovative Practice Seminar Series, October 21, 2022.
- "The Uganda Project: History, Context, and Water Quality and Public Health Issues Facing the Mbarara Region", Inspiring Future Water Technology – Improving Access to Potable Water. Global, online conference hosted by USD. September, 2021.
- "Water dispersive rare earth containing nanoparticles – synthesis, spectroscopic properties, and surface modifications", University of San Diego, September 25, 2019 – **Presented the work of 4 undergraduate researchers from my lab.**

- “Water Quality, Public Health, and the Developing World: A Chemists View of Water Issues in Uganda”, University of Canterbury, Christchurch, New Zealand, May 29, 2019 - **Presented the work of several undergraduate researchers from my lab.**
- “Water dispersive rare earth containing nanoparticles – synthesis, spectroscopic properties, and surface modifications”, University of Canterbury, Christchurch, New Zealand, May 23, 2019 - **Presented the work of 4 undergraduate researchers from my lab.**
- “Water Quality Issues in the Developing World – Uganda”, Mbarara University of Science and Technology, February 20, 2019
- “Water Quality Issues in the Developing World – Uganda”, Aix-Marseille University, Marseille, France, July 17, 2018.
- “Water Quality and Public Health in Uganda”, Horn of Africa Water Security Workshop, Entebbe, Uganda, September 12 – 15, 2017.

### Publications

- 1) “Facile Synthesis and Characterization of Multi-walled Carbon Nanotubes Decorated with Hydroxyapatite from Cattle Horns for Fluoride Removal,” W. Ojok, J. Bolender, J. Wasswa, E. Ntambi, W. Wanasolo, and B. Moodley, submitted to Heliyon, Vol.9, Issue 3, March, 2023. (<https://doi.org/10.1016/j.heliyon.2023.e14341>)
- 2) “Synthesis and characterization of mesoporous gamma-alumina by a simple cassava starch-polymer complex solution route for fluoride removal from water,” W. Ojok, E. Ntambi, J. Bolender, J. Wasswa, W. Wanasolo, and B. Moodley – submitted Sustainable Chemistry for the Environment.
- 3) “Synthesis and characterization of novel alpha-sodium iron oxide composite using cassava starch template for aqueous phase removal of fluoride” W. Ojok, E. Ntambi, J. Bolender, J. Wasswa, W. Wanasolo, and B. Moodley. Carbohydrate Polymer Technologies and Applications, Vol. 4, December, 2022. (<https://doi.org/10.1016/j.carpta.2022.100241>)
- 4) “Plant-based point-of-use water filtration: A simple solution for potable water in developing countries”. Dr Yaal Lester, Nadeem Ibrahim; Lidori Edri; [Ava Bellizzi](#); [Christina Kozlovsky](#); [Mira Wiley](#); Frank Jacobitz; Martha Fuller; Keith Macdonald; James Bolender; Gad Ruzaaza Ndaruhutsef. Groundwater for Sustainable Development, Vol. 18, August 2022, (<https://doi.org/10.1016/j.gsd.2022.100802>). **(3 USD undergraduate co-authors)**
- 5) “Fluoride Contamination in Ndali-Kasenda Crater Lakes in Albertine Graben, Uganda: Assessment using multivariate statistics and human health risk.” W. Ojok, W. Wanasolo, J. Wasswa, J. Bolender, and E. Ntambi. Groundwater for Sustainable Development, Vol.15, November 2021, (<https://doi.org/10.1016/j.gsd.2021.100650>).
- 6) “A Note on the Gyromagnetic Properties of Hydrogens.” G.D. Severn and J.P. Bolender, 21 October 2013, in American Journal of Physics (Vol.81, Issue 11).

- 7) "The Uganda Project – A Cross-Disciplinary Student-Faculty Research and Service Project to Develop a Sustainable Community Development Program." James P. Bolender and Anita J. Hunter, CURQ on the Web, Winter 2009.
- 8) "Chirality-Dependent Interactions between Molecular Propeller Structures in Solution. Chiral Recognition and Discrimination Processes Modulated by Temperature and Incremental Changes in Structural Chirality." James P. Bolender and F. S. Richardson, *Biophysical Chemistry*, 105 (2003) 293 - 322.
- 9) "Field Research at the Core of an Interdisciplinary Science Course." James P. Bolender and Michel A. Boudrias, *Council for Undergraduate Research – Quarterly*, 22 (2002) 180-185.
- 10) "Chiral Recognition Phenomena Probed by Steady-State Luminescence Measurements: Stern-Volmer Analysis of Chiral Discriminatory Behavior" James P. Bolender, Andrew Meyers, Joseph Cordaro, and Ryan S. Ries, *Chirality* 14 (2002) 456-464. **(3 undergraduate coauthors)**
- 11) "Pore Formation by Apoptotic Cytoplasmic Peptide of Neurotrophin Receptor p75NTR", Martha L. Medina, Barbara S. Chapman, James P. Bolender, and Leigh A. Plesniak, *Journal of Peptide Research*, 59 (2002) 149-158. **(Includes one undergraduate coauthor)**
- 12) "Lanthanide Ions as Redox Probes of Long-Range Electron Transfer in Proteins." Ronald M. Supkowski, James P. Bolender, Wendy D. Smith, Lewis E.L. Reynolds, and William DeW. Horrocks, Jr.; *Coord. Chem. Rev.*, 185-186 (1999) 307-319.
- 13) "Photosensitized Near Infrared Luminescence of Ytterbium(III) in Proteins and Complexes Occurs Via an Internal Redox Process." William DeW. Horrocks, Jr., James P. Bolender, Wendy D. Smith, and Ronald M. Supkowski; *J. Am. Chem. Soc.* 119 (1997) 5972-5973.
- 14) "Polarized Optical Spectra, Transition Line Strengths, and the Electronic Energy-Level Structure of  $\text{Eu}(\text{dpa})_3^{3-}$  Complexes in Single Crystals of Hexagonal  $\text{Na}_3[\text{Yb}_{0.95}\text{Eu}_{0.05}(\text{dpa})_3] \cdot \text{NaClO}_4 \cdot 10\text{H}_2\text{O}$ ." T.A. Hopkins, James P. Bolender, David H. Metcalf, and F.S. Richardson, *Inorg. Chem.*, 35 (1996) 5347-5355.
- 15) "Polarized Optical Absorption and Emission Spectra, and the Electronic Energy-Level Structure of  $\text{Tb}(\text{dpa})_3^{3-}$  Complexes in  $\text{Na}_3[\text{Yb}_{0.95}\text{Tb}_{0.05}(\text{dpa})_3] \cdot \text{NaClO}_4 \cdot 10\text{H}_2\text{O}$ ." T.A. Hopkins, James P. Bolender, David H. Metcalf, and F.S. Richardson, *Inorg. Chem.*, 35 (1996) 5356-5362.
- 16) "Chiral Discrimination in Electronic Energy-transfer Processes in Solution. Effects of Temperature and Solution Properties on Chirality-dependent Rate Parameters.", Deborah P. Glover-Fischer, David H. Metcalf, James P. Bolender, and F.S. Richardson, *Chem. Phys.* 198 (1995) 207-234.
- 17) "Chirality-Dependent Intermolecular Interactions Probed by Time-Resolved Chiroptical Luminescence Measurements of Enantio-Differential Excited-State Quenching Kinetics", James P.

Bolender, David H. Metcalf, and F. S. Richardson, Chem. Phys. Lett. 213 (1993) 131-138.

- 18) "Chirality-Dependent Excited-State Quenching of  $\text{Eu}(\text{dpa})_3^{3-}$  and  $\text{Tb}(\text{dpa})_3^{3-}$  Luminophores by Diastereomeric Structures of  $\Delta\text{-}[\text{Co}(\text{trans-1,2-cyclohexanediamine})_3]^{3+}$  in Aqueous Solution", James P. Bolender, David H. Metcalf, and F.S. Richardson, J. Alloys and Compounds 207-8 (1994) 55-58.
- 19) "Chiral Discrimination in Electronic Energy Transfer between Dissymmetric Lanthanide (III) and Cobalt (III) Complexes in Solution. Effects of Ligand Size, Shape, and Configuration in the Acceptor Complexes", David H. Metcalf, James P. Bolender, Michael S. Driver, and F.S. Richardson. J. Phys. Chem. 1993, 97, 553-564.
- 20) "Optical Absorption and Emission Spectra of  $\text{Tb}^{3+}$  in Hexagonal Crystals of  $\text{Na}_3[\text{Tb}(\text{pyridine-2,6-dicarboxylate})_3] \cdot \text{NaClO}_4 \cdot 10\text{H}_2\text{O}$ " James P. Bolender, David H. Metcalf, and F.S. Richardson. J. Alloys and Compounds, 1992, 180, 177-181.
- 21) "f-Electron Localization / Delocalization Phenomena in  $\text{PrBa}_2\text{Cu}_3\text{O}_7$  and  $\text{CmBa}_2\text{Cu}_3\text{O}_7$ " L. Soderholm, C.-K. Loong, G.L. Goodman, U. Welp, J. Bolender, and C.W. Williams. Physica B, 1990, 163, 655-658.
- 22) "The Synthesis and Characterization of  $\text{CmBa}_2\text{Cu}_3\text{O}_7$ ." L. Soderholm, G.L. Goodman, U. Welp, C.W. Williams, and J. Bolender. Physica C, 1989, 161, 252-256.