

Dr. Andrew Frazer - Curriculum Vitae

University of Central Florida Department of Chemistry

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EDUCATION:

- 1988-1993 **UNIVERSITY OF HERTFORDSHIRE** Hatfield, Herts., UK
Ph.D. Chemistry (with Prof. Brian Piggott)
Synthesis and Characterization of Indium Complexes with Scorpionate Ligands
- 1985-1988 **THE HATFIELD POLYTECHNIC** Hatfield, Herts., UK
B.Sc. Chemistry

APPOINTMENTS:

- 2006 - Present: **UNIVERSITY OF CENTRAL FLORIDA** Orlando, FL
Department of Chemistry
Visiting Lecturer (06), Lecturer (08) Associate Lecturer (14) in Chemistry
- 2001 - 2006: **VALENCIA COLLEGE** Orlando, FL
Adjunct Lecturer (01), Lecturer (02)
Department of Science
Lecturer of Chemistry
- 1993-1995: **UNIVERSITY OF HERTFORDSHIRE** Hatfield, Herts., UK
Department of Chemistry
Postdoctoral Research Fellow (with Prof Brian Piggott)
- 1988-1993 **UNIVERSITY OF HERTFORDSHIRE** Hatfield, Herts., UK
Department of Chemistry
Research Assistant

Articles Published in Peer Reviewed Journals:

Yue, Xiling; Armijo, Zach; King, Kevan; Bondar, Mykhailo V.; Morales, Alma R.; **Frazer, Andrew**; Mikhailov, Ivan A.; Przhonska, Olga V.; Belfield, Kevin D. Steady-State and Femtosecond Transient Absorption Spectroscopy of New Two-Photon Absorbing Fluorene-Containing Quinolizinium Cation Membrane Probes, *ACS Applied Materials & Interfaces* (2015), 7(4), 2833-2846

Woodward Adam W., **Frazer Andrew**; Morales Alma R.; Yu Jin; Moore Anthony F.; Campiglia Andres D.; Jucov Evgheni V.; Timofeeva Tatiana V. and Belfield Kevin D. Two-photon sensitized visible and near-IR luminescence of lanthanide complexes using a fluorene-based donor- π -acceptor diketone, *Dalton Transactions* (2014), 43(44), 16626-16639 (*Inside Front Cover*).

Frazer, Andrew; Morales, Alma R.; Woodward, Adam W.; Tongwa, Paul; Timofeeva, Tatiana; Belfield, Kevin D. Luminescent Fluorene-Based Bis-Pyrazolyl Aniline Ligand for Aluminum Detection. *Journal of Fluorescence* (2014), 24(1), 239-250.

Bondar, M. V.; Przhonska, O. V.; Kachkovsky, O. D.; **Frazer, A.**; Morales, A. R.; Belfield, K. D. New fluorene-based fluorescent probe with efficient two-photon absorption: *Ukrainian Journal of Physics* (2013), 58(8), 748-757.

Belfield, Kevin D.; Bondar, Mykhailo V.; Morales, Alma R.; **Frazer, Andrew**; Mikhailov, Ivan A.; Przhonska, Olga V. Photophysical Properties and Ultrafast Excited-State Dynamics of a New Two-Photon Absorbing Thiopyranyl Probe. *Journal of Physical Chemistry C* (2013), 117(23), 11941-11952.

Sui, Binglin; Kim, Bosung; Zhang, Yuanwei; **Frazer, Andrew**; Belfield, Kevin Highly selective fluorescence turn-on sensor for fluoride detection. *ACS Applied Materials & Interfaces* (2013), 5(8), 2920-2923.

Morales, Alma R.; **Frazer, Andrew**; Woodward, Adam W.; Ahn-White, Hyo-Yang; Fonari, Alexandr; Tongwa, Paul; Timofeeva, Tatiana; Belfield, Kevin D. Design, Synthesis, and Structural and Spectroscopic Studies of Push-Pull Two-Photon Absorbing Chromophores with Acceptor Groups of Varying Strength; *Journal of Organic Chemistry* (2013), 78(3), 1014-1025.

Diaz, Carlos; **Frazer, Andrew**; Morales, Alma; Belfield, Kevin D.; Ray, Supriyo; Hernandez, Florencio E. Structural Identification of a Novel Axially Chiral Binaphthyl Fluorene Based Salen

Ligand in Solution Using Electronic Circular Dichroism: A Theoretical-Experimental Analysis *Journal of Physical Chemistry A* (2012), 116(10), 2453-2465.

Belfield, Kevin D.; Bondar, Mykhailo V.; **Frazer, Andrew**; Morales, Alma R.; Kachkovsky, Oleksiy D.; Mikhailov, Ivan A.; Masunov, Artem E.; Przhonska, Olga V. Fluorene-Based Metal-Ion Sensing Probe with High Sensitivity to Zn^{2+} and Efficient Two-Photon Absorption: *Journal of Physical Chemistry B* (2010), 114(28), 9313-9321.

Nguyen, Dao M.; **Frazer, Andrew**; Rodriguez, Luis; Belfield, Kevin D. Selective Fluorescence Sensing of Zinc and Mercury Ions with Hydrophilic 1,2,3-Triazolyl Fluorene Probes: *Chemistry of Materials* (2010), 22(11), 3472-3481.

Frazer, Andrew; Piggott, Brian, Syntheses and crystal structures of three indium pyrazolyl complexes two of which contain novel bridging features, *Journal of the Chemical Society, Dalton Transactions*: (1999), (19), 3483-3486

Frazer, Andrew; Hodge, Paul; Piggott, Brian. Novel redox properties of $\text{HB}(3\text{-Butpz})_3^-$ as shown by its reaction with InIII and SnIV : *Chemical Communications* (1996), (15), 1727-1728.

Frazer, Andrew; Piggott, Brian; Hursthouse, Michael B.; Mazid, Mohamed. Synthesis and Crystal and Molecular Structure of $[\{\text{Hydroboratotriss}(3'\text{-phenylpyrazolyl})\}\text{indium}]$: An Air-Stable Monomeric Indium(I) Complex: *Journal of the American Chemical Society* (1994), 116(9), 4127-8.

Frazer, Andrew; Piggott, Brian; Harman, Mary; Mazid, Mohamed; Hursthouse, Michael B. Syntheses and x-ray crystal structures of $[\text{bis}\{(3,5\text{-dimethylpyrazolyl})_3\text{hydridoborato}\}\text{In}]\text{I}$ and $[\text{bis}\{(\text{pyrazolyl})_3\text{methylgallato}\}\text{In}][\text{InI}_4]$: *Polyhedron* (1992), 11(23), 3013-17.

CONFERENCE PROCEEDINGS:

Frazer, Andrew; Morales, Alma R.; Woodward, Adam W.; Tang, Simon and Belfield, Kevin D., Novel Lysosomal Targeting Two-Photon Fluorescence Probe Based on Fluorene Difluoroboron β -diketonate.; OSA Optics and Photonics Congress; Optics in Life Sciences: Waikola Beach Marriot Resort, Waikola Beach, Hawaii. April 11-18 2013. (Talk)

Andrew Frazer, Xuhua Wang, Dao Nguyen, Alma R. Morales, Mykhailo V. Bondar, Kevin D. Belfield, " Novel Two-Photon Fluorescence Probes for Zinc Ion Sensing," Optical Molecular Probes, Imaging and Drug Delivery, OSA Optics and Photonics Congress, Monterrey, California April 4-6, 2011.

Andrew Frazer, Alma Morales and Kevin Belfield "Two-Photon Absorbing Fluorene-Based bis-Pyrazolyl Aniline Ligands for Aluminum and Mercury Sensing". 9th International Symposium on Functional π -Electron Systems (F- π -9), Georgia Institute of Technology in Atlanta, Georgia, May 23- 28, 2010

Frazer, Andrew; Belfield, Kevin D.; Morales, Alma R.; Novel two photon absorbing fluorene-based bis-pyrazolyl aniline ligands for biosensing applications: Alma R. Abstracts of Papers, 236th ACS National Meeting, Philadelphia, PA, United States, August 17-21, 2008.

Supervised and Collaborative Conference Proceedings.

Woodward, Adam W.; **Frazer, Andrew**; Morales, Alma R.; Yu, Jin; Moore, Anthony F.; Campiglia, Andres D.; Jucov, Evgheni V.; Timofeeva, Tatiana; Belfield, Kevin D, Visible and NIR lanthanide luminescence sensitized through a two-photon absorbing fluorene-based diketonate ligand, Abstracts, 66th Southeast Regional Meeting of the American Chemical Society, Nashville, TN, United States, October 16-19 (2014), SERMACS-813

Haugen, Kasey C.; **Frazer, Andrew**; Morales, Alma R.; Kim, Bosung; Belfield, Kevin D. Nonlinear optical characterization, pH titration and 2PFM imaging of novel near-infrared diphenylaminofluorene-based aza-BODIPY dyes: Abstracts of Papers, 245th ACS National Meeting & Exposition, New Orleans, LA, United States, April 7-11, 2013 (2013).

King Kevan D.; Armijo, Zach; Morales, Alma R.; **Frazer, Andrew**; Belfield, Kevin D. Novel V-shaped cationic molecules as potential two-photon fluorescence probes King, Abstracts of Papers, 245th ACS National Meeting & Exposition, New Orleans, LA, United States, April 7-11, 2013 (2013).

Victoria, Rosmery; **Frazer, Andrew**; Morales, Alma R.; Belfield, Kevin D. Development of luminescent ruthenium RGD peptide conjugate complex for fluorescence lifetime imaging Abstracts of Papers, 243rd ACS National Meeting & Exposition, San Diego, CA, United States, March 25-29, 2012 (2012).

Kasey C.; **Frazer, Andrew**; Morales, Alma R.; Belfield, Kevin D. Synthesis and nonlinear optical characterization of a novel near-infrared emitting diphenylaminofluorene-based aza-BODIPY dye Haugen Abstracts of Papers, 243rd ACS National Meeting & Exposition, San Diego, CA, United States, March 25-29, 2012.

Diaz, Carlos; **Frazer, Andrew**; Morales, Alma; Ray, Supriyo; Tatulian, Suren; Belfield, Kevin D.; Hernandez, Florencio E. Experimental-theoretical characterization of a new optically active binaphthyl fluorene based Salen ligand Abstracts of Papers, 241st ACS National Meeting & Exposition, Anaheim, CA, United States, March 27-31, 2011.

PROFESSIONAL EXPERIENCE – TEACHING

2006 - Present: **University of Central Florida** **Orlando, FL**

Department of Chemistry

Visiting Lecturer (06), Lecturer (08) Associate Lecturer (14) in Chemistry

Classes Taught

General Chemistry CHM 1032

Principles of Chemistry for Engineers CHS 1440

Chemistry Fundamentals IA CHM 2040

Chemistry Fundamentals IB CHM 2041

Organic Chemistry 1 CHM 2210

Organic Chemistry II CHM 2211

Organic Chemistry Laboratory 2211L

Analytical Chemistry Lab CHM 3212L

Undergraduate Research, CHM 4912

Advance Inorganic Chemistry CHM 4610

Advance Inorganic Chemistry Lab CHM 4610L

Solid State Inorganic Chemistry CHM 6620

2001 - 2006: VALENCIA COLLEGE

Orlando, FL

Department of Science

Adjunct Lecturer (01), Lecturer (02)

Introductory Chemistry 1025C;

General Chemistry I 1045C

General Chemistry II 1046C

Organic Chemistry I 2210C

Organic Chemistry II 2211C

1993-1995: University of Hertfordshire

Department of Chemistry

Adjunct Lecturer

Inorganic Chemistry 1A

Main Group Organometallic Chemistry

Educational Material Written;

Textbook Chapters. Practice Your Scientific Analysis and Reasoning Organic Chemistry: McMurry 9th Edition (Cengage) (2015). (*One of the Top 3 Selling Organic Chemistry Texts for Undergraduates Internationally*)

Digital Media: Knewton Adaptive Learning for Mastering Organic Chemistry for Organic Chemistry Wade (Pearson) (2014)

SERVICE:

Reviewer, Editor and Contributor.

Peer Reviewed Journals: *Journal of Materials Chemistry, Dalton Transactions, Journal of Fluorescence Chemistry, Chemical Physics Letters and Journal of Organic Chemistry.*

Invited Editor and Contributor for Text and Software Media; Textbook Publishers:

Organic Chemistry: Cengage, McGraw Hill, Norton, Pearson, W.H. Freeman and Wiley.

Inorganic Chemistry: Cengage, McGraw Hill, Oxford University Press, Pearson, W.H. Freeman, and Wiley.

General Chemistry: Cengage, McGraw Hill Pearson, Norton, Oxford University Press, W.H. Freeman and Wiley.

DEPARTMENTAL COMMITTEES:

Chemistry Department UCF: (1) *Inorganic Chemistry 2007-2014*, (2) *Organic Chemistry 2007-2014* and (3) *Instrumentation 2007-2014*

Students Partial or Full Supervision

Graduates

Adam Woodward

Dao Ngyuen

Undergraduates

Fengchun Li (Chemistry Major) Accepted Medical School Summer 2014

Kevan King (Chemistry Major) Accepted M.Sc. Biotechnology Summer 2014

Rosmery Victoria* (Biology Major) Accepted Student Medical School Fall 2012

Kasey Haugen* (Chemistry Major).

*Received University SMART awards for their research and Honorable Mention under Math and Physical Science category at the UCF Showcase of Undergraduate Research Excellence.

Rania Bassouni (Forensic Major) PhD Biomedical Sciences. UCF (Graduated 2015)

Jin Yu (Biology Major) School of Pharmacy LECOM Bradenton Florida (Graduated 2014)

THESIS COMMITTEE MEMBER

Bassam Al-farhani (Ph.D. Dissertation UCF Chemistry, Spring 2016) Advisor Andres Campiglia
Bosung Kim (Ph.D. Dissertation UCF Chemistry, Spring 2015) Advisor Kevin Belfield
Simon Tang (Ph.D. Dissertation UCF Chemistry, Spring 2015) Advisor Kevin Belfield
Candace Kirkland (Ph.D. Dissertation UCF Chemistry, Fall 2014) Advisor Cherie Yestrebbsky
Adam Woodward (Ph.D. Dissertation UCF Chemistry, Fall 2014) Advisor Kevin Belfield
Mengyuan Wang (Ph.D. Dissertation UCF Chemistry, Fall 2014) Advisor Kevin Belfield
Xiling Yue (Ph.D. Dissertation UCF Chemistry, Fall 2014) Advisor Kevin Belfield
Simon Novaes-Card (Ph.D. Dissertation UCF Chemistry, Summer 2013) Advisor Cherie Yestrebbsky
Bill Moreshead (Ph.D. Dissertation UCF Chemistry, Fall 2013) Advisor Kevin Belfield
Yuanwei Zhang (Ph.D. Dissertation UCF Chemistry, Fall 2013) Advisor Kevin Belfield
Xuhua Wang (Ph.D. Dissertation UCF Chemistry, Spring 2011) Advisor Kevin Belfield
Hyo-Yang Ahn (Ph.D. Dissertation UCF Chemistry, Summer 2011) Advisor Kevin Belfield

Madeline Johnson (Ph.D. Candidacy UCF Chemistry, Spring 2016) Advisor Andres Campiglia
Amel Garbou (Ph.D. Candidacy UCF Chemistry, Spring 2014) Advisor Cherie Yestrebbsky
Simon Tang (Ph.D. Candidacy UCF Chemistry, Spring 2014) Advisor Kevin Belfield
Bosung Kim (Ph.D. Candidacy UCF Chemistry, Spring 2014) Advisor Kevin Belfield
Bassam Al-farhani (Ph.D. Candidacy UCF Chemistry, Fall 2014) Advisor Andres Campiglia
Carolina Franco (Ph.D. Candidacy UCF Chemistry, Fall 2013) Advisor Cherie Yestrebbsky
Candace Kirkland (Ph.D. Candidacy UCF Chemistry, Fall 2013) Advisor Cherie Yestrebbsky
Mengyuan Wang (Ph.D. Candidacy UCF Chemistry, Fall 2013) Advisor Kevin Belfield
Adam Woodward (Ph.D. Candidacy UCF Chemistry, Summer 2013) Advisor Kevin Belfield
Bingling Sui (Ph.D. Candidacy UCF Chemistry, Fall 2013) Advisor Kevin Belfield
Simon Novaes-Card (Ph.D. Candidacy UCF Chemistry, Summer 2013) Advisor Cherie Yestrebbsky
Christopher Gabrill (Ph.D. Candidacy UCF Chemistry, Fall 2012) Advisor Steven Kuebler
Yuanwei Zhang (Ph.D. Candidacy UCF Chemistry, Summer 2012) Advisor Kevin Belfield
Bill Moreshead (Ph.D. Candidacy UCF Chemistry, Spring 2011) Advisor Kevin Belfield
Kristen Lynch (Ph.D. Candidacy UCF Chemistry, Fall 2010) Advisor Steven Kuebler
Xuhua Wang (Ph.D. Candidacy UCF Chemistry, Summer 2009) Advisor Kevin Belfield

Maria Jezebel Colon Gomez (Honors Thesis UCF Chemistry, Spring 2013) Advisor Kevin Belfield
Rosmary Victoria (Honors Thesis UCF Chemistry, Summer 2012) Co Advisor with Kevin Belfield

PROFESSIONAL AFFILIATIONS

American Chemical Society 2003
Royal Society of Chemistry 1987
Optical Society of America 2008