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# Curriculum Vitae

## B. Dee Barker, Ph.D. Chemistry

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### Home address

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### Education:

#### Science:

- 2006 Ph.D. in Chemistry, University of South Florida: Dissertation Research in Chemical Education,  
PhD research in two subfields:  
(1) Chemical Education: National Science Foundation (NSF) funded research area: Reform in Chemical Education  
(2) Biophysical Chemistry: National Institute of Health (NIH) and American Heart Association (AHA) funded research: energy transduction in membranes-invitro systems
- 2000 M.S. in Chemistry; subfield Physical (laser spectroscopy) and Biophysical Chemistry; AHA funded physical chemistry applications to Halobacterium salinarum and biological energy transduction: University of Hawaii
- 1997 B. S. in Chemistry: Organic Photochemistry: extramural (local industry) and intramural funded research: University of Victoria (B.C.) Canada

#### Humanities:

BA. Philosophy; subfield epistemology and philosophy of science:  
Wheaton College; Massachusetts

### Experience:

**2019-2020: Assistant Professor in Environmental Studies, Alaska Pacific University, Anchorage, AK;**

**Fall Session 2019 Teaching Duties:** Developed and implemented curriculum for Organic Chemistry I, which involved lab curation, creation of lecture class activities, and online homework system organization. Taught Principles of Chemistry I, organized multiple lab sections with a TA and trained TA. Added an online homework system for Chem I, which entailed collecting and modifying the

online homework system content for each topic to fit the scheduled curriculum. Taught University Physics I, which had two lab sections and organized these with a TA and trained the TA.

**Service Duties:** Began to take inventory of chemicals in GH 300 lab cabinets. Participated in the APU Farm Committee. Supervised the creation of a Chemistry and Physics lab equipment inventory with a student. Reorganized a storage room of equipment and glassware to fit fire code and earthquake safety issues. Updated the APU catalogue description of the University Physics I course and presented it for faculty approval. Began curriculum development for Environmental Physics in preparation for teaching it Spring 2021. Wrote the Organic Chemistry II course proposal for faculty approval. Continued working as the ‘Scientist in Residence’, at the Anchorage Museum; met with personnel at the Anchorage Museum and with Alaska Native speakers in an effort to conduct a discussion panel on Alaska Native science and their knowledge of medicinal properties in local plants.

**Spring Session 2020 Teaching Duties:** Principles of Chemistry I & II. Collected and organized content in an online homework system for Chem II. University Physics II as an Independent study; Organic Chemistry II, curriculum development and implementation.

**Teaching Duties March 2020:** Switched all classes to online in response to COVID-19 restrictions. Principles of Chemistry I & II were conducted online synchronously, while Organic Chemistry II and Physics II were conducted non-synchronously. All online work was conducted through Blackboard Collaborate Ultra. Virtual labs were created and conducted using online simulations provided by government, private companies, and university initiatives. A selection of these include: ChemCollective, PhET, nmrdb.org, webbook.nist.gov/chemistry, <https://www.uccs.edu/vgcl>, <https://chemdemos.uoregon.edu>. Advised students regarding their degree requirements. Conducted tutorials online in Blackboard Collaborate synchronously. Provided online course content guidance for two students working on incompletes. Rewrote syllabi reflecting the changes in course structure in the transfer to the online environment.

**Service Duties:** Began work to upgrade equipment for labs. Participated in committee work online. Committees: APU Farm Committee, Senior Project committee member for a student, Field Supervisor for a Student Practicum. Grant writing preparations for lab upgrades and new instrumentation.

**Scholarship:** Continuation of research project on modernity, science and religion and began writing two articles.

**2018-2019: Visiting Assistant Professor in Environmental Studies, Alaska Pacific University, Anchorage, AK;**

**Fall Block (Aug-Sept 2018) Teaching Duties:** Taught Introduction to Weather and Climate in a condensed “Block” format of four weeks; introduced three intensives: observations and introduction in a local Weather Station at Sand Lake, two Planetarium shows at UAA: “Dynamic Earth” and “Kiuguyat: the Northern Lights” and last an introduction to the relationship between the earth-soil systems and the atmosphere, with scientists doing research on the APU Kellogg campus farm soils.

**Fall Session 2018 Teaching Duties:** Taught first year physical sciences, Principles of Chemistry I and University Physics I. This work involved curriculum development and lab instrumentation curation.

**Spring Session 2019 Teaching Duties:** Curriculum development and implementation of Principles of Chemistry II, and University Physics II. Taught the Introduction to Weather and Climate in a synchronous online format using Blackboard Collaborate. Advised Students regarding the fulfillment of their degree requirements.

**Service Duties:** Served on the search committees for the Environmental Public Health faculty position and for the Liberal Studies faculty position. Served on the APU Farm Committee. Served as the ‘Scientist in Residence’ at the Anchorage Museum, provided research support for the science content they currently have for school ages (k-12) and Adults.

**Scholarship:** Began reading scholarly research papers and books in preparation for writing papers. The general area of research is on the impact of western culture ‘modernity’ (philosophy and values) on science as an exploratory discipline (specifically applied to Chemistry and/or Particle Physics). The work will involve a close examination of the relationship between science and religion that resulted from the societal effects of the Reformation.

**2010 to 2018: Market Farming, Beekeeping and Cosmetics manufacture and sales:**

My work entailed: development, manufacture, and sales of “Abeille Alaska”<sup>TM</sup>, our brand of natural cosmetics and skin care line using beeswax and honey from our farm hives. I conducted research development, manufacturing SOP’s, production, packaging development, marketing and sales of these products for our farm business. Our sales are generally conducted at farmers’ markets and in an online store. And last, I’m the webmaster for the two websites associated with our farm and cosmetics businesses: [www.earthworksfarmalaska.com](http://www.earthworksfarmalaska.com) and [www.abeillealaska.com](http://www.abeillealaska.com). Occasionally our workload requires the hiring of seasonal labor to support the market sales and production demand. In addition, I conduct market farming and beekeeping work for our farm business (Earthworks Farm). My work in the market farming is focused on flower growing and flower sales and beekeeping and honey sales.

From 2014 to 2016 I was Chair of the local Alaskan section of the American Chemical Society. I was a member of the Society for 18 years and was continually active, participating in conferences and other activities each year until I was hired by UAA. After my hire, I attempted to participate at least once a year in activities or conferences that would take me out of state. In 2014 I was invited to become Chair of the local section which has approximately 120 members. Shortly after becoming Chair, I helped the section organize and host the American Chemical Society Northwest Regional Meeting (NORM2016). Initially I took on the role of fundraiser and helped with fundraising and obtaining sponsors, lecturers, speakers, and personnel support for the conference. After doing some of the preliminary work in support of the conference, I resumed the role as the Chair of the section.

**2012 to 2014: Founder of EduEquity Consulting Group LLC**

A consulting business created in 2012 to train and facilitate organizational and educational innovations and to support processes that establish diversity and equity.

**2005-2011:**

**University of Alaska, Anchorage (UAA):**

**2005- 2010 Assistant Professor, University of Alaska Anchorage**

**2010-2011 Term Assistant Professor, University of Alaska, Anchorage**

**2010, 2011 Adjunct Professor, Matsu College, Palmer;**

**UAA workload distribution: 3:1:1 Teaching:Research:Service**

Courses taught at UAA	
Introductory Biology 102	Introductory Biology Lab 103
Survey of Chemistry 103	Survey of Chemistry Lab 103L
Preparatory Chemistry 055	Allied Health Biochemistry Lab 104L
Independent Study Chemistry 397	Senior Project Chemistry 498
General Chemistry 105, 106	General Chemistry Labs 105L, 106L

**Instruction duties at UAA and Matsu College:**

Summer 2011: Adjunct, Matsu College, UAA; taught Biology 102, Biology 103, and Chemistry 103

Summer 2010-2011 Term Assistant Instructor at UAA, and Matsu College; Taught Introductory Biology Lecture; Development of Introductory Biology Lab; Development and implementation of ecology and sustainability project for both lecture and lab classes. Chemistry 103 and Chemistry 103 Lab including a chemistry-based ecology and sustainability project for both lecture and lab.

Fall 2005- Spring 2010: Tenure tract, Assistant Professor in Chemistry; Workload typically involved three, 3-credit lecture courses per semester. The lecture courses enrolled a range of students from approximately 70 students to 130 students per class. Lab courses typically enrolled 14-24 students. The workload involved two to three lecture classes per semester and 1 or 2 labs per semester. Labs were 'grading intensive' involving 14 – 24 lab reports weekly.

Based on the diagnostic test I conducted the first day of classes, students presented a vast range of preparedness for the General Chemistry Courses. To retain as many students as possible across this range, I conducted an evaluation of their entry level understanding of chemistry and gave them an outline customized to their performance on the diagnostic to inform them of the workload that they would need to undergo to be successful in the class. I implemented 'Process-Oriented Guided Inquiry Learning', a pedagogy which had been substantiated as effective for a wide range of students. Additionally, I conducted chemistry writing modules, set-up and managed online homework,

weekly face-to-face tutoring sessions and additional online tutoring session; created online and in-class activities, preparatory learning modules and PowerPoint lectures.

In 2006-2007 I was assigned coordinator of courses among junior and senior faculty teaching first year chemistry (Chemistry 105 and 106). More description is given below under the heading of service to the Chemistry Department.

In 2007 I was assigned to write the curriculum documents for all the first-year chemistry courses. Afterward I presented these documents to the GERC and UAB for review and acceptance. They were accepted and became the templates for GER courses across the UAA university system. More details are provided below in the service section.

### **Courses taught prior to UAA employment as a graduate student in two universities:**

General Chemistry course and labs, Analytical Chemistry labs, Physical Chemistry labs and Organic Chemistry labs

### **Research that I conducted at UAA 2005-2010:**

- Statistical analysis of retention and achievement of students through the application of sociological research methodology involving both quantitative and qualitative methods. Implementation and study of innovative pedagogy among underprepared students (funded by Chancellor Strategic Opportunity Fund). Report noted in the "Reports" section.
- Statistical analysis of the validity/reliability of survey and testing instruments;
- Demographic study of learning paradigms and academic achievement;
- Demographic study of faculty and teaching practices.
- Applied 'Action Research', interviewing methodology, sociological research, psychological research involving learning strategies and concept modeling, and triangulation methods;
- Used software packages for sociological and demographics research such as SPSS, SAS, and Hyper-Research. The statistical work I conducted included (as examples) multi-linear regression analyses, analysis of interactions of variables, correlation studies, 'internal-reliability' of survey instruments (e.g. Cronbachs alpha), and post hoc studies, such as power analyses.

### **Service at UAA 2005-2011:**

#### **Department level: Curriculum development and program development.**

- Organized, coordinated, and implemented pedagogical innovations to improve student retention and achievement across all first-year general chemistry courses.
- In 2006-2007 was assigned to write new course curriculum guides and course action requests for the Chemistry Department, on the basis that I had the skill set and background for curriculum development. After writing the documents for all the first-year courses, I presented the documents and their rationale to the General

Education Requirement Committee (GERC) and the Undergraduate Review Board (UAB). The review process went well, and the documents were approved. Later I learned that the documents were utilized as curriculum models in the Curriculum Handbook, which was used throughout the university. Eventually I was invited to participate in GERC as a committee member.

- In my second year of teaching at UAA I was assigned coordinator of the General Chemistry courses at UAA. The chemistry faculty, who had various levels of experience in teaching first year courses, had a wide range of needs to begin implementing new pedagogy. This work entailed a collaboration to help with the implementation of the new pedagogy and streamline and make consistent the strategies used across three courses. The impact of the coordination improved both student retention and higher achievement among underprepared students within these chemistry courses. Later I received a grant to analyze the impact of this work across semesters. The retention studies included a comparison of intra and inter-class retention (within class and across semesters). I was able to confirm the success of this work by statistically analyzing data obtained from Banner and from a pre/post test protocol using standardized and normed tests produced by the American Chemical Society, Educational Division. I found and reported the positive impact of retention and achievement not only in chemistry but to following classes in biology which required these chemistry courses as pre-requisites. I submitted the report to the Chancellor. The report is listed in the report section of this C.V.
- Because of my personal background and history, I had a commitment to support diversity within my courses and among faculty and I am attentive and sensitive to diversity issues. I contributed to the awareness and development of diversity compliance and ethical behavior. As my background became known among the faculty, I was given opportunities to work with the Alaska Education Innovations Network (AEIN). At first, I participated in their workshops to learn more about providing a friendly online environment for long-distance learners, but greatly enjoyed the camaraderie of Alaska Native faculty who also participated. In the Spring of 2007, I was given the opportunity to provide an “in-service” workshop to teachers in the Pribilof Islands, an experience which was one of the highlights of my work at UAA.
- Funding support: I continued to apply curriculum development in chemistry and biology beyond the General Chemistry courses. Toward the goal of helping with program development in chemistry, I helped other faculty implement their own innovations by acquiring funds to support faculty attempting these innovations.

**University level: Curriculum development and program development across disciplines at the university level. These are activities that I initiated or participated in as a committee co-member.**

- Participated in university governance as a member of the general education requirement committee (GERC). This work involved curriculum review and development at the university wide level.
- Participated and contributed a report on diversity nationally in the sciences and in chemistry specifically, as a member to the Diversity Committee.
- I organized and conducted faculty development workshops as facilitator and organizer.
- Received invitations to give lectures to a liberal arts course in the Liberal Arts College and honors course in the Honors College, which I was honored to give.
- Received support from AEIN to give oral presentations on topics of Chemical Education, teaching and learning, and retention of underprepared students, which included representing UAA at national conferences of the American Chemical Society and the International Pacific Rim Conference on Education.
- Collected data and conducted statistical analysis of student retention, and the relationship of student retention to teaching practices. Then I combined that data with the data and statistical analysis of student demographics and student achievement. I wrote a report of my findings and presented it to the University Chancellor's Office.

**Community level:**

- AEIN supported my collaborations with local high school teachers in teaching chemistry; AEIN funded and provided 'in-service' workshops in innovative pedagogy to teachers (middle school and high school) who were teaching chemistry and collaborated on the implementations of these innovations.
- One collaboration involved co-teaching and co-facilitating workshops with a Bartlett High School teacher, Robert Taylor.
- I was invited as a guest speaker to two local high schools, to provide several talks to inspire high school students to attain science university degrees

**Industrial and Academic Employment Prior to UAA Experience**

**2002 to Summer 2006:** Graduate Research Associate, Chemical Education Lab (Dr. Jennifer Lewis), University of South Florida: During my graduate work in Chemical Education, I collected data from across the nation as a graduate research evaluator for the Multi-Initiative Dissemination Project (MID Project) and for the National Science Foundation-funded evaluation of the project. The MID Project was a national workshop

program designed to encourage and support faculty teaching innovations in chemistry. I was charged to explore the teaching practices of chemistry faculty, who participated in the project. I designed and conducted the research project which also included an application for and implementation of an Institution Review Board Approval process across multiple universities and colleges. I wrote a report of my findings which was submitted and well received to various agencies, including the National Science Foundation that funded the work. This report was included and became part of my Ph.D. dissertation in chemical education.

The approach that I used in this study for the MID Project involved the application of ‘mixed methods’ on ‘grounded’ theory. These are methods that I had learned at the graduate level in the social sciences that I was required to take as part of my curriculum in Chemical Education, beyond chemistry courses. While I conducted a case study of a small sample (ten) of participating faculty and designed the protocols for classroom observations and observed faculty teaching practices in their classrooms, my work was monitored and critiqued to ensure I understood and followed appropriate protocols. To explore faculty conceptions about teaching, I designed the interview protocols which required prior approval at the institutional levels as well as from the participating faculty. I transcribed the interviews and coded the transcriptions applying social science methods that I had learned through the Chemical Education program. Using these skills that I had learned in the social sciences and in educational research, I organized, explored and documented the teaching conceptions faculty espoused and enacted. I used this qualitative data (interviews and class observations) to triangulate with quantitative data (obtained from 900 participants) that I generated from conducting an online survey and a mailed survey among the faculty who participated in the MID Project. Last, I evaluated both the qualitative and quantitative data using SPSS and SAS software.

My interview and class observation sampling protocol, an IRB approved sampling procedure, also received approval from the principle investigator of the MID Project, and the chemistry faculty (three members), sociology faculty (two members) and science education faculty (College of Education, one member) who were on my dissertation committee. The sampling protocol entailed interviewing faculty across various institutional levels in the chemistry discipline and in-class observations using contextual based, social science (sociology and psychology) and education evaluation methods. At



the risk of redundancy, I reiterate, that I received formal training in these methods in my graduate program in Chemical Education at USF and this work constitutes a second disciplinary program along with my chemistry class and lab work at the doctoral level. This qualitative data allowed for a better understanding of the implications of the quantitative data that I obtained for the MID Project.

**Aug/1998-Dec/2001:** Graduate Research, Physical Chemistry Lab (Dr. Randy Larsen), University of Hawaii: Pulsed Laser Spectroscopy, Photo-acoustics; I received the Masters of Science degree in chemistry from the University of Hawaii, Manoa. The focus of the thesis research was in the development of laser spectroscopy methods and instrumentation. This work involved an interdisciplinary (computational work, physics and chemistry) approach integrating computer software with laser functions, and troubleshooting laser and detector functions. I was trained in and used: data extraction and trend analysis using SigmaPlot statistical fitting programs, Pulsed Laser Spectroscopy, Photo-acoustics and Photothermal Beam Deflection data collection, analysis and interpretation. The work I performed involved handling temperature/pH controlled, photosensitive/oxygen sensitive biological samples; I tuned the laser, aligned/adjusted the laser apparatus (tuning and maintenance operations involved adjusting dichroics and optics and replacing water pump). I used the Virtual Bench Oscilloscope software in data collection/analysis. I applied the Grams/32 AI and HyperChem software in data analysis and interpretation.

I conducted the laser work on a wide range of molecular systems. The biological samples that I studied included myoglobin, cytochrome c oxydase, and bacteriodopsin. The inorganic molecular systems I studied were metaloporphyrins and the organic systems were small proteins. The reaction dynamics I studied included: protein folding volume changes, the kinetics and thermodynamics of porphyrins, biological enzyme reactivity and small molecule photolysis. Thesis: Development and Application of Photothermal Beam Deflection to Molecular Ion Pumps. © 2000

**1997-1998:** Data Analyst of environmental samples for an analytical company, Axys Analytical Services, Sydney, B.C. (Canada); interpreted GC/MS and GC/ECD chromatographic data to determine whether the data passed QA/QC verification criteria

and EPA codes. Verified data were quantified for varied purposes dependent on client needs. Interpreted data for PAHs, phthalate esters, precursors, chlorophenolics, resin/fatty acids, and nonylphenols.

**1993-1996:** Undergraduate Research Assistant, Organic Photochemistry Research Lab (Dr. Peter Wan), University of Victoria: British Columbia B.Sc. in Organic Photochemistry. I received a Bachelor of Science degree from the University of Victoria, British Columbia, Canada. The degree major was in chemistry and a minor in Biology. In addition to my undergraduate studies, I had the opportunity to conduct research in Dr. Peter Wan's research lab conducting organic photochemistry, using NMR spectroscopy, Ray Net, Mass spectroscopy, and general organic synthesis methods. This work was conducted with Dr. Wan's graduate students and culminated in a Merck-Frosst award in 1995.

**1992:** Lab technician at the Disease Control Centre in Vancouver BC (Canada): performed routine testing of water samples submitted to B.C.C.D.C. water bacteriology lab for maintaining quality water supplies in the province.

## **Stipends and Fellowships**

**2019** Scientist in Residence at the Anchorage Museum (\$2500)

**2010** Climate Change Mini Grant (\$1000)

**2010** UAA Tech Fellows (\$2000)

**2008** Scholarship of Teaching and Learning Fellow (\$2000)

**2008** AEIN Distance Learning Course Development Fellows Stipend (\$1200)

**2007** AEIN Distance Learning Course Development Fellows Stipend (\$2000)

**2007** Cool Climate Fellows Curriculum Development (\$1000)

**2006** Writing Across the Curriculum Fellows Stipend (\$1000)

## Awards

- 2007 UAA Faculty Travel Award
- 2003 & 2004 Graduate Travel Award, University of South Florida.
- 2002 Biophysical Chemistry, Castle Conference, University of South Florida.
- 2000 Biophysical Chemistry, International Chemical Congress of Pacific Basin Societies
- 2000 Biophysical Chemistry, U. of Hawaii Biomedical Science Dean's Graduate Division Award
- 1996 Organic Chemistry, 10<sup>th</sup> Annual Western Canadian Undergraduate Chemistry Conference
- 1995 Organic Chemistry, Merck-Frosst Award (Canada) with Dr. P. Wan
- 1993 Bio-Photochemistry 7<sup>th</sup> Annual Western Canadian Undergraduate Chemistry Conference
- 1992 Dean's Bursary Award, University of Victoria

## Grant Proposals and Funding

- 2009 NSF Application: *Integrating Photochemistry and Alaska Native Traditional Ecological Knowledge into the Undergraduate Chemistry Curriculum* (proposal not funded for lacking a Dean's recommendation letter and specs for an economical laser; invited to re-apply)
- 2009 NIH Application: *Laser Induced-Photoacoustic Spectroscopy in the University of Alaska, Anchorage*
- 2008 **Funded:** Chancellor's Strategic Opportunity Grant: (\$16500 awarded) *Critical Mass Among High Achieving, Initially Under-Prepared Chemistry Students: A New Paradigm in the University of Alaska, Anchorage*
- 2007 Chancellor's Fund: *POGIL in Alaska: An integrated Approach to Study Retention and Achievement in a Diverse Student Population*
- 2006 Mathematics and Science Partnership Grant: prepared the evaluation procedures component in this grant co-submitted in the Spring 2006

## Publications

- Barker, B.D\*. Teaching philosophy and practices among chemistry faculty attending the MID Project workshops: Implications for reform in chemistry, " (2006). Graduate School Theses and Dissertations, American Scholars Commons, <http://scholarcommons.usf.edu/etd/2452>
- Barker, B.D. and R.W. Larsen\*. Volume and enthalpy profiles of CO binding to Fe (II) tetrakis-(4-sulfaonatophenyl)porphyrin. *J. Inorg. Biochem.* (2001) Jun; **85**(2-3): 107-116.
- Barker, B.D., R.W. Larsen\*. Photothermal Methods applied to Energy Transducing Membrane Proteins: a Review. (2001) *J. Biochem. Mol. Biol. Biophys.* **5**:407-434.
- Barker, B., L. Diao, P. Wan\*. Intramolecular [4 + 2] cycloaddition of a Photogenerated o-Quinone Methide in Aqueous Solution. (1997) *J. Photochem. Photobiol. A: Chemi.* **104**:91-96.
- Wan\* P., B. Barker, L. Diao, M. Fisher, Y. Shi, and C. Yang. Quinone Methides: Relevant Intermediates in Organic Chemistry. (1996) *Can. J. Chem.* **74**: 465-475.

## Reports

- 2010** \*B.D. Barker, *Women and Diversity in Chemistry: Demography of academic chemists in the US and implications about the function of Chemical Education as a subfield in Chemistry: Implications for diversity*, presented to the Faculty Senate Diversity Committee, UAA
- 2009** \*B.D. Barker and Reid Johnson, funded research report: **UAA Chancellor's Strategic Opportunity Report: *Critical Mass Among High Achieving, Initially Under-Prepared Chemistry Students: A New Paradigm in the University of Alaska, Anchorage***; report submitted to the Chancellor's Office

## National Meeting Research Presentations

\* Faculty and/or Principle Investigator

- 2008** \*B.D. Barker (UAA) & Robert Taylor (Bartlett High School-Anchorage) 2<sup>nd</sup> Pacific Rim Education Conference Presentation: *Culturally Responsive Teaching in Science, Technology, Engineering, and Math Education, Alaska* (Sponsored by the Alaska Education Innovations Network)
- 2008** \*B.D. Barker (UAA) & Robert Taylor (Bartlett High School-Anchorage School District) 2008 Biennial Conference in Chemical Education Presentation: *Cross-*

- Institutional Implementation of POGIL: New Horizons in Alaska* (Sponsored by the Alaska Education Innovations Network)
- 2007** \*B.D. Barker & \*Tim Jester (UAA) National Network for Educational Renewal 2007 Annual Conference Presentation: *Culturally Responsive Practice: Live and in Person: Bridging Philosophy and Ideology with Practice*. (Sponsored by Alaska Education Innovations Network)
- 2007** \*B.D. Barker (UAA), D. Freistroffer, L Heasley, S. Kinjo-Hischer, L. Murdoch; American Chemical Society National Meeting Boston; *Achievement and Retention among Under-prepared Students in General Chemistry*.
- 2006** \*B.D. Barker (UAA), & S. Applebaum, (University of South Florida) & D. Pinzino, (University of South Florida) National Association of Science Teachers Meeting 2006. *Socioscientific Issues as Context for Conceptual Understanding of Content*.
- 2004** \*B.D. Barker and \*J.E. Lewis 18<sup>th</sup> ACS Biennial Conference in Chemical Education, Oral Presentation: *Implications of Demographic Relationships to Teaching Practices: MID Project*.
- 2004** J.E. Lewis\* and B.D. Barker, ACS 227<sup>th</sup> National Meeting, Oral Presentation: *MID Project Participants: A comparison with ACS survey data*.
- 2003** \*B.D. Barker and J.E. Lewis\* ACS 225<sup>th</sup> National Meeting, Oral Presentation: *Investigation of demographic factors among chemistry faculty attending MID Project workshops*.
- 2003** \*B.D. Barker and J.E. Lewis\* Castle Conference USF, Oral Presentation: *Sex differences in reported teaching practices among chemistry faculty*.
- 2003** \*B.D. Barker and J.E. Lewis\* Arts and Sciences College Graduate Division Symposium, USF, Poster Presentation: *Faculty Demographics and Teaching Preferences in Chemical Education*.
- 2002** \*B.D. Barker, Castle Conference, USF, Poster Presentation: *The Development and Application of Photothermal Beam Deflection to Molecular Ion Pumps*.
- 2001** \*B.D. Barker, University of Hawaii Chemistry Symposium, Oral presentation: *Membrane thermodynamics in biological systems*.
- 2001** \*B.D. Barker and R.W. Larsen\* Biophysical Society, Poster presentation: *A photothermal beam deflection study of the bacteriorhodopsin photocycle: a second look*.
- 2001** \*B.D. Barker and R.W Larsen\* Biomedical Sciences Symposium, Poster Presentation: *Conformational studies of the early stages of the bacteriorhodopsin photocycle*.

- 2000** \*B.D. Barker and R. W. Larsen\* International Chemical Congress of Pacific Basin Societies, Poster Presentation: *Photothermal Beam Deflection Studies of the Bacteriorhodopsin Photocycle.*
- 2000** \*B.D. Barker and R. W. Larsen\* Biomedical Sciences Symposium, Poster presentation: *Conformational studies of CO binding to a water soluble porphyrin, Fe (II) tetrakis-(4-sulfonatophenyl) porphyrin*
- 2000** \*B.D. Barker and R. W. Larsen\* Biophysical Society, Poster Presentation: *Conformational dynamic studies of CO binding to water soluble iron porphyrins using photothermal beam deflection.*
- 1996** \*B. Barker and P. Wan\* 10<sup>th</sup> Annual Western Canadian Undergraduate Chemistry Conference, Oral Presentation: *Intramolecular Hetero-Diels-Alder Reaction of Photogenerated o-Quinone Methides.*
- 1996** \*B. Barker, Vancouver Island C.I.C. Student Symposium, Oral Presentation: *From Light to Life: Photochemistry in Metabolic Regulation.*
- 1994** \*B. Barker, Vancouver Island C.I.C. Student Symposium, Oral Presentation: *Nitric Oxide: Nature's Unexpected Messenger.*
- 1993** \*B. Barker, 7<sup>th</sup> Annual Western Canadian Undergraduate Chemistry Conference, Poster Presentation: *Photo-stimulation of Mitochondrial Respiratory Enzymes and Implications for Human Health.*

## **Volunteer/ Community Service**

- 2020** Updated and designed webpages for St Herman Orthodox Church
- 2019** Conducted Adult Catechism classes on theology for St Herman Orthodox Church
- 2011-2017** Informal talks on the chemistry of cosmetics, beeswax and honey, green fertilizer, beekeeping, and soil chemistry
- 2014-2016** American Chemical Society, Alaska Section Chair
- 2009-11** Governance: General Education Requirement Committee, UAA
- 2009-10** Faculty Senate Diversity Committee
- 2008** Scholarship of Teaching and Learning workshop for mentoring faculty
- 2008-09** educational reform development and documentation
- 2008** **(dept service)** department assessment of student outcomes after implementation of reform pedagogy

- 2008** (dept, college, and university service) POGIL workshop (part of SoTL workshop) designed for chemistry content for non-chemistry faculty
- 2008** (Community service) Web blog development for community engagement and to provide a forum to facilitate innovative teaching practices among teachers and faculty
- 2008** (community service) mentored student in community engagement for facilitating communication among teachers through online blog
- 2007** (university, college, departmental service) Creation and revision of Course Curriculum Guides and Curriculum Action Request Documentation for all introductory level chemistry lecture and lab course; & presentation to the chemistry department, CAS review board and UAB
- 2007** (Dept service) Revision of CCG and CAR for Biochemistry course and attendance in UAB meetings
- 2007** (college service) Presentation to Liberal Studies course
- 2007** university-wide Plagiarism software discussion (pertaining to Writing Across the Curriculum)
- 2007** (community service) Conducted “in-service” workshop for teachers on the Pribilof Islands
- 2007** AEIN meetings for pedagogical renewal
- 2006-2007** (Dept service) Department Curriculum Assessment Committee
- 2006-2007** (Dept service) Facilitator training for Chem 105 & 106
- 2006-2007** (Dept service) Co-facilitation of Chemistry 105 & 106 classes to mentor faculty implementing POGIL
- 2006-2007** (University Service) Classroom Technology Committee
- 2006-2007** co-mentoring teachers and co-facilitated POGIL for an AP high-school course
- 2006** Hosted and facilitated a faculty development workshop for Chemistry faculty, science and non-science faculty, and Chemistry High School teachers in innovative pedagogy in Chemistry called “Process-Oriented Guided Inquiry Learning” (POGIL)
- 2006** Development and Implementation of Summer Teacher Institute (for Chemistry High School teachers)

- 2005-2006** Writing Across the Curriculum Steering Committee in UAA
- 2005** Organized Consultation and workshop for Science Education faculty in “Process-Oriented, Guided Inquiry Learning”, POGIL.
- 2004** Yoga for the physically challenged, Lotus Room, South Tampa, Florida.
- 2003** Research Consultation (in conjunction with Dr. Jennifer Lewis): “UR Smart” USF/K-12 school district collaboration; Research into teacher attrition in local schools.
- 2002-2003** Research Consultation (in conjunction with Dr. Jennifer Lewis): Museum/USF (interdisciplinary)/charter (local) school collaboration; “Global Warming Project”
- 2002** Chemistry Symposium, Castle Conference; Marketing and Organization Committees
- 2001** Mentorship in physical chemistry for high school students competing in local science fairs, Honolulu, Hawaii.
- 2000-1999** Mentorship in physical chemistry for undergraduate research projects, University of Hawaii.
- 1999** Teaching Assistant Orientation: Spokesperson, University of Hawaii (invited oral presentation)
- 1999, 1998** Open House Chemistry Dept. University of Hawaii, Demonstrator of photothermal beam deflection
- 1996, 1994** Vancouver Island Regional Science Fair Judge
- 1995** Open House Chem. Dept. University of Victoria, Demonstrator of photochemistry
- 1993** XVI<sup>th</sup> International Conference of Photochemistry, Organization

## **Faculty Development**

- 2020** Participated in a one-day workshop on NIH grant writing.
- 2019** Compliance Health Stream training.
- 2010** Tech Fellows workshop
- 2008** Scholarship of Teaching and Learning Workshop (Kansas University)
- 2008** AEIN distance learning workshop



- 2008** POGIL Advanced workshop
- 2008** Participatory Action Research Retreat
- 2007** Community Engagement Reading & Discussion Group Series
- 2007** CAFÉ Seminar on Best Practices in Teaching
- 2007** POGIL intensive-advanced workshop on writing activities and class facilitation
- 2007** AEIN Distance Learning Intensive Workshop
- 2007** Cool Climate Intensive workshop
- 2007** Colleague-to-Colleague for Teaching Excellence
- 2006-2007** Writing Across the Curriculum Intensive Workshop
- 2006-2007** CAFE series for Culturally Responsive Teaching
- 2006** Institutional Review Board Training (UAA)
- 2006** Facilitation of an introductory workshop POGIL workshops at the 2006 Biennial Conference in Chemical Education (BCCE); Facilitation of a Activity Design workshop in Chemical Education
- 2005** Participated in “CAFE” faculty orientation and development workshops at UAA
- 2005** Participated in the Advanced workshop in Process-Oriented Guided Inquiry Learning
- 2004** Introductory four day intensive workshop in Process-Oriented Guided Inquiry Learning
- 2003** Introductory four day intensive workshop in Process-Oriented Guided Inquiry Learning

## **Memberships**

Formerly a member of the American Chemical Society (18 years)