Ron D. Briggs, Ph.D.

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SUMMARY

Coordinator of General Chemistry at the Second Largest University in the Nation

HIGHLIGHTS

- 13 Years Experience Teaching University-Level Chemistry including Introductory, General, Engineering, Organic, and Physical Chemistry
- Exceptional Supervisor, Peer, and Student Teaching Reviews
- Multiple Teaching Awards and Nominations
- Redesign of General Chemistry Program (for ~5,500 students/year), saving over $600,000 annually, while simultaneously improving access and impact
- Development and Instruction of Collaborative Learning Methods (including Inquiry) in Lab, Lecture, and Recitation Settings
- Utilization of Multimedia and Emerging Technologies in the Classroom
- Dedicated Community Service and Scholarly Outreach
- Strong Practical and Theoretical Background in Scientific Instrumentation

EDUCATION

Ph.D., Analytical/Physical Chemistry, 2004
University of California, San Diego and San Diego State University - San Diego, CA
Dissertation Title: "High-Resolution Nonlinear Laser Wave-Mixing Spectroscopy for Gas-Phase Environmental and Atmospheric Studies"
Advisor: Professor William G. Tong

M.A., Chemistry, 1999
San Diego State University
Advisor: Professor William G. Tong

B.S., Chemistry, 1994
University of California, San Diego

EXPERIENCE

2006-Present **Coordinator of General Chemistry**
Arizona State University, Tempe, AZ

- Managed general chemistry program at the second largest university in the nation
- Coordinated over 26,000 hours of combined student time per week in lecture, lab, and recitation sections (CHM 101, 113, 114, 116)
- Hired, trained and/or supervised seven faculty members and 100 teaching assistants per semester
- Supervised/mentored chemical stockroom, demonstration room, Learning Resource Center (LRC) and Supplemental Instruction (SI) personnel
- Pioneered implementation of a $650,000 Learner-Centered Education (LCE) course redesign initiative with General Chemistry faculty at three ASU campuses
- Planned and designed the new Chemistry Collaborative Learning Center (CCLC) in coordination with faculty and staff at multiple ASU offices
- Coordinated scheduling and enrollment for all 100-level courses
- Maintained grade records for over 5,000 students per year
- Submitted textbook orders and organized collaborative efforts with publishers and vendors
- Served as point of contact for outreach and publicizing General Chemistry Program

2004-Present **Chemistry Lecturer (Senior Lecturer 2007-present)**
Arizona State University, Tempe, AZ

- Designed curriculum, coordinated and supervised inquiry-based laboratory exercises in Introductory, General, Physical, and Organic Chemistry (CHM 101, 113, 114, 235, 343, 348)
- Mentored course teaching assistants
- Coordinated over 2,000 hours of combined student time per week
- Received excellent student evaluations (as high as 4.88/5.0)

- Served on several Departmental Committees: Undergraduate Programs Committee, Committee on Teaching Assistants (Chair), Learning Resource Center Committee (Chair), General Chemistry Instructional Programs Committee, and multiple faculty/staff hiring committees

2003-2006 **Analytical Chemistry Consultant/Expert Witness**
San Diego, CA
- Analyzed GF-AAS, ICP-AES, and ICP-MS data for a prominent law firm
- Worked under strict deadlines to deliver professional technical reports to a general audience
- Provided expert testimony at deposition and in Federal Court

1996-2003 **Doctoral Candidate, Graduate Research Assistant**
Dr. William Tong Laser Spectroscopy Group at San Diego State University
- Developed and managed individual and joint research projects in both gas and liquid phases using novel technique of degenerate four-wave mixing (D4WM) spectroscopy
- Performed experiments that coupled D4WM with a variety of different atomizers including the graphite furnace, cathode discharge, and inductively coupled plasma
- Measured and reported the lowest current detection limits (parts-per-quadrillion level) for any technique of select atomic elements

1999-2002 **Chemistry Instructor**
Summer Bridge, Health Careers Opportunity Program (HCOP), Upward Bound and Upward Bound Math/Science Programs
- Designed curriculum and research assignments for federally funded summer programs that provided experience to underrepresented and disadvantaged high school and college students from all over the world
- Coordinated over 70 hours of student time per week
- Responded to unique student needs from a variety of different ethnic, social, and academic backgrounds
- Assisted students in the development of several unique research projects and the creation of scientific web pages for publication on the campus web server
- Supervised and evaluated a course teaching assistant
- Received excellent instructional reviews from students and program administrators

1996-2003 **Graduate Teaching Assistant and Asst. Lab Coordinator**
San Diego State University and University of California, San Diego
- Coordinated undergraduate laboratory courses and managed grades and course preparation for over 500 students per semester
- Instructed and evaluated over 50 students per semester in lecture and laboratory courses at two major universities
- Designed, developed, and maintained the complete undergraduate chemistry web site with an average use of over 12,000 hits per semester
- Maintained independent accountability for the instruction and upkeep of several advanced analytical and physical chemistry experiments in two upper-division college chemistry courses

PROFESSIONAL DEVELOPMENT & WORKSHOPS

2009 **MasteringChemistry & MyLabs Plus Workshop**
Arizona State University, September 22, 2009
- Participated in round table discussion of the online homework and course management system
- Provided feedback to publishing representatives on current limitations of the package

2009 **Arizona Board of Regents (ABOR) /Learner Centered Education (LCE) Redesign Workshop**
Phoenix, AZ, August 13, 2009
- Discussed final outcomes of course redesign efforts at ASU, U of A, and NAU
- Formulated recommendations to the Academic Affairs Committee concerning next steps with the LCE Program

2009 **ALEKS Online Assessment Workshop**
Arizona State University, July 16, 2009
- Learned about novel online assessment tools for freshman placement, self-advancement, and remediation
- Participated in panel discussion with Provost, Vice Provost, and department representatives from Chemistry, Math, and English

2008 **Managing Change: Creating Effective Campus Learning Spaces**
Herman Miller Webinar, November 13, 2008
- Discovered new methods for aligning institutional strategy with learning space strategy
- Discussed approaches for design and innovation projects to support pedagogical goals
- Assessed effective strategies for documenting student learning through key metrics

2008 **Collegiate Learning Assessment (CLA) in the Classroom Academy**
Arizona State University, November 6-7, 2008
- Learned about rubric-based assessment
- Brainstormed strategies for using performance-based assessment in courses
- Planned administration and scoring of a disclosed CLA Performance Task, as well as how to use results to diagnose student work
- Developed performance tasks to embed course content or concepts

2006-2007 **Arizona Board of Regents (ABOR)/ National Center for Academic Transformation (NCAT) Workshops in Curriculum Redesign**
Arizona State University (Tempe and West campuses)
- Learned effective course redesign strategies based on previous implementations at other universities across the nation
- Participated in peer discussions with multidisciplinary faculty at Arizona State University, University of Arizona, and Northern Arizona University on optimizing the delivery of the general chemistry program while supporting higher enrollment and improving TA mentoring
- Awarded the highest redesign grant of all proposals ($100,000)

2006 **Chemical Education Seminar Series**
Arizona State University, Fall 2006 Semester
- Participated in peer-led discussions on learning models and chemical education publications

2006 **American Chemical Society Leaders Conference**
Baltimore, MD, January 27-29, 2006
- Developed management skills in the areas of goal setting, budget planning, meeting planning, volunteer recruitment, and communication
- Networked with other ACS executive board members from all over the nation

2005 **Process Oriented Guided Inquiry Learning (POGIL) Teaching Workshop**
Arizona State University, February 11, 2005
- Discussed recent developments in cognitive learning theory
- Engaged in chemistry active-learning exercises with peers from around the nation
- Introduced methods of instructor-centered collaborative learning classroom approaches in concert with recent advances in chemical education research

SERVICE & OUTREACH ACTIVITIES

2008-present **Faculty Administrator**
Supplemental Instruction (SI) Program, Arizona State University
- Worked with ASU faculty, staff, and administration to bring proven peer-led tutoring opportunity to first year general chemistry (CHM 101, 113) students
- Collaborated on administrative plans with program directors
- Mentored student SI leaders

2008 **Oral Presentation Judge**
2008 Symposium on Research in Interdisciplinary Science & Engineering (RISE), October 5, 2008
- Judged oral presentations of graduate student research in Chemistry

2007 **Chair**
American Chemical Society (ACS), Central Arizona Section
- Coordinated outreach programs, general and technical seminars, and collaborative efforts for over 840 ACS members in the Central Arizona region
- Planned local section meetings
- Donated hundreds of college textbooks to local schools
- Partnered with local industry to sponsor career shadowing events for local schools
- Designed and maintained the local section web site

2006 **Chair-Elect**
American Chemical Society, Central Arizona Section
- Shadowed activities of current local section officers for service in 2007
- Scheduled tour speakers for local engagements

2006-2007 **Faculty Administrator**
Teaching Teams Program, Arizona State University
- Integrated course-specific learning communities into CHM 101 and 113 curricula
- Provided a proven method to allow students to interact with one another, develop leadership skills, earn higher grades, enhance their resumes, and network with faculty

2005 **Grand Awards Judge, Analytical Chemistry Division**
Intel International Science & Engineering Fair (ISEF), Phoenix, AZ, May 8-14, 2005
- Interviewed students and reviewed independent research projects for scholarships and awards in excess of $3 million at the largest international science project competition in the world
- Participated in caucusing sessions and active debate among nearly 1,500 professionals from academia, business, government and industry
- Encouraged student research and fostered scientific investigation through one-on-one discussion with promising young scientists

2004-present **Honors Project Advising**
Arizona State University, Department of Chemistry
- Mentored undergraduate students in support of the Barrett Honors College at ASU
- Encouraged participation in peer learning groups for lower division chemistry courses

2002 **Undergraduate Research Symposium Judge**
San Diego State University
- Judged undergraduate research posters on content, style, and oral defense for cash awards

1999-2001 **Chemistry Lab Event Captain**
San Diego Regional Science Olympiad
- Created new written and experimental exams for student competition in the chemical sciences
- Judged laboratory and problem solving skills of almost 100 students for regional awards and advancement to competition at the state level
- Recruited and supervised volunteers for the development of additional chemistry events

1997-1998 **University Science Evaluator, Chemistry Support Specialist**
San Diego P.I.S.C.E.S. Project
- Evaluated new kit-based learning projects for use in K-12 student curriculum
- Provided email support in chemistry, physics, and general science to facilitate the incorporation of material into daily lessons by educators

RESEARCH EXPERIENCE

Spectroscopic Methods
- Nonlinear and linear laser spectroscopy in gas and liquid phase systems
- Multi-photon optical methods
- Doppler-free and sub-Doppler spectroscopic methods
- Isotope and hyperfine studies including simulation by optical coherence theory
- Trace detection of atomic analytes (including environmental pollutants) at parts-per-quadrillion (ppq) levels
- Atomic spectroscopic detection of metals and non-metals
- Off-resonance spectroscopy of atmospheric species
- Intercombination transition spectroscopy
- Optogalvanic spectroscopy
- Graphite furnace, inductively coupled plasma, and dc cathode discharge atomizers
- Nonlinear frequency conversion and doubling crystals
- Vacuum systems and low pressure cells
- Plasma density mapping
- Polarization methods
- Ultra-sensitive photon detection methods
- Stimulated Raman Scattering (SRS)
- Laser Induced Fluorescence (LIF)
- Microwave Stark Spectroscopy
- Fourier Transform Infrared (FTIR) spectroscopy

Lasers and Optoelectronics

- External cavity tunable diode lasers
- Solid-state lasers (including near-IR, red, and blue semiconductor diodes)
- Nd:YAG lasers
- Pulsed dye lasers
- Red and green He-Ne lasers
- Argon Ion lasers
- Lock-in amplifiers, boxcar averagers, and mechanical choppers
- Laser wavemeters
- Photodetectors, polarizers, beamsplitters, line filters, and laser optics
- Fast oscilloscopes and function generators
- High voltage power supplies
- Active and passive filters, operational amplifiers, logic gates, etc.

Additional Instrumentation

- IR, UV, visible, and fluorescence spectrometers
- HPLC/LC/GC separation systems
- NMR spectrometers
- Flow meters and gas handling equipment
- Calorimeters
- Capillary Electrophoresis
- Micro-array Chips
- Gas Diffusion Cells

Computer Experience

- Mac OS 10.5.x, Mac OS 9.x
- Windows (95, 98, Me, 2000, XP, Vista)
- Notebook DataLab, DADisp, SigmaPlot, MathCAD
- Adobe Illustrator, Adobe Photoshop, Corel Draw, Adobe Acrobat, MS Office (PowerPoint, Excel, Word, and Access), Apple Keynote
- HTML design, including Adobe GoLive, Macromedia Dreamweaver, Apple iWeb
- OASIS, Ad Astra
- VPN Securemote, Queensland, Hyperion, Peoplesoft
- Analog-to-digital (AD), digital-to-analog (DA) conversion and computer interfacing
- Multimedia presentation, editing, and conversion

AWARDS & HONORS

- College of Liberal Arts and Sciences (CLAS) Dean's Distinguished Teaching Award Winner (2006/2007)
- ASU Centennial Professorship Award Nominee (2008)
- College of Liberal Arts and Sciences (CLAS) Outstanding Instructor/Lecturer Award Nominee (2007/2008)
- College of Liberal Arts and Sciences (CLAS) Dean's Distinguished Teaching Award Nominee (2005/2006)
- Quality rating of 4.5/5.0 on RateMyProfessor.com
- Designated "Honors Disciplinary Faculty" for continued support of the Barrett Honors College (2006-present)
- "Favorite Teacher," College Affair Magazine (2006)
- "Most Outstanding Teaching Assistant," San Diego State University (1999)

GRANTS

- Bond-Robinson, Janet, Bauer II, Richard C, Briggs, Ron D , Huffman, Holly Ann , Marks, Pamela Sue. Increasing Access, Retention, and Excellence in General Chemistry at all ASU Campuses. AZ BOARD OF REGENTS (7/15/2007 - 6/30/2009). Award Total: $100,000 (plus additional funding from vendors).

AFFILIATIONS

- Past Chair, American Chemical Society Central Arizona Section
- Sigma Xi Scientific Research Society

PUBLICATIONS

1. Briggs, R. D. High Resolution Nonlinear Laser Wave-Mixing Spectroscopy for Gas-Phase Environmental and Atmospheric Studies; Doctoral Dissertation, San Diego State University and University of California, San Diego, 2004.
2. Briggs, R., Mickadeit, F., and Tong, W. G., "Parts-Per-Quadrillion Level Detection of Cesium Using Graphite Furnace-Coupled Laser Wave Mixing Spectroscopy" (In Preparation).
3. Briggs, R., Lyons, W., and Tong, W. G., "Nonresonant Excitation and Detection of Atomic Oxygen Using Laser Wave-Mixing in a DC Hollow-Cathode Discharge Atomizer" (In Preparation)
4. Briggs, R., and Tong, W. G., "High-Resolution Absorption-Based Detection of Strontium Using Sub-Doppler Laser Wave-Mixing Spectroscopy" (In Preparation).
5. Briggs R, Schafer J, Lyons W, Tong W. G. "Sub-Doppler High-Resolution Wave-Mixing Detection Method for Isotopes in Environmental Applications", Proc. SPIE-Intl. Soc. Opt. Eng., Advanced Environmental, Chemical and Biological Sensing Technologies II, Vol. 5586, pp. 54-59, 2004.
6. Lyons, W., Gregerson, J., Schafer, J. Briggs, R. D., and Tong, W. G., "Nonlinear Wave-Mixing Spectroscopy for Sub-Doppler Isotope Analysis with Trace-Level Detection Sensitivity," Proc. SPIE-Photonics North 2005, Vol. 5971, 2005.
7. Recitation and Laboratory Activities for General Chemistry (preparing/compiling for publication in lab and recitation manuals).
8. Briggs, R. "New Classroom on the Way: General Chemistry is Bringing the THUNDER!", ASU Department of Chemistry & Biochemistry Newsletter, Summer, 2008.
9. Briggs, R. "From Cookbook to Discovery - Advancements in Chemical Education at ASU", ASU Department of Chemistry & Biochemistry Newsletter, Fall, 2008.

PRESENTATIONS

1. W. Lyons, M. Gregerson, J. Schafer, R. D. Briggs, and W. G. Tong, "Nonlinear Wave-Mixing Spectroscopy for Sub-Doppler Isotope Analysis With Trace-Level Detection Sensitivity," SPIE Regional Photonics North 2005, Toronto, Canada, September 12-14, 2005.
2. R. D. Briggs, J. Schafer, W. Lyons, and W. G. Tong, "Sub-Doppler High-Resolution Wave-Mixing Detection Method for Isotopes in Environmental Applications," SPIE International Symposium on Optics East--Advanced Environmental, Chemical, and Biological Sensing Techniques, Philadelphia, PA, October 25-28, 2004.
3. W. Lyons, R.D. Briggs, and J. Schafer, "Environmental and Atmospheric Applications of Sensitive Nonlinear Wave-Mixing Spectroscopy," 2003 American Chemical Society Western Regional Meeting, Long Beach, CA, October 15-18, 2003.
4. J. Schafer, R. D. Briggs, W. Lyons, and W. G. Tong, "Nonlinear Multi-Photon Spectroscopy for Trace-Concentration Isotope Detection and Hyperfine Analysis," 2003 American Chemical Society Western Regional Meeting, Long Beach, CA, October 15-18, 2003.
5. R. D. Briggs, W. Lyons, J. Schafer, and W. G. Tong, High-Resolution Hyperfine Structure Measurements by Diode Laser-Based Wave Mixing," 226th American Chemical Society National Meeting, New York, NY, September 7-11, 2003.
6. J. Schafer, R. D. Briggs, W. Lyons, and W. G. Tong, "Laser Wave-Mixing Spectroscopy as a Tool for Mapping High-Temperature Plasma Atomizers," 226th American Chemical Society National Meeting, New York, NY, September 7-11, 2003.
7. W. Lyons, R. D. Briggs, J. Shafer, and W. G. Tong, "Nonlinear Laser Spectroscopy for Sensitive High-Resolution Detection of Environmental Isotopes," 226th American Chemical Society National Meeting, New York, NY, September 7-11, 2003.
8. W. Lyons, R. D. Briggs, and W. G. Tong, "High-Resolution Laser Wave Mixing Spectroscopy For Environmental and Atmospheric Analysis," 8th Annual Maria Goeppert-Mayer Interdisciplinary Symposium, San Diego, CA, March 1, 2003.
9. R. D. Briggs, and W. G. Tong, "Analytical, Geological, and Environmental Applications of Degenerate Four-Wave Mixing Spectroscopy," NASA Jet Propulsion Laboratory, Pasadena, CA, September 25, 2002 (Invited Talk).
10. W. Lyons, R. D. Briggs, and W. G. Tong, "Sensitive High-Resolution Detection Of Isotopes Using Multi-Photon Nonlinear Laser Spectroscopy," 224th American Chemical Society National Meeting, Boston, MA, August 18-22, 2002.
11. R. D. Briggs, W. Lyons, and W. G. Tong, "Compact Diode Laser-Based Wave-Mixing Spectroscopy for High-Resolution Gas-Phase Hyperfine Applications," 224th American Chemical Society National Meeting, Boston, MA, August 18-22, 2002.
12. R. D. Briggs, M. Lopez, and W. G. Tong, "Using Lasers in Chemical Research," Minority Biomedical Research Symposium, San Diego, CA, March 22, 2002.
13. H. K. Kemp, J. Schafer, R. D. Briggs, W. Lyons, and W. G. Tong, "Multi-Photon Nonlinear Spectroscopy as a Sensitive Optical Probe for Gas-Phase Population Mapping," Euro-Mediterranean Laser Induced Breakdown Spectroscopy Conference 2001 (EMLIBS), Cairo, Egypt, November 2001.

14. R. D. Briggs, H. K. Kemp, W. Lyons, and W. G. Tong, “Environmental Analysis and Elemental Trace Detection by Laser Wave-Mixing Spectroscopy,” Euro-Mediterranean Laser Induced Breakdown Spectroscopy Conference 2001 (EMLIBS), Cairo, Egypt, November 2001.
15. W. Lyons, H. K. Kemp, R. D. Briggs, and W. G. Tong, “Compact Diode Laser-Based Nonlinear Spectroscopic Methods for Environmental and Atmospheric Applications,” 37th American Chemical Society Western Regional Meeting, Santa Barbara, CA, October 28-31, 2001.
16. W. Lyons, H. K. Kemp, R. D. Briggs, and W. G. Tong, “Sub-Doppler Laser Spectroscopic Methods for Trace Analysis of Metals,” 37th American Chemical Society Western Regional Meeting, Santa Barbara, CA, October 28-31, 2001.
17. R. D. Briggs, H. K. Kemp, and W. G. Tong, “Diode Laser-Based Nonlinear Laser Wave-Mixing Probes for Environmental Applications,” 221st American Chemical Society National Meeting, San Diego, CA, April 1- 5, 2001.
18. H. K. Kemp, R. D. Briggs, and W. G. Tong, “Sensitive Sub-Doppler Nonlinear Spectroscopic Method for Simplified Isotope-Ratio Measurements,” 221st American Chemical Society National Meeting, San Diego, CA, April 1- 5, 2001.
19. J. Schafer, R. D. Briggs, and W. G. Tong, “Sensitive Detection of Stable Isotopes In Geochemistry Using Multi-Photon Laser Wave-Mixing Spectroscopy,” 221st American Chemical Society National Meeting, San Diego, CA, April 1- 5, 2001.
20. R. D. Briggs, F. Mickadeit, H. K. Kemp, and W. G. Tong, "Doppler-Free High-Resolution Laser Wave-Mixing Spectroscopy for Environmental Analyses," III International Symposium on Chemical Research in the Border Region, Tijuana, Mexico, November 16, 2000.
21. J. Knittle, H. K. Kemp, and R. D. Briggs, "Sub-Doppler Laser Wave-Mixing Spectroscopy for Environmental and Geological Applications," 36th American Chemical Society Western Regional Conference, San Francisco, CA, October 25, 2000.
22. H. K. Kemp, R. D. Briggs, F. Mickadeit, W. Lyons, and W. G. Tong, “Sub-Doppler Laser Wave-Mixing Spectroscopy for Environmental and Geological Applications,” 2000 Pacific Conference on Chemistry and Spectroscopy, American Chemical Society for Applied Spectroscopy, San Francisco, CA, October 29-31, 2000.
23. J. Schafer, W. G. Tong, F. Mickadeit, H. K. Kemp, and R. D. Briggs, “High-Resolution, Sub-Doppler, Multiphoton, Wave-Mixing Spectroscopy for Isotope Analysis,” 219th American Chemical Society National Meeting, San Francisco, CA, March 26, 2000.
24. H. K. Kemp, R. D. Briggs, and W. G. Tong, "Sensitive Gas Phase Sub-Doppler Laser Wave-Mixing Spectroscopy," 1999 National Minority Research Symposium, Phoenix, AZ, November 10-13, 1999.
25. R. D. Briggs, and W. G. Tong, "High-Resolution Sub-Doppler Wave-Mixing Laser Spectroscopy for Isotope and Hyperfine Structure Analyses," 1999 Pacific Conference on Chemistry and Spectroscopy, American Chemical Society Applied Spectroscopy, Ontario, CA, October 6-8, 1999.

PUBLICATION REVIEWS

1. Halpern, A., McBane, G., “Experimental Physical Chemistry, 3rd Ed.,” W.H. Freeman & Co., 2006.
2. Burge, J, “General Chemistry, 1st Ed.,” McGraw Hill, 2008.
3. CATALYST Online Homework/Learning System, John Wiley & Sons, 2008.
4. General Chemistry Text (in preparation), Cengage, 2009.

REFERENCES

Professional references available on request