

Willis B. Jones

Assistant Professor

Department of Chemistry and Biochemistry, University of North Florida

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Education:

Ph.D. in Analytical Chemistry, University of Florida (May 2019)

Dissertation: “Laser-induced breakdown spectroscopy of solid samples: critical considerations, characterization, and experimental evaluation of signals and associated noises”

B.S. in Chemistry with Honors, Wake Forest University, *magna cum laude* (May 2014)

Honors Thesis: “Gradient Flow Analysis”

Professional Experience:

Assistant Professor of Chemistry – University of North Florida, (Aug 2022 – present)

Postdoctoral Research Scientist – Wake Forest University, (Apr – Jul 2022, Jun – Nov 2019)

Advisors – Prof. Brad Jones and Dr. George Donati

Postdoctoral Research Scientist – Savannah River National Laboratory, (Dec 2019 – Mar 2022)

Advisor – Dr. Alicia Fessler

Graduate Teaching/Research Assistant – University of Florida (Aug 2014 – May 2019)

Advisors – Prof. Nico Omenetto and Dr. Ben Smith

Undergraduate Research Assistant – Wake Forest University (Jun 2010 – July 2014)

Advisors – Prof. Brad Jones and Dr. George Donati

Research Group:

Research in the Jones Lab is focused on the development of novel calibration strategies that improve the sample throughput and efficiency of analyses, without sacrificing analytical accuracy, precision, or sensitivity. These calibration techniques are largely focused on the detection of trace metals in a wide variety of sample types. Analytical instrumentation currently available in the lab at UNF includes an Agilent 5900 Inductively Coupled Plasma Optical Emission Spectrometer (ICP-OES). Dr. Jones has research experience with a wide variety of workhorse analytical spectroscopic techniques, including ICP-OES, inductively coupled plasma mass spectrometry (ICP-MS), flame atomic emission spectrometry (FAES), laser-induced breakdown spectroscopy (LIBS), laser-induced fluorescence (LIF), tungsten coil atomic emission spectrometry (WC-AES), Raman spectroscopy, and time-of-flight mass spectrometry (TOF-MS).

Undergraduates Mentored in Research at UNF:

David Hoyt, Spring 2025 – present

Micah DeCoursey, Spring 2025 – present

Laryssa Sadsarin, Spring 2025 – present

Long Nguyen, Spring 2025 – present

Abby Crossman, Spring 2024 – present

Robbie Huff, Summer 2023 – present

Taylor Dessoify, Summer 2023 – present

Cadi Swaim, Fall 2024

Sophie Lewis, Fall 2023 – Fall 2024

Adam Richardson, Summer 2023 – Spring 2024

Alexandria Eddy, Summer 2023 – Spring 2024

Publications From UNF Research Group:

Corresponding author denoted with *, UNF undergraduates denoted with ^

Peer Reviewed:

1. Elia, R.^; Johnston, T.J.^; Figueroa, A.D.^; Curbow, E.M.^; Gonzalez Guzman, M.S.^; Rodriguez Cabrera, L.C.^; Morcom, M.M.^; **Jones, W.B.*** "Multi-wavelength internal standardization using inductively coupled plasma optical emission spectrometry," *Anal. Chim. Acta*, 2025, 1370, 344386. <https://doi.org/10.1016/j.aca.2025.344386>
2. Helli, H.; Fontoura, B.M.; **Jones, W.B.**; Jones, B.T.* "Analysis of milk samples using calibration by proxy directly in the digestion vessel," *Talanta*, 2026, **296**, 128506. <https://doi.org/10.1016/j.talanta.2025.128506>
3. Huff, R.M.^; **Jones, W.B.***; Jones, B.T. "Multi-channel dilution analysis using a single peristaltic pump tube," *Appl. Spectrosc.*, 2025. <https://doi.org/10.1177/00037028251315753>
4. Crossman, A.J.^; **Jones, W.B.***; Jones, B.T. "Multi-channel dilution analysis using a microwave-induced plasma," *Anal. Lett.*, 2025. <https://doi.org/10.1080/00032719.2024.2446727>
5. **Jones, W.B.***; Jones, B.T. "Rapid multi-channel dilution analysis for simultaneous measurements," *Microchem. J.*, 2025, **208**, 112423. <https://doi.org/10.1016/j.microc.2024.112423>
6. **Jones, W.B.***; Huff, R.M.^; Richardson, A.L.^; Dessoffy, T.^; Lewis, S.M.^; Eddy, A.^; Crossman, A.J.^; Jones, B.T. "Multi-channel dilution analysis," *J. Anal. At. Spectrom.*, 2024, **39**, 2220-2229. <https://doi.org/10.1039/D4JA00112E>
7. **Jones, W.B.***; Crossman, A.J.^; Jones, B.T. "Calibration by Proxy," *Anal. Chem.*, 2024, **96(29)**, 11906-11914. <https://doi.org/10.1021/acs.analchem.4c01614>

Publications Pre-UNF:

Peer Reviewed:

1. **Jones, W.B.**; Darvin, J.R.; O'Rourke, P.E.; Fessler, K.A.S. "Isotopic signatures of lithium carbonate and lithium hydroxide monohydrate measured using Raman spectroscopy," *Appl. Spectrosc.*, 2023, **77(2)**, 151-159. <https://doi.org/10.1177/00037028221131039>
2. McNamara, L.; Waldron, A.; Thomas, M.; **Jones, W.**; O'Rourke, P.; Simmons, D.; Fessler, K.A.S. "Investigating the hydrolysis of cryogenically layered molybdenum hexafluoride through a disordered hydrogen-bonded network," *Phys. Chem. Chem. Phys.*, 2023, **25(4)**, 2990-2998. <https://doi.org/10.1039/D2CP04147B>
3. Green, M.; Kaydanik, K.; Orozco, M.; Hanna, L.; Marple, M.A.T.; Fessler, K.A.S.; **Jones, W.B.**; Stavila, V.; Ward, P.A.; Teprovich, Jr., J.A. "Closo-borate gel polymer electrolyte with remarkable electrochemical stability and a wide operating temperature window," *Adv. Sci.*, 2022, **9**, 2106032. <https://doi.org/10.1002/advs.202106032>
4. **Jones, W.B.**; Jones, A.M.; Sutton, A.M.; Donati, G.L.; Calloway Jr., C.P.; Jones, B.T. "Standard dilution analysis: an introduction to accurate and precise quantitative analysis with no tedious solution preparation," *Chem. Educator*, 2020, **25**, 98-102. DOI: 10.1333/s00897202902a
5. **Jones, W.B.**; Donati, G.L.; Calloway Jr., C.P.; Jones, B.T. "Automated standard dilution analysis," *J. Anal. At. Spectrom.*, 2020, **35**, 178-187. <https://doi.org/10.1039/C9JA00339H>
6. **Jones, W.B.**; Calloway Jr., C.P.; Jones, B.T. "Internal standard analysis of marshmallow peeps," *Chem. Educator.*, 2019, **24**, 188-190. DOI: 10.1333/s00897192885a
7. Fu, Y.; Warren, R.A.; **Jones, W.B.**; Smith, B.W.; Omenetto, N. "Detecting temporal changes of self-absorption in a laser-induced copper plasma from time-resolved photomultiplier signal emission profiles," *Appl. Spectrosc.*, 2018, **73**, 163-170. <https://doi.org/10.1177/0003702818812087>
8. **Jones, W.B.**; Donati, G.L.; Calloway Jr., C.P.; Jones, B.T. "Standard dilution analysis," *Anal. Chem.*, 2015, **87**, 2321-2327. <https://doi.org/10.1021/ac504152x>

Non-peer Reviewed:

1. **Jones, W.**; Groden, N.; McNamara, L.; Achey, R.; Fessler, A.; Wellons, M. "An Analytical Assessment of the JEOL InfiToF as an Advanced Option for High Resolution Mass Spectroscopy and TIDS Applications." Technical Report. SRNL: **2021**.
2. **Jones, W.B.** "Laser-induced breakdown spectroscopy of solid samples: critical considerations, characterization, and experimental evaluation of signals and associated noises." Ph. D. in Chemistry Dissertation. Gainesville, Florida, USA: University of Florida. **2019**.
3. Omenetto, N.; Ewusi-Annan, E.; Günther, T.; **Jones, W.B.**; Smith, B.W. "Feasibility of atomic and molecular laser induced breakdown spectroscopy (LIBS) to in situ determination of chlorine in concrete." FDOT Report #BVD31-977-32, 00119410, Florida Department of Transportation. **2016**.

Presentations From UNF Research Group:

Presenting author denoted with *, UNF undergraduates denoted with ^

1. Huff, R.*^; **Jones, W.B.** Standard dilution analysis using laser induced breakdown spectroscopy (poster), *UNF ARISE 2025*.
2. Crossman, A.J.*^; **Jones, W.B.**; Jones, B.T. Calibration by analyte proxies (poster), *UNF ARISE 2025*.
3. DeCoursey, M.X.*^; Crossman, A.J.*; **Jones, W.B.** Multi-isotope internal standardization (poster), *UNF ARISE 2025*.
4. Crossman, A.J.*^; Sadsarin, L.^, **Jones, W.B.** Standard in the rinse (poster), *FURC 2025*.
5. Crossman, A.J.*^; **Jones, W.B.** Standard in the rinse (poster), *UNF UGLIDE 2024*.
6. Huff, R.*^; **Jones, W.B.** Lowering instrumental limits of detection using multi-channel dilution analysis (poster), *UNF UGLIDE 2024*.
7. Lewis, S.*^; **Jones, W.B.** Calibration by proxy: methodology and volume correction (poster), *UNF Natural Sciences Symposium 2024*.
8. Huff, R.*^; **Jones, W.B.** Multi-channel dilution analysis using a single peristaltic pump channel (oral), *UNF Natural Sciences Symposium 2024*.
9. **Jones, W.B.***; Crossman, A.J.^; Jones, B.T. Calibration by proxy (invited oral presentation), *SciX 2024*.
10. **Jones, W.B.*** Novel matrix-matched calibration techniques (invited departmental seminar), *Wake Forest University 2024*.
11. Dessoff, T.*^; Huff, R.^; Richardson, A.^; Lewis, S.^; Crossman, A.J.^; Eddy, A.^; **Jones, W.B.**; Jones, B.T. Multi-channel dilution analysis (poster), *SciX 2024*.
12. Huff, R.*^; **Jones, W.B.**; Jones, B.T. Multi-channel dilution analysis using a single peristaltic pump channel (poster), *SciX 2024*.
13. Helli, H.*; Fontoura, B.M.; **Jones, W.B.**; Jones, B.T. Analysis of infant formula using calibration by proxy (poster), *SciX 2024*.
14. Judd, N.B.*; **Jones, W.B.**; Jones, B.T. Standards in the rinse (poster), *SciX 2024*.
15. Read, A.F.*; **Jones, W.B.**; Jones, B.T. Peri-pump analysis: an automated calibration method for inductively coupled plasma optical emission spectroscopy (poster), *SciX 2024*.
16. Crossman, A.*^; **Jones, W.B.**; Jones, B.T. Multi-channel dilution analysis using microwave induced plasma optical emission spectrometry (poster), *UNF ARISE 2024*.
17. Lewis, S.*^; **Jones, W.B.** Multi-channel dilution analysis: optimization of tubing manifold and matrix effect correction (poster), *UNF SOARS 2024*.
18. Crossman, A.*^; **Jones, W.B.** Multi ratio calibration (poster), *FURC 2024*.
19. Huff, R.*^; **Jones, W.B.** Multi-channel dilution analysis using a single pump channel (poster), *FURC 2024*.
20. Dessoff, T.*^; **Jones, W.B.** Validation of the multi-channel dilution analysis method using different sample matrices and real-world samples (poster), *FURC 2024*.

21. Richardson, A.[^]; Lewis, S.^{*^}; **Jones, W.B.** Multi-channel dilution analysis: optimization of tubing manifolds and calculation approaches (poster), *FURC 2024*.
22. Richardson, A.^{*^}; Huff, R.^{*^}; Dessoify, T.[^]; Eddy, A.[^]; Lewis, S.[^]; **Jones, W.B.**; Jones, B.T. Multi-channel dilution analysis (poster), *UNF Natural Sciences Poster Session 2023*.

Presentations Pre-UNF:

Presenting author denoted with *

1. **Jones, W.B.***; Darwin, J.R.; Fessler, K.A.S. Li Isotope Signatures Using Optical Spectroscopies (poster), *SciX 2021*.
2. **Jones, W.B.*** Some recent developments in analytical spectroscopy (community engagement presentation), *Science on Tap, SRNL, October 2020*.
3. **Jones, W.B.***; Smith, B.W.; Omenetto, N. Investigation into spectral fluctuations in laser-induced breakdown spectroscopy: some recent considerations and experimental results (oral), *Pittcon 2019*.
4. Fu, Y.*; Warren, R.A.; **Jones, W.B.**; Smith, B.W.; Omenetto, N. Investigation of Self-Absorption Temporal Behavior with a Photomultiplier-Spectrometer Combination (poster), *SciX 2016*.
5. **Jones, W.B.***; Ewusi-Annan, E.; Günther, T.; Smith, B.W.; Omenetto, N. Detection of Chlorine in Concrete Using Laser Ablation and CaCl Emission in Ambient Air and He Environments (poster), *SciX 2016*.
6. Günther, T.*; **Jones, W.B.**; Smith, B.W.; Omenetto, N. Quantitative Detection of Chlorine in Concrete by LIBS: Analytical Comparison of Different Emission and Photon Detection Approaches (poster), *LIBS 2016*.
7. **Jones, W.B.***; Ewusi-Annan, E.; Günther, T.; Smith, B.W.; Omenetto, N. Atomic and Molecular Laser Induced Breakdown Spectroscopy for Detection of Chlorine in Concrete (poster), *Pittcon 2016*.
8. **Jones, W.B.***; Donati, G.L.; Calloway Jr., C.P.; Jones, B.T. Inductively Coupled Plasma Gradient Flow Analysis (poster), *SciX 2013*.

Funding Acquired as a UNF Faculty Member:

External to UNF

1. Applied Spectra LIBS instrument donation, \$130,000. Mar 2025.
2. USFDA microwave assisted digestion system donation, \$73,000. Mar 2025.
3. Wake Forest University Collaborative Pilot Grant (CPG), "Multi-channel dilution analysis," \$20,000. Aug 2023 – Dec 2024.

Internal to UNF

1. Institute of Environmental Research and Education (IERE) Seed Grant, "Improving contaminant limits of detection using multi-channel dilution analysis," \$10,000. Jan 2025 – Dec 2025.
2. High Impact Practice Grant (HIPS), "Enabling one-on-one mentorship for cutting edge research in analytical chemistry," \$10,200. Jan 2025 – Jun 2025.
3. Undergraduate Research Scholarship and Creative Activities (U-RSCA) Grant, "Improving Instrumental Limits of Detection Using Multi-Channel Dilution Analysis," \$2,000. Fall 2024.
4. Undergraduate Research Scholarship and Creative Activities (U-RSCA) Grant, "Multi-Channel Dilution Analysis," \$2,000. Summer 2024.
5. Academic Technology Grant, "Technologies for Chemical Research," \$1,000. 2023.

Awards:

1. Society for Applied Spectroscopy Early Career Interest Group Travel Award. 2025.

2. Federation of Analytical Chemistry and Spectroscopy Societies (FACSS) Innovation Award. Finalist, 2024.
3. UNF STARS Award of Excellence. 2024.

Teaching Experience at UNF:

Approximately 4 lecture or laboratory courses annually. Courses taught to date are summarized below.

Course Name	UNF Course Number (credit hours)	Enrollment per Section	Times Instructed
General Chemistry II	CHM 2046 (3)	~100	5
Quantitative Analytical Chemistry	CHM 3120 (3)	~40	5
Quantitative Analytical Chemistry Laboratory	CHM 3120L (1)	~15	3
Modern Analytical Chemistry Laboratory	CHM 4130L (1)	~12	2
Spectrochemical Analysis	CHM 4991C (3)	~10	1
Chemical Research	CHM 4910 (1-4)	~3	5
Chemical Research Experience	CHM 4911 (0)	~3	5

Academic Service at UNF:

UNF Department of Chemistry and Biochemistry Compliance Committee, 2023 – present

UNF Department of Chemistry and Biochemistry Search Committee, 2024

UNF Department of Chemistry and Biochemistry Chemistry Success Advisory Board, 2022 – present

UNF Department of Chemistry and Biochemistry Curriculum Committee, 2022-2023

UNF Department of Chemistry and Biochemistry Assessment Committee, 2022-2023

Other Service:

Recommendation Letter Writer, 2022 – present

Peer Reviewer for *Talanta*, *Journal of Analytical Atomic Spectrometry*, *Analytical Letters*, *Scientific Reports*, and *Heliyon*, 2024 – present

UNF Student Conduct Board Panel Member, 2023 – present

UNF Student Conduct Board Forgiveness Review Member, 2023 – present

UNF Natural Sciences Poster Session Chemistry and Biochemistry Liaison, 2023

UNF Natural Sciences Poster Session Judge, 2022

Professional Societies:

Society for Applied Spectroscopy, 2014 – present