Eleanor Castracane, Ph.D.

Physical and Environmental Chemistry

National Research Council Postdoctoral Associate
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Adjunct Professor, Cerro Coso Community College
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EDUCATION

2024 Ph.D. Physical Chemistry, UC San Diego, La Jolla, CA
Thesis: "Photodissociation and Dissociative Photodetachment Dynamics of Carboxylate Anions"
Advisor: Prof. Robert E. Continetti

2017 M.S. Chemistry, Stony Brook University, Stony Brook, NY
Thesis: "Spectroscopic and Mass Spectrometric Studies of Atmospherically Relevant Clusters"
Advisor: Prof. Christopher J. Johnson

2016 B.S. Chemistry, Stony Brook University, Stony Brook, NY
Thesis: "Development of a FRET-Based Continuous Glucose Sensor"
Advisor: Prof. Dale G. Drueckhammer

RESEARCH EXPERIENCE

2024 – Present National Research Council Postdoctoral Associate, Naval Air Warfare Center Weapons Division
- Evaluate boron nitride nanomaterial processing *via* scanning electron microscopy and Raman spectroscopy
- Investigate nanomaterial photocatalytic effects on PFAS degradation using mass spectrometry
- Determine PFAS-nanomaterial interactions using X-ray photoelectron spectroscopy and density functional theory calculations on a high performance computing cluster

2018 – 2024 Graduate Student Researcher, UC San Diego
- Designed, simulated, and implemented modifications to a home-built mass spectrometer, including cryogenic systems
- Operated, maintained, and repaired mass spectrometer and multiple laser systems
- Investigated energetic partitioning between electron photodetachment and molecular fragmentation in atmospherically relevant reactive species

2016 – 2017 Graduate Student Researcher, Stony Brook University
- Developed methodology for aerosol cluster formation in a closed-atmosphere electrospray ionization environment
- Designed and implemented modifications to a Thermo LTQ mass spectrometer for *in situ* hydrogen/deuterium exchange

2014 – 2016 Undergraduate Student Researcher, Stony Brook University
- Synthesized precursor compounds for a continuous glucose monitoring molecule
- Analyzed synthesized compounds using nuclear magnetic resonance spectroscopy

RESEARCH PUBLICATIONS

8. Estevez, J.E.; Davis, C.R.; Gaitonde, A.; Schaeffer, M.; Yelton, C.G.; Razgaleh, S.A.; Miles, J.; **Castracane. E.**; Marconnet, A. "Electospun boron nitride nanotube fabrics: tunable thermal conductivity through controlled nanotube orientation." *Submitted - Advanced Materials.*
7. **Castracane, E**; Molnar, B.T.; Lambert, A.; Harvey, B.G.; Estevez, J.E.; Fedick, P.W. "Improved Boron Nitride Nanomaterial Morphologies for the Enhanced Photocatalytic Remediation of Perfluorooctanoic Acid. *Submitted – Environmental Science Advances.*

6. Gibbard, J.A.; **Castracane, E.**; Krylov, A.I.; Continetti, R.E. "Photoelectron photofragment coincidence spectroscopy of aromatic carboxylates: benzoate and p-coumarate." *Phys. Chem. Chem. Phys*., **2021**, *34* (23), 18414. DOI: 10.1039/D1CP02972J
5. Gibbard, J.A.; **Castracane, E.**; Continetti, R.E. "Photoelectron–photofragment coincidence spectroscopy of the mixed trihalides." *J. Chem. Phys.,* **2020**, 153 (5), 054304. DOI: 10.1063/5.0014253
4. Gibbard, J.A.; **Castracane, E.**; Shin, J.A.; Continetti, R.E. "Dissociative photodetachment dynamics of the oxalate monoan- ion." *Phys. Chem. Chem. Phys.*, **2020**, 22 (3), 1427-1436. DOI: 10.1039/C9CP05338G
3. Waller, S.E.; Yang, Y.; **Castracane, E.;** Kreinbihl, J.K.; Nickson, K.; Johnson, C.J. "Electrospray Ioniztion-Based Synthesis and Validation of Amine-Sulfuric Acid Clusters of Relevance to Atmospheric New Particle Formation." *J. Am. Soc. Mass Spectrom*., **2019**, *30* (11), 2267-2277. DOI: 10.1007/s13361-019-02322-3
2. Gibbard, J.A.; Shin, A.J.; **Castracane, E.**; Continetti, R.E. "A high beam energy photoelectron-photofragment coincidence spectrometer for complex ions." *Rev. Sci. Instrum*., **2018,** *89* (12), 123304. DOI: 10.1063/1.5074112
1. Waller, S.E.; Yang, Y.; **Castracane, E.**; Racow, E.; Kreinbihl, J.; Nickson, K.; Johnson, C.J. "The Interplay Between Hydrogen Bonding and Coulombic Forces in Determining the Structure of Sulfuric Acid-Amine Clusters." *J. Phys. Chem. Lett.,* **2018**, *9* (6), 1216–1222. DOI: 10.1021/acs.jpclett.8b00161

OTHER PUBLICATIONS

1. **Castracane, E.**; "Breaking up with Pretty Bad." C&EN, **2018**, 96 (36), [Online only].

ORAL PRESENTATIONS

3. **Castracane, E.**; Hanold, K.A; Continetti, R.E. "Two- and three-body dissociative photodetachment dynamics of α-keto acid anions." *266th American Chemical Society National Meeting,* San Francisco, CA, August 2023.
2. **Castracane, E.**; Gibbard, J.A.; Continetti, R.E. "Photoelectron-photofragment coincidence spectroscopy." *UC San Diego Department of Chemistry and Biochemistry Student Research Seminar*. San Diego, CA, February 2019. *(Invited talk)*
1. **Castracane, E**.; Racow, E.; Yang, Y.; Waller, S.E.; Kreinbihl, J.; Johnson, C.J. "Amine substitution studies of atmospherically relevant anionic clusters." *254th American Chemical Society National Meeting*, Washington, DC, August 2017.

POSTER PRESENTATIONS

7. **Castracane, E.**; Gibbard, J.A.; Continetti, R.E. "Dissociation dynamics of aromatic carboxylic acid anions." *Pacifichem 2021*. Online. December 2021.
6. **Castracane, E.**; Gibbard, J.A.; Continetti, R.E. "Towards the dissociation dynamics of multiply charged ions." *258th American Chemical Society National Meeting.* San Diego, CA. August 2019.
5. **Castracane, E.**; Racow, E.; Waller, S.E.; Yang, Y.; Kreinbihl, J.; Johnson, C.J. "Infrared Studies of Binary Proton-bound Complexes: Quantum Delocalization and Temperature Determination." *Chemistry Research Day*. Stony Brook, NY. November 2016.
4. **Castracane, E.**; Gao, S.Q.; Drueckhammer, D.G. "Development of a FRET-Based Continuous Glucose Sensor." *Undergraduate Research and Creative Activities Symposium*, Stony Brook, NY, April 2016.
3. **Castracane, E.**; Marcella, N.; Corrao, A.; Daly, K.; Aubrecht, K.B. "Promoting Science Literacy and Communication." *Stony Brook University Admitted Students Day – Chemistry Department Tours.* Stony Brook, NY. April 2016.
2. **Castracane, E.**; Gao, S.Q.; Drueckhammer, D.G. "Development of a FRET-Based Continuous Glucose Sensor." *Stony Brook University Admitted Students Day*. Stony Brook, NY. April 2016.
1. **Castracane, E.;** Marcella, N.; Corrao, A.; Daly, K.; Aubrecht, K.B. "Promoting Science Literacy and Communication." *251st American Chemical Society National Meeting.* San Diego, CA. March 2016.

AWARDS AND HONORS

2024	Alumni Spotlight, UC San Diego	
2023	Empowerment Award, Females in Mass Spectrometry (FeMS)	$300
	Travel Award, UC San Diego - Department of Chemistry & Biochemistry	$500
2019	Graduate Student Spotlight, UC San Diego	
2016	Commencement Speaker, Stony Brook University - Department of Chemistry	
	Roy W. Sonntag Award, Gamma Sigma Epsilon Chemistry Honor Society	$200
	Outstanding Service Award, Stony Brook University - Department of Chemistry	
2012-2016	Presidential Scholarship, Stony Brook University	$10,000

OUTREACH

NAWCWD:	ACS Chemistry Olympiad Coordinator - Mojave Section (2025)
	Burroughs High School STEM Outreach Day, Volunteer (2024)
UC San Diego:	Chemistry Graduate Student Mental Health Support Group, Organizer (2019-2020)
	Expanding Your Horizons, Volunteer (2019)
	Chemistry Graduate Student Research Seminar, Organizer (2019)
	Comienza con un Sueño, Volunteer (2018, 2019)
Stony Brook University:	Department of Chemistry Undergraduate Poster Session, Organizer (2015, 2016)
	American Chemical Society Student Chapter, Treasurer (2014-2016)
	Gamma Sigma Epsilon - Kappa Pi Chapter, President & Charter Member (2014-2016)

TEACHING EXPERIENCE

Cerro Coso Community College:	General Chemistry I, Lecture and Laboratory (1 semester)
UC San Diego:	General Chemistry Laboratory (3 quarters)
	Analytical Chemistry Laboratory (3 quarters)
	Instrumental Analysis Laboratory (1 quarter)
Stony Brook University:	General Chemistry I, II (3 semesters)
	Organic Chemistry I (1 semester)
	Inorganic Chemistry I (2 semesters)
	Freshman Seminar: Ethics in Science (1 semester)

PROFESSIONAL DEVELOPMENT

American Sign Language, five quarters of college-level ASL.
Introduction to College Teaching, a ten-week long pedagogy course related to teaching at the college level.
CommSciCon, a science communication workshop for graduate students.

PROFESSIONAL MEMBERSHIPS

American Chemical Society
American Society of Mass Spectrometry
Females in Mass Spectrometry
Society of Women Engineers