

## RESUME

**Stéphanie A. Cretté**

## PERSONAL DATA

**Director Warren Lasch Conservation Center  
Clemson University Restoration Institute  
Research Assistant Professor – CU - MS&E  
1250 Supply Street  
North Charleston, SC 29405  
(843)-730-5093  
[scrette@clemson.edu](mailto:scrette@clemson.edu)**

DOB: 10/10/1970, Vitry-sur-seine, France.  
Permanent Resident

## EDUCATION

**2001 PhD** in Polymer/Organic Chemistry - **University of North Carolina at Chapel Hill-USA**

**1995 D.E.A.** (Master equivalent) in Inorganic Chemistry, Polymers and Catalysis – **Université Montpellier II - Sciences et Techniques - Montpellier, France**

**1994 DEUG B** (BS equivalent) in Molecular Chemistry - **Université Montpellier II -Sciences et Techniques - Montpellier, France**

## PROFESSIONAL POSITION

Sept 2012 - present **Director of the Warren Lasch Conservation Center (WLCC) - Research Scientist - Clemson University** (CURI, N. Charleston, SC) – **Research Assistant Professor (MS&E)**

Additional responsibilities to below include:

- Manage, direct the WLCC operational budget (1.2M) and daily operation of the Center.
- Supervise a team of 12-14 conservators, archaeologists, research scientists, interns, and volunteers.
- Coordinate activities and lead updates and collaborations related to the Hunley Project, with the Friends of the Hunley, the SC Hunley Commission, and the Naval Historic Branch.
- Prioritize WLCC projects, set agendas, and assign workload while maintaining quality and timeliness of work.
- Coordinate and maintain research activities, laboratory capabilities and services.
- Staffing planning, hiring, counseling and development.

Mar 2008 – Sept 2012 **Research Scientist/Lecturer at the WLCC - Clemson University** (School of Material Science & Engineering (2008-2010), Clemson University Restoration Institute (2011-present), N. Charleston, SC)

- Developed and led supercritical CO<sub>2</sub> drying processes for the conservation of waterlogged organic materials.
- Implemented characterization of organic, inorganic, and composite materials using high vacuum and VP-SEM, ED and WD spectroscopies, micro-FTIR, micro-Raman and X-ray Fluorescence Spectrometry.
- Contributed to the Conservation Center sustainability efforts of creating new sources of revenue.
- Led Collaboration research with various conservation entities (QAR Laboratory, NC; Parks Canada; National Park Service, US; SCIAA)
- Taught short-courses on Non-destructive Analytical techniques to the Historic Preservation Graduate Program (Clemson and College of Charleston combined degree)
- Initiated and Led teaching collaboration with Historic Preservation Graduate Program
- Developed research projects in corrosion mitigation and inhibition, coating weathering and biofouling for a granted project by National Park Service
- Led, coordinated and applied to collaborative grants (NSF, NCPTT, Loeb Foundation)
- Led and performed projects for external clientele (Kapstone, Lauscha FI, Conservation Solutions, Eaton Aerospace, Honeywell, MUSC, CofC, USC)

- Operated, maintained and troubleshooted VP-SEM/EDS-WDS, XRF and ScCO<sub>2</sub> equipments.
- Supervised and mentored summer interns, graduate students and conservators.
- Participated in K-12 outreaches (student tours, STEM Conference Judge)

Aug 2007 – Oct. 2010

**Mathematiques, Sciences, and Biology Tutor at Tutor.com** (online homework help and tutoring services - K-12 and college students and adult learners).

Oct. 2001 - Feb. 2008

**Research Chemist at MeadWestvaco Corp.** (Specialty Chemicals Division, SPG Research-Business development, planning & Technology, North Charleston, SC)

- High level of expertise in the area of acrylic-, epoxy-based coatings and hybrid technology. Expertise in silane, siloxane, fluorine and melamine chemistries.
- Designed UV-cured and waterborne coatings for various substrate applications in the area of architectural and industrial coatings (natural stones, concrete, wood, natural stone laminate).
- Five patents.
- Developed nanocomposite type coatings for both areas of industrial/architectural coatings and packaging (nanofillers, nanofibers).
- Developed coatings with improved mechanical and barrier properties for food and non-food packaging applications, to be coated on or off machine. Paper and non-woven applications.
- Developed and maintained cooperative working relationships with divisional business units. Provided technical expertise and exchanged innovative technology information on product and application developments to ensure alignment and support of strategic projects as well as facilitate timely technical solutions.
- Developed and led cross-divisional projects with potential significant financial impact.
- Established personal and team goals, managed the activities of analysts.
- Participated in K-12 outreaches

## RESEARCH EXPERIENCE

**University of North Carolina at Chapel Hill-USA** (1996-2001)

Dissertation Research: *Solid Supports for Carbon Dioxide Applications – Advisor: Pr. J. DeSimone*

- Designed cross-linked fluorinated copolymers.
- Synthesized of porous and non-porous micron-sized beads by suspension polymerization in water.
- Performed swelling investigations in gaseous, liquid and supercritical CO<sub>2</sub>.
- Transition metal catalysis and enzymatic catalysis / Gas Separation.
- Two patents.

**University of North Carolina at Chapel Hill-USA**, Research Assistant (1995-1996)

Research Project: *Dispersion polymerization of MMA in supercritical CO<sub>2</sub> using PDMS-macromonomer*

**USTL, Montpellier II-France, D.E.A.** Internship (1995)

Research Project: *New process of F-alkylation of organic compounds*

**USTL, Montpellier II-France, BS** Internship (1994)

Research Project: *Novel biodegradable polymers: Synthesis and Characterization of polyhydroxybutyrate by chemical route*

## SKILLS Leadership/Management

- Managed and directed the activities and research of conservators, archaeologists, chemistry analysts, students and interns.
- Initiated and maintained involvement of Meadwestvaco in a NSF Center at USC, Columbia, SC.
- Led and coordinated grant application involving national and international research teams and sponsors.
- Initiated collaboration with Los Alamos National Laboratories-USA (UNC-Chapel Hill)

- Led training on SEM/EDS and WDS equipment, XRF and High-pressure drying equipment (Clemson University)
- Maintained and operated GPC equipment for the Chemistry Department at UNC-CH, the VP-SEM/EDS-WDS, XRF and supercritical CO<sub>2</sub> equipment for Clemson University.
- Safety manager for the Laboratory of Polymer Synthesis at UNC-CH.
- Leadership role in organizing Advancement in Coatings Series Additives 2006 (FSCT/American Coatings Association)
- Active member of the Professional Development Committee of the American Coatings Association: developed short-courses in Green Chemistry, and Nanotechnology at ICE2006, ICE 2007, Futurecoat 2008, and CoatingsTech 2011.
- Session Chair at The International Society of Supercritical Fluids (ISSF) 2012, San Francisco, CA, May 2012.
- Organized Field Session on Metal Corrosion for APT/PTN Conference in Charleston, SC, October 2012.
- Chair of the Transportation Coatings Conference for ACA in Charleston, SC, October 2012.

### Technical

Synthesis: Polymer and organic chemistry, traditional and high-pressure polymerizations, Polymer synthesis by suspension, dispersion and emulsion, controlled radical polymerizations, high-pressure equipment techniques, dry box techniques. Coating technology applied to Graphic Arts, Architectural, Industrial and Maritime coatings systems (resin synthesis, formulation, and ASTM testing). Paper and non-woven technologies (papermaking process, sizing, TAPPI test methods, barrier coatings). Corrosion and Biofouling processes, conservation techniques.

Characterization Technique: GPC, Optical and Electron Microscopies (SEM, VP-SEM, TEM), Energy Dispersive and Wave Dispersive Spectroscopies (EDS/WDS), Thermal analysis (DSC, TGA), NMR, UV-Vis, micro-FTIR, GC/MS, micro-Raman, XRF.

### PROFESSIONAL DEVELOPMENT

- *Empowered Leadership Program* (Specialty Chemicals Division, MeadWestvaco Corp.) August 2002.
- *Building Trust and teamwork* (Focus Management Development) July 2004
- *Hands-on Workshop for Pulp and Paper Basics* (TAPPI workshop, NCState University) June 2002.
- *Polymer Coatings* (ACS short courses) August 2002.
- *Crosslinking for the Coatings Chemist* (FSCT Courses) November 2002.
- *Nanotechnology* (FSCT Courses) November 2003.
- *Combinatorial Chemistry for Coating Technology* (FSCT Courses) November 2003.
- *Variable Pressure Scanning Electron Microscope* (Hitachi High Technologies short course) June 2009.
- *INCA Energy* (Oxford Instruments short course) July 2009.
- *XRF* (Bruker AXS), November 2010.
- *EPA Lead RRP Certified, May 2013.*

### Languages

French (Native), English

**Bilingual.** (Experience in technical translation for Global Translation Systems Inc).

German

Fair

### OTHERS

Reviewer for Journal of Supercritical Fluids, ed. Elsevier.

Membership: **ACS, TAPPI, RadTech, MSA, SSPC, American Coatings Association.**

## PUBLICATIONS and REFERENCES

### PATENTS:

- DeSimone, J.M.; Carbonell, R.; Cretté, S.A.; Kendall, J. **US 6,211,422** for *Enzyme Catalysis in Carbon Dioxide Fluids*.
- DeSimone, J.M.; Carbonell, R.; Cretté, S.A. **WO 01/14289 A2 (EP1210306 A2; US 6,747,179)** for *Carbon dioxide-soluble polymers and swellable polymers for carbon dioxide applications*.
- Cretté, S.A., deOliveira, I.N., Johnson, M.A. **20050176321A1** for *Wear Layer for Flooring and Other Products*.
- Cretté, S.A., Tortorelli, L.J., deOliveira, I.N. **US60/804,658** for *Homogeneous Dispersion of Surface Modified Kaolin Clay into a Hard Resin Formulation*.
- Cretté, S.A., Conte A.J., deOliveira, I.N. **US07/63953** for *Wear Resistant Coating Composition*.
- Cretté, S.A., Conte A.J., deOliveira, I.N. **WO2007114997 A2 and A3** for *Composition de Revêtement Résistant à l'Usure*.
- Knox D.E.; Willoughby J.A.; Ewing J.C.; Mclaughlin T.C.; Ruffner C.G.; Cretté S.A.; Brown G.R. **WO2010/123689(A1)** for *A Method for Making Multilayer Paper-based Packaging Materials Having Enhanced Barrier Properties*.

### PAPERS:

- Jaimes, C.; Couve, J.; Cretté, S.; Sledz, J.; Schué, F. *Polymerization of (R,S)- $\beta$ -butyrolactone from tetraisobutyldialuminumoxane (TIBAO) catalyst* Eur.Polym. J. **1996**, 32(10), 1175.
- Cretté, S.A.; Polley, J.; Carbonell, R.; DeSimone, J.M. *Solid Supports for CO<sub>2</sub> Applications* Polym. Prep., (Am. Chem. Soc., Div. Polym. Chem.), **2000**, 41(1), 254.
- Cretté, S.A.; DeSimone, J.M.; Carbonell, R.; Tumas, W.; Brady, J. *Solid Supports for CO<sub>2</sub> Applications* Polym. Prep., (Am. Chem. Soc., Div. Polym. Chem.), **2000**, 41(2), 1395.
- Cretté, S.A.; DeSimone, J.M. *Novel Polymeric Materials for Application in Carbon Dioxide* Proceedings of the 7th International Symposium on Supercritical Fluids, Antibes, France, **2000**, 1, 255.
- Cretté, S.A.; DeSimone, J.M.; Carbonell, R.; Tumas, W.; Brady, J. *Solid Supports for Catalysis and Separation Processes in Compressed Carbon Dioxide* Proceedings of the 7th International Symposium on Supercritical Fluids, Antibes, France, **2000**, 1, 475.
- Cretté, S.A.; DeSimone, J.M. *Neueste Anwendungen von komprimiertem Kohlendioxid (Latest applications in Compressed Carbon Dioxide)* Nachrichten aus der Chemie **2001**, 49(4), 462.
- Cretté, S.A.; DeSimone, J.M.; Carbonell, R.; Tumas, W. *Solid Supports for Catalysis and Separation Processes in Compressed Carbon Dioxide* Polym. Prep., (Am. Chem. Soc., Div. Polym. Chem.), **2001**, 42(1), 522.
- Deitzel, J.M.; Kosik, W.; McKnight, S.H.; Beck Tan, N.C.; DeSimone, J.M.; Cretté, S. *Electrospinning of polymer nanofibers with specific surface chemistry* Polymer **2002**, 43, 1025.
- Visitin, P.M.; Denison, G.M.; Cretté, S.A.; Schauer, C.K.; DeSimone, J.M. *Copper Chemical Mechanical Planarization Processes with carbon Dioxide* PMSE Prep., (Am. Chem. Soc., Div. Polym. Mat.: Sci. Eng.), **2002**, 87, 205.
- Rubio, S.; Cretté, S.; Blancou, H. *An improved procedure for the synthesis of perfluoroalkylacetylenes* Synthesis **2003**, 3, 361.
- Mardikian, P.; Cretté, S.A.; Drews, M.; Gonzalez, N.G.; Rivera, J.; Tindal, C. *Connecting Materials Science and Engineering with Archaeological Conservation* AIC 37<sup>th</sup> Annual meeting, **2009**.
- Rivera, J.; Cretté, S.A. *Waterlogged Textile Recovered from the Civil War Submarine HL Hunley* AIC 37<sup>th</sup> Annual Meeting - Textile Specialty Group Postprints, **2009**. In press
- Cretté S.A.; González-Pereyra N.G.; Rennison B.; Scafuri M.P.; Mardikian P.; Drews M.J.; Carrier M. *Conserving Waterlogged Archaeological Corks Using Supercritical CO<sub>2</sub> and Monitoring Their Shrinkage Using Structured-Light 3D Scanning*. 11th ICOM - Wet Organic Archaeological Materials (WOAM), **2010**. In press

- González-Pereyra N.G.; Brocard T.; Cretté S.A.; de Viviés P.; Drews M.J.; Mardikian P. *The Use of Subcritical Fluids for the Stabilization of Concreted Iron Artifacts*, Proceedings of the Interim Meeting of the ICOM-CC Metal Working Group - Metal 2010. Charleston, SC. October **2010**. 39-49.
- Näsänen L.M.E.; González-Pereyra N.G.; Cretté S.A. *The Subcritical Mass-Treatment of a Range of Iron Artifacts from Varying Contexts* Proceedings on the Asia-Pacific Regional Conference on Underwater Cultural Heritage. Manila, Philippines. November **2011**. 733-744.
- Cretté, S.A.; Näsänen, L. *Coating Challenges in Cultural Heritage Conservation*, CoatingsTech, 9(9) **2012**: 48-60.
- Rivera, J.A., Cretté, S.A., *Preliminary analysis of a candle recovered from the H.L.Hunley submarine*, 12<sup>th</sup> Interim Meeting of the ICOM-CC Wet Organic Archaeological Materials Working Group, WOAM 2013, Istanbul, Turkey, May **2013**
- Cretté, S.A.; Näsänen, L.; González-Pereyra, N. G.; Rennison, B. *Conservation of Waterlogged Archaeological Corks Using Supercritical CO<sub>2</sub> and Treatment Monitoring using Structured-light 3D Scanning*, Journal of Supercritical Fluids, **2013**, 79, 299-313.
- Näsänen, L.; González-Pereyra, N. G.; Cretté, S.A.; DeViviés, P. *The Applicability of Subcritical Fluids to the Conservation of Actively Corroding Iron Artifacts of Cultural Significance* Journal of Supercritical Fluids, **2013**, 79, 289-298.
- González-Pereyra, N.G., Näsänen, L.M.E., Cretté, S.A., *From rivets to composites – ten years of subcritical research*, Interim Meeting of the ICOM-CC Metal Working Group - Metal 2013. Edinburgh, UK, September **2013**
- Ternisien, V.A., González-Pereyra N.G., Mardikian, P., Näsänen, L.M.E., Cretté, S.A., Rennison, B., *Evaluating subcritical alkaline fluids for the stabilization treatment of iron artifacts from the H. L. Hunley submarine (1864)*, Interim Meeting of the ICOM-CC Metal Working Group - Metal 2013. Edinburgh, UK, September **2013**
- Näsänen, L.M.E., González-Pereyra, N.G., Cretté, S.A., Watkinson, D. *Stabilization of Archaeological Copper Alloy Artifacts Using Subcritical Fluids*, Interim Meeting of the ICOM-CC Metal Working Group - Metal 2013. Edinburgh, UK, September **2013**

#### **PRESENTATIONS:**

- 5<sup>th</sup> Meeting of The **International Society for the advancement of Supercritical Fluids (I.S.A.S.F.)**, Materials and Natural Product Processing, Nice, France; March **1998**  
“Bioextraction in Liquid CO<sub>2</sub>“, poster presentation
- **Kenan Center for the Utilization of CO<sub>2</sub> in Manufacturing**, Chapel Hill, USA; **1999-2000**  
“Cross-linked Fluoropolymers: Immobilization Supports for CO<sub>2</sub>“, oral and poster presentations
- **A.C.S. Spring National Meeting**, San Francisco, USA; March **2000**  
“Solid Supports for CO<sub>2</sub> Applications“, poster presentation
- The 5<sup>th</sup> **International Symposium on Supercritical Fluids (ISSF 2000)**, Atlanta, USA; April **2000**  
“Solid Supports for CO<sub>2</sub> Applications“, poster presentation
- **A.C.S. Fall National Meeting**, Washington, DC; August **2000**  
“Solid Supports for CO<sub>2</sub> Applications“, oral presentation
- **American Physical Society** 2000 March Meeting, Minneapolis, MN  
“Surface Segregation of fluorine in thin films of Poly(methyl methacrylate-co-tetrahydroperfluorooctylacrylate) (PMMA/TAN) Random Copolymers“, poster presentation.
- 7<sup>th</sup> Meeting of The **International Society for the advancement of Supercritical Fluids (I.S.A.S.F.)**, Antibes-Juan les pins, France; November **2000**  
“Novel Polymeric Materials for Application in Carbon Dioxide“ oral presentation  
“Solid Supports for Catalysis and Separation Processes in Compressed Carbon Dioxide“ poster presentation
- **Particles 2001**, Orlando, FL, February **2001**  
“Solid Supports for Catalysis and Separation Processes in Compressed Carbon Dioxide“ oral presentation



- **39<sup>th</sup> International Wood Composites Symposium**, Washington State University, Pullman, WA, April **2005**  
“Durable Surface Laminates in Flooring Applications” Workshop Oral Presentation (invited speaker)
- 11th **ICOM - Wet Organic Archaeological Materials (WOAM)**, Greenville, NC, May **2010**  
“Conserving Waterlogged Archaeological Corks Using Supercritical CO<sub>2</sub> and Monitoring Their Shrinkage Using Structured-Light 3D Scanning” Oral presentation.
- American Institute for Conservation (**AIC**) **39<sup>th</sup> Annual Meeting** – Architecture/Research and Technical Studies Joint Session. Philadelphia, PA, June **2011**  
“Assessment and Characterization of the Architectural Metal Finishes at Fort Moultrie: A Successful Student – Scientist Collaboration” Oral Presentation.
- Cretté, S.A.; Näsänen, L., Virtual Learning Conference on Coating Challenges in Cultural Heritage Conservation for The American Coatings Association, **2012**.
- Cretté, S.A., Näsänen, L., González-Pereyra, N. G., Rennison, B. *Conservation and Treatment Monitoring of Waterlogged Archeological Corks Using Supercritical CO<sub>2</sub>* Proceedings of the 10th International Symposium on Supercritical Fluids, San Francisco, **2012**.