

Nicholas D. Altieri

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Education

University of California, Los Angeles

Los Angeles, CA

PhD in Chemical Engineering; GPA: 3.45

Summer 2018 (Expected)

- Doctoral Adviser: Jane P. Chang
- Dissertation Title: "Etch Chemistry Selection for Enabling Atomic Layer Etch of Metals"
- Advancement to Candidacy: July 26, 2016

Tulane University

New Orleans, LA

BSE in Chemical Engineering, Cum Laude; GPA: 3.41

May 2013

Experience

Graduate Student Researcher, *Electronic Materials Synthesis & Plasma Processing Lab* August 2013-Present

University of California, Los Angeles

Los Angeles, CA

- Researched reactive ion etch, surface modification, and alternative organic etchants for anisotropic atomic layer etch of metallic and intermetallic thin films for application in memory technologies, sponsored by Lam Research Corporation (2014-2016)
- Developed methodology for selecting non-PFC plasma chemistries for reducing environmental impact of processes in patterning dielectric interlayer materials, sponsored by Intel Corporation through Semiconductor Research Corporation (SRC) (2013-2015)
- Investigated alternative reactive ion and organic vapor etch of metallic and intermetallic magnetic thin films, sponsored by Intel Corporation through Semiconductor Research Corporation (SRC) (2013-2015)
- Addressed challenges in etching extreme ultra-violet photolithography mask materials using Monte Carlo feature profile modeling, sponsored by IMPACT+ program and C-DEN (2013-present)
- Examined role of oxidation and plasma processing in modification of chalcogenide phase change materials for memory applications, sponsored by Lam Research Corporation (2016-present)

Teaching Assistant, *Department of Chemical & Biomolecular Engineering* September 2016-December 2016

- Formulated lesson plans and lectured on fundamental principles of chemical engineering

Undergraduate Research Assistant, *Department of Chemical Engineering*

May 2012-May 2013

Tulane University

New Orleans, LA

- Simulated surfactant chain and micellization behavior using molecular dynamics
- Calculated thermochemical potentials of micelle formation and solution-surfactant interactions

Publications

1. **N. D. Altieri**, J. K. Chen, L. Minardi, and J. P. Chang, "Plasma-surface interactions at the atomic scale for patterning metals," *J. Vac. Sci. Technol. A*, 35 (5) (2017) 05C203
2. J. K. Chen, **N. D. Altieri**, T. Kim, T. Lill, M. Shen, and J. P. Chang, "Directional etch of magnetic and noble metals. I. Role of surface oxidation states," *J. Vac. Sci. Technol. A*, 35 (5) (2017) 05C304
3. J. K. Chen, **N. D. Altieri**, T. Kim, E. Chen, T. Lill, M. Shen, and J. P. Chang, "Directional etch of magnetic and noble metals. II. Organic chemical vapor etch," *J. Vac. Sci. Technol. A*, 35 (5) (2017) 05C305
4. J. K. Chen, T. Kim, **N. D. Altieri**, E. Chen, and J. P. Chang, "Ion beam assisted organic chemical vapor etch of magnetic thin films," *J. Vac. Sci. Technol. A*, 35 (3) (2017) 031304
5. X. Li, K. Fitzell, D. Wu, C. T. Karaba, A. Buditama, G. Yu, K. L. Wong, **N. D. Altieri**, C. Grezes, N. Kioussis, S. Tolbert, "Enhancement of voltage-controlled magnetic anisotropy through precise control of Mg insertion thickness at CoFeB|MgO interface," *Appl. Phys. Lett.*, 110 (5) (2017) 052401

Presentations

1. **N. D. Altieri***, J. K. Chen, L. Minardi, E. Chen, and J. P. Chang, Presentation: "Organic Etchants Toward Atomic Layer Etching of Magnetic Metals," AVS 63rd International Symposium & Exhibition, Nashville, TN, November 9, (2016)
2. L. Minardi, **N. D. Altieri***, J. K. Chen, E. Chen, and J. P. Chang, Presentation: "Thermodynamic Prediction and Experimental Verification of Etch Selectivity for EUV Mask Materials," AVS 63rd International Symposium & Exhibition, Nashville, TN, November 10, (2016)

3. **N. D. Altieri***, L. Minardi, E. Chen, and J. P. Chang, Poster: “Enabling Nano-Fabrication with Atomic Precision in Etch Directionality and Selectivity,” C-DEN Workshop, San Jose, CA, November 4, (2016)
4. L. Minardi*, J. K. Chen, **N. D. Altieri**, and J. P. Chang, Poster: “Thermodynamic prediction and experimental verification of etchant selectivity for tantalum-based materials,” IMPACT+ Workshop, San Jose, CA, November 24, (2015)
5. **N. D. Altieri***, J. K. Chen, L. Minardi, M. Paine, and J. P. Chang, Presentation: “Non-PFC Plasma Chemistries for Patterning Low-k Dielectric Materials,” AVS 62nd International Symposium & Exhibition, San Jose, CA, October 20, (2015)
6. J. K. Chen*, **N. D. Altieri**, L. Minardi, T. Kim, and J. P. Chang, Presentation: “Generalized Approach for Selecting Plasma Chemistries in Metal Etch,” AVS 62nd International Symposium & Exhibition, San Jose, CA, October 20, (2015)
7. J. K. Chen*, **N. D. Altieri**, L. Minardi, and J. P. Chang, Presentation: “Benefit of Modeling-Based Process Development,” IMPACT+ Workshop, Almaden, CA, March 6, (2015)
8. J. K. Chen*, **N. D. Altieri**, L. Minardi, and J. P. Chang, Poster: “Benefit of Modeling-Based Process Development,” IMPACT+ Workshop, Almaden, CA, March 6, (2015)
9. J. K. Chen*, **N. D. Altieri**, M. Paine, T. Kim, and J. P. Chang, Poster: “Non-PFC Plasma Chemistries for Patterning Low-k Dielectric Materials,” AIChE Annual Meeting, Atlanta, GA, November 16, (2014)
10. J. K. Chen*, **N. D. Altieri**, M. Paine, and J. P. Chang, Presentation: “Non-PFC Plasma Chemistries for Patterning Low-k Dielectric Materials,” AVS 61st International Symposium & Exhibition, Baltimore, MD, November 10, (2014)
11. **N. D. Altieri***, M. Paine, J. K. Chen, T. Kim, and J. P. Chang, Poster: “Alternative Plasma Chemistries for Etching Carbon-Doped Silica,” Plasma Processing Science, Gordon Research Conference, Smithfield, RI, July 26, (2014)

Leadership & Activities

Member , AIChE	August 2011-Present
Member , AVS	August 2013-Present
President , AIChE Tulane University Chapter	May 2012-May 2013

Honors & Awards

1. Finalist, John Coburn and Harold Winters Student Award in Plasma Science & Technology, AVS, 2017
2. Dorothy M. and Earl S. Hoffman Travel Grant award, AVS, 2016
3. Plasma Science and Technology Division (PSTD) Travel Grant, AVS, 2015
4. Francis M. Taylor Award in Chemical Engineering, Spring 2013
5. Randall K. Nichols Award in Chemical Engineering, Spring 2012
6. Dean’s List, Tulane University, Fall 2011-2012
7. Science and Engineering Honor Society, Tulane University, Fall 2009-Spring 2013
8. Presidential Scholar Award, Tulane University, Fall 2009-Spring 2013

Relevant Skills

- **Laboratory:** Integration, operation, and maintenance of custom-built inductively coupled plasma (ICP) chamber with chemical vapor etch, ion beam, and *in-situ* x-ray photoelectron spectrometer. Electron beam and UV photolithography, cleanroom processing experience, vacuum technology (mechanical, turbomolecular, cryogenic, and ion pumps, chamber design)
- **Materials Characterization:** Energy Dispersive X-ray Spectroscopy (EDS), Focused Ion Beam (FIB), Scanning Electron Microscopy (SEM), Superconducting Quantum Interference Device (SQUID) magnetometry, Spectroscopic Ellipsometry, X-ray Photoelectron Spectroscopy (XPS)
- **Computer:** Proficiency in Microsoft, MacOS, Linux, MS Office, Adobe Creative Suite, HTML, MATLAB, ChemCAD, and VBA