

DEIRDRE D. RAGAN, Ph.D.

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EDUCATION

Ph.D. in Materials 1999

University of California at Santa Barbara, College of Engineering (Santa Barbara, CA)

Dissertation: "The Effect of Cation Dopants on Phase Transformations in Alumina"

Advisor: David R. Clarke

M.S. in Materials 1995

University of California at Santa Barbara, College of Engineering (Santa Barbara, CA)

Thesis: "Decohesion of Thin Films in Microelectronic Circuits: An Investigation of the SiO₂/TiN Interface"

Committee: David R. Clarke, Steven Denbaars, Evelyn Hu

B.S. in Materials Science and Engineering 1992

Rice University, School of Engineering (Houston, TX)

SELECTED HONORS AND AWARDS

Oxford ISGAP Scholar (Oxford University, St. John's College, England) 2019

Lowcountry Engineer of the Year (Charleston, SC) 2019

Excellence in Teaching Award, University-Wide Graduate Student Runner-Up (UCSB) 1997

Fulbright Research Fellowship recipient 1995

EXPERIENCE

The Citadel Honors Program (Charleston, SC)

Director 2018 - Present

Responsibilities: Mentor and advise Honors Program students regarding personal and professional development, study away programs, research, and Citadel coursework; Identify and recruit eligible high school students; Act as liaison for students and parents about Honors Program and The Citadel; Monitor metrics on Citadel Honors Program students and applicants; Serve as Chair of The Citadel Scholarships Committee; Develop, select, schedule, and teach Honors courses; Follow national and regional issues in Honors education through participation in Honors councils; Advocate for students and Honors platform; Maintain alumni communication and involvement; Design and refine communication tools for Honors Program; Fundraise in coordination with The Citadel Foundation; Convene Honors Faculty Council; Participate in Honors Program Student Advisory Council; Verify accuracy of records of cadets and prospective students.

Undergraduate Courses:

First-year Experience

Honors Seminar: Controversy and Critical Thinking

Personal and Professional Development

Assistant 2014 - 2018

Responsibilities: Advise and encourage Honors Program students; Provide daily Honors Program operational support; Act as back-up to the Honors Program Director as needed; Communicate with prospective students and parents about Honors Program and The Citadel; Ensure that all communication tools for Honors Program are relevant, accurate,

and updated; Stay informed on high school education trends; Be informed about national issues and trends in Honors education; Encourage alumni communication and involvement; Create metrics on Citadel Honors Program students and applicants; Interview student candidates for Honors Program acceptance as needed; Maintain complete, error-free records on cadets and prospective students; Attend regional conferences when possible.

The Citadel Mechanical Engineering Department (Charleston, SC)

Faculty 2017 - Present

Responsibilities: Teach Materials Science classes to undergraduate and graduate students; mentor students; involve students in research

Undergraduate Courses:

Introduction to Materials (includes a Materials lab)

Engineering Design

Graduate Courses:

Fracture and Fatigue

Providence Preschool (Charleston, SC)

Director 2012 - 2014

Responsibilities: Create a positive, welcoming school environment for parents and students; Develop age-appropriate curriculum for toddler to Pre-K classrooms; Balance resources to provide a quality environment while minimizing costs; Manage all personnel matters including recruitment, hiring, firing, staff meetings, and performance reviews of eight teachers; Coach teachers on positive classroom techniques; Maintain budget records; Create and distribute monthly newsletters and other regular communication with school families; Report quarterly to Board of Directors.

Lead Teacher, Kindergarten Readiness (4K) class 2011 - 2014

Responsibilities: Design and implement age-appropriate, developmental class lessons to ensure continual progress toward kindergarten readiness; Utilize multiple instruction techniques to assist students with different learning styles; Create a culture of open communication with parents; Collaborate with and mentor assistant teacher.

Creative Learning Center for Very Young Children (Winston-Salem, NC)

Lead Teacher, 2 to 3-year old's classroom 2007 - 2008

Responsibilities: Create opportunities for learning through play with age-appropriate materials; Develop foundational language and math literacy skills with books, art, blocks, and other toys.

PPG Industries, Inc. (Pittsburgh, PA)

Development Project Engineer, Glass New Product Development 2001 - 2004

Responsibilities: Conceive and fabricate nanotechnology-related products for automotive and architectural glass; Drive technology transfer with national laboratories; Lead educational outreach program to regional at-risk students.

PPG Industries, Inc. (Pittsburgh, PA)

Chemist, Automotive Powder Coatings 1999 - 2001

Responsibilities: Explore the incorporation of inorganic nanoparticles for property improvements of automotive clearcoat paints; Direct an electrostatic research study contracted to the University of Arkansas, Little Rock.

University of California, Santa Barbara

Graduate Researcher, Materials 1996 - 1999

Responsibilities: Develop thin film fabrication technology and testing methodology for measuring the effect of ions on crystal phase transformations.

Dean of Engineering Search Committee 1998

Invited to be the sole graduate representative on committee

Graduate Teaching Assistant, Materials (Course: Graduate Thermodynamics) 1996 - 1997

Responsibilities: Hold weekly office hours to assist graduate students; Host study sessions; Design study guides; Lead class in the absence of the professor

Uppsala University (Uppsala, Sweden)

1995 - 1996

Visiting Fulbright Researcher, Solid-State Physics

Responsibilities: Investigate the fabrication and behavior of various electrochromic materials; Collaborate with various researchers to characterize material behavior.

University of California, Santa Barbara

1992 - 1995

Graduate Researcher

Responsibilities: Create and utilize microelectronics processing techniques for determining the weakest interface in a thin film stack.

Rice University Admissions Office (Houston, TX)

1991 - Present

Alumni Recruiter and Interviewer

Responsibilities: Act as a regional representative of the university; Conduct interviews of prospective students; Provide information about the university at regional college fairs.

Texas Instruments, Inc. (Houston, TX)

1991 Summer

Summer Intern

Responsibilities: Verify the failure of fabricated circuits due to voltage cycling.

Los Alamos National Laboratory (Los Alamos, NM)

1988-90, 1992 Summers

Undergraduate Researcher

Responsibilities: Measure the behavior of materials when subjected to static high-pressures; Maintain a Department of Energy Q-Level (Top Secret) Clearance

PRESENTATIONS and POSTERS

“The Citadel: Not Your Typical College” 2019

ISGAP Conference (Oxford, England)

“Student Training” 2018

National Collegiate Honors Conference (Boston, MA)

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“Temperature Comparison of Hybrid, Sealed, and Steel Ball Bearings” Summer Undergrad Research Project poster (Charleston, SC)	2018
“Building Your Network” ReStart Career Workshop (Mt. Pleasant, SC)	2018
“Job Searching” ReStart Career Conference (Mt. Pleasant, SC)	2018
“A Structured Course in Personal and Professional Development” Southern Regional Honors Council Conference (Asheville, NC)	2017
“Dream Big: Discover Your Passion” Seacoast TEDTalx (Charleston, SC)	2017
“Superstar Interviewing” ReStart Career Conference (Mt. Pleasant, SC)	2015 - 2018
“Elementary School Science Fairs: Parent Involvement” Forsyth County Schools (Winston-Salem, NC)	2010
“Powder Electrostatics” PPG Industries, Inc., (Pittsburgh, PA)	1999
“The Effect of Cation Dopants on Phase Transformations in Alumina” University of California at Santa Barbara	1999
“Phase Transformations in Alumina Thin Films” PPG Industries, Inc. (Pittsburgh, PA)	1998
“Using Time Resolved Reflectivity to Monitor Planar Transformations in Alumina” University of California at Santa Barbara	1997
“An Investigation of Electrochromic Ni-Oxide Based Films” University of California at Santa Barbara	1996
“Electrochromic Ti-Ce Oxides” Electrochemical Society (San Antonio, TX)	1996
“Electrochromic Research at Uppsala University” PPG Industries, Inc. (Pittsburgh, PA)	1996
“An Investigation of NiO _x H _y Films” Uppsala University (Uppsala, Sweden)	1996
“Decohesion of Thin Films in Microelectronic Circuits” University of California at Santa Barbara	1995

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“A Novel Method for Determining Strain Energy in Thin Films” University of California at Santa Barbara	1994
“Electrochromism of WO ₃ ” University of California at Santa Barbara	1994
“Ruby Fluorescence: A Technique for Measuring Stress” University of California at Santa Barbara	1993
“The Use of Silicone Fluid as a Pressure Medium in Diamond Anvil Cells” Los Alamos National Laboratory	1993

PUBLICATIONS

“Comparison of Mentors’ and Mentees’ Perceptions of Mentees’ Research Skill Gains at The Citadel”, S. T. Ghanat, M. K. Zanin, D. Garner, D.Ragan, J. M. Plumblee, D.B. Bornstein, J.H. Lewis, proceeding of American Society of Engineering Education 126th Annual Conference and Exposition, Tampa, Florida, June 16-19, 2019

“Small Mentoring Efforts that Make a Big Difference for Retention,” R. Rabb, R. Welch, W. Davis, D. Ragan, J. Geathers, proceeding of American Society of Engineering Education 126th Annual Conference and Exposition, Tampa, Florida, June 16-19, 2019

“A Structured Course in Personal and Professional Development,” D.D. Ragan, *Honors in Practice* **14** (2018)

“How to Prepare for a Science Fair: A Guide for Parents,” D.D. Ragan, Forsyth County School District (2010)

“The effect of yttrium and erbium ions on the epitaxial phase transformations in alumina,” D.D. Ragan, T. Mates, D.R. Clarke, *J. Amer. Ceramic Society* **86**, 541 (2003)

“Electrochromic Ni oxide films studied by magnetic measurements,” D.D. Ragan, P. Svedlindh, C.G. Granqvist, *Solar Energy Materials and Solar Cells* **54**, 247 (1998)

“Optically passive counter electrodes for electrochromic devices: transition metal-cerium oxide thin films,” A. Azens, L. Kullman, D.D. Ragan, C.G. Granqvist, *Solar Energy Materials and Solar Cells* **54**, 85 (1998)

“Magnetic measurements on electrochromic Ni-oxide-based films,” D.D. Ragan, P. Svedlindh, C.G. Granqvist, *J. Appl. Phys.* **82**, 1759 (1997)

“Cerium-containing counter electrodes for transparent electrochromic devices,” L. Kullman, M. Veszelei, D. D. Ragan, J. Isidorsson, G. Vaivars, U. Kandars, A. Azens, S. Schelle, B. Hjorvarsson, C. G. Granqvist, in *Optical Organic and Semiconductor Inorganic Materials*, E. A. Silinsh, A. Medvid, A. R. Lusis, and A. O. Ozols, eds., Proc. SPIE 2968, 219–224 (1997).

“Electrochromic properties of Ti-Ce oxides: the effect of varying stoichiometry,” A. Azens, L. Kullman, D. D. Ragan, M. Strømme Mattsson, and C. G. Granqvist, in *Electrochromic Materials III*, K.-C. Ho, C. B. Greenberg, and D. M. MacArthur, eds., Electrochem. Soc. Proc. **96-24**, 218–228 (1997).

“Measurement of the Fracture Energy of SiO₂/TiN Interfaces Using the Residually-Stressed Thin-Film Micro-Strip Test.” X. Guanghai, D. D. Ragan, D. R. Clarke, M.Y. He, Q. Ma, and H. Fujimoto, *MRS Proceedings* 458 (1996)

“Optical and electrochemical properties of dc magnetron sputtered Ti-Ce oxide films,” A. Azens, L. Kullman, D. D. Ragan, C. G. Granqvist, B. Hjorvarsson, and G. Vaivars, *Appl. Phys. Lett.* **68**, 3701–3703 (1996)

“Silicone fluid as a high-pressure medium in diamond anvil cells,” D.D. Ragan, D. Schiferl, D.R. Clarke, *Rev. Sci. Instr.* **67**, 494 (1996)

“Calibration of the ruby R1 and R2 fluorescence shifts as a function of temperature from 0-600 K,” D.D. Ragan, R. Gustavsen, D. Schiferl, *J. Appl. Phys.* **72**, 5539 (1992)

“Calibration of the nitrogen vibron pressure scale for use at high temperature,” S.C. Schmidt, D. Schiferl, A.S. Zinn, D.D. Ragan, D.S. Moore, *J. Appl. Phys.* **69**, 2793 (1991)

PATENTS

Display Panel

Mehran Arbab, Adam D. Polcyn, Deirdre D. Ragan, Michael Buchanan
USPTO# 8,629,610; Issued Jan. 2014

Material having laser induced light redirecting features

Mehran Arbab, Adam D. Polcyn, Deirdre D. Ragan
USPTO# 8,547,008; Issued Oct. 2013

Coating compositions providing improved mar and scratch resistance and methods of using the same

Karen A. Barkac, Anthony M. Chasser, Roy E. Dean, Mildred Lisa Perrine, Deirdre D. Ragan, Karen S. Rechenberg, John R. Schneider
USPTO# 8,258,225; Issued Sept. 2012

Article having nano-scaled structures and a process for making such article

Mehran Arbab, Deirdre D. Ragan, Songwei Lu
USPTO# 7,851,016; Issued Dec. 2010

Organic solvent-free film-forming compositions, multi-layer composite coatings, and related methods

Charles M. Kania, Roxalana L. Martin, Carolyn A. K. Novak, Thomas R. Hockswender, Mark A. Tucker, Mary Beth Grolemond, Deirdre Ragan, Alicia Williams
USPTO# 7,241,830; Issued July 2007

SERVICE
Service to College

Judge at The Citadel Students of Excellence poster competition 2017, 2018
 Leadership Day Volunteer 2017

Service to Students

Summer Undergraduate Research Experience Mentor 2018
 Mock Interviewer for The Citadel Career Center 2017
 Club Advisor for The Citadel Honors Program student club 2014 - Present

Service to Community

National Collegiate Honors Council
 Conference Planning Committee 2018 - Present
 Reviewer of student research conference submissions 2018 - Present
 Judge of STEM-related student research posters 2017 - Present
 Introduce A Girl to Engineering Volunteer 2018
 Middle School Robotics Competition Volunteer Judge 2018
 ReStart (Charleston, SC) 2014 – Present
 Restart, a not-for-profit organization, equips the unemployed, underemployed and those in career transition as well as those seeking important "life skills" development, with powerful tools to enhance their search for employment today or in the future.
 Core Leadership Team member
 Community Mentor
 Seacoast Church (Mt. Pleasant, SC) 2016 – Present
 Group Leader for middle school girls
 Presenter and Team Leader
 Daniel Island School (Charleston, SC) 2011 – 2017
 Math and Reading Tutor
 Sherwood Forest Elementary School (Winston-Salem, NC) 2009 – 2011
 Science Fair Coordinator
 Board Member, PTA
 Junior League of Winston-Salem 2004 – 2011
 Board Member
 Marketing and Communications Chair
 PPG Industries, Inc. Community Outreach 2003 – 2004
 Beginning with Books (Pittsburgh, PA) 2002 – 2004
 Literacy Tutor for high-risk youth
 Principal for a Day (Pittsburgh, PA) 2003
 Junior League of Pittsburgh (Pittsburgh, PA) 2001 – 2004
 Board Member
 Community Projects Chair
 Leadership Pittsburgh 2000
 Selected participant
 Literacy Initiative (Santa Barbara, CA) 1996 – 1998
 Literacy Tutor – Adults with learning disabilities

PROFESSIONAL MEMBERSHIPS

American Society for Engineering Education

Society of Women Engineers

National Collegiate Honors Council

Southern Regional Honors Council

CERTIFICATIONS

Mini-EXCEED Engineering Education

National Coalition Building Institute

Online Teaching Academy

Critical Problem-Solving Skills

Design of Experiments

Six Sigma Methodology

Understanding Learning Styles