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PROFESSIONAL EXPERIENCE

| | |
|-----------------------------|---|
| September 2016-current | Associate Professor of Physics |
| August 2010-August 2016 | Assistant Professor of Physics University of Alabama at Birmingham |
| September 2004 – July 2010 | Research Assistant Professor Department of Physics University of Alabama at Birmingham |
| November 2000 – August 2004 | Research Associate Department of Physics University of Alabama at Birmingham |
| October 1999 – October 2000 | Postdoctoral Research Associate Department of Physics University of Alabama at Birmingham |

EDUCATION

| <u>Degree</u> | <u>Program</u> | <u>Date</u> | <u>University</u> |
|---------------|-------------------|-------------|-------------------------------------|
| Ph.D. | Materials Science | Aug. 1999 | University of Alabama at Birmingham |
| B.S. | Physics | May 1993 | California State Univ. Sacramento |

PHD ADVISOR

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SCHOLARSHIP

PEER REVIEWED PUBLICATIONS (PUBLISHED OR ACCEPTED)

Scopus data as of Mar 2021 (**excluding self-citations from all authors**)

87 cited documents, author h-index: 24

1766 total number of citations.

1. B. Storr, D. Kodali, K. Chakrabarty, P. A. Baker, V. Rangari, and S. A. Catledge, Single-Step Synthesis Process for High-Entropy Transition Metal Boride Powders Using Microwave Plasma. *Ceramics* 4, 257 (2021). <https://doi.org/10.3390/ceramics4020020>.

2. Gopi Samudrala, Kallol Chakrabarty, Paul Baker, Bernabe Tucker, Yogesh Vohra, and Shane Catledge. Selective Deposition of Hard Boron-Carbon Microstructures on Silicon. *Materials* 14(6) 1397 (2021).
3. Bhavesh Ramkorun, Kallol Chakrabarty and Shane A Catledge, Effects of direct current bias on nucleation density of superhard boron-rich boron carbide films made by microwave plasma chemical vapor deposition, *Materials Research Express* 8 046401(2021); <https://doi.org/10.1088/2053-1591/abf38c>.
4. Seth Iwan, Kaleb C. Burrage, Bria C. Storr, Shane A. Catledge, Yogesh K. Vohra, Rostislav Hrubiak, and Nenad Velisavljevic. High-pressure high-temperature synthesis and thermal equation of state of high-entropy transition metal boride. *AIP Advances* 11, 035107 (2021); <https://doi.org/10.1063/5.0045592>.
5. Gopi Samudrala, Kallol Chakrabarty, Paul Baker, Bernabe Tucker, Yogesh Vohra, and Shane Catledge. Selective Deposition of Hard Boron-Carbon Microstructures on Silicon. Accepted March 11, 2021 in journal 'Materials'.
6. K. Chakrabarty, W.-C. Chen, P.A. Baker, V.M. Vijayan, C.-C. Chen, S.A. Catledge, Superhard Boron-Rich Boron Carbide with Controlled Degree of Crystallinity. *Materials* 13, 3622 (2020). <https://www.mdpi.com/1996-1944/13/16/3622>
7. A. Rau, K. Chakrabarty, W. Gullion, P.A. Baker, I. Bikmukhametov , R.L. Martens, G.B. Thompson and S.A. Catledge, A diffusion approach for plasma synthesis of superhard tantalum borides. *Journal of Materials Research*, 35(5), 481-490 (2020). doi:10.1557/jmr.2019.357
8. Baker, P.A., Chen, W., Chen, C., Shane A. Catledge, and Y. K. Vohra, "First-Principles Predictions and Synthesis of B₅₀C₂ by Chemical Vapor Deposition", *Sci Rep* 10, 4454 (2020). <https://doi.org/10.1038/s41598-020-61462-9>
9. Vijayan VM, Tucker BS, Hwang PTJ, Bobba PS, Jun HW, Catledge SA, Vohra YK, Thomas V. Non-equilibrium organosilane plasma polymerization for modulating the surface of PTFE towards potential blood contact applications. *J Mater Chem B*. 8(14), 2814-2825 (2020). doi: 10.1039/c9tb02757b.
10. K. Chakrabarty, I. Arnold, S.A. Catledge, Hexagonal boron nitride grown using high atomic boron emission during microwave plasma chemical vapor deposition, *Journal of Vacuum Science & Technology A* 37, 061507 (2019). <https://doi.org/10.1116/1.5123210>.
11. Reim A. Almotiri; Kathryn J. Ham; Vineeth M. Vijayan; Shane A. Catledge, "Molecularly Imprinted Polyacrylamide with Fluorescent Nanodiamond for Creatinine Detection", *Materials* 12 (13), 2097 (2019).
12. R. Almotiri and S.A. Catledge, "Molecular Imprinted Polyacrylamide as a Receptor for Creatinine Detection", *Adv. Sci. Eng. Med.* 11, 394–400 (2019).
13. Moore, S.L., Samudrala, G.K., Catledge, S.A., Vohra, Y.K., "Rapid Growth of Nanocrystalline Diamond on Single Crystal Diamond for Studies on Materials under Extreme Conditions", *Scientific Reports*, 8 (1), 1402 (2018).
14. Paul A. Baker, Shane A. Catledge, Sumner B. Harris, Kathryn J. Ham, Wei-Chih Chen, Cheng-Chien Chen and Yogesh K. Vohra, "Computational Predictions and Microwave Plasma Synthesis of Superhard Boron-Carbon Materials" *Materials* 11(8), 1279 (2018).

15. Jamin Johnston and Shane A. Catledge, "Metal-boride phase formation on tungsten carbide (WC-Co) during microwave plasma chemical vapor deposition", *Applied Surface Science* 364, Pages 315–321 (2016).
16. Paul A. Baker, Raymond G. Thompson, and Shane A. Catledge, "A wear simulation study of nanostructured CVD diamond-on-diamond articulation involving concave/convex mating surfaces", *Journal of Coatings Technology and Research*, vol. 13 (2), 385-393 (2016).
17. Jamin Johnston, Matthew Jubinsky, Shane Catledge, "Plasma Boriding of a Cobalt-Chromium Alloy as an Interlayer for Nanostructured Diamond Growth", *Applied Surface Science* 328, 133-139 (2015).
18. Andrei V Stanishevsky, Michael J Walock, Shane A Catledge, "Surface modification and stability of detonation nanodiamonds in microwave gas discharge plasma", *Applied Surface Science* 357, 1403-1409 (2015).
19. Jared Ballinger, Shane A. Catledge, "Metal-boride interlayers for chemical vapor deposited nanostructured NSD films on 316 and 440C stainless steel", *Surf. Coat. Tech.* 261, 244-252 (2015)
20. Fei Liu, Veronika Kozlovskaya, Oleksandra Zavgorodnya, Claudia Martinez-Lopez, Shane Catledge, and Eugenia Kharlampieva, "Encapsulation of anticancer drug by hydrogen-bonded multilayers of tannic acid", *Soft Matter*. 10, 9237-47 (2014).
21. O. Zavgorodnya, V. Kozlovskaya, X. Liang, N. Kothalawala, S.A. Catledge, A. Dass, E. Kharlampieva, "Temperature Responsive Properties of Poly(N-vinylcaprolactam) Multilayer Hydrogels in the Presence of Hofmeister Anions", *Mater. Res. Express* 1 035039. (2014).
22. Sonal Singh, Vinoy Thomas, Dmitry Martyshkin, Veronika Kozlovskaya, Eugenia Kharlampieva and Shane A. Catledge, "Spatially Controlled Fabrication of a Bright Fluorescent Nanodiamond-Array with Enhanced Far-Red Si-V Luminescence", *Nanotechnology* 25, 045302, (2014). <http://dx.doi.org/10.1088/0957-4484/25/4/045302>.
23. Sonal Singh and Shane A. Catledge, "Silicon Vacancy Color Center Photoluminescence Enhancement in Nanodiamond Particles by Isolated Substitutional Nitrogen on {100} surfaces", *J. App. Phys.* 113, p.044701 (2013). <http://dx.doi.org/10.1063/1.4783958>.
24. Michael J. Walock, Issam Rahil, Yujiao Zou, Luc Imhoff, Shane A. Catledge, Corinne Nouveau, and Andrei V. Stanishevsky, "Sputtered Tungsten-Based Ternary and Quaternary Layers for Nanocrystalline Diamond Deposition," *J. Nanosci. Nanotechnol.* Vol. 12, No. 6, 4825–4831 (2012). <http://dx.doi.org/10.1166/jnn.2012.4935>.
25. V. Thomas, B. Halloran, S. A. Catledge, N. Ambalavanan, and Y. K. Vohra, "In vitro studies on the effect of particle size on macrophage responses to nanodiamond wear debris", *Acta Biomaterialia* 8, 1939 (2012). <http://dx.doi.org/10.1016/j.actbio.2012.01.033>.
26. A. Naik, E.J. White, and S.A. Catledge, Development of a Dot Array Biosensor by Dip-pen Nanolithography of Polyacrylamide Inks. *Inquiro* 6, p. 48-53 (2012).
27. O. Hadjar, T. Schlathölter, S. Davila, G. Kibelka, S. A. Catledge, K. Kuhn, G. F. Verbeck, S. Kassin, C. Cameron, IonCCDTM for none-scanning sector-field instrument: keV ion detection induced peak shape and detector surface artifacts, *J. Amer. Soc. Mass Spec.* 22 p.612-623 (2011). <http://dx.doi.org/10.1007/s13361-011-0213-x>.

28. L. Booth, S. A. Catledge, D. Nolen, R. G. Thompson, and Y. K. Vohra, "Synthesis and Characterization of Multilayered Diamond Coatings for Biomedical Implants", *Materials* 4, p. 857-868 (2011). doi:10.3390/ma4050857
29. S.A. Catledge and S. Singh, "Strong narrow-band luminescence from silicon-vacancy color centers in spatially localized sub-10 nm nanodiamond", *Advanced Science Letters* 4, p. 512-515 (2011).
30. Phipps MC, Clem WC, Catledge SA, Xu Y, Hennessy KM, Thomas V, Jablonsky M, Chowdhury S, Stanishevsky AV, Vohra YK, Bellis SL. "Mesenchymal stem cell responses to bone-mimetic electrospun matrices composed of polycaprolactone, collagen I, and nanoparticulate hydroxyapatite.", *PLoS ONE* 6(2): e16813 (2011). DOI:10.1371/journal.pone.0016813
31. S.A. Catledge, R. Vaid, P. Diggins, J.J. Weimer, M. Koopman, Y. K. Vohra, "Improved adhesion of ultra-hard carbon films on cobalt-chromium orthopaedic implant alloy", *J. Mater. Sci. Mater. Med.* 22, 307-316 (2011). DOI: 10.1007/s10856-010-4207-1.
32. Y. Zou, M. Walock, S.A. Catledge, C. Nouveau, A. Stanishevsky, "Thermal Stability and Mechanical Properties of Sputtered Chromium-Molybdenum-Nitride (CrMoN) Coatings", *Journal of Achievements in Materials and Manufacturing Engineering* 37, 369 - 374 (2009).
33. P. Tyagi, S.A. Catledge, A. Stanishevsky, V. Thomas, Y.K. Vohra, "Nanomechanical Properties of Electrospun Composite Scaffolds Based on Polycaprolactone and Hydroxyapatite", *Journal of Nanoscience and Nanotechnology* 9, 4839-4845 (2009). DOI: <http://dx.doi.org/10.1166/jnn.2009.1588>
34. M. McClintock, R.A. Angus, M.R. McDonald, C.D. Amsler, S.A. Catledge, Y.K. Vohra, "Rapid dissolution of shells of weakly calcified Antarctic benthic macroorganisms indicates high vulnerability to ocean acidification", *Antarctic Science* 21, 449-456 (2009). DOI 10.1017/S0954102009990198.
35. Stanishevsky, S. Catledge, and Y. Vohra, Surface modification and functionalization of nanostructured carbons, *J. Achiev. Mater. Manuf. Eng.* 37, 348 - 353 (2009).
36. M.R. Hill, S.A. Catledge, V. Konovalov, W.C. Clem, S. Chowdhury, B.S. Etheridge, A. Stanishevsky, J.E. Lemons, Y.K. Vohra, and A.W. Eberhardt, "Preliminary tribological evaluation of nanostructured diamond coatings against ultra-high molecular weight polyethylene", *J. Biomed. Mat. Res. Part B: Applied Biomaterials* 85B, 140-148 (2008). DOI: 10.1002/jbm.b.30926
37. G. Samudrala, W. Qiu, S.A. Catledge, J.G. Harrison, Y.K. Vohra, and S.T. Weir, "Growth chemistry for the fabrication of designer diamonds for high pressure research", *High Pressure Research* 28, 1-8 (2008).
38. S. Chowdhury, J. Borham, S.A. Catledge, A.W. Eberhardt, P.S. Johnson, and Y.K. Vohra, "Synthesis and mechanical wear studies of ultra-smooth nanostructured diamond (USND) coatings deposited by microwave plasma chemical vapor deposition with He/H₂/CH₄/N₂ mixtures" *Diamond. Relat. Mater.* 17, 419-427 (2008).
39. S.A. Catledge, Y.K. Vohra, D.D. Jackson, and S.T. Weir, "Adhesion of nanostructured diamond film on a copper-beryllium alloy" *J. Materials Res.* 23, 2373-2381 (2008). 10.1557/jmr.2008.0287

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41. V. Thomas, X. Zhang, S. A. Catledge, and Y. K. Vohra, "Functionally graded electrospun scaffolds with tunable mechanical properties for vascular tissue regeneration", *Biomedical Materials* 2, 224 (2007). doi:10.1088/1748-6041/2/4/004
42. S.A. Catledge, W. C. Clem, N. Shrikishen, S. Chowdhury, A.V. Stanishevsky, M. Koopman, and Y.K. Vohra, "An electrospun triphasic nanofibrous scaffold for bone tissue engineering", *Biomedical Materials* 2, 142-150 (2007). doi:10.1088/1748-6041/2/2/013
43. S Chowdhury, Damon A Hillman, Shane A Catledge, Valery V Konovalov, Yogesh K Vohra, "Synthesis of ultrasmooth nanostructured diamond films by microwave plasma chemical vapor deposition using a He/H₂/CH₄/N₂ gas mixture", *Journal of materials research* 21, 2675-2682 (2006).
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45. William. C. Clem, Valeriy V. Konovalov, Shafiul Chowdhury, Yogesh K. Vohra , S. A. Catledge, and Susan L. Bellis, "Mesenchymal Stem Cell Adhesion and Spreading on Microwave Plasma Nitrided Titanium Alloy", *J Biomed Mater Res.* 76A(2), 279-287 (2006). DOI: 10.1002/jbm.a.30557
46. V.V. Konovalov, A. Melo, S.A. Catledge, S. Chowdhury, Y.K. Vohra, "Ultra smooth nanostructured diamond films deposited from He/H₂/CH₄/N₂ microwave plasmas", *J. Nanosci. Nanotech.* 6, 258-261 (2006).
47. S. Chowdhury, Vinoy Thomas, Derrick Dean, S.A. Catledge, Yogesh K. Vohra, "Nanoindentation on Porous Bioceramic Scaffolds for Bone Tissue Engineering", *Journal of Nanoscience and Nanotechnology* 5, 1816 (2005). <http://dx.doi.org/10.1166/jnn.2005.428>
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49. R. S. Peterson, P. A. Baker, S. A. Catledge, Y. K. Vohra, and S. T. Weir, "Optical Defect Centers and Surface Morphology of Isotopically Enriched Diamond Layers in Designer Diamond Anvils", *Journal of Applied Physics* 97, 073504-073504-8 (2005). DOI:10.1063/1.1872203
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51. S. A. Catledge, Y. K. Vohra, S. L. Bellis, and A. A. Sawyer, "Mesenchymal Stem Cell Adhesion and Spreading on Nanostructured Biomaterials", *J. Nanoscience and Nanotechnology* 4, 986 (2004). DOI: <http://dx.doi.org/10.1166/jnn.2004.137>

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55. Machado C., Catledge A., Lacefield W., HUMAN ENAMEL NANO HARDNESS, AND ELASTIC MODULUS AFTER CITRIC CONTACT. *J. of Dental Research* Vol 82, Special Issue A, March 2003.
56. S. A. Catledge. M. Cook, Y. K. Vohra, E. M. Santos, M. D. McClenney, and K. D. Moore, "Surface crystalline phases and nanoindentation hardness of explanted zirconia femoral heads", *J. Mat. Sci.-Mat. In Medicine* 14, 863 (2003). DOI: 10.1023/A:1025678525474
57. D. D. Jackson, C. Aracne-Ruddle, V. Malba, S. T. Weir, S. A. Catledge, and Y. K. Vohra, "Magnetic susceptibility measurements at high pressure using designer diamond anvils", *Rev. Sci. Instr.* 74, 2467 (2003). <http://dx.doi.org/10.1063/1.1544084>
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60. R. B. Corvin, J. G. Harrison, S. A. Catledge, and Y. K. Vohra, "Gas-Phase Thermodynamic Models of Nitrogen-Induced Nanocrystallinity in Chemical Vapor-Deposited Diamond", *App. Phys. Lett.* 80, April 2002. <http://dx.doi.org/10.1063/1.1467618>
61. P. A. Baker, S. A. Catledge, and Y. K. Vohra, "Low-Temperature Growth of Nanostructured Diamond Films", *Journal of Nanoscience and Nanotechnology* 1, 31 (2001). <http://dx.doi.org/10.1166/jnn.2001.007>
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- Interferometry", *Diam. and Relat. Mater.* 9, 1512 (2000).
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PUBLICATIONS (INTERNALLY PEER REVIEWED AT UAB)

1. A. Naik, E.J. White, and S.A. Catledge, "Development of a Dot Array Biosensor by Dip-pen Nanolithography of Polyacrylamide Inks", *Inquiro* 6, p. 48-53 (2012).

MANUSCRIPTS (SUBMITTED FOR PEER-REVIEW)

1. Almotiri, Reim; S Dhama, Bibek; D Subedi, Shova; Appavoo, Kannatassen; A Catledge, Shane, "Creatinine-imprinted polyacrylamide with fluorescent nanodiamond reporters" has been successfully submitted online and is presently being given full consideration for publication in Journal of Chemical Research, Manuscript ID is CHL-21-0011.
2. B. Ramkorun, K. Chakrabarty, S.A. Catledge SA, "Effects of direct current bias on nucleation density and growth of superhard boron-rich boron carbide films made by microwave plasma chemical vapor deposition", under review in Materials Research Express, Manuscript ID is MRX2-104617.R1.

MANUSCRIPTS (IN PREPARATION)

1. K. Chakrabarty, P.A. Baker, and S. A. Catledge, "Conversion of sp²- to sp³-bonded boron nitride by application of negative DC bias", in preparation, journal TBD.

PATENTS AND DISCLOSURES

1. Provisional patent application # 61/909,725 entitled "Process for Diamond-Coating of Cobalt-Containing Alloys Using Vapor-Deposited Boride Interlayer", S.A. Catledge, Y.K. Vohra, and J. Johnston, filed on November 27, 2013.
2. *United States Patent Application 20100209665-A1 entitled "Ultra smooth nanostructured diamond films and compositions and methods for producing same"*, Valeriy V. Konovalov, Yogesh K. Vohra, and Shane A. Catledge; Publication Date: August 19, 2010.
3. *United States Patent Number 6,183,818 entitled "Process for Ultra Smooth Diamond Coating on Metals and Uses Thereof"*, Yogesh K. Vohra and Shane A. Catledge; Patent Issued February 6, 2001.

BOOK CHAPTERS AND REVIEWS

1. V. Thomas, P. Baker, A. Catledge, G. P. Siegel, Y. K. Vohra, Book Chapter entitled "Ceramic Coatings in Load-Bearing Articulating Joint Implants", in Materials and Devices for Bone Disorders, Edited by Bose and Bandyopadhyay, Elsevier – Academic Press 2017, pp 315-347.
2. S.A. Catledge, V. Thomas, Y.K. Vohra, "Nanostructured Diamond Coatings for Orthopaedic Applications", in *Diamond based materials for biomedical application*, p.105-150, ed. by Roger Narayan; Woodhead Publishing Series in Biomaterials No. 55; Woodhead Publishing Limited (2013).

3. S. A. Catledge, M. Fries, and Y. K. Vohra, "Nanostructured Surface Modifications for Biomedical Implants", in Encyclopedia of Nanoscience and Nanotechnology, Edited by Hari Singh Nalwa, American Scientific Publishers, Volume 7, pages 741-762 (2004).
4. S. A. Catledge, M. Fries, Y. K. Vohra, W. R. Lacefield, J. E. Lemons, S. Woodard, and R. Krishna, "Nanostructured Ceramics for Biomedical Implants", Review Article; Journal of Nanoscience and Nanotechnology 2, 293 (2002).

CONFERENCE PROCEEDINGS (NON-PEER REVIEWED)

1. S. Singh and S.A. Catledge, "Fluorescent Nanodiamonds with Silicon-Vacancy Color Center: A Potential Cellular Biomarker", in Biosensors, Instruments, Medical, Environment and Energy, Nanotech Conference and Expo 2011, Nanotech Vol. 3, p.129-132 (2011). ISBN: 978-1-4398-7138-6
2. L. Booth, S.A. Catledge, A. Eberhardt, and Y.K. Vohra, "Multilayer Nanostructured Diamond Coatings for Hip and Knee Arthroplasty", in TRANSACTIONS OF THE ANNUAL MEETING - ORTHOPAEDIC RESEARCH SOCIETY- 56th Annual Meeting, (2010). ISSN: 0149-6443
3. S.A. Catledge, P. Tyagi, M. Koopman, A. Stanishevsky, and Y.K. Vohra, "Electrospun Gelatin/Hydroxyapatite Nanocomposite Scaffolds for Bone Tissue Engineering", in From Biological Materials to Biomimetic Materials Synthesis, eds. N. Kroger, R. Qiu, R. Naik, D. Kaplan, MRS Proceedings Vol. 1094 (2008). <http://dx.doi.org/10.1557/PROC-1094-DD09-05>
4. S. Fox, I. Stanishevskaya, S. Chowdhury, S.A. Catledge, and A. Stanishevsky, "Mechanical Properties of Nanoparticle Hydroxyapatite/gelatin Constructs", in Solids at the Biological Interface", eds. V.L. Ferguson, J.X-J. Zhang, C. Stoldt, C.P. Frick, MRS Proceedings Vol. 1063 (2008). <http://dx.doi.org/10.1557/PROC-1063-OO05-04>
5. A. Stanishevsky, P. Chinoda, S. Chowdhury, V. Thomas, S.A. Catledge, and D. Dean, "Compositionally Modified Hydroxyapatite Nanocrystals for Polymer/Ceramic Scaffold Applications", in Biomimetic Polymers and Gels, eds. N. Langrana, F. Horkay, B. Yurke, MRS Proceedings Vol. 897 (2006). <http://dx.doi.org/10.1557/PROC-0897-J03-18>
6. S. A. Catledge, Y. K. Vohra, S. Woodard, and K. Venugopalan "Structure and Mechanical Properties of Functionally-Graded Nanostructured Metallo-ceramic Coatings", in Mechanical Properties Derived from Nanostructuring Materials, eds. H. Kung, D.F. Bahr, N.R. Moody, K.J. Wahl, MRS Proceedings Vol. 778 (2004). <http://dx.doi.org/10.1557/PROC-778-U7.8>
7. Q. Liang, S. A. Catledge, and Y. K. Vohra, "Mechanical Properties of Boron Doped Diamond Films Prepared by MPCVD", in Mechanical Properties of Nanostructured Materials and Nanocomposites, eds. I. Ovid'ko, C.S. Pande, R. Krishnamoorti, E. Lavernia, G. Skandan, MRS Proceedings Vol. 791 (2004). <http://dx.doi.org/10.1557/PROC-791-Q8.19>
8. M. J. Papo, S. A. Catledge, C. Machado, S. Kashef, A. Eberhardt, and Y. K. Vohra, "On the Wear Assessment of Multilayer Nanocrystalline Diamond Coated Implants of the Temporomandibular Joint", in Mechanical Properties of Nanostructured Materials and

- Nanocomposites, eds. I. Ovid'ko, C.S. Pande, R. Krishnamoorti, E. Lavernia, G. Skandan, MRS Proceedings Vol. 791 (2004). <http://dx.doi.org/10.1557/PROC-791-Q8.20>
9. V. Vohra, S.A. Catledge, Y.K Vohra, "Effect of Surface Treatments on the Structural and Mechanical Properties of Nanostructured Diamond Coatings on Tungsten Carbide Cutting Tools", in Mechanical Properties of Nanostructured Materials and Nanocomposites, MRS Proceedings, Vol. 791 (2004). <http://dx.doi.org/10.1557/PROC-791-Q8.22>
 10. M. Bulut, S. A. Catledge, Y. K. Vohra, and R. Camata, "Thermal Stability of Nanocrystalline Diamond Films Grown by Microwave Plasma Chemical Vapor Deposition", in Surface Engineering 2002--Synthesis, Characterization and Applications, eds. Ashok Kumar, Wen Jin Meng, Yang-Tse Cheng, Jeffrey S. Zabinski, Gary L. Doll, Stan Veprek, MRS Proceedings Vol. 750 (2003). <http://dx.doi.org/10.1557/PROC-750-Y2.9>
 11. S. A. Catledge and Y. K. Vohra, "Effect of Nitrogen Feedgas Addition on the Mechanical Properties of Nano-Structured Carbon Coatings", in Mechanical Properties of Structural Films, eds. C. L. Muhlstein and S. T. Brown, ASTM STP1413, West Conshohocken, PA, (2001). DOI: 10.1520/STP10986S
 12. S. A. Catledge, P. T. Spencer, J. R. Patterson, and Y. K. Vohra, "Nanoindentation of Pressure Quenched Fullerenes and Zirconium Metal from a Diamond Anvil Cell", in Fundamentals of Nanoindentation and Nanotribology II, eds. S.P. Baker, R.F. Cook, S.G. Corcoran, and N.R. Moody, MRS Proceedings Vol. 649 (2001). <http://dx.doi.org/10.1557/PROC-649-Q7.24>
 13. P. Baker, S.A. Catledge, Y.K. Vohra, "Low Temperature Growth of Nanostructured Diamond Films on Metals", Proceedings of the Sixth Applied Diamond Conference/Second Frontier Carbon Technology Joint Conference, Auburn, AL, 6-10 August 2001 (document ID: 20010097445). <http://ntrs.nasa.gov/search.jsp?R=20010097445>
 14. J. Akella, S.A. Catledge, G.N. Chesnut, H. Prokop, Y.K. Vohra, S.T. Weir, "X-ray diffraction studies using diamond coated rhenium gasket to megabar pressures", International Conference on High Pressure Science and Technology, Honolulu, HI, July 25-30,1999. (UCRL-JC-133812; DP0102012, pub. date 09/30/1999).
 15. J. Akella, S.A. Catledge, Y.K. Vohra, S.T. Weir, "Diamond anvils with integrated diamond-encapsulated microprobes for high-pressure electrical transport experiments", International Conference on High Pressure Science and Technology, Honolulu, HI, July 25-30,1999. (Issue: UCRL-JC-133670; DP0102012, pub. date 07/21/1999).
 16. S. A. Catledge and Y. K. Vohra, "Nitrogen-Induced Nanocrystallinity of CVD Diamond Films on Ti-6Al-4V Alloys", in Properties and Processing of Vapor-Deposited Coatings, eds. R.N. Johnson, W.Y. Lee, M. Pickering, B.W. Sheldon, MRS Proceedings Vol. 555 (1999). <http://dx.doi.org/10.1557/PROC-555-377>
 17. S. A. Catledge and Y. K. Vohra, "Structure and Stress Evaluation of Diamond Films Deposited on Ti-6Al-4V Alloy at Low Temperature Using CH₄/O₂/H₂ and CO/H₂ Gas Mixtures", in Thin Films-Stresses and Mechanical Properties VII, eds. R. C. Cammarata, M. Nastasi, E. P. Busso, and W. C. Oliver, MRS Proceedings Vol. 505 (1998). <http://dx.doi.org/10.1557/PROC-505-629>

18. S.A. Catledge, Y.K. Vohra, C. Yan, H.T. Tohver, "Morphology and Quantitative Nitrogen Impurity Measurements in Homoepitaxial Chemical Vapor Deposited Diamond", in *Thin Films – Structure and Morphology*, eds. R.C. Cammarata, E.H. Chason, T.L. Einstein, E.D. Williams, D. Ila, S. Moss, MRS Proceedings Vol. 441 (1997). <http://dx.doi.org/10.1557/PROC-441-635>

PRESENTATIONS (INVITED, INCLUDING COLLOQUIUM)

1. S. A. Catledge, "Tailoring Nanomaterials toward Super-hardness and Molecular Sensing Capabilities" Physics colloquium, Feb. 14, 2020.
2. S.A. Catledge, "Chemical Vapor Deposition of Boron Nitride", NSF EPSCOR Annual Meeting, Huntsville, AL. June 15th, 2018.
3. S.A. Catledge, "Nanostructured Carbon-Based Materials for Biomedical Applications", UAB Dept. of Materials Science & Engineering Colloquium, Nov. 12, 2018.
4. S.A. Catledge, "Nanostructured Carbon-Based Materials for Biomedical Applications", UAH, Dept. Of Chemistry Colloquium, March 23, 2018.
5. S.A. Catledge, "Dazzling Diamonds: History and Potential Applications"; Birmingham Science Café Program (affiliated with McWane Science Center), Aug. 16th, 2016.
6. S.A. Catledge, "Atomic Force Microscopy – Principles and Applications"; UAB Dept. of Materials Engineering, Nov. 3rd, 2016.
7. S.A. Catledge, "Dazzling Diamonds: History and Medical Applications", UAB Department of Chemistry, non-technical seminar for Sigma Xi Chapter, to be given Jan 27, 2016.
8. S.A. Catledge, "Nanostructured Diamond for use in Biomedical Devices; NanoBio Summit 2015, UAB, October 15-16.
9. S.A. Catledge, "Advances in Nanostructured Diamond", UAB Dept. of Materials Engineering, Spring 2015
10. S.A. Catledge, "Advances in Nanostructured Diamond", UAB Dept. of Physics, Spring 2015.
11. S.A. Catledge, "Nanostructured Biomaterials: From Orthopaedic Implants to Fluorescent probes", Dept. of Chemistry, University of Alabama at Huntsville, Spring 2012.
12. S.A. Catledge, "Nanodiamond applications in medicine", UAB SPS seminar series, Fall 2012.
13. S.A. Catledge, "Nanostructured Biomaterials: From Orthopaedic Implants to Fluorescent probes", UAB Dept. of Materials and Mechanical Engineering Colloquium, Fall 2010.
14. S.A. Catledge, "Nanostructured Biomaterials: Surface Modification and Tissue Regeneration", UAB Dept. of Materials and Mechanical Engineering Colloquium, Spring 2009.
15. S.A. Catledge, UAB Physics Dept. Seminar, Fall 2008; Title: "Nanostructured Biomaterials: Surface Modification and Tissue Regeneration"

16. S.A. Catledge, "Nanoindentation Studies on Nanostructured Diamond and Tetrahedral Amorphous Carbon Materials", American Physical Society, March Meeting, Seattle, WA. (2001).

PRESENTATIONS (CONTRIBUTED)

2020 (TOTAL: 4)

1. B Ramkorun, K Chakrabarty, S Harris, S Catledge. Effects of substrate bias on current for varying argon intensity in a low-pressure hydrogen/argon plasma in chemical vapor deposition. Bulletin of the American Physical Society **65**; Paper # W52. 00012, (published 03/06/2020). APS March Meeting: Thin Film Coatings and Applications, CO, 6th Mar. 2020. (Abstract accepted, meeting cancelled due to COVID-19).
2. B. Ramkorun, P. Baker, S.A. Catledge, "Effects of DC bias on optical emission and nucleation density for growth of boron-rich materials made by microwave plasma chemical vapor deposition", hosted by Sigma Xi honor society. <https://www.sigmaxi.org/meetings-events/virtual-student-scholars-symposium>, Virtual Student Scholars Symposium, 14th May. 2020. (Oral Presentation).
3. Aaditya Rau, Kallol Chakrabarty, William Gullion, Paul A. Baker, Ilias Bikmukhametov, Richard L. Martens, Gregory B. Thompson and Shane A. Catledge. A Diffusion Approach for Plasma Synthesis of Superhard Tantalum Borides. NCUR 2020 at Montana State University, Mar 26-28, 2020. (Abstract accepted, meeting cancelled due to COVID-19). Now scheduled virtually for April 12-14, 2021. https://apps.cur.org/ncur2021/search/Display_NCUR.aspx?id=111588
4. Kallol Chakrabarty, Wei-Chih Chen, Paul A. Baker, Vineeth M. Vijayan, Cheng-Chien Chen and Shane A. Catledge. Microwave Plasma Chemical Vapor Deposition of Superhard Boron-Rich Boron Carbide with Controlled Degree of Crystallinity. EPSCoR Science & Technology Open House, October 22nd, 2020 (Oral Presentation, Virtual Conference). <https://www.uah.edu/cpu2al/meetings/stoh>

2019 (TOTAL:5)

1. K. Chakrabarty and Shane A. Catledge, Microwave Plasma Chemical Vapor Deposition to Synthesize Boron Nitride Thin Film, 2019 NSF EPSCoR CPU2AL Annual Meeting (Poster Presentation). <https://www.uah.edu/cpu2al/meetings/annual-meeting>
2. Kallol Chakrabarty, Aaditya Rau, Paul A. Baker, Shane A. Catledge, Superhard Tantalum Borides Via Microwave Plasma Chemical Vapor Deposition, 86th Annual Meeting of the APS Southeastern Section, North Carolina, Nov. 7th, 2019. (oral presentation) <https://meetings.aps.org/Meeting/SES19/Session/F04.7>
3. B. Ramkorun, K. Chakrabarty, S.A. Catledge, Effect of Argon flow and DC bias on optical emission spectroscopy of argon/hydrogen plasma, 86th Annual Meeting

- of the APS Southeastern Section, North Carolina, Nov. 7th , 2019. (poster presentation) <https://meetings.aps.org/Meeting/SES19/Session/D04.2>
4. B. Ramkorun, K. Chakrabarty, S.A. Catledge, Literature Review of DC Bias in the nucleation of BN thin films in Chemical Vapor Deposition, AL Material Science Symposium: Nanomaterials (Abstract # 44), AL, 24th Jan. 2019 (poster presentation) <https://materialsscience.ua.edu/symposium/>
 5. R.A. Almotiri, S.A.Catledge "Creatinine detection based on molecularly imprinted polymer technique of polyacrylamide hydrogel and luminescence of Nano diamond as a single transducer", NSF EPSCoR Regional Outreach: All About Research Center Programs (AARCP) meeting EPSCoR, Mobile , Alabama, April 3-4 2019. <https://www.uah.edu/cpu2al/meetings/aarcp>

2018 (TOTAL:5)

1. K. Chakrabarty, A. Catledge, "Development of Boron Nitride Thin Film using Microwave Plasma Chemical Vapor Deposition", Science & Technology Open House Hosted by Tuskegee University 2018 (Poster Presentation).
2. K. Chakrabarty, Junhi Chang, Joshua Vawdrey, Sumner Harris, and A. Catledge, "Spectroscopic study of excited species induced by Microwave Plasma Chemical Vapor Deposition in the H₂/N₂/B₂H₆ system". 2018 NSF EPSCoR CPU2AL Annual Meeting. (Poster Presentation).
3. R.A. Almotiri and S.A. Catledge "Creatinine detection based on molecularly imprinted polymer technique of polyacrylamide hydrogel and luminescence of Nano diamond as a single transducer" 28th. Anniversary World Congress on Biosensors 2018, Miami, Florida, USA, June 2018 (Oral)
4. C.J. Bartlett and S.A. Catledge, "Electrospun Polymer Fibers Infused with Cellulose Nanowhiskers to Improve Mechanical Properties of Injectable Composite Bone Cements: A Micromechanics Approach", World Conference and Expo on Biomedical Engineering, July 16-17, 2018 (oral).
5. J. Rice and S.A. Catledge, "Engineered Cementitious Composites as Injectable Bone Cements", World Conference and Expo on Biomedical Engineering, July 16-17, 2018 (poster).

2016 (TOTAL: 2)

6. Jamin M. Johnston and Shane A. Catledge, "Nanodiamond growth and adhesion on temperature varied tungsten borides formed by plasma enhanced chemical vapor deposition", MRS Spring Meeting, Phoenix, AZ, March 28-April 1, 2016. (poster)

7. R.A. Almotiri, "Development of a Molecularly Imprinted Polyacrylamide Polymer for applications in Bio sensing" 43 rd. International Conference on Metallurgical Coating and thin films, San Diego, CA, USA, April 25-29, 2016. (poster)

2015 (TOTAL: 1)

1. Shane A. Catledge, "Spatially Controlled Si-V Defect Nanodiamonds with Nitrogen-Enhanced Photoluminescence for Sensing in Molecularly-Imprinted Polymers", MRS Fall Meeting, Boston, MA, Nov. 31-Dec. 4, 2015.

2014 (TOTAL: 7)

1. Matthew Jubinsky, Sonal Singh, and Shane A. Catledge, "An investigation of the surface layer produced by plasma boriding Co-Cr-Mo biomedical alloy using chemical vapor deposition", Conference Tools for Materials Science & Technology 2014, Pittsburgh, PA, Oct.12-16, 2014.
2. Jared Ballinger and Shane A. Catledge, "Metal-boride interlayers for chemical vapor deposited nanostructured diamond films on 316 and 440C stainless steel", 3rd International Conference on Materials Science & Engineering, San Antonio, TX, Oct. 6-8, 2014.
3. Jamin Johnston, Matthew Jubinsky, and Shane A. Catledge, "Plasma Boriding of a Cobalt-Chromium Alloy as an Interlayer for Nanostructured Diamond Growth", 3rd International Conference on Materials Science & Engineering, San Antonio, TX, Oct. 6-8, 2014.
4. Sonal Singh, Vinoy Thomas, Dmitry Martyshkin, Veronika Kozlovskaya, Eugenia Kharlampieva and Shane A. Catledge, "Spatially Controlled Fabrication of Brightly Fluorescent Nanodiamond-Array with Enhanced Far-Red Si-V Luminescence", New Diamond and Nano Carbons Conference (NDNC 2014), May 25-29, 2014. (C8.08).
5. Sonal Singh, Vinoy Thomas, Dmitry Martyshkin, Veronika Kozlovskaya, Eugenia Kharlampieva and Shane A. Catledge, "Spatially Controlled Fabrication of Brightly Fluorescent Nanodiamond-Array with Enhanced Far-Red Si-V Luminescence", Nanotech Advanced Materials and Applications, Washington, DC., June 15-18, 2014.
6. C. Schindler, A. Goins, S. Singh, S.A. Catledge, D.R. Dean, "Carbon Nanotube inks for dip-pen nanolithography patterning", Nanotech Advanced Materials and Applications, Washington, DC., June 15-18, 2014.
7. E.J. White and S.A. Catledge, "Development of Polyacrylamide Molecularly Imprinted Polymer for Biosensing Application", UAB Spring Expo, April 11, 2014.

2013 (TOTAL: 3)

8. S.A. Catledge, "Vapor-deposited metal-boride interfacial layers as diffusion barriers for nanostructured diamond growth on cobalt alloys", 3rd International Conference on Nanotek and Expo, Las Vegas, NV, Dec. 2-4, 2013.
9. S.A. Catledge and Sonal Singh, "Spatially controlled Si-V defect nanodiamonds with nitrogen-enhanced photoluminescence prepared by scanning probe lithography", 3rd International Conference on Nanotek and Expo, Las Vegas, NV, Dec. 2-4, 2013.
10. A. Naik, E.J. White, and S.A. Catledge, "Development of a Dot Array Biosensor by Dip-pen Nanolithography of Polyacrylamide Inks", National Collegiate Research Conference (NCRC), January 24-26 (2013), Harvard University.

2012 (TOTAL: 3)

11. S. Singh and S.A. Catledge, "Scanning Probe Lithography of Nanodiamond array and enhanced fluorescence from Si-V defects, Materials Research Society Spring Meeting and Exhibit, San Francisco, CA, April 9-13, 2012. (FF2.2)
12. J. Ballinger and S.A. Catledge, "Microwave Plasma CVD Diamond on Borided 440c and 316 Stainless Steel", NANOSMAT USA 2012, Tampa FL, March 27-30.
13. J. Ballinger and S.A. Catledge, "Microwave Plasma CVD Diamond Employing Interlayers on 440c and 316 Stainless Steel", NIBIB Training Grantees Meeting in Bethesda, MD, June 28-29, 2012.

2011 (TOTAL: 3)

14. S. Singh and S.A. Catledge, "Fluorescent Nanodiamonds with Silicon-Vacancy Color Center: A Potential Cellular Biomarker", Nanotech Conference and Expo, June 13-16, Boston, MA, 2011.
15. S.A. Catledge and S. Singh "Scanning probe lithography and fluorescence of nanodiamond with silicon-vacancy centers" NANOSMAT-6, October 17-20, 2011, Krakow, Poland.
16. S.A. Catledge and J. Ballinger "CVD diamond on stainless steel via TiN and graded boride interlayers" NANOSMAT-6, October 17-20, 2011, Krakow, Poland

2010 (TOTAL: 2)

17. L. Booth, S. A. Catledge, A. Eberhardt, and Y. K. Vohra, "Multilayer Nanostructured Diamond Coatings for Hip and Knee Arthroplasty", Poster No. 2262 • 56th Annual Meeting of the Orthopaedic Research Society, March 6-9, New Orleans, 2010.
18. L. Booth, S. A. Catledge, A. W. Eberhardt, Y. K. Vohra *Multilayered Nanostructured Diamond Coatings for Biomedical Implants* Presented at 2nd International Workshop on Science and Application of Nanoscale Diamond Materials, June 2010, Zakopane, Poland.

2009 (TOTAL: 2)

19. S.A. Catledge, "Improved adhesion of nanostructured diamond films on CoCrMo alloy", International Conference on Vacuum and Plasma Surface Engineering 2009, held jointly with the International Workshop on Science and Application of Nanoscale Diamond Materials, in Hejnice, Czech Republic, Oct 22-26, 2009.
20. S.A. Catledge, "Improved adhesion of nanostructured diamond films on CoCrMo alloy", International Diamond Conference, Athens, Greece, Sept 6-10, 2009.

2008 (TOTAL: 4)

21. Clem WC, Catledge SA, Chowdhury S, Hennessy KM, Stanishevsky AV, Tousson A, Koopman M, Shaikh FM, Vohra YK, Bellis SL (2008). "Mesenchymal Stem Cell Interaction with Nanostructured Diamond and Electrospun Composite Fibers for Orthopaedic Applications." National Institute of Biomedical Imaging and Bioengineering Meeting. Washington D.C.
22. Parul Tyagi, Shane Aaron Catledge, Reshu Saini, Xing Zhang, Andrei Stanishevsky and Yogesh Kumar Vohra, "Electrospun Polymer/hydroxyapatite Nanocomposite Scaffolds Made Using Gelatin or Polycaprolactone for Bone Tissue Engineering", MRS Spring Meeting 2008, San Francisco, CA. March 25-28th, 2008.
23. Vinoy Thomas, Xing Zhang, Shane A Catledge and Yogesh K Vohra, "Tubular Scaffolds of Protein/PDS® Nanofiber Blends with Spatially Designed Tri-layer Structure for Vascular Tissue Engineering", MRS Spring Meeting 2008, San Francisco, CA. March 25-28th, 2008.
24. Xing Zhang, Vinoy Thomas, Aaron Catledge and Yogesh Vohra, "Mechanical Properties of Electrospun Vascular Grafts during In Vitro Degradation", MRS Spring Meeting 2008, San Francisco, CA. March 25-28th, 2008.

2007 (TOTAL: 3)

25. S. Fox, I. Stanishevskaya, S. Chowdhury, S.A. Catledge, and A. Stanishevsky, "Mechanical Properties of Nanoparticle Hydroxyapatite/gelatin Constructs", 2007 MRS Fall Meeting. Nov.26-30.
26. Clem WC, Catledge SA, Chowdhury S, Hennessy KM, Thomas V, Tyagi P, Bellis SL, Vohra YK (2007) "In Vitro and In Vivo Study to Evaluate Polycaprolactone/ Hydroxyapatite/ Collagen I Electrospun Scaffolds for Bone Tissue Engineering Applications." Society for Biomaterials Meeting. Chicago, IL. April 17-21.
27. Chowdhury S, Clem WC, Catledge SA, Johnson PS, Eberhardt AW, Luque SA, Lemons JE, Vohra YK (2007). "Ultra smooth Nanocrystalline Diamond Coatings for Dental Implant Applications." Society for Biomaterials Meeting. Chicago, IL. April 17-21

2006 (TOTAL: 2)

28. S.A. Catledge, "Microwave Plasma Nitriding and Carbiding Surface Modification for Nanostructured Diamond Growth on CoCrMo Alloy", NSTI Nanotech 2006, Boston, MA, May 10th, 2006.

29. Clem WC, Chowdhury S, Thomas V, Catledge SA, Laugier MT, Bellis SL, Vohra YK (2006) "Comparison of Mesenchymal Stem Cell Adhesion and Spreading on Diamond-Like Carbon (DLC), Carbon Nitride, and Nanocrystalline Diamond." NSTI Nanotech. Boston, MA. May 7-11.

2005 (TOTAL: 5)

30. A. Stanishevsky, P. Chinoda, S. Chowdhury, V. Thomas, S.A. Catledge, and D. Dean, "Compositionally Modified Hydroxyapatite Nanocrystals for Polymer/Ceramic Scaffold Applications", Nov. 27-Dec. 2, 2005
31. S.A. Catledge, "Nanotribology of Boron-doped and Undoped Nanostructured Diamond Films on Titanium Alloys", MRS Spring meeting 2005, San Francisco, CA, March 31st, 2005.
32. Clem WC, Bellis SL, Catledge SA, and Vohra YK (2005). "Surface Modified Titanium and Nanostructured Diamond Surfaces to Enhance Mechanical Properties and Biocompatibility of Implants". Southeastern Workshop on Tissue Engineering and Biomaterials. Birmingham, AL, Feb. 11-12, 2005.
33. Clem WC, Bellis SL, Catledge SA, Vohra YK (2005). "Human Mesenchymal Stem Cell Adhesion and Spreading on Nanostructured Diamond and Plasma Nitrided Titanium Alloy Surfaces.", March 28-April 1, 2005. MRS Spring Meeting. San Francisco, CA.
34. Thomas V, Jagani S, Kalonda J, Jose MV, Dean D, Clem WC, Bellis SL, Catledge SA, Vohra YK (2005) "Nanostructured collagen and nanohydroxyapatite composite scaffolds for bone tissue engineering." MRS Fall Meeting. Nov 28-Dec. 2 Boston, MA.

2004 (TOTAL: 2)

35. R. Lawson, S.A. Catledge, and Y.K. Vohra, "Nanostructured Diamond Coated CoCrMo Alloys for Use in Biomedical Implants", Proceedings of the 17th International Symposium on Ceramics in Medicine; the Annual Meeting of the International Society for Ceramics in Medicine, New Orleans, Louisiana, USA, 8-12 December 2004.
36. S.A. Catledge, Y. K. Vohra, S. L. Bellis, and A. A. Sawyer "Mesenchymal stem cell adhesion and spreading on metalloceramic biomaterials", Proceedings of the 17th International Symposium on Ceramics in Medicine; the Annual Meeting of the International Society for Ceramics in Medicine, New Orleans, Louisiana, USA, 8-12 December 2004.

2003 (TOTAL: 7)

37. Machado C., Catledge A., Lacefield W., HUMAN ENAMEL NANO HARDNESS, AND ELASTIC MODULUS AFTER CITRIC CONTACT. Presented at AADR Meeting, San Antonio, Texas, March 2003.
38. H. Kim, S. A. Catledge, Y. K. Vohra, R. P. Camata, W. R. Lacefield, "Mechanical Properties of Nanostructured and Preferentially Oriented Hydroxyapatite Coatings Grown by Pulsed Laser Deposition," 2003 Spring Meeting of the Materials Research Society, April 21-25, 2003, San Francisco, California.

39. R. P. Camata, H. Kim, S. A. Catledge, Y. K. Vohra, and W. R. Lacefield, "*Nanostructuring and texturing of pulsed laser deposited hydroxyapatite thin films*," 2003 March Meeting of The American Physical Society, March 3 – 7, 2003, Austin, Texas (Bull. Amer. Phys. Soc. 48, 572 (2003).
40. Q. Liang, S. A. Catledge, and Y. K. Vohra, "Mechanical Properties of Boron Doped Diamond Films Prepared by MPCVD", MRS Fall Meeting 2003, Boston, MA, Dec. 1-5, 2003.
41. M. J. Papo, S. A. Catledge, C. Machado, S. Kashef, A. Eberhardt, and Y. K. Vohra, "On the Wear Assessment of Multilayer Nanocrystalline Diamond Coated Implants of the Temporomandibular Joint", MRS Fall Meeting 2003, Boston, MA, Dec. 1-5, 2003.
42. V. Vohra, S.A. Catledge, Y.K Vohra, "Effect of Surface Treatments on the Structural and Mechanical Properties of Nanostructured Diamond Coatings on Tungsten Carbide Cutting Tools", MRS Fall Meeting 2003, Boston, MA, Dec. 1-5, 2003.
43. S. A. Catledge, Y. K. Vohra, S. Woodard, and K. Venugopalan "Structure and Mechanical Properties of Functionally-Graded Nanostructured Metallo-ceramic Coatings", MRS Spring Meeting 2003, April 21-25, 2003.

2002 (TOTAL: 5)

44. Machado C., Lacefield W., Vohra Y., Catledge A. ABRASION RESISTANCE OF NANOCRYSTALLINE DIAMOND COATINGS ON TITANIUM ALLOY OF TMJ IMPLANTS. Presented at Society for Biomaterials Meeting - Tampa, Florida 2002.
45. Machado C., Lacefield W., Vohra Y., Catledge A, Johnson J. WEAR TESTING OF NANOCRYSTALLINE DIAMOND COATINGS ON TITANIUM ALLOY OF TMJ DEVICES. Presented at IADR-AADR Meeting - San Diego, California 2002.
46. H. Kim, S. A. Catledge, R. P. Camata, W. R. Lacefield, Y. K. Vohra; "*Mechanical properties of hydroxyapatite thin films for applications in medical implants*," 2002 March Meeting of The American Physical Society, March 18 – 22, 2002, Indianapolis, Indiana.
47. H. Kim, S. A. Catledge, Y. K. Vohra, R. P. Camata, W. R. Lacefield, "*Mechanical properties of pulsed laser deposited hydroxyapatite thin films for applications in biomedical implants*," 2002 Fall Meeting of the Materials Research Society, December 2 – 6, 2002, Boston, Massachusetts.
48. M. Bulut, S. A. Catledge, Y. K. Vohra, R. P. Camata, "*Thermal stability of nanocrystalline diamond films grown by microwave plasma chemical vapor deposition*," 2002 Fall Meeting of the Materials Research Society, December 2 – 6, 2002, Boston, Massachusetts.

2001 (TOTAL: 1)

49. P. Baker, S.A. Catledge, Y.K. Vohra, "Low Temperature Growth of Nanostructured Diamond Films on Metals", Sixth Applied Diamond Conference/Second Frontier Carbon Technology Joint Conference, Auburn, AL, 6-10 August 2001

2000 (TOTAL: 2)

50. S. A. Catledge and Y. K. Vohra, "Effect of Nitrogen Feedgas Addition on the Mechanical Properties of Nano-Structured Carbon Coatings", 2000 Symposium on Mechanical Properties of Structural Films, Orlando, FL, Nov. 15-16, 2000.
51. S. A. Catledge, P. T. Spencer, J. R. Patterson, and Y. K. Vohra, "Nanoindentation of Pressure Quenched Fullerenes and Zirconium Metal from a Diamond Anvil Cell", 2000 Fall Meeting of the Materials Research Society, Nov. 27-30, Boston MA, 2000

1999 (TOTAL: 2)

52. J. Akella, S.A. Catledge, G.N. Chesnut, H. Prokop, Y.K. Vohra, S.T. Weir, "X-ray diffraction studies using diamond coated rhenium gasket to megabar pressures", International Conference on High Pressure Science and Technology, Honolulu, HI, July 25-30,1999.
53. J. Akella, S.A. Catledge, Y.K. Vohra, S.T. Weir, "Diamond anvils with integrated diamond-encapsulated microprobes for high-pressure electrical transport experiments", International Conference on High Pressure Science and Technology, Honolulu, HI, July 25-30,1999.

1998 (TOTAL: 1)

54. S. A. Catledge and Y. K. Vohra, "Nitrogen-Induced Nanocrystallinity of CVD Diamond Films on Ti-6Al-4V Alloys", MRS Fall Meeting 1998, Nov. 30-Dec.4, 1998.

1997 (TOTAL: 1)

55. S. A. Catledge and Y. K. Vohra, "Structure and Stress Evaluation of Diamond Films Deposited on Ti-6Al-4V Alloy at Low Temperature Using CH₄/O₂/H₂ and CO/H₂ Gas Mixtures", MRS Fall Meeting 1997, Dec. 1-5, 1997.

1996 (TOTAL: 1)

56. S.A. Catledge, Y.K. Vohra, C. Yan, H.T. Tohver, "Morphology and Quantitative Nitrogen Impurity Measurements in Homoepitaxial Chemical Vapor Deposited Diamond", MRS Fall Meeting 1996, Dec. 2-6, 1996.

TEACHING HONORS

In Spring 2015, I had the honor of being nominated by the Physics Department for the President's Award for Teaching Excellence.

CURRENT FUNDING SUPPORT (as of August 2021)

| PROJECT | SOURCE OF FUNDS | DURATION | AMOUNT |
|---|-----------------|------------------------|----------------|
| RII Track 1: CPU2AL: Connecting the Plasma Universe to Plasma Technology in AL (Role: Co-I)) | NSF | 4/1/2017- 3/31/2022 | \$2,164,743.00 |

| | | | |
|--|------------|----------------------|--------------|
| REU-Site: Regional Initiative to Promote Undergraduate Participation in Experimental and Computational Materials Research (Role: Co-PI)) | NSF | 3/1/2018-2.28/2021 | \$324,975.00 |
| Low-temperature plasma as a means to create superhard high-entropy metal diborides via borocarbothermal reduction (Role: PI) | NSF-EPSCoR | 10/01/2020-9/30/2021 | \$40,000.00 |
| MRI: Acquisition of a Spark Plasma Sintering System for Engineering Advanced Materials and Composites for Use in Extreme Environments (Role: PI) | NSF | 8/01/2021-7/31/2024 | \$308,844.00 |

CURRENT SERVICE ACTIVITIES (as of March 2021)

ADMINISTRATIVE

- Physics Early Acceptance Program: I serve as point of contact for Physics and developed (along with Mary Ellen Zvanut) the program requirements/pre-requisites.
- Biophysics Track Mentor: Create 4-year plans each registration cycle for UG students in biophysics track (currently 8) and conduct face-to-face (or via ZOOM) meetings.

DEPARTMENT, COLLEGE, AND UNIVERSITY COMMITTEES (NOT INCLUDED PHD COMMITTEES)

- Graduate Admissions Committee: Review graduate applications, conduct interviews, and rank prospective students. Developed 'Materials' MS Concentration curriculum. Ongoing since 9/2016.

- Undergraduate Curriculum Committee: Evaluate UG curricula including Physics Education Research (PER) pedagogy and develop effective teaching methods for the faculty. Ongoing since Nov. 2015.
- Quantum Mechanics Qualifying Exam Committee (Chair): Directs committee, helps to prepare and grade the exam (when applicable) and presents results for faculty vote. Ongoing since Fall 2017.
- Physics UG Scholarship Committee: Review and rank UG applications for Baumann and Garrison Scholarships. Ongoing since 2018.
- Technology-Enabled Physics Education Committee: Examines technology related to both in-person and distance accessible courses offered by the Department of Physics. Ongoing since Nov. 2018.

SERVICE TO DISCIPLINE (PAST YEAR)

- External reviewer for Deutsche Forschungsgemeinschaft (German Research Foundation) proposal: "Nitrogen Vacancy (NV) Quantum Centers for Sensing Applications with Bio-Receptors. July 2020.
- External reviewer for University of Nebraska Lincoln Energy Sciences Research proposal: "Diamond-Coated Metallic Structures for Molten-Salt Thermal-Energy Storage Systems" Energy Sciences Research – Cycle 15. October 2020.
- Ongoing Editor for the open access journal Materials (ISSN 1996-1944). Duties include soliciting potential authors in the field, suggesting reviewers, making decisions on sending manuscripts for review, and making final decisions after peer-review.

RECRUITMENT & OUTREACH (PAST YEAR)

- Participated in Physics Department Virtual Open House, March 27th, 2020. Gave tour of labs for recruitment efforts.
- Ongoing REU mentor and co-PI of current NSF REU-Site: Regional Initiative to Promote Undergraduate Participation in Experimental and Computational Materials Research" grant.

OTHER SERVICE (PAST YEAR)

- Volunteered for and served as judge for 2020 NSF EPSCoR Science & Technology Open House (virtual meeting). Ranked oral presentations of students. October 22, 2020.