

Vassilia Zorba

Group Leader and Career Staff Scientist & Associate Adjunct Professor
Lawrence Berkeley National Laboratory University of California, Berkeley

1 Cyclotron Rd., MS 70R0108B
Berkeley, CA 94720

Email: vzorba@lbl.gov; zorba@berkeley.edu

Website: teamd.lbl.gov

Phone: (510) 486-7040

SUMMARY

- Research at the intersection between physics, engineering and chemistry focusing on the development of the next generation of novel ultrafast laser sensors, with applications in the fields of batteries, solar cells, advanced manufacturing, biology and nuclear security.
- Head of the Laser Technologies Group at Berkeley Lab.
- Associate Adjunct Professor, Mech. Engr. Dept., University of California, Berkeley
- 72 archival journal publications in leading laser science and engineering journals; h-index: 28 (based on Google Scholar).
- 40+ invited conference presentations (SPIE Photonics West, MRS, ACS, FACSS/SCiX, PITTCAN, LPM, CLEO, CLEO Europe, OSA-Frontiers in Optics, COLA, Winter Plasma Conference, etc.).
- Senior editor for the Springer-Nature Journal Applied Physics A.
- R&D 100 award winner for the development of antifogging coatings for energy saving windows.
- Reviewer for multiple top science and engineering journals, and for several offices of the US Department of Energy.
- Extensive track record of leadership and outreach in STEM education and Diversity, Equity & Inclusion.

RESEARCH AREAS

Next-generation laser sensors for chemical imaging; Fundamentals of ultrafast laser-material interactions; Femtosecond laser filamentation for remote sensing; Ultrafast laser diagnostics for the analysis of Li-ion batteries; Femtosecond optical near-field phenomena; Ultrafast laser-based fabrication of novel materials for solar cells, field-electron emission and wettability applications; Laser-induced formation of biomimetic smart superhydrophilic/superhydrophobic/water-repellent and self-cleaning surfaces; Pulsed laser deposition.

PROFESSIONAL EXPERIENCE

2020-present Associate Adjunct Professor, Mech. Engr. Dept., University of California, Berkeley
2015-present Group Leader, Laser Technologies Group, Lawrence Berkeley National Laboratory
2017-present Guest Scientist, Chemistry Division, Los Alamos National Laboratory
2014-present Career Staff Scientist, Lawrence Berkeley National Laboratory, Energy Storage and Distributed Resources Division.

- 2012-2014 Career-Track Research Scientist, Lawrence Berkeley National Laboratory, Environmental Energy Technologies Division
- 2010-2011 Project Scientist, Lawrence Berkeley National Laboratory, Environmental Energy Technologies Division

EDUCATION AND TRAINING

- Postdoctoral Fellow 2008-2010
 Lawrence Berkeley National Laboratory (LBNL), Berkeley, CA.
 Environmental Energy Technologies Division
Advisor: Dr. Richard Russo
- Ph. D. in Applied Physics (Atomic, Molecular, and Optical Physics-AMO) 2008
 • LaserLab Europe – FORTH Ultraviolet Laser Facility, University of Crete, Greece.
PhD Thesis: Laser micro/nano-structuring of Si: Optical, Electronic and Wetting Properties
Advisor: Prof. Costas Fotakis
- Visiting Scholar, Laser Zentrum Hannover (LZH), Hannover, Germany 2006
Advisor: Prof. Boris Chichkov
- M. S. in Applied Physics (Microelectronics & Optoelectronics) 2004
 LaserLab Europe – FORTH Ultraviolet Laser Facility, University of Crete, Greece.
 MS Thesis: Laser structuring of Si for low-threshold field electron emission”
Advisor: Prof. Ioanna Zergioti
- B. S. in Physics (Atomic, Molecular, and Optical Physics-AMO) 2002
 LaserLab Europe – FORTH Ultraviolet Laser Facility, University of Crete, Greece.
 Diploma Thesis: Low-temperature growth of NiMnSb by Pulsed Laser Deposition”
Advisor: Prof. Costas Fotakis

HONORS AND AWARDS

- Co-Chair, 2017 International Conference on Laser Ablation (**COLA 2017**).
- LBNL ETA Diversity & Inclusion Ambassador (2015).
- **2011 R&D 100 Award** for “*Nanostructured Antifogging Coating.*”
- Berkeley Lab **Emerging Leader** Program (2012).
- Senior Editor, Springer-Nature **Applied Physics A** (2017-present).
- Board Member, NASLIBS (2013-present).
- CS-LIBS conference, Best Paper Award (2013).
- Outstanding Oral Presentation Award, European **MRS Spring meeting** (2003).
- Herakleitos award fund for fundamental research (2002-2005).
- Undergraduate Scholarship IESL-FORTH (2000-2002).

PUBLICATIONS AND PATENTS

As of January 3, 2020, 3039 citations, h-index: 29 (Google Scholar)

Peer-Reviewed Journal Publications

72. C. Gondhalekar, E. Biela, B. Rajwa, E. Bae, V. Patsekin, J. Sturgis, C.Reynolds, I-J. Doh, P. Diwakar, L. Stanker, V. Zorba, X. Mao, R. Russo and J.P. Robinson, "Detection of *E. coli* labeled with metal-conjugated antibodies using lateral-flow assay and laser-induced breakdown spectroscopy", Analytical and Bioanalytical Chemistry, <https://doi.org/10.1007/s00216-019-02347-371>.
71. B.B.S. Jaswal, P.K. Rai, T. Singh, V. Zorba and V.K. Singh, "Detection and quantification of heavy metal elements in gallstones using X-ray fluorescence spectrometry", X-Ray Spectrometry 48 (3), 178-187 (2019).
70. D. Oropeza, J. González, J. Chirinos, V. Zorba, E. Rogel and C. Ovalles, F. López-Linares, "Elemental Analysis of Asphaltenes Using Simultaneous Laser-Induced Breakdown Spectroscopy (LIBS)–Laser Ablation Inductively Coupled Plasma Optical Emission Spectrometry (LA-ICP-OES)", Applied spectroscopy Applied spectroscopy **73 (5)**, 540-549 Applied Spectroscopy (2019).
69. V.K. Singh, D.K. Tripathi, X. Mao, R.E. Russo and V. Zorba "Elemental mapping of lithium diffusion in doped plant leaves using LIBS", Applied spectroscopy **73 (4)**, 387-394 Applied Spectroscopy (2018).
68. Y. Lee, X. Mao, G.C.-Y. Chan, J. Gonzalez, R.E. Russo and V. Zorba, "Spatial and Temporal Distribution of Metal Atoms and their Diatomic Oxide Molecules in Femtosecond Laser-Induced Plasmas", J. Anal. Atom. Spectrom. **33**, 1875-1883 (2018). **Journal Cover**
67. J. Song, G.C.Y. Chan, X. Mao, J.D. Woodward, R.W. Smithwick III, T.G. Schaaff, A.C. Stowe, C.D. Harris, R. Zheng, V. Zorba and R.E. Russo, "Multi-variable Non-linear Spectral Fitting for Uranium Isotopic Analysis with Laser Induced Breakdown Spectroscopy" Spectrochim. Acta B. **150** 67-76 (2018).
66. R. Hai, X. Mao, G. C.-Y. Chan, R.E. Russo, H. Ding and V. Zorba, "Internal mixing dynamics of Cu/Sn-Pb plasmas produced by femtosecond laser ablation", Spectrochim. Acta B. **148** 92–98 (2018). **Journal Cover**
65. H. Hou, B. Yang, X. Mao, V. Zorba, P. Ran, and Richard E. Russo, "Characteristics of plasma plume in ultrafast laser ablation with a weakly ionized air channel", Optics Express, **26** 13425 (2018).
64. H. Hou, X.L. Mao, V. Zorba, R. E. Russo, 2017, "Laser Ablation Molecular Isotopic Spectrometry for Molecule Formation Chemistry in fs-Laser Ablated Plasmas", Anal. Chem. **89**, 7750–7757 (2017).
63. J. W. Grate, J. J. Gonzalez, M. J. O’Hara, C. M. Niver, D. W. Koppenaal, G. C-Y Chan, X.L. Mao, V. Zorba, R. E. Russo, 2017, "Solid Matrix Transformation and Tracer Addition using Molten Ammonium Bifluoride Salt as a Sample Preparation Method for Laser Ablation Inductively Coupled Plasma Mass Spectrometry", Analyst **142**, 3333 (2017).
62. L Cheng, H Hou, S Lux, R Kosteki, R Davis, V Zorba, A Mehta and M Doeff "Enhanced Lithium Ion Transport in Garnet-type Solid State Electrolytes", J. Electroceram. **38**, 168-175, (2017).
61. VK Singh, A Devi, S Pathania, V Kumar, DK Tripathi, S Sharma, D. K. Chauhane, V. K. Singh and V. Zorba, "Spectroscopic investigation of wheat grains (*Triticum aestivum*) infected by wheat seed gall nematodes (*Anguina tritici*)", Biocatal Agric Biotechnol. **9**, 58-66 (2017).
60. J Chirinos, D Oropeza, J González, V Zorba and RE Russo, "Analysis of Plant Leaves Using Laser Ablation Inductively Coupled Plasma Optical Emission Spectrometry: Use of Carbon to Compensate for Matrix Effects", Applied Spectroscopy, **71(4)**, 709 (2017).
59. Y. Lee, J. Chirinos, J. Gonzalez, D. Oropeza, V. Zorba, X. Mao, J. Yoo, and R. E. Russo, "Laser-Ablation Sampling for Accurate Analysis of Sulfur in Edible Salts" Applied Spectroscopy, **71(4)**, 651, (2017).

58. X Mao, GCY Chan, I. Choi, V Zorba and RE Russo "Combination of atomic lines and molecular bands for uranium optical isotopic analysis in laser induced plasma spectrometry" *J Radioanal Nucl Chem* **312**, 121 (2017).
57. L. Bush, V.Zorba, "Lasers and Optics Interface: Laser Induced Breakdown Spectroscopy (LIBS) at the Submicrometer Scale", *Spectroscopy* **31(6)**, 14-20 (2016).
56. C Koral, A De Giacomo, X Mao, V Zorba and RE Russo, "Nanoparticle Enhanced Laser Induced Breakdown Spectroscopy for Improving the Detection of Molecular Bands", *Spectrochim. Acta B* **125**, 11 (2016).
55. G.C.Y. Chan, I. Choi, X. Mao, V. Zorba, O.P. Lam, D.K. Shuh and R.E. Russo, "Isotopic determination of uranium in soil by laser induced breakdown spectroscopy", *Spectrochim. Acta B* **122**, 31 (2016).
54. X Mao, GCY Chan, V Zorba and RE Russo, "Reduction of spectral interferences and noise effects in laser ablation molecular isotopic spectrometry with partial least square regression—a computer simulation study", *Spectrochim. Acta B* **122**, 75 (2016).
53. U Fittschen, V Zorba, B Igne, R Ostendorf, M Baker, U Karst and SA Asher, "Spectroscopy in Real-World Applications: Current Trends in XRF, LIBS, NIR, QCLs, FT-IR, ICP-MS, and Raman", *Spectroscopy* **31**, 8 (2016).
52. H. Hou, L. Cheng, T. Richardson, G. Chen, M. Doeff, R. Zheng, R. Russo and V. Zorba, "Three-dimensional elemental imaging of Li-ion solid-state electrolytes using fs-laser induced breakdown spectroscopy (LIBS)", *J. Anal. At. Spectrom.* **30**, 2295-2302 (2015). **Journal Cover.**
51. V. Zorba, X. Mao and R.E. Russo, "Femtosecond Laser Induced Breakdown Spectroscopy of Cu at the micron/sub-micron scale", *Spectrochim. Acta B* **113**, 37 (2015).
50. H. Hou, G.C.-Y. Chan, X. Mao, R. Zheng, V. Zorba, and R. E. Russo, "Femtosecond filament-laser ablation molecular isotopic spectrometry", *Spectrochim. Acta B* **113**, 113 (2015).
49. I. Barman, M. Baudalet, R.R. Hark, S.J. Rehse, V. Motto-Ros, R. E. Russo, Z. Wang, V. Zorba, "Analysis of the State of the Art: Laser-Induced Breakdown Spectroscopy", *Spectroscopy* **30**, 6 (2015).
48. B.Y. Cai, X. Mao, H. Hou, V. Zorba, R.E. Russo and N-H Cheung, "Double-pulse laser ablation sampling: Enhancement of analyte emission by a second laser pulse at 213 nm", *Spectrochim. Acta B* **110**, 51 (2015).
47. H. Hou, G.C.-Y. Chan, X. Mao, V. Zorba, R. Zheng and R. E. Russo, "Femtosecond laser ablation molecular isotopic spectrometry for zirconium isotope analysis", *Analytical Chemistry* **87** (9), 4788 (2015).
46. J.S. Park, L. Cheng, V. Zorba, A. Mehta, J. Cabana, G. Chen, M.M. Doeff, T. J. Richardson, J. H. Park, J-W Son, and W-S Hong, "Effects of Crystallinity and Impurities on the Electrical Conductivity of Li-La-Zr-O Thin Films", *Thin Solid Films* **576**, 55 (2015).
45. L. Cheng, E.J. Crumlin, W. Chen, R. Qiao, H. Hou, S.F. Lux, V. Zorba, R.E.Russo, R. Kosteckí, Z. Liu, K. Persson, W. Yang, J. Cabana, T. Richardson, G. Chen and M. Doeff, "The origin of high electrolyte-electrode interfacial resistances in lithium cells containing garnet type solid electrolytes" *Phys Chem Chem Phys.* **16**, 18294 (2014).
44. J.R. Chirinos, D.D. Oropeza, J.J. Gonzalez, H. Hou, M. Morey, V. Zorba and R.E. Russo, "Simultaneous 3-Dimensional Elemental Imaging with LIBS and LA-ICP-MS", *J. Anal. At. Spectrom* **29**, 1292 (2014). **Journal Cover**
43. L. Cheng, J.S. Park, H. Hou, V. Zorba, G. Chen, T. Richardson, J.Cabana, R. Russo and M Doeff, "Effect of Microstructure and Surface Impurity Segregation on the Electrical and Electrochemical Properties of Dense Al-substituted $\text{Li}_7\text{La}_3\text{Zr}_2\text{O}_{12}$ ", *J. Mater. Chem. A* **2**, 172 (2014).
42. R. E. Russo, X. Mao, J. J. Gonzalez, V. Zorba and J. Yoo "Laser Ablation in Analytical Chemistry", *Analytical Chemistry* **85**, 6162 (2013). **Journal Cover**
41. Y. Lu, V. Zorba, X. Mao, R. Zheng and R.E. Russo, "UV fs-ns Double-pulse Laser Induced Breakdown Spectroscopy for High Spatial Resolution Chemical Analysis", *J. Anal. At. Spectrom.* **28**, 743 (2013).

40. V. Zorba, J. Sysdek, X. Mao, R.E. Russo and R. Kostecki, "Ultrafast laser induced breakdown spectroscopy of electrode/electrolyte interfaces", *Appl. Phys. Lett.* **100**, 234101 (2012).
39. E.L. Papadopoulou, V. Zorba, E. Stratakis and C. Fotakis, "Properties of Silicon and Metal Oxide Electrowetting Systems", *J. Adhes. Sci. Technol.* **26**, 2143-2163 (2012).
38. J.A. Stolee, B.N. Walker, V. Zorba, R.E. Russo and A. Vertes, "Laser-nanostructure interactions for ion production" *Phys. Chem. Chem. Phys.* **14**, 8453-8471 (2012). **Journal Cover**
37. R.E. Russo, T. W. Suen, A.A. Bol'shakov, J. Yoo, O. Sorkhabi, X. Mao, J. Gonzalez, D. Oropeza and V. Zorba, "Laser Plasma Spectrochemistry" *Journal of Analytical Atomic Spectrometry* **1596**, 26 (2011).
36. V. Zorba, X. Mao and R. E. Russo, "Ultrafast Laser Induced Breakdown Spectroscopy for high spatial resolution chemical analysis", *Spectrochimica Acta B-Atomic Spectroscopy* **66**, 189 (2011).
35. V. Zorba, X. Chen and S. S. Mao, "Super-hydrophilic TiO₂ surface without photocatalytic activation" *Appl. Phys. Lett.* **96**, 093702 (2010).
34. V. Zorba, X. Mao and R.E. Russo, "Optical far- and near-field femtosecond laser ablation of Si for nanoscale chemical analysis" *Analytical and Bioanalytical Chemistry* **396**, 173 (2010).
33. M. Barberoglou, V. Zorba, A. Pagkozidis, C. Fotakis and E. Stratakis, "Electrowetting on superhydrophobic micro and nanostructured black silicon", *Langmuir* **26**, 13007 (2010).
32. E. Spanakis, M. Barberoglou, V. Zorba, P. Tzanetakis, C. Fotakis, "Metal coated silicon spike cold-electron emitters show improvement of performance with operation", *Appl. Phys. Lett.* **96**, 033501 (2010).
31. V. Zorba, X. Mao and R.E. Russo, "Laser wavelength effects in ultrafast near-field nanostructuring of Si", *Appl. Phys. Lett.* **95**, 041110 (2009).
30. E.V. Barmina, M. Barberoglou, V. Zorba, A.V. Simakin, E. Stratakis, C. Fotakis and G.A. Shafeev "Laser control of the properties of nanostructures on Ta and Ni under their ablation in liquids", *Journal of Optoelectronics and Advanced Materials* **12**, 495-499 (2010).
29. E. L. Papadopoulou, V. Zorba, A. Pagozidis, M. Barberoglou, E. Stratakis and C. Fotakis, "Reversible wettability of ZnO nanostructured thin films prepared by Pulsed Laser Deposition", *Thin Solid Films* **518**, 1267 (2009).
28. E. Stratakis, V. Zorba, M. Barberoglou, C. Fotakis and G. A. Shafeev, "Laser writing of nanostructures on bulk Al via its ablation in liquids", *Nanotechnology* **20** 105303 (2009).
27. E.L. Papadopoulou, M. Barberoglou, V. Zorba, A. Manousaki, A. Pagozidis, E. Stratakis, and C. Fotakis, "Reversible Photoinduced Wettability Transition of Hierarchical ZnO Structures", *J. Phys. Chem. C* **113**, 2891 (2009).
26. E.V. Barmina, M. Barberoglou, V. Zorba, A.V. Simakin, E. Stratakis, C. Fotakis, G. A. Shafeev, "Surface nanotexturing of tantalum by laser ablation in water" *Quantum Electronics* **39**, 89 (2009).
25. V. Zorba, E. Stratakis, M. Barberoglou, E. Spanakis, P. Tzanetakis and C. Fotakis, "Biomimetic artificial surfaces that quantitatively reproduce the water repellency of the lotus leaf", *Adv. Materials* **20**, 4049 (2008).
24. V. Zorba, E. Stratakis, M. Barberoglou, E. Spanakis, P. Tzanetakis and C. Fotakis, "Tailoring the wetting response of silicon surfaces via fs laser structuring", *Appl. Phys. A* **93**, 819 (2008).
23. M. Barberoglou, V. Zorba, E. Stratakis, E. Spanakis, P. Tzanetakis, S. H. Anastasiadis and C. Fotakis, "Bio-inspired water repellent surfaces produced by ultrafast laser structuring of silicon", *Appl. Surf. Sci.* **255**, 5425 (2009).
22. E. Stratakis, V. Zorba, M. Barberoglou, C. Fotakis and G. A. Shafeev "Femtosecond laser writing of nanostructures on bulk Al via its ablation in air and liquids", *Appl. Surf. Sci.*, **255**, 5346 (2009).
21. E. Spanakis, J. Dialektos, E. Stratakis, V. Zorba, P. Tzanetakis and C. Fotakis "Ultraviolet laser structuring of SiC for cold cathode applications", *Phys. Status Solidi I* **5**, 3309 (2008).
20. V. Zorba, N. Boukos, I. Zergioti, C. Fotakis, "Ultraviolet femtosecond, picosecond and nanosecond laser microstructuring of silicon: structural and optical properties" *Appl. Optics* **47**, 1846 (2008).

19. C. Reinhardt, S. Passinger, V.Zorba, B. N. Chichkov, and C.Fotakis, “*Replica molding of picosecond laser fabricated Si microstructures*”, Appl.Phys.A **87**, 673 (2007).
18. V Zorba, L Persano, D Pisignano, A Athanassiou, E. Stratakis, R Cingolani, P. Tzanetakis, C Fotakis, “*Making silicon hydrophobic: wettability control by two-lengthscale simultaneous patterning with fs-laser irradiation*”, Nanotechnology **17**, 3234 (2006).
17. V. Zorba, P. Tzanetakis, C. Fotakis, E. Spanakis, E. Stratakis, D. G. Papazoglou, I. Zergioti, “*Silicon electron emitters fabricated by UV laser pulses*”, Appl. Phys.Lett. **88**, 081103 (2006).
16. V. Zorba, E. Stratakis, E. Spanakis, D.G. Papazoglou, I. Zergioti, P.Tzanetakis and C.Fotakis, “*Field Emission properties of arrayed and continuous areas of laser fabricated silicon microstructures*”, J. Nanoengineering and Nanosystems **220**, 143 (2006)- (Invited Paper).
15. E. Skantzakis, V. Zorba, D.G. Papazoglou, I. Zergioti, C. Fotakis “*Ultraviolet laser microstructuring of silicon and the effect of laser pulse duration on the surface morphology*”, Appl. Surf. Science **252**, 4462 (2006).
14. G. Filippidis, J. Catherine, M. Farsari, V. Zorba, C. Fotakis, “*Construction of micron three-dimensional structures employing multi-photon polymerization*”, J. Nanoengineering and Nanosystems **220**, 165 (2006).
13. C. Ristoscu, E. Gyorgy, I.N. Mihailescu, A. Klini, V. Zorba, C. Fotakis, “*Effects of pulse laser duration and ambient nitrogen pressure in PLD of AlN*” Appl. Phys. A **79**, 927 (2004).
12. V. Zorba, I. Alexandrou, I. Zergioti, A. Neumeister, A. Manousaki, C. Fotakis, C. Ducati, and G.A.J. Amaratunga, “*Laser microstructuring of Si surfaces for low-threshold field-electron emission*”, Thin Solid Films **453-454**, 492 (2004).
11. E. György, V.S. Theodorescu, I.N. Mihailescu, A. Klini, V. Zorba, A. Manousaki, and C. Fotakis, “*Surface morphology studies of sub-ps pulsed-laser-deposited AlN thin films*”, Journal of Materials Research **19**(3), 820 (2004).
10. V. Zorba, A. Klini, E. György, C. Ristoscu, V.S. Theodorescu, I.N. Mihailescu and C. Fotakis, “*Depedence of morphology of AlN thin films on laser irradiation in Pulsed Laser Deposition*”, Laser Physics **13**(10), 1325 (2003).
9. C. E. A. Grigorescu, S. A. Manea , M. Mitrea, O. Monnereau, R. Notonier, L. Tortet, R. Keschawarz, J. Giapintzakis, A. Klini, V. Zorba, and C. Fotakis, “*Surface particularities in pulsed laser ablation/deposition of the ferromagnetic alloy NiMnSb*” , Appl. Surf. Sci. **212-213**, 78 (2003).
8. J. Giapintzakis, C. Grigorescu, A. Klini, A. Manousaki, V. Zorba, J. Androulakis, Z. Viskadourakis, and C. Fotakis, “*Pulsed-laser deposition of NiMnSb thin films at moderate temperatures*”, Appl. Surface Science **197-198**, 421-425 (2002).
7. J. Giapintzakis, C. Grigorescu, A. Klini, A. Manousaki, V. Zorba, J. Androulakis, Z. Viskadourakis, and C. Fotakis, “*Low-temperature growth of NiMnSb thin films by pulsed-laser deposition*” Appl. Phys. Lett. **80**, 2716 (2002).

Peer Reviewed Conference Proceedings

6. C. Fotakis, M. Barberoglou, V. Zorba, E. Stratakis, E. L. Papadopoulou, A. Ranella, K. Terzaki and M. Farsari, “*Applications of ultrafast lasers in materials processing: fabrication on self-cleaning surfaces and scaffolds for tissue engineering*”, Proc. SPIE **7027**, 702702-1 (2008).
5. V. Zorba, “*Tailoring the Optical, Electronic and Wetting properties of Si surfaces by ultrafast laser microstructuring*”, Proceedings of the Fourth International WLT-Conference on Lasers in Manufacturing 2007, p.769 (Invited).
4. C. Fotakis, V. Zorba, E. Stratakis, A. Athanassiou, P. Tzanetakis, I. Zergioti, D. G. Papagoglou, K. Sambani, G Filippidis, M. Farsari, V. Pouli, G. Bounos, S. Georgiou, “*Novel Aspects of Materials*

Processing by Ultrafast Lasers: From Electronic to Biological and Cultural Heritage Applications”, Journal of Physics: Conference series 59, 266 (2007) (Invited).

3. C. E. A. Grigorescu, O. Monnereau, S. A. Manea, R. Notonier, A. Klini, V. Zorba, A. Manousaki, J. Giapintzakis and C. Fotakis ; “*Stoichiometry issues in pulsed laser deposition of the ferromagnetic alloy NiMnSb*”, Proc. SPIE Vol 4762, p. 260 –ALT’01 International Conference on Advanced Laser Technologies.

Other Publications

2. E. Stratakis, V. Zorba, M. Barberoglou, E. Spanakis, S. Rhizopoulou P. Tzanetakis, S.H. Anastasiadis and C. Fotakis, “*Laser structuring of water-repellent biomimetic surfaces*”, SPIE newsroom, doi: 10.1117/2.1200901.1441.
1. U Fittschen, V Zorba, B Igne, R Ostendorf, M Baker, U Karst and SA Asher, “*Spectroscopy in Real-World Applications: Current Trends in XRF, LIBS, NIR, QCLs, FT-IR, ICP-MS, and Raman*”, Spectroscopy 31 (8), 4-12 (2016).

Book Chapters

- B1. E. Stratakis and V Zorba, “*Biomimetic Artificial Nanostructured Surfaces*” in “*Nanotechnologies for the Life Sciences: Biomimetic and Bioinspired Nanomaterials*” edited by C. Kumar, Wiley-VCH (2010). ISBN: 9783527610419
- B2. V. Zorba, J. Gonzalez, G. Chan, X. Mao and R.E. Russo, “*Applications of Laser Induced Breakdown Spectroscopy*” in “*Encyclopedia of Spectroscopy and Spectrometry, 3rd Edition*”. Edited by D.W. Koppenaal, Elsevier (2016). ISBN: 9780128032244

Patents

- “*Anti-fogging and superhydrophilic technology*”, S. S. Mao, V. Zormpa and X. Chen, US 9028958 B2 (R&D 100 award winner)
- “*Method of fabrication of ferromagnetic inter-metallic films*” C. Fotakis, J. Giapintzakis, C. Grigorescu, A. Klini, V. Zorba, WO 2002082479 A1

PRESENTATIONS

Invited/Keynote/Plenary Presentations

44. 2020 Winter Conference on Plasma Spectrochemistry, “*Emerging Ultrafast Laser Sampling Approaches in Laser Plasma Spectrochemistry*” (January 2020-Tuscon AZ). **Plenary Speaker**
43. WPC 2020 (Winter Conference on Plasma Spectrochemistry), Invited Short Course Organizer, “*Laser-Induced Breakdown Spectroscopy (LIBS)*” (January 2020-Tuscon AZ).
42. EWPC 2019 (European Winter Conference on Plasma Spectrochemistry), “*New and emerging femtosecond laser sampling approaches in laser induced breakdown spectroscopy*” (February 2019-Pau, France). **Keynote Speaker**

41. Material Research Society (MRS) 2018 meeting, *“Direct 3D Elemental Mapping of Li-Ion Batteries Using Ultrafast Laser Ablation Spectroscopy”* (November 2018-Boston, MA).
40. SciX 2018, Special SAS symposium: Past, Present and Future: Celebrating 60 Years of SAS and Spectroscopy Innovations, *“Novel laser ablation sampling technologies in Laser Induced Breakdown Spectroscopy (LIBS)”* (October 2018-Atlanta, GA).
39. SciX 2018, Lester W. Strock Award Symposium, *“Unconventional Ultrafast Laser Beams in LIBS Analysis”* (October 2018-Atlanta, GA).
38. LPM 2018 (19th International Symposium on Laser Precision Microfabrication)) *“Novel Ultrafast Laser Ablation Sampling Approaches in Chemical Imaging”* (June 2018-Edinburgh, Scotland)
37. 2018 ACS (American Chemical Society) Meeting, *“Novel ultrafast laser ablation sampling technologies in optical emission elemental and isotopic imaging”* (Mar. 2018-New Orleans, LA).
36. PITTCON 2018, *“Femtosecond and Nanosecond LIBS Elemental Imaging: Fundamentals, Applications and New Sampling Approaches”* (Feb. 2018-Orlando, FL).
35. Photonics West 2018, *“Three-dimensional elemental imaging of Li-ion batteries using ultrafast laser ablation optical emission spectroscopy”* (Jan. 2018-San Francisco, CA)
34. ICALEO 2017 conference (International Congress on Applications of Lasers & Electro-Optics) *“Ultrafast laser ablation 3D chemical imaging of Li-ion batteries”* (October 2017- Atlanta, GA)
33. SciX 2017 conference, *“Femtosecond LIBS with Optical Vortex Beams”* (Oct. 2017-Reno, NV)
32. SciX 2017 conference *“Ultrafast Laser-Induced Plasma Diffusion and Mixing Processes at Interfaces”* (Oct. 2017-Reno, NV)
31. FORTH-IESL colloquium, *“Ultrafast Laser Ablation Sampling Technologies in Optical Emission Elemental and Isotopic Imaging”* (September 2017-Heraklion, Greece)
30. International Conference on Instrumental Methods of Analysis (IMA) 2017, *“Novel Femtosecond Laser Ablation Sampling Technologies in Optical Emission Spectroscopy”*, (September 2017-Heraklion, Greece)
29. Pittcon 2017 conference, *“Femtosecond Filament-Laser Ablation Molecular Isotopic Spectrometry”*. (March 2017-Chicago IL)
28. SciX 2016 conference, *“Role of Interfacial Plasma Diffusion and Mixing Processes in 3D Chemical Imaging with Femtosecond LIBS”* (September 2016- Minneapolis, MN)
27. SciX 2016 conference, *“Femtosecond Filaments in Remote Isotope Analysis”* (September 2016- Minneapolis, MN)
26. PIERS 2016 conference, *“Femtosecond Filament Remote Isotope Sensing”* (August 2016-Shanghai, CN)
25. International Conference on Laser Ablation (COLA 2015), *“High-resolution ultrafast laser ablation-based chemical imaging of energy materials”*. (September 2015-Cairns, AU).
24. SciX 2015 conference, *“All-Optical Laser Ablation-based Analytical Techniques: Status, Achievements and Directions”*. (September 2015-Providence, RI)
23. EMSLIBS (8th Euro-Mediterranean Symposium on Laser Induced Breakdown Spectroscopy), *“Femtosecond Filament-Laser Ablation Molecular Isotopic Spectrometry”*, (September 2015-Linz, AT).
22. Pittcon 2015 conference, *“Ultrafast LIBS for 3D Chemical Imaging”* (March 2015-New Orleans, LA)
21. Julius Springer Forum on Applied Physics 2014 honoring Harry Atwater and Albert Polman, *“Ultrafast laser attogram sampling and characterization of activated surfaces”* (September 2014-Amsterdam, NL)
20. SciX 2014 conference, *“Three-dimensional chemical imaging with femtosecond LIBS”* (October 2014-Reno, NV)
19. CLEO 2014 conference, *“Femtosecond 3D laser plasma spectroscopy chemical imaging of Li-ion batteries”* (June 2014-San Jose, CA).
18. ICSLS 2014 conference, *“Femtosecond Laser Chemical Imaging in Li-ion Battery Systems”* (June 2014-Tullahoma, TN).

17. SciX 2013 conference, *“Ultrafast Laser Induced Breakdown Spectroscopy for 3-Dimensional Chemical Imaging*, (October 2013- Milwaukee, WI).
16. Pittcon 2013 conference, *Nanoscale Plasma Spectrochemistry* (March 2013-Philadelphia, PA).
15. Dr. Steven Chu’s Sensors Workshop, *“Lasers zap rocks in earth and on Mars: New DOE sensor technology for science and industry”*, Chicago, October 2012 (Invited Poster).
14. FACSS 2012 conference, *High Spatial and Depth Resolution Sampling in Ultrafast LIBS* (October 2012- Kansas City, MO).
13. 3rd International Workshop on Nanoscale Imaging for Energy Applications, *Optical near- and far-field femtosecond laser ablation for nanoscale chemical imaging* (September 2012-Oak Ridge, TN).
12. LPM 2012 (13th Laser Precision Microfabrication Conference), *“Nanoscale Laser Plasma Spectrochemistry”* (June 2012-Washington, DC).
11. 32nd Annual DOE/NNSA Analytical Managers Meeting, *“Laser Ablation Chemical Analysis”*(June 2012- Chicago, IL).
10. 11th International Conference on Laser Ablation *“Laser Induced Breakdown Spectroscopy for High Spatial Resolution Analysis and Isotopic Detection”* (México, November 2011).
9. FACSS 2011 conference *“Ultrafast near- and far-field laser ablation for high spatial resolution chemical analysis* (2-6 October 2011-Reno, NV)
8. Julius Springer Forum on Applied Physics *“Optical far- and near-field ultrafast laser micro/nano structuring and applications”* (October 2010-Stanford, CA).
7. LASERION conference, *Ultrafast near- and far-field laser ablation for nanoscale chemical analysis* (July 2010-Munich, DE).
6. SPIE Photonics West conference *“Optical far- and near-field femtosecond laser micro/nanostructuring and applications”* (January 2010-San Francisco, CA).
5. OSA (Optical Society of America)-Frontiers in Optics conference, *“Ultrafast laser surface micro/nano- structuring and applications”*, (October 2009- San Jose, CA)
4. LASERION conference, *“Control of the wetting properties of laser structured Si”* (July 2007-Munich, DE).
3. CLEO Europe conference, *“Tailoring the Optical, Electronic and Wetting properties of Si surfaces by ultrafast laser microstructuring”* (June 2007- Munich, DE).
2. Indiana University, Chemistry Department Seminar *“All-Optical Ultrafast Laser Ablation Chemical Imaging”* (October 2015-Bloomington, IN).
1. Laser Zentrum Hannover, *Laser Microstructuring of Si: Optical, Field Emission and Wetting Properties* (June 2006-Hannover, DE).

Contributed Conference Presentations

1. V. Zorba, J.R. Becker, X. Mao, R. Russo and C.P. Grigoropoulos, *“Optical Vortex Beams in Femtosecond Laser Induced Breakdown Spectroscopy”*, 2018 Winter Conference on Plasma Spectrochemistry, Amelia Island, FL –January 2018 (Oral).
2. Y. Lee, X. Mao, G.C.Y. Chan, J. Gonzalez, R.E. Russo and V. Zorba, *“Facilitating diatomic metal oxide formation in femtosecond-laser-induced plasmas”*, SciX 2016 conference, Minneapolis, MN- September 2016. (Poster)
3. Y. Lee, J. Chirinos, J. Gonzalez, D. Oropeza, V. Zorba, X. Mao, J.Yoo, R.E. Russo, *“Accurate analysis of sulfur in edible salts by using laser-ablation sampling”*, SciX 2016 conference, Minneapolis, MN- September 2016. (Poster)
4. V. Zorba, *“Pathways Towards High-Resolution Chemical Analysis and Imaging with Femtosecond LIBS”*, SciX 2015 conference, Providence-Rhode Island, September 2015. (Oral)

5. H. Hou, R.E. Russo and V. Zorba, "High-Resolution Femtosecond LIBS: Far- And Near-Field Approaches", EMSLIBS 2015 conference, Linz-Austria, September 2015. (Oral)
6. H. Hou and V. Zorba, "Femtosecond Laser Three-Dimension Chemical Imaging", EMSLIBS 2015 conference, Linz-Austria, September 2015. (Poster)
7. S.A. Beldjilali, H. Hou, R. Russo, R. Kostecki and V. Zorba, "Chemical analysis of electrode/electrolyte interfaces with femtosecond LIBS", EMSLIBS 2015 conference, Linz-Austria, September 2015. (Poster)
8. V. Zorba, H. Hou, X. Mao, R. Zheng and R.E. Russo, "Ultrafast LIBS of Li-ion Battery Systems", LIBS 2014 conference, Beijing-China, September 2014. (Oral)
9. S.A. Beldjilali, H. Hou, R.E. Russo, R. Kostecki and V. Zorba, "Femtosecond LIBS of electrode/electrolyte interfaces" LIBS 2014 conference, Beijing-China, September 2014. (Poster)
10. V. Zorba, Y. Lu, X. Mao and R.E. Russo, "Femtosecond near- and far- field laser ablation for high spatial resolution chemical analysis", 11th International Conference on Laser Ablation, México, November 2011. (Poster)
11. V. Zorba, D. Oropeza, T. Owens, J.J. Gonzalez, X. Mao and R.E. Russo, "Capability Assessment of Sub-Micron LIBS", LIBS 2010 (13-17 September 2010-Memphis TN). (Poster)
12. V. Zorba, X.L. Mao, R.E. Russo, "Ultrafast Laser Induced Breakdown Spectroscopy for Nanoscale Chemical Analysis in the Optical Far- and Near-fields", Pittcon 2010, Florida, March 2010. (Oral)
13. V. Zorba, E. Stratakis, L.Persano, A. Athanassiou, D.Pisignano, P. Tzanetakis, R. Cingolani, C. Fotakis, "Control of the wetting properties of Si microstructured by fs laser pulses", 23th European Materials Research Society Conference (E-MRS 2006), Nice, June 2006. (Oral)
14. V. Zorba, I. Zergioti, D. G. Papazoglou, C. Fotakis, N. Boukos, "The effect of laser pulse duration on the structure and morphology of laser-fabricated Si cones", 23th European Materials Research Society Conference (E-MRS 2006), Nice, June 2006. (Poster)
15. V. Zorba, E. Stratakis, E. Spanakis, D.G. Papazoglou, I. Zergioti, , P.Tzanetakis, A. Manousaki, E. Skantzakis, D. Gray, C. Fotakis, "Pulse Duration Effects on Laser Microstructuring of Si and its Field Emission Properties", 3rd International Symposium on Nanomanufacturing (ISNM 2005), Limassol, Cyprus, November 2005. (Oral)
16. V. Zorba, E. Stratakis, E. Spanakis, D.G. Papazoglou,, I. Zergioti, P.Tzanetakis, A. Manousaki, D. Gray, "Pulse duration and pulse shaping effects in laser microstructuring of Si", 8th International Conference on Laser Ablation (COLA' 05), Banff, Canada, September 2005. (Poster)
17. E. Skantzakis, V. Zorba, D.G. Papazoglou, I. Zergioti, C. Fotakis "Ultraviolet laser microstructuring of silicon and the effect of laser pulse duration on the surface morphology", 22th European Materials Research Society Conference (E-MRS 2005), Strasbourg, June 2005.
18. V. Zorba, E. Skantzakis, E. Spanakis, E. Stratakis, I. Zergioti, D.G. Papazoglou, P.Tzanetakis, C. Fotakis, "Ultraviolet laser microstructuring of Si: Pulse duration effects", 2004 Gordon Research Conference on Laser Interactions with Materials, Andover, New Hampshire, USA, August 2004 . (Poster)
19. V. Zorba, A. Manousaki, I. Zergioti, C. Fotakis, C. Ducati, I. Alexandrou and G.A.J. Amaratunga, "Laser microstructuring of Si surfaces: Mechanisms and Applications", 7th International Conference on Laser Ablation (COLA' 03), Hersonissos, Crete, October 2003. (Poster)
20. V. Zorba, A. Neumeister, A. Manousaki, I. Zergioti, C. Fotakis, C. Ducati, I. Alexandrou and G.A.J. Amaratunga, "Laser microstructuring of Si surfaces for low-threshold field-electron emission", 20th European Materials Research Society Conference (E-MRS 2003), Strasbourg, June 2003. (Oral)

21. V. Zorba, C. Fotakis, A. Klini, C. Ristoscu, V.S. Theodorescu, I.N. Mihailescu, “*Depedence of AlN thin films morphology on laser irradiation parameters in PLD*”, 11th International Laser Physics Conference (LPHYS’ 02), Bratislava-Slovakia, July 2002. (Poster)

PROFFESIONAL ACTIVITY AND SERVICE

Conference Organization Activities

- Conference Chair, International Conference on Laser Ablation (COLA) 2019, Maui-Hawaii, USA (Sept. 8-13, 2019).
- Conference Co-Chair, International Conference on Laser Ablation (COLA) 2017, Marseille, France (Sept. 3-8, 2017).
- Organizer, SciX 2017 session “*New methods and advancements in LIBS*” (Oct. 8-13, 2017).
- Organizer, Pittcon 2017 symposium “*Advances in All-optical Plasma Spectroscopy*” (March 4 –9, 2017).
- Organizer, SciX 2015 session “*New hardware and novel methods in LIBS*” (Sept. 27 – Oct. 2, 2015)
- Co-organizer, 2014 MRS Fall Meeting, “*Symposium PP: Advances in Scanning Probe Microscopy for Multimodal Imaging at the Nanoscale*” (Nov. 30-Dec. 5, 2014).
- Organizer, SciX 2014 session “*Protocols and quantitative analysis by LIBS*” (Sept. 28 – Oct. 3, 2014).
- Scientific Program Committee, Photonics West 2011, “*Laser Applications in Microelectronic and Optoelectronic Manufacturing (LAMOM XVI)*”.

Editorial Activities

- Senior Editor for the journal Applied Physics A (2017-present).
- Member of the Editorial Board, Journal of Analytical Atomic Spectrometry (2019-present).
- Member of the Editorial Board, Applied Spectroscopy (2020-present).
- Member of the Editorial Board, Spectrochimica Acta Part B (2019-present).
- Member of the Editorial Board, Applied Physics A (2012-2016).
- Co-Editor, Special issue “*Current State-Of-The-Art in Laser Ablation*”, Applied Physics A (2019).
- Co-Editor, Special issue “*Laser Ablation: Basics and Applications of a Key Enabling Technology*”, Applied Physics A (2017).
- Co-Editor, 40-year Special Issue “*Short Pulse Laser Diagnostics and Processing of Novel Materials*” in Applied Physics A (2014).
- Co-editor, “*State-of-the-Art Developments in Materials Characterization*” Materials Research Society (MRS) Symposium Proceedings Volume 1754 (2014).
- Co-Editor of the Special Issue: “*Optics and Selective Diagnostics*” Proceedings of the 11th international Conference on Laser Ablation (2011) in Applied Physics A.

Reviewing Activities

Journals:

Nature Communications, Physical Review Letters, Scientific Reports, Angewandte Chemie, Optics Express, Spectrochimica Acta B, Applied Spectroscopy, Applied Optics, Applied Physics A, Applied

Surface Science, Thin Solid Films, Surface and Coatings Technology, Electrochimica Acta, Frontiers of Physics, Journal of Laser Micro/Nanoengineering.

Funding Proposals & Awards:

NSF (National Science Foundation)
DOE-BES (Department of Energy-Basic Energy Sciences)
DOE-SBIR (Department of Energy-Small Business Innovation Research)
DOE-STTR (Department of Energy- Small Business Technology Transfer)
R&D 100 Awards
Fulbright Scholar Program

Professional Societies

- Board Member, NASLIBS (North American Society for Laser-Induced Breakdown Spectroscopy).
- Technical Committee, IEEE Nanotechnology Council: Nano-Optics, Nano-Photonics, and Nano-Optoelectronics.
- Member, MRS (Materials Research Society).
- Member, OSA (Optical Society of America).
- Member, ACS (American Chemical Society).
- Member, SAS (Society for Applied Spectroscopy).

Lab Service and Diversity & Inclusion

1. LBNL ETA Diversity & Inclusion Ambassador.
2. Mentor for the LBNL Mentoring Program.
3. LBNL Laser Safety Committee.
4. Lead of Experimental Demo Development, STEM “Introduce a Girl to Engineering Day (Girl Day).”
5. LBNL Representative, DOE International STEM Teacher Workshop.
6. LBNL hiring committee head and member for ESDR hires.