SHANLIN PAN

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PROFESSIONAL APPOINTMENTS

Professor	The University of Alabama	2017-Present
Associate Professor	The University of Alabama	2014-2017
Assistant Professor	The University of Alabama	2008-2014

EDUCATION AND TRAINING

University of Texas at Austin	Chemistry	Postdoc	2006-2008
University of Rochester	Chemistry	PhD	2006
Lanzhou University	Chemistry	MS	2001
Lanzhou University	Chemistry	BS	1998

HONORS AND AWARDS

- 2019 Marilyn Williams Elmore and John Durr Elmore Endowed Professor, The University of Alabama
- 2018 The UA President's 2018 Faculty Research Award, The University of Alabama
- 2016-2019 College of Arts and Sciences Leadership Board Fellow, The University of Alabama
- 2014 DOE-EPSCoR travel award to present research work at Gordon Research Conference on Plasmonics in Newry of Maine
- 2012 DOE-EPSCoR travel award to present research work at the 244th ACS National Meeting in Philadelphia
- 2006-2008 Irving S. Sigal Postdoctoral fellowship (Highlighted in Chemical & Engineering News, September 25, 2006)
- 2005 Messersmith Fellowship, University of Rochester
- 2004 Elon Huntington Hooker Graduate Fellowship, University of Rochester
- 2002-2006 Sherman-Clarke Fellowship, University of Rochester

SERVICE AND SCHOLARSHIP ACTIVITIES

UNIVERSITY/COLLEGE/DEPARTMENT SERVICES

- Program director of UA's Individual-Based Talent Bridge from Minority Institutions to Graduate School and Energy Industry program, funded by NSF, 2022-Present
- Co-chair of Faculty Senate Research & Service Committee, April 15, 2021-Present
- Faculty Senate Steering Committee, April 15, 2021-Present
- Faculty Senate Webmaster, 2022-Present
- Faculty Senate Representative to the Research Grants Committee, 2023-Present
- Faculty Senate Representative to Graduate Council, 2021-Present
- Search Committee for Vice President for Research and Economic Development, The University of Alabama, 2023
- Chair of Instrument Committee, Department of Chemistry and Biochemistry, 2022-present
- Chair of Search Committee for a Mass Spec senior faculty position, 2022
- Search Committee member for Robert Ramsay Chair Faculty in Chemistry, 2021
- UA Strategic Plan subcommittees for Graduate Education August 2021-December 2021
- The Alabama Center for Mobility and Power (AMP) Planning Team Member Alabama Transportation Institute, 2021
- Chemistry Department Safety Committee August 2019-August 2022

- Member of the Graduate Recruiting Committee (Fall 2008-Fall 2014, 2020-2022)
- Advisory Board of Alabama Analytical Research Center (May 2019-Present)
- Committee of Undergraduate Creativity Research Academy (Fall 2014 to Fall 2018)
- Member of Diversity Committee for The College of Arts and Science (Fall 2010- Fall 2013)
- The search committee for an Inorganic Chemistry faculty position (Fall 2018)
- Captain of Material Science section and Forensic Science during the UA 2011, 2012, 2017 2018, 2021, and 2022 Science Olympiad event of arts and science
- The search committee for a Physical Chemistry faculty (Fall 2010) and Material Chemistry position (2014)

EDITORIAL BOARD MEMBER OF JOURNALS

- Editorial Board Member of Journal of Electrochemistry, ISSN (PRINT): 1006-3471. 2024-present
- Editorial Board Member of Essential Chem, Taylor & Francis Group. 2023-present
- Editorial Board Member of new journal Frontiers in Science, Technology, Engineering, and Mathematics (ISSN 2575-1387 (Print), ISSN 2575-1395 (Online)), 2017-Present.
- Editorial Review Board Member Journal of Analysis and Testing October 10, 2020-Present
- International editorial board member of The Journal of Chinese Chemistry Letter (2015-present)

EXTERNAL REVIEWERS

- Invited panel/proposal review from NSF, DOE, and ACS since 2008 (~199 proposals, *updated on Nov. 30, 2023*)
- Active reviewer of journal manuscripts and book proposals and T&P and full professor application packages

CONFERENCE ORGANIZATION AND CHAIRS

- Chair of 2022 ACS meeting Symposium "Nanostructured Colloids for Ultrasensitive Detection & Electrocatalysts", Chicago, IL, August 21-25, 2022.
- Chair of 2021 SERMACS symposiums “Photocatalysis and Electrocatalysts and Electrochemistry Methods for Clean Energy Harvesting, Conversion, and Storage”, “Energy & Fuels General” and general Analytical Chemistry session. November 10-13, 2021. Birmingham, Alabama.
- Chair of 2018 SERMACS symposium “Miniaturized Electrodes and Materials for Electrochemical Sensing, Imaging, and Energy Conversion”, Augusta Convention Center, Reynolds St, Augusta, GA 30901
- Committee member and section chair of Annual Research Symposium for Alabama State University August 15, 2017 - Present
- Symposium chair of 2018 The Southeastern Regional Meeting of the American Chemical Society (SERMACS), Augusta Convention Center, Reynolds St, Augusta, GA 30901
- Symposium chairs of “Light-Nanomaterial Interactions for Ultrasensitive Electrochemical Sensing & Imaging & Materials Chemistry”, 256th Fall 2018 National Meeting (August 19-23, 2018, Boston, MA)
- Symposium chair for 253rd ACS National Meeting (April 2-6, 2017, San Francisco), 249th ACS meeting (March 22-26, 2015, Denver, Colorado), and 245th ACS meeting (April 7-11, 2013, New Orleans, Louisiana) on plasmonics

CURRENT FUNDING SUPPORT (Total PI & Co-PI of ~$9.8 M funding since 2008)

1. Individual-Based Talent Bridge from Minority Institutions to Graduate School and Energy Industry, $998,670, National Science Foundation, 08/15/2022-08/14/27, Shanlin Pan (PI).

2. Understanding the Nanoscale Interactions of Surface Plasmon Mediated Semiconductor Surfaces with Water and Light for Renewable Energy Harvesting and Conversion, $334,641, National Science Foundation, 03/01/2022-2/28/25, Shanlin Pan (single PI).
3. Electrodeposited Layered Transition Metal Dichalcogenides for Electrochemical Desulfurization of Petroleum, $110,000, 01/3/2022-01/02/2025 ACS PRF, Shanlin Pan (single PI).

EXPIRED MAJOR FUNDING SUPPORT

4. Funding Source: The University of Alabama John Durr Elmore Professorship, PI: Shanlin Pan, Project Period: 08/16/2019-8/15/22, Funding support: $15,000
5. "Probing Interphase Chemistry and Charge Storage Mechanisms of Transition Metal Dichalcogenides Based High Energy Batteries for Electric Vehicles", UA, $30,000, 8/15/2021-9/15/2022, Shanlin Pan (PI).
6. Understanding Redox Reaction Mechanism and Dynamics at Single Nanoparticles Using ECL and Scanning Nanoelectrode with Improved Spatial and Spectral Resolution, PI: Shanlin Pan, $334,799.00, National Science Foundation, 07/15/2015-7/14/2020.
7. NSF, RII Track-2 FEC: Feeding and Powering the World - Capturing Sunlight to Split Water and Generate Fertilizer and Fuels, PI: Nathan Hammer; CoPIs: Shanlin Pan; Russell Schmehl; Charles Webster; Keith Hollis; Jared H. Delcamp, 9/01/15 – 8/31/20, $6,000,000.
8. Funding Source: The University of Alabama College of Arts and Sciences Leadership Board, PI: Shanlin Pan, Project Period: 08/16/2016-8/15/19, Funding support: $15,000
9. The NanoBio Science Partnership for the Alabama Black Belt Region, $760,625, National Science Foundation, 9/01/2011-8/31/2018, Shanlin Pan (CoPI), Janice M. Goldston (PI, Science Education), Dawen Li (CoPI), and Karen Boykin (CoPI).
10. Surface-enhanced electrode materials for solar energy conversion, $150,000 Shanlin Pan (PI), CoPIs: Aunava Gupta, Patrick Kung, Seongsin Kim, RGC-II, UA, 8/15/15-8/14/18.
11. Surface-Enhanced Solar Energy Conversion System for Advancing Alternative Energy, $420,200, National Science Foundation, 06/01/2012-05/31/16, Shanlin Pan (PI) and Arunava Gupta (CoPI).
12. Collaborative Research: Geopolymeric Nanocomposite, A Next Generation Material For Infrastructure Sustainability, National Science Foundation, Shanlin Pan (Co-PI). 05/01/2010-4/30/16 (no-cost extension), $450,000. Professor Jialai Wang (PI, Civil-UA), and Xinyu Zhang (Auburn).
13. DOE (Building EPSCoR-State/National Laboratory Partnerships: Single-Molecule Spectroelectrochemistry of Interfacial Charge Transfer Dynamics in Hybrid Organic Solar Cell, Department of Energy (DOE) single PI. $ 542,115, 08/15/10- 08/14/15.
14. The University of Alabama Research Stimulation Program for a postdoc, Understanding the organic/semiconductor interface: Modeling and characterization of functionalized titanium dioxide, $ 90,000, with Shane Street (PI), David Dixon and Kevin Shaughnessy, 12/15/2010-12/14/2012.
15. Synthesis of new dyes for organic photovoltaics, with Anthony J. Arduengo, III (PI) and David A. Dixon, $ 90,000, University of Alabama (Research Stimulation Program for a postdoc), 2012
16. College Academy for Research, Scholarship and Creative Activity (CARSCA) $8,825 (Co-PI), The Study of Enzyme Motions on a Single-Molecule Level, The University of Alabama, 05/01/2010-04/30/2011.
17. Research Grants Committee (RGC) of the University of Alabama (single PI), $5,000. Surface-enhanced photoelectrochemical system for water splitting using solar energy, 5/13/2010-5/14/2012.
18. 100 hours access to AFM and microscope of EMSL of PNNL for Spectroscopic and ultrafast dynamics study of double heterojunction hybrid organic solar cell, 10/01/2011-9/30/2012.
19. 150 hours access to AFM and microscope of EMSL of PNNL for Spectroscopic and ultrafast dynamics study of poly (3-hexylthiophene) in organic solar cell doped with graphene oxide. Single PI, 2010
20. The University of Alabama Startup Package, 08/15/2008-08/14/2010, $300,000.

TEACHING AND LEARNING EXPERIENCE

COURSES TAUGHT SINCE 2008 AND SOI RATES (*updated on Nov. 24, 2023, Weight Scale: Excellent (5) Above Average (4) Average (3) Below Average (2) Failure (1)***)**

- CH621 Fall 2023 Electrochemistry, 11 students (3 auditing) (course: 4.57, instructor: 4.57)
- CH223 Spring 2023 Quantitative Analysis, 48 students (course: 3.08, instructor: 3.54)
- CH223 Fall 2022 Quantitative Analysis, 65 students (course: 3.38, instructor: 3.69)
- CH621 Spring 2022 Electrochemistry, 11 students (course: 5.00, instructor: 5.00)
- CH102 Fall 2021 General Chemistry, 154 students (course: 3.11, instructor: 3.41)
- CH223 Spring 2021, Quantitative Analysis, 35 students (course: 3.93, instructor: 4.21)
- CH621 Fall 2020, Electrochemistry, 13 students (course: 4.75, instructor: 4.58)
- CH223 Spring 2020, Quantitative Analysis, 31 students (course: 3.11, instructor: 3.50)
- CH102, Fall 2019, General Chemistry, 179 students (course: 3.18, instructor: 3.47)
- Ch223 Spring 2019, Quantitative Analysis, 44 students (course: 3.11, instructor: 3.50)
- CH621, Fall 2018, Electrochemistry, 16 students (course: 4.60, instructor: 4.67)
- Ch223 Spring 2018, Quantitative Analysis, 40 students (course: 3.25, instructor: 3.38)
- CH223 Spring 2017, Quantitative Analysis, 41 students (course: 3.33, instructor: 3.76)
- CH621, Fall 2016, Electrochemistry, 16 students (course: 4.57, instructor: 4.75)
- CH223 Spring 2016, Quantitative analysis, 40 students (course: 3.21, instructor: 3.32)
- CH102 Fall 2015, General Chemistry, 149 students (course: 3.3, instructor: 3.46)
- CH223 Spring 2015, Quantitative analysis, 47 students (course: 3.09, instructor: 3.35)
- CH621, Fall 2014, Electrochemistry, 11 students (course: 4.5, instructor: 5.0)
- CH223, Spring 2014, Quantitative Analysis, 48 students (course: 3.48, instructor: 3.38)
- CH101 Fall 2013, General Chemistry, 188 students (course: 3.06, instructor: 3.13)
- CH223 Spring 2013, Quantitative analysis, 40 Students (course: 3.65, instructor: 3.71)
- Ch621 Fall 2012, electrochemistry, 13 students (course: 4.70, instructor: 5.00)
- CH101 Spring 2012, General Chemistry, 212 Students (course: 3.23, instructor: 3.41)
- CH101 Fall 2011, General Chemistry, 212 students (course: 3.47, instructor: 3.67)
- CH223 Spring 2011, Quantitative analysis, 34 students (course: 3.50, instructor: 3.94)
- CH621 Fall 2010, Electrochemistry, 15 students (course: 4.38, instructor: 4.77)
- CH223 Spring 2010, Quantitative analysis, 20 Students (course: 3.91, instructor: 4.45)
- CH621 Spring 2009, Electrochemistry, 16 Students (course: 3.29, instructor: 3.79)
- CH223 Fall 2008, Quantitative analysis, 49 Students (course: 3.10, instructor: 3.70)

TEACHING INITIATIVES

- Fall 2008: Certificate from Learner-Centered College Workshop Series on Learning Outcomes, Assessing Outcomes, and Evaluating Assessments
- Fall 2008-present: Implementation of iPad, Tegrity, clicker, and eLearning techniques in undergraduate classes.
- Spring 2010: Certificate from 3rd annual active & collaborative learning conference
- Certificate of completion from College Arts and Science for intensive training in utilizing quality circles to improve grant proposals.
- Certificate of completion of an 18-month research fellowship program on advanced grant-seeking skills

STUDENT AND SCHOLAR ADVISING

2008-present: 19 graduate students, 48 undergraduate students, 3 high school students, 4 visiting professors, 6 postdocs, 5 high school teachers

Graduate students (20)

Md Abdul Malek (Fall 2022-)
Shivam Rai (Fall 2023-)
Md Anwaruzzaman (Fall 2022-)
Asad Ashaduzzaman (Fall 2019-)
Isa Trevino (Fall 2021-)
Eric Wornyo (Fall 2021-)
Zhao Gao (Fall 2019-Fall 2020, Visiting graduate student)
Tyra Douglas *(Spring 2016-Spring 2018)*
Xin Kang (*Master's Degree,* Fall 2019-Summer 2021)
Michelle Benoist (*Master's Degree, Fall 2008- Spring 2011*)
Jia Liu (*Master's Degree, Fall 2011-Spring 2016*)
Dr. Xiao Li (Fall 2017-2022)
Dr. Lyndi Strange (*Summer 2016-Summer 2021*)
Dr. Jeetika Yadav (Fall 2016-Spring 2021)
Dr. Nelly Kaneza (*Fall 2014- Fall 2018*)
Dr. Wilson Yanxiao Ma (*Fall 2014- Summer 2019*)
Dr. Zhichao Shan (*Fall 2011-Summer 2016)*
Dr. Jue Wang (*Summer 2010-Summer 2015*)
Dr. Daniel Clayton (*Spring 2009-Summer 2014*)
Dr. Caleb Hill (*Summer 2009-Summer 2014*)

Postdoctoral associates (6)

Dr. Jue Wang (Spring 2016-present, from UA)
Dr. Hongwei Geng (Spring 2011-Spring 2013) from the Chinese University of Science and Technology (CUST)
Dr. Robert Bennett (Spring 2011-Spring 2013) from University of Sheffield, co-advised with Professor Shane Street
Dr. Ke Liu (Fall 2015-Spring 2016) from UCSB (currently at Intel)
Dr. Yiliyasi Wusimanjiang (Spring 2017-Summer 2018) from the University of Southern Mississippi
Dr. Pravin Shinde (Fall 2016- April 2019)

Visiting Faculties (4)

Dr. Yan Zhu (Spring 2010-spring 2011), Wuhan University of Science and Technology.
Dr. Cailing Xu (August 2011-August 2012), Lanzhou University
Dr. Jin Shi (Fall 2011-Spring 2012), KunMing University
Dr. Lillian Mathews (Summer 2017 with professor Paul Rupar group), University of Montevallo

Undergraduate Research Students (57)

Kris Kirby (Spring 2023-)
Matt Gentile (Fall 2023-)
Ana Albrecht (Fall 2022-)
Kaden Peart (Spring 2023-)
Charles Johnson (Spring 2023-)
Renee Angerer (Spring 2023-)
Benjamin Coiro (Spring 2023-)
Pieter Boer (UA, Spring 2022-Fall 2022)
Ryan Lockhart (UA, Fall 2021-Spring 2022)
Richard Broskey (UA, Fall 2021)
Burkette Moulder (UA, Fall 2021)
James Elbeck (UA, Summer 2023)
Om Hirurkar (UA, Spring 2020-Fall 2021)

Jeffrey Steltzner (UA, Fall 2019-Spring 2020)
Olivia Simmons (UA, Fall 2019-Spring 2020)
Kasey Ferguson (Undergraduate, UA, Fall 2018-Spring 2020)
Melanie Cottrell (UA, Fall 2019-Spring 2020)
Meredith Lee (Undergraduate, UA, Spring 2016-Fall 2019)
Hannah Gregg (Undergraduate, UA, Spring 2019-Fall 2019)
Hilary Walterscheid (UA, Fall 2015-Fall 2016)
Jeremy Hitt (Undergraduate, UA, Spring 2015-Spring 2017)
Dusty Trotman (UA, Fall 2015-Spring 2016)
Kieran bhattacharya(Fall 2014-Spring 2016)
Casey Dalton (emerging Scholar, Fall 2012-Fall 2015)
Scotty Rogers(Summer 2014-Fall 2015)
Qamar Tejani (Fall 2014-Spring 2016)
Marissa Leshnov (Fall 2014, Fall 2015)
Kristen Sabino (Fall 2014-Fall 2015)
Karson Brooks (Fall 2010-Spring 2013)
Stewart Herndon (Summer 2013-Spring 2014)
Jordan L. Jackson (Fall 2008)
Katherine Stovall (Fall 2011-Spring 2013)
Robert Matroni, (Fall 2010-Spring 2011)
Fraser Mole, ECTN-ACS-IREU Fellow (Summer 2011)
Mcpherson Tyler (Spring 2009-summer 2010)
Xiao Wang (Fall 2010-Spring 2012)
Rachel M. Rose (Fall 2008-Spring 2009)
Christopher Simpson (Fall 2012-Spring 2014
Chris palmer(Summer 2014-Spring 2015
Miriam Bryant (Spring 2015)
Jackson Gunter (Summer 2017-Fall 2017)
Patrick (Ryan) Randolph (Fall 2017)
Ashley Chonko (Undergraduate, UA, Fall 2016-Spring 2017)

2023 NSF Bridging EPSCoR Community Participants

Sarah Fechtali, Stillman College
Fakedria Graham, Stillman College
Aeriel Lundy, Stillman College

2019 Summer REU students

John McDonough, The University of Alabama
Megan Bruneau, The University of Alabama
Michael Murphy, The University of Alabama

2018 Summer REU students

Stephanie Spring, Houghton College

2017 Summer REU students

Victoria Arau, Gorden College
Zachary VanOrman, Hillsdale College
Jackson Gunter, The University of Alabama
Jordan Wilson, University of Montevallo

2016 Summer REU students

Jeremy Hitt (UA)
Elizabeth Dyer (Saint Francis University)
Timothy Lee (Rutgers University)
Heesoo Kim (Brown University)

<u>High School Students (6)</u>

Birdie Sun (Tuscaloosa Academy, summer 2022)

Jace Strickland (Brookwood High School, summer 2017)
Kryana Brown (Summer 2017)
Stephanie Wang, Nanoscience and Engineering High School Research Intern at MINT of UA (summer 2010)
Jada Bibb (Autaugaville High School-, summer 2016)
Mackenzie D. Rymond (Paul W. Bryant High School, summer 2016)
Robert Rainwater (May 29-July 10 2018)
Alissa Nicole (June 18-July 29, 2018);
Kayla Hawthorne (June 25-August 5, 2018)

High School Teachers (8)

Megan Liljenquist (summer 2017)
Monica Kirkman (Summer 2017)
Shari E. Jones (Summer 2009), Research Experiences for High School Teachers Program of NSF, Greensboro East High School in Greensboro of Alabama
Krystal Flantroy (Summer 2013), Northridge High School of Tuscaloosa in Alabama Felecia S. Briggins (Summer 2013, summer 2016), Greensboro East High School in Greensboro of Alabama
Shanel Lightfoot-Brown (Summer 2016), Hillcrest High School Jennifer Reynolds, (Summer 2016) Brookwood High School

PUBLICATIONS

A. *PUBLISHED FULL PATENTS*

1. Methods and Systems for Analysis, Inventors: Caleb Hill, Shanlin Pan, Patent number 11249046, issued on 2022-02-15
2. Composite Electrodes and Methods for The Fabrication and Use Thereof, inventors: Pravin Shinde, James Donahue, Arunava Gupta, Shanlin Pan, 11186917, issued on 10/28/2021

B. *REFERRED PUBLICATIONS*

3. Strange, Lyndi; Li, Xiao; Wornyo, Eric; Ashaduzzaman, Md; Pan, Shanli, "Scanning Electrochemical Microscopy for Chemical Imaging and Understanding Redox Activities of Battery Materials", *Chemical & Biomedical Imaging*, **2023**, https://doi.org/10.1021/cbmi.3c00014
4. Li, Xiao; Pan, Shanlin, "Open-Circuit Photopotential Characterization of Photoelectrochemical Activities of Au -Modified TiO2 Nanorods", *Advanced Sensor and Energy Materials*, **2023**, *Advanced Sensor and Energy Materials*, **2023,** https://doi.org/10.1016/j.asems.2023.100057.
5. Firdos Ali, Alecsander D. Mshar, Ka Ming Law, Xiao Li, A. J. Hauser, Shanlin Pan, Dawen Li & Subhadra Gupta (2023). Development of Indium-Tin Oxide Thin Films on PAMAM Dendrimer Layers for Perovskite Solar Cells Application. In: , et al. Energy Technology **2023**. TMS 2023. *The Minerals, Metals & Materials Series*. Springer, Cham. https://doi.org/10.1007/978-3-031-22638-0_3
6. Shanlin Pan, Md Ashaduzzaman, Xiao Li and Eric Wornyo*, Understanding the Nanoscale Interactions of Surface Plasmon Mediated Semiconductor Surfaces with Water and Light for Renewable Energy Harvesting and Conversion,* Current Opinion in Electrochemistry, Volume 37, February **2023**, 101174. https://doi.org/10.1016/j.coelec.2022.101174.
7. Hill, C. M. and Pan, S. SECM Techniques for Locally Interrogating the Photocatalytic Activity of Semiconducting Materials for Solar-Driven Chemical Transformations. In *Scanning Electrochemical Microscopy*, 3rd Edition; Bard, A. J. and Mirkin, M. V., Eds.; Taylor & Francis, **2022**.
8. Lyndi E. Strange, Sourav Garg, Patrick Kung, Md Ashaduzzaman, Gregory Szulczewski and Shanlin Pan, "Electrodeposited Transition Metal Dichalcogenides for Use in Hydrogen Evolution Electrocatalysts", *Journal of The Electrochemical Society*, DOI: 10.1149/1945-7111/ac4f25, **2022**, 169 026510.

9. Asad Ashaduzzaman, Xin Kang, Lyndi E. Strange, "Electrocatalytic CO_2 Reduction at Pyridine Functionalized Au Nanoparticles Supported by Nanostructured NanoCOT Electrode", **2022** *J. Electrochem. Soc.* 169 116510 DOI 10.1149/1945-7111/aca17f.
10. Shanlin Pan, Md Ashaduzzaman, Xiao Li, Lyndi E. Strange, and Yinghui Liu, "*Surface Plasmon Enabled Photoelectrochemical Water Splitting and CO_2 reduction for Chemical Fuels*", in "Photosynthesis: From Plants to Nanomaterials," Edited by Harvey J.M. Hou and Suleyman I. Allakhverdiev, Elsevier, **2022.**
11. Shanlin Pan, Xiao Li, and Jeetika Yadav, Single Nanoparticle Spectroelectrochemistry Studies Enabled by Localized Surface Plasmon Resonance, *Physical Chemistry Chemical Physics*, **2021**, https://doi.org/10.1039/D1CP02801D
12. Xiao Li, Shanlin Pan, "Transparent Ultramicroelectrodes for Studying Interfacial Charge Transfer Kinetics of Photoelectrochemical Water Oxidation at TiO2 Nanorods with Scanning Electrochemical Microscopy", Analytical Chemistry, **2021**, 93, 48, 15886-15896
13. Xiao Li, Shanlin Pan, "Quantification of Surface Reactive Oxygen Species at Co-Modified BiVO4 with Surface Interrogation Mode of Scanning Electrochemical Microscopy", *ECS Transactions*, in Renewable Fuels via Artificial Photosynthesis or Heterocatalysis 7 issue, **2021**, page 1-5.
14. Strange, Lyndi E.; Yadav, Jeetika; Li, Xiao; Pan, Shanlin, **Editors' Choice Review Article**, "Creating Electrocatalytic Heterojunctions for Efficient Photoelectrochemical CO2 Reduction to Chemical Fuels", *J. Electrochem. Soc.* https://doi.org/10.1149/1945-7111/abc841
15. Yadav, Jeetika; Liang, Qiaoli; Pan, Shanlin, "Electrogenerated Chemiluminescence and Spectroelectrochemistry Characteristics of Blue Photoluminescence Perovskite Quantum Dots", *ACS Applied Materials & Interfaces, **2020,*** https://doi.org/10.1021/acsami.0c01050
16. Yadav, Jeetika; Liang, Qiaoli; Pan, Shanlin "Electrochemical Deposition of Organometallic Halide Perovskite Single Crystal Particles with Density Gradients and Their Stability, Fluorescence, and Photoelectrochemical Properties", *Journal of Physical Chemistry C* (**2020**), https://doi.org/10.1021/acs.jpcc.0c01536
17. Strange, Lyndi E.; Yadav, Jeetika; Garg, Sourav; Shinde, Pravin S.; Hill, Joshua W.; Hill, Caleb M.; Kung, Patrick; Pan, Shanlin, "Investigating the Redox Properties of Two-Dimensional MoS2 Using Photoluminescence Spectroelectrochemistry and Scanning Electrochemical Cell Microscopy", *Journal of Physical Chemistry Letters* (**2020**), https://doi.org/10.1021/acs.jpclett.0c00769
18. Hammad Cheema, Jonathon Watson, Pravin S. Shinde, Roberta R. Rodrigues, Shanlin Pan and Jared H. Delcamp, "Precious metal-free solar-to-fuel generation: SSM-DSCs powering water splitting with NanoCOT and NiMoZn electrocatalysts", *Chem. Commun.*, **2020**, 56, 1569-1572, https://doi.org/10.1039/C9CC09209A
19. Kailu Guo Yantao Wang, Sizhuo Yang, Junfeng Huang, Zehu Zou, Hairui Pan, Pravin S.Shinde, Shanlin Pan, JierHuang and CailingXu, "Bonding interface boosts the intrinsic activity and durability of NiSe@Fe2O3 heterogeneous electrocatalyst for water oxidation", Science Bulletin, https://doi.org/10.1016/j.scib.2020.06.003, 3 June **2020**.
20. Pravin S. Shinde and Shanlin Pan, "Electrodeposition-A Versatile and Robust Technique for Synthesizing Nanostructured Materials", Chemical Methods for Processing Nanomaterials, https://doi.org/10.1201/9780429023187, Editor: *Vidya Nand Singh,* ISBN 9780367085889, CRC Press, **2020**.
21. Ma, Yanxiao; Shinde, Pravin; Li, Xiao; Pan, Shanlin, High-Throughput Screening and Surface Interrogation Studies of Au-Modified Hematite Photoanodes with Scanning Electrochemical Microscopy for Solar Water Splitting", ACS Omega, **2019**, *ACS Omega*, **2019**, http://dx.doi.org/10.1021/acsomega.9b01907.
22. Liping Guo, Pravin S. Shinde, Yanxiao Ma, Lin Li, Shanlin Pan, and Feng Yan, Submission Confirmation for Scalable Core-shell MoS2/Sb2Se3 Nanorod Array Photocathodes for Enhanced Photoelectrochemical Water Splitting, **Solar RRL**, **2019,** https://doi.org/10.1002/solr.201900442

23. Nguyen, P. X.; Garg, S.; Tse, W.-K.; Pan, S.; Kung, P.; Kim, S. M., Polarization dependent trion dynamics in large area CVD grown 2D monolayer MoS2 by terahertz time-domain spectroscopy. *Journal of Physics D: Applied Physics* **2019,** *52* (15).
24. Stephanie Spring, Pravin S. Shinde, Patricia R. Fontenot, James P. Donahue and Shanlin Pan, Self-Assembled Monolayers of Molybdenum Sulfide Clusters on Au Electrode as Hydrogen Evolution Catalyst for Solar Water Splitting, *Inorganics* **2019**, *7*(6), 79-82.
25. Kaneza, Nelly; Shinde, Pravin; Ma, Yanxiao; Pan, Shanlin, Photoelectrochemical Study of Carbon-Modified p-type Cu2O Nanoneedles and n-type TiO_{2-x} Nanorods for Z-scheme Solar Water Splitting in Tandem Cell Configuration, RSC Advances, **2019**, 9, 15495 – 15495. DOI:10.1039/C8RA09403A
26. Wusimanjiang, Y.; Yadav, J.; Arau, V.; Steen A.; Hammer, N.; Pan, S., Blue Electrogenerated Chemiluminescence from Halide Perovskite Nanocrystals, Journal of Analysis and Testing, **2019**, https://doi.org/10.1007/s41664-018-0082-4.
27. Ramasamy, Karthik; Shinde, Pravin Shripati; Naghibolashrafi, Nariman; Pan, Shanlin; Gupta, Arunava, Nanocrystals of CuMSnS4 (M = In or Ga) for Solar Energy Conversion Applications, Chemical Communications (Cambridge, United Kingdom), **2018**, DOI:10.1039/c8cc06644b.
28. Yanxiao Ma, Alton L. Highsmith, Caleb M. Hill, and Shanlin Pan, Dark Field Scattering Spectroelectrochemistry of Au Nanoparticles Modified Transparent Electrodes, Journal Physical Chemistry C, http://dx.doi.org/10.1021/acs.jpcc.8b05112, **2018.**
29. Daniel A. Clayton, Karson S. Brooks, Shanlin Pan "Single Molecule Surface-Enhanced Raman Spectroscopy of Region Regular poly (3-hexylthiophene-2, 5-diyl) on Nanostructured Silver Substrate" Frontiers in Science, Technology, Engineering, and mathematics, in print, **2018.**
30. Ashish Yengantiwar, Pravin Shinde, Shanlin Pan, and Arunava Gupta."Delafossite CuFeO2 Photocathodes Grown by Direct Liquid Injection Chemical Vapor Deposition for Efficient Photoelectrochemical Water Reduction", Journal of The Electrochemical Society, in print, **2018**. DOI: 10.1149/2.0471813jes
31. Yanxiao Ma, Alton L. Highsmith, and Shanlin Pan, Dark Field Scattering Spectroelectrochemistry of Single Au Nanoparticles at Transparent Planar and Micro-Sized Electrodes, ECS transition, **2018,** 85(13),1155-1162; DOI:10.1149/08513.1155ecst.
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OUTREACH AND EDUCATION DEVELOPMENT ACTIVITIES

1. Summer 2016 and 2017: advising 4 REU students and 5 high school teachers and student summer internship training in electrochemistry and module development.
2. New modules "Aluminum air battery","Chemiluminescence", and "Dye-sensitized Solar cell" for K12 teachers and schools, Summer 2016.
3. Providing hands-on activity for Verner Elementary students on "Solar Cell, Water Electrolysis for Hydrogen, and Hydrogen Fuel Cell" for helping students understand energy transformations and clean energy technology, Spring 2016.
4. Providing hands-on activity for Quarry Middle School students on "Solar Cell, Water Electrolysis for Hydrogen, and Hydrogen Fuel Cell" for helping students understand energy transformations and clean energy technology, Spring 2016.
5. New module development on "CO2 physical and chemical transformation and sensing" for K12 teachers and schools, Spring 2016.
6. Module development on "The Many Transformations of Energy: Generating Light from Chemical Energy" for K12 teachers and schools, Fall 2014 and SECME June 21, 2015.
7. Module presentation for MSP Annual Conference and NSF Site Visit Hosted by Tuskegee University Math and Science Partnership (MSP): A NanoBio Science Partnership for the Alabama Black Belt Region, September 26-27, 2014.
8. Module presentation and teacher training on new education module, "Alternative Energy Conversion: Photoeffect of titanium oxide and electrical energy production using solar energy", 38th Annual SECME Summer Institute, University of Alabama- Birmingham, June 21-28, 2014.
9. Module presentation and teacher training on new education module, "Nano Water Demonstration: Light Interactions with Dye Molecules and Nanomaterials", MSP NanoBio Science Days of the SECME Summer Institute (SI)-Embry-Riddle Aeronautical University (ERAU), 06/16/13-06/18/13.
10. Module presentation and teacher training on new education module "Plant's Nanomachinery for Photosynthesis and Nanotechnology for Solar Energy", January 2013, Conversion. Presentation for MSP institute. Kellogg Center, Tuskegee.
11. SECME Summer Institute Sessions for MSP Module demonstration for 6-8 grade teachers at UA. Dr. Pan has trained 37 teachers on an education module "Clean Energy: Nanoparticles, Chemical Reactions, and Light". 06/26/12 - 06/27/12.
12. Tested nanoscience module with middle-school teachers from the Black Belt at the McWane Center in Birmingham. 04/27/12.
13. Developed a new educational module for creating "Dye-Sensitized Solar Cells during the Southeast Consortium of Minorities in Engineering 35th Annual Workshop. 06/22/11 - 06/22/11.

CONFERENCE AND SEMINAR PRESENTATIONS FROM PAN GROUP SINCE 2008 (>184 TOTAL)

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