Sandhya Susarla

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Professional Preparation

Assistant Professor, Arizona State University — Phoenix, AZ, USA
School for Engineering of Matter, Transport and Energy — *Aug 2022 – Present*

Postdoctoral Scholar, Lawrence Berkeley National Laboratory — Berkeley, CA, USA
Advisor: R. Ramesh, P. Ericus — *Aug 2022 – Present*

Chateaubriand Fellowship, CNRS — Orsay, FR
Host: Odile Stephan — *Aug 2018 – May 2019*

PhD, Rice University — Houston, TX
Materials Science and Nanoengineering, Advisor: P.M. Ajayan — *Aug 2015 – Jul 2019*

Indian Institute of Technology — Varanasi, India
BTech, Metallurgical Engineering — *Aug 2011 – Jul 2015*

Honors and Awards

Scialog Fellowship, Quantum Matter and Information	2025
Albert Crewe Award, Microscopy Society of America	2025
Postdoctoral Travel Award, Microscopy Society of America	2022
DMP Postdoctoral Travel Award, American Physical Society	2022
Chateaubriand Fellow	2018
Smalley-Curl SCI-STAR Fellow	2018
Graduate Teaching Award	2017
Indian Academy of Science Undergraduate Fellow	2014

Honors and Awards (Students)

Mahir Manna, Best Poster Award Microscopy Society of America	2025
Patrick Hays, Student Scholar Award, Microscopy Society of America	2025
Mahir Manna, Student Travel Award, Pre-meeting congress	2025
Patrick Hays, Student Travel Award, Pre-meeting congress	2024
Patrick Hays, Graduate Student Government Travel Grant	2024
Patrick Hays, Best non-optical microscopy image	2024
Patrick Hays, Best image, Arizona Imaging and Microanalysis Society	2024
Patrick Hays, Graduate College travel award	2024
Patrick Hays, Graduate Student Government Travel Grant	2024
Sriram Sankar, MORE research award (declined)	2023
Sriram Sankar, Fulton Fellowship	2023
Patrick Hays, University Grad Fellowship (Summer only)	2022
Surya Prakash Reddy, MORE research award	2022
Patrick Hays, Fulton Fellowship	2022

Publications

Journal Articles (Nature family(6), Science family (4), Phys Rev family (2))

Independent Career at ASU

[1] **Anisotropic Ferroelectricity in Polar Vortices**
Piush Behera, Aiden M Ross, Nirmaan Shanker, Peter Meisenheimer, Mahir Manna, Ching-Che Lin, Shang-Lin Hsu, Isaac Harris, Pravin Kavle, Sajid Husain, Shashank K. Ojha, Sujit Das, Archana Raja, Lane W. Martin, Sandhya Susarla, Sayeef Salahuddin, Long-Qing Chen, Ramamoorthy Ramesh.
Advanced Materials 37, p. 2410149, 2025.

[2] **Electric-Field-Driven Reversal of Ferromagnetism in (110)-Oriented, Single Phase, Multiferroic Co-Substituted BiFeO3 Thin Films**
Takuma Itoh, Kei Shigematsu, Hena Das, Peter Meisenheimer, Kei Maeda, Koomok Lee, Mahir Manna, Surya Prakash Reddy, Sandhya Susarla, Paul Stevenson, Ramamoorthy Ramesh, Masaki Azuma.
Advanced Materials, p. 2419580, 2025.

[3] **Interface effects in the phase determination of Hf0. 5Zr0. 5O2 epitaxial thin films**
Jesse Schimpf, Wang Zhang, Mahir Manna, Sandhya Susarla, Xue-Zeng Lu, James M Rondinelli, Lane W Martin.
APL Materials 13, 2025.

[4] **High-Yield Delamination of Hydrothermally-Etched V2CT x**
Rose M Snyder, Sriram Sankar, Prajna Bhatt, Aysha A Riaz, Pardeep K Thakur, Tien-Lin Lee, Anna Regoutz, Sandhya Susarla, Christina S Birkel.
Inorganic chemistry 64, pp. 4761–4765, 2025.

[5] **Metallic 2D Janus SNbSe layers driven by a structural phase change**
Cheng-Lun Wu, Mohammad Y. Sayyad, Renee E. Sailus, Dibyendu Dey, Jing Xie, Patrick Hays, Jan Kopaczek, Yunbo Ou, Sandhya Susarla, Ivan S. Esqueda, Antia S. Botana, Seth A. Tongay.
Nanoscale 17, pp. 7801–7812, 2025.

[6] **Overcoming the surface paradox: Buried perovskite quantum dots in wide-bandgap perovskite thin films**
Hao Zhang, Altaf Pasha, Isaac Metcalf, Jianlin Zhou, Mathias Staunstrup, Yunxuan Zhu, Shusen Liao, Ken Ssennyimba, Jia-Shiang Chen, Surya Prakash Reddy, Simon Thébaud, Jin Hou, Xinting Shuai, Faiz Mandani, Siraj Sidhik, Matthew R. Jones, Xuedan Ma, R Geetha Balakrishna, Sandhya Susarla, David S. Ginger, Claudine Katan, Mercouri G. Kanatzidis, Moungi G. Bawendi, Douglas Natelson, Philippe Tamarat, Brahim Lounis, Jacky Even, Aditya D. Mohite.
https://arxiv.org/abs/2501.06061, 2025.

[7] **Structural and angle-resolved optical and vibrational properties of chiral trivial insulator InSeI**
Melike Erdi, Jesse Kapeghian, Patrick Hays, Medha Dandu, Daria D. Blach, Mohammed Sayyad, Jan Kopaczek, Renee Sailus, Archana Raja, Sandhya Susarla, Antia S. Botana, Seth Ariel Tongay.
Applied Physics Reviews 11, p. 041422, 2024.

[8] **Manipulating chiral spin transport with ferroelectric polarization**
Xiaoxi Huang, Xianzhe Chen, Yuhang Li, John Mangeri, Hongrui Zhang, Maya Ramesh, Hossein Taghinejad, Peter Meisenheimer, Lucas Caretta, Sandhya Susarla, Rakshit Jain, Christoph Klewe, Tianye Wang, Rui Chen, Cheng-Hsiang Hsu, Isaac Harris, Sajid Husain, Hao Pan, Jia Yin, Padraic Shafer, Ziqiang Qiu, Davi R Rodrigues, Olle Heinonen, Dilip Vasudevan, Jorge Íñiguez, Darrell G Schlom, Sayeef Salahuddin, Lane W Martin, James G Analytis, Daniel C Ralph, Ran Cheng, Zhi Yao, Ramamoorthy Ramesh.
Nature materials 23, pp. 898–904, 2024.

[9] **Emergent Ferroelectric Switching Behavior from Polar Vortex Lattice**
Piush Behera, Eric Parsonnet, Fernando Gómez-Ortiz, Vishantak Srikrishna, Peter Meisenheimer, Sandhya Susarla, Pravin Kavle, Lucas Caretta, Yongjun Wu, Zishen Tian, Abel Fernandez, Lane W. Martin, Sujit Das, Javier Junquera, Zijian Hong, Ramamoorthy Ramesh.
Advanced Materials 35, p. 2208367, 2023.

[10] **Large spin–orbit torque in bismuthate-based heterostructures**
Anthony L Edgeton, Isaac A Harris, Neil G Campbell, Yahong Chai, Marcel M Mazur, Gautam Gurung, Xiaoxi Huang, Sandhya Susarla, Evgeny Y Tsymbal, Daniel C Ralph, Tianxiang Nan, Mark S Rzchowski, Ramamoorthy Ramesh, Chang-Beom Eom.
Nature Electronics 6, pp. 973–980, 2023.

[11] **Experimental and Theoretical Studies of the Surface Oxidation Process of Rare-Earth Tritellurides**
Jan Kopaczek, Kentaro Yumigeta, Akram Ibrahim, Mohammed Y Sayyad, Shantanu Sinha, Renee Sailus, Patrick Hays, Seyed Tohid Rajaei Moosavy, Sandhya Susarla, Can Ataca.
Advanced Electronic Materials 9, p. 2201129, 2023.

[12] **Engineering relaxor behavior in (BaTiO3) n/(SrTiO3) n superlattices**
Eduardo Lupi, Robert B Wexler, Derek Meyers, Anton Zahradnik, Yizhe Jiang, Sandhya Susarla, Ramamoorthy Ramesh, Lane W Martin, Andrew M Rappe.
Advanced Materials 35, p. 2302012, 2023.

[13] **Imaging the electron charge density in monolayer MoS2 at the Ångstrom scale**
Joel Martis, Sandhya Susarla, Archith Rayabharam, Cong Su, Timothy Paule, Philipp Pelz, Cassandra Huff, Xintong Xu, Hao-Kun Li, Marc Jaikissoon, Victoria Chen, Eric Pop, Krishna Saraswat, Alex Zettl, Narayana R Aluru, Ramamoorthy Ramesh, Peter Ercius, Arun Majumdar.
Nature communications 14, p. 4363, 2023.

[14] **The emergence of three-dimensional chiral domain walls in polar vortices**
Sandhya Susarla, Shanglin Hsu, Fernando Gómez-Ortiz, Pablo García-Fernández, Benjamin H Savitzky, Sujit Das, Piush Behera, Javier Junquera, Peter Ercius, Ramamoorthy Ramesh, Colin Ophus.
Nature communications 14, p. 4465, 2023.

[15] **Uncovering polar vortex structures by inversion of multiple scattering with a stacked Bloch wave model**
Steven E Zeltmann, Shang-Lin Hsu, Hamish G Brown, Sandhya Susarla, Ramamoorthy Ramesh, Andrew M Minor, Colin Ophus.
Ultramicroscopy 250, p. 113732, 2023.

[16] **Hyperspectral imaging of exciton confinement within a moiré unit cell with a subnanometer electron probe**
Sandhya Susarla, Mit H Naik, Daria D Blach, Jonas Zipfel, Takashi Taniguchi, Kenji Watanabe, Libai Huang, Ramamoorthy Ramesh, Felipe H Jornada, Steven G Louie, Peter Ercius, Archana Raja.
Science 378, pp. 1235–1239, 2022.

Before ASU

[1] **Electric field control of chirality**
Piush Behera, Molly A May, Fernando Gómez-Ortiz, Sandhya Susarla, Sujit Das, Christopher T Nelson, Lucas Caretta, Shang-Lin Hsu, Margaret R McCarter, Benjamin H Savitzky, Edward S Barnard, Archana Raja, Zijian Hong, Pablo García-Fernandez, Stephen W Lovesey, Gerrit Laan, Peter Ercius, Colin Ophus, Lane W Martin, Javier Junquera, Markus B Raschke, Ramamoorthy Ramesh.
Science Advances 8, eabj8030, 2022.

[2] **Pervasive beyond Room-Temperature Ferromagnetism in a Doped van der Waals Magnet**
Xiang Chen, Yu-Tsun Shao, Rui Chen, Sandhya Susarla, Tom Hogan, Yu He, Hongrui Zhang, Siqi Wang, Jie Yao, Peter Ercius, David A. Muller, Ramamoorthy Ramesh, Robert J. Birgeneau.
Phys. Rev. Lett. 128, p. 217203, 2022.

[3] **Inherent Spin–Polarization Coupling in a Magnetoelectric Vortex**
Sujit Das, Valentyn Laguta, Katherine Inzani, Weichuan Huang, Junjie Liu, Ruchira Chatterjee, Margaret R McCarter, Sandhya Susarla, Arzhang Ardavan, Javier Junquera, Sinéad M Griffin, Ramamoorthy Ramesh.
Nano Letters 22, pp. 3976–3982, 2022.

[4] **Enabling ultra-low-voltage switching in BaTiO3**
Y Jiang, E Parsonnet, A Qualls, W Zhao, S Susarla, D Pesquera, A Dasgupta, M Acharya, H Zhang, T Gosavi, C.-C. Lin, D E Nikonov, H Li, I A Young, R Ramesh, L W Martin.
Nature Materials 21, pp. 779–785, 2022.

[5] **Chiral structures of electric polarization vectors quantified by X-ray resonant scattering**
Kook Tae Kim, Margaret R McCarter, Vladimir A Stoica, Sujit Das, Christoph Klewe, Elizabeth P Donoway, David M Burn, Padraic Shafer, Fanny Rodolakis, Mauro A P Gonçalves, Fernando Gómez-Ortiz, Jorge Íñiguez, Pablo García-Fernández, Javier Junquera, Sandhya Susarla, Stephen W Lovesey, Gerrit Laan, Se Young Park, Lane W Martin, John W Freeland, Ramamoorthy Ramesh, Dong Ryeol Lee.
Nature Communications 13, p. 1769, 2022.

[6] **Low temperature CVD growth of WSe2 enabled by moisture-assisted defects in the precursor powder**
Lucas M Sassi, Aravind Krishnamoorthy, Jordan A Hachtel, Sandhya Susarla, Amey Apte, Samuel Castro-Pardo, Alec Ajnsztajn, Robert Vajtai, Priya Vashishta, Chandra Sekhar Tiwary, Anand B Puthirath, Pulickel M Ajayan.
2D Materials 9, p. 045026, 2022.

[7] **Room-temperature skyrmion lattice in a layered magnet ($(Fe_{0.5}Co_{0.5})_5GeTe_2$)**

Hongrui Zhang, David Raftrey, Ying-Ting Chan, Yu-Tsun Shao, Rui Chen, Xiang Chen, Xiaoxi Huang, Jonathan T. Reichanadter, Kaichen Dong, Sandhya Susarla, Lucas Caretta, Zhen Chen, Jie Yao, Peter Fischer, Jeffrey B. Neaton, Weida Wu, David A. Muller, Robert J. Birgeneau, Ramamoorthy Ramesh.
Science Advances 8, eabm7103, 2022.

[8] **A room temperature polar magnetic metal**
Hongrui Zhang, Yu-Tsun Shao, Rui Chen, Xiang Chen, Sandhya Susarla, David Raftrey, Jonathan T. Reichanadter, Lucas Caretta, Xiaoxi Huang, Nicholas S. Settineri, Zhen Chen, Jingcheng Zhou, Edith Bourret-Courchesne, Peter Ercius, Jie Yao, Peter Fischer, Jeffrey B. Neaton, David A. Muller, Robert J. Birgeneau, Ramamoorthy Ramesh.
Phys. Rev. Mater. 6, p. 044403, 2022.

[9] **Novel spin–orbit torque generation at room temperature in an all-oxide epitaxial La0. 7Sr0. 3MnO3/SrIrO3 system**
Xiaoxi Huang, Shehrin Sayed, Joseph Mittelstaedt, Sandhya Susarla, Saba Karimeddiny, Lucas Caretta, Hongrui Zhang, Vladimir A Stoica, Tanay Gosavi, Farzad Mahfouzi, Qilong Sun, Peter Ercius, Nicholas Kioussis, Sayeef Salahuddin, Daniel C. Ralph, Ramamoorthy Ramesh.
Advanced Materials 33, p. 2008269, 2021.

[10] **Structure, Properties and Applications of Two-Dimensional Hexagonal Boron Nitride**
Soumyabrata Roy, Xiang Zhang, Anand B Puthirath, Ashokkumar Meiyazhagan, Sohini Bhattacharyya, Muhammad M Rahman, Ganguli Babu, Sandhya Susarla, Sreehari K Saju, Mai Kim Tran, Lucas M Sassi, M A S R Saadi, Jiawei Lai, Onur Sahin, Seyed Mohammad Sajadi, Bhuvaneswari Dharmarajan, Devashish Salpekar, Nithya Chakingal, Abhijit Baburaj, Xinting Shuai, Aparna Adumbumkulath, Kristen A Miller, Jessica M Gayle, Alec Ajnsztajn, Thibeorchews Prasankumar, Vijay Vedhan Jayanthi Harikrishnan, Ved Ojha, Harikishan Kannan, Ali Zein Khater, Zhenwei Zhu, Sathvik Ajay Iyengar, Pedro Alves da Silva Autreto, Eliezer Fernando Oliveira, Guanhui Gao, A Glen Birdwell, Mahesh R Neupane, Tony G Ivanov, Jaime Taha-Tijerina, Ram Manohar Yadav, Sivaram Arepalli, Robert Vajtai, Pulickel M Ajayan.
Advanced Materials 33, p. 2101589, 2021.

[11] **Corrosion Resistance of Sulfur–Selenium Alloy Coatings**
Sandhya Susarla, Govinda Chilkoor, Jawahar R Kalimuthu, M A S R Saadi, Yufei Cui, Taib Arif, Thierry Tsafack, Anand B Puthirath, Pawan Sigdel, Bharat Jasthi, Parambath M Sudeep, Leiqing Hu, Aly Hassan, Samuel Castro-Pardo, Morgan Barnes, Soumyabrata Roy, Rafael Verduzco, Md Golam Kibria, Tobin Filleter, Haiqing Lin, Santiago D Solares, Nikhil Koratkar, Venkataramana Gadhamshetty, Muhammad M Rahman, Pulickel M Ajayan.
Advanced Materials 33, p. 2104467, 2021.

[12] **Mapping modified electronic levels in the moiré patterns in MoS2/WSe2 using low-loss EELS**
Sandhya Susarla, Lucas M. Sassi, Alberto Zobelli, Steffi Y Woo, Luiz HG Tizei, Odile Stéphan, Pulickel M Ajayan.
Nano letters 21, pp. 4071–4077, 2021.

[13] **2D electrets of ultrathin moO2 with apparent piezoelectricity**
Amey Apte, Kosar Mozaffari, Farnaz Safi Samghabadi, Jordan A Hachtel, Long Chang,

Sandhya Susarla, Juan Carlos Idrobo, David C Moore, Nicholas R Glavin, Dmitri Litvinov, Pradeep Sharma, Anand B. Puthirath, Pulickel M. Ajayan.
Advanced Materials 32, p. 2000006, 2020.

[14] **Two-Dimensional Lateral Epitaxy of 2H (MoSe)–1T'(ReSe) Phases**
Amey Apte, Aravind Krishnamoorthy, Jordan A Hachtel, Sandhya Susarla, Jongwon Yoon, Palash Bharadwaj, James M Tour, Juan Carlos Idrobo, Rajiv K Kalia, Aiichiro Nakano, P. Vashishta, C.S. Tiwary, P.M. Ajayan.
Nano Letters 19, 2019.

[15] **Interface and defect engineering of hybrid nanostructures toward an efficient HER catalyst**
Sehmus Ozden, Sumit Bawari, Soumya Vinod, Ulises Martinez, Sandhya Susarla, Claudia Narvaez, Jarin Joyner, Chandra Sekhar Tiwary, Tharangattu N Narayanan, Pulickel M Ajayan.
Nanoscale 11, pp. 12489–12496, 2019.

[16] **Fiber Reinforced Layered Dielectric Nanocomposite**
Muhammad M Rahman, Anand B Puthirath, Aparna Adumbumkulath, Thierry Tsafack, Hossein Robatjazi, Morgan Barnes, Zixing Wang, Sampath Kommandur, Sandhya Susarla, Seyed Mohammad Sajadi, Devashish Salpekar, Fanshu Yuan, Ganguli Babu, Kazuki Nomoto, S M Islam, Rafael Verduzco, Shannon K Yee, Huili G Xing, Pulickel M Ajayan.
Advanced Functional Materials 29, p. 1900056, 2019.

[17] **Strain-induced structural deformation study of 2D MoxW (1-x) S2**
Sandhya Susarla, Praveena Manimunda, Ygor M Jaques, Jordan A Hachtel, Juan C Idrobo, SA Syed Asif, Douglas S Galvão, Chandra Sekhar Tiwary, Pulickel M Ajayan.
Advanced materials interfaces 6, p. 1801262, 2019.

[18] **Atomic-level alloying of sulfur and selenium for advanced lithium batteries**
Sandhya Susarla, Anand B Puthirath, Thierry Tsafack, Devashish Salpekar, Ganguli Babu, Pulickel M Ajayan.
ACS applied materials & interfaces 12, pp. 1005–1013, 2019.

[19] **High-K dielectric sulfur-selenium alloys**
Sandhya Susarla, Thierry Tsafack, Peter Samora Owuor, Anand B Puthirath, Jordan A Hachtel, Ganguli Babu, Amey Apte, BenMaan I Jawdat, Martin S Hilario, Albert Lerma, Hector A. Calderon, Francisco C. Robles Hernandez, David W. Tam, Tong Li, Andrew R. Lupini, Juan Carlos Idrobo, Jun Lou, Bingqing Wei, Pengcheng Dai, Chandra Sekhar Tiwary, Pulickel M. Ajayan.
Science advances 5, eaau9785, 2019.

[20] **Porous graphene current collectors filled with silicon as high-performance lithium battery anode**
Khalid Ababtain, Ganguli Babu, Sandhya Susarla, Hemtej Gullapalli, Nirul Masurkar, Pulickel M Ajayan, Leela Mohana Reddy Arava.
Materials Research Express 5, p. 014004, 2018.

[21] **Telluride-based atomically thin layers of ternary two-dimensional transition metal dichalcogenide alloys**
Amey Apte, Aravind Krishnamoorthy, Jordan Adam Hachtel, Sandhya Susarla, Juan Carlos Idrobo, Aiichiro Nakano, Rajiv K Kalia, Priya Vashishta, Chandra Sekhar Tiwary, Pulickel M Ajayan.

Chemistry of Materials 30, pp. 7262–7268, 2018.

[22] **Differences in the mechanical properties of monolayer and multilayer WSe2/MoSe2**
Ygor Morais Jaques, P Manimunda, Y Nakanishi, S Susarla, CF Woellner, S Bhowmick, SAS Asif, DS Galvão, CS Tiwary, PM Ajayan.
MRS advances 3, pp. 373–378, 2018.

[23] **Soft-Lithographic Patterning of Luminescent Carbon Nanodots Derived from Collagen Waste**
AshokKumar Meiyazhagan, Amir Aliyan, Anumary Ayyappan, Ines Moreno-Gonzalez, Sandhya Susarla, Sadegh Yazdi, Karina Cuanalo-Contreras, Valery N Khabashesku, Robert Vajtai, Angel A Martí, Pulickel M Ajayan.
ACS Applied Materials Interfaces 10, pp. 36275–36283, 2018.

[24] **Interconnecting Bone Nanoparticles by Ovalbumin Molecules to Build a Three-Dimensional Low-Density and Tough Material**
Peter Samora Owuor, Thierry Tsafack, Hye Yoon Hwang, Mohamed Sajadi, Seohui Jung, Tong Li, Sandhya Susarla, Bingqing Wei, Robert Vajtai, Jun Lou, Sanjit Bhowmick, Chandra Sekhar Tiwary, Pulickel M Ajayan.
ACS Applied Materials Interfaces 10, pp. 41757–41762, 2018.

[25] **Achieving Self-Stiffening and Laser Healing by Interconnecting Graphene Oxide Sheets with Amine-Functionalized Ovalbumin**
Peter Samora Owuor, Thierry Tsafack, Steven Schara, HyeYoon Hwang, Seohui Jung, Rodrigo V Salvatierra, Tong Li, Sandhya Susarla, Muqing Ren, Bingqing Wei, Robert Vajtai, James M Tour, Jun Lou, Chandra Sekhar Tiwary, Pulickel M Ajayan.
Advanced Materials Interfaces 5, p. 1800932, 2018.

[26] **Thermally Induced 2D Alloy-Heterostructure Transformation in Quaternary Alloys**
Sandhya Susarla, Jordan A. Hachtel, Xiting Yang, Alex Kutana, Amey Apte, Zehua Jin, Robert Vajtai, Juan Carlos Idrobo, Jun Lou, Boris I. Yakobson, Chandra Sekhar Tiwary, Pulickel M. Ajayan.
Advanced Materials 30, p. 1804218, 2018.

[27] **Deformation mechanisms of vertically stacked WS2/MoS2 heterostructures: the role of interfaces**
Sandhya Susarla, Praveena Manimunda, Ygor Morais Jaques, Jordan A Hachtel, Juan Carlos Idrobo, Syed Asif Syed Amnulla, Douglas Soares Galvão, Chandra Sekhar Tiwary, Pulickel M Ajayan.
ACS nano 12, pp. 4036–4044, 2018.

[28] **Molecular simulation of MoS2 exfoliation**
Guoqing Zhou, Pankaj Rajak, Sandhya Susarla, Pulickel M Ajayan, Rajiv K Kalia, Aiichiro Nakano, Priya Vashishta.
Scientific reports 8, p. 16761, 2018.

[29] **Re Doping in 2D Transition Metal Dichalcogenides as a New Route to Tailor Structural Phases and Induced Magnetism**
Vidya Kochat, Amey Apte, Jordan A. Hachtel, Hiroyuki Kumazoe, Aravind Krishnamoorthy, Sandhya Susarla, Juan Carlos Idrobo, Fuyuki Shimojo, Priya Vashishta, Rajiv Kalia, Aiichiro Nakano, Chandra Sekhar Tiwary, Pulickel M. Ajayan.

Advanced Materials 29, p. 1703754, 2017.

[30] **Nanoscale deformation and friction characteristics of atomically thin WSe2 and heterostructure using nanoscratch and Raman spectroscopy**
P Manimunda, Y Nakanishi, YM Jaques, S Susarla, CF Woellner, S Bhowmick, SAS Asif, DS Galvão, CS Tiwary, PM Ajayan.
2D Materials 4, p. 045005, 2017.

[31] **Lightweight Hexagonal Boron Nitride Foam for CO_2 Absorption**
P.S. Owuor, O.-K. Park, C.F. Woellner, A.S. Jalilov, S. Susarla, J. Joyner, S. Ozden, L. Duy, R.V. Salvatierra, R. Vajtai, J.M. Tour, J. Lou, D.S. Galvão, C.S. Tiwary, P.M. Ajayan.
ACS Nano 11, pp. 8944–8952, 2017.

[32] **Phase segregation behavior of two-dimensional transition metal dichalcogenide binary alloys induced by dissimilar substitution**
Sandhya Susarla, Vidya Kochat, Alex Kutana, Jordan A Hachtel, Juan Carlos Idrobo, Robert Vajtai, Boris I Yakobson, Chandra Sekhar Tiwary, Pulickel M Ajayan.
Chemistry of Materials 29, pp. 7431–7439, 2017.

[33] **Quaternary 2D transition metal dichalcogenides (TMDs) with tunable bandgap**
Sandhya Susarla, Alex Kutana, Jordan A Hachtel, Vidya Kochat, Amey Apte, Robert Vajtai, Juan Carlos Idrobo, Boris I Yakobson, Chandra Sekhar Tiwary, Pulickel M Ajayan.
Advanced Materials 29, p. 1702457, 2017.

Conference Proceedings

[1] **(Sub) nanoscale hyperspectral imaging of excitons in two-dimensional materials**
Medha Dandu, Sriram Sankar, Takashi Taniguchi, Kenji Watanabe, Peter Ercius, Jordan Hachtel, Mit Naik, Archana Raja, Sandhya Susarla.
2D Photonic Materials and Devices VIII, 2025.

[2] **Identification of Novel Stacking Faults in Chiral InSeI Nanowires**
Patrick Hays, Melike Erdi, Seth Ariel Tongay, Sandhya Susarla.
Microscopy and Microanalysis, 2025.

[3] **Mapping Phonons Induced by Polarization using Differential Momentum Resolved Scanning Transmission Electron Microscopy-Electron Energy Loss Spectroscopy**
Mahir Manna, Shayantan Chaudhuri, Surya Prakash Reddy, Sujit Das, Katherine Inzani, Jan Rusz, Sandhya Susarla.
Microscopy and Microanalysis, 2025.

[4] **"Seeing"(Sub) Nanoscale Moiré Excitons with meV Scale Energy Resolution**
Sriram Sankar, Medha Dandu, Patrick J Hays, Daria Blach, Takashi Taniguchi, Kenji Watanabe, Seth Ariel Tongay, Peter Ercius, Jordan A Hachtel, Mit H Naik.
Microscopy and Microanalysis, 2025.

[5] **STEM Defocus Influenced Misinterpretations in Imaging Exciton Confinements**
Sriram Sankar, Medha Dandu, Patrick J Hays, Daria Blach, Takashi Taniguchi, Kenji Watanabe, Seth Ariel Tongay, Peter Ercius, Jordan A Hachtel, Mit H Naik.
Microscopy and Microanalysis, 2025.

[6] **Mapping the spatial modulations of excitons in moiré heterostructures**

Medha Dandu, Sriram Sankar, Mit H Naik, Patrick Hays, Daria Blach, Elyse Barre, Takashi Taniguchi, Kenji Watanabe, Steven G Louie, Felipe H Jornada.
Quantum Sensing and Nano Electronics and Photonics XX, 2024.

[7] **Difficult Measurements of Materials Systems at Cryogenic Temperatures: Cryo-EELS and Cryo-4D-STEM**
Peter Ercius, Sandhya Susarla, Mit H Naik, Yujun Xie, Jingyang Wang, Archana Raja, Colin Ophus, Haimei Zheng.
, 2024.

[8] **Exploring the Structure of the Chiral, One-Dimensional Semiconductor InSeI Via High-Resolution Electron Microscopy**
Patrick Hays, Melike Erdi, Brent Nannenga, Dewight Williams, Sefaattin Tongay, Sandhya Susarla.
, 2024.

[9] **Deciphering Phonon Modes in Thin Film Ferroelectrics**
Mahir Manna, Surya Prakash Reddy, Sujit Das, Sandhya Susarla.
, 2024.

[10] **Investigation of the effect of polarization on the phonon modes in thin film ferroelectric material**
Mahir Manna, Yifan Wang, Surya Reddy, Peter Crozier, Sandhya Susarla.
APS March Meeting Abstracts, 2024.

[11] **Transmission Electron Microscopy of Formaldehyde Lead Bromide and Iodide Perovskite Quantum Dots**
Surya Prakash Reddy, Hao Zhang, Aditya D Mohite, Piyush Haluai, Sandhya Susarla.
, 2024.

[12] **In Situ Light Injection Study on Stacked WS2/WSe2/hBN Hetero-Bilayers**
Sriram Sankar, Piyush Haluai, Medha Dandu, Takashi Taniguchi, Kenji Watanabe, Archana Raja, Sandhya Susarla.
, 2024.

[13] **Room Temperature Topological Spin Textures in a van der Waals Ferromagnet Revealed by Multi-modal Lorentz Electron Microscopy**
Yu-Tsun Shao, Hongrui Zhang, Rui Chen, Xiang Chen, Sandhya Susarla, Jonathan Reichanadter, Lucas Caretta, Xiaoxi Huang, Zhen Chen, Peter Ercius.
APS March Meeting Abstracts, 2024.

[14] **Spatial and spectral signatures of intralayer moiré excitons in layered superlattices**
Medha Dandu, Jordan Hachtel, Mit Naik, Patrick Hays, Sriram Sankar, Elyse Barre, Takashi Taniguchi, Kenji Watanabe, Steven Louie, Felipe Jornada.
APS March Meeting Abstracts, 2023.

[15] **Understanding the Distribution of Rhenium Dopants in Monolayer Molybdenum Disulfide**
Patrick Hays, Mohammed Sayyad, Cheng-Lun Wu, Sefaattin Tongay, Sandhya Susarla.
, 2023.

[16] **Spatially Resolved Moiré Excitons Fine Structure Using Cryogenic Low-loss EELS**

Sriram Sankar, Patrick Hays, Medha Dandu, Mit H Naik, Elyse Barre, Takashi Taniguchi, Kenji Watanabe, Steven Louie, Felipe Jornada, Sefaattin Tongay.
, 2023.

[17] **Applications of electron energy loss spectroscopy for atomic-scale imaging of exciton and phonon dynamics in quantum materials**
Sandhya Susarla.
APS March Meeting Abstracts, 2023.

[18] **Cryogenic Electron Microscopy Challenges to Image the Nanoscale Exciton Density of States**
Sandhya Susarla.
, 2023.

[19] **Disentangling Tilt and Polarization Measurements in 4D-STEM Measurements of a Multilayer by Inversion of a Stacked Bloch Wave Model**
Steven E Zeltmann, Shang-Lin Hsu, Hamish G Brown, Sandhya Susarla, Andrew Minor, Colin Ophus.
, 2023.

[20] **Carrier doping enhanced ferromagnetism in Fe5-xGeTe2**
Xiang Chen, Yu-Tsun Shao, Rui Chen, Sandhya Susarla, Tom Hogan, Yu He, Hongrui Zhang, Siqi Wang, Jie Yao, Peter Fischer.
APS March Meeting Abstracts, 2022.

[21] **Room temperature Néel-type skyrmions in a van der Waals ferromagnet revealed by Lorentz 4D-STEM**
Yu-Tsun Shao, Hongrui Zhang, Rui Chen, Xiang Chen, Sandhya Susarla, Jonathan T Reichanadter, Lucas Caretta, Xiaoxi Huang, Nicholas S Settineri, Zhen Chen.
Microscopy and Microanalysis, 2022.

[22] **Nanoscale Imaging of moiré excitons in WS 2/WSe 2 heterostructures using low-loss EELS.**
Sandhya Susarla, Daria Blach, Mit Naik, Zhenglu Li, Johan Carlstroem, Takashi Taniguchi, Kenji Watanabe, Libai Huang, Felipe Jornada, Ramamoorthy Ramesh.
APS March Meeting Abstracts, 2022.

[23] **Atomic Scale Crystal Field Mapping of Polar Vortices in Oxide Superlattices**
Sandhya Susarla, Pablo García-Fernández, Colin Ophus, Sujit Das, Pablo Aguado-Puente, Margaret McCarter, Peter Ercius, Lane W Martin, Ramamoorthy Ramesh, Javier Junquera.
Microscopy and Microanalysis, 2022.

[24] **Probing Three-dimensional Chiral Domain Walls in Polar Vortices**
Sandhya Susarla, Shanglin Hsu, Piush Behera, Benjamin Savitzky, Sujit Das, Peter Ercius, Colin Ophus, Ramamoorthy Ramesh.
Microscopy and Microanalysis, 2022.

[25] **Temperature-and Field-Dependent Study of Magnetic Textures and Skyrmions in a Layered Van der Waals Magnet**
Reed Yalisove, Sandhya Susarla, Hongrui Zhang, Rui Chen, Xiang Chen, Robert Birgeneau, Jie Yao, Mary Scott, Ramamoorthy Ramesh.
APS March Meeting Abstracts, 2022.

[26] **Unravelling Temperature-Dependent Ordered Skyrmion Phases in Magnetic Layered Materials using Lorentz transmission Electron Microscopy**
Reed Yalisove, Sandhya Susarla, Hongrui Zhang, Rui Chen, Xiang Chen, Robert J Birgeneau, Jie Yao, Ramamoorthy Ramesh, Mary Scott.
Microscopy and Microanalysis, 2022.

[27] **Room temperature skyrmions in layered magnet**
Hongrui Zhang, Yu-Tsun Shao, Rui Chen, Xiang Chen, David Raftrey, Ying-Ting Chan, Sandhya Susarla, Weida Wu, Jie Yao, Peter Ercius.
APS March Meeting Abstracts, 2022.

[28] **Atomic scale understanding of the electronic structure of 5d-3d perovskite oxide heterostructures using STEM-EELS.**
Sandhya Susarla, Xiaoxi Huang, Shehrin Sayed, Lucas Caretta, Hongrui Zhang, Sayeef Salahuddin, Peter Ercius, Ramamoorthy Ramesh.
Microscopy and Microanalysis, 2021.

[29] **Atomic resolution crystal field splitting mapping in polar vortices oxide superlattices**
Sandhya Susarla, Sujit Das, Weichuan Huang, Colin Ophus, Peter Ercius, Ramamoorthy Ramesh.
Microscopy and Microanalysis, 2020.

[30] **Low Loss EELS of Lateral MoS2/WS2 Heterostructures**
Sandhya Susarla, Luiz Henrique Galvão Tizei, Steffi Y Woo, Alberto Zobelli, Odile Stephan, Pulickel M Ajayan.
Microscopy and Microanalysis, 2019.

[31] **Structural phase transition and magnetic behavior in two-dimensional rhenium-doped molybdenum diselenide**
Amey Anant Apte, Vidya Kochat, Jordan Hachtel, Hiroyuki Kumazoe, Aravind Krishnamoorthy, Sandhya Susarla, Juan Carlos Idrobo, Fuyuki Shimojo, Priya Vashishta, Rajiv Kalia.
APS March Meeting Abstracts, 2018.

[32] **Quaternery two dimensional transiton metal dichalcogenide alloys**
Sandhya Susarla, Alex Kutana, Jordan Hachtel, Vidya Kochat, Amey Apte, Robert Vajtai, Juan Carlos Idrobo, Boris Yakobson, Chandra Sekhar Tiwary, Pulickel Ajayan.
APS March Meeting Abstracts, 2018.

[33] **Directly Identifying Phase Segregation in 2D Quaternary Alloys**
Jordan A Hachtel, Sandhya Susarla, Vidya Kochat, Chandrasekhar Tiwary, Pulickel Ajayan, Juan Carlos Idrobo.
Microscopy and Microanalysis, 2017.

Presentations and Invited Lectures

Invited talk (PI: Susarla)

1. ARO Webinar on Quantum Materials, Virtual, May 28, 2025
2. Materials Research Society, Spring Meeting, Seattle, Washington, April 7-11, 2025
3. Materials Research Society, Spring Meeting, Seattle, Washington, April 7-11, 2025

4. 2D Photonic Materials and Devices VIII, SPIE photonics, January 25-30, 2025

5. CNMS User Meeting, Oak Ridge National Laboratory, Tennessee, August 12, 2024
Mapping exciton fine structure in two-dimensional materials at cryogenic temperatures

6. Materials Research Society, Spring Meeting, Seattle, Washington, April 22-26, 2024
Low-loss electron energy loss spectroscopy: A toolbox to understand quantum materials.

7. Electronic Materials and Applications 2024, Denver, Colorado, 2024, Feb 13–16, 2024,
Phonons in ferroelectric oxides domains.

8. Recent Progress in Graphene and 2D materials Research, Bengaluru, India, Nov. 20-23 2023
Confined Intralayer Excitons in moiré materials.

9. Microscopy and Microanalysis, Minneapolis, Minnesota, July 27, 2023
Cryogenic electron microscopy challenges to image the nanoscale exciton density of states.

10. Materials Research Society, Spring Meeting, San Francisco, April 12 2023,
Imaging excitons in semi-conducting two-dimensional heterostructures.

11. Lawrence Symposium, Arizona State University, Tempe, USA, Jan 5, 2023 *Understanding structural correlations in quantum materials*

12. Gatan Webinar, USA, Continuum with Direct Detection,
Understanding electronic correlations in quantum materials (online seminar for a worldwide audience)

13. Spence Symposium, Arizona State University, Tempe, USA,Oct 11-13, 2022
Understanding structural correlations in quantum materials

14. Molecular Foundry, Annual User Meeting, Berkeley, California, USA, Aug 18-19, 2022
Real space imaging of moiré excitons in transition metal dichalcogenides.

15. Ferroelectric Young Investigators in ISAF-ECAPD-PFM 2022, Tours, France, June 27-July 1, 2022
Understanding atomic scale electronic and physical properties in polar topologies in oxide superlattices

16. Materials Research Society (MRS), Spring Meeting, Honolulu, Hawaii, USA May 8-13, 2022
Understanding Atomic Scale Electronic and Physical Properties in Polar Topologies

17. Majumdar Group meeting, Stanford University, Palo Alto, California, April 01, 2022
Understanding electronic correlations in quantum materials

18. Materials Science Seminar, University of Illinois, Chicago, Illinois, April 6, 2022
Understanding electronic correlations in quantum materials

19. Materials Science Seminar, Arizona State University, Phoenix, March 03, 2022
Understanding electronic correlations in quantum materials

20. Materials Science Seminar, University of Pennsylvania, Philadelphia, February 23, 2022
Understanding electronic correlations in quantum materials

21. Condensed Matter Physics Seminar, Brookhaven National Laboratory (BNL), Upton, January 10, 2022
Understanding electronic correlations in quantum materials

22. Materials Science Seminar, Ohio State University, Columbus, Ohio, November 3, 2021
Understanding electronic correlations in quantum materials

23. Nano seminar, University of California, Berkeley, California, September 24, 2021
Measuring electronic correlations in quantum materials.

24. Microscopy seminar, Oak Ridge National Laboratory (ORNL), Knoxville, Tennessee, June 11, 2021
Measuring electronic correlations in quantum materials

Contributed talk (PI: Susarla)

1. Microscopy and Microanalysis, 2022, Portland, Oregon, 2022
Atomic scale crystal field mapping of polar vortices in oxide superlattices

2. Microscopy and Microanalysis, 2022, Portland, Oregon, 2022
Probing three-dimensional chiral domain walls in polar vortices

3. Materials Research Society, Fall Meeting Virtual Meeting, 2021,
Three-dimensional mapping of chiral domain walls using 4D-STEM

4. Materials Research Society, Virtual Spring Meeting, 2021,
Atomic scale crystal field splitting mapping in polar vortices oxide superlattices.

5. Microscopy and Microanalysis, Virtual Meeting, 2020
Atomic resolution crystal field splitting mapping in polar vortices oxide superlattices

6. Microscopy and Microanalysis, Portland, 2019,
Low Loss EELS of Lateral MoS2/WS2 heterostructures.

7. MRS Spring Meeting and Exhibit, 2019,
Low loss EELS of lateral confined MoS2/WS2 heterostructures.

8. MRS Spring Meeting and Exhibit 2022,
Visualizing Moiré Excitons in WS2/WSe2 Heterostructures Using Low-Loss EELS.

9. APS March Meeting, March 15-19, 2022
Nanoscale Imaging of moiré excitons in WS2/WSe2 heterostructures using low-loss EELS.

10. Materials today: Materials Science for next two decades, Rice University, Houston, Texas, 2018
Quaternary transition metal dichalcogenide alloys with tunable band gap.

11. SCI-Transdisciplinary Symposium, 2018
Synthesis of Two- dimensional Quaternary alloys

12. American Physical Society March Meeting, March 8, 2018
Quaternary two-dimensional transition metal dichalcogenide alloys.

13. American Physical Society March Meeting, March 9, 2017
Structural phase transition and magnetic behavior in two-dimensional rhenium-doped molybdenum diselenide

14. Microscopy and Microanalysis, July 2017
Directly Identifying Phase Segregation in 2D Quaternary Alloys

15. American Physical Society March Meeting, March 8, 2017
Quaternary two-dimensional transition metal dichalcogenide alloys.

Contributed talk and poster (Student from Susarla group)

1. **Poster**: Analysis of Vibrational EELS Datasets to Unravel the Nanoscale Ferroelectric-Ferroelastic Coupling in Oxides: Surya Prakash Reddy et. al., MORE symposium, 2023

2. **Poster**: Understanding atomic scale Rhenium distribution in monolayer Molybdenum Disulfide: Patrick Hays et. al.„ Microscopy and Microanalysis, Minneapolis, Minnesota 2023

3. **Poster**: Spatially resolved moiré excitons fine structure using cryogenic low-loss EELS: Sriram Sankar et. al.„ Microscopy and Microanalysis, Minneapolis, Minnesota 2023

4. **Talk**: Investigation of the effect of polarization on the phonon modes in thin film ferroelectric material: Mahir Manna et. al„ APS March Meeting, Minneapolis, Minnesota 2024

5. **Talk**: Exploring the Structure of the Chiral, One-Dimensional Semiconductor InSeI Via High-Resolution Electron Microscopy, Patrick Hays et. al., Microscopy and Microanalysis, Cleveland, Ohio 2024

6. **Poster**: Deciphering phonon modes in thin film ferroelectrics through off-axis EELS: Mahir Manna et. al., Microscopy and Microanalysis, Cleveland, Ohio 2024

7. **Poster**: In Situ Light Illumination Study on Stacked WS2/WSe2 /hBN Hetero-bilayers: Sriram Sankar et. al., Microscopy and Microanalysis, Cleveland, Ohio 2024

Professional and Leadership Service

Teaching

MSE552: Transmission electron microscopy I	Fall 2022-25
MSE 250: Structure and Properties of Materials	Spring 2024
MSE 212: Microstructure and Properties Lab	Spring 2025
MSE 451: Nanomaterials and Electronics Characterization Lab	Spring 2025

Mentorship

PhD

Patrick Hays	Fall 2022-present
Sriram Sankar	Fall 2022-present
Mahir Manna	Fall 2022-present

Masters

Surya Prakash Reddy (graduated with thesis)	Fall 2022-24
Sriram Sankar	Fall 2022-23
Kshitish Raghavedra Mujumdar (graduated with thesis)	Fall 2023-24
Ethan Wang	Fall 2024-present

Undergraduates

Badar Aladawi	Fall 2023-24
Tochukwu Anyigbo	Fall 2023-24
Nicole Lopez	Summer 2024
Siddhant Kullkarni	Fall 2024
Brandon Miller	Fall 2024
Woojin Bae	Summer 2025
Preston Yazzie	Fall 2024-present
Triston Vo	Fall 2024-present

Service

External

1. **Journal reviewer (2018-present)**: Nature, ACS Nano, Nano Letters, Carbon, Nature Communications, Applied Physics Letters, npj Computational Materials, Journal of Applied Physics, Physical Review Letters, ACS Applied Nano Materials, Physical Review B, npj 2D Materials, Advanced Materials, Physical Review Materials, Nanomaterials, Journal of Materials Science

2. **Symposium Organizer (2022-present)**: Materials Research Society (MRS) Fall meeting 2023, ASU Winter School (2022-present), Materials Research Society (MRS) Spring meeting 2024, Microscopy and Microanalysis 2024, 2026

3. **Proposal Reviewer (2022-present)**: Molecular Foundry (MF), Center for Nanophase Sciences (CNMS), AFOSR Composites Program (mailed in), NSF Ceramics Program (mailed in), DOE-BES (mailed-in), DOD-ARO (mailed in)

4. **Session Chair (2022-present)**:MRS Spring Meeting APS March Meeting, Chicago, MM, Portland, Spence Symposium, Phoenix, SPIE.

Internal

Undergraduate Curriculum Committee	Fall 2022-present
Graduate Admissions Committee	Fall 2023-24
Internal Proposal Reviewer (MORE, FURI)	Fall 2022-present
Undergraduate Defense Committee: Bryce Thornton	Fall 2023
Masters Defense Committee: Abhishek Katta	Fall 2024
Comprehensive Committee, Amirhossein Shafieizad	Fall 2024

Outreach

ASU High Resolution Electron Microscopy Winter School	Fall 2022-present
E2 Summer Camp	Summer 2023
Migrant Student Summer Academy (MSSA) Camp	Summer 2023, 24,25
Science and Engineering Experience	Fall 2023-present
Arizona Science Museum Outreach	Fall 2023
Faculty Advisor, Materials Advantage program	Fall 2024-present

Student Alumni

Tochukwu Anyigbo, UG Class of 2024	Texas Instruments
Kshitish Raghavedra Mujumdar, MS, Fall 2024	PhD student, Arizona State University
Surya Prakash Reddy, MS, Spring 2024	PhD student, University of North Texas