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R&D Staff Scientist, Oak Ridge National Laboratory, TN, USA
Affiliate Faculty & Allied Graduate Faculty, Idaho State University, ID, USA

H Index: 25

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Publications: Journals-75, Technical Reports-06, Patents-05, Conference proceedings -03, Book-01, Chapter-10

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Research Interests

Nuclear materials and fuels, additive manufacturing, nuclear, bio and physical sensors, catalysis and photocatalysis, carbon and metal oxides, nanomaterials, energy and fuels, coatings, and materials for extreme environments

Expertise:

Manufacturing: Additive manufacturing (AM), LENS, DLP, 3D printing, Electrospinning, Lithography, CVD, PECVD, Sputtering

Characterization and instruments: SEM, TEM, XRD, Nanoindentation, BET, DLS, TGA, DSC, Uv-Vis spectroscopy, Photoluminescence (PL), XPS, Instron, Rheometer

Other: Rad workers 2, Metallography, instrumentation and design, furnaces and high temperature mensurate systems

Education:

Doctor of Philosophy (Ph.D): Chemical Engineering, 2015, Indian Institute of Technology (IIT) Kanpur, U.P., India; under the supervision of Professor Ashutosh Sharma

Master of Technology (M.Tech): Materials Engineering, 2010, Indian Institute of Engineering Science and Technology, (IEST) Shibpur, West Bengal, India

Master of Science (M.Sc): Applied Physics (Specialization in Nuclear Physics), 2008, Indian Institute of Engineering Science and Technology, Shibpur, West Bengal, India

Bachelor of Science (B.Sc): Physics, 2006, University of Burdwan, West Bengal, India

Experience:

1. **Staff Scientist** (2023-present) at the Idaho National Laboratory, Idaho Falls, ID USA, in the Materials Science and Engineering Department
2. **Staff Scientist** (2019-2023) at the Idaho National Laboratory, Idaho Falls, ID USA, in the Materials Science and Engineering Department
3. **Affiliate Faculty** and **Allied Graduate Faculty** (2020-present) at the Idaho State University, Pocatello, ID in the Department of Civil and Environmental Engineering
4. **Associate Editor (2021-present)** at the Elsevier journal Sensor International
5. **Postdoctoral Fellow** (2018-2019) at Florida Atlantic University, Boca Raton, FL, USA in the Department of Ocean & Mechanical Engineering
6. **Postdoctoral Research Associate** (2015-2018) at NC State University, Raleigh, NC, USA in the Department of Chemical and Biomolecular Engineering
7. **Senior Project Associate** (2014-2015) at Indian Institutes of Technology Kanpur, UP, India, in the Department of Chemical Engineering
8. **Teaching Assistantship** (2010-2015) at Indian Institutes of Technology Kanpur in the Department of Chemical Engineering: Partial teaching in (a) Colloids and Interfacial Sciences, (b) Fabronics, (c) Nano-microfabrication and Materials Characterizations, (d) External Seminar
9. **Mentoring Students** (2010-till date) one M.Tech. student, one REU student, nine undergraduate students, and two high school students
10. **Teaching Experience:** (2018-2019) Co-Instructor for the course Engineering Design 1 for 4th year Mechanical Engineering Under Graduates
11. **Teaching Experience:** (2020-present) Teaching classes at the Idaho State University.

Achievements and Membership

Awards:

1. Best Poster Award in International Conference on Materials for Advanced Materials (ICMAT) **2013**, Singapore, organized by Materials Research Society (MRS).

2. 2nd Prize in Artistic Micrographic Contest **2014**, organized by Indian Institute of Metal, Kanpur Chapter at Indian Institute of Technology Kanpur.
3. Invention award for the patent (Invention ID: IN-875004) by Intellectual Ventures Asia, **2014**.
4. Best research presentation award by the Department of Chemical Engineering, Indian Institute of Technology Kanpur, December **2014**.
5. Malhotra Weikfield Foundation Nano Science Fellowship Award **2014** in conjunction with Bangalore INDIA NANO by Govt. of Karnataka, India and Bangalore Nano. Selected by Bharat Ratna Prof. C.N.R. Rao.
6. Best Paper Award **2018** by the international Journal *Inventions* ((ISSN 2411-5134), international scientific peer-reviewed open access journal published quarterly online by MDPI from Basel, Switzerland) for the paper "Recent Advances in the Synthesis of Metal Oxide Nanofibers and Their Environmental Remediation Applications"
7. CAES (Centre for Advanced Energy Studies), Idaho, USA collaboration finding Award for the year **2021**.
8. Idaho 40 under 40 award by the Idaho Business Review, **2022**

Professional:

1. Member of American Institutes of Chemical Engineers (AIChE): 2017 to present
2. Member of Materials Research Society (MRS): 2014-2015; 2018-Present
3. Member of American Nuclear Society (ANS): 2019-present
4. Editorial Board member: Biosensors and Bioelectronics Open Access: 2017- Present
5. Editorial Board member: Materials Science for Energy Technologies: 2021- Present
6. Editor: Lead Guest Editor for the Journal of Nanotechnology to the Special Issue "Carbon nanostructures for energy, healthcare and environment": 2018
7. Editorial Board member: Journal of Chemical Engineering and Technology (Kosmos Publishers): 2018- Present
8. Guest editor for the journal Catalysts (IF 3.6) to the special issue "Metal–Semiconductor Core–Shell Nanocatalysts: Application and Recycling": 2019- Present

9. Guest editor, Special Issue on Materials, Interfaces and Microstructural Evolution for Energy Applications: Experimental and Computational Advances, Catalysts, MDPI (IF: 3.5)
10. Guest editor, Special Issue "Hierarchical Materials for Structural Applications" Crystals, MDPI (IF: 2.404).
11. Guest editor, Special Issue on Advanced Materials and Micro-, Nanostructures for Chemical and Physical Sensors, Sensor International, ELSEVIER and KEAI publishers.
12. Guest editor, Special Issue on Smart Sensors for Intelligent Healthcare: Towards Electronic Health to Intelligent Health (E-health to I-health), Sensor International, ELSEVIER publishers.
13. Guest editor, Special Issue on Materials, Interfaces and Microstructural Evolution for Energy Applications: Experimental and Computational Advances, Materials Science for Energy Technologies, ELSEVIER and KEAI publishers.
14. Editor: Metal oxides for device application: Book for Elsevier, 2020.
15. Editor: Advanced Materials for Biomedical Applications: Book for CRC Press, 2020
16. **Associate Editor:** Elsevier journal *Sensor International*: 2021-present
17. **Associate Editor:** Frontiers in Materials, Energy Materials section: 2022-present

Publications

1. Biswal, Hrudaya Jyoti, Pandu R. Vundavilli, Kunal Mondal, Nagaraj P. Shetti, and Ankur Gupta. "ZnO/CuO nanostructures anchored over Ni/Cu tubular films via pulse electrodeposition for photocatalytic and antibacterial applications." *Materials Science for Energy Technologies* (2023).
2. Erlenbach, S., Mondal, K., Ma, J., Neumann, T. V., Ma, S., Holbery, J. D., & Dickey, M. D. Flexible-to-Stretchable Mechanical and Electrical Interconnects. *ACS Applied Materials & Interfaces*, 2023, 15 (4), 6005-6012.
3. Sana, Siva Sankar, Ramakrishna Vadde, Raj Kumar, Sai Kumar Arla, Adinarayana Reddy Somala, KSV Krishna Rao, Zhang Zhijun, Vijaya Kumar Naidu Boya, Kunal Mondal, and Narsimha Mamidi. "Eco-friendly and facile production of antibacterial zinc oxide nanoparticles from *Grewia flavescens* (*G. flavescens*) leaf extract for biomedical

applications." *Journal of Drug Delivery Science and Technology* 80 (2023): 104186.

4. Gupta, Hari Prabhat, Uttam Ghosh, Biplab Sikdar, Tanima Dutta, Jan Faigl, Venkat R. Bhethanabotla, and Kunal Mondal. "Guest Editorial Special Issue on the Role of Smart Sensing for Communicable Diseases (Including COVID-19)." *IEEE Sensors Journal* 23, no. 2 (2023): 864-864.
5. Sawkar, R.R.; Shanbhag, M.M.; Tuwar, S.M.; Mondal, K.; Shetti, N.P. Sodium Dodecyl Sulfate–Mediated Graphene Sensor for Electrochemical Detection of the Antibiotic Drug: Ciprofloxacin. *Materials* 2022, 15, 7872.
6. Sawkar, R.R.; Shanbhag, M.M.; Tuwar, S.M.; Mondal, K.; Shetti, N.P. Zinc Oxide–Graphene Nanocomposite-Based Sensor for the Electrochemical Determination of Cetirizine. *Catalysts* 2022, 12, 1166.
7. Patil, V.B.; Ilager, D.; Tuwar, S.M.; Mondal, K.; Shetti, N.P. Nanostructured ZnO-Based Electrochemical Sensor with Anionic Surfactant for the Electroanalysis of Trimethoprim. *Bioengineering* 2022, 9, 521.
8. Chorney, MP.; Hurley, BP.; Mondal, K, Khanolkar, AR; Downey, JP.; Tripathy, PK., "Transformation of a ceramic precursor to a biomedical (metallic) alloy: Part I - sinterability of Ta₂O₅ and TiO₂ mixed oxides," *Materials Science for Energy Technologies*, 2022, 5, 22, 181–188.
9. Chorney, MP, Mondal, K, Downey, JP, Tripathy, PK, On the Sintering Behavior of Nb₂O₅ and Ta₂O₅ Mixed Oxide Powders, *Materials*, 2022, 15 (14), 5036
10. Shanbhag, YM., Shanbhag, MM., Malode, SJ., Dhanalakshmi, S., Mondal, K., Shetti, NP., 2D Graphene Sheets as a Sensing Material for the Electroanalysis of Zileuton, 2022, *Catalysts* 12 (8), 867
11. Shanbhag, YM, Shanbhag, MM, Malode SJ, Dhanalakshmi, Mondal, K*, Shetti, NP, Direct and Sensitive Electrochemical Evaluation of Pramipexole Using Graphitic Carbon Nitride (gCN) Sensor, *Biosensors*, 2022, 12 (8), 552.
12. Kundu, A., Shetti, N.P., Basu, S., Mondal, K., Sharma, A., Aminabhavi, T.A., Versatile Carbon Nanofiber-Based Sensors, *ACS Appl. Bio Mater.* 2022, 5 (9), 4086–4102
13. Raut, P, Kishnani, V, Mondal, K*, Gupta, A, Jana, SC, A Review on Gel Polymer Electrolytes for Dye-Sensitized Solar Cells, *Micromachines*, 2022, 13 (5), 680
14. Beausoleil II, G.L., Parry, M.E., Mondal, K., Kwon, S., Gomez-Hurtado,

L.R., Kaoumi, D., Aguiar, J.A., Spark plasma sintered, MoNbTi-based multi-principal element alloys with Cr, V, and Zr, *Journal of Alloys and Compounds*, 2022, 927, 167083

15. Patil, VB, Malode SJ, Mangasul, SN, Tuwar, SM, Mondal, K*, Shetti, NP, An Electrochemical Electrode to Detect Theophylline Based on Copper Oxide Nanoparticles Compositated with Graphene Oxide, *Micromachines*, 2022, 13 (8), 1166
16. Chen, J.; Saeidi-Javash, M.; Palei, M.; Zeng, M.; Du, Y.; Mondal, K.; McMurtrey, MD.; Hoffman, A J.; Zhang, Y., “Printing noble metal alloy films with compositional gradient”, *Applied Materials Today*, 2022, 27, 101405.
17. Rozati, SA., Keesara, P., Mahajan, C., Mondal, K., Gupta, A., “Magnetically aligned metal-organic deposition (MOD) ink-based nickel/copper heater surfaces for enhanced boiling heat transfer”, *Applied Thermal Engineering*, 2022, 211, 118473.
18. Tripathy, Prabhat K., Mondal, K. “A Molten Salt Electrochemical Process for the Preparation of Cost-Effective p-Block (Coating) Materials,” *Crystals*, 2022, 12 (3), 385.
19. Sharma, S. Basu, S., Shetti, NP., Mondal, K., Sharma, A., Aminabhavi, TM., “Versatile Graphitized Carbon Nanofibers in Energy Applications,” *ACS Sustainable Chem. Eng.* 2022, 10, 4, 1334–1360.
20. Mondal, K.*, Islam, M., Singh, S., Sharma, A., “Fabrication of High Surface Area Microporous ZnO from ZnO/Carbon Sacrificial Composite Monolith Template,” *Micromachines*, 2022, 13 (2), 335.
21. Poblete, FR., Mondal, K., Ma, Y., Dickey, MD., Genzer, J., Zhu, Y., “Direct measurement of rate-dependent mode I and mode II traction-separation laws for cohesive zone modeling of laminated glass”, *Composite Structures* 279, 11475, 2021.
22. Free, Z., Hernandez, M., Mashal, M, Mondal, K.*, “A Review on Advanced Manufacturing for Hydrogen Storage Applications”, 2021, *Energies* 14 (24), 8513.
23. V Kishnani, V., Park, S., Nakate, UT, Mondal, K., Gupta, A, “Nano-functionalized paper-based IoT enabled devices for point-of-care testing: a review”, *Biomedical Microdevices* 24 (Article number 2), 2021.
24. V Kishnani, V., Yadav, A., Mondal, K., Gupta, A, “Palladium-Functionalized Graphene for Hydrogen Sensing Performance: Theoretical Studies” *Energies* 14 (18), 5738, 2021.

25. Verma, G., Mondal, K., Gupta, A, "Si-based MEMS resonant sensor: A review from microfabrication perspective", *Microelectronics Journal*, 2021, 105210.
26. Singla, S., Shetti, NP., Basu, S., Mondal, K., Aminabhavi, TM., Hydrogen production technologies - Membrane based separation, storage and challenges, *Journal of Environmental Management* 302 (Part A), 113963, 2021.
27. Mondal, K*, Tripathy, PK., Preparation of Smart Materials by Additive Manufacturing Technologies: A Review, *Materials* 14 (21), 6442, 2021.
28. Verma, GK, Mondal, K., Gupta, A, "Si-based MEMS Resonant Sensor: A Review from Micro-fabrication Perspective", *Microelectronics Journal* 118, 105210, 2021.
29. Kumar, R. et al. (2021) "Neurodegenerative Disorders Management: State-of-art and prospects of nano-biotechnology," *Critical Reviews in Biotechnology*, 42(8), pp. 1180–1212. Available at: <https://doi.org/10.1080/07388551.2021.1993126>.
30. Tripathy, PK., Mondal, K., Khanolkar, AR, "One-step manufacturing process for neodymium-iron (magnet-grade) master alloy", *Materials Science for Energy Technologies*, 4, 2021, 249-255
31. Mondal, K., Nunez II, L; Downey, CM, van Rooyen, IJ, "Recent advances in the thermal barrier coatings for extreme environments", *Materials Science for Energy Technologies*, 4, 2021, 208-210
32. Mondal, K., Nunez II, L; Downey, CM, van Rooyen, IJ, "Thermal Barrier Coatings Overview: Design, Manufacturing, and Applications in High-Temperature Industries", *Ind. Eng. Chem. Res.* 2021, 60, 17, 6061–6077.
34. Mondal, K., Fujimoto, K., McMurtrey, MD., "Advanced Manufacturing of Printed Melt Wire Chips for Cheap, Compact Passive In-Pile Temperature Sensors", *JOM*, (2020), DOI:10.1007/s11837-020-04426-8.
35. Mondal, K., * McMurtrey, MD., "Present status of the functional advanced micro-, nano-printings– a mini review" *Mater. Today, Chem.*, (2020), DOI: 10.1016/j.mtchem.2020.100328.
36. Kumar, R., Mondal, K., * Panda, PK., Kaushik, A., Abolhassani, R., Ahuja, R., H-G., and Mishra, YK., *J. Mater. Chem. B*, (2020), DOI: 10.1039/D0TB01559H
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38. Mondal, K., Pawar, G., McMurtrey, M. D., Sharma, A., Finetuning hierarchical energy material microstructure via high temperature material synthesis route, *Mater. Today, Che.*, (2020), DOI: 10.1016/j.mtchem.2020.100269.
39. Mondal, K., Maitra, T., Srivastava, AK., Pawar, G., McMurtrey, MD., Sharma, A., 110th Anniversary: Particle Size Effect on Enhanced Graphitization and Electrical Conductivity of Suspended Gold/Carbon Composite Nanofibers, *Ind. Eng. Chem. Res.*, (2020), DOI: 10.1021/acs.iecr.9b06592.
40. Mondal, K., Balasubramaniam, B., Gupta, A., Lahcen, Kwiatkowski, M., Carbon Nanostructures for Energy and Sensing Applications, (2019), DOI: 10.1155/2019/1454327.
41. Park, S., Nallainathan, U., Mondal, K., Sen, P., Dickey, M. D., Light-induced Buckles Localized by Polymeric Inks Printed on Bilayer Films, *Small*, (2018), DOI: 10.1002/sml.201704460.
42. Andrews, J. B., Mondal, K., Neumann, T., Dickey, M.D., Franklin, A. D., 3D Patterned Liquid Metal Contacts for Printed Carbon Nanotube Transistors, *ACS Nano*, (2018) DOI: 10.1021/acsnano.8b00909.
43. Barbee, M. H., Mondal, K., Deng, J. D., Dickey, M. D., Craig, S. L., Mechanochromic Stretchable Electronics, *ACS Appl. Mater. Interfaces*, (2018), DOI: 10.1021/acsami.8b09130.
44. #Mondal, K. Recent advances in soft e-textiles, *Inventions*, 3(2), 23, (2018).
45. Barbee, M. H., Mondal, K., Deng, J. D., Dickey, M. D., Craig, S. L., Mechanochromic Stretchable Electronics, *ACS Appl. Mater. Interfaces*, (2018), DOI: 10.1021/acsami.8b09130.
46. #Mondal, K. Recent advances in synthesis of metal-oxide nanofibers and their environmental remediation applications, *Inventions*, 2(2), 9, (2017).
47. Singh, S., Mondal, K. Sharma, A., ZnO nanoparticle fortified carbon/silica monoliths with high mechanical strength and permeability as a flow-through media for catalytic applications, *Langmuir*, 33 (31), 7692–7700, (2017).
48. Balasubramaniam, B., *, #Mondal, K., Ramasamy, K., Gadyam Palani, G. S., Iyer, N. R., Hydration Phenomena of Functionalized Carbon Nanotubes (CNT)/Cement Composites, *Fibers*, 5(4), 39 (2017).
49. Ali, M. A., Mondal, K. et al. In situ integration of graphene foam–titanium nitride-based bio-scaffolds and microfluidic structures for soil nutrient

sensors. *Lab Chip* 17, (2017), 274–285.

50. Srivastava, A. K., *Mondal, K., Mukhopadhyay, K., Prasad, N. E. & Sharma, A. Facile reduction of para-nitrophenols: catalytic efficiency of silver nanoferns in batch and continuous flow reactors. *RSC Adv* 6, 113981–113990 (2016).
51. Mondal, K., Kumar, R. & Sharma, A. Metal-oxide decorated multilayered three-dimensional (3D) porous carbon thin films for supercapacitor electrodes. *Ind. Eng. Chem. Res.* 55, (2016), 12569–12581.
52. #Mondal, K. & Sharma, A. ChemInform Abstract: Recent advances in the synthesis and application of photocatalytic metal-metal oxide core-shell nanoparticles for environmental remediation and their recycling process. *ChemInform* 47, (2016).
53. #Mondal, K. & Sharma, A. Recent advances in electrospun metal-oxide nanofiber-based interfaces for electrochemical biosensing. *RSC Adv* 6, 94595–94616 (2016).
54. #Mondal, K. & Sharma, A. Recent advances in the synthesis and application of photocatalytic metal–metal oxide core–shell nanoparticles for environmental remediation and their recycling process. *RSC Adv* 6, 83589–83612 (2016).
55. Ali, M. A. Mondal, K., et al. Microfluidic immuno-biochip for detection of breast cancer biomarkers using hierarchical composite of porous graphene and titanium dioxide nanofibers. *ACS Appl. Mater. Interfaces* 8, 20570–20582 (2016).
56. Singh, N., Mondal, K., Misra, M., Sharma, A. & Gupta, R. K. Quantum dot sensitized electrospun mesoporous titanium dioxide hollow nanofibers for photocatalytic applications. *RSC Adv* 6, 48109–48119 (2016).
57. Ali, M. A. Mondal, K., et al. Mesoporous few-layer graphene platform for affinity biosensing application. *ACS Appl. Mater. Interfaces* 8, 7646–7656 (2016).
58. Mondal, K., Ali, M. A., Srivastava, S., Malhotra, B. D. & Sharma, A. Electrospun functional micro/nanochannels embedded in porous carbon electrodes for microfluidic biosensing. *Sens. Actuators B Chem.* 229, 82–91 (2016).
59. Katiyar, S., *Mondal, K. & Sharma, A. One-step sol–gel synthesis of hierarchically porous, flow-through carbon/silica monoliths. *RSC Adv* 6, 12298–12310 (2016).
60. Gupta, A., *Mondal, K., Sharma, A. & Bhattacharya, S.

Superhydrophobic polymethylsilsesquioxane pinned one dimensional ZnO nanostructures for water remediation through photo-catalysis. *RSC Adv* 5, 45897–45907 (2015).

61. Ali, M. A., *Mondal, K., Singh, C., Dhar Malhotra, B. & Sharma, A. Anti-epidermal growth factor receptor conjugated mesoporous zinc oxide nanofibers for breast cancer diagnostics. *Nanoscale* 7, 7234–7245 (2015).
62. Khosla, R., Sharma, D. K., Mondal, K. & Sharma, S. K. Effect of electrical stress on Au/Pb (Zr 0.52 Ti 0.48) O₃ /TiO_x N_y /Si gate stack for reliability analysis of ferroelectric field effect transistors. *Appl. Phys. Lett.* 105, 152907 (2014).
63. Ali, M. A., Srivastava, S., Mondal, K., et al. A surface functionalized nanoporous titania integrated microfluidic biochip. *Nanoscale* 6, 13958–13969 (2014).
64. Mondal, K., Bhattacharyya, S. & Sharma, A. Photocatalytic degradation of naphthalene by electrospun mesoporous carbon-doped anatase TiO₂ nanofiber mats. *Ind. Eng. Chem. Res.* 53, 18900–18909 (2014).
65. Mondal, K., Ali, M. A., Agrawal, V. V., Malhotra, B. D. & Sharma, A. Highly sensitive biofunctionalized mesoporous electrospun TiO₂ nanofiber-based interface for biosensing. *ACS Appl. Mater. Interfaces* 6, 2516–2527 (2014).
66. Kundu, S., Chakraborty, A., Mondal, K. & Chandrasekhar, V. Multi-ruthenocene assemblies on an organostannoxane platform. Supramolecular signatures and conversion to (Ru–Sn) O₂. *Cryst. Growth Des.* 14, 861–870 (2014).
67. Lakhotiya, H., Mondal, K., Nagarale, R. K. & Sharma, A. Low voltage non-gassing electro-osmotic pump with zeta potential tuned aluminosilicate frits and organic dye electrodes. *RSC Adv.* 4, 28814 (2014).
68. Mondal, K., Kumar, J. & Sharma, A. Self-organized macroporous thin carbon films for supported metal catalysis. *Colloids Surf. Physicochem. Eng. Asp.* 427, 83–94 (2013).
69. Singh, P., Mondal, K. & Sharma, A. Reusable electrospun mesoporous ZnO nanofiber mats for photocatalytic degradation of polycyclic aromatic hydrocarbon dyes in wastewater. *J. Colloid Interface Sci.* 394, 208–215 (2013).
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Energy 2, 121–133 (2013).

**Conference
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71. Ali, M. A., Mondal, K. et al. Microfluidic detection of soil nitrate ions using novel electrochemical foam electrode. (2017) IEEE 30th International Conference on Micro Electromechanical Systems (MEMS), Las Vegas, NV, 2017, pp. 482-485, DOI: 10.1109/MEMSYS.2017.7863448.
72. Abd., MA, Al-Saidi, M., Lin, M., Liddle, G., Mondal, K., Engeberg, ED, "Surface Feature Recognition and Grasped Object Slip Prevention with a Liquid Metal Tactile Sensor for a Prosthetic Hand", 2020 8th IEEE RAS/EMBS International Conference for Biomedical Robotics and Biomechatronics (BioRob), Accepted on 15 August 2020. DOI: 0.1109/BioRob49111.2020.9224294.
73. Labrier, D., Ebrahimpour, A., Eidelpes, E., Johnson, DC., Mustafa Mashal, M., Mondal, K., Valuation of Novel High-Performance Concrete for Utilization in the Nuclear Industry, 2021 ANS Winter Meeting and Technology Expo at Washington, D.C.

Book

Mondal, Kunal, and Ghenadii Korotcenkov, eds. *Metal Oxides for Biomedical and Biosensor Applications*. Elsevier, 2021.

**Book
Chapters**

8. Divakaran, Anoop Mampazhasseri, and Kunal Mondal. "Metal Oxide Nanostructures for Gas Sensing Applications." In *Gas Sensors*, pp. 261-270. CRC Press, 2022.
- 7 Singh, Shiv Prakash, Sudheer Kumar Yadav, and Kunal Mondal. "What We Need to Know about Quantum Dots Nanoparticles." In *Science and Applications of Nanoparticles*, pp. 29-53. Jenny Stanford Publishing, 2022.
6. M. D., A., and Mondal, K., "Metal-oxide nanostructures for gas-sensing applications", Submitted to Springer on 22 June 2020.
5. Mondal, K., Pawar, GM., Isaac, B., Kumar, R., "Metal-oxide Nanofibers and Biosensing", Submitted to ELSEVIER in July 2020. INL/MIS-20-58725
4. Gupta A., #Mondal K., Kumar S. (2018) Role of Photo-catalysis in Water Remediation. In: Bhattacharya S., Gupta A., Gupta A., Pandey A. (eds) *Water Remediation. Energy, Environment, and Sustainability*. Springer, Singapore, DOI: 10.1007/978-981-10-7551-3_7, Print ISBN 978-981-10-7550-6.
3. 66. #Mondal K., Gupta A. (2018) Recent Advances in Carbon–Semiconductor Nanocomposites for Water Remediation. In: Bhattacharya S., Gupta A., Gupta A., Pandey A. (eds) *Water Remediation. Energy, Environment, and Sustainability*. Springer, Singapore, DOI: https://doi.org/10.1007/978-981-10-7551-3_4, Print ISBN 978-981-10-7550-6.
2. Moitra, P., #Mondal, K., *Metal-semiconductor core-shell nanostructured photocatalysts for environmental applications and their recycling process*, Elsevier, 2017, ISBN: 9780323449229.
1. Mondal, K., Sharma, A., *Photocatalytic oxidation of pollutant dyes in wastewater by TiO₂ and ZnO nano-materials—A Mini-review*, *Nanoscience & Technology for Mankind 2014*, Chapter: 5, Publisher: The National Academy of Sciences India (NASI), Editors: Ashok Misra, Jayesh R. Bellare, 2015, pp.36-72.

5. Singh, S., Mondal, K., Sharma, A., Facile synthesis of porous “flow through” monoliths with enhanced mechanical strength and permeability, Ref. No: IN 201611018954, Year: 08/2016.
4. Mondal, K., Ali, Md. A., Singh, C., Malhotra, B. D., Sharma, A., Carbon nanofiber as a template for silver nanoparticle growth: A Study of enzyme kinetics and triglyceride detection, Ref. No: IN-201611026698, Year: 08/2016.
3. Sharma, A., Katiyar, S., Mondal, K., Hierarchically porous polymer, carbon, silica, and composite carbon/silica monoliths with ultra-high BET surface area synthesized by combined templated sol-gel and micro-phase separation for applications in supported metal catalysis. Ref. No: IN-875004, Year: 06/2015.
2. Sharma, A., Katiyar, S., Mondal, K., Hierarchically porous polymer, carbon, silica, and composite carbon/silica monoliths with ultra-high BET surface area synthesized by combined templated sol-gel and micro-phase separation for applications in supported metal catalysis. Ref. No: IN-875004, Year: 06/2015.
1. Daw J, Unruh TC, Heidrich BJ, Hurley DH, Fujimoto KT, Estrada D, McMurtrey M, Mondal K, Hone L, Seifert RD, inventors; Boise State University, assignee. Sensors for passively measuring a maximum temperature of a nuclear reactor, and related methods. United States patent application US 17/303,633. 2021 Dec 23.

Technical
Reports:

- 7 Advanced manufacturing for nuclear industries, NRC review, 2021.
- 6 Initial Temperature Testing of Advanced Manufactured Melt Wire Package, INL/EXT-20-57939- Rev000, <https://www.osti.gov/biblio/1826597/>, 2021.
- 5 McMurtrey, MD., Mondal, K., Fujimoto, KT., "Sensor Fabrication by Advanced Manufacturing – Process Control and Sensor Fabrication", Advanced Sensors and Instrumentation Project Summaries, Publication date 2020-06.
- 4 Wilding; M., Davis, K., Hone, Fujimoto, KT., Mondal, K., McMurtrey, MD., and Unruh, T., "Nuclear Instrumentation - Passive Monitors", Advanced Sensors and Instrumentation Project Summaries, Publication date 2020-06.

- 3 Mondal, K., Fujimoto, KT., McMurtrey, MD "In-Pile Instrumentation: Printed Melt-Wire Chips for Cheaper, Compact Instrumentation", Update on NEET ASI Advanced Instrumentation Development Activities, Publication date 2020-03.
- 2 Mondal, K., Fujimoto, KT., McMurtrey, MD., "Non-visual analysis of miniaturized melt wire arrays for in-pile measurement of peak irradiation temperature", DOI: 10.2172/1668675, Publication date 2020-02-25.
- 1 McMurtrey, MD., Mondal K., Joseph Louis Bass, JL., Fujimoto, KT., Biaggne, A., "Report on plasma jet printer for sensor fabrication with process parameters optimized by simulation input", DOI: 10.2172/1668670 Publication date 2019-09-26.

Presentations
in
conferences

24. Kunal Mondal, Jitendra Kumar and Ashutosh Sharma, "Porous carbon structures and its application for catalysis reaction" Abstract ID- PP 16, Indo-US Bilateral Workshop on Nanoparticle Assembly: From Fundamentals to Applications, 12-14 December 2011, New Delhi, India.
23. Kunal Mondal, Ying Liu, Michael D. Dickey, and Jan Genzer, "Patterning Buckles in Polymer/Metal Thin Films by Laser Irradiation" Oral Presentation, 2017 Annual Meeting in Minneapolis, MN on October 29 – November 3, 2017
22. Kunal Mondal, Michael D Dickey, Jan Genzer, Ashutosh Sharma "Multifunctional Soft-Nano Interfaces for Energy, Environment, and Healthcare" Poster Presentation, 2017 Annual Meeting in Minneapolis, MN on October 29 – November 3, 2017
21. Sungjune Park, Kunal Mondal, Michael D Dickey "Stretchable and Soft Electrodehesion Enhanced by Liquid-Metal Subsurface Microstructures" Oral Presentation, 2017 Annual Meeting in Minneapolis, MN on October 29 – November 3, 2017
- 20 Kunal Mondal, Ying Liu, Michael D. Dickey and Jan Genzer, "Micro

- patterning by buckling of thin films” Abstract ID-16, Triangle Soft-matter Workshop, 9 May 2016, Duke University, NC, USA
19. Kunal Mondal, Ying Liu, Michael D. Dickey and Jan Genzer, “Micro patterning by buckling of thin films” Abstract ID-34, Triangle Soft-matter Workshop, 16 May 2017, University of North Carolina, Chapel Hill, NC, USA
 18. Kunal Mondal, Jitendra Kumar and Ashutosh Sharma, “Synthesis of silver nanoparticles impregnated reusable free standing hierarchically porous catalytic carbon nanofibers” Abstract ID-1855842, 2014 MRS Spring Meeting & Exhibit, April 21-25, 2014, San Francisco, California, USA.
 17. Kunal Mondal, Md. Azahar Ali, Ved V. Agrawal, Bansi D. Malhotra and Ashutosh Sharma, “Highly sensitive biofunctionalized mesoporous electrospun TiO₂ nanofiber based interface for biosensing” Abstract ID- P4, Advanced Materials: Current trends & Future Prospects, 28-31 May 2014, Manali, India.
 16. Kunal Mondal, Narendra Singh, Raju Kumar Gupta and Ashutosh Sharma, “Synthesis of TiO₂ and ZnO nanostructures and their application for wastewater treatment utilizing ultraviolet mediated photocatalytic oxidation” 4th Molecular Materials Meeting @ Singapore, 14 - 16 January 2014, Biopolis, Singapore.
 15. Kunal Mondal, Souryadeep Bhattacharyya and Ashutosh Sharma, “Naphthalene degradation by electrospun mesoporous anatase TiO₂ nanofibers as photocatalyst”, Abstract ID- P 41, International Conference on Nano Science and Technology (ICONSAT) 2014, 2-5 March 2014, Mohali, Punjab, India.
 14. Kunal Mondal, Jitendra Kumar and Ashutosh Sharma, “TiO₂ nanoparticles impregnated photocatalytic macroporous carbon films by spin coating” Abstract ID-ICMAT13-A-0998, International Conference on materials for advanced technologies 2013, from 30 June - 5 July 2013, Singapore.
 13. Kunal Mondal, Md. Azahar Ali, Ved V. Agrawal, Bansi D. Malhotra and Ashutosh Sharma, “Highly sensitive biofunctionalized mesoporous electrospun titania nanofiber based interface for biomedical application” Abstract ID- 1049, India-Japan Workshop IJWBME 2013, 13-15 December 2013, New Delhi, India.
 12. Kunal Mondal, Jitendra Kumar and Ashutosh Sharma, “Porous carbon structures and its application for catalysis reaction” Abstract ID- PP 16, Indo-

US Bilateral Workshop on Nanoparticle Assembly: From Fundamentals to Applications, 12-14 December 2011, New Delhi, India.

11. Kunal Mondal, Jitendra Kumar and Ashutosh Sharma, "Self-organized macroporous thin carbon films for supported metal catalysis" Two-Day DST Sponsored Workshop on Advanced Materials and Delivery Devices, 25-26 February 2013, Mumbai, India.
10. Kunal Mondal, Ying Liu, Michael D. Dickey and Jan Genzer, "Micro patterning by buckling of thin films" Abstract ID-16, Triangle Soft-matter Workshop, 9 May 2016, Duke University, NC, USA
9. Raudel O. Avila, Kunal Mondal and Michael D. Dickey, Liquid Metal Stability in Soft and Stretchable Micro-Channels, MRSEC REU Symposium, July 28, 2017, Duke University, NC, USA
8. Kunal Mondal, Jitendra Kumar and Ashutosh Sharma, "Synthesis of silver nanoparticles impregnated reusable free standing hierarchically porous catalytic carbon nanofibers" Abstract ID-1855842, 2014 MRS Spring Meeting & Exhibit, April 21-25, 2014, San Francisco, California, USA.
7. Kunal Mondal, Md. Azahar Ali, Ved V. Agrawal, Bansi D. Malhotra and Ashutosh Sharma, "Highly sensitive biofunctionalized mesoporous electrospun TiO₂ nanofiber based interface for biosensing" Abstract ID- P4, Advanced Materials: Current trends & Prospects, 28-31 May 2014, Manali, India.
6. Kunal Mondal, Narendra Singh, Raju Kumar Gupta and Ashutosh Sharma, "Synthesis of TiO₂ and ZnO nanostructures and their application for wastewater treatment utilizing ultraviolet mediated photocatalytic oxidation" 4th Molecular Materials Meeting @ Singapore, 14 - 16 January 2014, Biopolis, Singapore.
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3. Kunal Mondal, Md. Azahar Ali, Ved V. Agrawal, Bansi D. Malhotra and Ashutosh Sharma, “Highly sensitive biofunctionalized mesoporous electrospun titania nanofiber based interface for biomedical application” Abstract ID- 1049, India-Japan Workshop IJWBME 2013,13-15 December 2013, New Delhi, India.

1. Kunal Mondal, Jitendra Kumar and Ashutosh Sharma, “Self-organized macroporous thin carbon films for supported metal catalysis” Two-Day DST Sponsored Workshop on Advanced Materials and Delivery Devices, 25-26 February 2013, Mumbai, India.

Proposals/Funding

1. Funded award as a PI for CAES Research Development Funds: Hydrogen Storage: Total funding \$59, 000
2. Develop High Fidelity Computation Models to Calculate the Effective Material Properties of Porous Cells, LDRD20A44-177. Total finding \$90,000
3. First to failure, characterization of HEA for nuclear application. Total finding \$150,000
4. High Entropy Alloys \$30,000
5. Molten Salt characterization \$10000
6. Electrochemical reduction of metal from metal oxides \$10000 Plasma jet printing of thermoelectric materials: AMO \$30000

Mentoring and supervision

1. Intern (Zach Free (INL) and Maya Hernandez (ISU)
2. PhD student (Kuan-Yu Chen) mentoring as co-supervisor (University with Prof. Joseph Andrews of Wisconsin Madison)-

Teaching and adjunct faculty contract

Adjunct faculty at the Idaho State University in the Civil and Environmental Engineering Department since June 2020.

Invited talk

"Finetuning hierarchical energy material microstructure via high temperature material synthesis route", Carbon MEMS, Germany, September, 2021

Workshop and teaching-

"Advanced manufacturing workshop, 2021", Taught course on advanced manufacturing, Idaho State University Campus, September 2021, Idaho

Recommendations:

1. Department of Chemical Engineering, Indian Institute of Technology Kanpur, Kanpur - 208016, U.P., India, Ph.D. Supervisor: Prof. Ashutosh Sharma, (E-Mail: ashutos@iitk.ac.in)
2. Department of Chemical and Biomolecular Engineering, North Carolina State University, Engineering Building, I - Centennial Campus - 911 Partners Way, Raleigh, NC 27695-7905 NC, USA, Postdoctoral Supervisors: Prof. Jan Genzer (E-mail: jan_genzer@ncsu.edu)
3. Department of Chemical and Biomolecular Engineering, North Carolina State University, Engineering Building, I - Centennial Campus - 911 Partners Way, Raleigh, NC 27695-7905 NC, USA, Postdoctoral Supervisors: Prof. Michael D Dickey (E-mail: mddickey@ncsu.edu)