

## JOURNAL PUBLICATIONS IN 2021

Note that CoMFRE affiliates are identified by **bold** names.

### First Quarter:

- Aliseda, A., and T.J. Heindel, "X-ray flow visualization in multiphase flows," *Annual Review of Fluid Mechanics*, 53:543-567, 2021. <https://doi.org/10.1146/annurev-fluid-010719-060201>
- Alméras, E., F. Risso, O. Masbernat, and R.O. Fox, "Statistics of velocity fluctuations in a homogeneous liquid fluidized bed," *Physical Review Fluids* 6, 034301, 2021. <https://doi.org/10.1103/PhysRevFluids.6.034301>
- Barkley, S.J., J.E. Lynch, E.J. Miklaszewski, J.M. Dilger, W.F. Crespo, J.B. Michael, S. Subramaniam, and T.R. Sippel, "Microwave-assisted modulation of light emission intensity in alkali-pyrotechnic plumes," *Combust Flame* 225, 406–16, 2021. <https://doi.org/10.1016/j.combustflame.2020.11.005>
- Clarke, G.A., B.X. Hartse, A.E. Niaraki Asli, M. Taghavimehr, N. Hashemi, M.A. Shirsavar, R. Montazami, N. Alimoradi, V. Nasirian, L.J. Ouedraogo, N.N. Hashemi, "Advancement of Sensor Integrated Organ-on-Chip Devices," *Sensors* 21:1367, 2021. <https://doi.org/10.3390/s21041367>
- Culp, T.E, K. Biswajit, K.P. Brickey, M. Geitner, T.J. Zimudzi, J.D. Wilbur, S.D. Jons, A. Roy, Mou Paul, B. Ganapathysubramanian, A.L. Zydney, M. Kumar, and Enrique D. Gomez, "Nanoscale control of internal inhomogeneity enhances water transport in desalination membranes," *Science* 371, 6524:72-75, 2021. <https://doi.org/10.1126/science.abb8518>
- Ilgun, A., A. Passalacqua, and R.O. Fox, "Solution of the first-order conditional moment closure for multiphase reacting flows using quadrature-based moment methods," *Chemical Engineering Journal* 405, 127020, 2021. <https://doi.org/10.1016/j.cej.2020.127020>
- Ilgun, A., X. Hu, A. Passalacqua, R.O. Fox, F. Bertola, M. Milosevic, and F. Visscher, "CFD simulations of stirred-tank reactor for gas-liquid and gas-liquid-solid systems using OpenFOAM," *International Journal of Chemical Reactor Engineering*, 10.1515/ijcre-2019-0229, 2021. <https://doi.org/10.1515/ijcre-2019-0229>
- Nadeem, H., S. Subramaniam, K. Sinha, and T.J. Heindel, "Characterization of intruder particle motion in a bladed mixer," *Powder Technology*, 381:440-450, 2021. <https://doi.org/10.1016/j.powtec.2020.12.002>
- Pillers, R.A., and T.J. Heindel, "Dynamic Visualization of Hydrate Formation using X-ray Imaging," *Journal of Petroleum Science and Engineering*, 200, Paper 108334, 2021. <https://doi.org/10.1016/j.petrol.2020.108334>
- Shabaniverki, S., S. Xie, J. Ren, and J.J. Juárez, "Soft Ferrofluid Actuator Based on 3D-Printed Scaffold Removal," *3-D Printing and Additive Manufacturing*, online 4 Feb 2021. <https://doi.org/10.1089/3dp.2020.0012>
- Williams, K., N.N. Hashemi, M Riddley, G.A. Clarke, N. Igwe, D. Elnagib, and Reza Montazami, "Progress of graphene devices for electrochemical biosensing in electrically excitable cells." *Progress in Biomedical Engineering* 3 (2), 022003, 2021. <https://doi.org/10.1088/2516-1091/abe55b>
- Wrede, A.H., J. Luo, R. Montazami, A. Kanthasamy, N.N. Hashemi, "How do neuroglial cells respond to ultrasound induced cavitation?" *AIP Advances* 11 (1), 015314, 2021. <https://doi.org/10.1063/5.0034936>

## Second Quarter:

- Awate, D.M., C.C. Pola, G.L. Gomes and J.J. Juárez, "3D printed imaging platform for portable cell counting, "3D printed imaging platform for portable cell counting," *Analyst*, online 24 May 2021. <https://doi.org/10.1039/D1AN00778E>
- Codoni, D., G. Moutsanidis, M.-C. Hsu, Y. Bazilevs, C. Johansen, A. Korobenko, "Stabilized methods for high-speed compressible flows: toward hypersonic simulations," *Computational Mechanics*, 67:785–809, 2021. [https://ui.adsabs.harvard.edu/link\\_gateway/2021CompM..67..785C/doi:10.1007/s00466-020-01963-6](https://ui.adsabs.harvard.edu/link_gateway/2021CompM..67..785C/doi:10.1007/s00466-020-01963-6)
- Geredeli, P.G., "Bounded semigroup wellposedness for a linearized compressible flow structure PDE interaction with material derivative," *SIAM Journal on Mathematical Analysis*, 53 (2):1711-1744, 2021. <https://doi.org/10.1137/20M1345840>
- Johnson E.L., D.W. Laurence, F. Xu, C.E. Crisp, A. Mir, H.M. Burkhart, C.-H. Lee, M.-C. Hsu, "Parameterization, geometric modeling, and isogeometric analysis of tricuspid valves," *Computer Methods in Applied Mechanics and Engineering*, 384:113960, 2021. <https://doi.org/10.1016/j.cma.2021.113960>
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- Saurabh, K., B. Gao, M. Fernando, S. Xu, B. Khara, M.A. Khanwale, M.-C. Hsu, A. Krishnamurthy, H. Sundar, B. Ganapathysubramanian, "Industrial scale large eddy simulations (LES) with adaptive octree meshes using immersogeometric analysis," *Computers and Mathematics with Applications*, 97:28-44, 2021. <https://doi.org/10.1016/j.camwa.2021.05.028>
- Scheirer, N., S. Holland, A. Krishnamurthy, "Fiber layup generation on curved composite structures," *Computer-Aided Design*, 136:103031, 2021. <https://doi.org/10.1016/j.cad.2021.103031>
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- Sliefert, N., G. Li, J.B. Michael, and A.L. Yarin, "Experimental and Numerical Study of Blood Backspatter Interaction with Firearm Propellant Gases," *Physics of Fluids*, 33:043319, 2021. <https://doi.org/10.1063/5.0045219>
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- Xu, F, E.L. Johnson, C. Wang, A. Jafari, C.H. Yang, M.S. Sacks, A. Krishnamurthy, M.-C. Hsu, "Computational investigation of left ventricular hemodynamics following bioprosthetic aortic

and mitral valve replacement," *Mechanics Research Communications*, 112:103604, 2021.  
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### Third Quarter:

- Balu, A., J. Khristy, M. R. Rajanna, **A. Krishnamurthy, M. Hsu**, "Immersogeometric analysis of flow over point cloud representations of objects," US National Congress on Computational Mechanics, Page 8, 2021.
- Barkley, S. J., A.R. Lawrence, M. Zohair, O.L. Smithhisler, C.L. Pint, **J.B. Michael, T.R. Sippel**, "Smart electromagnetic thermites: GO/rGO nanoscale thermite composites with thermally switchable microwave ignitability," *ACS Applied Materials Interfaces*, vol. 13, August 2021
- Belekar, V.V., Murphy, E., Sinha, K., Ho, R., Ketterhagen, W.R., Nere, N.K., **Heindel, T.J.**, and **Subramaniam, S.**, "The next evolution of multidisciplinary collaborations between industry and academia," *AIChE Particle Technology Forum Newsletter*, Vol. 26, No. 2, Summer 2021.
- Burtnett, T.J., Morgan, T.B., Dahlstrom, T.C., Aliseda, A., and **Heindel, T.J.**, "A pressurized tank for high flow rate atomization studies," *ICLASS – 15th International Conference on Liquid Atomization and Spray Systems*, Virtual, August 29 - September 2, 2021, Submission ID: 350.
- Jignasu, A., S. Ghadai, **A. Krishnamurthy**, "Direct fused deposition modeling (FDM) additive manufacturing of voxelized CAD models, US National Congress on Computational Mechanics," Page 443, 2021.
- Khara, B., A. Balu, A. Joshi, **A. Krishnamurthy**, S. Sarkar, C. Hegde, **B. Ganapathysubramanian**, "Field solutions of parametric PDEs," US National Congress on Computational Mechanics, Page 465, 2021.
- **Kingston, T.A.**, B.D. Olson, J.A. Weibel, and S.V. Garimella, "Transient flow boiling and maldistribution characteristics in heated parallel channels induced by flow regime oscillations," *IEEE Transactions on Components, Packaging and Manufacturing Technology*, 2021.
- Pillers, R.A., and **Heindel, T.J.**, "Stereographic backlit imaging and bubble identification from a plunging jet with floor interactions," *ASME Fluids Engineering Division Summer Meeting*, Virtual, August 10-12, 2021, Paper Number: FEDSM2021-65313.
- LoCurto, A. C., M. A. Welch, **T. R. Sippel, and J. B. Michael**, "Highspeed visible supercontinuum laser absorption spectroscopy of metal oxides," *Optics Letters*, 46, 3288-3291 (2021)
- Mukherjee, S., J. K. Streit, E. Gann, K. Saurabh, D. F. Sunday, **A. Krishnamurthy, B. Ganapathysubramanian**, L. J. Richter, R. A. Vaia, D. M. DeLongchamp, "Polarized X-ray scattering measures molecular orientation in polymer-grafted nanoparticles," *Nature Communications*, 12(1):1-10.
- Rade, J., E. Herron, A. Balu, S. Sarkar, **A. Krishnamurthy**, "Physics aware machine learning for structural topology optimization," US National Congress on Computational Mechanics, Page 861, 2021.
- Saraeian, M., A. Jafari, R. Braun, **M. Hsu, A. Krishnamurthy**, "Coupled left ventricular and atrial FSI simulations with bioprosthetic valves," US National Congress on Computational Mechanics, Page 932, 2021.
- Saurabh, K., B. Gao, M. Ishii, M. Fernando, M. Khanwale, B. Khara, S. Menon, **M. Hsu, A. Krishnamurthy**, H. Sundar, **B. Ganapathysubramanian**, "Industrial scale simulations using immersogeometric analysis on Octree meshes," US National Congress on Computational Mechanics, Page 899, 2021.

- Shabaniverki, S. and **J. J. Juárez**, "Directed assembly of particles for additive manufacturing of particle-polymer composites," *Micromachines* 12, no. 8: 935, 2021.
- Shah, H., O. R. Bingol, E. Johnson, M. Rajanna, **M. Hsu, A. Krishnamurthy**, "Modeling and isogeometric analysis of thin layered structures using volumetric NURBS," *US National Congress on Computational Mechanics*, Page 839, 2021.
- Tan, K., B. Gao, C. Yang, E. Johnson, **M. Hsu, A. Krishnamurthy, A. Passalacqua, B. Ganapathysubramanian**, "An immersogeometric approach for transmission risk assessment in classrooms," *US National Congress on Computational Mechanics*, Page 894, 2021.
- Vu, V., Machicoane, N., Li, D., Morgan, T.B., **Heindel, T.J.**, Aliseda, A., and Desjardins, O., "Detailed validation of simulations of air-blast atomization against experimental shadowgraphs and radiographs," *ICLASS – 15th International Conference on Liquid Atomization and Spray Systems*, Virtual, August 29 - September 2, 2021, Submission ID: 281.
- Yang, C., K. Saurabh, H. Sundar, **A. Krishnamurthy, B. Ganapathysubramanian**, "Massively parallel implementation of the finite cell method on incomplete octrees," *US National Congress on Computational Mechanics*, Page 785, 2021.

#### Fourth Quarter:

- Balu, A., Botelho, S., Khara, B., Rao, V., Sarkar, S., Hegde, C., **Krishnamurthy, A.**, Adavani, S., Bakar **Ganapathysubramanian, B.**; Distributed multigrid neural solver on megavoxel domains, 2021 Supercomputing Conference, St. Louis, MO, November 14-19, 2021.
- Balu, A., Botelho, S., Khara, B., Rao, V., Sarkar, S., Hegde, C., **Krishnamurthy, A.**, Adavani, S., **Ganapathysubramanian, B.**; "Distributed multigrid neural solver on megavoxel domains," *Mechanistic Machine Learning and Digital Twins for Computational Science, Engineering & Technology*, Hyatt Regency Mission Bay, San Diego, CA, September 26-29, 2021.
- Belekar, V.V., Nere, N.K., Sinha, K., **Heindel, T.J.**, and **Subramaniam, S.**, "Continuum simulations of multiphase heat and mass transfer in wet granular mixtures modeled as separated phases," 2021 AIChE Annual Meeting, Boston, MA, November 7-12, 2021, Abstract #628310.
- Belekar, V.V., **Passalacqua, A.**, **Heindel, T.J.**, Sinha, K., and **Subramaniam, S.**, "Continuum simulations of granular flow near the maximum packing limit using a novel solution approach to address realizability," 2021 AIChE Annual Meeting, Boston, MA, November 7-12, 2021, Abstract #628330.
- Cho, M., Balu, A., Joshi, A., Deva Prasad, A., Khara, B., Sarkar, S., **Ganapathysubramanian, B.**, **Krishnamurthy, A.**, Hegde, C.; "Differentiable spline approximations," *Neural Information Processing Systems*, December 7-10, 2021.
- Deva Prasad, A., Balu, A., Shah, H., Sarkar, S., Hegde, C., **Krishnamurthy, A.**; NURBS-Diff: "A differentiable programming module for NURBS," *Mechanistic Machine Learning and Digital Twins for Computational Science, Engineering & Technology*, Hyatt Regency Mission Bay, San Diego, CA, September 26-29, 2021.
- Ghadai, S., Lee, X., Balu, A., Sarkar, S., **Krishnamurthy, A.**, "Multiresolution 3D CNN for learning multi-scale spatial features in CAD models," *Computer Aided Geometric Design*, 91(102038):1-13, 2021.
- Nadeem, H., Jamdagni, P., **Subramaniam, S.**, Sinha, K., and **Heindel, T.J.**, and "Mixture homogeneity measurements in a vertical bladed mixer using tracer particles," 2021 AIChE Annual Meeting, Boston, MA, November 7-12, 2021, Abstract #625043.

- Rade, J., Balu, A., Herron, E., Pathak, J., Ranade, R., Sarkar, S., **Krishnamurthy, A.**; “Algorithm consistent deep learning for structural topology optimization,” Mechanistic Machine Learning and Digital Twins for Computational Science, Engineering & Technology, Hyatt Regency Mission Bay, San Diego, CA, September 26-29, 2021.
- Rade, J., Balu, A., Herron, E., Pathak, J., Ranade, R., Sarkar, S., **Krishnamurthy, A.**, “Algorithm consistent deep learning for structural topology optimization,” Engineering Applications of Artificial Intelligence, 106(104483):1-19, 2021.
- Rade, J., Zhang, J., Sarkar, S., **Krishnamurthy, A.**, Ren, J., Sarkar, A.; “AI guided measurement of live cells using AFM,” 2021 Modeling, Estimation and Control Conference, Austin, TX, October 24-27, 2021.
- Saurabh, K., Ishii, M., Fernando, M., Gao, B., Tan, K., Hsu, M., **Krishnamurthy, A.**, Sundar, H., **Ganapathysubramanian, B.**; “Scalable adaptive PDE solvers in arbitrary domains,” 2021 Supercomputing Conference, St. Louis, MO, November 14-19, 2021.
- Shah, H., Huang, X., Bingol, O., Rajanna, M., **Krishnamurthy, A.**, “GPUaccelerated post-processing and animated volume rendering of isogeometric analysis results,” Computer-Aided Design and Applications, 19(4):779-796, 2021. doi: 10.14733/cadaps.2022.779-796